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31 July 2006

To: Recipients of FSD Circular Letters

Dear Sirs/Madams,

FSD Circular Letter No. 2/2006
Pressurization of Staircases to British Standard 5588: Part 4

This Circular Letter announces the formal implementation of the recommendations as attached with immediate effect.

According to Section 5.21 of the Code of Practice for Minimum Fire Service Installations and Equipment (COP), the provision of staircase pressurization system shall be based on the requirements of the latest edition of British Standard 5588: Part 4 (BS 5588: Part 4) with changes listed therein to suit local applications.

The 1998 edition of BS 5588: Part 4 - "Code of Practice for Smoke Control Using Pressure Differentials" incorporating Amendment No. 1 and Corrigendum No. 1 is currently in effect. It covers a wide range of technical details and a series of examples on normative applications which may not be entirely suitable for local application.

To facilitate easy understanding of the above Standard as well as to expedite the processing of related submission, a sub-working group has been formed under the Fire Safety Standard Advisory Group to study and deliberate this British Standard and the relevant requirements of the COP for the purpose of drawing up a set of comprehensive guidelines on its local applications. After a long period of review and consultation, the extent of application of BS 5588: Part 4 as specified in "Lists One" to "List Four" and the "Inspection Checklist" annexed to this Circular Letter are recommended and endorsed by the Fire Safety Standard Advisory Group.

/….P.2

In addition, your attention is also drawn to the requirements specified in Section 5.21 of the Code of Practice for Minimum Fire Service Installations and Equipment which should be read in conjunction with the attachments when designing the system.

Yours faithfully,

(CHAN Chor-kam)
for Director of Fire Services

Encl.

Recommendations of the Fire Safety Standard Advisory Group (FSSAG)
BS 5588: Part 4 1998 – Code of Practice for Smoke Control Using Pressure Differentials

Except those named in the following lists, all clauses stipulated in the subject Code of Practice including Notes, Commentary and Recommendations are to be followed: -

List One : Clauses not to be applied

List Two : Clauses to be replaced by modified conditions

Appendix I : Replacement to Figure 1 in page 9 of BS 5588, Part 4

List Three : Clauses with acceptable alternatives

List Four : Clauses to be taken as reference only

Checklist for staircase pressurization system

List One : Clauses not to be applied
(Schedule for the use of BS5588: Part 4: 1998 Incorporating Amendment No. 1 and Corrigendum No. 1)

List Item	BS Clause / Paragraph / Table (Page)	Context	Reason
1.1	Clause 5.4 Table 3 Figure 3 (Page 12 & 13)	5.4 Class C System Table 3 – Minimum pressure differentials for Class C systems Figure 3 – Design conditions for Class C systems	It is not practical to adopt these requirements in local industry.
1.2	Clause 5.5 Table 4 Figure 4 (Page 13, 14 & 15)	5.4 Class D System Table 4 – Minimum pressure differentials for Class D system Figure 4 – Design conditions for Class D systems	It is not practical to adopt these requirements in local industry.
1.3	Clause 5.6 Table 5 Figure 5 (Page 16 & 17)	5.4 Class E System Table 5 – Minimum pressure differentials for Class E system Figure 5 – Design conditions for Class C systems	It is not practical to adopt these requirements in local industry.
1.4	Clause 9.2.3.3 all paragraphs (Page 41)	9.2.3.3 Interaction with normal ventilation equipment “ The purpose of a pressurization system is .... in accordance with Annex C.”	It is not practical to adopt these requirements in local industry.

List Two : Clauses to be replaced by modified conditions
(Schedule for the use of BS5588 : Part 4 : 1998 Incorporating Amendment No. 1 and Corrigendum No. 1)

List item	BS Clause / Paragraph / Table (Page)	Context	Replaced by	Reason
2.1	Definitions Clause 3.4 (Page 2)	basement "Storey with a floor that is at some point more than 1.2 m below the highest level of ground adjacent to the outside walls."	"Basement" means Any storey of a building which is below the lower or lowest ground storey and from which any required exit route is in an upward direction	To align with the definition as stipulated in the Code of Practice of Buildings Department.
2.2	Definitions Clause 3.13 (Page 2)	fire compartment "Building or part of a building, comprising one or more rooms, spaces or storeys, constructed to prevent the spread of fire to or from another part of the same building, or to an adjoining building."	"Fire compartments" means An enclosed space in a building that is separated from all other parts of the building by enclosing construction providing a fire separation that may be required to have a fire-resisting rating.	To align with the definition as stipulated in the Code of Practice of Buildings Department.
2.3	Definitions Clause 3.37 (Page 4)	protected lobby "Circulation area consisting of a lobby enclosed with fire-resisting construction (other than any part that is an external wall of a building)"	"Protected lobby" means The intercepted approach, to a staircase or an exit route, which acts as a fire and smoke check between a storey and the staircase or the exit route, and enclosed throughout by walls and doors in accordance with the Code of Practice for Fire Resisting Construction.	To align with the definition as stipulated in the Code of Practice of Buildings Department.
2.4	Clause 5.1 Paragraph 1 & 2 (Page 8)	5.1 General "Smoke control using pressure differentials can be implemented in several different types of buildings, with differing requirements and design conditions For the purposes of this standard, the design conditions have been placed into five separate systems (classes A, B, C, D and E) and are detailed in Table 1."	5.1 General "Smoke control using pressure differentials can be implemented in two different types of buildings, with differing requirements and design conditions For the purposes of this standard, the design conditions have been placed into two separate systems (classes A & B) and are detailed in Table 1."	To suit the current practice of local building industry.

