

**CODE OF PRACTICE**  
**FOR**  
**MINIMUM FIRE SERVICE INSTALLATIONS**  
**AND EQUIPMENT**

MINIMUM FIRE SERVICE INSTALLATIONS AND EQUIPMENT

- PART I --- GENERAL
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*NOTE*

In the final drafts all pages will be given a date. Subsequent amendment sheets will be serially numbered and dated. An amendments serial number register sheet will be inserted.

*Amendment  
Serial  
Number*

*Sections  
Amended*

*Date*

*Signature*

**PART I**  
**GENERAL**

**1.1 Title**

This Code of Practice shall be titled "Minimum Fire Service Installations and Equipment" hereinafter referred to as "The Code".

**1.2 Definitions**

"Building" means

As defined in Buildings Ordinance Cap. 123.

"Cubical Extent" means

The space contained within the external surfaces of its walls and roof and the upper surface of the floor of its lowest storey but excluding any space within any enclosure on the roof of the building used exclusively for accommodating a water tank or lift gear or any like apparatus and where a building on one or more of its sides is not enclosed by a wall or walls the building where unenclosed shall be deemed to be extending downwards from the outer edge of the roof.

"Fire Compartment" 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.

"Fire Load" means

The theoretical amount of heat that may be released during the burning of combustibles in the building under fire conditions and is computed by the formula:

$$\frac{\text{Calorific value of contents in MJ/kg} \times \text{weight of contents in kg}}{\text{Floor area in square metres}}$$

"Fire Service Installations or Equipment" means

Any equipment or installation manufactured, used or designed to be used for the purpose of:

- (a) extinguishing, attacking, preventing or limiting a fire;
- (b) giving warning of a fire;
- (c) providing access to any premises or place for the purpose of extinguishing, attacking, preventing or limiting a fire.

"Natural Venting of Staircases" means

As an alternative to pressurisation of staircase by provision of venting of smoke from staircase in accordance with Section 2 of BS 5588: Part 5: 1986, in particular paras. 8.2(b), (c) and 8.4.

"Place" means

Any area, lot or site on which buildings are located.

"Premises" means

Any building works or structure which is subject to the formal approval or consent of Government for its construction, alteration, change of use or demolition.

"Protected Means of Escape" means

Protected corridors, protected lobbies (including lobbies protecting fireman's lifts) and protected staircases as defined in the Code of Practice for Means of Escape published by the Buildings & Lands Department.

"Public Resort" means

Any place or premises to which the general public have right of access.

"Sleeping Risk" means

Increased life risk during hours of darkness when the occupants, in addition to being in a natural resting state with their consciousness nearly suspended, required additional assistance in the event of a fire either due to:

- their physical conditions, such as the old, the infirm and the children, or
- their transient presence in a strange building, and are unable to identify the means of escape.

Definitions of systems and classification of premises are at Parts II & III respectively.

### **1.3 Discretionary powers of the Director of Fire Services**

For the avoidance of doubt, the Director of Fire Services may, in the case of any particular building, vary any of the requirements of the Code (whether by requiring the provision of any fire service installations or equipment not indicated in the Code either in addition to or in substitution for any fire service installations or equipment so indicated or by relaxing any of the requirements in the Code or otherwise) where, in his opinion, such a variation is required in order to ensure the provision of all such fire service installations and equipment, as, having regard to the purpose for which the building is intended to be put, comprise the minimum fire service installations and equipment necessary for that building/premises, or as the case may be, where such a variation is not inconsistent with the provision for the building of all such fire service installations and equipment as aforesaid.

### **1.4 Approval of plans for building works**

The Building Authority may, under Section 16(1)(b) of the Buildings Ordinance, refuse to give his approval of any plans of building works where:

“the plans are not endorsed with or accompanied by a certificate from the Director of Fire Services certifying either:

- (i) that, having regard to the purpose to which the building is intended to be put (which purpose shall be stated in the certificate), no fire service installation or equipment is necessary in connection with the building that will result from the carrying out of the building works shown on the plans; or
- (ii) that the plans have been examined and are approved by him as showing all such fire service installations and equipment as in his opinion, having regard to the purpose to which the building is intended to be put (which purpose shall be stated in the certificate), comprise the minimum fire service installations and equipment necessary for the building in accordance with the Code of Practice published from time to time by the Director of Fire Services”.

### **1.5 Design of fireman’s lift**

Whilst the requirements for fireman’s lift are included in this Code, it should be pointed out that these are formulated in accordance with Reg. 38C of the Building (Lifts) Regulations and as such are not considered as fire service installations within the meaning of para 1.2 above.

## PART II

## TABLE AND DEFINITIONS OF SYSTEMS/INSTALLATIONS/EQUIPMENT

**2.1 Table**

The following systems/installations/equipment may be required to be installed in various premises under this Code:

1. Audio/visual advisory systems
2. Automatic actuating devices
3. Automatic fixed installations other than water
4. Automatic fixed installations using water
5. Deluge systems
6. Drencher systems
7. Dust detection systems
8. Dynamic smoke extraction systems
9. Emergency generators
10. Emergency lighting
11. Exit signs
12. Fire alarm systems
13. Fire control centre
14. Fire detection systems
15. Fire hydrant/hose reel systems
16. Fireman's lifts
17. Fixed automatically operated approved appliances
18. Fixed foam systems
19. Gas detection systems
20. Gas extraction systems
21. Hose reels
22. Portable hand-operated approved appliances
23. Pressurization of staircases
24. Ring main systems with fixed pumps
25. Sprinkler systems
26. Static smoke extraction systems
27. Supply tank
28. Ventilation/air conditioning control systems
29. Water spray systems
30. Water supplies

**2.2 Definition**

“Audio/visual advisory systems” means

Equipment which is supplementary to exit signs and fire alarm warning devices which, when operated in the event of a fire, provides audio/visual indication of safe direction of egress from the area.

“Automatic actuating devices” means

Building components such as doors, shutters, dampers, fire curtains, etc., and the devices for automatically controlling their movement in the event of fire.

“Automatic fixed installations other than water” means

A system of cylinders, pipes, valves, and delivery points so designed as to automatically detect and instantaneously attack a fire with an inert medium and sound an alarm (e.g. CO<sub>2</sub> protection of electrical equipment).

“Automatic fixed installations using water” means

A system of water supplies, pumps, pipes, valves and delivery points so arranged as to automatically detect and instantaneously attack a fire with water and sound an alarm. Such requirements for this item may include Sprinklers, Drenchers, Deluge or Water Spray Systems as required and appropriate.

“Deluge systems” means

A system requiring a discharge of water over a considerable area in rapid and certain response to a fire.

“Drencher systems” means

A system which provides a curtain of water for protection against internal and external “exposure” to fire, and/or the protection of large openings.

“Dust detection systems” means

Equipment designed to give warning of a potentially explosive concentration of dust.

“Dynamic smoke extraction systems” means

A mechanical ventilating system capable of removing smoke and products of combustion from a designated fire compartment, and also supplying fresh air in such a manner as to maintain a specified smoke free zone below the smoke layer.

“Emergency generators” means

An independently powered electrical generator of sufficient electrical capacity to meet the essential services it is required to provide.

“Emergency lighting” means

A system of artificial lighting designed to provide adequate illumination and indication of exit routes within a building under emergency conditions.

“Exit signs” means

Fixed illuminated signs indicating an approved exit route.

“Fire alarm systems” means

Any manually operated system designed to give warning of fire.

“Fire control centre” means

A compartment (situated at street level having direct access to open air and vehicular approach) containing annunciator boards, controls, terminals, etc. of the Fire Protection and Life Safety Systems within that building/complex.

“Fire detection systems” means

Any system designed to detect automatically the presence of smoke, heat, combustion products or flame and give warning of same.

“Fire hydrant/hose reel systems” means

An installation of pipes, water tanks, pumps, hydrant outlets and/or hose reels in a building to provide a ready means by which a jet of water can be delivered in any part of the building for the purpose of fire fighting.

“Fireman’s lift(s)” means

A designated lift(s) so designed as to allow Fire Services personnel safe access to at least all alternate floors of the building.

“Fixed automatically operated approved appliances” means

Any fire service equipment which is manufactured, used or designed to be used as an independent unit for the purpose of extinguishing, attacking, preventing or limiting a fire, but automatic in operation and fixed in position, e.g. a BCF unit in a Dangerous Goods store.

“Fixed foam systems” means

Any combination of generators; pipework; valves; nozzles and pourers designed to deliver finished foam to the seat of a fire which may be automatic in operation.

“Gas detection systems” means

Equipment designed to give warning of the presence of a noxious, toxic, irritant or inflammable vapour in potentially dangerous concentration.

“Gas extraction systems” means

An electrically/mechanically operated system capable of removing flammable vapours/gases from the part of the building where such vapours/gases may be generated through normal operation of the plants or work processes.

“Hose reel” means

Any standard type hose reel of a pattern approved by the Director of Fire Services.

“Portable hand-operated approved appliances” means

Any fire service equipment which is manufactured, used or designed to be used as an independent unit for the purpose of extinguishing, attacking, preventing or limiting a fire, e.g. water type, foam, inert gas, any chemical extinguishers, fire blankets and sand buckets.

“Pressurization of staircases” means

A system designed to protect staircases against the ingress of smoke by maintaining the air within staircases at pressures higher than those in adjacent parts of the building. The number of staircase(s) requiring pressurization shall be determined by the cubical extent of the basement, or building as the case may be, according to the following table provided that the number of pressurized staircases required shall not exceed the total number of staircases required by the Code of Practice for Means of Escape:

<i>Cubical Extent (cubic metres)</i>	<i>No. of Staircase(s)</i>
(For basements of three or more levels)	
Exceeding 7 000 but not exceeding 56 000	1
Exceeding 56 000 but not exceeding 112 000	2
Exceeding 112 000 but not exceeding 168 000	3
Exceeding 168 000	4
(For buildings other than hotels and hospitals)	
Exceeding 28 000 but not exceeding 56 000	1
Exceeding 56 000 but not exceeding 112 000	2
Exceeding 112 000 but not exceeding 168 000	3
Exceeding 168 000	4
(For hotels and hospitals)	
Not exceeding 56 000	1
Exceeding 56 000 but not exceeding 112 000	2
Exceeding 112 000 but not exceeding 168 000	3
Exceeding 168 000	4

“Ring main systems with fixed pump(s)” means

A fixed system of piping fitted with delivery outlets at fixed intervals and permanently primed pump(s) set for imparting pressure and flow to the water.

“Sprinkler systems” means

A system designed to discharge water under pressure from sprinkler heads (detecting devices) at/or near the point of origin of the fire and to sound an alarm.

“Static smoke extraction systems” means

A smoke extraction system utilizing smoke reservoirs; localised ducting; and permanent openings and/or automatic opening of windows, panels or external louvers actuated by smoke detectors; to remove, on the principles of natural ventilation, smoke and products of combustion from a designated fire compartment.

Static smoke extraction system may be provided, as the alternative to the Dynamic smoke extraction system if ALL of these three conditions are satisfied:

- (a) smoke reservoirs each not exceeding 500 square metres in area can be provided under the ceiling by fixed or automatically operated smoke screens to the specifications as contained in Part V, and



- (b) the horizontal distance between the perimeter of any smoke reservoir and the external wall of the building where windows, panels or external louvres functioning as smoke outlets are installed, does not exceed 30 metres and that one side of the reservoir shall abut the external wall, and
- (c) the aggregate area of windows, panels or external louvres functioning as smoke outlets is not less than 2% of the floor area this system serves, and that at least half of these outlets are operable by automatic actuating devices.

“Supply tank” means

A water tank containing a specified quantity of water reserved solely for fire fighting.

“Ventilation/air conditioning control systems” means

An automatic control system, designed to stop mechanically induced air movement within a designated fire compartment, actuated by smoke detectors and provided with a central, manually operated back up facility.

“Water spray systems” means

A system designed for extinguishing or controlling fires involving flammable liquids by emulsification, cooling and smothering.

“Water supply” means

A supply acceptable to Water Authority and Director of Fire Services.

## PART III

## CLASSIFICATION OF PREMISES AND DEFINITIONS

**3.1 Definition**

“Audio/Visual Production Facilities” means

Premises used for audio/visual production such as film and television studios.

“Basement Storeys” means

Any storey of a building below the ground storey and from which all required exit routes are in an upward direction to the ground storey.

“Car Parking Facilities” means

See “Car Port” and “Garage”.

“Car Port” means

A covered parking area open for its entire length or width on at least two sides.

“Cold Storage Area” means

Any area incorporating a unit of specific volume which is entirely given over to storage in an atmosphere of less than 10°C above zero.

“Commercial Building” means

A building, or that part of the building, constructed or intended to be used for business, trade or entertainment.

“Composite Building” means

Any building which is constructed or intended to be used for a combination of any two or more of the following purposes, and in respect of each of these purposes, separate sections of this Code shall apply:

- (a) Domestic
- (b) Commercial
- (c) Institutional
- (d) Hotel

“Curtain Walled Building” means

A building which has curtain walls. A curtain wall is a non load bearing wall primarily fixed in front of the structural frame with its own dead weight and wind loads transferred to the structural frame through anchorages.

“Domestic Building” means

A building constructed, used or intended to be used for habitation.

“Garage” means

A covered parking area enclosed by walls, with or without windows, on more than two sides.

“Godown” means

A warehouse or any building used wholly or in part for the storage of goods or raw material of any kind.

“Group I” means

A designated area of special hazard normally within a building.

“Group II” means

A building, group of buildings or complex considered to present special hazard.

“High Rise Building” means

Any building of which the floor of the uppermost storey exceeds 30 m above the point of staircase discharge at ground floor level.

“Hotel” means

Any building used wholly or in part primarily for the purposes of accommodation on a commercial basis.

“Industrial Building” means

Any building used wholly or in part in any process for or incidental to any of the following purposes, namely:

- (a) the making of any article or of part of any article; or
- (b) the altering, repairing, ornamenting, finishing, cleaning or washing or breaking up or demolition of any article; or
- (c) the adapting for sale of any article being a building in which work is carried out by way of trade or for purposes of gain.

“Institutional Building” means

Any building used wholly or in part for the purposes of the following:

- (a) Club premises
- (b) Educational establishments
- (c) Hostels
- (d) Hospitals including mental institutions and clinics
- (e) Prisons and similar corrective institutions
- (f) Sanatoria

“Low Rise Building” means

Any building of which the floor of the uppermost storey does not exceed 30 m above the point of staircase discharge at ground floor level.

“Mechanical plant rooms” means,

“Room accommodating mechanical plants such as air handling unit (AHU), fan, air conditioning (A/C), chiller, compressor, water pump, fire pump and the like.”

“Passenger Terminals/Station” means

Any building and/or place used wholly or in part for the purposes of embarking/disembarking passengers to/from any mode of transport.

“Place of Public Entertainment” means

As defined in Chapter 172 of the Laws of Hong Kong.

### 3.2 Special and other risks

Group I: A designated area of special hazard normally within a building i.e.:

- Audio/Visual production facilities
- Battery Rooms and electrical charging facilities
- Boiler Rooms
- Bowling Alleys
- Cold Storage Areas
- Dangerous Goods Stores
- Electrical equipment, incorporating transformers, switchgears, (above 1 Kilovolt) generators/alternators, requiring separate installation
- Kitchens
- Lift Motor Rooms
- Telephone Distribution Equipment, computer installation and similar installations

Group II: A building, group of buildings or complex considered to present special hazard(s) i.e.:

- Aircraft Maintenance and repair facilities
- Audio/Visual Production Facilities (Building(s) devoted to this purpose)
- Bulk Fuel Storages
- Chemical Manufacturing/Processing Plants
- Cold Storage Areas (Building(s) devoted to this purpose)
- Container Terminals, yards and freight stations
- Curtain Walled Buildings
- Dangerous Goods Stores (Range of D.G. Stores in an area devoted to this purpose)
- Explosive Production and/or Storages
- Mechanical Plant Room
- Open Sites of Public Assembly
- Petro-Chemical Complexes
- Road Tunnels
- Railway Marshalling Yards
- Shipyards

*Note:* “Audio/Visual Production Facilities”, “Cold Storage Areas” and “Dangerous Goods Stores” are included in both groups.

**PART IV**

**FIRE PROTECTION AND LIFE SAFETY SYSTEMS (INSTALLATIONS & EQUIPMENT)  
REQUIREMENTS FOR PREMISES ACCORDING TO CLASSIFICATION**

**General**

Attention is drawn to Part I of this Code, under which the Director of Fire Services has discretionary powers to vary any requirements of this Code.

Where the requirements are not detailed hereunder for particular premises, the Director of Fire Services will determine the requirements.

## CLASSIFICATION OF PREMISES AND AREAS OF SPECIAL RISKS

- 4.1 Aircraft Maintenance and Repair Facilities
- 4.2 Audio/Visual Production Facilities
- 4.3 Basements not exceeding 230 m<sup>2</sup> of usable floor area
- 4.4 Basements which exceed 230 m<sup>2</sup> of usable floor area
- 4.5 Battery Rooms and Electrical Charging Facilities
- 4.6 Boiler Rooms
- 4.7 Bowling Alleys
- 4.8 Bulk Fuel Storage
- 4.9 Car Ports
- 4.10 Chemical Manufacturing/Processing Plants
- 4.11 Cold Storage Areas (Group I) Minor (Under 140 m<sup>3</sup> capacity)
- 4.12 Cold Storage Areas (Group I) Major (of and over 140 m<sup>3</sup> capacity)
- 4.13 Cold Storage Areas (Group II)
- 4.14 Commercial Buildings—Low Rise
- 4.15 Commercial Buildings—High Rise
- 4.16 Composite Buildings
- 4.17 Container Terminal Yards and Freight Stations
- 4.18 Curtain Walled Buildings below six storeys in height
- 4.19 Curtain Walled Buildings of and above six storeys in height
- 4.20 Dangerous Goods Stores under 42 m<sup>3</sup> capacity
- 4.21 Dangerous Goods Stores of 42 m<sup>3</sup> capacity and above
- 4.22 Domestic Buildings—Low Rise (up to and including 3 storeys in height)
- 4.23 Domestic Buildings—Low Rise (over 3 storeys in height)
- 4.24 Domestic Buildings—High Rise
- 4.25 Electrical Equipment: incorporating transformers, switchgear above 1 Kilovolt, generators/  
alternators requiring separate installations
- 4.26 Explosive Production and/or storages
- 4.27 Garages
- 4.28 Hotels—Low Rise
- 4.29 Hotels—High Rise
- 4.30 Industrial/Godown Buildings—Low Rise
- 4.31 Industrial/Godown Buildings—High Rise
- 4.32 Institutional Buildings—Low Rise
- 4.33 Institutional Buildings—High Rise
- 4.34 Kitchens (other than kitchens in domestic premises)
- 4.35 Lift Motor Rooms
- 4.36 Mechanical Plant Rooms (Group I)
- 4.37 Mechanical Plant Rooms (Group II)
- 4.38 Passenger Terminals/Stations
- 4.39 Petro-chemical Complexes
- 4.40 Railway Marshalling Yards (encompassing a site area of more than 2 300 m<sup>2</sup>)
- 4.41 Road Tunnels
- 4.42 Shipyards (encompassing a site area of more than 2 300 m<sup>2</sup>)
- 4.43 Telephone distribution equipment, computer installation and similar installations

#### 4.1 Aircraft maintenance and repair facilities

##### *REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:*

- (i) Automatic actuating devices
- (ii) Automatic fixed installations other than water
- (iii) Automatic fixed installations using water
- (iv) Dust detection systems
- (v) Emergency generators
- (vi) Emergency lighting
- (vii) Exit signs
- (viii) Fire alarm systems
- (ix) Fire control centre
- (x) Fire detection systems
- (xi) Fire hydrant/hose reel systems
- (xii) Fireman's lifts
- (xiii) Fixed automatically operated approved appliances
- (xiv) Fixed foam systems
- (xv) Gas extraction systems
- (xvi) Portable hand-operated approved appliances
- (xvii) Ring main systems with fixed pump(s)
- (xviii) Ventilation/air conditioning control systems

##### *EXTENT*

- (i) As required by that equipment which needs to be automatically actuated.
- (ii) To be provided to areas where the use of water is incompatible with the occupancy or trade.
- (iii) In all areas excepting where covered by (ii) above, including staircases.
- (iv) To be provided in all areas where there is a potential dust explosion hazard.
- (v) An independently powered generator of sufficient electrical capacity to meet the essential services it is required to provide.
- (vi) Emergency lighting shall be provided throughout the entire building and all exit routes leading to ground level.
- (vii) Sufficient directional and exit signs to ensure that all exit routes from any floor within the buildings are clearly indicated as required by the configuration of staircases serving the buildings.
- (viii) One actuating point and one audio warning device to be located at each hose reel point. This actuating point should include facilities for fire pump start and audio warning device initiation.
- (ix) Minimum of one, additional to be provided according to the complexity of the buildings.
- (x) To be provided in areas not covered by automatic fixed installations.
- (xi) There shall be sufficient hydrants and hose reels to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.
- (xii) Lift or lifts as designated.
- (xiii) As required by occupancy.
- (xiv) To be provided as an alternative to other fixed automatic systems, when required by Director of Fire Services.
- (xv) Approved type for the part of building where flammable vapours may be generated, and to reduce the concentration below its lower explosive limit.
- (xvi) As required by occupancy.
- (xvii) To be required to cover those areas of such complexes not adequately served by public water mains.
- (xviii) When a ventilation/air conditioning control system to a building is provided, it shall stop mechanically induced air movement within a designated fire compartment.

*ADDITIONAL REQUIREMENTS*

- (i) All linings for acoustic and thermal insulation purposes in ductings and concealed locations shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (ii) All linings for acoustic, thermal insulation and decorative purposes within protected means of escape shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (iii) Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.

