



**CODES OF PRACTICE**  
**FOR**  
**MINIMUM FIRE SERVICE INSTALLATIONS**  
**AND EQUIPMENT**  
**AND**  
**INSPECTION, TESTING AND MAINTENANCE OF**  
**INSTALLATIONS AND EQUIPMENT**

April 2012



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**CODE OF PRACTICE**

**FOR**

**MINIMUM FIRE SERVICE INSTALLATIONS**

**AND EQUIPMENT**



**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.

“Car Parking Area” includes

Driveways but excludes loading/unloading area.

“Cubical Extent” means

The space contained within the external surfaces of the walls and roof of a building and the upper surface of the floor of its lowest storey, excluding any space within any enclosure on the roof used exclusively for accommodating a water tank or lift gear or any other services, and, if any side of the building is not enclosed by a wall, that side shall be deemed to be enclosed by a wall 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 installation or equipment 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;
- (d) facilitating the evacuation from any premises in case of fire;
- (e) providing a stand-by power supply to an installation or equipment the purposes of which are mentioned in paragraphs (a) to (d) in the event of the loss of normal power supply.

“Natural Venting of Staircases” means

An alternative to pressurization of staircase by provision of venting of smoke from staircase adjacent to external wall in accordance with Section 2 of British Standard 5588: Part 5: 1991 under which vent opening into light well, atrium, etc. is unacceptable. Special attention shall be drawn to clauses 8.4(a), (b) and (h) of the standard.

“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 Fire Safety in Buildings published by the Buildings

Department.

“Sleeping Risk” means

Increased life risk when the occupants, being asleep and 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**

Compliance with the prescriptive provisions in this Code may be regarded as a reliable way to satisfy the requirements for fire service installations or equipment. However, 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.

For buildings of special designs or hazards which necessitate special considerations, the Director of Fire Services may accept, on a case by case basis, fire engineering approach as an alternative to the prescriptive provisions provided that the fire engineering approach shall not provide a level of safety inferior to that provided by prescriptive requirements. Methodology for application of the fire engineering approach should outline a structured fire engineering principle(s) to the assessment of total building fire safety effectiveness and to the achievement of pre-identified design objective(s) having taken into consideration of the objectives of fire service installations and equipment for the protection of life and property of the occupants within the premises and the firefighting personnel in the event of emergency.

### **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 Provision of street fire hydrants**

When designing their projects, the Authorized Persons should take into account the provision of street fire hydrants for the development in addition to the fire service installations and equipment in the building(s). Accessible street fire hydrant(s) shall be located or provided at a distance not greater than 100m from the building.

### **1.6 Design of fireman’s lift, firefighting and rescue stairway and emergency vehicular access**

The fireman’s lift, firefighting and rescue stairway and emergency vehicular access shall be provided to every building in accordance with Reg. 41B, 41C and 41D of the Building (Planning) Regulations. Whilst the requirements for fireman’s lift and fire fighting and rescue stairway are included in this Code, they should not be considered as fire service installations within the meaning of paragraph 1.2 above.

### **1.7 Provision of closed circuit television system, emergency power points, fireman’s communication system and pedestrian cross over facility**

Whilst the captioned requirements are included in this Code, they should not be considered as fire

service installations within the meaning of paragraph 1.2 above.

### **1.8 Source of Electrical Supply**

Where an electrical installation is required to comply with this Code, a primary and secondary source of supply shall be provided to the satisfaction of the Director of Fire Services and all such installations shall be fed from both the primary and secondary source of supply.

### **1.9 Standards**

The standards, specifications, rules, statutory requirements, etc. quoted in this Code shall be the current version at the time of building plans submission for approval.

For any non-standard provision of fire service installations or equipment, the standards and specifications shall conform to the prescribed requirements as specified by the Director of Fire Services.

**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:

- Audio/visual advisory system
- Automatic actuating devices
- Automatic fixed installation other than water
- Automatic fixed installation using water
- Closed circuit television system
- Deluge system
- Drencher system
- Dust detection system
- Dynamic smoke extraction system
- Emergency generator
- Emergency lighting
- Emergency power points
- Exit sign
- Fire alarm system
- Fire control centre
- Fire detection system
- Fire hydrant/hose reel system
- Fireman's communication system
- Fireman's lift
- Firefighting and rescue stairway
- Fixed automatically operated approved appliance
- Fixed foam system
- Gas detection system
- Gas extraction system
- Pedestrian cross over facilities
- Portable hand-operated approved appliance
- Pressurization of staircase
- Ring main system with fixed pump(s)
- Sprinkler system
- Static smoke extraction system
- Street fire hydrant system
- Supply tank
- Ventilation/air conditioning control system
- Water mist system
- Water spray system
- Water supply

## 2.2 Definitions

“Audio/visual advisory system” 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, roof vents, etc., and the devices for automatically controlling their movement in the event of fire.

“Automatic fixed installation other than water” means

A system of cylinders/containers, 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> /clean agent gaseous protection of electrical equipment).

“Automatic fixed installation 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 sprinkler, drencher, deluge, water mist or water spray system as required and appropriate.

“Closed circuit television system” means

A system of video cameras and display units designed for surveillance from remote locations.

“Deluge system” means

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

“Drencher system” means

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

“Dust detection system” means

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

“Dynamic smoke extraction system” 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 generator” means

An independently powered electrical generator of sufficient electrical capacity to meet the fire service installations and fireman’s lifts 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.

“Emergency power point” means

A source of electricity to be used by firemen in operating fire fighting/rescue equipment.

“Exit sign” means

A fixed illuminated sign indicating an approved exit route.

“Fire alarm system” 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 system” 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 system” 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 communication system” means

A system designed to enable Fire Services personnel to use direct telephone and/or their mobile/portable radio equipment for maintaining voice and/or data communications with the Fire Services Communication Centre, other Fire Services personnel at the premises, and/or the fire control centre of the premises, as required.

“Fireman’s lift” means

A lift designed and installed to be used by firemen in the event of a fire.

“Firefighting and rescue stairway” means

A stairway accommodating an access staircase and a fireman’s lift.

“Fixed automatically operated approved appliance” 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 sprayer unit in a Dangerous Goods store.

“Fixed foam system” 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 system” means

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

“Gas extraction system” 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.

“Pedestrian cross over facility” means

Cross passage designed to enable users inside a tube of a twin-tube tunnel to travel to another tube of the tunnel for escape purposes.

“Portable hand-operated approved appliance” 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 staircase” 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 Fire Safety in Buildings:

<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

<i>Cubical Extent (cubic metres)</i>	<i>No. of Staircase(s)</i>
(For buildings other than hotels, hospitals and sanatoria)	
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, hospitals and sanatoria)	
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 system with fixed pump(s)” means

A fixed system of piping fitted with hydrant outlets with/without hose reels at fixed intervals and permanently primed pump(s) set for imparting pressure and flow to the water.

“Sprinkler system” 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 system” means

A smoke extraction system utilizing smoke reservoirs; localised ducting; and permanent openings and/or automatic opening of windows, panels or external louvres 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.

“Street fire hydrant system” means

A system of water mains and fire hydrants supplied by a government water main, or a static water supply with pumping facilities.

“Supply tank” means

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

“Ventilation/air conditioning control system” means

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

“Water mist system” means

A system connected to a water supply or water and atomizing media supplies and equipped with nozzles capable of delivering water mist to control, suppress, or extinguish fires.

“Water spray system” means

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

“Water supply” means

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

**PART III****CLASSIFICATION OF PREMISES AND DEFINITIONS****3.1 Definitions**

“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.

“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 paragraphs 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 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) Government, institution and community facilities, including those directly related to or in support of the work of the government, organizations providing social services to meet community needs, and other institutional establishments
- (b) Club premises
- (c) Educational establishments
- (d) Hostels
- (e) Hospitals including mental institutions and clinics
- (f) Prisons and similar corrective institutions
- (g) 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 Room” 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.

“Refuge Floor” means

A protected floor that serves as a refuge for the occupants of the building to assemble in case of fire, for a short period of time, before reaching an ultimate place of safety.

### **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

Consumer electrical equipment, incorporating transformers, switchgears, generators/alternators, requiring separate installation

Kitchens (other than kitchens in domestic premises)

Lift motor rooms

Mechanical plant 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 DG stores in an area devoted to this purpose)

Explosive production and/or storages

Mechanical plant rooms (Building(s) devoted to this purpose)

Open sites of public assembly

Petro-chemical complexes

Railway marshalling yards

Road tunnels

Shipyards

Substation/switchgear buildings

*Note:* “Audio/visual production facilities”, “cold storage areas” “dangerous goods stores” and “mechanical plant rooms” are included in both groups.

**PART IV****REQUIREMENTS FOR PREMISES****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
- 4.21 Domestic Buildings—Low Rise (up to and including 3 storeys in height)
- 4.22 Domestic Buildings—Low Rise (over 3 storeys in height)
- 4.23 Domestic Buildings—High Rise
- 4.24 Consumer Electrical Equipment: incorporating transformers, switchgear, generators/alternators requiring separate installations
- 4.25 Explosive Production and/or storages
- 4.26 Garages
- 4.27 Hotels—Low Rise
- 4.28 Hotels—High Rise
- 4.29 Industrial/Godown Buildings—Low Rise
- 4.30 Industrial/Godown Buildings—High Rise
- 4.31 Institutional Buildings—Low Rise
- 4.32 Institutional Buildings—High Rise
- 4.33 Kitchens (other than kitchens in domestic premises)

- 4.34 Lift Motor Rooms
- 4.35 Mechanical Plant Rooms (Group I)
- 4.36 Mechanical Plant Rooms (Group II)
- 4.37 Passenger Terminals/Stations
- 4.38 Petro-chemical Complexes
- 4.39 Railway Marshalling Yards
- 4.40 Refuge Floors
- 4.41 Road Tunnels
- 4.42 Shipyards
- 4.43 Substation/Switchgear Buildings
- 4.44 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 installation other than water
- (iii) Automatic fixed installation using water
- (iv) Dust detection system
- (v) Emergency generator
- (vi) Emergency lighting
- (vii) Exit sign
- (viii) Fire alarm system
- (ix) Fire control centre
- (x) Fire detection system
- (xi) Fire hydrant/hose reel system
- (xii) Fireman's lift or firefighting and rescue stairway
- (xiii) Fixed automatically operated approved appliance
- (xiv) Fixed foam system
- (xv) Gas extraction system
- (xvi) Portable hand-operated approved appliance
- (xvii) Ring main system with fixed pump(s)
- (xviii) 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 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 fire service installations and fireman's lifts 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. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point shall include facilities for fire pump start and audio/visual 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 on each floor to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose and hose reel tubing.
- (xii) As required by the Code of Practice for Fire Safety in Buildings
- (xiii) As required by occupancy.
- (xiv) To be provided as an alternative to other fixed automatic systems, when required by the 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 where public water mains are inadequate.
- (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 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 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 system
- (ii) Automatic actuating devices
- (iii) Automatic fixed installation other than water
- (iv) Automatic fixed installation using water
- (v) Emergency generator
- (vi) Emergency lighting
- (vii) Exit sign
- (viii) Fire alarm system
- (ix) Fire control centre
- (x) Fire detection system
- (xi) Fire hydrant/hose reel system
- (xii) Portable hand-operated approved appliance
- (xiii) Static or dynamic smoke extraction system
- (xiv) Ventilation/air conditioning control system

##### **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 fire service installations and fireman's lifts 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 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. Visual alarm signals shall be provided where necessary in accordance with current Design Manual:

Barrier Free Access. This actuating point shall include facilities for fire pump start and audio/visual 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 on each floor to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose and 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.

The requirement of hot smoke test will be stipulated if considered necessary by the Director of Fire Services in the building plans involving compartments: —

  - (i) with headroom of 12 m or more; or
  - (ii) with irregular geometrical dimensions or extraordinary large size.
- (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 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 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 with total floor area not exceeding 230 m<sup>2</sup>**

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

- (i) Automatic fixed installation other than water
- (ii) Emergency lighting
- (iii) Exit sign
- (iv) Fire alarm system
- (v) Fire detection system
- (vi) Fire hydrant/hose reel system
- (vii) Fireman's lift or firefighting and rescue stairway
- (viii) Portable hand-operated approved appliance
- (ix) Ventilation/air conditioning control system

##### *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. Visual alarm signals shall be provided where necessary in accordance with current Design Manual:

Barrier Free Access. This actuating point shall include facilities for fire pump start and audio/visual 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 on each floor 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 and hose reel tubing.
- (vii) As required by the Code of Practice for Fire Safety in Buildings.
- (viii) As required by occupancy.
- (ix) 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 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 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.

#### **4.4 Basements with total area exceed 230 m<sup>2</sup>**

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

- (i) Audio/visual advisory system
- (ii) Automatic fixed installation other than water
- (iii) Emergency lighting
- (iv) Exit sign
- (v) Fire alarm system
- (vi) Fire detection system
- (vii) Fire hydrant/hose reel system
- (viii) Firefighting and rescue stairway
- (ix) Portable hand-operated approved appliance
- (x) Pressurization of staircase
- (xi) Sprinkler system
- (xii) Static or dynamic smoke extraction system
- (xiii) Ventilation/air conditioning control system

##### *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. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point shall include facilities for fire pump start and audio/visual 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 on each floor 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 and hose reel tubing.
- (viii) Required for basements of three or more levels, or as required by the Code of Practice for Fire Safety in Buildings.
- (ix) As required by occupancy.
- (x) Required for basements of three or more levels where:
  - (a) no open air access routes for firemen are provided;
  - (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 staircase 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 Fire Safety in Buildings.
- (xi) In all parts of the basements, fast response type sprinkler heads shall be used with the exception of areas where covered by (ii), or strong rooms and safe deposit vaults covered by (vi).
- (xii) Required for:
  - (a) any fire compartment exceeding 7 000 cubic metres where the designed fire load is likely to exceed 1135 MJ/m<sup>2</sup>, or
  - (b) industrial basements, or
  - (c) basements of three or more levels except areas solely for car parking purposes.

The requirement of hot smoke test will be stipulated if considered necessary by the Director of Fire Services in the building plans involving compartments: —

  - (i) with headroom of 12 m or more; or
  - (ii) with irregular geometrical dimensions or extraordinary large size.
- (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 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 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.

#### 4.5 Battery rooms and electrical charging facilities

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

- (i) Automatic fixed installation other than water
- (ii) Exit sign
- (iii) Fire alarm system
- (iv) Fire detection system
- (v) Gas extraction system
- (vi) Portable hand-operated approved appliance
- (vii) Ventilation/air conditioning control system

##### *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. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point shall include facilities for audio/visual 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 installation other than water
- (iii) Automatic fixed installation using water
- (iv) Emergency lighting
- (v) Exit sign
- (vi) Fire detection system
- (vii) Fixed foam system
- (viii) Portable hand-operated approved appliance

##### *EXTENT*

- (i) As required by that equipment which needs to be automatically actuated.
- (ii) To be provided in gas/oil boiler rooms.
- (iii) To be provided in gas/oil boiler rooms where automatic fixed installation other than water are not installed.
- (iv) Emergency lighting shall be provided throughout the entire area and all exit routes leading to ground level.
- (v) 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.

- (vi) To be provided in areas not covered by automatic fixed installations.
- (vii) To be provided in oil boiler rooms located in basements in lieu of the automatic fixed installations at (ii) & (iii) above.
- (viii) 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 system
- (ii) Automatic actuating devices
- (iii) Automatic fixed installation other than water
- (iv) Emergency generator
- (v) Emergency lighting
- (vi) Exit sign
- (vii) Fire alarm system
- (viii) Fire detection system
- (ix) Fire hydrant/hose reel system
- (x) Portable hand-operated approved appliance
- (xi) Sprinkler system
- (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 fire service installations and fireman's lifts 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. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point shall include facilities for fire pump start and audio/visual warning device initiation.
- (viii) To be provided in areas not covered by automatic fixed installations.
- (ix) There shall be sufficient hydrants and hose reels on each floor to ensure that every part of the premises can be reached by a length of not more than 30 m of Fire Services hose and hose reel tubing.
- (x) As required by occupancy.
- (xi) In all parts of the alleys and associated areas including staircases, common corridors and toilets.
- (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 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 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 the Energy Institute
- (ii) Automatic actuating devices
- (iii) Automatic fixed installation other than water
- (iv) Automatic fixed installation using water
- (v) Emergency generator
- (vi) Emergency lighting
- (vii) Exit sign
- (viii) Fire alarm system
- (ix) Fire control centre
- (x) Fire detection system
- (xi) Fire hydrant/hose reel system
- (xii) Fixed automatically operated approved appliance
- (xiii) Fixed foam system
- (xiv) Portable hand-operated approved appliance
- (xv) Ring main system with fixed pump(s)

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

- (i) As considered necessary by the 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 fire service installations and fireman's lifts it is required to provide.
- (vi) Emergency lighting shall be provided throughout the entire building and all exit routes leading to ground level. In addition, such lighting shall also be provided to ensure adequate 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 staircases serving the buildings.
- (viii) One actuating point and one audio warning device to be located at each hose reel point. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point shall include facilities for fire pump start and audio/visual 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 on each floor to ensure that every part of the buildings can be reached by a length of not more than 30 m of Fire Services hose and 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 where public water mains are inadequate.

*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) Emergency lighting
- (ii) Exit sign
- (iii) Fire alarm system
- (iv) Fire hydrant/hose reel system
- (v) Fireman's lift
- (vi) Portable hand-operated approved appliance

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

- (i) Emergency lighting shall be provided throughout all public areas and exit routes leading to ground level.
- (ii) 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.
- (iii) As required by the risk. If required, one actuating point and one audio warning device to be located at each hose reel point. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point shall include facilities for fire pump start and audio/visual warning device initiation.
- (iv) As required by the risk.
- (v) As required by the Code of Practice for Fire Safety in Buildings.
- (vi) 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.

*Note:* Carports within buildings shall conform to the requirements specified for those buildings in accordance with this Code.

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

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

- (i) Automatic actuating devices
- (ii) Automatic fixed installation other than water
- (iii) Automatic fixed installation using water
- (iv) Dust detection system
- (v) Emergency generator
- (vi) Emergency lighting
- (vii) Exit sign
- (viii) Fire alarm system
- (ix) Fire control centre
- (x) Fire detection system
- (xi) Fixed automatically operated approved appliance
- (xii) Fixed foam system

- (xiii) Gas detection system
- (xiv) Gas extraction system
- (xv) Portable hand-operated approved appliance
- (xvi) Ring main system with fixed pump(s)
- (xvii) Special equipment/requirements
- (xviii) 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 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 fire service installations and fireman's lifts 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 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. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point shall include facilities for fire pump start and audio/visual warning device initiation, and in addition, one actuating point and audio/visual 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 where public water mains are inadequate.
- (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 appliance.

*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 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 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 installation using water
- (ii) Fire alarm system
- (iii) Portable hand-operated approved appliance

*EXTENT*

- (i) Dry sprinklers or sprinkler installation operating in dry mode to be provided in the cold room, as defined by the Loss Prevention Council Rules.
- (ii) The system provided to the building to be extended to cover the cold storage area. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access.
- (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 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 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 installation using water
- (iii) Emergency generator
- (iv) Emergency lighting
- (v) Exit sign
- (vi) Fire alarm system
- (vii) Fire hydrant/hose reel system
- (viii) Fireman's lift or firefighting and rescue stairway
- (ix) Gas detection system
- (x) Portable hand-operated approved appliance

*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 sprinklers or sprinkler installation operating in dry mode in accordance with the Loss Prevention Council Rules.
- (iii) An independently powered generator of sufficient electrical capacity to meet the fire service installations and fireman's lifts 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. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point shall include facilities for fire pump start and audio/visual warning device initiation.
- (vii) There shall be sufficient hydrants and hose reels on each floor to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose and hose reel tubing.
- (viii) As required by the Code of Practice for Fire Safety in Buildings.
- (ix) To be provided in those areas as required by the risk.
- (x) 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 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 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 system
- (ii) Automatic actuating devices
- (iii) Automatic fixed installation other than water
- (iv) Emergency generator
- (v) Emergency lighting
- (vi) Exit sign
- (vii) Fire alarm system
- (viii) Fire detection system
- (ix) Fire hydrant/hose reel system
- (x) Fireman's lift
- (xi) Portable hand-operated approved appliance
- (xii) Sprinkler system
- (xiii) Static or dynamic smoke extraction system
- (xiv) Ventilation/air conditioning control system

##### *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 fire service installations and fireman's lifts 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. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point shall include facilities for fire pump start and audio/visual warning device initiation.
- (viii) To be provided in areas not covered by automatic fixed installations.
- (ix) There shall be sufficient hydrants and hose reels on each floor to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose and hose reel tubing.
- (x) As required by the Code of Practice for Fire Safety in Buildings.
- (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, common corridors and toilets.
- (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, or
  - (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.

The requirement of hot smoke test will be stipulated if considered necessary by the Director of Fire Services in the building plans involving compartments: —

  - (i) with headroom of 12 m or more; or
  - (ii) with irregular geometrical dimensions or extraordinary large size.
- (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 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 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 system
- (ii) Automatic actuating devices
- (iii) Automatic fixed installation other than water
- (iv) Emergency generator
- (v) Emergency lighting
- (vi) Exit sign
- (vii) Fire alarm system
- (viii) Fire control centre
- (ix) Fire detection system
- (x) Fire hydrant/hose reel system
- (xi) Fireman's lift
- (xii) Portable hand-operated approved appliance
- (xiii) Pressurization of staircase
- (xiv) Sprinkler system
- (xv) Static or dynamic smoke extraction system
- (xvi) Ventilation/air conditioning control system

##### *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 fire service installations and fireman's lifts 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. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point shall include facilities for fire pump start and audio/visual 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 on each floor to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose and hose reel tubing.
- (xi) As required by the Code of Practice for Fire Safety in Buildings.
- (xii) As required by occupancy.
- (xiii) Required where:
  - (a) natural venting of staircase is not provided;
  - (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;
  - (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 staircase 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 Fire Safety in Buildings.