List Two : Clauses to be replaced by modified conditions
(Schedule for the use of BS5588 : Part 4 : 1998 Incorporating Amendment No. 1 and Corrigendum No. 1)

<table>
<tr><th>List item</th><th>BS Clause / Paragraph / Table (Page)</th><th>Context</th><th>Replaced by</th><th>Reason</th></tr>
<tr><td>2.5</td><td>clause 5.1
Table 1
(Page 8)</td><td>Table 1- Classification of buildings for smoke control using pressure differentials
<table><tr><td>Class</td><td>Examples</td></tr><tr><td>A</td><td>Residential, sheltered housing & buildings designed for three door protection (see 5.2)</td></tr><tr><td>B</td><td>protection of firefighting shafts (see 5.3)</td></tr><tr><td>C</td><td>Commercial premises (using simultaneous evacuation) (see 5.4)</td></tr><tr><td>D</td><td>Hotels, hostels and instructional type buildings, excluding buildings designed to meet class A (see 5.5)</td></tr><tr><td>E</td><td>Phased evacuation (see 5.6)</td></tr></table></td><td>Table 1 – Classification of protection
<table><tr><td>Class</td><td>Examples</td></tr><tr><td>A</td><td>Protection of escape (see 5.2)</td></tr><tr><td>B</td><td>Protection of firefighting shafts (see 5.3)</td></tr></table></td><td>To suit the current practice of local building industry.</td></tr>
<tr><td>2.6</td><td>clause 5.2
paragraph 1 - 4
(page 8)</td><td>Class A system
“The design conditions for blocks of flats and maisonettes ……..
Note 1……
The level of fire compartmentation ……
…….
Note 1 …….
Note 2 ……
Note 3 ……
It is unlikely…….
Note 4 …….
The air flow through ……..when :
A/. the door ……..
B/. the air release …….
C/. all doors……..
D/. all doors ……
E/. the final exit door is closed.</td><td>Class A system

“System Class “A” would be referred to Means of Escape (MOE) for local application. The technical arrangement of the inspection would be :-
a. The air flow velocity at the door of measurement on the ‘fire zone floor’ should not be less than 0.75m/s
b. The total numbers of doors to be opened when the measurement was conducted should comply with the requirements of the Code of Practice for Minimum Fire service Installations and Equipment.
c. Checking and testing on the air release required by BS5588: Part 4: 1998 from the lobby and corridor would be conducted on the ‘fire zone floor’ only.
All floors should be subject to the above tests throughout the entire staircase.</td><td>To suit the current practice of local building industry.</td></tr>
</table>

List Two : Clauses to be replaced by modified conditions
(Schedule for the use of BS5588 : Part 4 : 1998 Incorporating Amendment No. 1 and Corrigendum No. 1)

<table>
<tr><th>List item</th><th>BS Clause / Paragraph / Table (Page)</th><th>Context</th><th>Replaced by</th><th>Reason</th></tr>
<tr><td>2.6 (Cont'd)</td><td>clause 5.2 paragraph 1 - 4 (page 8)

(Cont'd)</td><td></td><td>The air flow velocity at the door of measurement on the 'fire zone floor' should not be less than 0.75m/s when :-

a. The door between the lobby/corridor and the pressurized stair is open on three consecutive levels.
b. The air release from the lobby/corridor on fire zone is open;
c. All doors between the pressurized stair and the lobbies/corridors are closed on all other storeys.
d. The final exit door is open.</td><td></td></tr>
<tr><td>2.7</td><td>Figure 1 (page 9)</td><td>Figure 1-Design conditions for class A systems</td><td>Figure 1-Design conditions for class A systems (see Appendix I)</td><td>To suit the current practice of local building industry.</td></tr>
<tr><td>2.8</td><td>Clause 6.3 Table 6 (page 19)</td><td>Table 6 – Minimum temperature/time design criteria for fans and HVAC ductwork used for air/smoke release
<table>
<tr><th colspan="3">Features of building design</th><th rowspan="2">Min Temp and time design criteria</th></tr>
<tr><th>Phased evacuation</th><th>fire fighting shaft</th><th>Life safety sprinklers</th></tr>
<tr><td>Yes</td><td>No</td><td>No</td><td>600°C for 2 h</td></tr>
<tr><td>Yes</td><td>Yes</td><td>No</td><td>600°C for 2 h</td></tr>
<tr><td>Yes</td><td>Yes</td><td>Yes</td><td>300°C for 2 h</td></tr>
<tr><td>Yes</td><td>No</td><td>Yes</td><td>300°C for 2 h</td></tr>
<tr><td>No</td><td>No</td><td>Yes</td><td>300°C for 1 h</td></tr>
<tr><td>No</td><td>No</td><td>No</td><td>600°C for 2 h</td></tr>
<tr><td>No</td><td>Yes</td><td>Yes</td><td>300°C for 2 h</td></tr>
<tr><td>No</td><td>Yes</td><td>No</td><td>600°C for 2 h</td></tr>
</table></td><td>Table 6 – Minimum temperature/time design criteria for fans and HVAC ductwork used for air/smoke release
<table>
<tr><th colspan="3">Features of protection</th><th rowspan="2">Min Temp and time design criteria</th></tr>
<tr><th>Means of escape</th><th>Means of fire fighting</th><th>Sprinklers building</th></tr>
<tr><td>Yes</td><td>-</td><td>No</td><td>600°C for 2 h</td></tr>
<tr><td>Yes</td><td>-</td><td>Yes</td><td>250°C for 1 h</td></tr>
<tr><td>-</td><td>Yes</td><td>No</td><td>600°C for 2 h</td></tr>
<tr><td>-</td><td>Yes</td><td>Yes</td><td>250°C for 1 h</td></tr>
</table></td><td>To suit the current practice of local building industry.</td></tr>
</table>

List Two : Clauses to be replaced by modified conditions
(Schedule for the use of BS5588 : Part 4 : 1998 Incorporating Amendment No. 1 and Corrigendum No. 1)

List item	BS Clause / Paragraph / Table (Page)	Context	Replaced by	Reason
2.9	Clause 6.5 Paragraph 4 (page 20)	"The indicator lights should show the status of each smoke control zone, primary and emergency power supplies, and primary and stand-by fans."	"The indicator lights should show the true status of each staircase pressurization system, the following items should be included :- a. Power supplies status of each staircase pressurization system (including duty & standby fan (for duplicate fan), duty & standby motor (for single fan), air release fan & etc b. Control status of each staircase pressurization system (when operated in local control mode at local fan panel, auto control mode & local control mode at supervisory panel.) c. Status of probe type detector. d. Running status of duty & standby staircase pressurization fan (running, stop, fault) or e. Running status of duty & standby motor for single fan (running, stop, fault) f. Running status of air release fan"	To align with the definition as stipulated in the Code of Practice of Fire Services Department.