*Note:* Buildings within such complexes shall conform to the requirements specified for similar premises in accordance with this Code.

**4.2 Audio/visual production facilities****REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:**

- (i) Audio/visual advisory systems
- (ii) Automatic actuating devices
- (iii) Automatic fixed installations other than water
- (iv) Automatic fixed installations using water
- (v) Emergency generators
- (vi) Emergency lighting
- (vii) Exit signs
- (viii) Fire alarm systems
- (ix) Fire control centre
- (x) Fire detection systems
- (xi) Fire hydrant/hose reel systems
- (xii) Portable hand-operated approved appliances
- (xiii) Static or dynamic smoke extraction systems
- (xiv) Ventilation/air conditioning control systems

*EXTENT*

- (i) As required by the risk.
- (ii) As required by that equipment which needs to be automatically actuated.
- (iii) To be provided to areas where the use of water is undesirable for the occupancy or trade.
- (iv) As required by the risk.
- (v) An independently powered generator of sufficient electrical capacity to meet the essential services it is required to supply.
- (vi) Emergency lighting shall be provided throughout the entire building and all exit routes leading to ground level.
- (vii) Sufficient directional and exit signs to ensure that all exit routes from the premises within the buildings are clearly indicated as required by the configuration of staircases serving the building.
- (viii) One actuating point and one audio warning device to be located at each hose reel point. This actuating point should include facilities for fire pump start and audio warning device initiation.
- (ix) As required by the risk.
- (x) To be provided in areas not covered by automatic fixed installations.

- (xi) There shall be sufficient hydrants and hose reels to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.
- (xii) As required by the risk.
- (xiii) Required for any fire compartment exceeding 7 000 cubic metres where:
  - (a) the aggregate area of openable windows of the compartment does not exceed 6.25% of the floor area of that compartment, and
  - (b) the designed fire load of that compartment is likely to exceed 1 135 MJ/square metre.
- (xiv) When a ventilation/air conditioning control system to a building is provided, it shall stop mechanically induced air movement within a designated fire compartment.

#### *ADDITIONAL REQUIREMENTS*

- (i) All linings for acoustic and thermal insulation purposes in ductings and concealed locations shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (ii) All linings for acoustic, thermal insulation and decorative purposes within protected means of escape shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (iii) Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.

#### **4.3 Basements not exceeding 230 m<sup>2</sup> of usable floor area**

##### *REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:*

- (i) Automatic fixed installations other than water
- (ii) Emergency lighting
- (iii) Exit signs
- (iv) Fire alarm systems
- (v) Fire detection systems
- (vi) Fire hydrant/hose reel systems
- (vii) Portable hand-operated approved appliances
- (viii) Ventilation/air conditioning control systems

##### *EXTENT*

- (i) To be provided in areas of special risk.
- (ii) Emergency lighting shall be provided throughout the entire basement area and all exit routes leading to ground level.
- (iii) Sufficient directional and exit signs to ensure that all exit routes from the basement are clearly indicated as required by the configuration of staircases serving the basement.
- (iv) One actuating point and one audio warning device to be located at each hose reel point. This actuating point should include facilities for fire pump start and audio warning device initiation.
- (v) The entire basement area shall be covered by a fire detection system, excepting car parking areas, strong rooms and safe deposit vaults.
- (vi) There shall be sufficient hydrants and hose reels to ensure that every part of the basement with the exception of strong rooms and safe deposit vaults can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.
- (vii) As required by occupancy.
- (viii) When a ventilation/air conditioning control system to a building is provided, it shall stop mechanically induced air movement within a designated fire compartment.



*ADDITIONAL REQUIREMENTS*

- (i) All linings for acoustic and thermal insulation purposes in ductings and concealed locations shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (ii) All linings for acoustic, thermal insulation and decorative purposes within protected means of escape shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (iii) Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.

**4.4 Basements which exceed 230 m<sup>2</sup> of usable floor area***REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:*

- (i) Audio/visual advisory systems
- (ii) Automatic fixed installations other than water
- (iii) Emergency lighting
- (iv) Exit signs
- (v) Fire alarm systems
- (vi) Fire detection systems
- (vii) Fire hydrant/hose reel systems
- (viii) Portable hand-operated approved appliances
- (ix) Pressurization of staircases
- (x) Sprinkler systems
- (xi) Static or dynamic smoke extraction systems
- (xii) Ventilation/air conditioning control systems

*EXTENT*

- (i) Required for any part or parts of building where the area occupied by any one single occupancy on any one floor exceeds 2 000 square metres AND where the occupants, due to their transient presence either as shoppers, audience or guests, are exposed to risks to require additional advice through such systems.
- (ii) To be provided to areas where the use of water is undesirable for the occupancy or trade.
- (iii) Emergency lighting shall be provided throughout the entire basement area and all exit routes leading to ground level.
- (iv) Sufficient directional and exit signs to ensure that all exit routes from the basement are clearly indicated as required by the configuration of staircases serving the basement.
- (v) One actuating point and one audio warning device to be located at each hose reel point. This actuating point should include facilities for fire pump start and audio warning device initiation.
- (vi) The entire basement area shall be covered by a fire detection system, excepting car parking areas, strong rooms and safe deposit vaults.
- (vii) There shall be sufficient hydrants and hose reels to ensure that every part of the basement with the exception of strong rooms and safe deposit vaults can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.
- (viii) As required by occupancy.
- (ix) Required for basements of three or more levels where:
  - (a) no open air access routes for firemen are provided; and
  - (b) the cubical extent of the basement exceeds 7 000 cubic metres; and
  - (c) the designed fire load of the basement is likely to exceed 1 135 MJ/square metre.

The number of pressurized staircases to be provided shall be determined by the table stipulated under the definition of Pressurization of Staircases in Pt. II provided that the number of pressurized staircases required shall not exceed the total number of staircases required by the Code of Practice for Means of Escape.

- (x) In all parts of the basements excepting strong rooms and safe deposit vaults and where covered by (ii) above.
- (xi) Required for any fire compartment exceeding 7 000 cubic metres where the designed fire load is likely to exceed 1 135 MJ/square metre.
- (xii) When a ventilation/air conditioning control system to a building is provided, it shall stop mechanically induced air movement within a designated fire compartment.

#### *ADDITIONAL REQUIREMENTS*

- (i) All linings for acoustic and thermal insulation purposes in ductings and concealed locations shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (ii) All linings for acoustic, thermal insulation and decorative purposes within protected means of escape shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (iii) Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.

#### **4.5 Battery rooms and electrical charging facilities**

##### *REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:*

- (i) Automatic fixed installations other than water
- (ii) Exit signs
- (iii) Fire alarm systems
- (iv) Fire detection systems
- (v) Gas extraction systems
- (vi) Portable hand-operated approved appliances
- (vii) Ventilation/air conditioning control systems

##### *EXTENT*

- (i) To be provided to areas where the use of water is undesirable for the risk.
- (ii) Sufficient directional and exit signs to ensure that all exit routes from any floor within the premises are clearly indicated as required by the configuration of staircase serving the building.
- (iii) One actuating point and one audio warning device to be located at all exit doorways. This actuating point should include facilities for audio warning device initiation.
- (iv) To be provided in areas not covered by automatic fixed installations.
- (v) Approved type for the part of building where flammable vapours may be generated, and to reduce the concentration below its lower explosive limit.
- (vi) As required by occupancy.
- (vii) When a ventilation/air conditioning control system to a building is provided, it shall stop mechanically induced air movement within a designated fire compartment.

##### *ADDITIONAL REQUIREMENT*

Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.

#### 4.6 Boiler rooms

##### *REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:*

- (i) Automatic actuating devices
- (ii) Automatic fixed installations other than water
- (iii) Emergency lighting
- (iv) Exit signs
- (v) Fire detection systems
- (vi) Fixed foam systems
- (vii) Portable hand-operated approved appliances

##### *EXTENT*

- (i) As required by that equipment which needs to be automatically actuated.
- (ii) To be provided in gas/oil boiler rooms.
- (iii) Emergency lighting shall be provided throughout the entire area and all exit routes leading to ground level.
- (iv) Sufficient directional and exit signs to ensure that all exit routes from the area within the buildings are clearly indicated as required by the configuration of staircases serving the buildings.
- (v) To be provided in areas not covered by automatic fixed installations.
- (vi) To be provided in oil boiler rooms located in basements.
- (vii) As required by the risk.

##### *ADDITIONAL REQUIREMENT*

Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.

#### 4.7 Bowling alleys

##### *REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:*

- (i) Audio/visual advisory systems
- (ii) Automatic actuating devices
- (iii) Automatic fixed installations other than water
- (iv) Emergency generators
- (v) Emergency lighting
- (vi) Exit signs
- (vii) Fire alarm systems
- (viii) Fire detection systems
- (ix) Fire hydrant/hose reel systems
- (x) Portable hand-operated approved appliance
- (xi) Sprinkler systems
- (xii) Ventilation/air conditioning control systems

##### *EXTENT*

- (i) Required for any part or parts of building where the area used for bowling alley on any one floor exceeds 2 000 square metres AND where bowlers and spectators, due to their transient presence, are exposed to risks to require additional advice through such systems.
- (ii) As required by that equipment which needs to be automatically actuated.
- (iii) To be provided to areas where the use of water is undesirable for the risk.
- (iv) An independently powered generator of sufficient electrical capacity to meet the essential services it is required to provide.

- (v) Emergency lighting shall be provided throughout the entire premises and all exit routes leading to ground level.
- (vi) Sufficient directional and exit signs to ensure that all exit routes from any floor within the building are clearly indicated as required by the configuration of staircases serving the building.
- (vii) One actuating point and one audio warning device to be located at each hose reel point. This actuating point should include facilities for fire pump start and audio warning device initiation.
- (viii) To be provided in areas not covered by automatic fixed installations.
- (ix) There shall be sufficient hydrants and hose reels to ensure that every part of the premises can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.
- (x) As required by occupancy.
- (xi) In all parts of the alleys and associated areas including staircases and common corridors.
- (xii) When a ventilation/air conditioning control system to a building is provided, it shall stop mechanically induced air movement within a designated fire compartment.

#### *ADDITIONAL REQUIREMENTS*

- (i) All linings for acoustic and thermal insulation purposes in ductings and concealed locations shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (ii) All linings for acoustic, thermal insulation and decorative purposes within protected means of escape shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (iii) Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.

#### **4.8 Bulk fuel storage**

##### *REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:*

- (i) Appropriate requirements of Model Code of Safe Practice published by Institute of Petroleum
- (ii) Automatic actuating devices
- (iii) Automatic fixed installations other than water
- (iv) Automatic fixed installations using water
- (v) Emergency generators
- (vi) Emergency lighting
- (vii) Exit signs
- (viii) Fire alarm systems
- (ix) Fire control centre
- (x) Fire detection systems
- (xi) Fire hydrant/hose reel systems
- (xii) Fixed automatically operated approved appliances
- (xiii) Fixed foam systems
- (xiv) Portable hand-operated approved appliances
- (xv) Ring main systems with fixed pump(s)

##### *EXTENT*

- (i) As considered necessary by Director of Fire Services.
- (ii) As required by that equipment which needs to be automatically actuated.

- (iii) To be provided to areas of special risk where the use of water is undesirable for the risk.
- (iv) To be provided for the cooling and protection of products tanks, product pipelines and jetties.
- (v) An independently powered generator of sufficient electrical capacity to meet the essential services it is required to provide.
- (vi) Emergency lighting shall be provided throughout the entire building and all exit routes leading to ground level.
- (vii) Sufficient directional and exit signs to ensure that all exit routes from any floor within the buildings are clearly indicated as required by the configuration of staircases serving the buildings.
- (viii) One actuating point and one audio warning device to be located at each hose reel point. This actuating point should include facilities for fire pump start and audio warning device initiation.
- (ix) Minimum of one, additional to be provided according to the complexity of the area.
- (x) To be provided in areas not covered by automatic fixed installations.
- (xi) There shall be sufficient hydrants and hose reels to ensure that every part of the buildings can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.
- (xii) As required by occupancy.
- (xiii) To be provided as an alternative to other fixed automatic systems, when required by the Director of Fire Services.
- (xiv) As required by occupancy.
- (xv) To be provided to cover those areas of such complexes, not adequately served by public water mains.

*Note:* Buildings within such complexes shall conform to the requirements specified for similar premises in accordance with this Code.

#### **4.9 Car ports**

##### ***REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:***

- (i) Exit signs
- (ii) Fire alarm systems
- (iii) Fire hydrant/hose reel systems
- (iv) Portable hand-operated approved appliances

##### ***EXTENT***

- (i) Sufficient directional and exit signs to ensure that all exit routes from premises within the building are clearly indicated as required by the configuration of staircases serving the building.
- (ii) As required by the risk.
- (iii) As required by the risk.
- (iv) As required by the risk.

##### ***ADDITIONAL REQUIREMENT***

Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.

#### **4.10 Chemical manufacturing/processing plants**

##### ***REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:***

- (i) Automatic actuating devices
- (ii) Automatic fixed installations other than water
- (iii) Automatic fixed installation using water
- (iv) Dust detection systems

- (v) Emergency generators
- (vi) Emergency lighting
- (vii) Exit signs
- (viii) Fire alarm systems
- (ix) Fire control centre
- (x) Fire detection systems
- (xi) Fixed automatically operated approved appliances
- (xii) Fixed foam systems
- (xiii) Gas detection systems
- (xiv) Gas extraction systems
- (xv) Portable hand-operated approved appliances
- (xvi) Ring main systems with fixed pump(s)
- (xvii) Special Equipment/requirements
- (xviii) Ventilation/air conditioning control systems

*EXTENT*

- (i) As required by that equipment which needs to be automatically actuated.
- (ii) To be provided to areas where the use of water is undesirable for the risk.
- (iii) In all areas excepting where covered by (ii) above, including staircases.
- (iv) To be provided in all areas where there is a potential dust explosion hazard.
- (v) An independently powered generator of sufficient electrical capacity to meet the essential services it is required to provide.
- (vi) Emergency lighting shall be provided to all buildings within the premises and in addition, such lighting shall also be provided to ensure adequate external illumination to permit safe evacuation to the outside of the site boundary.
- (vii) Sufficient directional and exit signs to ensure that all exit routes from any floor within the buildings are clearly indicated as required by the configuration of the staircases serving the buildings.
- (viii) One actuating point and one audio warning device to be located at each hose reel point within the buildings. This actuating point should include facilities for fire pump start and audio warning device initiation, and in addition, one actuating point and audio warning device to be provided at each hydrant outlet on the ring main system.
- (ix) Minimum of one, additional to be provided according to the layout of the complex.
- (x) To be provided in areas not covered by automatic fixed installations.
- (xi) As required by the risk.
- (xii) As required by the risk.
- (xiii) To be provided in all areas of risk.
- (xiv) Approved types for the part of building where flammable vapours may be generated, and to reduce the concentration below its lower explosive limit.
- (xv) As required by the risk.
- (xvi) To be provided to cover those areas of such complexes not adequately served by public water mains.
- (xvii) As required by the Director of Fire Services.
- (xviii) When a ventilation/air conditioning control system to a building is provided, it shall stop mechanically induced air movement within a designated fire compartment.

*Note:* Buildings within such complexes shall conform to the requirements specified for similar premises in accordance with this Code.

*ADDITIONAL REQUIREMENT*

Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.

**4.11 Cold storage areas (Group I) minor (under 140 m<sup>3</sup> capacity)***REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:*

- (i) Portable hand-operated approved appliances.

*EXTENT*

- (i) As appropriate to the plant and construction.

*ADDITIONAL REQUIREMENTS*

- (i) All linings for acoustic and thermal insulation purposes in ductings and concealed locations shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (ii) All linings for acoustic, thermal insulation and decorative purposes within protected means of escape shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (iii) Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.

**4.12 Cold storage areas (Group I) major (of and over 140 m<sup>3</sup> capacity)***REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:*

- (i) Automatic fixed installations using water
- (ii) Fire alarm systems
- (iii) Portable hand-operated approved appliances

*EXTENT*

- (i) A dry pipe system to be provided in the cold room, as defined by Fire Offices' Committee Rules.
- (ii) The system provided to the building to be extended to cover the cold storage area.
- (iii) As appropriate to the plant and construction.

*ADDITIONAL REQUIREMENTS*

- (i) All linings for acoustic and thermal insulation purposes in ductings and concealed locations shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (ii) All linings for acoustic, thermal insulation and decorative purposes within protected means of escape shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (iii) Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.

**4.13 Cold storage areas (Group II)***REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:*

- (i) Automatic actuating devices
- (ii) Automatic fixed installations using water
- (iii) Emergency generators
- (iv) Emergency lighting

- (v) Exit signs
- (vi) Fire alarm systems
- (vii) Fire hydrant/hose reel systems
- (viii) Gas detection systems
- (ix) Portable hand-operated approved appliances

#### *EXTENT*

- (i) As required by that equipment which needs to be automatically actuated.
- (ii) In all areas including staircases with the exception of cold storage room which should be provided with a dry pipe system in accordance with Fire Offices' Committee Rules.
- (iii) An independently powered generator of sufficient electrical capacity to meet the essential services it is required to provide.
- (iv) Emergency lighting shall be provided throughout the entire area.
- (v) Sufficient directional and exit signs to ensure that all exit routes from any floor within the area are clearly indicated as required by the configuration of staircases serving the area.
- (vi) One actuating point and one audio warning device to be located at each hose reel point. This actuating point should include facilities for fire pump start and audio warning device initiation.
- (vii) There shall be sufficient hydrants and hose reels to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.
- (viii) To be provided in those areas as required by the risk.
- (ix) As required by occupancy.

#### *ADDITIONAL REQUIREMENTS*

- (i) All linings for acoustic and thermal insulation purposes in ductings and concealed locations shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (ii) All linings for acoustic, thermal insulation and decorative purposes within protected means of escape shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (iii) Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.

#### **4.14 Commercial buildings—low rise**

##### *REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:*

- (i) Audio/visual advisory systems
- (ii) Automatic actuating devices
- (iii) Automatic fixed installations other than water
- (iv) Emergency generators
- (v) Emergency lighting
- (vi) Exit signs
- (vii) Fire alarm systems
- (viii) Fire detection systems
- (ix) Fire hydrant/hose reel systems
- (x) Fireman's lifts
- (xi) Portable hand-operated approved appliances
- (xii) Sprinkler systems
- (xiii) Static or dynamic smoke extraction systems
- (xiv) Ventilation/air conditioning control systems



*EXTENT*

- (i) Required for any part or parts of building where the area occupied by any one single occupancy on any one floor exceeds 2 000 square metres AND where the occupants, due to their transient presence either as shoppers, audience or guests, are exposed to risks to require additional advice through such systems.
- (ii) As required by that equipment which needs to be automatically actuated.
- (iii) To be provided to areas where the use of water is undesirable for the occupancy or trade.
- (iv) An independently powered generator of sufficient electrical capacity to meet the essential services it is required to provide.
- (v) Emergency lighting shall be provided throughout the entire building and all exit routes leading to ground level.
- (vi) Sufficient directional and exit signs to ensure that all exit routes from any floor within the building are clearly indicated as required by the configuration of staircases serving the building.
- (vii) One actuating point and one audio warning device to be located at each hose reel point. This actuating point should include facilities for fire pump start and audio warning device initiation.
- (viii) To be provided in areas not covered by automatic fixed installations.
- (ix) There shall be sufficient hydrants and hose reels to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.
- (x) Lift or lifts as designated.
- (xi) As required by occupancy.
- (xii) Required for buildings with total floor areas exceeding 230 square metres and to cover all parts of the buildings including staircases and common corridors.
- (xiii) Required for:
  - (a) atrium of the building, if the compartment of the atrium exceeds 28 000 cubic metres, or any basement level or floor of building forming part of that compartment which exceeds 7 000 cubic metres, and
  - (b) any fire compartment exceeding 7 000 cubic metres in that building where:
    - (i) the aggregate area of openable windows of the compartment does not exceed 6.25% of the floor area of that compartment, and
    - (ii) the designed fire load is likely to exceed 1 135 MJ/square metre.
- (xiv) When a ventilation/air conditioning control system to a building is provided, it shall stop mechanically induced air movement within a designated fire compartment.

*ADDITIONAL REQUIREMENTS*

- (i) All linings for acoustic and thermal insulation purposes in ductings and concealed locations shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (ii) All linings for acoustic, thermal insulation and decorative purposes within protected means of escape shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (iii) Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.

**4.15 Commercial buildings—high rise***REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:*

- (i) Audio/visual advisory systems
- (ii) Automatic actuating devices
- (iii) Automatic fixed installations other than water

- (iv) Emergency generators
- (v) Emergency lighting
- (vi) Exit signs
- (vii) Fire alarm systems
- (viii) Fire control centre
- (ix) Fire detection systems
- (x) Fire hydrant/hose reel systems
- (xi) Fireman's lifts
- (xii) Portable hand-operated approved appliances
- (xiii) Pressurization of staircases
- (xiv) Sprinkler systems
- (xv) Static or dynamic smoke extraction systems
- (xvi) Ventilation/air conditioning control systems

#### *EXTENT*

- (i) Required for any part or parts of building where the area occupied by any one single occupancy on any one floor exceeds 2 000 square metres AND where the occupants, due to their transient presence either as shoppers, audience or guests, are exposed to risks to require additional advice through such systems.
- (ii) As required by that equipment which needs to be automatically actuated.
- (iii) To be provided to areas where the use of water is undesirable for the occupancy or trade.
- (iv) An independently powered generator of sufficient electrical capacity to meet the essential services it is required to provide.
- (v) Emergency lighting shall be provided throughout the entire building and all exit routes leading to ground level.
- (vi) Sufficient directional and exit signs to ensure that all exit routes from any floor within the building are clearly indicated as required by the configuration of staircases serving the building.
- (vii) One actuating point and one audio warning device to be located at each hose reel point. This actuating point should include facilities for fire pump start and audio warning device initiation.
- (viii) Minimum of one, additional to be provided according to the complexity of the building.
- (ix) To be provided in areas not covered by automatic fixed installations.
- (x) There shall be sufficient hydrants and hose reels to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.
- (xi) Lift or lifts as designated.
- (xii) As required by occupancy.
- (xiii) Required where:
  - (a) natural venting of staircase is not provided; and
  - (b) the aggregate area of openable windows of the rooms/units of the building does not exceed 6.25% of the floor area of those rooms/units, calculated on a floor by floor basis; and
  - (c) the cubical extent of the building exceeds 28 000 cubic metres; and
  - (d) the designed fire load of the building is likely to exceed 1 135 MJ/square metre.