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

The requirement of hot smoke test will be stipulated if considered necessary by the Director of Fire Services in the building plans involving compartments: —

- (i) with headroom of 12 m or more; or
  - (ii) with irregular geometrical dimensions or extraordinary large size.
- (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 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 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:*

- (i) The fire service installations and equipment required for each of the various usages of a composite building shall conform to the relevant paragraph of this Code.
- (ii) For composite building with sprinkler system in non-domestic portion, the sprinklers in staircase (only those communicate with the domestic portion) should be extended to 2 more floors above or below the non-domestic portion and the sprinkler head should be of fast response type.

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

*REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:*

- (i) Automatic actuating devices
- (ii) Automatic fixed installation other than water
- (iii) Automatic fixed installation using water
- (iv) Emergency generator
- (v) Emergency lighting
- (vi) Exit sign

- (vii) Fire alarm system
- (viii) Fire control centre
- (ix) Fire hydrant/hose reel system
- (x) Fixed automatically operated approved appliance
- (xi) Portable hand-operated approved appliance
- (xii) Pressurization of staircase
- (xiii) Ring main systems with fixed pump(s)
- (xiv) Special equipment/requirements
- (xv) Static or dynamic smoke extraction system
- (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 including staircases, common corridors and toilets excepting where covered by (ii) above.
- (iv) An independently powered generator of sufficient electrical capacity to meet the fire service installations and fireman's lifts 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. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point shall include facilities for fire pump start and audio/visual 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 on each floor to ensure that every part of the buildings can be reached by a length of not more than 30 m of Fire Services hose and 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 staircase 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 Fire Safety in Buildings.
- (xiii) To be provided to cover those areas of such complexes where public water mains are inadequate.
- (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  $1\,135\text{ MJ/m}^2$ .

The requirement of hot smoke test will be stipulated if considered necessary by the Director of Fire Services in the building plans involving compartments: —

- (i) with headroom of 12 m or more; or
  - (ii) with irregular geometrical dimensions or extraordinary large size.
- (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, except for those buildings constructed to the standard stipulated in the current Code of Practice for Fire Safety in Buildings.

e.g. LH (light hazard) becomes OH 1 (ordinary hazard group 1); OH 4 (ordinary hazard group 4) becomes HH (high hazard).

**4.20 Dangerous goods stores**

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

- (i) Automatic actuating devices
- (ii) Automatic fixed installation other than water
- (iii) Automatic fixed installation using water
- (iv) Exit sign
- (v) Fire alarm system
- (vi) Fixed automatically operated approved appliance
- (vii) Fixed foam system
- (viii) Gas detection system
- (ix) Portable hand-operated approved appliance
- (x) Special equipment/requirements

**EXTENT**

- (i) As required by that equipment which needs to be automatically actuated.
- (ii) As required by the risk of the dangerous goods and the volume of the store.
- (iii) As required by the risk of the dangerous goods and the volume of the store.
- (iv) 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.
- (v) One actuating point and one audio warning device to be located at each exit from the store where automatic fixed installation is provided. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point should include facilities for audio warning device initiation.
- (vi) As required by the risk of the dangerous goods and the volume of the store.
- (vii) As required by the risk.
- (viii) As required by the risk.
- (ix) As required by the Director of Fire Services.
- (x) As required by the Director of Fire Services.

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

Portable hand-operated approved appliance.

**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 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 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.

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

- (i) Fire alarm system
- (ii) Fire hydrant/hose reel system
- (iii) Portable hand-operated approved appliance

**EXTENT**

- (i) One actuating point and one audio warning device to be located at each hose reel point. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point shall include facilities for fire pump start and audio/visual warning device initiation.
- (ii) There shall be sufficient hydrants and hose reels on each floor to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose and hose reel tubing.
- (iii) 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 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 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—high rise****REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:**

- (i) Emergency generator
- (ii) Emergency lighting
- (iii) Exit sign
- (iv) Fire alarm system
- (v) Fire hydrant/hose reel system

- (vi) Fireman's lift
- (vii) Portable hand-operated approved appliance

*EXTENT*

- (i) An independently powered generator of sufficient electrical capacity to meet the fire service installations and fireman's lifts it is required to provide.
- (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. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point shall include facilities for fire pump start and audio/visual warning device initiation.
- (v) There shall be sufficient hydrants and hose reels on each floor to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose and hose reel tubing.
- (vi) As required by the Code of Practice for Fire Safety in Buildings.
- (vii) 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 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 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 Consumer electrical equipment: incorporating transformers, switchgear, generators/alternators requiring separate installations**

*REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:*

- (i) Automatic actuating devices
- (ii) Automatic fixed installation other than water
- (iii) Fire detection system
- (iv) Portable hand-operated approved appliance

*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 and where the portion of the building is required to be provided with fire detection system.
- (iv) As required by the Director of Fire Services.

**4.25 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.

#### 4.26 Garages

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

- (i) Automatic actuating devices
- (ii) Emergency lighting
- (iii) Exit sign
- (iv) Fire alarm system
- (v) Fire hydrant/hose reel system
- (vi) Fireman's lift
- (vii) Portable hand-operated approved appliance
- (viii) Sprinkler system
- (ix) Ventilation/air conditioning control system

##### *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. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point shall include facilities for fire pump start and audio/visual warning device initiation within the premises.
- (v) There shall be sufficient hydrants and hose reels on each floor to ensure that every part of the premises can be reached by a length of not more than 30 m of Fire Services hose and hose reel tubing.
- (vi) As required by the Code of Practice for Fire Safety in Buildings.
- (vii) As required by the risk.
- (viii) 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.
- (ix) 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.

#### 4.27 Hotels—low rise

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

- (i) Audio/visual advisory system
- (ii) Automatic actuating devices
- (iii) Automatic fixed installation other than water
- (iv) Emergency generator
- (v) Emergency lighting
- (vi) Exit sign
- (vii) Fire alarm system
- (viii) Fire control centre
- (ix) Fire detection system
- (x) Fire hydrant/hose reel system
- (xi) Fireman's lift
- (xii) Portable hand-operated approved appliance

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

*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 fire service installations and fireman's lifts 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. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point shall include facilities for fire pump start and audio/visual warning device initiation.
- (viii) Minimum of one, additional to be provided according to the complexity of the building.
- (ix) (a) To be provided in areas not covered by automatic fixed installations;
- (b) a smoke detection system to be provided for the entire floor excluding toilets, bathrooms and staircases which are covered by sprinkler system, if any part of that floor is used for sleeping accommodation. Heat detection system would be acceptable in electrical/mechanical rooms and kitchens; and
- (c) all smoke detectors provided in guestrooms shall be integrated with proprietary made sounder bases.
- (x) There shall be sufficient hydrants and hose reels on each floor to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose and hose reel tubing.
- (xi) As required by the Code of Practice for Fire Safety in Buildings.
- (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 staircase 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 Fire Safety in Buildings.
- (xiv) In all parts of the hotels including staircases, common corridors, toilets and bathrooms.
- (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, or

- (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, or
- (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.

The requirement of hot smoke test will be stipulated if considered necessary by the Director of Fire Services in the building plans involving compartments: —

- (i) with headroom of 12 m or more; or
  - (ii) with irregular geometrical dimensions or extraordinary large size.
- (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 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 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.

#### **4.28 Hotels—high rise**

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

- (i) Audio/visual advisory system
- (ii) Automatic actuating devices
- (iii) Automatic fixed installation other than water
- (iv) Emergency generator
- (v) Emergency lighting
- (vi) Exit sign
- (vii) Fire alarm system
- (viii) Fire control centre
- (ix) Fire detection system
- (x) Fire hydrant/hose reel system
- (xi) Fireman's lift
- (xii) Portable hand-operated approved appliance
- (xiii) Pressurization of staircase
- (xiv) Sprinkler system
- (xv) Static or dynamic smoke extraction system
- (xvi) Ventilation/air conditioning control system

##### **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 fire service installations and fireman's lifts 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. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point shall include facilities for fire pump start and audio/visual warning device initiation.
- (viii) Minimum of one, additional to be provided according to the complexity of the building.
  - (ix) (a) To be provided in areas not covered by automatic fixed installations;
  - (b) a smoke detection system to be provided for the entire floor excluding toilets, bathrooms and staircases which are covered by sprinkler system, if any part of that floor is used for sleeping accommodation. Heat detection system would be acceptable in electrical/mechanical rooms and kitchens; and
  - (c) all smoke detectors provided in guestrooms shall be integrated with proprietary made sounder bases.
- (x) There shall be sufficient hydrants and hose reels on each floor to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose and hose reel tubing.
- (xi) As required by the Code of Practice for Fire Safety in Buildings.
- (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 staircase 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 Fire Safety in Buildings.
- (xiv) In all parts of the hotels including staircases, common corridors, toilets and bathrooms.
- (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, or
  - (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, or
  - (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.

The requirement of hot smoke test will be stipulated if considered necessary by the Director of Fire Services in the building plans involving compartments: —

- (i) with headroom of 12 m or more; or
  - (ii) with irregular geometrical dimensions or extraordinary large size.
- (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 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 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 Industrial/godown buildings—low rise**

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

- (i) Automatic actuating devices
- (ii) Automatic fixed installation other than water
- (iii) Emergency generator
- (iv) Emergency lighting
- (v) Exit sign
- (vi) Fire alarm system
- (vii) Fire control centre
- (viii) Fire detection system
- (ix) Fire hydrant/hose reel system
- (x) Fireman's lift or firefighting and rescue stairway
- (xi) Portable hand-operated approved appliance
- (xii) Sprinkler system
- (xiii) Static or dynamic smoke extraction system
- (xiv) 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) An independently powered generator of sufficient electrical capacity to meet the fire service installations and fireman's lifts 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. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point shall include facilities for fire pump start and audio/visual 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 on each floor to ensure that every part of the

building can be reached by a length of not more than 30 m of Fire Services hose and hose reel tubing.

- (x) As required by the Code of Practice for Fire Safety in Buildings.
- (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, common corridors and toilets.
- (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.

The requirement of hot smoke test will be stipulated if considered necessary by the Director of Fire Services in the building plans involving compartments: —

  - (i) with headroom of 12 m or more; or
  - (ii) with irregular geometrical dimensions or extraordinary large size.
- (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.

#### **4.30 Industrial/godown buildings—high rise**

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

- (i) Automatic actuating devices
- (ii) Automatic fixed installation other than water
- (iii) Emergency generator
- (iv) Emergency lighting
- (v) Exit sign
- (vi) Fire alarm system
- (vii) Fire control centre
- (viii) Fire detection system
- (ix) Fire hydrant/hose reel system
- (x) Firefighting and rescue stairway
- (xi) Portable hand-operated approved appliance
- (xii) Pressurization of staircase
- (xiii) Sprinkler system
- (xiv) Static or dynamic smoke extraction system
- (xv) 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) An independently powered generator of sufficient electrical capacity to meet the fire service installations and fireman's lifts 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. Visual

alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point shall include facilities for fire pump start and audio/visual 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 on each floor to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose and hose reel tubing.
- (x) As required by the Code of Practice for Fire Safety in Buildings.
- (xi) As required by occupancy.
- (xii) Required where:
  - (a) natural venting of staircase is not provided;
  - (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;
  - (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 staircase 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 Fire Safety in Buildings.
- (xiii) In all parts of the buildings including staircases, common corridors and toilets.
- (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.

The requirement of hot smoke test will be stipulated if considered necessary by the Director of Fire Services in the building plans involving compartments: —

  - (i) with headroom of 12 m or more; or
  - (ii) with irregular geometrical dimensions or extraordinary large size.
- (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.

#### **4.31 Institutional buildings—low rise**

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

- (i) Audio/visual advisory system
- (ii) Automatic actuating devices
- (iii) Automatic fixed installation other than water
- (iv) Emergency generator
- (v) Emergency lighting
- (vi) Exit sign
- (vii) Fire alarm system
- (viii) Fire detection system
- (ix) Fire hydrant/hose reel system
- (x) Fireman's lift
- (xi) Portable hand-operated approved appliance

- (xii) Sprinkler system
- (xiii) Ventilation/air conditioning control system

*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) To be provided to hospitals, sanatoria, prisons or as required by the risks. The independently powered generator shall have sufficient electrical capacity to meet the fire service installations and fireman's lifts.
- (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. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point shall include facilities for fire pump start and audio/visual warning device initiation.
- (viii) (a) To be provided in areas not covered by automatic fixed installations;
- (b) a smoke detection system to be provided for the entire floor excluding toilets, bathrooms and staircases which are covered by sprinkler system, if any part of that floor is used for sleeping accommodation. Heat detection system would be acceptable in electrical/mechanical rooms and kitchens; and
- (c) all smoke detectors provided in bedrooms of student hostels shall be integrated with proprietary made sounder bases.
- (ix) There shall be sufficient hydrants and hose reels on each floor to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose and hose reel tubing.
- (x) As required by the Code of Practice for Fire Safety in Buildings.
- (xi) As required by occupancy.
- (xii) Required for all parts of buildings including staircases, common corridors, toilets and bathrooms with total floor area exceeding 230 m<sup>2</sup>.
- (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 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 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 and sanatorium 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.

### 4.32 Institutional buildings—high rise

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

- (i) Audio/visual advisory system
- (ii) Automatic actuating devices
- (iii) Automatic fixed installation other than water
- (iv) Emergency generator
- (v) Emergency lighting
- (vi) Exit sign
- (vii) Fire alarm system
- (viii) Fire control centre
- (ix) Fire detection system
- (x) Fire hydrant/hose reel system
- (xi) Fireman's lift
- (xii) Portable hand-operated approved appliance
- (xiii) Pressurization of staircase
- (xiv) Sprinkler system
- (xv) Ventilation/air conditioning control system

#### *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 fire service installations and fireman's lifts 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. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point shall include facilities for fire pump start and audio/visual warning device initiation.
- (viii) Minimum of one, additional to be provided according to the complexity of the building.
- (ix) (a) To be provided in areas not covered by automatic fixed installations;  
 (b) a smoke detection system to be provided for the entire floor excluding toilets, bathrooms and staircases which are covered by sprinkler system, if any part of that floor is used for sleeping accommodation. Heat detection system would be acceptable in electrical/mechanical rooms and kitchens; and  
 (c) all smoke detectors provided in bedrooms of student hostels shall be integrated with proprietary made sounder bases.
- (x) There shall be sufficient hydrants and hose reels on each floor to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose and hose reel tubing.
- (xi) As required by the Code of Practice for Fire Safety in Buildings.
- (xii) As required by occupancy.

- (xiii) Required for hospitals and sanatoria 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 staircase 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 Fire Safety in Buildings.
- (xiv) Required for all parts of buildings including staircases, common corridors, toilets and bathrooms.
- (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 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 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 and sanatorium 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 Kitchens (other than kitchens in domestic premises)**

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

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##### **EXTENT FOR:**

- (i) 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;
- (ii) Portable hand-operated approved appliances are to be provided as required by risk.

#### **4.34 Lift motor rooms**

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

- (i) Fire detection system.
- (ii) Portable hand-operated approved appliance.

##### **EXTENT**

- (i) To be provided in all lift motor rooms where the portion of building is required to be provided with fire detection system.
- (ii) As required by occupancy.

#### **4.35 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 system
- (iii) Gas detection system
- (iv) Gas extraction system

- (v) Portable hand-operated approved appliance
- (vi) Ventilation/air conditioning control system

**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 and where the portion of the building is required to be provided with fire detection system.
- (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.

**4.36 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 installation other than water
- (iii) Emergency generator
- (iv) Emergency lighting
- (v) Exit sign
- (vi) Fire detection system
- (vii) Fixed automatically operated approved appliance
- (viii) Gas detection system
- (ix) Gas extraction system
- (x) Portable hand-operated approved appliance
- (xi) 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) An independently powered generator of sufficient electrical capacity to meet the fire service installations and fireman's lifts 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.

**4.37 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 paragraphs of this Code for similar usages, with additional requirements for other areas as considered necessary e.g. passenger movement areas.

**4.38 Petro-chemical complexes****REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:**

- (i) Automatic actuating devices
- (ii) Automatic fixed installation other than water
- (iii) Automatic fixed installation using water
- (iv) Dust detection system
- (v) Emergency generator
- (vi) Emergency lighting
- (vii) Exit Sign
- (viii) Fire alarm system
- (ix) Fire control centre
- (x) Fire detection system
- (xi) Fixed automatically operated approved appliance
- (xii) Fixed foam system
- (xiii) Gas detection system
- (xiv) Gas extraction system
- (xv) Portable hand-operated approved appliance
- (xvi) Ring main system with fixed pump(s)
- (xvii) Special equipment/requirements
- (xviii) 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 risk.
- (iii) In all areas including staircases, common corridors and toilets 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 fire service installations and fireman's lifts it is required to provide.
- (vi) Emergency lighting shall be provided to all buildings within the complex. In addition, such lighting shall also be provided to ensure adequate 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 building 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 within the buildings. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point shall include facilities for fire pump start and audio/visual warning device initiation, and in addition, one actuating point and one audio/visual 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 type 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 where public water mains are inadequate.
- (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.

#### **4.39 Railway marshalling yards**

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

- (i) Automatic fixed installation other than water
- (ii) Automatic fixed installation using water
- (iii) Emergency generator
- (iv) Emergency lighting
- (v) Fire alarm system
- (vi) Fire control centre
- (vii) Fire hydrant/hose reel system
- (viii) Portable hand-operated approved appliance
- (ix) Ring main system 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 staircases, common corridors and toilets excepting where covered by (i) above.
- (iii) An independently powered generator of sufficient electrical capacity to meet the fire service installations 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 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. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point shall include facilities for fire pump start and audio/visual 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 on each floor to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose and hose reel tubing.
- (viii) As required by occupancy.
- (ix) To be provided to cover those areas of the yard where public water mains are inadequate.
- (x) As required by the Director of Fire Services.

- (xi) 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.

The requirement of hot smoke test will be stipulated if considered necessary by the Director of Fire Services in the building plans involving compartments: —

- (i) with headroom of 12 m or more; or
- (ii) with irregular geometrical dimensions or extraordinary large size.

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

#### **4.40 Refuge floors**

*REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:*

&

*EXTENT FOR:*

- (i) The fire service installations and equipment that are required to be provided in the building in accordance with relevant paragraphs of this Code shall also be extended to the refuge floors as appropriate; and
- (ii) an external drencher system with an independent water supply shall be provided to protect all external wall openings. The system shall be automatically operated by a quick opening valve or deluge valve which is operated by a system of approved heat detectors or sprinklers installed in the same areas as the drencher system, together with manual control.
- (iii) Sprinkler or drencher system is not required on open roof even though it is designed as refuge floor.

#### **4.41 Road tunnels**

*REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:*

- (i) Automatic fixed installation other than water
- (ii) Closed circuit television system
- (iii) Dynamic smoke extraction system
- (iv) Emergency generator
- (v) Emergency lighting
- (vi) Emergency power points
- (vii) Exit sign
- (viii) Fire alarm system
- (ix) Fire control centre
- (x) Fire hydrant/hose reel system
- (xi) Fireman's communication system
- (xii) Fixed foam system
- (xiii) Gas detection system
- (xiv) Pedestrian cross over facilities
- (xv) Portable hand-operated approved appliance

*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 fire service

installations it is required to provide.

- (v) Emergency lighting shall be provided throughout the entire tunnel.
- (vi) To be provided at 100 m intervals on both sides of the tunnel.
- (vii) To be provided to indicate the locations of pedestrian cross over facilities.
- (viii) One actuating point and one visual warning device to be located at each hose reel point. This actuating point shall include facilities for fire pump start and audio/visual warning device initiation within the tunnel control centre.
- (ix) A fire control centre to be provided. This may be part of the tunnel control centre.
- (x) For twin-tube tunnels, there shall be sufficient hose reels to ensure that every part of the tunnel can be reached by a length of not more than 30 m of hose reel tubing. Hose reels shall be provided at 50 m intervals. Fire hydrants shall be provided at 100 m intervals. The hydrant shall have twin outlets fitted with instantaneous couplings capable of delivering not less than 4 000 litres per minute (66.7 litres per second) at a minimum running pressure of 170 kPa with two outlets operating simultaneously.

For single-tube tunnels, 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 and hose reel tubing. Hydrants and hose reels shall be provided at 50 m intervals.

- (xi) As required by the Director of Fire Services.
- (xii) To be provided for nadir sump at middle portion of tunnel, especially in an immersed tunnel.
- (xiii) Gas detection systems to include carbon monoxide indication and alarm.
- (xiv) Cross over facilities shall be provided in twin-tube tunnels at 100 m intervals. In respect of single-tube tunnels, a small pedestrian tunnel is to be provided for escape purposes.
- (xv) As required by the risk.

#### **ADDITIONAL REQUIREMENT**

All tunnel wall lining/finishes shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7.