List Two : Clauses to be replaced by modified conditions
(Schedule for the use of BS5588 : Part 4 : 1998 Incorporating Amendment No. 1 and Corrigendum No. 1)

<table>
<tr><th>List item</th><th>BS Clause / Paragraph / Table (Page)</th><th>Context</th><th>Replaced by</th><th>Reason</th></tr>
<tr>
<td>2.10</td>
<td>Clause 6.4
Table 7
(page 19)</td>
<td>Table 7 Provision of standby pressure differential system equipment
<table>
<tr><td>Function of pressure differential system equipment</td><td>Equipment to be provided</td></tr>
<tr><td>To provide air under pressure to the escape routes within a building</td><td>Duplicate fans complete with motors</td></tr>
<tr><td>To extract air/smoke from the accommodation area and is the sole means of creating the pressure differential within the escape routes from a building</td><td>Duplicate fans complete with motors</td></tr>
<tr><td>The powered air release system equipment extracts air/smoke from the accommodation area and is not the sole means of creating the pressure differentia within the escape routes from a building</td><td>At least single fans with duplicate motors</td></tr>
</table>
</td>
<td>Table 7 Provision of standby pressure differential system equipment
<table>
<tr><td>Function of pressure differential system equipment</td><td>Equipment to be provided</td></tr>
<tr><td>For sleeping risk premises, I.e. Hotels, Hospitals and where designated by the Director of Fire services, with a single pressurized staircase. [Note]</td><td>Duplicate fans complete with motors</td></tr>
<tr><td>For buildings with more than one pressurized staircase [Note]</td><td>Single fans with duplicate motors fully belted and/or connected up shall be provided</td></tr>
<tr><td>To extract air/smoke from the accommodation area and is the sole means of creating the pressure differential within the escape routes from a building</td><td>Duplicate fans complete with motors</td></tr>
<tr><td>The powered air release system equipment extracts air/smoke from the accommodation area and is not the sole means of creating the pressure differential within the escape routes from a building</td><td>At least single fans with duplicate motors</td></tr>
</table>
Note : Except for sleeping risk premises, the total air requirement for each pressurized staircase is made up from two or more separate supplies acting together (e.g. top and bottom plants), than no further duplication of equipment is necessary.
</td>
<td>To align with the definition as stipulated in the Code of Practice of Fire Services Department.</td>
</tr>
</table>

List Two : Clauses to be replaced by modified conditions
(Schedule for the use of BS5588 : Part 4 : 1998 Incorporating Amendment No. 1 and Corrigendum No. 1)

List item	BS Clause / Paragraph / Table (Page)	Context	Replaced by	Reason
2.11	Clause 7 Paragraph 6 (page 20)	"Where a pressure differential system is required to protect both : a. The means of escape prior to the arrival of the fire brigade (Class A, C, D or E systems); and b. The fire brigade during firefighting operations (Class B system)"	"Where a pressure differential system is required to protect both : a. The means of escape prior to the arrival of the fire brigade (Class A system); and b. The fire brigade during firefighting operations (Class B system)"	To align with the amendment in list item 2.5.
2.12	Clause 7 Paragraph 8 (page 20)	"The enforcing authority may agree that the pressure differential system should be started automatically on detection of smoke within space in the: a. Means of escape mode (Class A, C, D or E systems) and subsequently, on arrival of the fire brigade…….operational mode (Class B system); or b. Firefighting mode (Class B system), with no subsequent change of operation of the system."	"The enforcing authority may agree that the pressure differential system should be started automatically on detection of smoke within space in the: a. Means of escape mode (Class A system) and subsequently, on arrival of the fire brigade .. …… …….operational mode (Class B system); or b. Firefighting mode (Class B system), with no subsequent change of operation of the system."	To align with the amendment in list item 2.5.
2.13	Clause 7 Paragraph 9 (page 20)	"Manual system-override switches for the pressurization system should be situated at the following locations: a. The building services plant room and the pressure differential system equipment plant room (where separate); and Where b. Near the building entrance at a location agree with the fire authority"	"Manual system-override switches for the pressurization system should be situated at the following locations: a. The pressure differential system equipment plant room; and Where b. Near the building entrance at a location agree with the fire authority or Staircase pressurization supervisory panel at the F.S. control room"	To suit the current practice of local building industry.

List Two : Clauses to be replaced by modified conditions
(Schedule for the use of BS5588 : Part 4 : 1998 Incorporating Amendment No. 1 and Corrigendum No. 1)

List item	BS Clause / Paragraph / Table (Page)	Context	Replaced by	Reason
2.14	Clause 8.2 Paragraph 1 (page 21)	"8.2 Primary power supplies All primary power supplies to the following should originate from the point at which the power supply enters the building and should be independent of the main switched fuse of the building"	"8.2 Primary power supplies All primary power supplies to the following should originate from the point at which the power supply enters the building and should be independent of other circuits from main switchboard of the building"	To suit the current practice of local building industry.
2.15	Clause 8.2 Paragraph 7 (page 21)	"The supply to these isolating protective devices should be independent of the main power switch for the building and should be appropriately labelled in accordance with 16.2 of BS 5839-1:1988"	"The supply to these isolating protective devices should be independent of other circuits from main switchboard for the building and should be appropriately labelled in accordance with 16.2 of BS 5839-1:1988."	To suit the current practice of local building industry.
2.16	Clause 8.4 All paragraphs (page 22)	"8.4 Secondary power supplies "It is essential that a secondary power supply…… …… ……. …… …..and fire protection installations."	"8.4 Secondary power supplies The provision of secondary power supply shall be complied with HKFSD Circular Letter No.4/96 Part IX and HKFSD Circular Letter No.1/2000. Note1- the original paragraphs are only used for reference."	To align with the requirements as stipulated under FSD Circular Letter No 4/96 & 1/2000.
2.17	Clause 9.1.3 Paragraph 1 (page 27)	"9.1.3 Minimum pressure differentials To ensure that a system performs……. ……. during a fire. The minimum pressure difference required can depend on the nature of the building and its usage (see clause 5). See also 5.2, 5.3, 5.4, 5.5 and 5.6 for the values of minimum pressure differential appropriate to design and to acceptance testing."	"9.1.3 Minimum pressure differentials To ensure that a system performs……. ……. during a fire. The minimum pressure difference required can depend on the nature of the building and its usage (see clause 5). See also 5.2 and 5.3 for the values of minimum pressure differential appropriate to design and to acceptance testing."	To align with the amendment in list item 2.5.