The number of pressurized staircases to be provided shall be determined by the table stipulated under the definition of Pressurization of Staircases in Pt. II provided that the number of pressurized staircases required shall not exceed the total number of staircases required by the Code of Practice for Means of Escape.

- (xiv) Required to cover all parts of the buildings including staircases and common corridors.

- (xv) Required for:
- (a) atrium of the building, if the compartment of the atrium exceeds 28 000 cubic metres, or any basement level or floor of building forming part of that compartment which exceeds 7 000 cubic metres, and
  - (b) any fire compartment exceeding 7 000 cubic metres in that building where:
    - (i) the aggregate area of openable windows of the compartment does not exceed 6.25% of the floor area of that compartment, and
    - (ii) the designed fire load is likely to exceed 1 135 MJ/square metre.
- (xvi) When a ventilation/air conditioning control system to a building is provided, it shall stop mechanically induced air movement within a designated fire compartment.

#### *ADDITIONAL REQUIREMENTS*

- (i) All linings for acoustic and thermal insulation purposes in ductings and concealed locations shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (ii) All linings for acoustic, thermal insulation and decorative purposes within protected means of escape shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (iii) Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.

#### **4.16 Composite buildings**

*REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:*

&

*EXTENT FOR:*

The fire service installations and equipment required for each of the various usages of a composite building shall conform to the relevant section of this Code.

#### **4.17 Container terminal yards and freight stations**

*REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:*

- (i) Automatic actuating devices
- (ii) Automatic fixed installations other than water
- (iii) Automatic fixed installations using water
- (iv) Emergency generators
- (v) Emergency lighting
- (vi) Exit signs
- (vii) Fire alarm systems
- (viii) Fire control centre
- (ix) Fire hydrant/hose reel systems
- (x) Fixed automatically operated approved appliances
- (xi) Portable hand-operated approved appliances
- (xii) Pressurization of staircases
- (xiii) Ring main systems with fixed pump(s)
- (xiv) Special equipment/requirements
- (xv) Static or dynamic smoke extraction systems
- (xvi) Ventilation/Air conditioning control system

*EXTENT*

- (i) As required by that equipment which needs to be automatically actuated.
- (ii) To be provided to areas where the use of water is undesirable for the occupancy or trade.
- (iii) In all areas excepting where covered by (ii) above, including staircases.
- (iv) An independently powered generator of sufficient electrical capacity to meet the essential services it is required to provide.
- (v) Emergency lighting shall be provided throughout the entire buildings and all exit routes leading to ground level.
- (vi) Sufficient directional and exit signs to ensure that all exit routes from any floor within the buildings are clearly indicated as required by the configuration of staircases serving the buildings.
- (vii) One actuating point and one audio warning device to be located at each hose reel point. This actuating point should include facilities for fire pump start and audio warning device initiation.
- (viii) Minimum of one, additional to be provided according to the complexity of the building.
- (ix) There shall be sufficient hydrants and hose reels to ensure that every part of the buildings can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.
- (x) As required by occupancy.
- (xi) As required by occupancy.
- (xii) Required where:
  - (a) natural venting of staircase is not provided; and
  - (b) the aggregate area of openable windows of the rooms/units of the building does not exceed 6.25% of the floor area of those rooms/units, calculated on a floor by floor basis.  
The number of pressurized staircases to be provided shall be determined by the table stipulated under the definition of Pressurization of Staircases in Part II provided that the number of pressurized staircases required shall not exceed the total number of staircases required by the Code of Practice for Means of Escape.
- (xiii) To be provided to cover those areas of such complexes not adequately served by public water mains.
- (xiv) As required by Director of Fire Services.
- (xv) Required for any fire compartment exceeding 7 000 cubic meters where
  - (a) the aggregate area of openable windows of the compartment does not exceed 6.25% of the floor area of that compartment, and
  - (b) the designed fire load of that compartment is likely to exceed 1 135 MJ/m<sup>2</sup>.
- (xvi) When a ventilation/air conditioning control system to a building is provided, it shall stop mechanically induced air movement within a designated fire compartment.

*ADDITIONAL REQUIREMENT*

Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.

*Note:* Buildings within such complexes shall conform to the requirements specified for similar premises in accordance with this Code.

**4.18 Curtain walled buildings below six storeys in height****REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:**

Normal requirements according to occupancy.

**4.19 Curtain walled buildings of and above six storeys in height****REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:**

Normal requirements according to occupancy. Where a sprinkler system is required, this shall be one grade in excess of that normally required for the accepted risk category.

e.g. XLH (extra light hazard) becomes OH1 (ordinary hazard Group 1);

OH3(S) (ordinary hazard Group 3 special) becomes XHH (extra high hazard).

**4.20 Dangerous goods stores under 42 m<sup>3</sup> capacity****REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:**

- (i) Fixed automatically operated approved appliances.
- (ii) Portable hand-operated approved appliances.

**EXTENT**

- (i) As required by the risk.
- (ii) As required by the risk.

**4.21 Dangerous goods store of 42 m<sup>3</sup> capacity and above****REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:**

- (i) Automatic actuating devices
- (ii) Automatic fixed installations other than water
- (iii) Exit signs
- (iv) Fire alarm systems
- (v) Fixed automatically operated approved appliances
- (vi) Fixed foam systems
- (vii) Gas detection systems
- (viii) Portable hand-operated approved appliances
- (ix) Special equipment/requirements

**EXTENT**

- (i) As required by that equipment which needs to be automatically actuated.
- (ii) To be provided to areas where the use of water is undesirable for the occupancy or trade.
- (iii) Sufficient directional and exit signs to ensure that all exit routes from any floor within the building are clearly indicated as required by the configuration of staircases serving the building.
- (iv) One actuating point and one audio warning device to be located at each exit from the store. This actuating point should include facilities for audio warning device initiation.
- (v) As required by the risk.
- (vi) As required by the risk.
- (vii) To be provided in all areas of risk.
- (viii) As required by the Director of Fire Services.
- (ix) As required by the Director of Fire Services.

**4.22 Domestic buildings—low rise (up to and including three storeys in height)****REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:**

Portable hand-operated approved appliances.

**EXTENT**

One per floor plus additional for car-ports.

**ADDITIONAL REQUIREMENTS**

- (i) All linings for acoustic and thermal insulation purposes in ductings and concealed locations shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (ii) All linings for acoustic, thermal insulation and decorative purposes within protected means of escape shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (iii) Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.

**4.23 Domestic buildings—low rise (over 3 storeys in height)****REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:**

- (i) Fire alarm systems
- (ii) Fire hydrant/hose reel systems

**EXTENT**

- (i) One actuating point and one audio warning device to be located at each hose reel point. This actuating point should include facilities for fire pump start and audio warning device initiation.
- (ii) There shall be sufficient hydrants and hose reels on each floor to ensure that every part of each floor can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.

**ADDITIONAL REQUIREMENTS**

- (i) All linings for acoustic and thermal insulation purposes in ductings and concealed locations shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (ii) All linings for acoustic, thermal insulation and decorative purposes within protected means of escape shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (iii) Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.

**4.24 Domestic buildings—high rise****REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:**

- (i) Emergency generators
- (ii) Emergency lighting
- (iii) Exit signs
- (iv) Fire alarm systems
- (v) Fire hydrant/hose reel systems
- (vi) Fireman's lifts

**EXTENT**

- (i) Emergency generators of sufficient electrical capacity to supply power for the fire protection and life safety systems required to be installed in the building.
- (ii) Emergency lighting shall be provided to all staircases, passages and public areas including lift lobbies on all floors and refuge areas.
- (iii) Sufficient directional and exit signs to ensure that all exit routes from public areas to staircases are clearly indicated.
- (iv) One actuating point and one audio warning device to be located at each hose reel point. This actuating point should include facilities for fire pump start and audio warning device initiation.
- (v) There shall be sufficient hydrants and hose reels on each floor to ensure that every part of each floor can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.
- (vi) Lift or lifts as designated.

**ADDITIONAL REQUIREMENTS**

- (i) All linings for acoustic and thermal insulation purposes in ductings and concealed locations shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.

- (ii) All linings for acoustic, thermal insulation and decorative purposes within protected means of escape shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (iii) Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.

**4.25 Electrical equipment: Incorporating transformers, switchgear above 1 kilovolt, generators/alternators requiring separate installations**

*REQUIREMENTS*—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:

- (i) Automatic actuating devices
- (ii) Automatic fixed installations other than water
- (iii) Fire detection systems
- (iv) Portable hand-operated approved appliances

*EXTENT*

- (i) As required by that equipment which needs to be automatically actuated.
- (ii) To be provided in oil filled transformer rooms with capacity in excess of 1 500 kVA.
- (iii) To be provided in areas not covered by automatic fixed installations.
- (iv) As required by the Director of Fire Services.

**4.26 Explosive production and/or storages**

*REQUIREMENTS*—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:

Managements shall direct their enquiries to respective licensing authorities, viz. Commissioner of Mines and Commissioner of Police in conjunction with the Building Authority.

**4.27 Garages**

*REQUIREMENTS*—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:

- (i) Automatic actuating devices
- (ii) Emergency lighting
- (iii) Exit signs
- (iv) Fire alarm systems
- (v) Fire hydrant/hose reel systems
- (vi) Portable hand-operated approved appliances
- (vii) Sprinkler systems
- (viii) Ventilation/air conditioning control systems

*EXTENT*

- (i) As required by that equipment which needs to be automatically actuated.
- (ii) Emergency lighting shall be provided throughout the premises and all exit routes.
- (iii) Sufficient directional and exit signs to ensure that all exit routes from the premises within the building are clearly indicated as required by the configuration of staircases serving the building.
- (iv) One actuating point and one audio warning device to be located at each hose reel point. This actuating point should include facilities for fire pump start and audio visual warning device initiation within the premises.
- (v) There shall be sufficient hydrants and hose reels to ensure that every part of the premises can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.
- (vi) As required by the risk.
- (vii) Required for garages with total floor areas exceeding 230 square metres and to cover all parts of the garages including the staircases leading to these garages.
- (viii) When a ventilation/air conditioning control system to a building is provided, it shall stop mechanically induced air movement within a designated fire compartment.

*ADDITIONAL REQUIREMENT*

Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.

**4.28 Hotels—low rise***REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:*

- (i) Audio/visual advisory systems
- (ii) Automatic actuating devices
- (iii) Automatic fixed installations other than water
- (iv) Emergency generators
- (v) Emergency lighting
- (vi) Exit signs
- (vii) Fire alarm systems
- (viii) Fire control centre
- (ix) Fire detection systems
- (x) Fire hydrant/hose reel systems
- (xi) Fireman's lifts—if lift(s) is/are installed
- (xii) Portable hand-operated approved appliances
- (xiii) Pressurization of staircases
- (xiv) Sprinkler systems
- (xv) Static or dynamic smoke extraction systems
- (xvi) Ventilation/air conditioning control systems

*EXTENT*

- (i) Required for any part or parts of building where the area occupied by any one single occupancy on any one floor exceeds 2 000 square metres AND where the occupants, due to their transient presence either as shoppers, audience or guests, are exposed to risks to require additional advice through such systems.
- (ii) As required by that equipment which requires to be automatically actuated.
- (iii) To be provided to areas where the use of water is undesirable for the occupancy or trade.
- (iv) An independently powered generator of sufficient electrical capacity to meet the essential services it is required to provide.
- (v) Emergency lighting shall be provided throughout the entire building and all exit routes leading to ground level.
- (vi) Sufficient directional and exit signs to ensure that all exit routes from any floor within the building are clearly indicated as required by the configuration of staircases serving the building.
- (vii) One actuating point and one audio warning device to be located at each hose reel point. This actuating point should include facilities for fire pump start and audio warning device initiation.
- (viii) Minimum of one, additional to be provided according to the complexity of the building.
- (ix) A smoke detection system to be provided for the entire floor including the lift lobbies if any part of that floor is used for sleeping accommodation.
- (x) There shall be sufficient hydrants and hose reels to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.
- (xi) Lift or lifts as designated.
- (xii) As required by occupancy.



(xiii) Required where:

- (a) natural venting of staircase is not provided; and
- (b) the aggregate area of openable windows of the rooms/units of the building does not exceed 6.25% of the floor area of those rooms/units, calculated on a floor by floor basis.

The number of pressurized staircases to be provided shall be determined by the table stipulated under the definition of Pressurization of Staircases in Pt. II provided that the number of pressurized staircases required shall not exceed the total number of staircases required by the Code of Practice for Means of Escape.

(xiv) In all parts of the hotels including staircases and common corridors.

(xv) Required for:

- (a) all internal means of escape serving all guest rooms irrespective of the cubical extent of the building or the volume of the fire compartment on any floor. "Internal means of escape" for this purpose, means the route leading from the outside of all guest rooms to a pressurized or naturally ventilated staircase; a protected lobby or open air, unless the route itself is provided with openable windows communicating to the open air and the aggregate area of such windows exceeds 6.25% of the floor area of that route, and
- (b) atrium of the hotel building, if the compartment of the atrium exceeds 28 000 cubic metres, or any basement level or floor of building forming part of that compartment which exceeds 7 000 cubic metres, and
- (c) any fire compartment exceeding 7 000 cubic metres in that hotel building where:
  - (i) the aggregate area of openable windows of the compartment does not exceed 6.25% of the floor area of that compartment, and
  - (ii) the designed fire load is likely to exceed 1 135 MJ/square metre.

(xvi) When a ventilation/air conditioning control system to a building is provided, it shall stop mechanically induced air movement within a designated fire compartment.

#### *ADDITIONAL REQUIREMENTS*

- (i) All linings for acoustic and thermal insulation purposes in ductings and concealed locations shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (ii) All linings for acoustic, thermal insulation and decorative purposes within protected means of escape shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (iii) Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.

#### **4.29 Hotels—high rise**

##### *REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:*

- (i) Audio/visual advisory systems
- (ii) Automatic actuating devices
- (iii) Automatic fixed installations other than water
- (iv) Emergency generators
- (v) Emergency lighting
- (vi) Exit signs
- (vii) Fire alarm systems
- (viii) Fire control centre
- (ix) Fire detection systems
- (x) Fire hydrant/hose reel systems
- (xi) Fireman's lifts—if lift(s) is/are installed
- (xii) Portable hand-operated approved appliances

- (xiii) Pressurization of staircases
- (xiv) Sprinkler systems
- (xv) Static or dynamic smoke extraction systems
- (xvi) Ventilation/air conditioning control systems

*EXTENT*

- (i) Required for any part or parts of building where the area occupied by any one single occupancy on any one floor exceeds 2 000 square metres AND where the occupants, due to their transient presence either as shoppers, audience or guests, are exposed to risks to require additional advice through such systems.
- (ii) As required by that equipment which requires to be automatically actuated.
- (iii) To be provided to areas where the use of water is undesirable for the occupancy or trade.
- (iv) An independently powered generator of sufficient electrical capacity to meet the essential services it is required to provide.
- (v) Emergency lighting shall be provided throughout the entire building and all exit routes leading to ground level.
- (vi) Sufficient directional and exit signs to ensure that all exit routes from any floor within the building are clearly indicated as required by the configuration of staircases serving the building.
- (vii) One actuating point and one audio warning device to be located at each hose reel point. This actuating point should include facilities for fire pump start and audio warning device initiation.
- (viii) Minimum of one, additional to be provided according to the complexity of the building.
- (ix) A smoke detection system to be provided for the entire floor including the lift lobbies if any part of that floor is used for sleeping accommodation.
- (x) There shall be sufficient hydrants and hose reels to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.
- (xi) Lift or lifts as designated.
- (xii) As required by occupancy.
- (xiii) Required where:
  - (a) natural venting of staircase is not provided; and
  - (b) the aggregate area of openable windows of the rooms/units of the building does not exceed 6.25% of the floor area of those rooms/units, calculated on a floor by floor basis.
 

The number of pressurized staircases to be provided shall be determined by the table stipulated under the definition of Pressurization of Staircases in Pt. II provided that the number of pressurized staircases required shall not exceed the total number of staircases required by the Code of Practice for Means of Escape.
- (xiv) In all parts of the hotels including staircases and common corridors.
- (xv) Required for:
  - (a) all internal means of escape serving all guest rooms irrespective of the cubical extent of the building or the volume of the fire compartment on any floor. "Internal means of escape" for this purpose, means the route leading from the outside of all guest rooms to a pressurized or naturally ventilated staircase; a protected lobby or open air, unless the route itself is provided with openable windows communicating to the open air and the aggregate area of such windows exceeds 6.25% of the floor area of that route, and
  - (b) atrium of the hotel building, if the compartment of the atrium exceeds 28 000 cubic metres; or any basement level or floor of building forming part of that compartment which exceeds 7 000 cubic metres, and
  - (c) any fire compartment exceeding 7 000 cubic metres in that hotel building where:
    - (i) the aggregate area of openable windows of the compartment does not exceed 6.25% of the floor area of that compartment, and
    - (ii) the designed fire load is likely to exceed 1 135 MJ/square metre.
- (xvi) When a ventilation/air conditioning control system to a building is provided, it shall stop mechanically induced air movement within a designated fire compartment.

*ADDITIONAL REQUIREMENTS*

- (i) All linings for acoustic and thermal insulation purposes in ductings and concealed locations shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (ii) All linings for acoustic, thermal insulation and decorative purposes within protected means of escape shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (iii) Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.

**4.30 Industrial/godown buildings—low rise***REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:*

- (i) Automatic actuating devices
- (ii) Automatic fixed installations other than water
- (iii) Emergency generators
- (iv) Emergency lighting
- (v) Exit signs
- (vi) Fire alarm systems
- (vii) Fire control centre
- (viii) Fire detection systems
- (ix) Fire hydrant/hose reel systems
- (x) Fireman's lifts
- (xi) Portable hand-operated approved appliances
- (xii) Sprinkler systems
- (xiii) Static or dynamic smoke extraction systems
- (xiv) Ventilation/air conditioning control systems

*EXTENT*

- (i) As required by that equipment which needs to be automatically actuated.
- (ii) To be provided to areas where the use of water is undesirable for the occupancy or trade.
- (iii) An independently powered generator of sufficient electrical capacity to meet the essential services it is required to provide.
- (iv) Emergency lighting shall be provided throughout the entire building and all exit routes leading to ground level.
- (v) Sufficient directional and exit signs to ensure that all exit routes from any floor within the building are clearly indicated as required by the configuration of staircases serving the building.
- (vi) One actuating point and one audio warning device to be located at each hose reel point. This actuating point should include facilities for fire pump start and audio warning device initiation.
- (vii) Minimum of one, additional to be provided according to the complexity of the building.
- (viii) To be provided in areas not covered by automatic fixed installations.
- (ix) There shall be sufficient hydrants and hose reels to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.
- (x) Lift or lifts as designated.
- (xi) As required by occupancy.
- (xii) Required for buildings with total floor areas exceeding 230 square metres and to cover all parts of the buildings including staircases and common corridors.

- (xiii) Required for any fire compartment exceeding 7 000 cubic metres where:
  - (a) the aggregate area of openable windows of the compartment does not exceed 6.25% of the floor area of that compartment, and
  - (b) the designed fire load is likely to exceed 1 135 MJ/square metre.
- (xiv) When a ventilation/air conditioning control system to a building is provided, it shall stop mechanically induced air movement within a designated fire compartment.

*ADDITIONAL REQUIREMENT*

Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.

**4.31 Industrial/godown buildings—high rise**

*REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:*

- (i) Automatic actuating devices
- (ii) Automatic fixed installations other than water
- (iii) Emergency generators
- (iv) Emergency lighting
- (v) Exit signs
- (vi) Fire alarm systems
- (vii) Fire control centre
- (viii) Fire detection systems
- (ix) Fire hydrant/hose reel systems
- (x) Fireman's lifts
- (xi) Portable hand-operated approved appliances
- (xii) Pressurization of staircases
- (xiii) Sprinkler systems
- (xiv) Static or dynamic smoke extraction systems
- (xv) Ventilation/air conditioning control systems

*EXTENT*

- (i) As required by that equipment which needs to be automatically actuated.
- (ii) To be provided to areas where the use of water is undesirable for the occupancy or trade.
- (iii) An independently powered generator of sufficient electrical capacity to meet the essential services it is required to provide.
- (iv) Emergency lighting shall be provided throughout the entire building and all exit routes leading to ground level.
- (v) Sufficient directional and exit signs to ensure that all exit routes from any floor within the building are clearly indicated as required by the configuration of staircases serving the building.
- (vi) One actuating point and one audio warning device to be located at each hose reel point. This actuating point should include facilities for fire pump start and audio warning device initiation.
- (vii) Minimum of one, additional to be provided according to the complexity of the building.
- (viii) To be provided in areas not covered by automatic fixed installations.
- (ix) There shall be sufficient hydrants and hose reels to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.
- (x) Lift or lifts as designated.
- (xi) As required by occupancy.