#### **4.42 Shipyards**

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

- (i) Automatic actuating devices
- (ii) Emergency generator
- (iii) Emergency lighting
- (iv) Fire alarm system
- (v) Fire control centre
- (vi) Portable hand-operated approved appliance
- (vii) Ring main system 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 fire service installations it is required to provide.
- (iii) Emergency lighting shall be provided to all buildings within the yard. In addition, such lighting shall also be provided to ensure adequate 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. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point shall include facilities for fire pump start and audio/visual 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 Substation/switchgear buildings**

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

- (i) Automatic actuating devices
- (ii) Automatic fixed installation other than water
- (iii) Automatic fixed installation using water
- (iv) Emergency generator
- (v) Emergency lighting
- (vi) Exit sign
- (vii) Fire alarm system
- (viii) Fire control centre
- (ix) Fire detection system
- (x) Fire hydrant/hose reel system
- (xi) Fireman's lift or firefighting and rescue stairway
- (xii) Portable hand-operated approved appliance
- (xiii) 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) As required by the risk.
- (iv) An independently powered generator of sufficient electrical capacity to meet the fire service installations and fireman's lifts 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. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point shall include facilities for fire pump start and audio/visual 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) As required by the risks, there shall be sufficient hydrants and hose reels on each floor to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose and hose reel tubing.
- (xi) As required by the Code of Practice for Fire Safety in Buildings.
- (xii) As required by occupancy.
- (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 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.

**4.44 Telephone distribution equipment, computer installation and similar installations***REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:*

- (i) Automatic actuating devices
- (ii) Automatic fixed installation other than water
- (iii) Automatic fixed installation using water
- (iv) Emergency lighting
- (v) Exit sign
- (vi) Fire alarm system
- (vii) Fire detection system
- (viii) Fixed automatically operated approved appliance
- (ix) Portable hand-operated approved appliance
- (x) Ventilation/air conditioning control system

*EXTENT*

- (i) As required by that equipment which needs to be automatically actuated.
- (ii) To be provided if not otherwise protected by automatic fixed installation using water.
- (iii) To be provided if not otherwise protected by automatic fixed installation 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. If required, visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access.
- (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 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 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**

- 5.1 Audio/visual advisory system
- 5.2 Automatic actuating devices
- 5.3 Automatic fixed installation other than water
- 5.4 Automatic fixed installation using water
- 5.5 Deluge system
- 5.6 Drencher system
- 5.7 Dust detection system
- 5.8 Emergency generator
- 5.9 Emergency lighting
- 5.10 Exit sign
- 5.11 Fire alarm system
- 5.12 Fire control centre
- 5.13 Fire detection system
- 5.14 Fire hydrant/hose reel system
- 5.15 Fire resisting cable for fire service installations
- 5.16 Fireman's lift and firefighting and rescue stairway
- 5.17 Fixed automatically operated approved appliance
- 5.18 Fixed foam system
- 5.19 Gas detection system
- 5.20 Portable hand-operated approved appliance
- 5.21 Pressurization of staircase
- 5.22 Ring main system with fixed pump(s)
- 5.23 Smoke extraction system
- 5.24 Sprinkler system
- 5.25 Street fire hydrant system
- 5.26 Supply tank
- 5.27 Ventilation/air conditioning control system
- 5.28 Water mist system
- 5.29 Water spray system
- 5.30 Water supply

## 5.1 Audio/visual advisory system

### *SPECIFICATION*

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

The audio/visual advice shall be provided throughout the required floors and/or areas leading to staircase only.

### *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, sanatoria, 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.

The power supply to the sound system should be from essential circuits.

### *VISUAL*

A system of flashing lights with directional signs, which may be incorporated to the exit signs and directional signs as required under paragraph 5.10 and supplemented by low level directional signs to indicate:

- (a) the floors and/or areas to be evacuated by operating the flashing lights with directional signs at the corresponding floors and/or areas,
- (b) the evacuation routes by following the low level directional signs.

High level flashing lights with directional signs shall be positioned between 2 m and 2.5 m above finished floor level measured to the base of the flashing lights. Low level directional signs shall be installed with the lower edges not higher than 200 mm from the finished floor level.

Low level directional signs shall be of self luminous types and conform to British Standard 5499: Part 10 or, alternatively, shall be of photoluminous types and conform to DIN 67510 Part 4 or equivalent.

## 5.2 Automatic actuating devices

### *SPECIFICATION*

Components under this paragraph 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 paragraph.

They shall be constructed and installed in accordance with the standards acceptable to the Director of Fire Services and/or the Director of Buildings as appropriate.

Pursuant to the Code of Practice for Fire Safety in Buildings issued by the Building Authority, fire shutter shall be constructed, installed and assembled to the satisfaction of the Building Authority. The operation of fire shutters shall be designed, installed, tested and maintained to the satisfaction of the Director of Fire Services.

Unless otherwise agreed by the Director of Fire Services, all fire shutters shall be provided with smoke detectors and manual control devices on both sides of wall openings for automatic and manual operation respectively. The detectors shall be installed as far as practicable to the provisions of British Standard 5839: Part 1 – Fire Detection and Fire Alarm Systems for Buildings.

The descending time of a vertical shutter shall be within 15 to 60 seconds for openings in excess of 2.5 m in height. For openings of height within 2.5 m, the descending time shall not be faster than 8 seconds 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.

For opening which is protected by horizontal travelling fire shutter, the shutter shall be able to close off the opening within 60 seconds and under no circumstances its travelling speed shall be greater than 0.2 m/s or the safety limit specified by the equipment manufacturer. If the opening is of such a size that the travelling time of the horizontal fire shutter is longer than 60 seconds, approval shall be obtained from the Director of Fire Services. Under such circumstances, other means for automatic actuation of the horizontal fire shutter at early stage of fire may be required.

### 5.3 Automatic fixed installation other than water

#### *SPECIFICATION*

Carbon dioxide, clean agent, dry chemical 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 (paragraph 5.2) may be necessary, in addition, to ensure complete compartmentation.

### 5.4 Automatic fixed installation using water

These may include:

Deluge system

Drencher system

Sprinkler system

Water mist system

Water spray system

Specifications for the above are in the respective paragraphs.

### 5.5 Deluge system

#### *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 the Fire Services Department.

### 5.6 Drencher system

#### *SPECIFICATION*

##### General

- (i) Such system shall be installed in accordance with standards acceptable to the Director of Fire Services.

##### Drencher system for refuge floors (other than refuge floor on roof / flat roof)

- (ii) Drencher system shall be installed on all refuge floors to cover all external wall openings. The flow rate of the water curtain shall be maintained not less than 10 litres per minute per square metre of the opening to be covered. The spacing of drencher heads shall be not more than 2.4m. The flow rate and pressure of the water supply shall be sufficient to achieve the discharge density and the discharge pressure at all drencher heads shall be not less than 0.35 bars. The water supply shall be sufficient for 30 minutes operation.
- (iii) A deluge valve set shall be installed close to the inlet for the drencher system. Manual operating device(s) with operation instruction displayed nearby shall be provided on refuge floor at location(s) acceptable to the Director of Fire Services.
- (iv) Independent water tank shall be provided for the drencher system of each building block with the capacity to operate for at least 30 minutes. If there are two refuge floors in a building block, the capacity of the water tank shall be calculated in accordance with the refuge floor with the larger external wall opening area. For a building block with 3 or more refuge floors, the water tank capacity will be considered on a case by case basis.
- (v) The water supply for the drencher system may be fed by static pressure directly from an elevated drencher tank without drencher pump if such pressure and flow are sufficient to give the required performance.

##### Operation

- (vi) The system shall be automatically and manually operated as approved by the Director of Fire Services.

- (vii) Automatically operated system shall normally be activated by pilot sprinkler or heat detector as approved by the Director or Fire Service. Manual operating devices with operating instruction shall be provided at the control valve and each exit door of the area served by the system.

#### Drencher Pump

- (viii) The drencher pump shall preferably be electrically driven. The electric motor shall have a power output not less than 120% of the hydraulic power needed to drive the pump at the rated flow and pressure. Once started, the pump must run continuously until stopped manually at the pump control panel installed near the pump. In addition to the start and stop buttons at the pump control panel, a lock-off button may be installed adjacent to each pump.
- (xi) The drencher pump shall be duplicated for duty and standby use. Should the duty pump electrically or mechanically fail to operate within 15 seconds, the standby pump shall be energized to become the duty pump. The drencher pumps shall be permanently primed and with non-return valves installed at the discharge side of the pumps. Where necessary, non-return valve(s) shall also be installed in other locations to prevent water backflow into the water tank.
- (x) The status of each drencher pump comprising "Power supply on", "Pump running" and "Pump failed" shall be monitored and displayed at the pump control panel and repeated to the fire control centre or a status panel at the main entrance of the building.
- (xi) The pumps shall be housed in a suitable enclosure designed solely for occupation of fire services equipment. Such pump enclosure shall lie clear of any exit or normal communication routes through the premises and suitably locked to prevent unauthorized tampering of the pumps. Such enclosures shall be clearly marked in English and Chinese characters "DRENCHER PUMP" (水簾泵), of at least 50mm high.

#### Drencher Intermediate Booster Pump

- (xii) In installation where the height between the topmost drencher head and the lowest drencher inlet serving that installation is in excess of 60 m, the flow and pressure, where necessary, shall be maintained by drencher intermediate booster pump. With the fire engines boosting water into the drencher inlet at a constant pressure of 800 kPa upstream of the inlet, the drencher intermediate booster pump shall be capable to provide adequate flow and pressure for the installation. Provision must be made for the water supplied to the inlet to by-pass the intermediate booster pumps in the event of failure of the pumps.
- (xiii) The drencher intermediate booster pumps may also be utilized as the drencher pump if they are arranged to perform both functions as stipulated.
- (xiv) The drencher intermediate booster pump shall preferably be electrically driven. The electric motor shall have a power output not less than 120% of the hydraulic power needed to drive the pump at the rated flow and pressure. Drencher intermediate booster pump shall be duplicated for duty and standby use. Should the duty pump fail to operate, the standby pump shall be energized to become the duty pump within 15 seconds. Suitable start/stop push buttons together with pump running indicator lights and alarm buzzer shall be provided adjacent to the corresponding drencher inlet(s) to enable Fire Services personnel to exercise control of the drencher intermediate booster pumps. Clear indications in English and Chinese characters "DRENCHER INTERMEDIATE BOOSTER PUMP CONTROL" (水簾中途泵開關) of at least 5mm high shall be provided.
- (xv) The pumps shall be housed in a suitable enclosure designed solely for occupation of fire services equipment. Such pump enclosure shall lie clear of any exit or normal communication routes through the premises and suitably locked to prevent unauthorized tampering of the pumps. Such enclosure shall be clearly marked in English and Chinese characters "DRENCHER INTERMEDIATE BOOSTER PUMP" (水簾中途泵) of at least 50mm high.
- (xvi) The status of each drencher intermediate booster pump (where provided), comprising "Power supply on", "Pump running" and "Pump failed" shall be monitored and displayed at the pump control panel and repeated to the fire control centre or a status panel at the main entrance of the building.

#### Drencher Inlet

- (xvii) The drencher inlet(s) shall be in a prominent position on the exterior of the corresponding

building block. The drencher inlet(s) must be suitably identified, enclosed and protected against corrosion and abuse. The inlet(s) shall be readily accessible by Fire Services personnel.

- (xviii) The centre of 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. There shall be a non-return valve behind each inlet.
- (xix) Each inlet shall be affixed with a metal identification plate raised or engraved with English and Chinese characters. The frontage of each inlet enclosure shall be clearly and permanently indicated in English and Chinese characters “DRENCHER INLET” (水簾入水掣) of at least 50 mm high.

The specification of drencher system for compartmentation shall make reference to the specification of the drencher system for refuge floor except the water supply shall be sufficient for operation same as the required fire resistance rating.

## 5.7 Dust detection system

### *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 system for the premises.

## 5.8 Emergency generator

### *SPECIFICATION*

#### (a) *GENERAL*

The emergency generator set shall be designed for cold starting and be capable of supplying power for the full rated essential load in not more than 15 seconds from initiation of the starting procedure.

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

Each essential item of equipment incorporated in the emergency generator set shall be to the latest edition of the relevant British Standard or alternative equivalent national or international standard. Full compliance with the current edition of the Institution of Engineering and Technology Wiring Regulations (British Standard 7671) shall also be necessary.

The emergency generator 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.

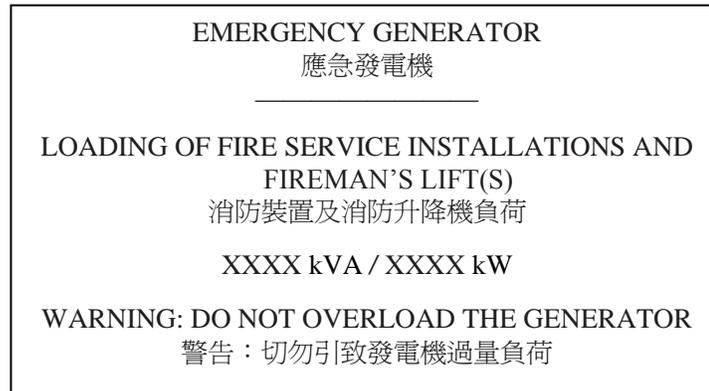
Petrol, kerosene and similar highly volatile liquid fuels are not acceptable.

The emergency generator set shall have a minimum continuous full load rating of not less than the consumption of all fire service installations and fireman's lifts connected thereto, running simultaneously. Under all load conditions the output voltage and frequency shall be maintained for satisfactory operation of all fire service installations devices.

Notices in English and Chinese “EMERGENCY GENERATOR” (應急發電機) and “NO SMOKING” (不准吸煙) shall be provided at the entrance to the emergency generator room. The characters of the notices shall be at least 120 mm high.

A sign shall be provided for each generator set and affixed in a prominent position inside emergency generator room and main switch room to indicate the essential loading of fire service

installations and fireman's lifts connected to the generator. The English and Chinese characters of the sign shall be at least 8 mm and 15 mm high respectively and the details are as follows:—



Each building shall have an independent emergency generator when required to have such provision. In developments with multiple domestic blocks on top of podium, the aforesaid requirement may be specially considered. In this circumstance, the emergency generator shall have sufficient capacity to serve the following essential loading simultaneously: —

- (i) All fire service installations and fireman's lifts of the entire podium and one tower block; and
- (ii) All fireman's lifts, exit signs and emergency lighting of another three tower blocks.

In all cases, one emergency generator shall cover a maximum of four tower blocks and one podium only.

If any non-FSI load is required to be connected to the emergency generator, approval should be obtained from the Director of Fire Services

**(b) FUEL STORAGE**

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

**(c) INSTALLATION**

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

Adequate ventilation 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 emergency generator 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. Where the air supply and/or exhaust ductwork is not fully contained within the generator room but passes through adjacent compartments or units the ductwork shall be so constructed as to have the same fire resistance rating as that required for either the generator room or the compartment through which it passes, whichever is the greater.

Exhaust discharge of combustion products shall not cause a public nuisance and shall be in accordance with the guidelines and requirements of the Director of Environmental Protection.

**(d) OPERATION**

Failure of one or more phases of the mains supply, or a reduction of voltage to less than 70% of normal, for a duration exceeding 1 second, shall initiate automatic starting of the emergency generator set. Full load transfer shall take place automatically. Should the prime mover fail to start, a further attempt to start shall then be made.

If it again fails to start, the starting sequence shall be locked out, an audible and visual alarm shall be given locally, and at the fire control main panel, and it shall remain in this locked out condition until manually reset.

The starting system shall have a capacity to ensure four starting operations.

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 mains supply for a duration exceeding 0.5 second, while the unit is running, shall cause the load transfer to take place.

An audio device and an indicator light on the fire control main panel, or if no fire panel, an indicator light outside the generator room, shall indicate that the generator is running.

## 5.9 Emergency lighting

### *SPECIFICATION*

Emergency lighting for all premises shall comply with British Standard 5266: Part 1 and BS EN 1838 except that exit sign shall be as at paragraph 5.10 hereof.

Emergency lighting shall be backed up by emergency power supply. The emergency power supply shall be either fed from an emergency generator or from self-contained secondary battery.

Connections between the secondary battery and the source of charging current should be such that in no circumstances should the battery discharge other than to the secondary lighting circuits.

A rectifier for battery charging should be for that purpose only and should be so regulated that the battery cannot discharge appreciably under normal conditions.

In the event of power failure, the emergency lighting shall be activated within 5 seconds for all bowling alleys, commercial buildings, hotel buildings and institutional buildings.

### *CINEMAS, THEATRES, ETC.*

Emergency lighting for cinemas/theatres and other specified premises used for entertainment shall, additionally, comply with the following:—

- (a) 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.
- (b) Batteries used shall be heavy duty of rechargeable (secondary) type; batteries of primary cells of any type whatsoever will not be acceptable.
- (c) Batteries shall be installed in a room approved for this purpose by the licensing authority and the building authority, unless otherwise agreed by the Director of Fire Services.
- (d) Batteries in celluloid containers shall not be installed, stored or used.
- (e) A margin allowance of 12½ % of the total required battery capacity (amperehour rating not voltage) shall be provided, i.e. 100% + 12½ % = 112 ½ %.
- (f) 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.
- (g) 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, if the emergency lighting is not also backed up by emergency generator.
- (h) Upon failure of the main lighting system the emergency lighting system shall automatically light up.
- (i) 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.
- (j) 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

- (k) Outgoing circuits shall be suitably protected by fuses or miniature circuit breakers in compliance with the Code of Practice for the Electricity (Wiring) Regulations published by the Electrical and Mechanical Services Department.
- (l) 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.
- (m) The emergency lighting system shall be wired in MICC cable to British Standard 6207 or other fire resistant cable approved by the Loss Prevention Council and be fully segregated from the general distribution system.
- (n) 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 an illuminance meter.

- (o) 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.
- (p) The maximum permissible period for visual adaptation shall not exceed 5 seconds at any point on the premises.
- (q) 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.)
- (r) All lighting fittings in the emergency lighting system shall be of flame retardant construction, shall comply with BS EN 60598-2-22 and be permanently fixed in position.

## 5.10 Exit sign

### *SPECIFICATION*

#### *INTERNALLY ILLUMINATED SIGNS*

Internally illuminated signs to British Standard 5499: Part 10 are approved for general use as both exit and directional signs. These signs shall be connected to both mains and emergency power supply. If the building is not equipped with an emergency generator, the signs shall be provided with secondary battery in accordance with British Standard 5266: Part 1.

#### *SELF LUMINOUS SIGNS*

Self luminous signs to British Standard 5499: Part 2 or other standards acceptable to the Director of Fire Services are approved for use as both exit and directional signs only in premises which are under single ownership or central management such as: —

- (a) Premises requiring the provision of audio/visual advisory system according to paragraph 5.1
- (b) Government buildings
- (c) Gymnasiums and stadiums
- (d) Hotels and service apartments
- (e) Institutional buildings as defined in paragraph 3.1
- (f) Museums, exhibition halls, libraries and places of worship
- (g) Office buildings
- (h) Parking garages
- (i) Passenger and cargo terminals

- (j) Tunnels
- (k) Temporary show flats
- (l) Other premises or buildings as approved by the Director of Fire Services from time to time.

A self-luminous sign illuminated by tritium or other radioactive source shall be indelibly marked at its lower corner to indicate the radiation hazard and the expiration date (month/year) of the sign for easy identification purposes and shall have a label at its back giving instruction or warning to users on the proper method of disposal as required by the Radiation Board.

The requirements of the Radiation Board shall be observed for any installation of self luminous signs in any premises.

#### *EXIT SIGN REQUIREMENT*

Sufficient exit signs shall be provided 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. Characters exit signs, combined graphical symbol and characters exit signs, and graphical symbol exit signs are acceptable. For new buildings, single type of exit signs shall be installed within the same development in order to maintain uniformity.

#### Characters exit signs

The signs shall bear the words in English and Chinese of not less than 125 mm high as shown in Figure 1. The letter style shall be in 'Helvetica' or 'Marigold' or 'Modified Garamond' as indicated on the samples while the Chinese characters shall be with width of vertical strokes not less than 15 mm and with width of horizontal strokes not less than 10 mm.



FIGURE 1

#### Combined graphical symbol and characters exit signs

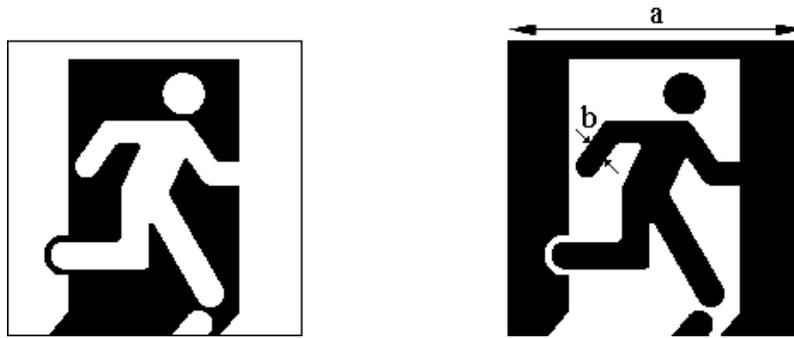
All requirements of characters exit signs shall be met. In addition, a graphical symbol with dimensions of not less than 125mm x 125mm shall be incorporated between the Chinese and English characters. Detailed scale of symbol is illustrated in Figure 3.



FIGURE 2

#### Graphical symbol exit signs

The signs shall bear a graphical symbol with dimension of not less than 125mm x 125mm. Detailed scale of symbol is illustrated in Figure 3.



(Dimension:  $a \geq 125\text{mm}$  and  $b \geq 10\text{mm}$ )

FIGURE 3

#### *DIRECTIONAL SIGN REQUIREMENT*

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 signs shall be erected 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. The graphics of directional signs shall be as shown in Figure 4. Signs having substantial compliance with Figure 4 shall also be acceptable.



FIGURE 4

#### *COLOURS*

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

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

White figure or lettering is preferred for internally-illuminated and self-luminous signs. The colour combination selected shall preferably be consistent throughout the same building.