List Two : Clauses to be replaced by modified conditions
(Schedule for the use of BS5588 : Part 4 : 1998 Incorporating Amendment No. 1 and Corrigendum No. 1)

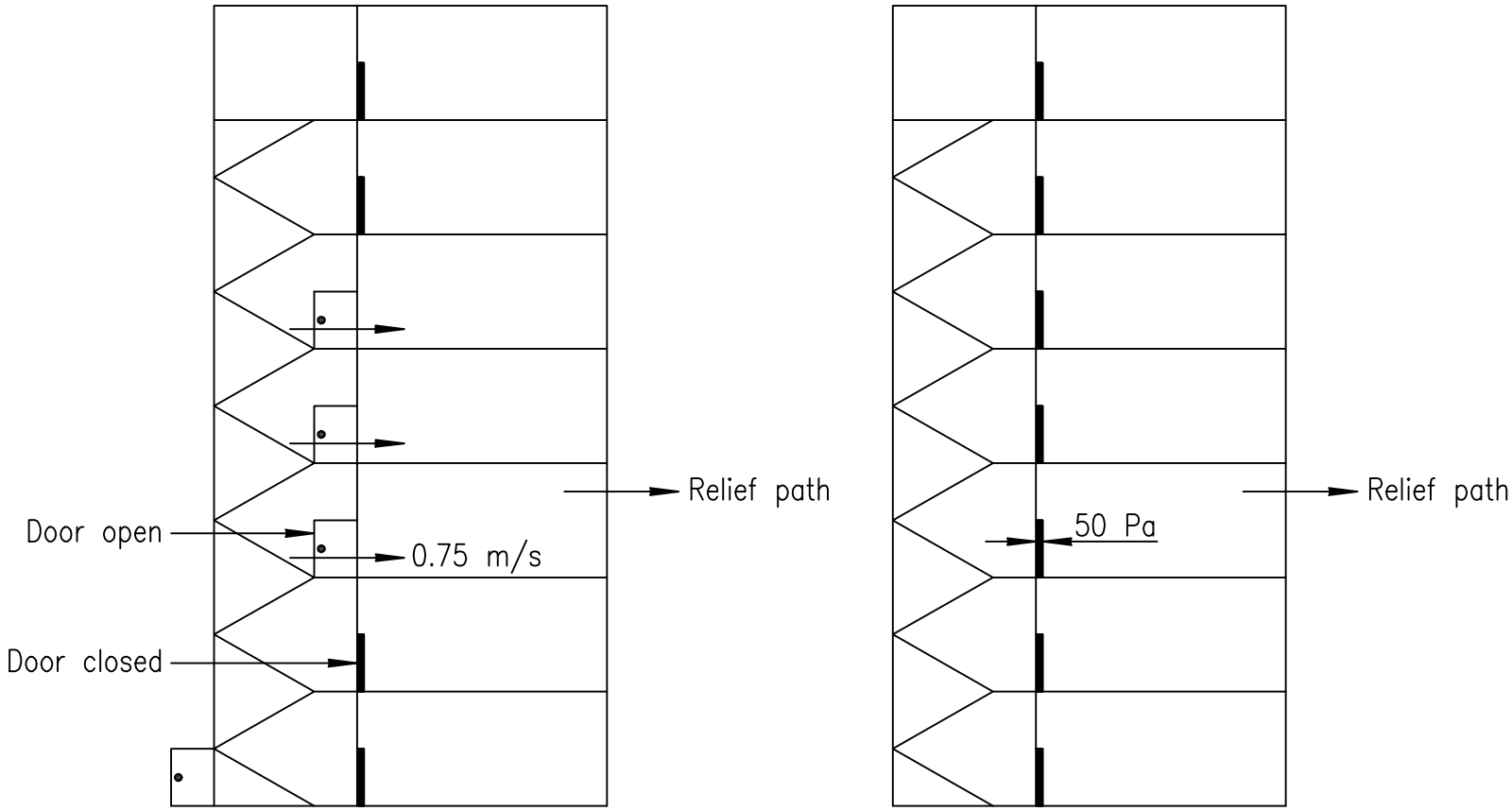
List item	BS Clause / Paragraph / Table (Page)	Context	Replaced by	Reason
2.18	Clause 9.2.2.2 Paragraph 3 (page 35)	"For this method, the stair should be designed to be approached directly from the accommodation or through a simple lobby."	"For this method, the stair should be designed to be approached directly from the accommodation or through a simple lobby. The maximum door opening force for the simple lobby from accommodation also limited to 100N."	To limit the opening force of simple lobby door for practical reason.
2.19	Clause 11.1 Paragraph 7 (page 49)	"The ductwork construction should be in accordance with appropriate guidance such as HVCA publication DW/142. Adhesive tape should not be used to seal joints."	"The ductwork construction should be in accordance with appropriate guidance such as HVCA publication DW/144. Adhesive tape should not be used to seal joints."	To align with the current edition of publication.
2.20	Clause 11.1 Paragraph 11 (page 50)	"Where air intake is not at roof level a smoke detector should be provided in the intake duct or within the immediate vicinity of the supply ductwork in order to cause the automatic shut down of the pressure differential system if substantial quantities of smoke are present in the supply. An override switch to reopen the closed damper should be provided for fire brigade use in the positions stated in clause 7."	"A smoke detector should be provided in the intake duct or within the immediate vicinity of the supply ductwork in order to cause the automatic shut down of the staircase pressurization system if substantial quantities of smoke are present in the supply. An override switch to resume the staircase pressurization system should be provided for fire brigade use in the positions stated in clause 7."	To suit the current practice of local building industry.
2.21	Clause 12.1 Paragraph 3 (page 51)	"The entire pressure differential……. …for the specified class (see 5.2, 5.3, 5.4, 5.5 and 5.6), and secondly…… … ……..when a door is opened between the spaces."	"The entire pressure differential……. …for the specified class (see 5.2 and 5.3), and secondly ……..…… …… ……..when a door is opened between the spaces."	To align with the amendment in list-item 2.5.