- (xii) Required where:
  - (a) natural venting of staircase is not provided; and
  - (b) the aggregate area of openable windows of the rooms/units of the building does not exceed 6.25% of the floor area of those rooms/units, calculated on a floor by floor basis; and
  - (c) the cubical extent of the building exceeds 28 000 cubic metres; and
  - (d) the designed fire load of the building is likely to exceed 1 135 MJ/square metre.

The number of pressurized staircases to be provided shall be determined by the table stipulated under the definition of Pressurization of Staircases in Pt. II provided that the number of pressurized staircases required shall not exceed the total number of staircases required by the Code of Practice for Means of Escape.
- (xiii) In all parts of the buildings including staircases and common corridors.
- (xiv) Required for any fire compartment exceeding 7 000 cubic metres where:
  - (a) the aggregate area of openable windows of the compartment does not exceed 6.25% of the floor area of that compartment, and
  - (b) the designed fire load is likely to exceed 1 135 MJ/square metre.
- (xv) When a ventilation/air conditioning control system to a building is provided, it shall stop mechanically induced air movement within a designated fire compartment.

#### *ADDITIONAL REQUIREMENT*

Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.

#### **4.32 Institutional buildings—low rise**

##### *REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:*

- (i) Audio/visual advisory systems
- (ii) Automatic actuating devices
- (iii) Automatic fixed installations other than water
- (iv) Emergency generators (in hospitals and prisons only)
- (v) Emergency lighting
- (vi) Exit signs
- (vii) Fire alarm systems
- (viii) Fire detection systems
- (ix) Fire hydrant/hose reel systems
- (x) Fireman's lifts
- (xi) Portable hand-operated approved appliances
- (xii) Sprinkler systems
- (xiii) Ventilation/air conditioning control systems

#### *EXTENT*

- (i) Required for any part or parts of building where the area occupied for institutional purposes on any one floor exceeds 2 000 square metres AND where the occupants, due to their transient presence either as guests or visitors, are exposed to risks to require additional advice through such systems.
- (ii) As required by that equipment which needs to be automatically actuated.
- (iii) To be provided to areas where the use of water is undesirable for the occupancy or trade.
- (iv) An independently powered generator of sufficient electrical capacity to meet the essential services it is required to provide.
- (v) Emergency lighting shall be provided throughout the entire building and all exit routes leading to ground level.

- (vi) Sufficient directional and exit signs to ensure that all exit routes from any floor within the building are clearly indicated as required by the configuration of staircases serving the building.
- (vii) One actuating point and one audio warning device to be located at each hose reel point. This actuating point should include facilities for fire pump start and audio warning device initiation.
- (viii) A smoke detection system to be provided for the entire floor including the lift lobbies if any part of that floor is used for sleeping accommodation.
- (ix) There shall be sufficient hydrants and hose reels to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.
- (x) Lift or lifts as designated.
- (xi) As required by occupancy.
- (xii) Required for all parts of buildings including staircases and common corridors with total floor area exceeding 230 square metres.
- (xiii) When a ventilation/air conditioning control system to a building is provided, it shall stop mechanically induced air movement within a designated fire compartment.

#### *ADDITIONAL REQUIREMENTS*

- (i) All linings for acoustic and thermal insulation purposes in ductings and concealed locations shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (ii) All linings for acoustic, thermal insulation and decorative purposes within protected means of escape shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (iii) Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.
- (iv) Protection for hospital lifts which are designated for evacuation purpose shall satisfy every condition for a Fireman's lift with the exception of the internal floor area of car, and the minimum rated load factors.

#### **4.33 Institutional buildings—high rise**

##### *REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:*

- (i) Audio/visual advisory systems
- (ii) Automatic actuating devices
- (iii) Automatic fixed installations other than water
- (iv) Emergency generators
- (v) Emergency lighting
- (vi) Exit signs
- (vii) Fire alarm systems
- (viii) Fire control centre
- (ix) Fire detection systems
- (x) Fire hydrant/hose reel systems
- (xi) Fireman's lifts
- (xii) Portable hand-operated approved appliances
- (xiii) Pressurization of staircases
- (xiv) Sprinkler systems
- (xv) Ventilation/air conditioning control systems

*EXTENT*

- (i) Required for any part or parts of building where the area occupied for institutional purposes on any one floor exceeds 2 000 square metres AND where the occupants either as guests or visitors, due to their transient presence, are exposed to risks to require additional advice through such systems.
- (ii) As required by that equipment which needs to be automatically actuated.
- (iii) To be provided to areas where the use of water is undesirable for the occupancy or trade.
- (iv) An independently powered generator of sufficient electrical capacity to meet the essential services it is required to provide.
- (v) Emergency lighting shall be provided throughout the entire building and all exit routes leading to ground level.
- (vi) Sufficient directional and exit signs to ensure that all exit routes from any floor within the building are clearly indicated as required by the configuration of staircases serving the building.
- (vii) One actuating point and one audio warning device to be located at each hose reel point. This actuating point should include facilities for fire pump start and audio warning device initiation.
- (viii) Minimum of one, additional to be provided according to the complexity of the building.
- (ix) A smoke detection system to be provided for the entire floor including the lift lobbies if any part of that floor is used for sleeping accommodation.
- (x) There shall be sufficient hydrants and hose reels to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.
- (xi) Lift or lifts as designated.
- (xii) As required by occupancy.
- (xiii) Required for hospitals where:
  - (a) natural venting of staircase is not provided; and
  - (b) the aggregate area of openable windows of the rooms/units of the building does not exceed 6.25% of the floor area of those rooms/units, calculated on a floor by floor basis.

The number of pressurized staircases to be provided shall be determined by the table stipulated under the definition of Pressurization of Staircases in Pt. II provided that the number of pressurized staircases required shall not exceed the total number of staircases required by the Code of Practice for Means of Escape.
- (xiv) Required for all parts of buildings including staircases and common corridors.
- (xv) When a ventilation/air conditioning control system to a building is provided, it shall stop mechanically induced air movement within a designated fire compartment.

*ADDITIONAL REQUIREMENTS*

- (i) All linings for acoustic and thermal insulation purposes in ductings and concealed locations shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (ii) All linings for acoustic, thermal insulation and decorative purposes within protected means of escape shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (iii) Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.
- (iv) Protection for hospital lifts which are designated for evacuation purpose shall satisfy every condition for a Fireman's lift with the exception of the internal floor area of car, and the minimum rated load factors.

**4.34 Kitchens (other than kitchens in domestic premises)****REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:**

Kitchens shall normally be required to incorporate the fire protection and life safety systems in the building in which they are located with the addition of any special equipment/requirements as may be required by the Director of Fire Services.

**4.35 Lift motor rooms****REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:**

- (i) Fire detection systems.
- (ii) Portable hand-operated approved appliances.

**EXTENT**

- (i) To be provided in all lift motor rooms.
- (ii) As required by occupancy.

**4.36 Mechanical plant rooms (Group I)****REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:**

*Note:* Plant Rooms to exclude open gas fired appliances

- (i) Automatic actuating devices
- (ii) Fire detection systems
- (iii) Gas detection systems
- (iv) Gas extraction systems
- (v) Portable hand-operated approved appliances
- (vi) Ventilation/air conditioning control systems

**EXTENT**

- (i) As required by that equipment which needs to be automatically actuated.
- (ii) To be provided in areas not covered by automatic fixed installations.
- (iii) To be provided where flammable vapours may be generated.
- (iv) Approved type for the part of building where flammable vapours may be generated, and to reduce the concentration below its lower explosive limit.
- (v) As required by the risk.
- (vi) When a ventilation/air conditioning control system to a building is provided, it shall stop mechanically induced air movement within a designated fire compartment.

**ADDITIONAL REQUIREMENT**

Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.

**4.37 Mechanical plant rooms (Group II)****REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:**

*Note:* Plant Rooms to exclude open gas fired appliances

- (i) Automatic actuating devices
- (ii) Automatic fixed installations other than water
- (iii) Emergency generators
- (iv) Emergency lighting
- (v) Exit signs
- (vi) Fire detection systems
- (vii) Fixed automatically operated approved appliances



- (viii) Gas detection systems
- (ix) Gas extraction systems
- (x) Portable hand-operated approved appliances
- (xi) Ventilation/air conditioning control systems

**EXTENT**

- (i) As required by that equipment which needs to be automatically actuated.
- (ii) To be provided to areas where the use of water is undesirable for the occupancy or trade.
- (iii) An independently powered generator of sufficient electrical capacity to meet the essential services it is required to provide.
- (iv) Emergency lighting shall be provided throughout the entire building and all exit routes.
- (v) Sufficient directional and exit signs to ensure that all exit routes from any floor within the building are clearly indicated as required by the configuration of staircases serving the building.
- (vi) To be provided in areas not covered by automatic fixed installations.
- (vii) As required by the risk.
- (viii) To be provided where flammable vapours may be generated.
- (ix) Approved type for the part of building where flammable vapours may be generated, and to reduce the concentration below its lower explosive limit.
- (x) As required by the risk.
- (xi) When a ventilation/air conditioning control system to a building is provided, it shall stop mechanically induced air movement within a designated fire compartment.

**ADDITIONAL REQUIREMENT**

Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.

**4.38 Passenger terminals/stations**

**REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:**

Such terminals/stations to be the subject of individual consideration by the Director of Fire Services, taking into account their size and complexity. Requirements will be based generally on the various usages of the terminals/stations in accordance with the relevant sections of this Code for similar usages, with additional requirements for other areas as considered necessary e.g. passenger movement areas.

**4.39 Petro-chemical complexes**

**REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:**

- (i) Automatic actuating devices
- (ii) Automatic fixed installations other than water
- (iii) Automatic fixed installations using water
- (iv) Dust detection systems
- (v) Emergency generators
- (vi) Emergency lighting
- (vii) Fire alarm systems
- (viii) Fire control centre
- (ix) Fire detection systems
- (x) Fixed automatically operated approved appliances
- (xi) Fixed foam systems
- (xii) Gas detection systems

- (xiii) Gas extraction systems
- (xiv) Portable hand-operated approved appliances
- (xv) Ring main systems with fixed pump(s)
- (xvi) Special equipment/requirements
- (xvii) Ventilation/air conditioning control systems

*EXTENT*

- (i) As required by that equipment which needs to be automatically actuated.
- (ii) To be provided to areas where the use of water is undesirable for the risk.
- (iii) In all areas including staircase excepting where covered by (ii) above.
- (iv) To be provided in all areas where there is a potential dust explosion hazard.
- (v) An independently powered generator of sufficient electrical capacity to meet the essential services it is required to provide.
- (vi) Emergency lighting shall be provided to all buildings within the complex and in addition, such lighting shall also be provided to ensure adequate external illumination to permit safe evacuation to the outside of the site boundary.
- (vii) One actuating point and one audio warning device to be located at each hose reel point within the buildings. This actuating point should include facilities for fire pump start and audio warning device initiation, and in addition, one actuating point and one audio warning device to be provided at each hydrant outlet on the ring main system.
- (viii) Minimum of one, additional to be provided according to the layout of the complex.
  - (ix) To be provided in areas not covered by automatic fixed installations.
  - (x) As required by the risk.
  - (xi) As required by the risk.
  - (xii) To be provided in all areas of risk.
- (xiii) Approved type for the part of building where flammable vapours may be generated, and to reduce the concentration below its lower explosive limit.
- (xiv) As required by the risk.
- (xv) To be provided to cover those areas of such complexes not adequately served by public water mains.
- (xvi) As required by the Director of Fire Services.
- (xvii) When a ventilation/air conditioning control system to a building is provided, it shall stop mechanically induced air movement within a designated fire compartment.

*Note:* Buildings within such complexes shall conform to the requirements specified for similar premises in accordance with this Code.

**4.40 Railway marshalling yards (encompassing a site area of more than 2 300 m<sup>2</sup>)**

***REQUIREMENTS- SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:***

- (i) Automatic fixed installations other than water
- (ii) Automatic fixed installations using water
- (iii) Emergency generators
- (iv) Emergency lighting
- (v) Fire alarm systems
- (vi) Fire Control Centre
- (vii) Fire hydrant/hose reel systems
- (viii) Portable hand-operated approved appliances
- (ix) Ring main systems with fixed pump(s)
- (x) Special equipment/requirements
- (xi) Static or dynamic smoke extraction system.

*EXTENT*

- (i) To be provided to areas where the use of water is undesirable for the risk.
- (ii) In all areas including staircase excepting where covered by (i) above.
- (iii) An independently powered generator of sufficient electrical capacity to meet the essential services it is required to provide.
- (iv) Emergency lighting shall be provided to all buildings within the yard, and in addition, such lighting shall also be provided to ensure adequate external illumination to permit safe evacuation to the outside of the site boundary.
- (v) One actuating point and one audio warning device to be located at each hydrant point on the ring main systems. This actuating point should include facilities for fire pump start and audio warning device initiation.
- (vi) Minimum of one, additional to be provided according to the layout of the yard.
- (vii) There shall be sufficient hydrants and hose reels to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.
- (viii) As required by occupancy.
- (ix) To be provided to cover those areas of the yard not adequately served by public water mains.
- (x) As required by the Director of Fire Services.
- (xi) Required for any fire compartment exceeding 7 000 m<sup>3</sup> where
  - (a) the aggregate area of openable windows of the compartment does not exceed 6.25% of the floor area of that compartment, and
  - (b) the designed fire load of that compartment is likely to exceed 1 135 MJ/m<sup>2</sup>.

*Note:* Buildings within the yard shall conform to the requirements specified for similar premises in accordance with this Code.

**4.41 Road tunnels***REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:*

- (i) Automatic fixed installations other than water
- (ii) Closed circuit television system
- (iii) Dynamic smoke extraction systems
- (iv) Emergency generators
- (v) Emergency lighting
- (vi) Fire alarm systems
- (vii) Fire control centre
- (viii) Fire hydrant/hose reel systems
- (ix) Fireman's communication system(s)
- (x) Gas detection system(s)
- (xi) Pedestrian cross over facilities
- (xii) Portable hand-operated approved appliances
- (xiii) Traffic control signs

*EXTENT*

- (i) To be provided to areas where the use of water is undesirable for the risk.
- (ii) To be provided to enable clear visual observation throughout the length of the tunnel.
- (iii) To be provided where the tunnel exceeds 230 m and may be incorporated into the ventilating system of the tunnel.
- (iv) An independently powered generator of sufficient electrical capacity to meet the essential services it is required to provide.
- (v) Emergency lighting shall be provided throughout the entire tunnel.

- (vi) One actuating point and one visual warning device to be located at each hose reel point. This actuating point should include facilities for fire pump start and audio visual warning device initiation within the tunnel control centre.
- (vii) A fire control centre to be provided. This may be part of the tunnel control centre.
- (viii) There shall be sufficient hydrants and hose reels to ensure that every part of the tunnel can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.
- (ix) Direct telephone system with telephones sited alongside the hydrant/hose reel points, terminating at the fire control centre.
- (x) Gas detection system(s) to include carbon monoxide indication and alarm.
- (xi) Facilities to be provided in twin tube tunnels where practicable.
- (xii) As required by the risk.
- (xiii) To be provided at each entrance together with warning lights within the tunnel.

#### **4.42 Shipyards (encompassing a site area of more than 2 300 m<sup>2</sup>)**

##### **REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:**

- (i) Automatic actuating devices
- (ii) Emergency generators
- (iii) Emergency lighting
- (iv) Fire alarm systems
- (v) Fire control centre
- (vi) Portable hand-operated approved appliances
- (vii) Ring main systems with fixed pump(s)
- (viii) Special equipment/requirements

##### **EXTENT**

- (i) As required by that equipment which needs to be automatically actuated.
- (ii) An independently powered generator of sufficient electrical capacity to meet the essential services it is required to provide.
- (iii) Emergency lighting shall be provided to all buildings within the yard, and in addition, such lighting shall also be provided to ensure adequate external illumination to permit safe evacuation to the outside of the site boundary.
- (iv) One actuating point and one audio warning device to be located at each hydrant point on the ring main systems. This actuating point should include facilities for fire pump start and audio warning device initiation.
- (v) Minimum of one, additional to be provided according to the layout of the yard.
- (vi) As required by occupancy.
- (vii) To be provided to cover those areas of the yard not adequately served by public water mains.
- (viii) As required by the Director of Fire Services.

*Note:* Buildings within the yard shall conform to the requirements specified for similar premises in accordance with this Code.

##### **ADDITIONAL REQUIREMENT**

Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.

#### **4.43 Telephone distribution equipment, computer installation and similar installations**

##### **REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:**

- (i) Automatic actuating devices
- (ii) Automatic fixed installations other than water
- (iii) Automatic fixed installations using water

- (iv) Emergency lighting
- (v) Exit signs
- (vi) Fire alarm systems
- (vii) Fire detection systems
- (viii) Fixed automatically operated approved appliances
- (ix) Portable hand-operated approved appliances
- (x) Ventilation/air conditioning control systems

*EXTENT*

- (i) As required by that equipment which needs to be automatically actuated.
- (ii) To be provided if not otherwise protected by automatic fixed installations using water.
- (iii) To be provided if not otherwise protected by automatic fixed installations other than water.
- (iv) Emergency lighting shall be provided throughout the entire building and all exit routes leading to ground level.
- (v) Sufficient directional and exit signs to ensure that all exit routes from the premises within the buildings are clearly indicated as required by the configuration of staircases serving the building.
- (vi) As required by the risk.
- (vii) To be provided in areas not covered by automatic fixed installations.
- (viii) As required by the equipment at risk.
- (ix) As required by the risk.
- (x) When a ventilation/air conditioning control system to a building is provided, it shall stop mechanically induced air movement within a designated fire compartment.

*ADDITIONAL REQUIREMENTS*

- (i) All linings for acoustic and thermal insulation purposes in ductings and concealed locations shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (ii) All linings for acoustic, thermal insulation and decorative purposes within protected means of escape shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7: 1971 (revised 1987) or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
- (iii) Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.

**PART V****SPECIFICATION AND TESTING**

- 5.1 Audio/Visual Advisory Systems
- 5.2 Automatic Actuating Devices
- 5.3 Automatic Fixed Installations Other Than Water
- 5.4 Automatic Fixed Installations Using Water
- 5.5 Deluge Systems
- 5.6 Drencher Systems
- 5.7 Dust Detection Systems
- 5.8 Emergency Generators
- 5.9 Emergency Lighting
- 5.10 Exit Signs
- 5.11 Fire Alarm Systems
- 5.12 Fire Control Centre
- 5.13 Fire Detection Systems
- 5.14 Fire Hydrant/Hose Reel Systems
- 5.15 Fireman's Lifts
- 5.16 Fixed Automatically Operated Approved Appliances
- 5.17 Fixed Foam Systems
- 5.18 Gas Detection Systems
- 5.19 Hose Reels
- 5.20 Portable Hand-Operated Approved Appliances
- 5.21 Pressurization of Staircases
- 5.22 Ring Main Systems with Fixed Pumps
- 5.23 Smoke Extraction Systems—Dynamic and Static
- 5.24 Sprinkler Systems
- 5.25 Supply Tank
- 5.26 Ventilation/Air Conditioning Control Systems
- 5.27 Water Spray Systems
- 5.28 Water Supplies

## 5.1 Audio/visual advisory systems

### (i) SPECIFICATION

Fire alarm bells, klaxons, sirens etc. which are an integral part of an automatic or a manual fire alarm system are not included in this section.

#### AUDIO

A system of records/signals either verbal or musical or direct transmission over a Public Address System to advise staff and other occupants of emergency conditions and the action to be followed.

In special occupancy premises e.g. hospitals, cinemas, an agreed sound signal may be broadcast to give early warning to staff of emergency conditions which may or may not necessitate action by them at that time.

In a major building the power supply to the sound system should be from both main and emergency (essential) circuits.

#### VISUAL

A system of coloured and/or flashing lights, which may be incorporated to the Exit Signs and Directional Signs as required under 5.10 and supplemented by low-level Directional Signs to indicate:

- (a) the floor/floors to be evacuated by operating the lights on that floor/those floors in flashing mode,
- (b) the evacuation routes to be followed by operating the lights of the low-level Directional Signs.

### (ii) TESTING

A weekly visual and audio check of all signals.

The system shall also be checked during any fire drill.

## 5.2 Automatic actuating devices

### (i) SPECIFICATION

Components under this section will include fire stop doors, fire dampers, fire curtains and other means of providing compartmentation/fire separation automatically in the event of fire. Automatic fire detection and fire suppression systems are not included in this section.

They shall be constructed and installed in accordance with Fire Offices' Committee Rules or other standards acceptable to the Director of Fire Services.

### (ii) TESTING

The component shall be capable of manual and automatic operation and regular testing. Test shall confirm that the designed enclosure/separation shall be completed within the time specified for that particular device.

## 5.3 Automatic fixed installations other than water

### (i) SPECIFICATION

Carbon dioxide, BCF and BTM or similar extinguishing system, shall be installed in accordance with standards acceptable to the Director of Fire Services.

When installed the system may be combined manual/automatic with or without remote operation.

Such systems in their simplest form consist of one or more storage containers with discharge valves, detection heads, piping and discharge nozzles.

If the system is intended for total flooding of the premises/compartment, then automatic actuating devices (Section 5.2) may be necessary, in addition, to ensure complete compartmentation.

(ii) *TESTING*

The system shall be tested by direct and/or remote control in accordance with test procedures as laid down in the acceptable standard.