Exit and directional signs shall be positioned between 2 m and 2.5 m above floor level measured to the base of the sign and exit signs shall be positioned directly above the doorway of the exit. If this is not practicable, the Director of Fire Services should be consulted.

### **5.11 Fire alarm system**

#### *SPECIFICATION*

*Note:* This paragraph deals only with manually operated alarm points of a system.

Manual fire alarm system shall comply with relevant sections of British Standard 5839: Part 1.

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 interconnected with 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. In addition, manual actuating points shall be provided at each hose reel point and, in particular, adjacent to all storey exits (or the entrance lobby in lieu if such lobby leads only to the storey exits) within a distance of not more than 2 m and adjacent to all staircase exits to open air on ground storey or place of ultimate safety. Where the building is provided with a caretaker's or management office, one actuating point and the repeater panel for showing a common fire alarm signal and a common fault signal of the main panel shall be provided therein.

The manual fire alarm system shall be linked to the fire detection system and the Fire Services Communication Centre by direct line where a fire detection system is provided for the building.

Visual alarm signals in addition to audio warning devices shall be provided to form part of the fire alarm system in accordance with the current Design Manual: Barrier Free Access. The visual alarm signals shall be in the form of flashing red lights, labelled "FIRE ALARM" (火警) (height of English letters and Chinese characters shall not be less than 10 mm & 15 mm respectively. They can be indicated on separate plate affixed nearby or engraved on the light cover). Design of the visual alarm signals shall conform to NFPA 72 with red flashing lights or British Standard 5839: Part 1.

In addition to DC supply and back-up power from battery, all visual fire alarm (VFA) systems may alternatively be powered by AC supply with secondary supply from emergency generator or electricity obtained before the main switch.

For VFA systems installed according to British Standard 5839, the visual alarm signal shall be in form of red flashing light and the minimum rating of a VFA shall be 15 cd. For spacing, the basic requirement is that the flashing light should be visible to normal eyesight in all areas required to be protected. A broad guideline for the installation is that one VFA point shall be located near every hose reel and alarm point. Each compartment shall be provided with at least one VFA point and the maximum distance between two VFA points shall not exceed 60 m.

## 5.12 Fire control centre

### *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 resistance rating 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 / promptly attended by trained personnel in case of emergency.

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.

## 5.13 Fire detection system

### *SPECIFICATION*

Systems shall be installed in accordance with British Standard 5839: Part 1 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.

## 5.14 Fire hydrant/hose reel system

### *SPECIFICATION*

#### (a) *HYDRANT*

Each hydrant assembly shall conform to British Standard 5041: Part 1 as appropriate.

The hydrant shall be of non-corrosive metal. Each outlet of all hydrants shall be of male round thread or female instantaneous type conforming to British Standard 336 and be individually controlled by a wheel-operated screw valve designed to open by counterclockwise rotation. The direction of opening of the valve shall be clearly engraved in both English and Chinese on the wheel of the valve.

The centre of hydrant outlet couplings shall be not less than 800 mm nor more than 1 200 mm above finished floor level.

The hydrant shall be prominently sited in an approach lobby to a staircase or in the staircase enclosure. 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 and the fitting of an adaptor. When not recessed the hydrant shall be adequately protected against damage. As an optional safe guard against tampering or pilfering, the hydrant whether or not installed in recessed position, may be protected by lockable glass panels/cabinets, provided that the glass shall be of frangible type and shall not exceed 3 mm in thickness, and that it shall be of such size and design as would not cause any obstruction to the free use of the hydrant. Such glass panels/cabinets may be linked to security alarms.

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

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

Water supply for hydrant system may be fed by static pressure directly from the elevated water tank without fixed fire pump if such pressure and flow are sufficient to give the required performance as that specified with fixed fire pump provided.

#### (b) *HOSE REEL*

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 supply main or the hydrant supply main.

The internal bore of the hose reel tubing shall be not less than 19 mm, such tubing shall have a bursting pressure of not less than 2 700 kPa and shall not be porous nor exhibit any sign of percolation under pressure up to 2 000 kPa.

The tubing of every hose reel shall not exceed 30 metres in length and be capable of being wound round a drum of not less than 150 mm in diameter and led around sharp obstructions without kinking. When fitted with hose reel nozzle, the tubing shall be capable of projecting a jet not less than 6 metres in length.

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 the jet. The valve shall not be spring-loaded.

The hose reel control valve shall be of gate valve type approved by the Hong Kong Water Authority. Such valve shall be closed by turning the hand-wheel in a clockwise direction. A simple two-way ball valve approved by the Hong Kong Water Authority may be used as an alternative to a gate valve.

Hose reel drums shall be painted in red. The hose reel assembly shall be robust in construction and be capable of withstanding normal impact and stress during operation.

Rising mains and associated pipework used for the hose reels shall be not less than 40 mm nominal bore and pipes feeding individual hose reel shall not be less than 25 mm nominal bore.

A hose reel shall be so installed that its control valve and nozzle, which should be situated adjacent to each other, are at a position above and not more than 1 350 mm from the finished floor level. The nozzle of hose reel shall reach any parts of premises unless otherwise specified. For a recessed type hose reel, such control valve and nozzle may be recessed to a discernible and

accessible position of not more than 500 mm from the surface of the wall. Fire hose reel nozzles should be housed in a glass-fronted cabinet secured under lock and key. The glass panel shall be of frangible type and shall not exceed 1.5 mm in thickness, and that it shall be of such size and design as would not cause any undue obstruction to the free use of the hose reel. Furthermore, a metal or plastic striker about 300 mm long shall be provided in the vicinity of the cabinet for the purpose of breaking the glass panel in case of emergency.

The hose reel should normally be located in occupied units/areas to enable the occupants of the building to attack a fire. However, in case of a building having a number of small units, hose reels may be located in common areas immediately outside the occupied units/areas on that floor to provide coverage as specified in respective paragraphs of Part IV.

Any hose reel sited on any escape route may be of fixed type or swinging cradle type and recessed into the wall. If the hose reel is carried on a swinging cradle, it should be constructed in such a way 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 freely into the corridor or passage. If the hose reel is of a fixed type, suitable guide ring(s) shall be installed to permit easy withdrawal of the hose reel tubing.

If hose reels are located in recesses to which doors are fitted, such doors shall be hinged so that when they are opened, they shall not cause obstruction to any means of escape nor to the operation of the hose reels nor to the hose being run out in either directions. The doors shall bear the words "FIRE HOSE REEL" (消防喉轆), lettering of which shall be of at least 50 mm high. Door locks shall not be fitted to such doors. As an optional safe guard against tampering or pilfering, the hose reels, whether or not installed in recessed position, may be protected by lockable glass panels/cabinets, provided that the glass shall be of frangible type and shall not exceed 3 mm in thickness, and that it shall be of such size and design as would not cause any undue obstruction to the free use of the hose reel. Such glass panels/cabinets may be linked to security alarms.

An operation instruction notice of the hose reel shall be provided and affixed to the wall in a prominent position adjacent to the hose reel. If the hose reel is located in a recess to which a door is fitted, such notice shall be affixed immediately below the words "FIRE HOSE REEL" on the outer surface of the door. They shall be finished in such a way that they would not be subject to undue weathering. The notice shall be clearly marked with the following standard wordings in English and Chinese characters of at least 5 mm high in red lettering on white background or white lettering on red background. Pictorial instructions showing the components and operation of the hose reel set may be provided in addition to the standard notice.

#### TO OPERATE FIRE HOSE REEL

使用消防喉轆

- (1) **BREAK GLASS OF THE FIRE ALARM CALL POINT.** (or)

打爛火警鐘玻璃

**ACTUATE FIRE ALARM CALL POINT.**

按動火警鐘掣

- (2) **OPEN CONTROL VALVE BEFORE RUNNING OUT HOSE.**

先開啓來水掣，再拉出膠喉

- (3) **TURN ON WATER AT NOZZLE AND DIRECT JET AT BASE OF FIRE.**

將喉咀掣開啓，然後射向火之底部

**(NOT SUITABLE FOR ELECTRICAL FIRES)**

不適用於電火

The centre of manual fire alarm call points shall be positioned at prominent and accessible locations near the hose reels at a level of not more than 1 200 mm above finished floor level.

Upon actuation of any manual fire call point in the building, the fixed fire pump(s) shall come into operation regardless of the zoning of the manual fire alarm call point. For podium having shared staircase(s) linking one or more building blocks above, upon actuation of any manual fire call point in any of such building block, both the fixed fire pump serving the corresponding building block and the fire pump serving the podium shall come into operation. Upon actuation

of any manual fire call point in the podium, the fixed fire pump serving the podium shall come into operation. An independent indication shall be provided at the fire control centre or at the main entrance of the building to indicate the floor upon which the manual fire alarm call point has been actuated.

Water supply for hose reel system or part of the system may be fed by static pressure directly from an elevated water tank if such pressure is sufficient for its designed operation.

(c) *SUPPLY TANK*

The reserve water supply for fire fighting shall be contained in a supply tank. (See paragraph 5.26)

(d) *FIXED FIRE PUMP*

The fixed fire pump shall preferably be electrically driven. Where the motive power for the pump is not electricity, alternative means for starting the pump manually in addition to manual fire alarm call points, shall be provided adjacent to the pump together with starting instructions prominently displayed. Once started, the fixed fire pump must run continuously until stopped manually at the pump control panel installed near the pump. In addition, a lock-off button may be installed adjacent to each pump. Whenever the fire pump has been stopped by means of the lock-off button, a status signal shall be indicated on the pump control panel and a common fault signal shall be repeated to main fire control panel until resume of the button.

The fixed fire pumps shall be capable to provide adequate flow in the case of:—

(1) Industrial/godown buildings, for

any 3 hydrant outlets (i.e. each with a flow of 450 l/min at a running pressure of not less than 350 kPa) operating simultaneously with an aggregate flow of not less than 1350 l/min.

(2) Buildings other than industrial/godown buildings, for

any 2 hydrant outlets (i.e. each with a flow of 450 l/min at a running pressure of not less than 350 kPa) operating simultaneously with an aggregate flow of not less than 900 l/min.

The pressure at any fire hydrant outlet shall in no case exceed 850 kPa. The running pressure at any hydrant outlet when delivering 450 l/min shall be not less than 350 kPa.

The fixed fire pump shall be duplicated for duty and standby use. The fire pump starting control shall be wired through a selector switch for duty and standby pump selection. Should the duty pump electrically or mechanically fail to operate within 15 seconds the standby pump shall be energized to become the duty pump.

The motor/engine driving the fixed fire pump shall be rated to give 20% more power in addition to the hydraulic power required for the rated flow of the system.

Fixed fire pumps shall be permanently primed with non-return valves installed at the discharge side of the pumps. Where necessary, non-return valves shall also be installed in other locations to prevent water backflow into the water tank.

The status of each fixed fire pump comprising “Power Supply On”, “Pump Running” and “Pump Failed” shall be monitored and displayed at the pump control panel and repeated at the fire control centre or to a status panel at the main entrance of the building.

All fixed fire pumps shall be housed in suitable enclosures, preferably brick or concrete, designed solely for occupation by F.S. pumps. Such pump enclosures 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” (消防泵) and suitably locked to prevent unauthorized tampering of the pumps.

(e) *INTERMEDIATE BOOSTER PUMP*

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, shall be maintained by intermediate booster pumps incorporated in the rising main system.

With the fire engines boosting water into the Fire Service inlet at a constant pressure of 800 kPa upstream of the inlet, the intermediate booster pumps shall be capable to provide adequate flow for:—

- (1) Industrial/godown buildings
  - if only 1 rising main is installed in the building, the aggregate flow shall be not less than 1 350 l/min. (i.e. any 3 hydrant outlets each with a flow of 450 l/min at a running pressure of not less than 350 kPa)
  - if 2 or more rising mains are installed in the building, the aggregate flow shall be not less than 2 700 l/min. (i.e. any 6 hydrant outlets each with a flow of 450 l/min at a running pressure of not less than 350 kPa, with not more than 3 hydrant outlets operating in one rising main)
- (2) Domestic buildings
  - the aggregate flow shall be not less than 900 l/min. (i.e. any 2 hydrant outlets each with a flow of 450 l/min at a running pressure of not less than 350 kPa)
- (3) Other buildings
  - if only 1 rising main is installed in the building, the aggregate flow shall be not less than 900 l/min. (i.e. any 2 hydrant outlets each with a flow of 450 l/min at a running pressure of not less than 350 kPa)
  - if 2 or more rising mains are installed in the building, the aggregate flow shall be not less than 1 800 l/min. (i.e. any 4 hydrant outlets each with a flow of 450 l/min at a running pressure of not less than 350 kPa, with not more than 2 hydrant outlets operating in one rising main)

The pressure at any fire hydrant outlet shall in no case exceed 850 kPa. The running pressure at any hydrant outlet when delivering 450 l/min shall be not less than 350 kPa.

Intermediate booster pumps shall be duplicated for duty and standby use. One set of intermediate booster pumps (duty and standby) may feed all risers in the same system to supply the required flow and pressure. Should the duty pump failed to operate, the standby pump shall be energized to become the duty pump within 15 seconds.

Two or three pumps of same capacity arranged in parallel using sequential starting may be employed as the duty intermediate booster pumps to achieve the required pressure and flow within 30 seconds. Under this arrangement, only one standby pump is required and shall be arranged in parallel to the above duty pumps. This standby pump shall be identical to a duty pump and capable to come into operation automatically upon failure of any duty pump.

The motor/engine driving the intermediate booster pump shall be rated to give 20% more power in addition to the hydraulic power required for the rated flow of the system.

All intermediate booster pumps shall be permanently primed and electrically driven. Once started, the pump must run continuously until stopped manually. Suitable start/stop push buttons together with pump running indicator lights and alarm buzzers shall be provided adjacent to the Fire Service inlets to enable Fire Services personnel to exercise control of the intermediate booster pumps. For building with tower(s) on podium, such start/stop buttons shall be provided adjacent to the Fire Service inlet nearest to the staircase serving the tower. Clear indications in English and Chinese characters “INTERMEDIATE BOOSTER PUMP CONTROL” (中途泵開關掣) of at least 5 mm high shall be provided.

The status of each intermediate booster pump comprising “Power supply on”, “Pump running” and “Pump failed” shall be monitored and displayed at the pump control panel and repeated to the fire control room or to a status panel at the main entrance of the building.

All intermediate booster pumps shall be housed in suitable enclosures, preferably brick or concrete, designed solely for occupation of FS pumps. Such pump enclosures shall lie clear of any exit or normal communication routes through the premises and suitably locked to prevent unauthorized tampering of the pump(s). Such enclosures shall be clearly marked in English and Chinese characters “INTERMEDIATE BOOSTER FIRE PUMP” (中途泵) of at least 50 mm high.

The intermediate booster pumps may also be utilized as the fixed fire pump if they are arranged to perform both functions as stipulated.

*(f) RISING MAIN*

The nominal bore of the rising main, in industrial/godown buildings shall be not less than 100 mm. Each rising main shall supply 2 hydrant outlets per floor.

The nominal bore 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.

Each rising main shall be provided with a standard Fire Service inlet at ground floor level. Where the intermediate booster pump is interposed between the Fire Service inlet and the hydrant outlets, provision must be made for the water supplied to the inlet to by-pass this pump in the event of failure of the pump.

All rising and down coming mains shall be permanently primed with water and fitted with air relief valves at suitable locations to prevent air lock in the installation. If a by-pass is provided for fixed fire pumps, there shall be a non-return valve for such by-pass.

Each rising main shall be connected to an independent Fire Service inlet. Where there are more than one rising mains in the system, such inlets shall be interconnected. Header pipe(s) may be provided to connect the Fire Service inlets to the rising mains. The header pipe shall be positioned close to Fire Service inlet(s) wherever practicable, with a maximum height of 30 m above ground level. The diameter of the header pipe shall be not less than 150 mm nominal bore for industrial/godown buildings and 100 mm nominal bore for other buildings.

In the case of an industrial/godown building, a rising main shall be provided for each staircase, with independent Fire Service inlet and inter-connection as described above.

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

*(g) FIRE SERVICE INLET*

Each Fire Service inlet shall be in a prominent position on the exterior of the building and preferably near the staircase where its rising main situated. Each Fire Service inlet must be suitably identified, enclosed and protected against corrosion and abuse. The inlet shall be readily accessible by Fire Services personnel.

The centre of 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. There shall be a non-return valve behind each inlet.

Each inlet shall be affixed with a metal identification plate raised or engraved with English and Chinese characters. The frontage of each inlet enclosure shall be clearly and permanently indicated in English and Chinese characters “FS INLET” (消防入水掣) of at least 50 mm high.

**5.15 Fire resisting cable for fire service installations****SPECIFICATION**

The requirements of fire resisting cables for sprinkler, fire alarm and emergency lighting installations are clearly specified in respective sections of LPC Rules for Automatic Sprinkler Installations incorporating BS EN 12845, British Standard 5839: Part 1 and paragraph 5.9 of this Code – British Standard 5266: Part 1.

For other types of fire service installations, the fire resisting cable requirements are listed in Appendix 8 of Code of Practice for Inspection, Testing and Maintenance of Installations and Equipment.

**5.16 Fireman’s lift and firefighting and rescue stairway**

The design and construction of fireman’s lift and firefighting and rescue stairway shall comply with the requirements stipulated in

- (a)* the Code of Practice on the Design and Construction of Lifts and Escalators issued by the Director of Electrical and Mechanical Services; and
- (b)* the Code of Practice for Fire Safety in Buildings issued by the Building Authority.

### 5.17 Fixed automatically operated approved appliance

#### *SPECIFICATION*

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

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 the Director of Fire Services.

### 5.18 Fixed foam system

#### *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.

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.

### 5.19 Gas detection system

#### *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.

### 5.20 Portable hand-operated approved appliance

#### *SPECIFICATION*

Sand buckets shall:

- (a) be made of durable materials;
- (b) be completed with cover;
- (c) have capacity of not less than 9 litres;
- (d) be red in colour on exterior surfaces, with suitable label in English and Chinese characters to indicate that the sand inside is used as fire extinguishing agent;
- (e) contain dry sand only; and
- (f) be filled to at least 80% by volume.

Other portable hand-operated appliances shall have received the approval from the Director of Fire Services. Attention is drawn to Fire Service (Installations and Equipment) Regulations, Chapter 95B.

### 5.21 Pressurization of staircase

#### A. *DESIGN AND SUBMISSIONS*

- A. 1 The designer shall be a registered professional engineer under Cap. 409 in the discipline of building services, fire or mechanical engineering.
- A. 2 The designer shall be responsible for all submissions to the Fire Services Department 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.

- A. 3 All drawing submissions shall be in the form set out in the FSD Circular Letters issued by the 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 British Standard 5588 “Fire Precautions in the Design, Construction and Use of Buildings”: Part 4 “Code of Practice for Smoke Control Using Pressure Differentials” 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 133 N (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 all entry doorways of 0.75 m/s be maintained with any three single leaf doors (one on each of 3 consecutive levels) and the largest exit door open, plus leakage allowances for all other doors.
  - (c) Note that in British Standard 5588: Part 4 Clause 6.1, Code of Practice 352 has been withdrawn and replaced by British Standard 5720.
  - (d) The minimum fire resistance rating for the enclosure of the pressurization plant detailed in clause 6.3.4 of British Standard 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 British Standard 5588: Part 4 on 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 British Standard 5588: Part 4.

B. *BASIC CONSIDERATIONS*

- B. 1 One system for each pressurized staircase shall be provided.
- 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 Heating and Ventilating Contractors’ Association specification DW 144 or subsequent amendments. Flat oval ducts wider than 1 m shall not be used. Aluminium sheets shall NOT be used.
- B. 4 All ductwork, including builder’s work, ducts, shafts or other construction, in these systems shall be pressure tested to Heating and Ventilating Contractors’ Association specification DW 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 2.21(ii) of the Code of Practice for Inspection, Testing and Maintenance of Installations and Equipment).
- 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 AND CONTROL”)
- B. 7 All systems shall be provided with remote on/off override control at the fire control panel. (see

section “E. ACTUATION AND CONTROL”)

- B. 8 The air intake arrangements should be in accordance with Clause 6.2 of British Standard 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 AND 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 °C and 100% relative humidity.
- 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 British Standard 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 British Standard 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 paragraph A.5(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 terrazzo or similar finish.
- D. 8 Inspection and testing of all door sets, closers, releases, etc. shall form part of the acceptance tests conducted under Section 2.21(i) of the Code of Practice for Inspection, Testing and Maintenance of Installations and Equipment.
- D. 9 Further inspection and testing of these components shall take place as part of the annual maintenance certificate inspection detailed under paragraph 4 of Section 2.21(ii) of the Code of Practice for Inspection, Testing and Maintenance of Installations and Equipment.