List Two : Clauses to be replaced by modified conditions
(Schedule for the use of BS5588 : Part 4 : 1998 Incorporating Amendment No. 1 and Corrigendum No. 1)

List item	BS Clause / Paragraph / Table (Page)	Context	Replaced by	Reason
2.22	Clause 12.1 Paragraph 4 (page 51)	"The acceptance test should conform to the following recommendations: a/. When tested in accordance…….…. …….that specified in 5.2, 5.3, 5.4, 5.5 and 5.6; b/. when tested in accordance…….. …..not exceed 100N (applied at the door handle); c/. when tested in accordance…….. ..that specified in 5.2, 5.3, 5.4, 5.5 and 5.6."	"The acceptance test should conform to the following recommendations: a/. When tested in accordance…….…. …….that specified in 5.2 and 5.3; b/. when tested in accordance…….. …..not exceed 100N (applied at the door handle); c/. when tested in accordance…….. ..that specified in 5.2 and 5.3."	To align with the amendment in list item 2.5.
2.23	Clause 12.1 Paragraph 5 (page 51)	"All test equipment should be accurate to ± 5%. The calibration of all test equipment…….. ……, in the UK, are the responsibility of the National Physical Laboratory."	"All test equipment should be accurate to ± 2%. The calibration of all test equipment…….. ……, in the UK, are the responsibility of the National Physical Laboratory."	To align with the definition as stipulated in the Code of Practice of Fire Services Department.

List Two : Clauses to be replaced by modified conditions
(Schedule for the use of BS5588 : Part 4 : 1998 Incorporating Amendment No. 1 and Corrigendum No. 1)

List item	BS Clause / Paragraph / Table (Page)	Context	Replaced by	Reason
2.24	Annex F (Page 70)		Add the following paragraphs to the last paragraph of this clause "Test method for measuring velocities for the new volumetric requirement of variable supply fans or dampers At least 10 measurements should be taken. Measurement points should be uniformly distributed over the doorway for accurate air velocity measurement. Then by averaging the measured results, a reference point mostly closed to the mean air velocity is determined. Preferably, the air velocity of this reference point should be within ±10% of the mean air velocity. Close the door for at least few minutes to allow the variable supply fans or dampers to establish steady condition. When the variable supply fans or dampers are in steady operational mode, open the door and measure the new air velocity at the reference point. The new air velocity of reference point should achieve 90% to 110% of the original air velocity within 5 sec. Test method for the response of overpressure release All doors should be closed except the fire zone door with air release path opened for few minutes so as to allow the variable supply fans or dampers to be steady. When the variable supply fans or dampers are in steady operational mode, close the fire zone door and measure the door opening force within 5 sec. The door opening force should be limited to 100N all the time from 5 sec after the fire zone door is closed."	To adopt a more practical approach for the measurement of new velocity of the volumetric requirement and the response of overpressure release.



(To replace Figure 1 in page 9 of BS5588, part 4)

List Three : Clauses with acceptable alternatives
(Schedule for the use of BS5588: Part 4: 1998 Incorporating Amendment No. 1 and Corrigendum No. 1)

ListI item	BS Clause / Paragraph / Table (Page)	Context	Alternative	Reason
3.1	Clause 6.5 Paragraph 2 (Page 20)	"Indicator lights displaying the status of any pressure differential systems protecting the firefighting access and the means of escape from the building should be located at each fire service access point."	"Indicator lights displaying the status of any pressure differential systems protecting the firefighting access and the means of escape from the building should be located at each fire service access point or supervisory panel located in F.S. control room."	To suit the current practice of local building industry.
3.2	Clause 7 Paragraph 2 (Page 20)	"Point type smoke detectors should be used, mounted in the accommodation area adjacent to the doors; leading to the protected space at each storey served by the system. Location of the smoke detectors should be in accordance with clause 12 of BS5839-1:1988."	"Point type smoke detectors should be used, mounted in the accommodation area adjacent to the doors leading to the protected space at each storey served by the system. Location of the smoke detectors should be in accordance with clause 12 of BS5839-1:1988 or installed at a distance within 1.0 m from the doors leading to the protected space at each storey served by the system." Note : For the simple lobby, the smoke detector should be mounted in the accommodation area adjacent to the door of simple lobby.	To align with the requirements as stipulated in the Code of Practice of Fire Services Department.

List Four : Clauses to be taken as reference only
(Schedule for the use of BS5588: Part 4: 1998 Incorporating Amendment No. 1 and Corrigendum No. 1)

List item	BS Clause / Paragraph / Table (Page)	Context	Reason
4.1	Clause 5.1 Paragraph 3 (Page 8)	"Systems for atrium buildings are not covered within the standard, but the recommendations given in Annex A should be followed."	This clause deals with general design consideration only.
4.2	Clause 9.2.2.3. All paragraphs (Page 36)	9.2.2.3 Pressurizing stair and lift	There is no such requirement in the Code of Practice of Fire Services Department.
4.3	Clause 9.2.2.5 All paragraphs (Page 36)	9.2.2.5 Pressurization of lift wells	There is no such requirement in the Code of Practice of Fire Services Department.
4.4	Clause 9.2.2.7 All paragraphs (Page 36)	9.2.2.7 Pressurization of evacuation lift wells	There is no such requirement in the Code of Practice of Fire Services Department.
4.5	Clause 9.2.2.8 All paragraphs (Page 39)	9.2.2.7 Pressurization of refuges and central control rooms.	There is no such requirement in the Code of Practice of Fire Services Department.
4.6	Clause 9.2.3.2. All paragraphs (Page 39)	9.2.3.2 Pressurized escape routes and other pressurized spaces in the same building.	There is no such requirement in the Code of Practice of Fire Services Department.
4.7	Clause 9.3 All paragraphs (Page 41 & 42)	9.3 Depressurization systems 9.3.1 General 9.3.2 Depressurization of fire zone	This requirement is considered as reference for smoke extraction system as relevant requirements have been covered by the Code of Practice of Fire Services Department.
4.8	Clause 9.4 All paragraphs (Page 43 & 44)	9.4 Zoned smoke control systems 9.4.1 General 9.4.2 Features of zoned smoke control system 9.4.3 Choice of smoke control zones	This clause deals with general design consideration only.
4.9	Clause 10.2 All paragraphs (Page 48 & 49)	10.2 Depressurization systems	There is no such requirement in the Code of Practice of Fire Services Department.