If any part of the system fails during test, then the whole system shall be brought up to full readiness by a registered fire service installation contractor.

**5.4 Automatic fixed installations using water**

These may include:

Deluge Systems

Drencher Systems

Sprinkler Systems

Water Spray Systems

Fixed Foam Systems

Specifications and testing for the above are in the respective sections.

**5.5 Deluge systems**(i) *SPECIFICATION*

A deluge system may be required in a risk area where fire may be expected to spread quicker than the progressive operation of normal sprinkler heads.

The design of such system will be the subject of consultation with Fire Services Department.

(ii) *TESTING*

Testing shall be in accordance with the requirements of the Director of Fire Services.

**5.6 Drencher systems**(i) *SPECIFICATION*

Such system shall be installed in accordance with the current edition of Fire Offices' Committee Rules or other standards acceptable to the Director of Fire Services.

(See Water Supplies—Section 5.28)

(ii) *TESTING*

The testing procedure shall be in accordance with the appropriate standard or as required by the Director of Fire Services.

**5.7 Dust detection systems**(i) *SPECIFICATION*

Very few types of premises will require such a system and the type will depend on the industry/trade/usage of the premises.

Each required system shall be designed in consultation with and to the approval of the Fire Services Department.

Each system shall:

- (a) be automatic in action;
- (b) close down the affected process;
- (c) operate pressure relief vent (if appropriate);
- (d) be connected to the fire alarm systems for the premises.

(ii) *TESTING*

Testing appropriate to the system will be carried out at intervals agreed with the Director of Fire Services.

If the system is capable of being actuated manually, such manual actuation will be tested to confirm subsequent operations.



## 5.8 Emergency generators

### (i) SPECIFICATION

#### *General*

The alternator set shall be designed for cold starting and be capable of accepting the full rated load in not more than 15 seconds.

The set shall be capable of continuously operating under the appropriate site conditions which shall normally be a temperature range of 5 deg.C to 40 deg.C, relative humidity 100% and the altitude of the actual site.

For reliability it is recommended that the shaft speed shall not exceed 25 r/s.

Each item of equipment incorporated in the set shall be to the latest edition of the relevant British Standard. Full compliance with the latest edition of the I.E.E. Regulations is also necessary.

The alternator set shall be completely assembled and tested at the manufacturer's works and delivered to site as a complete unit.

The prime mover may be of any form provided that the start-up time of 15 seconds is not exceeded and reliability is ensured.

Petrol, kerosene and similar fuels are not acceptable.

The alternator set shall have a minimum full load rating of not less than the consumption of all devices simultaneously connected thereto plus 10%.

### (ii) ALTERNATOR

The alternator shall be self-exciting, self-regulating and brushless.

It shall be a screen protected, drip proof machine complying with British Standard 5000: Part 99: 1973.

The alternator shall be fitted with an anti-condensation heater.

Under steady load conditions the output voltage shall be maintained within plus or minus 1½% whilst under surge and starting load conditions regulation shall be within plus or minus 6% with frequency maintained at 50 Hz plus or minus 1½%.

### (iii) DIESEL ENGINE

If a diesel engine is provided as the prime mover it is recommended that the shaft speed shall not exceed 25 r/s.

The engine may be of any form either naturally aspirated or pressure charged and shall be of industrial type complying with British Standard 5514: Parts 1 to 5.

The recommended fuel is "light" diesel fuel to Class A1 or A2 of British Standard 2869: 1983.

### (iv) FUEL STORAGE

The unit shall be complete with an integral fuel storage system capable of sustaining full load operation for a period of not less than 6 hours.

### (v) INSTALLATION

The provision of anti-vibration mountings for all sets is recommended.

Adequate (not less than 600 mm) space all round units shall be provided for maintenance and cleaning.

Ventilation to the approval of the Director of Fire Services shall be provided for both combustion and cooling air. If fans are necessary to provide this air they shall operate at all times while the alternator set is running.

The air supply and discharge shall be direct to outside air without any possible obstructions i.e. no fire, smoke or regulating dampers shall be fitted.

Attention is drawn to the possible necessity to provide acoustic or other treatment to ensure the noise level outside the building is within the relevant guidelines set down by Environmental Protection Department or other authorities.

Exhaust discharges of both combustion products and cooling air shall not cause a public nuisance.

(vi) *ENGINE STARTING*

Engine starting may be electric or compressed air.

## (a) Electric starting

Shall be served by heavy duty batteries especially designed for starting purposes.

The batteries shall be of such a capacity as to ensure four operations of the starter each of 15 seconds duration with 5 seconds intervals between each operation without permanent damage nor reduction in the rated life.

Batteries may be of any reliable type and either vented or sealed.

For lead-acid batteries high performance Planté positive type to British Standard 6290: Part 2: 1984 are recommended.

Where vented batteries are used they shall be installed in suitable ventilated enclosures to the approval of the Director of Fire Services. British Standard 6133: 1982 shall be used as a guideline for lead-acid battery installations.

The system shall be provided with a trickle/boost type battery charger which shall be energised at all times either from the mains or the alternator set.

## (b) Compressed air starting

Shall be served from a compressed air receiver of sufficient volume to provide for the starting sequence described in sub-section (a) above. The receiver shall be maintained at working pressure at all times by an air compressor which shall be operated at all times either from the mains or the alternator set.

Provide all necessary operating and safety devices to ensure operation when required including a low pressure alarm.

(vii) *OPERATION*

Failure of one or more phases of the mains supply or a reduction of voltage to less than 70% of normal shall initiate a timing device having an adjustable setting from 0.5 to 1.0 second.

If the failure persists at the expiry of the time delay period the prime mover start sequence shall begin.

Within 15 seconds of the start sequence commencing, the unit shall be stabilised at its running speed and full load transfer shall take place automatically.

Should the prime mover fail to start after a period of 15 seconds, the sequence shall be interrupted for a period of 5 seconds and a further attempt to start of 15 seconds duration shall then be made. If it again fails to start, the starting sequence should be locked out, an audible and visual alarm given and it shall remain in this locked out condition until manually reset.

Restoration of the mains supply during the starting period shall not interrupt the starting sequence but shall prevent operation of the load transfer.

Subsequent failure of the main supply while the unit is running shall, after expiration of the 0.5 to 1.0 second time delay, cause the load transfer to take place.

On the full restoration of normal supply, load transfer and shutting down of the unit shall be by manual operation.

Detailed instructions for operation, manual testing and shut down of the unit shall be clearly displayed on or adjacent to the control panel.

All operating personnel shall be given regular instructions in the operation and use of the plant.

(viii) *CONTROLS, SAFETY DEVICES & CONTROL PANEL/CUBICLE*

The alternator set shall be complete with all necessary devices for safe operation and control but not less than the following:

- (a) Prime mover speed governor
- (b) Engine time run meter
- (c) Output voltmeter and selector switch
- (d) Output ammeter and selector switch

- (e) Output frequency meter
- (f) Automatic voltage regulator
- (g) Mains sensing device(s) –see operation sub-section
- (h) Load transfer contactor(s)
- (i) “Fail to start” audible and visible alarms with contacts for remote signals where applicable
- (j) “Engine fault” audible and visible alarms with contacts for remote signals where applicable
- (k) Manual selector switch for “run” and “test” with manual start button
- (l) Manual stop button

Controls and operating devices shall be mounted in a panel or cubicle which may be unit or floor mounted. In all instances it shall be of substantial construction and shall incorporate not less than the following:

- (a) Corrosion resistant construction
- (b) Anti-condensation heater
- (c) Labels with lettering in English (not less than 5 mm high) and Chinese (not less than 8 mm high) indicating functions of all devices
- (d) Wiring of oil and fire resistant materials
- (e) Ease of access for servicing
- (f) Protective fuses for all circuits
- (g) Vibration free mounting

The controls arrangements shall be such that under normal situations the unit may shut down on fault conditions occurring.

However, where danger to life exists, in the event of mains failure i.e. fire in a building, the automatic shut down features on fault shall be overridden by a signal from a fire panel or other device approved by the Director of Fire Services and the unit shall run to destruction if necessary or until the danger to life has passed.

#### (ix) *MAINTENANCE AND TESTING*

Fully detailed maintenance and testing instructions shall be provided in a permanent form adjacent to the unit.

A log book shall be provided, be retained in the plant room and be kept up to date recording at the time of occurrence all operations, faults occurrences and corrective action taken, routine servicing, maintenance and periodic operation, etc. including dates, times, hour meter readings, workers/supervisors names and signatures, etc. for the unit, batteries, compressors, etc.

Care and maintenance of any batteries shall be based on Section 5 of British Standard 6133: 1982 but shall incorporate the manufacturers specific recommendations for operation under Hong Kong conditions.

All units shall be exercised once monthly under full load conditions for a period of not less than 30 minutes. During this running period all operating conditions shall be checked. Following this running period functional tests shall be carried out on all automatic and manual starting devices and safety controls.

Care and maintenance of any compressed air starting system shall include running of the compressor and functional operation of all operating and safety devices.

Further routine testing and maintenance for a particular installation may be required by the Director of Fire Services.

Fuel tanks must be left filled after testing.

## 5.9 Emergency lighting

### (i) *SPECIFICATION*

- (a) Emergency lighting for all premises shall comply with British Standard 5266: Part 1: 1975 except that exit signs shall be as at Section 5.10. hereof.

*CINEMAS, THEATRES, ETC.*

- (b) Emergency lighting for cinemas/theatres and other specified premises used for entertainment shall, additionally, comply with the following:—
- (c) Battery emergency lighting systems shall be operated at a normal battery voltage of not less than 24 volts and not more than 120 volts D.C., from a common bank.
- (d) Batteries used shall be heavy duty of rechargeable (secondary) type; batteries of primary cells of any type whatsoever will not be acceptable.
- (e) Batteries shall be installed in a room approved for this purpose by the Licensing Authority.
- (f) Batteries in celluloid containers shall not be installed, stored or used.
- (g) A margin allowance of  $12\frac{1}{2}\%$  of the total required battery capacity (amperehour rating not voltage) shall be provided, i.e.  $100\% + 12\frac{1}{2}\% = 112\frac{1}{2}\%$ .
- (h) All batteries for the emergency lighting circuits shall be kept fully charged at all times and shall be capable of maintaining the stipulated lighting levels for a period of not less than 2 hours.
- (i) An automatic trickle charger with mains input and suitable output, fitted with meters, regulators and pilot lights, shall be provided for the batteries. The charger shall be capable of fully re-charging the batteries in not more than 12 hours.
- (j) Upon failure of the main lighting system the emergency lighting system shall automatically light up.
- (k) In the event of failure of the main lighting the public shall, unless the capacity of the battery is sufficient to maintain specified conditions for not less than four hours, within one hour be required to leave the building and they shall not be re-admitted until the general lighting has been fully restored and the emergency system recharged.
- (l) The supply from the batteries shall feed a main distribution fuse board and thence be subdivided to four subdistribution fuse boards, as follows:—
- Exit lighting
  - Stair lighting
  - Auditorium lighting
  - Stage lighting
- (m) Outgoing circuits shall be suitably protected by fuses to British Standard 88 or miniature circuit breakers to British Standard 3871: Part 1.
- (n) A diagram showing details of the distribution system and the circuit wiring of the emergency lighting system shall be erected at the main distribution board.
- (o) The emergency lighting system shall be wired in M.I.C.C. cable to British Standard 6207: Part 1: 1969 or other fire resistant cable approved by Fire Offices' Committee and be fully segregated from the general distribution system.
- (p) The minimum illumination provided at floor level by the emergency lighting system shall be:—
- |  |                        |
|--|------------------------|
| Staircase  | not less than 2 Lux.   |
| Nightclub, restaurant, dance hall, or premises where people have freedom of movement and there are loose fixtures and fittings | not less than 1 Lux.   |
| Cinemas and theatres   | not less than 0.5 Lux. |
- measured at the mid-point between any two emergency lighting fittings. A discretionary tolerance of minus 10% is permitted and all readings shall be taken by a portable photoelectric photometer.
- (q) All points shall have equal lumen output and distribution characteristics giving equal intensity of light in all material directions. Each point shall be so sited as to avoid impairment of vision from glare. Points, except where so specified and approved, shall be mounted at a height of not less than 2 metres.
- (r) The maximum permissible period for visual adaptation shall not exceed 5 seconds at any point on the premises.

- (s) The minimum number of fittings permissible in any installation shall not be less than two (N.B. if only one fitting were provided and a lamp filament failure occurred, a hazardous situation would result.)
- (t) All lighting fittings in the emergency lighting system shall be of flame retardant construction, shall comply with British Standard 4533 Section 1.13 and be permanently fixed in position.

#### *MAINTENANCE*

- (u) Once every month a discharge test, for 1 minute at the 10-hour discharge rate, shall be carried out, and the results entered in a register, the on-load voltage of each cell after this test shall be not less than 2.01 for Lead Acid and 1.25 for Nickel Cadmium.
  - (v) For battery systems the control and safety devices installed, shall be regularly tested as under:—
    - (i) Connections between the battery and the source of charging current shall be such that in no circumstances shall the battery discharge other than to the secondary lighting circuits.
    - (ii) A rectifier for charging shall be for that purpose only and shall be so regulated that the battery cannot discharge appreciably under normal conditions.
  - (w) Voltage and Hydrometer tests shall be carried out weekly and recorded in a register.
- (ii) *TESTING*
- (x) Further tests shall be carried out in accordance with British Standard 5266: Part 1: 1975.
  - (y) Emergency lighting systems installed in cinemas/theatres and other specified premises used for entertainment shall additionally be tested annually by the appropriate power supply company who shall issue to the Director of Fire Services a certificate of a satisfactory test result.

### **5.10 Exit signs**

#### (i) *SPECIFICATION*

Exit signs shall be internally illuminated bearing the word and characters “EXIT 出口” in block letters and characters of not less than 125 mm high with 15 mm wide strokes.

#### *COLOURS*

Colour contrast for translucent surrounds to lettering shall be as follows:

<i>Colour</i>	<i>Contrasting Colour</i>
Green	White
Green	Black
White	Green

The colour combination selected shall be consistent throughout the same building.

#### *DIRECTIONAL SIGNS*

If a sign is not installed immediately above an exit or if an exit is not clearly visible from normally occupied parts of the premises, directional sign conforming to Table 10 of B.S. 5499 shall be erected.

#### *SELF LUMINOUS SIGNS*

Self luminous signs to British Standard 4218 (adapted as for para. 1) are approved for use in Hong Kong, however, their use is not permitted where legislation specifies illuminated exit signs.

#### (ii) *TESTING*

Exit signs shall be tested whenever an emergency lighting system is tested. As exit signs are normally lit when premises are occupied, no additional test procedure is necessary, other than regular maintenance.

### 5.11 Fire alarm systems

#### (i) SPECIFICATION

*Note:* This section deals only with manually operated alarm points of a system. (See British Standard 5839: Part 1: 1980)

Pure manual systems such as hand bells, whistles, rotary gongs, etc. are not within the scope of this Code, however, subject to the approval of the Director of Fire Services, an existing sound signal system within a premises may be utilized as a manual fire alarm system (e.g. school premises) subject to the specific signal being used solely to notify occupants of a fire situation.

Manual actuating points of a pattern conforming with standards acceptable to the Director of Fire Services may be installed as an integrated part of an automatic fire detection system. Such manual actuating points shall be installed in compliance with the appropriate standard, in such locations within the premises, as set out elsewhere in this Code for the individual types of premises.

#### (ii) TESTING

Manual fire alarm points are to be tested when the whole system is required to be tested in accordance with the appropriate standard.

Attention is drawn to Regulation 38 of the Education Regulations, Chapter 279 in respect of fire alarm testing and fire drills in schools.

### 5.12 Fire control centre

#### (i) SPECIFICATION

A room/compartment normally at ground floor level on the main face of a building, preferably adjacent to main entrance.

The room shall be separated from the remainder of the building by walls having a minimum fire resisting period of one hour, and shall be large enough to house equipment, recorders, annunciators, etc. ancillary to the fire protection system installed in the building.

It shall be continuously manned by trained personnel.

Local termination/repeaters of fire protection and life safety systems will be installed together with test facilities of the systems as appropriate.

Electrical supply will be from the essential supplies circuit (both normal and emergency).

It may be called into use as Fire Services Department Command Unit during an incident involving the premises.

#### (ii) TESTING

The routine testing of the various systems within the premises will be carried out in accordance with the appropriate standard or code and as outlined elsewhere in this Code.

No other individual test is considered appropriate.

### 5.13 Fire detection systems

#### (i) SPECIFICATION

Systems shall be installed in accordance with Fire Offices' Committee Rules or other standards acceptable to the Director of Fire Services. A direct line connection shall be provided to the Fire Services Communication Centre or such other premises as may be agreed with the Director of Fire Services.

Detection heads may be of heat detecting type or smoke detecting type and heads of both types may be installed within the same system. The choice of type of head will in most instances be dictated by the circumstances, however, liaison with the Fire Services Department in the planning stage is essential.

Monitoring of the system in the early stages of building operation will be necessary to "locate" any head that, for any reason, is originating false/unwanted alarms.

#### (ii) TESTING

The system and components will be tested in accordance with the appropriate standard or as required by the Director of Fire Services.

The direct line connection will be tested at such time and interval as agreed by the Director of Fire Services.

## 5.14 Fire hydrant/hose reel systems

### (i) SPECIFICATION

Each hydrant outlet shall conform with British Standard 5041: Part 1: 1975 and British Standard 5306: Part 1: 1976 as appropriate and:--

#### (a) HYDRANT OUTLET

Shall be prominently sited in an approach lobby to a staircase or in the staircase enclosure. It should preferably be recessed into a wall which is not a staircase enclosing wall or smoke lobby wall. When recessed there shall be an all round clearance between any part of the hydrant outlet and valve and the enclosing walls sufficient to permit the free use of the hydrant, the fitting of an adaptor. When not recessed the hydrant shall be adequately protected against damage.

Shall be not less than 800 mm nor more than 1 200 mm above floor level.

Shall not obstruct wholly, partly or indirectly any door opening, or the required width of any exit route.

Shall be so sited as not to be concealed by the leaves of an adjacent door when that door is opened.

Shall be of non-corrosive metal. The outlets of all hydrants shall be of 63.5 mm standard female instantaneous type and be controlled by a wheel operated screw valve designed to open by counter-clockwise rotation. The direction of opening of the valve shall be clearly engraved in both English and Chinese on the wheel of the valve.

#### (b) HOSE REEL

Hose reels shall comply with British Standard 5274: 1976 and British Standard 5306: Part 1: 1976 or other standards acceptable to the Director of Fire Services.

The design of the hose reel shall be such that the tubing is permanently connected, via pipes in the drum of the hose reel and such stuffing boxes as may be necessary, to the hydrant supply main.

The hose reel nozzle shall have a 4.5 mm orifice and be fitted with a simple two way valve to open or shut off jet, the valve must not be spring loaded.

Any hose reel sited on any escape route may be carried on a swinging cradle so recessed into the wall that when not in use the outer face of the reel is flush with the wall and when required for use the cradle may swing out into the corridor or passage, without undue obstruction and without serious interference with any exit point or, be of a fixed type with a suitable guide ring.

#### (c) SUPPLY TANK

The reserve water supply for fire fighting shall be contained in a supply tank. (See Section 5.25)

#### (d) FIRE PUMPS

Fire pumps shall be permanently primed and duplicated for duty and standby use.

The pump should preferably be electrically driven but, whatever mode of power for driving the pump is employed, means shall be provided for starting the pump by electric remote control button. Where the motive power for any pump is not electricity, alternative means of starting the pump motor manually, in addition to remote control buttons, shall be provided and directions for so starting prominently displayed in the pump house. Remote starting points shall be wired for starting the pump and operating the manual alarm system. There shall be no means of stopping the pump, other than by switches of the press button type, which re-set the remote control start switches.

The fire pump starters shall be wired through a selector switch for duty and standby pump selection. Should the duty pump fail to operate within 15 seconds the standby pump shall be energized to become the duty pump. A lock-off button adjacent to the fire pump shall be permitted.

Where fixed fire pumps other than the pump fed direct by the supply tank are provided in wet rising mains, suitable stop/start switches shall be provided to enable the Fire Services to exercise control of such booster pumps independently of the switches required by the above paragraph. Such switches must be situated in or near the Fire Service Inlet Box and clearly indicated.

The water supplied through the fixed fire pump shall feed a wet rising main to all fire hydrants and hose reels.

A non-ferrous non-return valve to be provided between the downcoming main and the fixed fire pump.

Remote control buttons for fixed fire pumps shall be sited near the hose reel. Starter buttons shall be enclosed in an independent glass fronted cabinet and must be clearly marked in English and Chinese characters "FIRE PUMP STARTER" (救火泵發動掣).

All fixed fire pumps shall be housed in suitable enclosures, preferably brick or concrete, designed solely for occupation by the pump. Such pump houses shall lie clear of any exit or normal communication routes through the premises and shall be clearly marked in English and Chinese characters "FIXED FIRE PUMP" (固定救火泵).

The pressure and flow available for the fire hydrant/hose reel system shall be such as to provide for a static pressure of not less than 400 kPa and not more than 700 kPa with a flow of not less than 1 350 L/min for industrial buildings and not less than 900 L/min for all other types of buildings from any hydrant outlet of the system. In all buildings where the height between the topmost hydrant and the lowest Fire Service Inlet is in excess of 60 m, the flow and pressure, where necessary in the opinion of the Director of Fire Services, shall be maintained by booster pumps and/or water tanks inserted in the rising main system. The booster pump shall be capable to maintain the required flow and pressure at the topmost hydrant when water is pumping through the Fire Service Inlet at a pressure of not more than 800 kPa.