E. *ACTUATION AND CONTROL*

- E. 1 All systems shall be automatically actuated and remain in operation. It shall be able for manually reset and monitored by audio and visual indication. Actuation of all systems shall be

direct from the local 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 exceeding 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 building management or automation system prevent its operation. However, such building management or automation system 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 the Fire Services Department.
- E. 5 Control panel shall be provided for all staircase pressurization systems and located adjacent to fire control panel with the following facilities provided.
  - (a) Switches for all staircase pressurization systems shall be grouped in one area of the panel together with those for smoke extraction systems or the like. On/Off switches for each fan shall be provided.
  - (b) All switches shall have the same method/direction of operation.
  - (c) The indicator light shall be actuated by a device that senses effective operation, such as an air-flow switch or an air pressure switch, of the relevant pressurization system. The indicating lights shall indicate the system operation status of all system components including motorized dampers and motorized fire smoke dampers.
  - (d) Manual override facility shall be of manually reset type. Audio and visual indications shall also be provided to monitor the status of the manual override device. These indications shall be installed in public area, if the location of the staircase pressurization control panel is not normally manned. After actuating the manual override device, all staircase pressurization systems shall be individually operated via the staircase pressurization control panel.
  - (e) All switches and indicators shall be clearly labelled (red letters on white background, not less than 3 mm high) to show the operating positions and systems served.
  - (f) A further label shall be provided with letters not less than 6 mm high stating that the controls shall be operated by authorized personnel.
  - (g) All labels shall be permanent, legible and firmly secured (adhesive is not satisfactory) and shall be lettered in both English and Chinese by engraving or similar.
  - (h) Simplified schematic diagram for all staircase pressurization systems shall be provided adjacent to the staircase pressurization control panel.
- 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 equipment serving staircase pressurization systems shall be provided with an electrical supply from essential source.
- F. 2 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. 3 All controls, starters, relays, etc., shall be suitable for continuous operation at 250 °C for not less than 1 hour. All electrical power cable used shall be of fire resistant cable, and for those control cables NOT of fire resistant type shall be enclosed in metal conduit systems.

However the following situations are acceptable:—

- (a) Provided the main switchboard is of a type tested cubicle form constructed to BS EN 60439 from not less than 2 mm panel steel and is installed in a room having a fire

resistance rating (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) The plant room housing the staircase pressurization fans shall contain no other services.
  - (d) Pressure sensors in the pressurized space shall be suitable for normal ambient conditions only i.e. not less than 37 °C and 100% relative humidity.
- F.4 Pressure sensors and associated equipment shall be of industrial process grade to BS EN 60654-1. Commercial quality heating, ventilation and air-conditioning controls are not acceptable.
- G. *STANDBY OR DUPLICATE EQUIPMENT*
- G.1 For sleeping risk premises, i.e. hotels, hospitals, sanatoria, 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 for each pressurized staircase 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 6.4 of British Standard 5588: Part 4.

## 5.22 Ring main system with fixed pump(s)

### *SPECIFICATION*

Attention is drawn to British Standards 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 installed above ground or underground but must 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 paragraph 5.30)

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 Fire Services Department pattern.

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

Water piping used shall be of approved type in accordance with the standard requirements for fire service mains issued by the Water Supplies Department.

## 5.23 Smoke extraction system

### (i) DYNAMIC SYSTEM

#### A. *DESIGN AND SUBMISSIONS*

- A. 1 The designer shall be a registered professional engineer under Cap. 409 in the discipline of building services, fire or mechanical engineering.
- A. 2 The designer shall be responsible for all submissions to the Fire Services Department and each drawing and all calculations shall be signed by the designer, on behalf of the design company/organization, as having been checked by him.
- A. 3 All drawing submissions shall be in the form set out in the FSD Circular Letters issued by the 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 as

well as a full written description thereof.

- A. 5 Submissions shall include all details; certificates, etc. concerning temperature rating of equipment handling smoke, as required in paragraph B.20. The details can either be submitted on an item-by-item basis or on a complete system basis.
- B. *BASIC CONSIDERATIONS*
- B. 1 All systems shall be as simple as practicable in all aspects and each shall comprise extraction and supply/make-up air installations.
- B. 2 Fire compartmentation shall be ensured at all times.
- B. 3 All systems shall be “fail safe” to ensure a free passage of smoke.
- B. 4 Systems shall be arranged such that the travel of the smoke is generally counter-flow to that of the egress/escape route.
- B. 5 Egress/escape routes shall be kept as free as possible of smoke i.e. smoke flow shall be away from these routes.
- B. 6 Air/smoke flow paths shall be such that a “scouring” or “cross-flow” effect occurs in all areas within a fire compartment.
- B. 7 Smoke shall not travel more than 30 m before entering the nearest point of inlet to the extract system and at least one extract point shall be provided within each 500 square metres unit of floor area. The exceptions are atria and tunnels which shall be agreed on an individual project basis, and hotels where requirements shall comply with paragraph G.2(2) hereof.
- B. 8 Point(s) of smoke extraction shall be from high level in the space concerned and shall be reasonably distributed.
- B. 9 Makeup air, where not mechanically propelled, shall have as direct and short a route as possible.
- B. 10 Make-up air shall enter at a low level and/or in such a manner as to avoid premature mixing with the hot gases.
- B. 11 Maximum velocities, based on free area of the grille, shall be:—
- (a) At make-up air inlets where not mechanically propelled—3 m/s.
  - (b) At make-up air inlets where mechanically propelled—6 m/s.
  - (c) At extract grilles or outlets—6 m/s.
- B. 12 Generally, the minimum supply or make-up air rate shall be 80% of the extraction rate. When supply or make-up air is provided by mechanical means this shall be supplied by a separate independent system or by the normal air conditioning system changing over to full outside air subject to paragraph B.10. i.e. positive ducted system, special air inlets, low level air supply points. As stated in paragraph B.2, fire compartmentation shall be ensured at all times.
- B. 13 Separate systems shall be provided for each atria or basement compartment and/or as otherwise designated by the Fire Services Department. (see also section “D. BASEMENTS”)
- B. 14 Duct construction shall be, as a minimum requirement, to not less a standard than Heating and Ventilating Contractors’ Association specification DW 144 or subsequent amendments. Flat oval ducts wider than 1 m shall not be used. Aluminium sheets shall not be used. Care shall be taken to ensure that no failure of ductwork will be caused by any pressure changes due to the sudden closure of fire or smoke dampers.
- B. 15 As a general principle there shall be no fire and smoke dampers nor other restrictions in the ductwork of smoke control systems. The exceptions shall be where one extraction/supply system serves several compartments where motorised fire and smoke dampers shall be required, and at the main exhaust outlet louvre and main supply intake louvre, where motorised fire and smoke dampers may be required. The entire assembly of the fire and smoke damper shall be tested to maintain efficient operation at 250 °C for not less than one hour.
- B. 16 If smoke extract system ductwork passes through compartments, any part of the ductwork within the serviced compartment beyond the fire and smoke dampers provided in accordance with paragraph B.15, and any part outside the serviced compartment shall be covered with insulation of minimum insulating period of 30 minutes in compliance with the Code of Practice

for Fire Safety in Buildings issued by the Buildings Department, such part shall be fire resisting to British Standard 476: Part 24, or be totally enclosed by fire resisting construction to British Standard 476: Part 20, to the same fire resisting period as the serviced compartment or the containing compartment whichever is the higher. This fire resisting ductwork shall be constructed from material which, apart from its fire resisting quality, shall be capable of resisting accidental mechanical damage. To this end, the ductwork shall pass the hard body impact test in accordance with BS EN 1128 with the weight being dropped through not less than one metre. Alternatively the exterior surface of the fire resisting ductwork shall require to be totally protected from accidental mechanical damage. If smoke extract/make-up air fans are installed within the serviced compartment, the system including fans, motors, drives, electrical works, ductwork linking fans and the boundary of compartment etc. should be protected by a fire resisting material of rating not less than one hour.

- B. 17 All ductwork including builders work ducts or shafts and other construction, in these systems shall, where outside the serviced fire compartment, be pressure tested to Heating and Ventilating Contractors' Association specification DW 143 or subsequent amendments. No pressure sensitive tapes shall be used for sealing. The ductwork system shall be retested as necessary after remedial action has been taken to reduce any excessive losses until satisfactory results are obtained.
- B. 18 Shafts used for smoke extraction purposes shall contain no other services.
- B. 19 All smoke extraction fans shall be connected directly to outside by non-combustible ductwork including flexible connection, if installed.
- B. 20 Equipment handling smoke shall be suitable for continuous operation at 250 °C for not less than 1 hour. This includes fans, motors, drives, damper operators, ductwork, flexible ducts (preferably not to be used at all), etc.
- B. 21 To prevent recirculation of smoke as far as possible, discharge outlets for smoke shall be separated by not less than 5 m in any direction from all air inlets or other openings into any building. They shall not discharge into any means of escape nor a free air fireman's staircase. No discharges shall be at a height above the surrounding horizontal surface of less than 3 m to the bottom of the outlet and where below 6 m shall not discharge downwards. No discharges shall be under any canopy or overhang.
- B. 22 Systems used for "normal" purposes may be utilised for smoke extraction purposes provided that under smoke extraction mode the construction and operation of the system complies with the requirements herein.
- B. 23 All systems to be automatically activated. (see section "K. CONTROL AND ACTUATION")
- B. 24 All systems shall be provided with remote on/off/override control at the fire control panel. (see section "K. CONTROL AND ACTUATION")
- B. 25 Actuation of systems shall be by a smoke detector installation serving the area unless otherwise detailed. Where considered appropriate and to reduce false alarms it is preferable that cross zoned smoke detector systems be utilised. Where a sprinkler system is provided, a flow switch on the main sprinkler feed pipe serving the area shall activate the system. In addition the system shall be operated by the operation of any other detection/protection system excluding the manual fire alarm system in the area/floor served.
- B. 26 Smoke curtains systems used for separating different smoke compartments shall comply with BS EN 12101: Part 1 and the curtain material shall comply with British Standard 476: Part 20.
- B. 27 In case that smoke extraction rate is designed by using a fire engineering approach, the maximum area of the smoke reservoir should not be larger than 2 000 square metres and the methodology should be approved by the Director of Fire Services.
- C. *ATRIA*
- C. 1 To be detailed as required.
- D. *BASEMENTS*
- D. 1 Comply with all requirements as detailed under:—
  - (i) B. BASIC CONSIDERATIONS

- (ii) K. CONTROL AND ACTUATION
  - (iii) L. ELECTRICAL AND AUTOMATIC CONTROLS
  - (iv) M. STANDBY OR DUPLICATE EQUIPMENT
- D. 2 Separate systems shall be provided for each compartment and each system shall comprise at least two independent plants and ductwork i.e. for a proportion of the area and extract/supply volumes.
- D. 3 Where small separated areas which are normally not occupied occur within larger compartments, such as pump rooms, these areas may be connected to the extract system and be provided with fire dampers in all ducts serving the area at the separation wall. This does not apply to fire service installation rooms which are to have independent systems.
- D. 4 The minimum extraction rate shall be equivalent to not less than eight air changes per hour of the total compartment volume. The design volume shall be considered to be 7 000 cubic metres for any compartment of 7 000 cubic metres or less.
- D. 5 Emergency electrical supplies shall be capable of operating simultaneously all systems relevant to smoke extraction systems in the two adjacent compartments having the highest total electrical load. “Adjacent” shall be in any direction.
- E. *BATTERY ROOMS AND ELECTRICAL CHARGING FACILITIES*
- E. 1 Details of smoke extraction systems are as set out in separate requirements for these particular facilities.
- F. *COMMERCIAL BUILDINGS*
- F. 1 Comply with all requirements as detailed under:—
- (i) B. BASIC CONSIDERATIONS
  - (ii) K. CONTROL AND ACTUATION
  - (iii) L. ELECTRICAL AND AUTOMATIC CONTROLS
  - (iv) M. STANDBY OR DUPLICATE EQUIPMENT
- F. 2 Any basements shall comply with section “D. BASEMENTS” hereof.
- F. 3 The minimum extraction rate shall be equivalent to not less than eight air changes per hour of the total compartment volume. The design volume shall be considered to be 7 000 cubic metres for any compartment of 7 000 cubic metres or less.
- F. 4 Multi-zone smoke extraction/make-up air system may serve up to ten separate ‘above ground’ fire compartments but shall be capable of fully operating any one smoke extraction zone.
- F. 5 Emergency electrical supplies shall be capable of operating simultaneously all systems relevant to smoke extraction system in any one “above ground” fire compartment in addition to any requirements for basements and atria.
- G. *HOTELS*
- G. 1 General
1. Comply with all requirements as detailed under:—
    - (i) B. BASIC CONSIDERATIONS
    - (ii) K. CONTROL AND ACTUATION
    - (iii) L. ELECTRICAL AND AUTOMATIC CONTROLS
    - (iv) M. STANDBY OR DUPLICATE EQUIPMENT
  2. Any basements shall comply with section “D. BASEMENTS” hereof.
  3. Any atria, commercial or shopping areas shall comply with the relevant sectional requirements detailed herein.
- G. 2 Internal means of escape shall comply with the following:—
- (1) The minimum extraction rate shall be not less than 10 air changes per hour of the total compartment “internal means of escape” volume.
  - (2) The supply and extraction points shall be distributed along the corridor in such a manner

that the distance between any supply and extraction point shall not exceed 10 m.

- (3) Any one smoke extraction/make-up air system may serve the Internal Means of Escape of up to ten separate above ground fire compartments but shall be capable of fully operating any two such compartments simultaneously. Fire separation shall be maintained at all times.

H. *INDUSTRIAL/GODOWN BUILDINGS*

H. 1 Comply with all requirements as detailed under:—

- (i) B. BASIC CONSIDERATIONS
- (ii) K. CONTROL AND ACTUATION
- (iii) L. ELECTRICAL AND AUTOMATIC CONTROLS
- (iv) M. STANDBY OR DUPLICATE EQUIPMENT

H. 2 Any basements shall comply with section “D. BASEMENTS” hereof.

H. 3 The minimum extraction rate shall be equivalent to not less than eight air changes per hour of the total compartment volume. The design volume shall be considered to be 7 000 cubic metres for any compartment of 7 000 cubic metres or less.

H. 4 In industrial processes where the hazard of fire is higher than normal, appropriate smoke hoods, boards or barriers should be provided to prevent spread of smoke.

H. 5 Any one smoke extraction/make-up air system may serve up to ten separate above ground fire compartments but shall be capable of fully operating any one such compartment. Fire separation shall be maintained at all times.

I. *PLACES OF PUBLIC ENTERTAINMENT*

I. 1 To be detailed as required.

J. *TUNNELS*

To be detailed as required.

K. *CONTROL AND ACTUATION*

K. 1 All systems shall be automatically actuated and remain in operation. It shall be able for manually reset and monitored by audio and visual indication. Actuation of all systems shall be direct from the local automatic fire alarm panel whenever that panel transmits a ‘Fire’ signal to the Fire Services Communication Centre.

K. 2 When in “fire” mode no system connected therewith shall be controlled or under the influence of any building management or automation system. However, such building management or automation system may monitor the operations if desired.

K. 3 No transmission of actuating signals from the automatic fire alarm panel for the operation of the smoke extraction systems shall be effected by multiplex or similar devices unless such devices have the approval or certification of one of the testing organisations recognised by the Fire Services Department.

K. 4 Control panel shall be provided for all smoke extraction systems and located adjacent to fire control panel with the following facilities provided.

- (a) Switches for all smoke extraction systems shall be grouped in one area of the panel together with those for staircase pressurization systems or the like. Where the smoke extraction system is served by both supply and extract fans, on/off switches for each fan shall be provided.
- (b) All switches shall have the same method/direction of operation.
- (c) The indicator light shall be actuated by a device that senses effective operation, such as an air-flow switch or an air pressure switch, of the relevant smoke extraction/air handling system. The indicating lights shall indicate the system operation status of all system components including motorized dampers and motorized fire smoke dampers.
- (d) Manual override facility shall be of manually reset type. Audio and visual indications shall also be provided to monitor the status of the manual override device. These indications shall be installed in public area, if the location of the smoke extraction control panel is not

normally manned. After actuating the manual override device, all smoke extraction systems shall be individually operated via the smoke extraction control panel.

- (e) 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.
- (f) A further label shall be provided with letters not less than 6 mm high stating that the controls shall be operated by authorised personnel.
- (g) All labels shall be permanent, legible and firmly secured (adhesive is not satisfactory) and shall be lettered in both English and Chinese by engraving or similar.
- (h) Simplified schematic diagram for all smoke extraction systems shall be provided adjacent to the smoke extraction control panel.

#### L. *ELECTRICAL AND AUTOMATIC CONTROLS*

- L. 1 All systems shall be as simple as possible. Complex and untried electronic devices shall not be used.
- L. 2 All equipment serving smoke extraction and complementary air make-up systems shall be provided with an electrical supply from essential source.
- L. 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 mechanical, electrical, or physical, effects.
- L. 4 All electrical wiring, controls, starters, relays, etc. shall be suitable for continuous operation at 250 °C for 1 hour. Where pneumatic controls are used these shall be similarly rated. All wiring from the building primary and secondary source of supply for these systems shall comply with these requirements.

However, the following situations are acceptable:—

- (a) Provided the main switchboard is of a type tested, cubicle form, constructed to BS EN 60439 from not less than 2 mm panel steel and is installed in a room having a fire resistance rating (including self-closing doors) of not less than 2 hours and containing no other equipment, no further protection will be required for this switchboard. 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.
- L. 5 PVC or similar materials shall not be used for pneumatic system tubing or components.
  - L. 6 All controls and equipment utilised shall be of industrial grade—controls of normal commercial heating, ventilation and air-conditioning quality shall not be acceptable.

#### M. *STANDBY OR DUPLICATE EQUIPMENT*

- M. 1 In all premises where sleeping normally occurs all fans, motors, drives, starters, etc., shall be installed in duplicate with automatic changeover facilities, should one unit fail to operate for any reason. Each fan/motor/drive set shall be capable of operation on essential electrical supplies (as required for paragraph L.2). This shall be achieved by the two electrical supplies being routed separately into the fan room and then connected into the switchboard, which serves the fan/motor/drive sets. This switchboard must also be located in the fan room.
- M. 2 In premises where dual purpose systems are utilised, duplicate plants as detailed in paragraph M.1 above shall be provided.

#### (ii) *STATIC SYSTEM*

##### A. *SMOKE BARRIER*

- (a) The smoke barrier may be permanently fixed or operate only when activated.
- (b) The smoke barrier shall be constructed of substantial non-combustible materials that will resist the passage of smoke and have a fire resistance rating of not less than 1 hour when tested to British Standard 476: Parts 20 to 23 inclusive.
- (c) Where a smoke barrier consists of a number of separate units, care shall be taken to ensure smoke resistant junctions or joints. This is particularly necessary when using flexible materials.

- (d) For “below ground” compartments the smoke barrier shall extend to a depth of 800 mm below the lowest beam, obstruction, window head or top of vent opening situated in the compartment.

For “above ground” compartments the smoke barrier shall extend to a depth of 500 mm below the lowest beam, obstruction, window head or top of vent opening.

- (e) The lowest portion of the smoke barrier, when in the fire position, shall be not less than 2 000 mm above the finished floor.
- (f) If not permanently fixed, the moving parts and any operating mechanism shall be suitable for atmospheric conditions of 35 °C and 100% relative humidity unless the space is permanently air conditioned. If the space is to be used for any particular process the parts and mechanisms shall be suitable for the most adverse conditions likely to be encountered.
- (g) All movable smoke barriers shall be arranged to be “fail safe”. That is to move to the “barrier down” position on power failure or any other fault.
- (h) Fire/smoke stopping shall be provided for services passing through the smoke barrier, except those having cross-sectional dimensions not more than 100 mm W×100 mm H.
- (i) Smoke curtain systems used shall comply with the BS EN 12101: Part 1 and British Standard 476: Part 20.
- (j) The smoke zone should not exceed 2 000 square metres in area.

*Note:* Large sized services in the smoke reservoir shall not interfere with the effectiveness of the static smoke extraction system for that reservoir.

#### B. SMOKE DISCHARGE

- (a) The smoke discharge may be permanently open or open only when the system activates.
- (b) The free area of the smoke discharge is required to be not less than 2% of the floor area served by the system. Of this not less than half shall be permanently open or automatically actuated.
- (c) If permanent openings are provided, signs shall be permanently displayed on or adjacent to the openings on the inside of the building with the following wording in both English and Chinese:—

THIS OPENING IS A SMOKE VENT.

DO NOT COVER OR CLOSE

此乃排煙口

不得遮蓋或關閉

- (d) The lettering shall be not less than 25 mm high, red on a white background. One notice shall be provided for every 3 square metres of opening or at not more than 4 m spacings, whichever is the less.
- (e) Openable discharges may open by gravity after a release is actuated or opened by a suitable mechanical or electrical device (operating devices).
- (f) Openable discharges shall be provided with high quality mechanisms and operating devices to suit, at least, the environmental conditions given under paragraph A. (f) hereof.
- (g) The operating devices for openable discharges shall be manufactured by a recognised reputable manufacturer with not less than two years experience in the production of such devices.
- (h) The operating devices shall have received the approval of the Fire Services Department.
- (i) All discharges shall be arranged to be “fail safe”.
- (j) If considered necessary by the designer, manual operating devices may be provided for automatically openable discharges provided such operation does NOT interfere with automatic operation.

- (k) The sections of discharges not required to be operated automatically shall be provided with easily operated and accessible quick release operating devices fixed at a height above floor not exceeding 1 800 mm. The minimum possible number of operating devices is desirable.
- (l) All discharges shall be provided with signs as described under paragraph (c) hereof except the wording shall be:—

THIS OPENING IS A SMOKE VENT.

DO NOT COVER OR OBSTRUCT

此乃排煙口

不得遮蓋或阻塞

### C. ACTUATION AND OPERATION

- (a) Systems with permanently fixed smoke barriers and permanently open discharges require no actuation.
- (b) All other systems shall be actuated by smoke detectors installed in accordance with the requirements of the Fire Services Department.
- (c) It is recommended that a cross-zoned system be utilised for the smoke detectors to reduce false alarms, especially under industrial conditions.
- (d) The smoke detector installation may be zoned, at the discretion of the designer, to serve only one smoke compartment or several smoke compartments.
- (e) Electrical supplies for the automatic operating devices/actuators where necessary for operation and for the detector installation shall be provided with an approved secondary source i.e. batteries or emergency generator where electrically operated or a pressure receiver having a capacity double that required to operate all units once, if air actuated.