List Four : Clauses to be taken as reference only
(Schedule for the use of BS5588: Part 4: 1998 Incorporating Amendment No. 1 and Corrigendum No. 1)

List item	BS Clause / Paragraph / Table (Page)	Context	Reason
4.10	Figure 9 Diagram c), d) & g) (Page 37 & 38)	Figure 9 c) Pressurization to stairs and liftwell Figure 9 d) Pressurization to stairs (associated lobbies and corridors) Figure 9 g) Pressurization to stairs, lobby and liftwell	There is no such requirement in the Code of Practice of Fire Services Department.
4.11	Figure 10 Diagram a) & b) (Page 40)	Figure 10-Pressurization of refuges and central control rooms Diagram a) Unenclosed refuge, integrated with escape route Diagram b) Enclosed control room, with escape route	There is no such requirement in the Code of Practice of Fire Services Department.
4.12	Figure 11 (Page 42)	Figure 11 – Features of a depressurization system	There is no such requirement in the Code of Practice of Fire Services Department.

Checklist for Staircase Pressurization System

Reference

Address: ..... F.S.D. Ref.:
..... 19/20/43/47/78*****.....

FSD Acceptance Letter/Approval date: .....

F.S.I.working drawing ref :. .....

Approved building plan ref: ..... dated: .....

Section I –General items for all staircase pressurization systems installed in the building

1.1 Measuring and Testing Instrument / Equipment Calibration

Measuring instrument used for testing purpose shall be provided in duplicate and calibrated in the past 3 months.

	Type	Model no.	Serial no.	Calibration cert. no.	Remark
(a)					
(b)					
(c)					
(d)					
(e)					
(f)					
(g)					
(h)					
(i)					
(j)					

1.2 Documentation

		Yes	No	Remark
a.	Equipment list of staircase pressurization system c/w related test report is attached.	[ ]	[ ]	
b.	Equipment list of builder's work (such as doorset, door closer & etc) c/w related test report is attached.	[ ]	[ ]	
c.	Certifying the building air tightness condition during the testing is equivalent to the occupation condition.	[ ]	[ ]	

1.3 Staircase Pressurization working drawings against building plans

		Yes	No	N/A	Remark
a.	Classifications of pressurized spaces for means of escape / firefighting & rescue tally with approved building plans.	[ ]	[ ]	[ ]	
b.	Designations of staircase number and fireman's lift number, fire fighting access number tally with approved building plans.	[ ]	[ ]	[ ]	
c.	Locations of staircase pressurization plant rooms tally with approved building plans.	[ ]	[ ]	[ ]	
d.	Fire resisting of plant rooms is same as the pressurized space.	[ ]	[ ]	[ ]	
e.	Air intake positions tally with approved building plans.	[ ]	[ ]	[ ]	
f.	Discharge positions of overpressure relief tally with approved building plans.	[ ]	[ ]	[ ]	

**** -Delete as appropriate***

Section II – For each staircase pressurization system only
(separate copy of Section II should be attached to respective pressurization system)

1.1 Description

a. Designation of pressurized staircase
(the designation should be the same as building plan & F.S. drawing & test report) _____

b. Pressurized space :- (Please tick as appropriate)
- Escape staircase; or [ ]
- Fire fighting staircase [ ]

c. Equipment to be provided :-
- Single fan with motor; or [ ]
- Duplicate fans complete with motors; or [ ]
- Single fan with duplicate motors [ ]

d. Design air velocity passes through the door between pressurized space and accommodation area _____ m/s

e. Design differential pressure between the pressurized space and accommodation _____ Pa

f. Design door opening force _____ N(≤ 100N)

1.2 Test report
(All systems should be tested and endorsed by Register Professional Engineer before witness by FSD Inspecting Officer)

		Appendix	Remark
a.	Pressure test report of all ductwork (including builder's work, ducts, shafts or other construction)	----------	----------
b.	Air velocity measurement report	----------	----------
c.	Door opening force measurement report	----------	----------
d.	Differential pressure measurement report	----------	----------
e.	System performance test report	----------	----------

1.3. Visual inspection

		Yes	No	N/A	Remark
a.	Air intake				
	(Item a.1 to a.5 for air intake not located at roof floor)				
a.1	Notice in Chinese & English characters "Staircase pressurization intake for (pressurization space)" is provided.	[ ]	[ ]	[ ]	----------
a.2	Position of air intake is located away from any potential fire hazards (such as basement smoke vent).	[ ]	[ ]	[ ]	----------
a.3	Air duct is provided from the intake to the fan when air intake is distant from the fan.	[ ]	[ ]	[ ]	----------
a.4	A smoke detector of a type suitable for use in air duct / plenum is installed.	[ ]	[ ]	[ ]	----------
a.5	Pressurization system can be shut down when the duct type smoke detector is activated.	[ ]	[ ]	[ ]	----------
	(Items a.6 to a.13 for air intake located at roof floor.)				
a.6	Two air intakes, which spaced apart and facing different directions, are provided.	[ ]	[ ]	[ ]	----------