(e) *RISING MAIN*

Rising mains shall comply with British Standard 5306: Part 1: 1976 as appropriate or other standards acceptable to the Director of Fire Services.

The wet rising main must be provided with a standard Fire Service Inlet at ground floor level. Where the pump is interposed between the Fire Service Inlet and the hydrant delivery valves, provision must be made for the water supplied to the Inlet to by-pass the fire pump in the event of failure of the pump.

All wet rising and downcoming mains shall be fitted with suitable air relief valves to prevent airlocks in the installation.

Each wet rising main shall be connected to an independent Fire Service Inlet. Where, however, there are several wet rising mains in one installation, one Fire Service Inlet may be provided for all risers in the system, subject to the cross-sectional area of the pipe between the Fire Service Inlet and each wet rising main being equal to the sum of the cross sectional areas of all the wet rising mains served thereby.

The internal diameter of the rising main, in the case of industrial buildings (and other buildings where the risk, in the opinion of the Director of Fire Services so justifies) shall be not less than 100 mm. Each rising main shall supply 2 hydrant outlets per floor.

The internal diameter of the rising main in other types of buildings shall be not less than 80 mm. Each rising main shall supply one hydrant outlet per floor.

The Director of Fire Services may require additional rising mains dependent upon the area of the building.

(f) *FIRE SERVICE INLET*

Each Fire Service Inlet shall be in a prominent position on the exterior of the building and must be suitably enclosed by glazing and protected against corrosion and abuse.

The inlet couplings shall be not less than 600 mm nor more than 1 000 mm above the ground level and shall be of a standard pattern approved by the Director of Fire Services.

Each inlet shall be clearly marked in English and Chinese characters "FIRE SERVICE INLET" (消防入水掣).

There shall be a non-ferrous non-return valve behind each inlet.

The Fire Service Inlet shall be so situated as to be within easy reach of a fire appliance parked in a thoroughfare adjacent to the building protected.



(ii) *TESTING*

Tests shall be carried out in accordance with approved standards by a registered Class 2 Fire Service Installation Contractor who shall forward a certificate of maintenance to the Director of Fire Services.

**5.15 Fireman's lifts**(i) *SPECIFICATION* (Formulated in accordance with Reg. 38C of the Building (Lifts) Regulations)(a) *FLOORS SERVICED*

Fireman's lift(s) shall aim to enable Fire Services personnel to reach any floor that may be on fire in the building without having to traverse more than two floors, and arranged in such a way that;

—in the case of single fireman's lift, it will serve at least the alternate floors,

—in the case of multiple fireman's lifts within the common lift shaft, the lifts may serve different zones of the building, which shall be clearly indicated.

—in all cases, the pattern of service must be uniform and regular. That is, either serving the odd floors, the even floors or all floors.

(b) *LIFT SHAFT*

Separate lift shaft must be provided for fireman's lift(s) and up to three lifts may share the same shaft provided all these lifts are designated as fireman's lifts.

A notice shall be displayed outside the lift shaft indicating which is/are fireman's lift(s) by the words "FIREMAN'S LIFT" (消防升降機) in English and Chinese and the floors served.

(c) *LIFT CAR*

The lift car shall be of a minimum size of 1.35 square metres net internal floor area with a minimum rated load of 680 kg.

The electric fan on top of the lift car shall be provided with automatic stop upon the opening of the safety hatch.

The speed of the lift car shall be such that it will reach the topmost discharge point of the building in not more than 1 minute, calculating from the time when the lift doors on the lowest discharge point are completely closed to the time when the lift doors at the topmost discharge point start to open.

(d) *LIFT LOBBY*

Each point of discharge from the fireman's lift shall be through a lift lobby protected by separation with a minimum of 1/2 hr. FRP, except the designated point of entry in the building.

(e) *LIFT DOOR*

The opening of the lift shall not be less than 800 mm wide and 2 000 mm high. The doors shall be fitted with power operated automatic self-closing device.

(f) *FIREMAN'S SWITCH*

The fireman's lift shall be provided with a suitable control switch, clearly indicated in English and Chinese as Fireman's Switch (消防掣), at the designated point of entry to enable Fire Services personnel to gain control over the lift which, on operation shall over-ride the instructions registered inside the lift and return to the designated point of entry as quickly as mechanically possible.

For easy identification of Fireman's lifts which conform to this standard, a red and white diagonal striped backing shall be provided behind the glass of the Fireman's switch.

(g) *POWER SUPPLY*

The power supply to the fireman's lift(s) shall be connected to a sub-main which shall be exclusive and independent of any other sub-main circuit. When a fireman's lift is one of a battery of lifts, the other lifts may be fed from the same supply, provided it is adequate for this purpose, and that arrangements are such that a fault occurring in any other lift or the battery will not affect in any way the operation of the fireman's lift.

*(h) OPERATION*

The purpose of the fireman's lift is aimed to protect the passengers from the effects of fire and smoke by keeping the lift doors automatically closed until operated to open from the inside. Therefore its operation shall be programmed in such a way that upon switching on the Fireman's Switch to gain control of the lift car, the Fire Services personnel need only take three simple steps to operate the lift.

Press the desired floor button or "door close" button continuously to close lift door and register call.

On arrival at the desired floor, press "door open" button continuously until lift doors are fully open.

If another floor is desired, press floor button of that floor.

*(ii) TESTING*

Lifts shall be tested against the specifications in association with the registered lift contractors.

**5.16 Fixed automatically operated approved appliances***(i) SPECIFICATION*

Such appliances designed to operate as independent units are included in this section.

Nevertheless, subject to the agreement of the Director of Fire Services a number of units, may be installed within a compartment such that operation of any one unit will automatically cause all units within the compartment to operate.

All appliances shall be approved by Fire Offices' Committee or to other acceptable national standards.

*(ii) TESTING*

No test is suitable however a check on the content weight to be made either by weighing or by reference to a pressure or other gauge which may be installed as part of the appliance.

**5.17 Fixed foam systems***(i) SPECIFICATION*

Systems shall be installed in compliance with standards acceptable to the Director of Fire Services.

Attention is drawn to British Standard 5041: Part 5: 1974.

Consultation with the Fire Services Department is strongly recommended in the design stage of any system. Particular attention to be placed on compatibility of various foam compounds, and integration of Fire Services equipment into the system.

A comprehensive ongoing training programme is necessary if the system is intended to be brought into use by employees.

*(ii) TESTING*

Tests to be carried out in accordance with the appropriate code and in compliance with manufacturer's instructions for the various items of equipment within the system.

**5.18 Gas detection systems***(i) SPECIFICATION*

Very few types of premises will require such a system. Each system must be designed to detect the escape or excessive concentration of the specific gases appropriate to the area of risk.

The system shall be designed in consultation with the Fire Services Department.

Each system shall:

- (a) monitor the area of risk continuously;
- (b) be automatic in operation;
- (c) close down affected process if circumstances permit;

- (d) operate ventilation/exhaust system if appropriate;
- (e) be connected to the fire alarm system for the premises.

(ii) *TESTING*

The system shall be tested by allowing sufficient amount of the gas across the detection point and efficient operation of all ancillary procedures will be confirmed.

**5.19 Hose reels**

This section has been considered as part of Section 5.14—Fire hydrant/hose reel systems.  
No further detail is considered necessary.

**5.20 Portable hand-operated approved appliances**

(i) *SPECIFICATION*

Attention is drawn to Fire Service (Installations and Equipment) Regulations, Chapter 95.

Appliances shall have received Fire Offices' Committee or other acceptable standard approval.

(ii) *TESTING*

Appliances will be tested by a registered fire service installation contractor to comply with Fire Service (Installations and Equipment) Regulations, Chapter 95.

Tests will be carried out in accordance with appropriate standard and the manufacturer's instructions.

**5.21 Pressurization of staircases**

*A. DESIGN AND SUBMISSIONS*

- A. 1 The designer shall have a suitable qualification based on a professional course in a discipline which emphasises mechanical ventilation and air handling and not less than five years post membership experience in practical design of air handling systems.
- A. 2 The designer shall be responsible for all submissions to F.S.D. and each drawing and all calculations shall be signed by the designer on behalf of the design company/organisation, as having been checked by him, and that they comply fully with the requirements of this Code of Practice.
- A. 3 All drawing submissions shall be in the form set out in the "REQUIREMENTS for Smoke Extraction & Staircase Pressurization Systems Submissions" issued by the Hong Kong Fire Services Department.
- A. 4 All submissions shall include all necessary schematic diagrams required to fully explain the operation of the installations including not less than "normal", "fire", and "no power" modes.
- A. 5 System design shall be based on the requirements of B.S. 5588 "Fire Precautions in the Design of Buildings": Part 4 "Smoke Control in protected escape routes using pressurization" (latest edition) with the following changes:—
  - (a) Table 1—the minimum pressurization level of 50 Pa shall be achieved with all doors closed and all pressure relief systems operating. The maximum design pressurization level shall be such that under no circumstances shall the combined force, to overcome the pressure differential across any door and the action of the door closer, exceed 133N (13.5 kgf) when applied at the designed door opening handle or push plate position.
  - (b) Calculations shall allow for pressurization to be maintained and/or the minimum average egress velocity through doorways of 0.75 m/s be maintained with any three single leaf entry doors (one on each of 3 levels) and the largest exit door open, plus leakage allowances for all other doors.
  - (c) Note that in B.S. 5588 Part 4 CLAUSE 6.1, CP 352 has been withdrawn and replaced by B.S. 5720.
  - (d) The minimum fire resistance rating for the enclosure of the pressurization plant detailed in clause 6.3.4 of B.S. 5588 Part 4 should be the same as that of the staircase served.

- (e) See section G hereof for amendments to clause 6.3.2 of B.S. 5588 Part 4 re standby plant requirements.
- (f) The staircase pressurization system shall be designed either as a single or multiple injection system based on the following criteria:—
  - (i) For buildings with an overall height less than 30 m, a single injection or multiple injection system shall be acceptable.
  - (ii) For buildings with an overall height of 30 m or more, only a multiple injection system with air supplies at no greater than 12 m apart, shall be acceptable.
  - (iii) For buildings with refuge floors the criteria in (i) and (ii) shall apply, but the height shall be measured from the floor level of the lower refuge floor to the floor level of the next refuge floor.

This supersedes the requirements of clause 5.4.1 of B.S. 5588 Part 4.

#### B. BASIC CONSIDERATIONS

- B. 1 All systems shall be as simple as practicable in all aspects.
- B. 2 Fire compartmentation shall be ensured at all times.
- B. 3 Duct construction within the fire compartment that is served by the system shall be, as a minimum requirement, to not less a standard than H.V.C.A. specification DW 142 or subsequent amendments. Flat oval ducts wider than 1.0m shall not be used. Aluminium sheets shall NOT be used.
- B. 4 All ductwork, including builders work ducts or shafts or other construction, in these systems shall be pressure tested to H.V.C.A. specification D.W. 143 or subsequent amendments. Retest as necessary after correcting any excessive losses. All results obtained shall be recorded and the record shall be signed by both the person carrying out the test and an independent witness. (see also section “H. COMPLETION, TESTING & OPERATION”).
- B. 5 Generally there shall be no fire or smoke dampers nor other restrictions in the ductwork or shafts.
- B. 6 Generally all systems shall be automatically activated whenever *any* fire service installation in the building is activated. (see section “E. ACTUATION & CONTROL”)
- B. 7 All systems shall be provided with remote on/off override control at the fire control panel. (see section “E. ACTUATION & CONTROL”)
- B. 8 The AIR INTAKE ARRANGEMENTS should be in accordance with Clause 6.2 of B.S. 5588 Part 4.
- B. 9 In order to prevent “over pressure” within the staircase the designer shall provide a pressure relief system. This shall be provided by any one or combination of the following:—
  - (i) automatic opening of the external exit doors on operation of the fan.
 

*Note:* For single injection system this method of “over pressure” relief cannot be utilized if the system is designed with the supply air point at the same level as the exit door.
  - (ii) Barometric Pressure relief vents to open automatically when the pressure exceeds the highest designed pressure. The location and arrangement of these valves shall be selected to maintain both the integrity of the fire rating of the staircases and the minimum design pressure.
  - (iii) an exhaust fan actuated by differential pressure sensors so that it will not operate when the pressure falls below a specified level.
  - (iv) a supply fan bypass which will vary the amount of air entering the staircase by actuating modulating bypass dampers controlled by differential pressure sensors sensing the pressure differences between the staircases and the building.
- B. 10 At every floor served by the Pressurized Staircase, a low resistance air flow path shall be provided to allow the designed air flow rate through the door, to be vented to the open air.

#### C. ARCHITECTURAL & CONSTRUCTION CONSIDERATIONS

- C. 1 The stair enclosure shall be constructed in such a manner as to reduce the number and size of air leakage paths to a minimum.

#### D. DOOR SETS

- D. 1 All doors sets (i.e. doors, frames and hardware) providing access to or from any pressurized staircase shall be to the satisfaction of the Building Authority.
- D. 2 The provision of supplementary gaskets to assist in preventing smoke leakage will not be permitted.
- D. 3 All doors, closers, hardware, etc. shall be suitable for continual use in an atmosphere of 35 deg. C and 100% R.H.
- D. 4 Door sets shall be installed in such a manner as to be smoke-resistant and all joints between frames and building structure shall be provided with sealants complying with B.S. 476, Part 23.
- D. 5 Self closers shall be provided for all doors to ensure integrity of the enclosure. The closers shall have been part of a "door, door frame and ironmongery" test assembly which has successfully passed the test in accordance with BS 476 Part 22. The closers shall be of such a design that they cannot be defeated i.e. no removable pins or bolts, etc.
- D. 6 Door closers shall be adjusted such that the force necessary to open the door shall comply with that allowed in the design calculations see para. A5(a). The testing of such force shall take place under static conditions i.e. the Staircase Pressurization system *not* operating.
- D. 7 Care shall be taken that the finished sill under the closed doors shall be wear resistant i.e. of terrazo or similar finish.
- D. 8 Inspection and testing of all door sets, closers, releases, etc. shall form part of the acceptance tests conducted under para. H hereof.
- D. 9 Further inspection and testing of these components shall take place as part of the annual maintenance certificate inspection detailed under para. J4 hereof.

#### E. ACTUATION AND CONTROL

- E. 1 All systems shall be automatically actuated and shall remain in operation until manually reset. Actuation of all systems shall be direct from the building Automatic Fire Alarm panel whenever that panel transmits a "Fire" signal to the Fire Services Communication Centre.
- E. 2 Where any building or that portion of a building immediately adjacent to a designated pressurized staircase is not provided with a smoke detection system, smoke detectors shall be installed at a distance not exceeded 1 m from and outside the access doors to the staircase or its approach lobbies to activate the system.
- E. 3 When in "fire" mode no system connected therewith shall be controlled or under the influence of any Building Management or Automation System nor shall failure or close down of such B.M.S. or B.A.S. prevent its operation. However, such B.M.S. or B.A.S. may monitor the operations if desired.
- E. 4 No transmission of actuating signals for the staircase pressurization system shall be effected by multiplex or similar devices unless such devices have the approval or certification of one of the Testing Authorities recognised by F.S.D.
- E. 5 Each system shall be provided with a manual on/off control switch and indicator light at the fire control panel. The indicator lights to show manual on or off operation shall be provided with a red bezel and be flashing. Those showing satisfactory operation of the fan(s) shall have a green bezel and be a steady light.
  - (a) Switches for all staircase pressurization systems shall be grouped in one area of the panel together with those for smoke extraction/removal systems or the like.
  - (b) All switches shall have the same method/direction of operation.
  - (c) The indicator light showing operation of each fan shall be actuated by a device that senses effective operation e.g. a centrifugal switch or air flow switch.
  - (d) All switches and indicators shall be clearly labelled (red letters on white background, not less than 3 mm high) to show operating positions and systems served.
  - (e) A further label shall be provided with letters not less than 6 mm high stating that the controls shall be operated only by authorized personnel.
  - (f) All labels shall be permanent, legible and mechanically secured (adhesive is not satisfactory) and shall be lettered in both English and Chinese by engraving or similar.
- E. 6 In each Staircase Pressurization fan intake duct, a suitably designed smoke sensor shall be installed which, when sensing the passage of smoke, shall override all other controlling devices, and shut down the Staircase Pressurization System, being served by that fan.

### F. ELECTRICAL & AUTOMATIC CONTROLS

- F. 1 All systems shall be as simple as possible. Complex and untried electronic devices shall not be used.
- F. 2 All equipment serving Staircase Pressurization systems shall be provided with an electrical supply from both non-essential and essential sources.
- F. 3 Cable routes shall be selected in such a way as to protect them from a fire anywhere in the building and to reduce likelihood of failure due to external effects—mechanical, electrical or physical.
- F. 4 All wiring, cables, electrical equipment, starters, relays, controls, etc. from the building primary and secondary source of supply shall be suitable for continuous operation at 250 deg. C ambient for 1 hour.

However the following situations are acceptable:—

- (a) Provided the main switchboard is of a type tested cubicle form constructed to B.S. 5486 from not less than 2 mm panel steel and is installed in a room having an F.R.P. (including self-closing doors) of not less than 2 hours and containing no other equipment, no further protection will be required. Also no further protection will be required for wiring, cables, or other electrical equipment.
  - (b) Sub-distribution boards and/or motor control centres constructed and installed as in (a) are similarly acceptable.
  - (c) All wiring, starters and other electrical equipment installed in the pressurization fan protecting structure detailed under para. A5(d) hereof (i.e. in a plant room not solely housing the S.P. fan) shall be suitable for continual operation in an ambient temperature of 170°C for 1 hour.
  - (d) Pressure sensors in the pressurized space shall be suitable for normal ambient conditions only i.e. not less than 37 deg. C and 100% R.H.
  - (e) Wiring to pressure sensors may be high temperature grade P.V.C. to B.S. 6141 (minimum 135°C) run in either surface galvanised conduit within the pressurized space or embedded in steel conduit in the structural enclosure of the space as close as possible to the face of the wall in the space.
- F. 5 Pressure sensors and associated equipment shall be of industrial process grade to B.S. 5967 (being IEC 654). Commercial quality H.V.A.C. controls are not acceptable.

### G. STANDBY OR DUPLICATE EQUIPMENT

- G. 1 For sleeping risk premises, i.e. Hotels, Hospitals, and where designated by the Director of Fire Services, with a single pressurized staircase, duplicate fans and motors shall be provided.
- G. 2 For buildings with more than one pressurized staircase, single fans with duplicate motors fully belted and/or connected up shall be provided.
- G. 3 If, however, *except for sleeping risk premises*, the total air requirement is made up from two or more separate supplies acting together (e.g. top and bottom plants), then no further duplication of equipment is necessary.
- G. 4 These requirements are based on clause 6.3.2. of B.S. 5588 Part 4.

### H. COMPLETION, TESTING AND OPERATION

- H. 1 Where interaction with other systems is part of the designed operational mode, all such systems shall also be correctly functioning before a final Fire Services inspection takes place.
- H. 2 "Completion" shall include all necessary permanent labels, instruction plaques, fully detailed operating and maintenance manuals and diagrams, record "as built" drawings, etc.
- H. 3 Ensure tests required under para. B.4 hereof are carried out, recorded and record certified.
- H. 4 All systems are to be completed and tested and the designer is to satisfy himself that they are functioning correctly before the final full test and demonstration takes place with F.S.D. Officers in attendance. A full set of test and functional operation check records (see para. H.10) shall be submitted with the request for the attendance of F.S.D. Officers, accompanying the records shall be a certificate signed by the designer on behalf of the design company or organisation confirming or otherwise that he is satisfied that the installation(s) are operating in accordance with his design and the requirements of F.S.D.

- H. 5 Acceptance tests shall be carried out in accordance with section 7.2 of B.S. 5588 part 4. It is *necessary* for the design engineer to be present at the tests.
- H. 6 It is preferable that the format/methods of the required operational and functional test be agreed with F.S.D. before any such work commences.
- H. 7 Fire Service Department will inspect the system and carry out a functional check against a standard check list.
- H. 8 If the inspection is satisfactory a Fire Certificate (FS 172) will be issued, subject to all other F.S.I.'s having been successfully tested.
- H. 9 Except for simple devices such as pitot-static tubes, inclined manometers, U gauges and the like all instruments, meters, etc. used for testing purposes shall:—
- (a) be provided in duplicate
  - (b) have a manufacturers claimed accuracy of not more than plus or minus two percent of range.
  - (c) shall be manufactured to an appropriate British Standard or recognised equal International or National Standard where appropriate and available.
  - (d) have been calibrated by a recognised testing or calibration laboratory not more than 3 months prior to the date of test. The calibration certificate provided by the laboratory shall be available during the test.
- H. 10 Full and complete records are to be taken of all tests and the results thereof including not less than:—
- (a) records of pressure testing during construction—see para. B.4.
  - (b) make, serial no., type and owner of all instruments used, with a copy of the calibration certificates.
  - (c) actual measurements taken.
  - (d) corrected measurements from (b).
  - (e) resulting air flows.
  - (f) make, serial no., type and use of every device checked.
  - (g) date and time of test.
  - (h) signature of operator/tester or supervisor and any witnesses for each test.
  - (i) signature of acceptance of and by designer.