#### 5.24 Sprinkler system

##### *SPECIFICATION*

Such systems shall be designed and installed in accordance with the Loss Prevention Council Rules for Automatic Sprinkler Installations incorporating BS EN 12845 (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 supply—paragraph 5.30)

#### 5.25 Street fire hydrant system

##### *SPECIFICATION*

All hydrants should be installed in accordance with the Water Supplies Department Standard Mainlaying Practice or other standards acceptable to the Director of Fire Services.

Spacing between fire hydrants should be 100 metres staggered on alternative sides of the roadway wherever applicable.

Wherever possible, there should be at least two street fire hydrants within the site of the building concerned and they should be fixed not less than 6 metres from the building they are intended to protect.

The hydrant shall be of an accepted standard pattern and, with one 65 mm outlet working, shall be capable of delivering not less than 2 000 litres per minute (33.3 litre/second) with a minimum running pressure of 170 kPa at the outlet. The minimum output should be made available from two 65 mm outlets of a system delivering at the same time, i.e. a total output of not less than 4 000 litres per minute (66.7 litre/second). The minimum delivery time shall be of at least 60 minutes.

Where the minimum standards are not possible the water supply may have to be augmented by other means – e.g. sump tank and pumps. This will depend on the size and nature of the property to be protected, together with total available supply.

## 5.26 Supply tank

### *SPECIFICATION*

Supply tank for fire hydrant and/or hose reel installation of adequate capacity shall be provided.

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 effective 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.

## 5.27 Ventilation/air conditioning control system

### *SPECIFICATION*

“Ventilation/air conditioning system” refers to a mechanical ventilating system defined as follows:—

Any air moving system, with the exceptions as listed hereunder, utilizing both a fan and duct, to mechanically force air into, around, or out of, any building or part thereof and includes systems which contain devices for reducing or increasing the temperature and/or humidity of the air inside any building, or part thereof, below or above the temperature of the external air for the purpose of environmental control.

The following mechanical ventilating systems shall be exempted from these requirements:—

- (a) Any mechanical ventilating system forming part of the fire service installations and installed solely for fire protection or fire fighting purposes i.e. staircase pressurization system and smoke extraction system.
- (b) Individual, self contained or split type, direct expansion room cooling units not connected to ductwork systems.
- (c) Minor mechanical ventilating systems which comply with ALL of the following criteria:—
  - (1) all air distribution ductwork systems are contained within the same compartment.
  - (2) the air flow rate handled by each air distribution ductwork system does not exceed 1 000 litres per second.
- (d) Mechanical ventilating systems handling toxic gas or grease/air mixtures i.e. fume cupboard ventilation, kitchen ventilation, systems handling toxic gases/explosive gases, etc.
- (e) Mechanical ventilating systems where all air is supplied at low level and/or extracted (not recirculated) at high level.
- (f) Individual plant rooms, and individual toilets which are mechanically ventilated directly (i.e. ventilating system not serving other areas) to outside.

The objective of this requirement is, in the event of fire, to reduce air movement within the affected compartment i.e. to allow smoke to rise and form a layer at ceiling level which will not be disturbed by the introduction of air into that smoke layer.

Any one of the following methods of override control shall be used:—

Method “A” — If the compartment/unit is provided with a smoke detector automatic fire alarm system or automatic sprinkler system, on activation of that system all fans serving the compartment shall be shut down.

Method “B” — Smoke detectors of a type suitable for use in air ducts, shall be installed in the exhaust and/or recirculation ductwork serving the compartment/unit, which on sensing smoke, will automatically shut down all fans in the mechanical ventilating system serving the compartment/unit.

Method “C” — The override control can be arranged to completely shut down all the fans in the building instead of isolated compartments/units, but this could lead to inconvenience for the building users. The actuation shall be provided by the building fire alarm system.

Method “D” — Smoke detector(s) shall be installed at suitable position(s) under slab/false ceiling at a space of 250 m<sup>2</sup> of net floor area for each detector, which on actuation will shut down all the fans in the affected compartment.

In addition to Method “A”, Method “B”, Method “C” or Method “D”, manual override switches shall be provided at the central fire control panel to allow the engineering staff of the building operator, or the Fire Services personnel, to switch off the fans for all the mechanical ventilating systems serving the building in the event of an emergency.

*Notes:* (a) For buildings where central mechanical fresh air supply and/or exhaust systems are installed, either

(1) the central fresh air supply and/or exhaust system shall be shut down, or

(2) the central fresh air supply and/or exhaust system shall not require to be shut down but the fresh air and/or exhaust to the affected compartment/unit shall be closed off from the central system by actuation of a local motorised smoke damper.

(b) Shut down of the mechanical ventilating systems utilizing a multiplex automatic fire alarm or building automation system shall be permitted so long as the multiplex system is on the Fire Services Department list for this type of equipment/system.

## **5.28 Water mist system**

### *SPECIFICATION*

Such systems shall be installed in accordance with the standards acceptable to the Director of Fire Services. Reference is made to NFPA 750.

Prior approval for the use of such system shall be obtained from the Director of Fire Services, and the water mist system must have been listed.

The protection objectives and installation design shall be endorsed by a qualified person, who should be a Registered Professional Engineer under Cap. 409 in the discipline of building services, fire or mechanical engineering, or one with qualifications acceptable to the Director of Fire Services, e.g. the system manufacturer.

The acceptance of water mist system is on project basis, and initially its application is limited to protection of mechanical plant rooms.

## **5.29 Water spray system**

### *SPECIFICATION*

Such systems shall be installed in accordance with the standards acceptable to the Director of Fire Services. Independent water tank shall be provided for the water spray system with the capacity to operate for at least 30 minutes.

## **5.30 Water supply**

### *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 the Water Authority.

The types of supply as listed in Loss Prevention Council 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.

Means shall be provided to refill the supply tank automatically. If the tank is situated at upper level of building and transfer pumps in duplicate for duty and standby are required to relay water to the tank, the pumps capacity shall be able to refill the tank to its full capacity within 6 hours. The transfer pumps shall be powered by essential power supply.



**CODE OF PRACTICE**

**FOR**

**INSPECTION, TESTING AND MAINTENANCE**

**OF INSTALLATIONS AND EQUIPMENT**



## **CODE OF PRACTICE FOR INSPECTION, TESTING AND MAINTENANCE OF INSTALLATIONS AND EQUIPMENT**

### **PRELIMINARY NOTE**

Pursuant to Section 21(6)(d) of the Buildings Ordinance, the Building Authority may refuse to issue a temporary occupation permit or an occupation permit where in the case of a building the plans whereof were certified by the Director of Fire Services in the terms indicated in Section 16(1)(b)(ii) of the Buildings Ordinance, the applicant for the permit fails to produce to the Building Authority a certificate from the Director of Fire Services in such form as may be prescribed certifying that he is satisfied that the fire service installations and equipment shown on the plans aforesaid have been provided and are in efficient working order and satisfactory condition.

This Code of Practice for Inspection, Testing and Maintenance of Installations and Equipment is published in accordance with Regulation 10 of the Fire Service (Installations and Equipment) Regulations of the Fire Services Ordinance, Cap. 95 to indicate the type and nature of inspections and tests which installations and equipment must normally pass in order 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.

### **Part I GENERAL**

- 1.1 Inspection and acceptance testing shall be carried out by a Fire Services Inspecting Officer by arrangement with the Authorized Person and the registered fire service installation contractor (RFSIC).
- 1.2 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 RFSIC and the Authorized Person.
- 1.3 An application should only be submitted by the Authorized Person when the installation and equipment has been installed, completed and certified as being in efficient working order by the RFSIC.
- 1.4 Upon receipt of an application the Fire Services Inspecting Officer will contact the Authorized Person (not the RFSIC) at the telephone number shown on the prescribed form, and arrange a mutually convenient inspection date. The Authorized Person, as the co-ordinator of the project, should attend the inspection and it is also his responsibility to contact and inform the RFSIC of the arrangements made.
- 1.5 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 Authorized Person and the RFSIC will also be required to sign this form confirming that the results of the inspection have been brought to their attention.
- 1.6 In respect of minor items requiring a further inspection the Authorized Person will, after the defects have been rectified, arrange a re-inspection date with the Senior Building Services Inspector, 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.
- 1.7 Re-inspections will be carried out as convenient, subject only to the availability of Inspecting Officer and provided that previous confirmed appointments are not affected.
- 1.8 Subsequent to a satisfactory inspection, the Authorized Person will be notified by telephone as soon as the Fire Services Certificate (F.S. 172) is ready for collection. If unable to be contacted by telephone a "ready for collection" letter will be despatched.

- 1.9 The Certification of Completion by the Water Authority in respect of fire service installations (FSI) requiring Government water mains connection will be sent direct to the Building Authority 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.
- 1.10 The FSI for a building for which a temporary occupation permit or occupation permit has been issued must be maintained, inspected and certified by a RFSIC at least once in every 12 months. Whenever a RFSIC maintains or inspects any FSI in any premises, he shall forward a certificate (Certificate of Fire Service Installations and Equipment (F.S. 251)) to the Director of Fire Services. A summary of statutory requirements for maintenance, inspection and repair of FSI and examination, testing and certification of gas cylinders used as FSI to be observed by RFSIC is enclosed at APPENDIX 10.
- 1.11 The certificate for annual inspection of fire service installations together with a list of the fire service installations and equipment should be displayed in a prominent area of the building by the RFSIC in consultation with the owner or building management.
- 1.12 Design engineers and RFSIC should advise the owner of the building, or his agent that any fire service installation or equipment (such as the staircase pressurization system etc.), which would normally be left in idle or standby conditions except in case of fire, should be actuated and checked by the owner or his agent at an interval of not more than three months to ensure that the installation or equipment are functioning and sequencing correctly.
- 1.13 For any shut-down of building FSI overnight or more than 24 hours continuously, RFSIC shall notify Fire Services Department in accordance with the laid down reporting procedures. RFSIC shall take and advise the residents/occupants/property management company to take preventative measures to mitigate the risk during the works period when any FSI is defective or shut down for inspection, maintenance, modification or repair. A set of procedures and measures to be observed by RFSIC is enclosed at APPENDIX 9.
- 1.14 Fire service installations and equipment which is not included in this Code shall be inspected, tested and maintained in accordance with the manufacturer's recommendations or other acceptable international standards as agreed by the Director of Fire Services.

## **Part II INSPECTION, TESTING AND MAINTENANCE**

### **2.1 Audio/visual advisory system**

#### **(i) Acceptance Testing**

The system shall be tested in a simulated alarm condition to verify the proper operation and functioning of the audio and visual alarm signals and alarm directives to the satisfaction of the Director of Fire Services.

#### **(ii) Maintenance**

The system shall be maintained in efficient working order at all times and shall be inspected by a registered fire service installation contractor at least once in every 12 months.

A weekly visual and audio check of all signals should be carried out by the owner or his agent. The system should also be checked in any fire drill.

### **2.2 Automatic actuating devices**

#### **(i) Acceptance Testing**

For fire shutters, roof vents or similar installations, the actuating devices shall be tested to confirm that the designed complete closure or compartment separation of the driven shutters/equipment can be achieved within the time specified.

The testing of automatic actuating devices for fire shutters shall be carried out in accordance with the checklist as laid down at APPENDIX 1. The testing for other similar installations shall be in accordance with the manufacturer's recommendations and other standards as may be prescribed by

the Director of Fire Services on account of specific features of the installations.

**(ii) Maintenance**

The components and devices shall be maintained in efficient working order at all times and shall be inspected by a registered fire service installation contractor at least once in every 12 months.

The fire shutters or roof vents should be regularly checked by the owner or his agent for proper operation in both manual and automatic modes.

**2.3 Automatic fixed installation other than water**

**(i) Acceptance Testing**

CO<sub>2</sub>, FM200 and other similar clean gas extinguishing system shall be checked and tested in accordance with the checklist as laid down at APPENDIX 2 and by direct and/or remote control sequences in accordance with test procedures as laid down in the NFPA 2001 or other acceptable international standard as agreed by the Director of Fire Services.

**(ii) Maintenance**

The system shall be maintained in efficient working order at all times and be inspected by a registered fire service installation contractor at least once in every 12 months.

**2.4 Automatic fixed installation using water**

These may include:

Deluge system

Drencher system

Sprinkler system

Water mist system

Water spray system

Acceptance testing and maintenance for the above are described in the respective sections.

**2.5 Deluge system**

**(i) Acceptance Testing**

The system shall be tested in accordance with the manufacturer's recommendations and other requirements as may be prescribed by the Director of Fire Services on account of specific features of the system.

**(ii) Maintenance**

The system shall be maintained in efficient working order at all times and shall be inspected by a registered fire service installation contractor at least once in every 12 months.

**2.6 Drencher system**

**(i) Acceptance Testing**

The system shall be tested to demonstrate the satisfactory performance including water flow rate, working pressure, water spraying pattern, means of actuation and other requirements as may be prescribed by the Director of Fire Services on account of specific features of the system.

**(ii) Maintenance**

The system shall be maintained in efficient working order at all times and shall be inspected by a registered fire service installation contractor at least once in every 12 months.

**2.7 Dust detection system**

**(i) Acceptance Testing**

The system shall be tested in accordance with the manufacturer's recommendations and other requirements as may be prescribed by the Director of Fire Services on account of specific features of the system.

**(ii) Maintenance**

The system shall be maintained in efficient working order at all times and shall be inspected by a

registered fire service installation contractor at least once in every 12 months.

Tests appropriate to the system should be carried out by the owner or his agent at intervals as recommended by the equipment manufacturer and agreed with the Director of Fire Services. If the system is capable of being actuated manually, such manual actuation should be tested to confirm subsequent operations.

## **2.8 Emergency generator**

### **(i) Acceptance Testing**

On completion of the installation a full test of the fire service installations in a building or premises shall be carried out, with all systems connected to the 'normal' electricity supply.

Upon satisfactory testing of the fire service installations on 'normal' electricity supply, the 'normal' electricity supply shall be switched off, and the emergency generator shall start automatically.

When the emergency generator has gained its capacity and is ready to accept the fire service installations load, each fire service installation shall be switched on until all installations are in operating conditions. A 'simultaneous running' test shall then take place and shall last for a continuous period of one hour. During this period the performance of each fire service installation shall be monitored.

After one hour of testing, the emergency generator set shall be examined and all instruments, safety devices, etc. shall indicate 'normal' running of the generator.

A checklist for testing of emergency generator installation is enclosed at APPENDIX 3.

### **(ii) Maintenance**

The emergency generator shall be maintained in efficient working order at all times and shall be inspected by a registered fire service installation contractor at least once in every 12 months.

Moreover, all units should be run once per month under load conditions for a period of not less than 30 minutes by the owner or his agent. During this running period all operating conditions should be checked. Following this running period functional tests should be carried out on all automatic and manual starting devices and safety controls.

A log book should be provided, and retained in the plant room, management office or building supervisor office, and should be kept up to date by the owner or his agent. The record should be made at the time of occurrence and should include details of all operations; faults and corrective actions 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.

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

Fuel tanks shall be refilled to full after testing.

## **2.9 Emergency lighting**

### **(i) Acceptance Testing**

Tests shall be carried out in accordance with British Standard 5266 : Part 1 and BS EN 1838 or in such manner as may be prescribed by the Director of Fire Services on account of specific features of the equipment.

### **(ii) Maintenance**

All emergency lighting shall be maintained in efficient working order at all times and shall be inspected by a registered fire service installation contractor at least once in every 12 months. The following maintenance procedures should be arranged by the owner or his agent:

- a. Once every month a discharge test, for 1 minute at the 10-hour discharge rate, should be carried out on the battery of the emergency lighting, and the results should be entered in a register. The on-load voltage of each cell after this test should be not less than 2.01 volts for lead acid and 1.25 volts for nickel cadmium battery.

- b. Voltage and hydrometer tests should be carried out weekly and recorded in a register.

## **2.10 Exit sign**

### **(i) Acceptance Testing**

Tests shall be carried out in accordance with British Standard 5266: Part 1 or in such manner as may be prescribed by the Director of Fire Services on account of specific features of the equipment.

### **(ii) Maintenance**

All exit sign shall be maintained in efficient working order at all times and shall be inspected by a registered fire service installation contractor at least once in every 12 months. Moreover, exit sign should be tested whenever an emergency lighting system is tested.

## **2.11 Fire alarm system**

### **(i) Acceptance Testing**

Manual fire alarm call points shall be tested together with automatic fire alarm when the whole system is required to be tested in accordance with the appropriate standards as required by the Director of Fire Services. Upon actuation of the manual alarm call points, alarm bells in all or designated zones, other audible/visual alarm signals, fire services link, and hydrant/sprinkler water pumps etc. shall be activated. Audibility of alarm bell sound shall be checked at hindered locations of the building/premises. A checklist for testing of fire alarm system is enclosed at APPENDIX 4.

### **(ii) Maintenance**

The system shall be maintained in efficient working order at all times and shall be inspected by a registered fire service installation contractor at least once in every 12 months.

Manual fire alarm points should 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.

## **2.12 Fire control centre**

### **(i) Acceptance Testing**

Testing of the fire control panels shall be carried out as part of the testing for various fire service systems in accordance with the appropriate standards or codes as outlined elsewhere in this Code.

Visual check on the integrity of room enclosures for compartmentation with respect to fire resistance rating shall be required. Appropriate certificate by the Authorized Person for the fire resistance rating of the materials/structure should be provided during inspection. Check shall be made on the ready visibility and accessibility of the control panels with regards to the room layout and security fixtures.

### **(ii) Maintenance**

Routine check of the provisions such as power supply, lighting and tidiness inside the control centre should be carried out by the owner or his agent.

## **2.13 Fire detection system**

### **(i) Acceptance Testing**

The testing of fire detection system shall be carried out in accordance with British Standard 5839-1:2002 + A2:2008 – Fire Detection and Fire Alarm Systems for Buildings (with suitable modifications pertinent to Hong Kong). A checklist for testing of fire detection system is enclosed at APPENDIX 4.

### **(ii) Maintenance**

The installation shall be maintained in efficient working order at all times and shall be inspected by a registered fire service installation contractor at least once in every 12 months.

The direct line connection should be tested once every 2 weeks or at such time and interval as agreed by the Director of Fire Services.

**2.14 Fire hydrant/hose reel system****(i) Acceptance Testing**

The system shall be tested in accordance with the checklist laid down at APPENDIX 5.

**(ii) Maintenance**

The installation shall be maintained in efficient working order at all times and shall be inspected by a registered fire service installation contractor at least once in every 12 months.

The owner or his agent should carry out regular checks to ensure the hydrant/hose reel nozzles, valves, fittings etc. remain intact at all times and are not damaged or misused for other purposes.

**2.15 Fire resisting cables for fire service installations****(i) Acceptance Testing**

The cables will be accepted as part of the fire service installation. Certificate of compliance of relevant standards may be required upon request.

**(ii) Maintenance**

The fire resisting cables are considered as integral part of the fire service installation and shall be inspected and maintained in safe and satisfactory condition by a registered fire service installation contractor when inspection to the relevant fire service installation is carried out.

**2.16 Fireman's lift and firefighting and rescue stairway****(i) Acceptance Testing**

Fireman's lift shall be tested by a registered lift engineer in accordance with the requirements stipulated in the Code of Practice for Lift Works and Escalator Works issued by the Director of Electrical and Mechanical Services.

**(ii) Maintenance**

Fireman's lift shall be maintained in efficient working order at all times and in accordance with the requirements stipulated in the Code of Practice for Lift Works and Escalator Works issued by the Director of Electrical and Mechanical Services.

**2.17 Fixed automatically operated approved appliance****(i) Acceptance Testing**

These types of fire extinguishing appliances, either of self-contained operating type or of alarm signal actuating type, shall be tested in accordance with the manufacturer's recommendations or other requirements as may be prescribed by the Director of Fire Services on account of specific features of the appliances.

A check on the content weight shall be made either by weighing or by reference to a pressure gauge or other gauge which may be installed as part of the appliances.

**(ii) Maintenance**

The installation shall be maintained in efficient working order at all times and shall be inspected by a registered fire service installation contractor at least once in every 12 months.

**2.18 Fixed foam system****(i) Acceptance Testing**

The testing procedures shall be in accordance with the manufacturer's recommendations for various items/equipment of the system, and shall be in accordance with the appropriate international standard or other requirements as may be prescribed by the Director of Fire Services on account of specific features of the system.

**(ii) Maintenance**

The installation shall be maintained in efficient working order at all times and shall be inspected by a registered fire service installation contractor at least once in every 12 months.

## 2.19 Gas detection system

### (i) Acceptance Testing

The system shall be tested by allowing sufficient amount of the gas to be released across the detection point and to confirm the proper activation of the detector and efficient operation of all ancillary alarm procedures. Testing shall be carried out in accordance with the manufacturer's recommendations and the appropriate international standard or as required by the Director of Fire Services on account of specific feature of the system.

### (ii) Maintenance

The installation shall be maintained in efficient working order at all times and shall be inspected by a registered fire service installation contractor at least once in every 12 months.

## 2.20 Portable hand-operated approved appliance

### (i) Acceptance Testing

Apart from visual inspection, no specific testing is required. The appliances shall be inspected and certified in efficient working order by a Class 3 registered fire service installation contractor.

### (ii) Maintenance

The appliances shall be maintained in efficient working order at all times and shall be inspected by a Class 3 registered fire service installation contractor at least once in every 12 months.

The tests for portable hand-operated approved appliances shall be carried out periodically in accordance with the appropriate standard and the manufacturer's recommendations.

The guidelines on portable hand-operated approved appliances maintenance is enclosed at APPENDIX 11.

These guidelines are also published in the Fire Protection Notice No. 11 "Notes on Fire Extinguishers (Suitability and Maintenance)".