		Yes	No	N/A	Remark
a.7	Each intake is capable of providing the full air requirements of the system.	[ ]	[ ]	[ ]	
a.8	Independently operated smoke control damper with duct type smoke detector is provided at each intake.	[ ]	[ ]	[ ]	
a.9	An override switch to reopen the closed damper and to close the open damper is provided.	[ ]	[ ]	[ ]	
a.10	No smoke discharge within 5 m of any direction of air intake.	[ ]	[ ]	[ ]	
a.11	Notice in Chinese & English characters “Staircase pressurization intake for (pressurization space)” is provided.	[ ]	[ ]	[ ]	
a.12	Air duct is provided from the intake to the fan when air intake is distant from the fan.	[ ]	[ ]	[ ]	
a.13	Smoke control damper properly actuated when duct type smoke detector activated.	[ ]	[ ]	[ ]	
b.	Plant room				
b.1	No other service inside the plant room	[ ]	[ ]	[ ]	
b.2	Minimum fire resistance rating for the enclosure of the pressurization plant is equal or greater than the pressurized space served (F.R.P of enclosure is _____ hrs.)	[ ]	[ ]	[ ]	
b.3	When plant room served more than one pressurization system, separate fire rated enclosure is provided to each pressurization system in order to maintain fire compartmentation between different pressurized spaces.	[ ]	[ ]	[ ]	
b.4	When fan room is used as an air plenum, all control panels should be located outside the fan room, or protected by fire resistant enclosure(s).	[ ]	[ ]	[ ]	
c.	Air injection point & associated ductwork				
c.1	Multiple injection points are provided when the pressurized staircase exceeds 11m.	[ ]	[ ]	[ ]	
c.2	Vertical distance between injection points is not greater than 12 m or three storeys.	[ ]	[ ]	[ ]	
c.3	Volume control dampers of air injection points are properly secured.	[ ]	[ ]	[ ]	
c.4	Injection duct work passing through other fire compartment is constructed to have the same F.R.P. required for either the pressurized space or the compartment through it passes, whichever is the greater.	[ ]	[ ]	[ ]	
c.5	An injection point of a single injection point system is away from the final exit door.	[ ]	[ ]	[ ]	
c.6	Ductwork construction is complied with or not less than DW144 standard.	[ ]	[ ]	[ ]	
c.7	Aluminum sheet and aluminum pop rivet shall not be provided in flat oval duct longer than 1 m.	[ ]	[ ]	[ ]	
d.	Air release system				
d.1	Spread of smoke between different fire compartments does not likely happen in both normal operation and fail-safe mode,	[ ]	[ ]	[ ]	
d.2	When the operation of air release system is automatic, it is actuated by the same detector / device that actuates the rest of the pressurization system.	[ ]	[ ]	[ ]	

		Yes	No	N/A	Remark
d.3	When the accommodation space is partitioned or compartmented into offices or similar unit, the air relief vent is provided at :-				
	i. Between the door into pressurized space and the start of the partitioning; or	[ ]	[ ]	[ ]	
	ii. On each offices & units, the size of each air relief vent is capable of discharging the total air flow from pressurized space.	[ ]	[ ]	[ ]	
d.4	Air release vent is located at or immediately below ceiling level	[ ]	[ ]	[ ]	
	Type of air release system				
	- Vertical Shaft (go to d5 – d6) ;	[ ] or			
	- Special vents at the building periphery; (go to d7 –d9)	[ ] or			
	- Mechanical air release (go to d10 – d12)	[ ]			
d.5	Top vent is provided at the vertical shaft.	[ ]	[ ]	[ ]	
d.6	When the shaft is designed for dual propose, automatic control fire & smoke damper is provided at each branch duct.	[ ]	[ ]	[ ]	
d.7	Special vents for external vent are provided on at least two sides of the sealed building.	[ ]	[ ]	[ ]	
d.8	Fail safe protection is provided to the ventilator.	[ ]	[ ]	[ ]	
d.9	Components of ventilator are compliant with BS7346-1/ BS7346-2.	[ ]	[ ]	[ ]	
d.10	Extraction flow rate is greater than the total pressurized air flow rate of all served staircase pressurization systems	[ ]	[ ]	[ ]	
d.11	Extraction system including ductwork is capable of working at the appropriate temperature and period of time (250^{o}C for 1 hour for building with sprinkler system, 600^{o}C for 2 hour for building without sprinkler system).	[ ]	[ ]	[ ]	
d.12	The following items should be complied with, when the central exhaust system also serves for mechanical air release:-				
	i. Component & ductwork of central exhaust system is capable of working at the appropriate temperature and period of time (250^{o}C for 1 hour for building with sprinkler system, 600^{o}C for 2 hour for building without sprinkler system); and	[ ]	[ ]	[ ]	
	ii. When the related pressurization system is actuated, function of VAC control system and VAC manual override switch for shutting down the central exhaust system is ignored; and	[ ]	[ ]	[ ]	
	iii. For pressurization system for fire fighting, the local motorized smoke damper in fire floor is opened and dampers for other compartments / units is closed; or For pressurization system for escape, the local motorized smoke damper in fire floor and two above floor should be opened and dampers for other compartments / units are closed.	[ ]	[ ]	[ ]	