*J. ROUTINE ACTIVATION, MAINTENANCE & ANNUAL CERTIFICATION*

- J. 1 For systems that only operate in an emergency (i.e. single stage systems), they shall be actuated at not more than three monthly intervals and checked to ensure that all functions sequence and operate correctly. (see para. J.3)
- J. 2 For systems that operate continuously at a low level and at an increased level in an emergency (i.e. two stage systems), they shall be actuated into emergency mode at not more than six monthly intervals and checked to ensure that all emergency functions sequence and operate correctly (see para. J.3).
- J. 3 Periodic actuation shall include, at least, the following actions:—
- (a) Activate system by manual switch.
  - (b) Check that indicator lights give correct signal.
  - (c) Inspect staircase to ensure all doors are closed especially if magnetically held doors are utilised.
  - (d) Full inspection of fan rooms including:—
    - (i) fresh air inlet is clear of debris and area in front is free of obstruction.
    - (ii) filters (if provided) correctly in place and not at end of useful life.
    - (iii) check any flexible connections for deterioration.
    - (iv) motor operating satisfactorily; not overheating, etc.
    - (v) belt drive tension and alignment correct or other type of drive functioning correctly.

- (vi) fan bearings satisfactory.
  - (vii) electrical equipment satisfactory (no contactor hum, etc.)
  - (viii) record motor currents on each phase.
  - (ix) no significant air leaks.
  - (x) check operation of pressure relief or fan by-pass dampers (and indirectly, pressure sensor) by opening and closing staircase entry door or door(s).
  - (xi) check plant room free of debris, stored materials, etc.
  - (xii) check fan room entry door self-closers.
- (e) Traverse staircase and check air is discharging from all outlets also that pressure sensor is clean and free from interference.
- (f) Remove manual activation.
- (g) Record actions progressively. Complete and sign record log.
- J. 4 In addition to the foregoing, at intervals not exceeding 12 months the systems shall be actuated and a full test shall be carried out as described in para. "H5" hereof, by a registered FSI Contractor and a maintenance certificate issued to the Director of Fire Services as required by Reg. 9 of Fire Service (Installation and Equipment) Regulations.
- J. 5 A record log shall be maintained for each and all systems providing a complete record of the actions carried out under paras. J1, J2 and J3 hereof and the results thereof under signature of the supervisor and witness. Records shall be retained for a period of at least seven years and shall be available at any reasonable time to the Director of Fire Services or his representative.

#### 5.22 Ring main systems with fixed pumps

##### (i) SPECIFICATION

Attention is drawn to British Standard 5041, 5306: Part 1 and 5908. The system shall be specifically for fire fighting purposes, however if the water supply is adequate there is some merit in using the system for cleaning purposes, thereby effectively testing the system.

The mains may be over or underground but must obviously be protected against physical damage.

The system shall be fed from at least 2 water supplies to the satisfaction of the Director of Fire Services and the Water Authority. (See Section 5.28)

Pumps will be fixed and capable of automatic and manual start. Fire pumps shall be permanently primed and duplicated for duty and stand-by use. In respect of any particular project the Director of Fire Services may permit fire pumps serving other systems to be utilized for stand-by purposes.

Hydrant outlets will be to standard Hong Kong Fire Services Department pattern.

Hose reels may be installed at selected, or all, hydrant outlets as required by the Director of Fire Services.

##### (ii) TESTING

The fixed pump will be tested monthly by both automatic and manual start.

The system shall be generally examined to ensure that pipework and hydrant outlets are in good order.

See also British Standard 5908.

#### 5.23 Smoke extraction systems—dynamic and static

##### (i) SPECIFICATION

The system shall be designed in consultation with the Director of Fire Services in accordance with the current Fire Services Department Circular Letters.

A cooling water curtain head with suitable drain may be introduced into the duct to reduce the temperature of the combustion products.

Dangerous gases, shall pass through a suitable "washing" agent before being discharged to open air.

##### (ii) TESTING

The system shall be tested by remote control operation from the fire control or other such point as agreed by the Director of Fire Services.



**5.24 Sprinkler systems****(i) SPECIFICATION**

Such systems shall be designed and installed in accordance with Fire Offices' Committee Rules (with suitable modification pertinent to Hong Kong) or other standards acceptable to the Director of Fire Services.

For the avoidance of doubt, a system is deemed to commence at the point of entry, to the building, of the pipework.

(See Water Supplies—Section 5.28)

**(ii) TESTING**

The testing procedure shall be in accordance with the appropriate standard or as required by the Director of Fire Services.

**5.25 Supply tank****(i) SPECIFICATION**

Supply tank for fire hydrant and hose reel installation of adequate capacity shall be provided when a wet system is installed in a building.

The tank shall be fed from such source of supply approved by the Water Authority and the Director of Fire Services.

The tank may be used for the combined storage of domestic (e.g. flushing) and fire fighting water provided that the maximum potential draw off by domestic services can in no way diminish the supply for fire fighting below the required reserve.

The minimum quantity of water required to be available, having regard to the floor area factor of the largest floor is as follows:

Floor area (gross)	Water storage required
Not exceeding 230 m <sup>2</sup> .....	9 000 L ( 9 m <sup>3</sup> )
Over 230 m <sup>2</sup> but not exceeding 460 m <sup>2</sup> .....	18 000 L (18 m <sup>3</sup> )
Over 460 m <sup>2</sup> but not exceeding 920 m <sup>2</sup> .....	27 000 L (27 m <sup>3</sup> )
Over 920 m <sup>2</sup> .....	36 000 L (36 m <sup>3</sup> )

A non-ferrous non-return valve to be provided between the downcoming main and the fixed fire pump.

**(ii) TESTING**

No test is appropriate other than periodic checking for water leakage.

**5.26 Ventilation/air conditioning control systems(\*)****(i) SPECIFICATION**

Ventilation of buildings and ventilation systems within buildings shall be installed in accordance with the appropriate regulations under the Buildings Ordinance or Public Health and Municipal Services Ordinance "Scheduled Premises" (as defined in that Ordinance).

Facilities may be required to operate ventilation/air conditioning control systems that embody the use of ducting or trunking which passes through one compartment to another other than in its normal mode by remote action from a fire control centre of the building by automatic means together with the provision of an overriding manual switch as shall be required by the Director of Fire Services.

**(ii) TESTING**

The ventilation/air conditioning control system shall be tested to ensure satisfactory operation to the approval of the Director of Fire Services.

The remote operation of the system, if required, shall be tested at such intervals as agreed with the Director of Fire Services.

(\*: To be superseded by Fire Services Department Circular Letter No. 2/90 with effect from 1.8.1990)

**5.27 Water spray systems****(i) SPECIFICATION**

Such systems shall be installed in accordance with the standards acceptable to the Director of Fire Services.

**(ii) TESTING**

The testing procedure shall be in accordance with the appropriate standard or as required by the Director of Fire Services.

**5.28 Water supplies****(i) SPECIFICATION**

All fixed systems using water will be served by water from at least two supplies to the satisfaction of the Director of Fire Services and Water Authority.

The types of supply as listed in Fire Offices' Committee Rules are acceptable EXCEPT

- (a) Town main with either a pressure tank, gravity tank or elevated private reservoir;
- (b) Town mains with automatic pump.

However, due to possible disruption of water supplies from town mains during water restriction periods, unless the town main is on 24 hour supply, provision must be made to guarantee 30 minutes stored supply, the town main feeding the storage tank.

**(ii) TESTING**

No actual testing of water supplies is appropriate other than periodic checking for leaks.

**CODE OF PRACTICE**  
**FOR**  
**INSPECTION AND TESTING OF**  
**INSTALLATIONS AND EQUIPMENT**

## BUILDINGS ORDINANCE, CHAPTER 123

### CODE OF PRACTICE (INSPECTION AND TESTING OF INSTALLATIONS AND EQUIPMENT)

#### PRELIMINARY NOTE

Where the plans of a building have been certified by the Director of Fire Services under S.16B(1)(b)(ii) of the Buildings Ordinance as showing all such fire service installations and equipment as in his opinion, having regard to the purpose to which the building is intended to be put, comprise the minimum fire service installations and equipment necessary for such building, the Building Authority may, under S.21(6)(d) of that Ordinance, refuse to issue a temporary occupation permit or an occupation permit (which is necessary before the building can be occupied in any way except by not more than two caretakers) unless the applicant for the permit produces a certificate from the Director of Fire Services certifying that he is satisfied that the fire service installations and equipment shown on the plans have been provided and are in efficient working order and satisfactory condition.

This Code of Practice (Inspection and Testing of Installations and Equipment) is published for information only, to indicate the type and nature of inspections and tests which installations and equipment must normally pass in order so to satisfy the Director of Fire Services and to give guidance as to the conduct of inspections and tests. It does not lay down any hard and fast rules. Special factors and circumstances may require variations in respect of any particular building, and in particular case the Director may require additional inspections or tests before he is so satisfied.

#### CODE OF PRACTICE (INSPECTION AND TESTING OF INSTALLATIONS AND EQUIPMENT)

#### PART I

#### GENERAL

- |  |  |
|--|--|
| 1. Inspections and testing shall be carried out by a Fire Services Inspecting Officer by arrangement with the Authorised Person and the Fire Service Installation Contractor.  | Inspection and testing by officer of Fire Services Department  |
| 2. Applications for initial inspection and testing should be made on the prescribed form to the Director of Fire Services. The form must be signed by both the Fire Service Installation Contractor and the Authorised Person.   | Application for inspection and testing   |
| 3. Applications should only be submitted by the Authorised Person when the installation and equipment has been installed, completed, and certified as being in efficient working order by the Fire Service Installation Contractor.  | Application to be submitted by Authorised Person   |
| 4. Upon receipt of an application the Fire Services Inspecting Officer will contact the Authorised Person (Not the Fire Service Installation Contractor) at the telephone number shown on the prescribed form, and arrange a mutually convenient inspection date. The Authorised Person, as the co-ordinator of the project, should attend the inspection and it is also his responsibility to contact and inform the Fire Service Installation Contractor of the arrangements made. | Date and time of inspection and testing to be confirmed by telephone and Authorised Person should attend |
| 5. A further prescribed form will be used to record the result of the inspection and will be completed and signed on site by the Fire Services Inspecting Officer. The Authorised Person and the Contractor will also be required to sign this form confirming that the results of the inspection have been brought to their attention.  | Recording result of inspection   |
| 6. In respect of minor items requiring a further inspection the Authorised Person will, after the defects have been rectified, arrange a re-inspection date with the Assistant Divisional Officer, Fire Service Installations Division. A further formal application for inspection on the prescribed form will only be required when a refusal letter has been issued subsequent to an inspection.  | Inspection and testing after further work  |

- Re-inspection subject to availability of Inspecting Officers
7. Re-inspections will be carried out as convenient, subject only to the availability of Inspecting Officers and provided that previous confirmed appointments are not affected.
- Issuance of Certificate
8. Subsequent to a satisfactory inspection, the Authorised Person will be notified by telephone as soon as the Fire Service Certificate (FS 172) is ready for collection. If unable to be contacted by telephone a "ready for collection" letter will be despatched.
- Certificate of Completion by Water Authority sent direct to Buildings Ordinance Office
9. The Certificate of Completion by Water Authority in respect of Fire Service Installations requiring Government water mains connection will be sent direct to the Buildings Ordinance Office by the Water Authority, copied to the applicant, after the installation has been inspected and approved by the Water Authority and the fire service connection completed.

## PART II

### INSPECTIONS AND TESTS

- Hose reel tubing
10. (1) The tubing of every hose reel must be capable of being readily wound round a drum of 180 mm diameter without kinking, must not kink when led around sharp obstructions, and shall be capable when fitted with branch pipe and nozzle, of projecting a jet not less than 6 m in length.
- (2) The tubing of every hose reel shall have a bursting pressure of not less than 2 700 kPa and shall not be porous nor exhibit any signs of percolation below 2 000 kPa.
- Hose reel branch
11. The hose reel branch nozzle shall have a 4.5 mm orifice and be fitted with a simple two way valve to open or shut off jet; the valve must not be spring loaded.
- Design of hose reel
12. The design of the hose reel shall be such that the tubing is permanently connected, via pipes in the drum of the hose reel and such stuffing boxes as may be necessary, to the hydrant supply main.
- Testing of sprinkler installations
13. The testing of sprinkler installations will be carried out according to the tests specified from time to time by the Fire Offices' Committee.
- Testing of drencher and fixed installations
14. The testing of drencher and fixed installations will be carried out according to such tests as the Director of Fire Services may require having regard to the nature and purpose of the installation.
- Testing of fire hydrant/hose reel installations
15. The tests for fire hydrant/hose reel installations shall consist of—
- (1) visual examination of installation;
  - (2) test of water tightness to a maximum of 1 700 kPa static pressure;
  - (3) a capacity and pressure test;
  - (4) the "static" pressure, without pump, at the topmost hydrant will be taken;
  - (5) a flow meter and pressure gauge will then be fitted to the hydrant the fixed fire pump or pumps started, and readings taken;
  - (6) a practical charging and supply of water through the wet rising main via the fire service inlet.
- Testing of dry riser installations
16. The tests for dry riser installations shall consist of—
- (1) a visual examination of the fittings and piping and their location;
  - (2) a practical charging of the rising main to show that the system can be easily charged via the fire service inlet within a reasonable time having regard to the size of the installation and with particular attention to the efficiency of air relief valves;
  - (3) the installation must prove clear of percolation and leakage for 10 minutes after being charged with water.

<p>17. The tests for hand appliances and other preventive media shall be in accordance with the tests specified by the Director of Fire Services from time to time. Pamphlets describing testing procedure can be obtained from the Director of Fire Services.</p>	<p>Testing of hand appliances etc.</p>
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<p>18. The testing of CO<sub>2</sub>/Halon Extinguishing System will be carried out according to the checklist as laid out at Appendix 1.</p>	<p>Testing of CO<sub>2</sub>/Halon Extinguishing System</p>
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<p>19. The testing of Fire Shutters constructed and installed in accordance with the Rules of the Fire Offices' Committee will be carried out according to the checklist as laid out at Appendix 2.</p>	<p>Testing of Fire Shutters</p>
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PART III

MISCELLANEOUS

<p>20. This Code deals only with the inspection and testing of fire service installations and equipment after the same have been provided for a building. The general requirements as to what installations and equipment are to be provided in buildings are dealt with in another Code called the Code of Practice (Minimum Fire Service Installations and Equipment), published by the Director of Fire Services.</p>	<p>Code of Practice (Minimum Fire Service Installations and Equipment)</p>
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<p>21. For the avoidance of doubt it is hereby declared that the Director of Fire Services, in his absolute discretion, may, in any particular case, vary any of the requirements of this Code and in particular may require different inspections or tests in regard to any installation or equipment than the inspections or tests indicated in this Code, either in addition to or in substitution for the inspections and tests so indicated.</p>	<p>Director of Fire Services may vary requirement of Code in particular cases</p>
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J. H. MARCH,  
*Director of Fire Services*

Checklist for CO<sub>2</sub>/Halon Extinguishing System

I. REFERENCE

Project .....	FSD Ref. ....
Address .....	Location/Room .....
.....	.....
Working/Design Drawing Ref. ....	Yes      No      N/A
Is drawing enclosed?	[ ]    [ ]    [ ]
Approved Computer Program Ref. ....	
Is program enclosed?	[ ]    [ ]    [ ]
Is catalogue enclosed?	[ ]    [ ]    [ ]
Is certification for pneumatic test to pipings enclosed?	[ ]    [ ]    [ ]

II. TYPE OF SYSTEM

		CO <sub>2</sub>	BTM	BCF
		[ ]	[ ]	[ ]
Total Flooding	[ ]	Local Application	[ ]	
Modular	[ ]	Cylinder	[ ]	
Pre-engineered	[ ]	Engineered	[ ]	
High Pressure	[ ]	Low Pressure	[ ]	
Single Hazard	[ ]	Multiple Hazard	[ ]	
Primary Bank Only	[ ]	With Reserve Bank	[ ]	

III. PROTECTED AREA

	Yes	No	Remarks
3.1 Does occupancy tally with approved building plans?	[ ]	[ ]	.....
3.2 Does compartmentation of protected premises tally with approved building plans?	[ ]	[ ]	.....
3.3 Does general layout tally with FSI drawings?	[ ]	[ ]	.....
3.4 Are openings properly sealed or closable automatically during/before agent discharge?	[ ]	[ ]	.....
3.5 Are warning/instruction signs provided at entrance to; and in the case of normally occupied premises, inside the protected area?	[ ]	[ ]	.....

3.6 Does the following components:—

	Tally with drawings?		If not, whether the as-fitted location/position acceptable?		Remarks
	Yes	No	Yes	No	
3.6.1 Audio Alarm— Bell/Buzzer etc.	[ ]	[ ]	[ ]	[ ]	.....
3.6.2 Visual Alarm— Light/Strobe etc.	[ ]	[ ]	[ ]	[ ]	.....
3.6.3 Detector	[ ]	[ ]	[ ]	[ ]	.....
3.6.4 Manual Release	[ ]	[ ]	[ ]	[ ]	.....
3.6.5 Piping	[ ]	[ ]	[ ]	[ ]	.....
3.6.6 Nozzles	[ ]	[ ]	[ ]	[ ]	.....
3.6.7 Agent Container	[ ]	[ ]	[ ]	[ ]	.....
3.6.8 Control/ Indication Panel	[ ]	[ ]	[ ]	[ ]	.....
3.6.9 Ignition/Fuel source shut down device	[ ]	[ ]	[ ]	[ ]	.....
3.6.10 Other Mechanical/ Electrical/ Pneumatic Operating Device	[ ]	[ ]	[ ]	[ ]	.....

IV. THE SYSTEM (STATIC CHECK)

	Yes	No	Remarks
4.1 Are system components approved/listed?			
4.1.1 Actuating Solenoid	[ ]	[ ]	.....
4.1.2 Cylinder Valve Assembly	[ ]	[ ]	.....
4.1.3 Cylinder/Agent Container	[ ]	[ ]	.....
4.1.4 Flexible Hose	[ ]	[ ]	.....
4.1.5 Distributor/Selector Valve	[ ]	[ ]	.....
4.1.6 Pilot Cylinder	[ ]	[ ]	.....
4.1.7 Alarm Bell (For Normal Application)	[ ]	[ ]	.....
4.1.8 Siren/Yodalarm	[ ]	[ ]	.....
4.1.9 Control/Indication Panel	[ ]	[ ]	.....
4.1.10 Remote Manual Release Unit	[ ]	[ ]	.....
4.1.11 Detector	[ ]	[ ]	.....
4.1.12 Discharge Nozzle	[ ]	[ ]	.....
4.2 Is permanent nameplate with adequate information provided to:---			
4.2.1 BTM Container?	[ ]	[ ]	.....
4.2.2 BCF Container?	[ ]	[ ]	.....
4.2.3 CO <sub>2</sub> Container?	[ ]	[ ]	.....
4.3 Is reliable means of indication provided for the determination of pressure in BCF/BTM container?	[ ]	[ ]	.....
4.4 Does the means of indication account for variation of container pressure with temperature?	[ ]	[ ]	.....



	Yes	No	Remarks
4.5 Is agent of sufficient quantity provided?	[ ]	[ ]	.....
4.6 Is cylinder/container properly mounted/secured?	[ ]	[ ]	.....
4.7 Are markings on nozzles showing make; type and orifice size readily discernible?	[ ]	[ ]	.....
4.8 Are pipings properly installed and secured in accordance with approved guide?	[ ]	[ ]	.....
4.9 Are pipings properly earthed?	[ ]	[ ]	.....
4.10 Are pipings suitably protected against mechanical, chemical, vibration or other damage?	[ ]	[ ]	.....
4.11 Are pipings of the approved type provided? (Please indicate the type used):--	[ ]	[ ]	.....
4.11.1 For 25-bar or 42-bar system:--			
4.11.1.1 BS 3601 Seamless Schedule 80	[ ]		
4.11.1.2 ASTM A53	[ ]		
4.11.1.3 ASTM A106	[ ]		
4.11.1.4 JIS 3454	[ ]		
4.11.2 For 25-bar system only:			
4.11.2.1 BS 1387 Heavy Grade Butt Welded (Up to and including 50 mm nominal pipe size)	[ ]		
4.11.2.2 BS 3601 Seamless Schedule 40 (Up to and including 100 mm nominal pipe size)	[ ]		
4.12 Are jointings of approved type provided? (Please indicate the type employed):--	[ ]	[ ]	.....
Screwed Joints	[ ]		
Welded Joints	[ ]		
Others (Please state)	[ ]		
.....			
.....			
4.13 Is electrical apparatus intrinsically safe or of flame-proof type? (For application in explosive atmosphere only)			
4.13.1 Detector	[ ]	[ ]	.....
4.13.2 Fire Alarm Bell/Sounder	[ ]	[ ]	.....
4.13.3 Opening/Closing device will not generate sparks	[ ]	[ ]	.....
4.13.4 Ventilation shut down device will not generate sparks	[ ]	[ ]	.....

V. *DETECTION, ACTUATION & CONTROL SYSTEM (STATIC CHECK)*

	Yes	No	Remarks
5.1 Is the correct type of detector provided? (Please indicate the type employed):— Heat [ ] Smoke [ ]	[ ]	[ ]	.....
5.2 Is operating alarm/indicator provided? (Please indicate the type provided):— Alarm [ ] Indication [ ] Both [ ] Audio [ ] Visual [ ] Olfactory [ ]	[ ]	[ ]	.....
5.3 Do electrical sources i.e. AC & DC provide adequate source of energy for:—			
5.3.1 Detection?	[ ]	[ ]	.....
5.3.2 Operating device?	[ ]	[ ]	.....
5.4 Is manual control suitably protected against mechanical, weather or environmental damage?	[ ]	[ ]	.....
5.5 Is manual control for actuation easily accessible at all times?	[ ]	[ ]	.....