### (iii) Maintenance Label

All portable extinguishers shall be provided or stuck with a label after maintenance as per the sample in APPENDIX 11. The purpose of this maintenance label is to provide and update all relevant information on the equipment after maintenance.

The label shall not be affixed over the original manufacturer's label on the equipment body, thus covering the name, model and reference number of that equipment.

Indelible and permanent ink shall be used to fill in the label.

Registered fire service installation contractors are reminded that only portable equipment approved by the Fire Services Department and listed in the The Government of the Hong Kong Special Administrative Region Gazette may be installed, and unless the equipment can be readily identified as being approved and listed, the Fire Services Certificate (F.S. 172) shall not be issued.

### Notes on Portable Equipment Maintenance Label

(Including fire extinguisher, fire blanket, sand bucket and fixed type extinguisher)

#### 1. Company Name

Either the name of the company or the company chop should be printed on the space provided. If company name is not applicable, "NA" should be entered and should not be left blank.

#### 2. Registration No.

The registration number of the Class 3 fire service installation contractor responsible for the maintenance of the portable equipment should be filled in.

#### 3. F.S. 251 No.

The number of the relevant Certificate of Fire Service Installations and Equipment (F.S. 251) should be filled in.

4. Maintenance Date

This date means the date when the maintenance of the portable equipment is completed. It should be the same date as shown on the Certificate (F.S. 251).

5. Next Maintenance

This date means 12 months later and should be counted from the date of the last maintenance. If within 12 months period, the fire extinguisher is required to have pressure test, then the date of pressure test should be filled in.

Example: Maintenance Date : 5.9.2003  
 Last Pressure Test : 10.7.1999 (pressure test is required for  
 every 5 years intervals)  
 Next Maintenance : 10.7.2004 (not 5.9.2004)

6. Last Pressure Test

The date shown on the last year's label should be filled in the new label. If last year's label becomes dilapidated or the date cannot be seen when carrying out the maintenance works, the condition of the extinguisher body should be checked to ascertain whether a pressure test is required. If the year of manufacture shown on the extinguisher body exceeds 5 years with no record of pressure test, pressure test should be carried out instead of merely replacing the parts or extinguishing medium.

(For fire blankets and sand buckets, "NA" should be filled in.)

7. Year of Manufacture

According to all standards accepted by the Fire Services Department from different countries, the year of manufacture must be permanently marked or stamped on the extinguisher body. So the year of manufacture can be checked out from the body. If there are only 2 digits, it means the last 2 digits of the year of manufacture, e.g. 99 means manufactured in 1999. For those non-high pressure extinguishers (25 bars below) manufactured according to Malaysian Standard MS1179:1990, it only requires the year of manufacture be clearly marked on the body, but for those Malaysian products manufactured according to BS EN-3, permanent marking or stamp for year of manufacture is shown on the extinguisher body.

(For fire blankets and sand buckets, "NA" should be filled in.)

8. Maintenance Result

If the maintenance procedures for this inspection cannot be fully completed in accordance with the guidelines in this Code and attained a satisfactory result, it should not be treated as "PASS". A cross by using two straight lines to join the opposite corners in the square for "FAIL" should be marked, e.g.  means fail. Particulars of defects must be listed in Part 3 of the relevant Certificate of Fire Service Installations and Equipment (F.S. 251).

Remarks:

Other than Fire Services licensing requirement or Fire Services requirement for new buildings, if the portable equipment is a new one, which can be readily used without assembly or filling of extinguishing media, and its year of manufacture shown on the body does not exceed one year, a Certificate of Fire Service Installations and Equipment (F.S. 251) is not required. The relevant purchase receipt should be retained for future identification. In case the year of manufacture of the portable equipment exceeds 12 months (i.e. 1 year) or the extinguisher requires assembly or refilling, then the portable equipment should be inspected by a registered fire service installation contractor and a Certificate of Fire Service Installations and Equipment (F.S. 251) be issued to prove its function.

## 2.21 Pressurization of staircase

### (i) Acceptance Testing

1. Where interaction with other systems is part of the designed operational mode, all such systems shall be correctly functioning before a final Fire Services inspection takes place.

2. 'Completion' shall include all necessary permanent labels, instruction plaques, fully detailed operating and maintenance manuals and diagrams, record 'as-built' drawings, etc.
3. Ensure tests required under sub-paragraph B.4 of paragraph 5.21 of the Code of Practice for Minimum Fire Service Installations and Equipment are carried out, recorded and record certified.
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 the Fire Services Inspecting Officers in attendance. A full set of completed checklists according to APPENDIX 6 and test and functional operation check records (see para. 8 hereof) shall be submitted with the request for the attendance of the Fire Services Inspecting Officers. Accompanying the checklists and records shall be a certificate signed by the designer on behalf of the design company or organization confirming or otherwise that he is satisfied that the installations are operating in accordance with his design and the requirements of the Fire Services Department.
5. Acceptance tests shall be carried out in accordance with British Standard 5588: Part 4 and the checklist. It is necessary for the designer to be present at the tests.
6. It is preferable that apart from the checklist, the format/method of the required operational and functional test be agreed with Fire Services Department before any such work commences.
7. 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 manufacturer's claimed accuracy of not more than plus or minus two percent of range;
  - c. be manufactured to an appropriate British Standard or recognized equivalent international or national standard where appropriate and available; and
  - d. have been calibrated by a recognized 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.
8. Full and complete records are to be taken of all the tests and the results thereof including not less than:—
  - a. records of pressure testing during construction—see sub-paragraph B.4 of paragraph 5.21 of the Code of Practice for Minimum Fire Service Installations and Equipment;
  - b. make, serial no., type and owner of all instruments used, with a copy of the calibration certificates;
  - c. actual measurements taken;
  - d. corrected measurement from (c) above;
  - 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 witness for each test; and
  - i. signature of acceptance of and by the designer.

**(ii) Maintenance**

1. For dedicated systems that only operate in emergency, they should be actuated by the owner or his agent at an interval of not more than three months, and checked to ensure that all functions and sequences are operating correctly. (See para. 3 below)
2. For dual purpose systems that operate continuously at a low level and at an increased level in emergency, they should be actuated into emergency mode by the owner or his agent at not more than six monthly intervals and checked to ensure that all emergency functions sequence

and operate correctly. (See para. 3 below)

3. Periodic actuation should include, at least, the following actions: —
  - a. activate system by manual switch;
  - b. check that indicator lights give correct signals;
  - c. inspect staircase to ensure all doors are closed especially if magnetically held doors are utilized;
  - d. full inspection of fan rooms including:—
    - (i) fresh air inlet to be clear of debris and area in front to be free of obstruction;
    - (ii) filters (if provided) correctly in place and not at end of useful life;
    - (iii) to check any flexible connections for deterioration;
    - (iv) motor operating satisfactorily (not overheating, etc.);
    - (v) belt drive with correct belt tension and alignment 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) to check operation of pressure relief or fan by-pass dampers (and indirectly, pressure sensor) by opening and closing staircase entry door(s);
    - (xi) to check plant room for free of debris, stored materials, etc.; and
    - (xii) to check fan room entry door self closers;
  - e. throughout the staircase, a check should be conducted to ensure that air is discharging from all outlets and that pressure sensor is clean and free from obstruction;
  - f. to deactivate the manual switch and restore automatic mode;
  - g. to record actions progressively, and to complete and sign record logs.
4. In addition to the foregoing, at intervals not exceeding 12 months, the system shall be actuated and a full test shall be carried out as described under Section 2.21(i) hereof, by a registered fire service installation contractor and a Certificate of Fire Service Installations and Equipment (F.S. 251) shall be sent to the Director of Fire Services; and
5. A record log should be maintained by the owner or his agent for each and all systems providing a complete record of the actions carried out under para 1 to 4 hereof and the results thereof under signature of the supervisor and witness. Records should be retained for a period of at least seven years and shall be made available at any reasonable time at the request of the Director of Fire Services.

## **2.22 Ring main system with fixed pump(s)**

### **(i) Acceptance Testing**

The system shall be tested to demonstrate its satisfactory performance including tests on the operation of the pumps, and on the water flow rate and working pressure of the street hydrants etc., and such other tests and inspections as may be prescribed by the Director of Fire Services on account of specific features of the system.

### **(ii) Maintenance**

The installation shall be maintained in efficient working order at all times and shall be inspected by a registered fire service installation contractor at least once in every 12 months.

The fixed pump should be tested by the owner or his agent monthly on both the automatic and manual start.

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

## 2.23 Smoke extraction systems

Where hot smoke test is required, the followings shall be observed: —

- a. Salient points for the test: —
  - (i) The temperature of simulated hot air plume should be maintained at about 10 °C below the temperature rating of the ceiling sprinklers to avoid any unwanted actuation of sprinklers or damage to building structures and finishes;
  - (ii) The size of the test fire should be at least 1 MW or of such size as agreed by the Director of Fire Services;
  - (iii) Non-contaminating industrial grade methylated spirit may be used subject to the agreement of the Director of Fire Services;
  - (iv) Non-toxic oil based smoke produced by smoke generator may be used subject to the agreement of the Director of Fire Services;
  - (v) The test will be conducted with reference to the Australian Standard AS 4391-1999 or other equivalent international standards.
- b. Safety measures to be observed during the Hot Smoke Test: —
  - (i) Adequate safety measures should be provided to prevent any possible spread of fire during the test;
  - (ii) Adequate fire extinguishers should be provided at scene;
  - (iii) The standing-by of a fire appliance may be required if considered necessary.
- c. The smoke extraction system will be considered acceptable if the following points are complied with during the hot smoke test:—
  - (i) The designed smoke clear height should be maintained;
  - (ii) The low level fresh air make-up and the high level air extract should be formed in such a pattern that the smoke flow paths shall have a “scouring” effect in all areas within the smoke compartment. The make-up fresh air should not have any impact on the stability of the smoke layer;
  - (iii) The smoke extraction system should actuate promptly in response to a fire alarm signal;
  - (iv) No significant disperse of smoke should occur at adjoining smoke compartment(s);
  - (v) No deflection exceeding the design limit should be observed at hanging smoke curtains;
  - (vi) No significant smoke should be built up in ‘stagnant corners’ beneath the smoke layer;
  - (vii) No smoke should re-enter into the building through building openings or fresh air intake louvres.

### A. Dynamic smoke extraction system

#### (i) Acceptance Testing

1. Where interaction with other systems is part of the designed operational mode, all such systems shall be correctly functioning before a final Fire Services inspection takes place.
2. ‘Completion’ shall include all necessary permanent labels, instruction plaques, fully detailed operating and maintenance manuals and diagrams, record ‘as-built’ drawings, etc.
3. Ensure tests required under sub-paragraph B.17 of paragraph 5.23 of the Code of Practice for Minimum Fire Service Installations and Equipment are carried out, recorded and record certified.
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 the Fire Services Inspecting Officers in attendance. A full set of test and functional operation check

records (see para. 7 hereof) shall be submitted with the request for the attendance of the Fire Services Inspecting Officers. Accompanying the records shall be a certificate signed by the designer on behalf of the design company or organization confirming or otherwise that he is satisfied that the installations are operating in accordance with his design and the requirements of the Fire Services Department.

5. The format/method/apparatus of the required operational and functional tests (including hot smoke test) shall be agreed with Fire Services Department before any such tests commence.
6. 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 manufacturer's claimed accuracy of not more than plus or minus two percent of range;
  - c. be manufactured to an appropriate British Standard or recognized equivalent international or national standard where appropriate and available; and
  - d. have been calibrated by a recognized 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.
7. 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 sub-paragraph B.17 of paragraph 5.23 of the Code of Practice for Minimum Fire Service Installations and Equipment;
  - b. make, serial no., type and owner of all instruments used, with a copy of the calibration certificates;
  - c. actual measurements taken;
  - d. corrected measurement from (c) above;
  - 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 witness for each test; and
  - i. signature of acceptance of and by designer.

**(ii) Maintenance**

1. For dedicated systems that only operate in emergency, they should be actuated by the owner or his agent at an interval of not more than three months, and checked to ensure that all functions and sequences are operating correctly.
2. For dual purpose systems that operate continuously at a low level and at an increased level in emergency, they should be actuated into smoke extraction mode by the owner or his agent at an interval of not more than six months, and checked as in para. 1 above.
3. Where systems are mixed types the shorter intervals should apply.
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 Section 2.23 (A) (i) hereof, by a registered fire service installation contractor and a Certificate of Fire Service Installations and Equipment (F.S. 251) shall be sent to the Director of Fire Services.
5. The owner or his agent should ensure that all routine oiling, greasing, etc. is carried out from time to time to ensure reliable operation.
6. Any fire/smoke dampers installed should be maintained regularly by the owner or his agent.
7. A record log should be maintained by the owner or his agent for all systems, providing a complete record of the actions carried out under para. 1 to 6 hereof and the results

thereof under signature of the supervisor and witness.

## **B. Static smoke extraction system**

### **(i) Acceptance Testing**

1. On completion of the installation the whole system shall be inspected by a registered fire service installation contractor. For installations with permanent barriers and/or exhaust openings, it shall be ensured that all barriers and openings are properly provided and all labels are supplied and fixed.
2. For systems without permanent fixed barriers and openings, all devices shall be checked in the non-operated positions; the actuation system shall then be operated and all devices checked to ensure they have operated correctly.
3. All components shall be reset to the non-operated position and then with the electrical power source removed. All devices shall again be checked to ensure that they have all correctly performed the 'fail safe' function, i.e. all in their fire positions.
4. Ensure all labels and instructions are provided.

### **(ii) Maintenance**

1. The system shall be inspected annually by a registered fire service installation contractor to ensure that they are in efficient working order.
2. The inspections shall include all actuation, checking of notices, etc. as described under Section 2.23 (B)(i) hereof.

## **2.24 Sprinkler system**

### **(i) Acceptance Testing**

The system should be tested in accordance with the Loss Prevention Council Rules for Automatic Sprinkler Installations (with suitable modifications pertinent to Hong Kong), or other standards and requirements as may be prescribed by the Director of Fire Services on account of the specific features of the system.

### **(ii) Maintenance**

The installation shall be maintained in efficient working order at all times and shall be inspected by a registered fire service installation contractor at least once in every 12 months.

## **2.25 Street fire hydrant system**

### **(i) Acceptance Testing**

The hydrant shall be of an accepted standard pattern and, when tested in accordance with provision of British Standard 1042 with one 65 mm outlet working, shall be capable of delivering not less than 2 000 litres per minute (33.3 l/sec.) with a minimum running pressure of 170 kPa at the outlet.

The minimum output and pressure at above paragraph should be made available from the 65 mm outlets of a system delivering at the same time, i.e. a total output of not less than 4 000 litres per minute (66.7 l/sec.).

The system shall be tested in accordance with the checklist laid down at APPENDIX 7.

### **(ii) Maintenance**

The installation shall be maintained in efficient working order at all times and shall be inspected by a registered fire service installation contractor at least once in every 12 months.

## **2.26 Supply tanks**

### **(i) Acceptance Testing**

No specific test is required other than visual inspection for the supply tank and measurement of its effective storage capacity for compliance with the requirements of the Director of Fire

Services.

**(ii) Maintenance**

The supply tank should be maintained in full storage capacity by the owner or his agent at all times and be checked for leakage periodically.

**2.27 Ventilation/air conditioning control system**

**(i) Acceptance Testing**

The override control of the ventilation/air conditioning control system shall be tested to ensure satisfactory operation at alarm condition to the satisfaction of the Director of Fire Services.

**(ii) Maintenance**

The installation shall be maintained in efficient working order at all times and shall be inspected by a registered fire service installation contractor at least once in every 12 months.

The operation of this override control system should be tested at least once every six months, and the results entered in a log book by the owner or his agent. This log book should be kept in the premises and be available for inspection by the Director of Fire Services as and when required.

**2.28 Water mist system**

**(i) Acceptance Testing**

The system shall be tested in accordance with all the technical requirements as stipulated in NFPA 750 on Water Mist Fire Protection Systems, and other requirements as may be prescribed by the Director of Fire Services on account of the specific features of the system.

**(ii) Maintenance**

The installation shall be maintained in efficient working order at all times and shall be inspected by a registered fire service installation contractor at least once in every 12 months.

Any alteration to, repair or maintenance on the water mist system after initial installation shall also be endorsed by a qualified person, who should be a registered professional engineer under Cap. 409 in the discipline of building services, fire or mechanical engineering, or one with qualifications acceptable to the Director of Fire Services, e.g. the system manufacturer.

All installation, repair and maintenance work shall be carried out and certified by a registered fire service installation contractor.

**2.29 Water spray system**

**(i) Acceptance Testing**

The system shall be tested in accordance with all the technical requirements as stipulated in NFPA 15 for Water Spray Fixed Systems for Fire Protection, and other requirements as may be prescribed by the Director of Fire Services on account of the specific features of the system.

**(ii) Maintenance**

The installation shall be maintained in efficient working order at all times and shall be inspected by a registered fire service installation contractor at least once in every 12 months.

**2.30 Water supply**

**(i) Acceptance Testing**

The water supply for fire service systems shall be checked for permanent connection at single or dual end feed. Transfer pump, if installed, shall be tested for efficient operation.

**(ii) Maintenance**

The water supply piping system should be checked for leakage by the owner or his agent

periodically. The transfer pump shall be maintained in efficient working order at all times and be inspected by a registered fire service installation contractor at least once in every 12 months.

### **Part III MISCELLANEOUS**

- 3.1 This Code deals only with the inspection, testing and maintenance 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 for Minimum Fire Service Installations and Equipment published by the Director of Fire Services.
- 3.2 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 other than the inspections or tests indicated in this Code, either in addition to or in substitution of the inspections and tests so indicated.

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**Checklist for Actuating Devices and Operation of Fire Shutter**

**I. REFERENCE**

Project .....	FSD Ref. ....
Address .....	Location .....
.....	.....
LPC Ref. ....	Maker's Name .....

**II. TYPE**

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

**III. INSTALLATION**

	Yes	No	Remarks
3.1 Where automatic self-closing devices are fitted, do they cause no interference to the manual opening and closing of the shutter?	[ ]	[ ]	.....
3.2 Where smoke detectors are provided for the actuation of the shutter, are they fitted to both sides of the wall opening?	[ ]	[ ]	.....
3.3 Are smoke detectors installed as far as practicable to the provisions of the BS 5839-1:2002+A2:2008?	[ ]	[ ]	.....
3.4 Is permanent nameplate with adequate information provided?	[ ]	[ ]	.....
3.5 Are manual controls provided to both sides of the wall opening?	[ ]	[ ]	.....

**IV. SHUTTER OPERATION**

4.1 Does the automatic actuation device function satisfactorily?	[ ]	[ ]	.....
4.2 Is secondary source of electricity supply provided?	[ ]	[ ]	.....
4.3 Is the descending speed* of the shutter acceptable?	[ ]	[ ]	.....

\* Descending time shall be 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.





	Tally with drawings?		If not, whether the as-fitted location/position acceptable?		Remarks
	Yes	No	Yes	No	
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 CO <sub>2</sub> Container?	[ ]	[ ]	.....
4.2.2 FM200 Container?	[ ]	[ ]	.....
4.2.3 NAFSIII Container?	[ ]	[ ]	.....
4.3 Is reliable means of indication provided for the determination of pressure in FM200/NAFSIII container?	[ ]	[ ]	.....
4.4 Does the means of indication account for variation of container pressure with temperature?	[ ]	[ ]	.....
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?	[ ]	[ ]	.....

		Yes	No	Remarks
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)*

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?	[ ]	[ ]	.....

		Yes	No	Remarks
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?	[ ]	[ ]	.....
<b>VI. FUNCTIONAL TEST (DYNAMIC TEST)</b>				
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?	[ ]	[ ]	.....
<b>VII. PRACTICAL DISCHARGE TEST (DYNAMIC TEST) (IF REQUIRED)</b>				
	By Designed Agent	[ ]		
	By Approved Substitute	[ ]		
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?	[ ]	[ ]	.....
<b>VIII. REINSTATEMENT OF SYSTEM AFTER DISCHARGE (STATIC CHECK)</b>				
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*

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Test witnessed by:—

..... (Signature)

..... (Signature)

..... (Name in block letters)

FSI Contractor's Representative

..... (Name in block letters)

Fire Services Inspecting Officer

Date .....

Date .....

**Checklist for Emergency Generator Installation**

**I. Reference**

Project: ..... FSD Ref.: .....  
 Address: .....

**II. Installations and Equipment Connected** (for record purpose)

Name of buildings  
 being protected: .....

	Peak Starting Current (I <sub>L</sub> )	Rated Input Power	Starting Method
(A) Fire service installation			Remarks: D.O.L. Star-delta Auto-tx. or others
i. Fixed fire pump	No. × A	No. × kW	
ii. Intermediate booster pump	No. × A	No. × kW	
iii. Sprinkler pump	No. × A	No. × kW	
iv. Fireman’s lift	No. × A	No. × kW	
v. Fire detection system	No. × A	No. × kW	
vi. Smoke extraction system	No. × A	No. × kW	
vii. Staircase pressurization	No. × A	No. × kW	
viii. Exit sign/emergency lighting	No. × A	No. × kW	
ix. Others: .....			
(B) Other equipment (please specify)			
.....	A	kW	
Estimated maximum simultaneous starting and running load		kW/ kVA	

**III. Emergency Generator Set Details**

	<u>Alternator</u>	<u>Prime Mover</u>
3.1 Make	.....	.....
3.2 Model	.....	.....
3.3 Serial No.	.....	.....
3.4 Rated Capacity	Power ..... kVA Current ..... A	Voltage: 380/220 Power factor ..... Power ..... kW Speed: ..... rpm Frequency ..... Hz

**IV. Fuel**

- 4.1 Type:  Diesel  Other (please specify) .....
- 4.2 Type of tank:  Built-in  Separate
- 4.3 Separate fuel tank room is provided  Yes  No
- 4.4 Capacity of service tank: ..... litres Capacity of main fuel tank:..... litres
- 4.5 a. Fuel consumption ..... litres/hour rate at full load:
- b. Fuel consumption curve of generator is attached  Yes  No
- c. Time allowed for max. fuel consumption at full load ..... hours
- d. Fuel storage is sufficient for 6 hrs. generator running to support fire service installations  Yes  No

	Yes	No	N/A	Remarks
4.6 Fuel tank room has been inspected and approved by Dangerous Goods Division. (N.B.: Supporting document is attached)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	.....
4.7 Surveyor report for fuel tank has been obtained as required by Dangerous Goods Division.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	.....
4.8 DG license for fuel tank room holding more than 2 500 litres diesel has been obtained. (N.B.: Supporting document is attached)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	.....