		Yes	No	N/A	Remark
e.	Over-pressure relief system				
	Type of over-pressure relief system				
	- Automatic opening of the external exit doors on operation of the fan (go to e1 – e2);	[ ] or			
	- Barometric Pressure relief vents / damper (go to e3 – e5);	[ ] or			
	- Mechanical exhaust (go to e6 – e7)	[ ]			
e.1	Door lock, latch, bolt, push bar & etc are not provided at the external exit doors	[ ]	]	[ ]	
e.2	Warning label: "Over pressure relief door. Do not obstruct" is provided in English and Chinese character at the external exit doors	[ ]	[ ]	[ ]	
e.3	Wire mesh is provided at the external opening of relief vent / damper.	[ ]	[ ]	[ ]	
e.4	Relief vent / duct passed through other fire compartment is enclosed by fire rated material, the F.R. should be same of pressurized space or passed through fire compartment, whichever is greater.	[ ]	[ ]	[ ]	
e.5	Free area of relief vent / damper "A_X" $\geqq$ 0.16 m^2 x (total required airflow (m^3/s) through the open doors – air supply satisfying the pressure differential requirement (m^3/s) in pressurized space) ***See equation (24) of section 14 of BS 5588: Part 4: 1988***	[ ]	[ ]	[ ]	
e.6	Fan can be activated by differential pressure sensor	[ ]	[ ]	[ ]	
e.7	Fan directly discharges to external or the discharge ductwork is constructed with fire rated material when passing through other fire compartment. The F.R.P. of ductwork should be same as that of pressurized space or fire compartment passed, whichever is greater.	[ ]	[ ]	[ ]	
f	Electrical & control				
f.1	Electrical supplies for all equipment (such as fans, air relief damper, over-pressure device, controller, supervisory panel & etc) are fed from the same essential source.	[ ]	[ ]	[ ]	
f.2	Requirement of main switchboard and/or local control panel :-				
	- Construction is complied with BS5486 from not less than 2 mm panel steel and is installed in a room having _____ hour F.R.P. (including self-closing doors) without other equipment installed therein; or	[ ]	[ ]	[ ]	
	- All controls, starters, relays, etc shall be suitable for continuous operation at 250°C for not less than 1 hour.	[ ]	[ ]	[ ]	
f.3	Requirement of power supply cable for pressurized system, controller, pressure sensor & etc :-				
	- BS6387 Cat CWZ ; or	[ ]			
	- BS6207 or BS EN 60702; or	[ ]			
	- other international standards acceptable to the Director of Fire Services; or	[ ]			
	- Specification complying with criteria for exemption in F.S.D. circular letter no. 1/2003 (Items _____ _____)	[ ]			
f.4	Separate pressure differential system is provided for each pressurized system.	[ ]	[ ]	[ ]	
f.5	End of pressure sensing tube is properly terminated at the pressurized space and accommodation	[ ]	[ ]	[ ]	
f.6	End of sensing tube is mechanically protected.	[ ]	[ ]	[ ]	
f.7	Label of "Sensing point of staircase pressurization system" is clearly indicated in English and Chinese characters.	[ ]	[ ]	[ ]	

		Yes	No	N/A	Remark
f.8	Protection is provided along the sensing tube.	[ ]	[ ]	[ ]	
f.9	Power supplies for the differential pressure sensor, control, overpressure device, air release device are distributed from sub-circuit of staircase pressurization system.	[ ]	[ ]	[ ]	
f.10	Manual override switch provided on local fan control panel is locked in "Automatic control" position.	[ ]	[ ]	[ ]	
f.11	An indication signal is transmitted to supervisory control panel, when local fan control panel is in manual control mode.	[ ]	[ ]	[ ]	
g.	Construction work				
g.1	Installations of door sets providing access to or from any pressurized space satisfy Building Authority's requirements.	[ ]	[ ]	[ ]	
g.2	All doors, closers, hardware etc are capable of use in an atmosphere of 35^{o}C & 100% R.H.	[ ]	[ ]	[ ]	
g.3	No supplementary gasket is provided to assist in preventing smoke leakage.	[ ]	[ ]	[ ]	
g.4	Door sets are installed in such a manner to be smoke leakage proof.	[ ]	[ ]	[ ]	
g.5	All joints between frames & building structure are provided with sealants in compliance with BS 476: Part 23.	[ ]	[ ]	[ ]	
g.6	Self closing closers are provided for all doors.	[ ]	[ ]	[ ]	
g.7	Finished sill under the closed doors is wear resistant.	[ ]	[ ]	[ ]	
h	Functional test				
h.1	Performance test is carried out and the result is satisfactory.	[ ]	[ ]	[ ]	
h.2	Measurement of door opening force is carried out and result is satisfactory.	[ ]	[ ]	[ ]	
h.3	Measurement of differential pressure across the pressurized space and accommodation is carried out and the result is satisfactory.	[ ]	[ ]	[ ]	
h.4	Measurement of pressurized air flow is carried out and the result is satisfactory.	[ ]	[ ]	[ ]	
h.5	Air intake fire/smoke damper is closed when the duct type smoke detector is activated ;				
	or	[ ]	[ ]	[ ]	
	Staircase pressurization system is shut down when the duct smoke detector at air intake is activated (for the air intake only facing in one direction)	[ ]	[ ]	[ ]	
h.6	In order to prevent overpressure in pressurized space, fail safe protection for over-pressure release is provided on conditions of :-				
	- Failure of controller.	[ ]	[ ]	[ ]	
	- Failure of pressure switch.	[ ]	[ ]	[ ]	
	- Failure of wiring of pressure switch.	[ ]	[ ]	[ ]	
	- Failure of actuator of by-pass damper.	[ ]	[ ]	[ ]	
	- Failure of wiring of actuator (by-pass damper).	[ ]	[ ]	[ ]	
	- Failure of over pressure exhaust fan.	[ ]	[ ]	[ ]	
h.7	Functional test of actuation				
	- by building fire alarm system is in order (Note: - manual fire alarm is not recommended for air relief system which is automatically controlled in the fire zones).	[ ]	[ ]	[ ]	
	- by smoke detection system is in order.	[ ]	[ ]	[ ]	

		Yes	No	N/A	Remark
-	by sprinkler system is in order.	[ ]	[ ]	[ ]	
-	by point type smoke detector mounted in the accommodation area adjacent to the doors (within 1 m) leading to the protected space at each storey served by the system is in order.	[ ]	[ ]	[ ]	
-	supervisory control panel when selected in manual mode is in order.	[ ]	[ ]	[ ]	
h.8	Functional test of response time The system is capable of achieving between 90% & 110% of the new volumetric requirements within 5 sec of a door being opened or closed (for the over-pressure release system by using variable supply fans or dampers).	[ ]	[ ]	[ ]	
h.9	Changeover from the duty equipment to the standby equipment is automatically operated when failure occurred in duty equipment.	[ ]	[ ]	[ ]	

Section III –For all staircase pressurization system installed in the building

1. The checklist is totally _____ pages (including attached copies for each additional staircase pressurization system).
2. Attached _____ number(s) of appendix.

Tested by :

Signature : ----------

Name of installation contractor : ----------

Company chop : ----------

Date : ----------

Certified by :

Signature : ----------

Full name of registered professional engineer : ----------

Register number of engineer : ----------

Company chop : ----------

Date : ----------