VI. *FUNCTIONAL TEST (DYNAMIC TEST)*

6.1 Does detector operate satisfactorily?	[ ]	[ ]	.....
6.2 If cross-zoning employed, is the zoning of detectors satisfactorily arranged?	[ ]	[ ]	.....
6.3 Does operating alarm/indication function properly?	[ ]	[ ]	.....
6.4 Does actuating solenoid operate satisfactorily?	[ ]	[ ]	.....
6.5 Does selector/distributor valve operate properly?	[ ]	[ ]	.....
6.6 Does the manual control require a force of not more than 178 newtons to secure operation?	[ ]	[ ]	.....
6.7 Does the manual control require a movement of not more than 356 mm to secure operation?	[ ]	[ ]	.....
6.8 Is the shut-down of ventilation system satisfactorily accomplished?	[ ]	[ ]	.....
6.9 If time delay of not more than 30 seconds is incorporated, does it function properly?	[ ]	[ ]	.....

VII. *PRACTICAL DISCHARGE TEST (DYNAMIC TEST) (IF REQUIRED)*

By Designed Agent	[ ]		
By Approved Substitute	[ ]		
	Yes	No	Remarks
7.1 Does agent discharge time within the limit specified by FSD?	[ ]	[ ]	.....
7.2 Are pipings securely installed to prevent pipe displacement or hazardous movement during discharge?	[ ]	[ ]	.....
7.3 Is mechanical tightness of pipings and associated equipment in order?	[ ]	[ ]	.....

VIII. REINSTATEMENT OF SYSTEM AFTER DISCHARGE (STATIC CHECK)

	Yes	No	Remarks
8.1 Is replacement cylinder/container of the correct type with sufficient pressure and content provided?	[   ]	[   ]	.....
8.2 Is cylinder/container properly mounted?	[   ]	[   ]	.....
8.3 Is cylinder/container properly connected?	[   ]	[   ]	.....
8.4 Is control/indication panel properly reset?	[   ]	[   ]	.....
8.5 Is ETL properly replaced/reinstated?	[   ]	[   ]	.....
8.6 Is actuating solenoid properly linked/connected?	[   ]	[   ]	.....

IX. GENERAL COMMENTS & REMARKS

Test witnessed by:—

..... (Signature)

..... (Signature)

..... (Name in block letters)

..... (Name in block letters)

F.S. Contractor's  
Representative

FSD Inspecting Officer

Date .....

Date .....

**Checklist for Fire Shutters Constructed and Installed in accordance  
with the Rules of the Fire Offices' Committee**

(For Proprietary Shutters Complete Sections I, II, IX, X and XI *ONLY*)

**I. REFERENCE**

Project .....	FSD Ref. ....
Address .....	Location .....
.....	.....
FOC Ref. ....	Maker's Name ,.....

**II. TYPE**

Single Steel Rolling Shutter	[ ]
Double Steel Rolling Shutter	[ ]
Push-up Type with Lifting Handle	[ ]
With Mechanical Gearing	[ ]

**III. WALL OPENING**

	Yes	No	Remarks
3.1 Does location tally with approved building plans?	[ ]	[ ]	.....
3.2 Is the doorway not exceeding 15.6 sq.m. in area?	[ ]	[ ]	.....
3.3 Is the doorway not exceeding 4.27 m in width?	[ ]	[ ]	.....
3.4 Is the doorway not exceeding 3.66 m in height?	[ ]	[ ]	.....
3.5 Are sill and jambs constructed of approved materials?	[ ]	[ ]	.....
3.6 Is the head constructed of reinforced concrete of at least 125 mm in depth?	[ ]	[ ]	.....
3.7 Where steel lintel is provided, is it protected by brickwork/concrete not less than 50 mm thick?	[ ]	[ ]	.....
3.8 Is a minimum bearing of 100 mm at each end provided on the jambs to support the barrel enclosure?	[ ]	[ ]	.....
3.9 Is adequate expansion clearance provided to barrel enclosure and enclosing jambs?	[ ]	[ ]	.....
3.10 Are chases with nominal dimension of 115 mm x 115 mm provided to house the channel guides?	[ ]	[ ]	.....
3.11 Are chases set back at least 100 mm from the front of the jambs?	[ ]	[ ]	.....
3.12 Is the barrel enclosure housed completely within the wall opening?	[ ]	[ ]	.....

	Yes	No	Remarks
3.13 Is the clearance between the sill and shutter, when closed, not exceeding 6 mm?	[ ]	[ ]	.....
3.14 Is there a minimum gap of 225 mm between the inner faces of double rolling shutters when they are in a closed position?	[ ]	[ ]	.....
3.15 Are barrels of double shutters installed at the same level?	[ ]	[ ]	.....
3.16 Are projecting jambs of a width not less than 225 mm provided?	[ ]	[ ]	.....
3.17 Are projecting jambs of at least 100 mm in width provided to enclose the ends of the barrel enclosure?	[ ]	[ ]	.....
3.18 Is the projecting head constructed of reinforced concrete of not less than 125 mm thick?	[ ]	[ ]	.....
3.19 Does the projecting head rest on projecting jambs?	[ ]	[ ]	.....
3.20 Does the projecting head extend the full width and projections of the projecting jambs?	[ ]	[ ]	.....
3.21 Where wall opening is to be used for the passage of powered vehicles, is adequate protection provided to prevent mechanical damage to the shutter assembly, frame and wall opening?	[ ]	[ ]	.....

#### IV. CONSTRUCTION OF CURTAIN

4.1 Is the curtain formed from rolled steel lath of 1.2 mm thick?	[ ]	[ ]	.....
4.2 Is steel of the appropriate class used for the laths?	[ ]	[ ]	.....
4.3 Do laths have sheared parallel edges?	[ ]	[ ]	.....
4.4 Do laths curl on both edges to form quirks of not more than 10 mm outside diameter?	[ ]	[ ]	.....
4.5 Does each quirk form a continuous, fully-interlocking hinge with that on the adjacent lath?	[ ]	[ ]	.....
4.6 Is a minimum engagement of 2 mm provided between 2 adjacent laths?	[ ]	[ ]	.....
4.7 Are centres of interlocks not less than 45 mm apart?	[ ]	[ ]	.....
4.8 Are centres of interlocks not more than 75 mm apart?	[ ]	[ ]	.....
4.9 Does the curtain have sufficient width to extend at least 64 mm (75 mm when the wall opening exceeds 2.44 m in width) into channel guides?	[ ]	[ ]	.....
4.10 Does the curtain have sufficient length to extend from the sill to the top of the barrel and thence round at least a quarter of the barrel circumference before fixing?	[ ]	[ ]	.....

	Yes	No	Remarks
4.11 Are steel or malleable cast iron end locks fitted to the ends of each lath?	[ ]	[ ]	.....
4.12 Do end locks have a minimum thickness of 3 mm?	[ ]	[ ]	.....
4.13 Are end locks riveted to the lath by 2 mild steel rivets of not less than 3 mm diameter?	[ ]	[ ]	.....
4.14 Do end locks fit the contour of the curtain laths and fill the channel guides closely?	[ ]	[ ]	.....
4.15 Is the bottom lath fitted with a bottom rail of one of the following methods of construction?	[ ]	[ ]	.....
4.15.1 a steel Tee section of at least 75 × 75 × 3*mm section with a backing strip of at least 64 × 6 mm.	[ ]		
4.15.2 2 steel flats of at least 38 × 6 mm.	[ ]		
4.15.3 2 steel angles of at least 38 × 38 × 3*mm section. *5 mm for shutters in opening in excess of 2.44 m in width.	[ ]		
4.16 Does the curtain extend at least 32 mm between the Tee section, flats or angles?	[ ]	[ ]	.....
4.17 Are Tee section, flats or angles welded, bolted or riveted to the laths by at least 8 mm diameter steel bolts or steel peened rivets?	[ ]	[ ]	.....
4.18 Do the above fixings space not more than 300 mm apart?	[ ]	[ ]	.....
4.19 Does the bottom rail extend the full width of the curtain except for the portion housed within the channel guides?	[ ]	[ ]	.....
4.20 Do expansion clearances of at least 12.5 mm per metre run provided for the bottom rail relative to the channel guides?	[ ]	[ ]	.....
4.21 Does bottom rail make flush contact with the sill when the shutter is closed?	[ ]	[ ]	.....
4.22 Are steel lifting handles bolted, riveted or welded to the bottom rail on each side of the curtain?	[ ]	[ ]	.....
4.23 Do the lifting handles space not more than 750 mm apart?	[ ]	[ ]	.....
4.24 Do the handles interfere with the correct opening or closing of the shutter?	[ ]	[ ]	.....
4.25 Is the curtain secured to the barrel by steel screws or steel bolts at least 6 mm in diameter?	[ ]	[ ]	.....

	Yes	No	Remarks
4.26 Are screws/bolts passing through laterally elongated horizontal holes (nominally 50 mm in length) in the top lath into drilled and tapped holes in the barrel?	[ ]	[ ]	.....
4.27 Do screws/bolts space not more than 250 mm apart?	[ ]	[ ]	.....
4.28 Does a screw/bolt provided to within 125 mm from each end of the top lath?	[ ]	[ ]	.....
4.29 Are screws/bolts located at centres of elongated holes?	[ ]	[ ]	.....
4.30 Are fusible metal and steel washers fitted to each screw/bolt?	[ ]	[ ]	.....

#### V. CHANNEL GUIDES

5.1 Do channel guides extend continuously from within the barrel enclosure to the sill?	[ ]	[ ]	.....
5.2 Does the top of the channel guide locate such as to permit upward expansion?	[ ]	[ ]	.....
5.3 Are guides fabricated from steel sections of at least 3 mm thick (5 mm when the doorway exceeds 3 m in width or 3 m in height)?	[ ]	[ ]	.....
5.4 Are steel peened rivets or steel bolts not less than 6 mm in diameter or 3 mm fillet welds used in fabrication of the guides?	[ ]	[ ]	.....
5.5 Do centres of rivets/bolts space not more than 150 mm apart?	[ ]	[ ]	.....
5.6 Is the length of the fillet welds not less than 50 mm and spaced not more than 150 mm apart?	[ ]	[ ]	.....
5.7 Do guides form a channel of sufficient depth to accommodate at least 64 mm (75 mm when the wall opening exceeds 2.44 m in width) of the curtain together with sufficient clearance to permit unrestricted expansion of the curtain?	[ ]	[ ]	.....
5.8 Are guides set back as far as possible within the chases provided in the jambs?	[ ]	[ ]	.....
5.9 Are they fitted as close as possible to the front side of the chases?	[ ]	[ ]	.....
5.10 Are they wholly contained within the chases so as not to project beyond the faces of the jambs?	[ ]	[ ]	.....
5.11 Are guides fixed to jambs by steel expanding anchor bolts of at least 6 mm diameter?	[ ]	[ ]	.....
5.12 Are centres of fixings not more than 600 mm apart?	[ ]	[ ]	.....

	Yes	No	Remarks
5.13 Is there a fixing bolt within 150 mm of the barrel enclosure and one within 150 mm of the sill?	[ ]	[ ]	.....
5.14 With the exception of the lowest one, are fixings provided with vertically elongated bolt holes (nominally 50 mm in length)?	[ ]	[ ]	.....
5.15 Are bolts fitted with fusible metal washers?	[ ]	[ ]	.....
5.16 Are bolts fitted with steel washers?	[ ]	[ ]	.....
5.17 Are bolts fixed at the highest positions of the slots to allow expansion of the guides in an upward direction?	[ ]	[ ]	.....

## VI. BARREL

6.1 Is the barrel formed from mild steel tube of not less than 114 mm outside diameter?	[ ]	[ ]	.....
6.2 Is the mild steel tube not less than 5.4 mm thick?	[ ]	[ ]	.....
6.3 Is the barrel mounted on mild steel axle of not less than 25 mm diameter?	[ ]	[ ]	.....
6.4 Does the axle extend the full length of the barrel?	[ ]	[ ]	.....
6.5 Is a minimum bearing of 25 mm provided in each axle support bracket?	[ ]	[ ]	.....
6.6 Does the axle project not more than 100 mm beyond each end of the barrel?	[ ]	[ ]	.....
6.7 Is expansion clearance provided between the axle and the ends of the barrel enclosure?	[ ]	[ ]	.....
6.8 Does barrel enclose helical steel spring for counterbalancing the curtain?	[ ]	[ ]	.....
6.9 Is the barrel mounted on rigid or self-aligning bearings?	[ ]	[ ]	.....
6.10 Is it fitted with mild steel spring charging device to enable the spring to be adjusted after the curtain is in position?	[ ]	[ ]	.....
6.11 Are axle support brackets made of steel or malleable cast iron?	[ ]	[ ]	.....
6.12 Do they support and enclose the axle at each end?	[ ]	[ ]	.....
6.13 Are they fixed to the ends of the barrel enclosure by at least 2 steel peened rivets or steel bolts at least 8 mm in diameter or 6 mm fillet welds?	[ ]	[ ]	.....
6.14 Are they of sufficient size to accommodate the axle and fusible metal packings?	[ ]	[ ]	.....



## VII. BARREL ENCLOSURE

	Yes	No	Remarks
7.1 Are barrel and axle enclosed completely by an enclosure pressed or fabricated from steel at least 6 mm thick?	[ ]	[ ]	.....
7.2 Are steel peened rivets, steel bolts not less than 8 mm in diameter or 6 mm fillet welds not less than 50 mm in length being used for the fixings?	[ ]	[ ]	.....
7.3 Are centres of fixings not more than 150 mm apart?	[ ]	[ ]	.....
7.4 Does the fabrication extend completely along each edge of the enclosure?	[ ]	[ ]	.....
7.5 Does the front edge of the bottom enclosure form a 40 mm wide flange?	[ ]	[ ]	.....
7.6 Is the distance between the flange and the face of the curtain not more than 15 mm?	[ ]	[ ]	.....
7.7 Where a drop bar is used, is the distance between the flange and the face of the curtain not more than 50 mm?	[ ]	[ ]	.....
7.8 Is the barrel enclosure bolted to each enclosing jamb by 2 steel expanding anchor bolts of not less than 10 mm diameter?	[ ]	[ ]	.....
7.9 If fixed vertically, are elongated fixing holes provided?	[ ]	[ ]	.....
7.10 Are fusible metal washers provided to the fixing bolts?	[ ]	[ ]	.....
7.11 Are steel washers provided to the fixing bolts?	[ ]	[ ]	.....
7.12 Where double shutters are fitted and barrels are accommodated in the same enclosure, is dividing plate made of steel at least 6 mm thick provided to separate the barrels?	[ ]	[ ]	.....
7.13 Is a fascia plate of 6 mm steel provided to form the front of the barrel enclosure?	[ ]	[ ]	.....
7.14 Does the fascia plate overlap the opening by at least 100 mm at the top and at each end?	[ ]	[ ]	.....
7.15 Is the fascia plate made of steel of at least 6 mm thick?	[ ]	[ ]	.....
7.16 Does the bottom edge of the fascia plate form a channel of a depth not less than 100 mm?	[ ]	[ ]	.....
7.17 Does the channel extend to within 15 mm of the face of the curtain?	[ ]	[ ]	.....
7.18 Does the channel have a flange not less than 40 mm wide next to the face of the curtain?	[ ]	[ ]	.....
7.19 Is the fascia plate fixed independently of the barrel enclosure by bolting to the head and jambs?	[ ]	[ ]	.....

	Yes	No	Remarks
7.20 Are steel expanding bolts of not less than 10 mm diameter used for the fixings?	[ ]	[ ]	.....
7.21 Are fixing bolts located as follows: —			
7.21.1 25 mm from top edge spaced at not more than 600 mm centres?	[ ]	[ ]	.....
7.21.2 50 mm from ends?	[ ]	[ ]	.....
7.21.3 50 mm from bottom edge?	[ ]	[ ]	.....
7.21.4 at mid-height of the fascia?	[ ]	[ ]	.....
7.22 Are elongated bolt holes provided to the fascia plate?	[ ]	[ ]	.....
7.23 Are bolts located in the centre of the elongated holes?	[ ]	[ ]	.....
7.24 Are bolts fitted with fusible metal washers?	[ ]	[ ]	.....
7.25 Are bolts fitted with steel washers?	[ ]	[ ]	.....
7.26 Where an opening is provided for the adjustment of the barrel springs, does the opening not exceed 250 mm × 150 mm?	[ ]	[ ]	.....
7.27 Is it covered by a 6 mm steel plate at least 50 mm longer and wider than the opening?	[ ]	[ ]	.....
7.28 Is the cover plate fixed by not less than six steel screws/bolts not less than 8 mm diameter?	[ ]	[ ]	.....

### VIII. MECHANICAL GEARING

8.1 Is mechanical gearing provided to doorway exceeding 5.2 sq. m. in area?	[ ]	[ ]	.....
8.2 Is mechanical gearing provided when the height of the bottom of the barrel enclosure above floor level exceeds 2.2 m?	[ ]	[ ]	.....
8.3 Is the gearing system so arranged that the shutter could be manually opened and closed from either side of the wall opening?	[ ]	[ ]	.....
8.4 Where double shutters were provided, do they operate simultaneously?	[ ]	[ ]	.....
8.5 Is the gearing system made of steel mounted on self-lubricating bushes and/or rigid self-aligning ball or roller bearings?	[ ]	[ ]	.....
8.6 Are gears machine cut from a suitable grade of steel?	[ ]	[ ]	.....
8.7 Are gears connected by shafts not less than 19 mm in diameter?	[ ]	[ ]	.....
8.8 Where gearing mechanism is housed in a chase, does the chase have a minimum dimension of 114 × 114 mm with side walls each at least 114 mm thick and the rear wall not less than 150 mm thick?	[ ]	[ ]	.....

	Yes	No	Remarks
8.9 Is the chase covered by steel plate at least 6 mm thick?	[ ]	[ ]	.....
8.10 Is the cover plate fixed by steel expanding bolts of not less than 6 mm diameter?	[ ]	[ ]	.....
8.11 Are centres of fixings not exceeding 600 mm?	[ ]	[ ]	.....
8.12 Are anchor bolts fitted with steel washers?	[ ]	[ ]	.....
8.13 Where chases are enclosed by brickwork/blockwork, does the latter have a minimum thickness of 100 mm?	[ ]	[ ]	.....
8.14 Is brickwork/blockwork keyed into the wall?	[ ]	[ ]	.....
8.15 Are steel maintenance covers provided and installed adjacent to the gearing ?	[ ]	[ ]	.....
8.16 Where gearing mechanism is enclosed in a casing, is the casing fabricated from steel at least 6 mm thick?	[ ]	[ ]	.....
8.17 Are steel peened rivets or steel bolts not less than 8 mm in diameter or 6 mm fillet welds at least 50 mm in length used for the fabrication of the casing?	[ ]	[ ]	.....
8.18 Do centres of rivets/bolts/welds not more than 150 mm?	[ ]	[ ]	.....
8.19 Is the casing fixed to the face of the wall by expanding anchor bolts?	[ ]	[ ]	.....
8.20 Is the diameter of the anchor bolts not less than 8 mm?	[ ]	[ ]	.....
8.21 Are steel washers fitted to the anchor bolts?	[ ]	[ ]	.....
8.22 Do centres of anchor bolts within 600 mm?	[ ]	[ ]	.....
8.23 Is access opening for maintenance incorporated in the casing?	[ ]	[ ]	.....
8.24 Is it covered by at least 6 mm thick steel plate at least 50 mm longer and wider than the opening?	[ ]	[ ]	.....
8.25 Is cover plate attached to casing by steel screws/bolts at least 8 mm in diameter?	[ ]	[ ]	.....
8.26 Are screws/bolts spaced at not more than 150 mm centres?	[ ]	[ ]	.....
8.27 Where the barrel enclosure, fascia plate or dividing plate are perforated to permit passage of gearing system, are size and number of perforations kept to a minimum consistent with the satisfactory operation of the gearing?	[ ]	[ ]	.....
8.28 Are perforations so arranged that there is no exposed opening into the barrel enclosure?	[ ]	[ ]	.....
8.29 Are they so arranged that lateral expansion of barrel enclosure and fascia plate is not restricted?	[ ]	[ ]	.....

	Yes	No	Remarks
8.30 Are operating wheels spokeless?	[ ]	[ ]	.....
8.31 Are operating wheels non-detachable?	[ ]	[ ]	.....
8.32 Are they located adjacent to the wall opening?	[ ]	[ ]	.....
8.33 Are they located not less than 750 mm, nor more than 1 200 mm above the floor?	[ ]	[ ]	.....
8.34 Where handles on the operating wheels are provided, are they so arranged as to close within the wheel when not in use?	[ ]	[ ]	.....

IX. INSTALLATION

9.1 Where automatic self-closing devices are fitted, do they cause no interference to the manual opening and closing of the shutter?	[ ]	[ ]	.....
9.2 Where smoke detectors are provided for the actuation of the shutter, are they fitted to both sides of the wall opening?	[ ]	[ ]	.....
9.3 Are smoke detectors installed as far as practicable to the provisions of the FOC rules for AFA?	[ ]	[ ]	.....
9.4 Is permanent nameplate with adequate information provided?	[ ]	[ ]	.....
9.5 Are manual controls provided to both sides of the wall opening?	[ ]	[ ]	.....

X. SHUTTER OPERATION

10.1 Does the automatic actuation device function satisfactorily?	[ ]	[ ]	.....
10.2 Is secondary source of electricity supply provided?	[ ]	[ ]	.....
10.3 Is the descending speed* of the shutter acceptable?	[ ]	[ ]	.....

\* Descending time shall within 15-60 seconds for shutters in openings in excess of 2.5 m in height; not faster than 8 seconds for other shutters in openings of height within 2.5 m and that the bottom rail of the shutter shall reach the mid-height in not less than half the total descending time of the shutter.

XI. GENERAL COMMENTS & REMARKS

Test witnessed by:—

..... (Signature) ..... (Signature)

..... (Name in block letters) ..... (Name in block letters)

F.S. Contractor's Representative

FSD Inspecting Officer

Date ..... Date .....