**V. Visual Inspection**

- 5.1 Adequate space (not less than 600 mm) is provided all round emergency generator for maintenance/cleaning.  Yes  No  N/A
- 5.2 Air supply and discharge ductworks (if any) are provided free from obstruction.  Yes  No  N/A
- 5.3 Air supply and discharge ductworks running in compartment other than emergency generator room are enclosed with proper fire resisting material.  Yes  No  N/A
- 5.4 Service fuel tank in generator room is made of 3 mm steel construction and of capacity less than 500 litres.  Yes  No  N/A
- 5.5 Generator built-in fuel tank is not greater than 500 litres.  Yes  No  N/A
- 5.6 Fuel tank is electrically earthed.  Yes  No  N/A

	Yes	No	N/A	Remarks
5.7 A baffle wall of brick-work construction or of 9 mm metal sheet is provided between the side of service tank (if installed) and generator, serving as a screen wall between the two.	[ ]	[ ]	[ ]	.....
5.8 Fuel refilling pump is connected to essential power supply.	[ ]	[ ]	[ ]	.....
5.9 A shut off valve is provided on the supply pipe from fuel tank to the service tank of generator.	[ ]	[ ]	[ ]	.....
5.10 Capacity of battery is capable of starting the generator 4 times consecutively and calculation sheet is enclosed. (Capacity: ..... Ah)	[ ]	[ ]	[ ]	.....
5.11 The batteries are kept in fully charged condition and the trickle charge is operating.	[ ]	[ ]	[ ]	.....
5.12 Inside emergency generator room,				
5.12.1 door sill of sufficient height is provided to contain the total fuel contents of the service tank (if installed), fuel tank and sump of the generator;	[ ]	[ ]	[ ]	.....
5.12.2 detailed operation instructions are displayed; and	[ ]	[ ]	[ ]	.....
5.12.3 a log book is provided.	[ ]	[ ]	[ ]	.....
5.13 Integrity of the fire resisting construction of generator room and the door is intact.	[ ]	[ ]	[ ]	.....
5.14 The notices “EMERGENCY GENERATOR” (應急發電機) and “NO SMOKING” (不准吸煙) in 120 mm English and Chinese characters are provided at the entrance to the emergency generator room.	[ ]	[ ]	[ ]	.....
<b>VI. Functional Testing</b>				
6.1 All testing are carried out with the generator room doors kept closed.	[ ]	[ ]	[ ]	.....
6.2 The manual starting facilities of the emergency generator can operate satisfactorily.	[ ]	[ ]	[ ]	.....
6.3 Upon failure of normal electricity supply, emergency generator:—	[ ]	[ ]	[ ]	.....
6.3.1 automatically starts when the duration of power failure exceeds 1 second; and	[ ]	[ ]	[ ]	.....
6.3.2 transfers to FS loads within 15 seconds.	[ ]	[ ]	[ ]	.....
6.4 Emergency generator is capable of restarting upon failure of first attempt in starting.	[ ]	[ ]	[ ]	.....

	Yes	No	N/A	Remarks
6.5 Audible and visual alarms are given locally, and at fire control main panel when the generator starting sequence is locked out due to starting failure.	[ ]	[ ]	[ ]	.....
6.6 After one hour of running test, all instruments, safety devices, etc. indicate "normal" condition.	[ ]	[ ]	[ ]	.....
6.7 The generator set will continue to run after a pre-determined time recommended by manufacturer unless it is stopped manually if the normal power supply has resumed.	[ ]	[ ]	[ ]	.....
6.8 Warning signal is given locally and at fire control main panel when manual/auto selector switch turn to manual position. (N.B. such provision is strongly recommended)	[ ]	[ ]	[ ]	.....
6.9 Remote control valve on supply pipe to the service tank is in good working order.	[ ]	[ ]	[ ]	.....
6.10 All moving parts are effectively and rigidly guarded for safety.	[ ]	[ ]	[ ]	.....
6.11 All hot parts are properly insulated.	[ ]	[ ]	[ ]	.....
6.12 No exhaust leak is detected inside generator room while the generator is running.	[ ]	[ ]	[ ]	.....

**VII. On Load Test**

- 7.1 All loadings as listed in item 2 were connected [ ] Yes [ ] No
- 7.2 Frequency (Hz) .....
- 7.3 Maximum starting current ( $I_{LMAX}$ )  
 R: ..... A      Y: ..... A      B: ..... A
- 7.4 Voltage dip: ..... %      Voltage recovery time: .....seconds
- 7.5 Running current ( $I_L$ )  
 R: ..... A      Y: ..... A      B: ..... A
- 7.6 Voltage (Volts)  
 R-Y: .....      Y-B: .....      B-R:.....  
 R-N: .....      Y-N: .....      B-N: .....
- 7.7 Engine speed (rpm) .....
- 7.8 Duration of on-load test (hr.) .....

**VIII. General Comments & Remarks**

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Tested by:

Signature: .....

Full Name of  
Installation Engineer: .....

Name of  
FSI Contractor: .....

Company Chop: .....

Date: .....

Witnessed by:

Signature: .....

Full Name of  
Design Engineer: .....

Name of  
Design Consultant: .....

Company Chop: .....

Date: .....

## Checklist for Fire Detection and Fire Alarm System

### I. Reference

Project: ..... FSD Ref.: .....  
 Address: .....  
 Type of Building:  
 Domestic/Industrial/Institutional/Godown/Commercial/Office/Composite/Hotel/Hospital/Others .....  
 ..... and with/without basement.

### II. Type of Equipment

#### 2.1 Alarm Annunciation Panel

2.1.1 Manufacturer/Model No.: (Main panel) .....  
 (Sub-panel/repeater panel, if any) .....  
 2.1.2 Type: Conventional type [ ]  
 Addressable type [ ]

#### 2.2 Detectors

2.2.1 Heat detector Manufacturer/Model No.: .....  
 Type: Fixed temperature [ ]  
 Rate-of-rise temperature [ ]  
 Combination [ ]  
 Linear cable [ ]  
 Others .....

2.2.2 Smoke detector Manufacturer/Model No.: .....  
 Type: Ionization [ ]  
 Optical [ ]  
 Beam [ ]  
 Aspirating [ ]  
 Others .....

2.2.3 Flame detector Manufacturer/Model No.: .....  
 Type: Infrared [ ]  
 Ultra-violet [ ]  
 Combination [ ]  
 Others .....



		Yes	No	N/A	Remarks	Reference	
						BS	CL
3.1.2	All individual components of the fire alarm system including detectors and the control panel are mutually compatible.	[ ]	[ ]	[ ]	.....		
3.1.3	An as-fitted zoning schedule is provided adjacent to the alarm annunciation panel.	[ ]	[ ]	[ ]	.....		
3.1.4	A log book is provided adjacent to the alarm annunciation panel.	[ ]	[ ]	[ ]	.....		
3.1.5	The building plans submission for extensions and additions involving major alterations and additions to the building is in excess of 50% by volume and is received by FSD on 1 September 2009 or later.	[ ]	[ ]	[ ]	.....		1/2009
3.2	<u>Detector</u>						
3.2.1	The detection zonings are properly labelled at the alarm annunciation panel.	[ ]	[ ]	[ ]	.....	13.2.4a)	
3.2.2	Detectors are provided in areas as indicated on approved building plans.	[ ]	[ ]	[ ]	.....		
	Point type heat detector: ..... nos.						
	Linear heat cable: ..... sets						
	Point type smoke detector: ..... nos.						
	Beam smoke detector: ..... sets						
	Aspirating smoke detector: ..... sets						
	Flame detector: ..... nos.						
	Others: ..... nos.						

		Yes	No	N/A	Remarks	Reference	
						BS	CL
3.2.3	On the floor(s) where sleeping risk exists (e.g. hotel, hospital, hostel, etc.):						2/2009
	(a) heat detector is used in kitchen and E/M plant room.	[ ]	[ ]	[ ]	.....		
	(b) smoke detector is used in other areas except toilet, bathroom and staircase where sprinkler is provided.	[ ]	[ ]	[ ]	.....		
	(c) sounder base is provided for smoke detector in guestrooms of hotels / guesthouses / bedrooms of student hostels except detector inside concealed space.	[ ]	[ ]	[ ]	.....		
3.2.4	Detectors are provided to basement according to the approved building plan.	[ ]	[ ]	[ ]	.....		
3.2.5	Intrinsically safe or flameproof device is used within potentially hazardous areas.	[ ]	[ ]	[ ]	.....		
3.2.6	External indicator is provided outside the doors of rooms where travel distance of the detectors inside the rooms exceeds 30 m of reach within a zone.	[ ]	[ ]	[ ]	.....	13.2.3b)	1/2009
3.2.7	Remote indicating lamps are provided for ceiling void or floor void detectors, if addressable text display in conjunction with layout plans are not provided adjacent to the control and indicating equipment.	[ ]	[ ]	[ ]	.....	13.2.4b) 13.2.5	1/2009
3.2.8	Detectors are provided for horizontal ceiling void $\geq 800$ mm high.	[ ]	[ ]	[ ]	.....	22.2d)	1/2009

	Yes	No	N/A	Remarks	Reference	
					BS	CL
3.2.9 Clearance below detector is $\geq 500$ mm. (Not applicable for ceiling voids, floor voids, and area having no horizontal dimension greater than 1 m.)	[ ]	[ ]	[ ]	.....	22.3n)	
3.2.10 Point smoke detector is installed within ceiling height limit (general) of 10.5 m. (Note: $\leq 10\%$ of ceiling height may exceed this limit and $\leq 12.5$ m).	[ ]	[ ]	[ ]	.....	22.9 Table 3	1/2009
3.2.11 Heat detector is installed within ceiling height limit (general) of 9 m for Class A1 to BS EN 54-5 and 7.5 m for other Classes to BS EN 54-5. (Note: $\leq 10\%$ of ceiling height may exceed this limit and $\leq 10.5$ m).	[ ]	[ ]	[ ]	.....	22.9 Table 3	1/2009
3.2.12 Under flat ceiling, horizontal distance between any point and the nearest heat detector is $\leq 5.3$ m.	[ ]	[ ]	[ ]	.....	22.3a)2)	
3.2.13 Under flat ceiling, horizontal distance between any point and the nearest smoke detector is $\leq 7.5$ m.	[ ]	[ ]	[ ]	.....	22.3a)	
3.2.14 In corridors $\leq 2$ m wide, heat detectors are sited at intervals of $\leq 10.6$ m and $\leq 5.3$ m from end wall.	[ ]	[ ]	[ ]	.....	22.3a), Note 1	
3.2.15 In corridors $\leq 2$ m wide, smoke detectors are sited at intervals of $\leq 15$ m and $\leq 7.5$ m from end wall.	[ ]	[ ]	[ ]	.....	22.3a), Note 1	

	Yes	No	N/A	Remarks	Reference	
					BS	CL
3.2.16 In detector installation, ceiling obstructions > 10% overall ceiling height are treated as wall. (Note: Within horizontal voids, obstructions > 10% of the height between structural floor and structural ceiling are treated as wall regardless of the void location.)	[ ]	[ ]	[ ]	.....	22.3j), Note 8	1/2009
3.2.17 In detector installation, partitions or storage racks reaching within 300 mm of the ceiling are treated as wall.	[ ]	[ ]	[ ]	.....	22.3i)	
3.2.18 Detectors are mounted $\geq$ 1 m from any air inlet of forced ventilation system.	[ ]	[ ]	[ ]	.....	22.3m)	
3.2.19 Horizontal ceiling comprises:  (a) a series of small cells (honeycomb ceiling), detector spacing is in accordance with Figure 10b) & Table 1 of BS 5839-1;	[ ]	[ ]	[ ]	.....	22.3k)	
(b) a number of closely spaced structural beams, detector spacing is in accordance with Figure 10c) & Table 2 of BS 5839-1.	[ ]	[ ]	[ ]	.....		
3.2.20 Detector(s) is provided under intermediate horizontal surfaces such as ducts, loading platforms and storage racks in excess of 3.5 m in width and whose undersurface is in excess of 800 mm above the floor (other than when the side of the duct or structure is in excess of 800 mm from the wall or other ducts or structure).	[ ]	[ ]	[ ]	.....	22.3o)	

		Yes	No	N/A	Remarks	Reference	
						BS	CL
3.2.21	Other than point type smoke and heat detectors, the following detectors are according to manufacturer's standard and specification.						
	(a) Aspirating smoke detectors	[ ]	[ ]	[ ]	.....		
	(b) Flame detectors	[ ]	[ ]	[ ]	.....		
	(c) Video smoke detectors	[ ]	[ ]	[ ]	.....		
	(d) Beam detectors	[ ]	[ ]	[ ]	.....		
	(e) Others, please specify: .....	[ ]	[ ]	[ ]	.....		
3.3	<u>Alarm Sounder</u>						
3.3.1	Provided in areas as indicated on FSI layout plans.						
	Alarm sounder: ..... nos.	[ ]	[ ]	[ ]	.....		
3.3.2	External fire alarm sounder is provided at the building entrance or the "Fire Service Access Point" and control and indicating equipment.					16.2.1f)	1/2009
	The sounder is clearly marked with the words "FIRE ALARM" (火警).	[ ]	[ ]	[ ]	.....		
3.3.3	One alarm sounder is provided at each hose reel point.	[ ]	[ ]	[ ]	.....	Code	
3.3.4	Each system incorporates at least two sounders and each fire compartment is provided with at least one sounder. (Note: Meaning of fire compartment is as defined in paragraph 5 of the FRC Code.)	[ ]	[ ]	[ ]	.....	16.2.1i)	1/2009

				Yes	No	N/A	Remarks	Reference		
								BS	CL	
3.4	<u>Manual Call Point (MCP)</u>									
3.4.1	Provided in areas as indicated on FSI layout plans.									
	MCP: ..... nos. [ ] [ ] [ ] .....									
3.4.2	The zoning is at least one zone per floor. [ ] [ ] [ ] .....							13.2.2	1/2009	
3.4.3	One MCP is located:							20.2c)	1/2009	
	(a) at hose reel point; [ ] [ ] [ ] .....									
	(b) adjacent to & within 2m from storey exit (or its entrance lobby if it leads only to the storey exit); [ ] [ ] [ ] .....									
	(c) adjacent to staircase final exit to open air on G/F or place of ultimate safety. [ ] [ ] [ ] .....									
3.4.4	For exit opening $\geq$ 12 m in width, two MCPs are provided within 2 m from each end of the opening before exit (or before the entrance lobby if such lobby leads only to the exit). [ ] [ ] [ ] .....							20.2c)	1/2009	
3.4.5	MCP is fixed at a height of 0.9 to 1.2 m above finished floor level. [ ] [ ] [ ] .....							20.2h)	1/2009	
3.4.6	MCPs are surface mounted or semi-recessed mounted as per manufacturer's design. [ ] [ ] [ ] .....							20.2i)	1/2009	
3.5	<u>Visual Fire Alarm (VFA)</u>									
3.5.1	VFA is labelled "FIRE ALARM" (火警) with height of English and Chinese wordings $\geq$ 10 mm and 15 mm respectively. [ ] [ ] [ ] .....							Code		
3.5.2	Alarm signal is in form of flashing red light. [ ] [ ] [ ] .....							Code		

		Yes	No	N/A	Remarks	Reference	
						BS	CL
3.5.3	Flashing light of VFA is visible to normal eyesight in all areas required to be protected.	[ ]	[ ]	[ ]	.....	Code	
3.5.4	One VFA point is provided for each compartment and the distance between two VFA points $\leq$ 60 m.	[ ]	[ ]	[ ]	.....	Code	
3.5.5	Areas covered by VFA are in compliance with approved building plans and Design Manual: Barrier Free Access.	[ ]	[ ]	[ ]	.....	Code	
3.5.6	Design of VFA system conforms to Code of Practice and					Code	
	(a) NFPA 72: 2010 or	[ ]	[ ]	[ ]	.....		
	(b) BS 5839-1:2002+A2: 2008	[ ]	[ ]	[ ]	.....		
3.5.7	One VFA point is located near every hose reel.	[ ]	[ ]	[ ]	.....		
3.5.8	The power supply of the VFA system is from:						
	(a) DC supply source with back-up supply by battery; or	[ ]	[ ]	[ ]	.....		
	(b) AC supply source with secondary supply from emergency generator; or	[ ]	[ ]	[ ]	.....		
	(c) AC supply source with secondary supply from the main electricity supply obtained before main supply switch.	[ ]	[ ]	[ ]	.....		

3.6	<u>Cables, Wiring and Other Interconnections</u>	Yes	No	N/A	Remarks	Reference	
						BS	CL
3.6.1	Cables used for:					26.2b)	1/2009
	(a) Critical signal path (panel to all field devices);						
	(b) extra low voltage supply from external power supply (charger / battery) to the system;						
	(c) final circuit providing low voltage mains supply to the system; and						
	(d) low voltage mains supply to the system (mains supply to panel / charger)						
	comply with:						
	(i) MICS cable conforming to BS EN 60702-1 & 60702-2;						
	or	[ ]	[ ]	[ ]	.....		
	(ii) Cable conforming to BS 7629; or	[ ]	[ ]	[ ]	.....		
	(iii) Cable conforming to BS 7846; or	[ ]	[ ]	[ ]	.....		
	(iv) Cable rated at 300/500 V (or greater) that provide same degree of safety to BS 7629;						
	or	[ ]	[ ]	[ ]	.....		
	(v) Fire resisting cables to other international standard accepted by FSD; or	[ ]	[ ]	[ ]	.....		
	(vi) Cables as per Remarks Section in Appendix 8 of FS CoP and accepted being exempted from requirement of fire resistance;	[ ]	[ ]	[ ]	.....		

	Yes	No	N/A	Remarks	Reference	
					BS	CL
Except for item (vi), item (i) to (v) shall also comply with:						
(vii) "Standard" fire resisting cables with PH30 classification according to BS EN 50200 and additional 30 min. survival time to Annex E of this standard; or	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	.....	26.2d)	1/2009
(viii) "Enhanced" fire resisting cables with PH120 classification according to BS 8434-2.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	.....	26.2e)	1/2009

	Yes	No	N/A	Remarks	Reference	
					BS	CL
3.6.2 Cables used for power supply to sounders, visual fire alarms, fire alarm devices, control modules, signalling devices, etc. comply with:					26.2b)	1/2009
(i) MICS cable conforming to BS EN 60702-1 & 60702-2; or	[ ]	[ ]	[ ]	.....		
(ii) Cable conforming to BS 7629; or	[ ]	[ ]	[ ]	.....		
(iii) Cable conforming to BS 7846; or	[ ]	[ ]	[ ]	.....		
(iv) Cable rated at 300/500 V (or greater) that provide same degree of safety to BS 7629; or	[ ]	[ ]	[ ]	.....		
(v) Fire resisting cables to other international standard accepted by FSD; or	[ ]	[ ]	[ ]	.....		
(vi) Cable conforming to BS 6387 AWX or CWZ; or	[ ]	[ ]	[ ]	.....		
(vii)Cables as per Remarks Section in Appendix 8 of FS CoP and accepted being exempted from requirement of fire resistance;	[ ]	[ ]	[ ]	.....		
Except for item (vii), item (i) to (vi) shall also comply with:						
(viii)“Standard” fire resisting cables with PH30 classification according BS EN 50200 and additional 30 min. survival time to Annex E of this standard; or	[ ]	[ ]	[ ]	.....	26.2d)	1/2009
(ix) “Enhanced” fire resisting cables with PH120 classification according to BS 8434-2.	[ ]	[ ]	[ ]	.....	26.2e)	1/2009

		Yes	No	N/A	Remarks	Reference		
						BS	CL	
3.6.3	Conductors are having a cross-sectional area of $\geq 1 \text{ mm}^2$ .	[ ]	[ ]	[ ]	.....	26.2j)		
3.6.4	Cables and conductors are separated from cables of other services.	[ ]	[ ]	[ ]	.....	26.2k) 26.2l) 26.2m)		
3.6.5	Cables carrying power in excess of extra-low voltage are segregated from extra-low voltage fire alarm circuits.	[ ]	[ ]	[ ]	.....	26.2n)		
3.6.6	Colour of cables is limited to $\leq$ two sets of common colours and one of the colours is red.	[ ]	[ ]	[ ]	.....	26.2o)		
3.7	<u>Control and Indicating Equipment</u>							
3.7.1	The alarm annunciation panel is located near entrance or in fire control centre.	[ ]	[ ]	[ ]	.....			
3.7.2	Manual call point indications are given at the control and indicating panel even if addressable text information is available.	[ ]	[ ]	[ ]	.....			
3.7.3	Manual call point and detection zone indications are given at the control and indicating panel even if addressable text information is available, by one or a combination of the following:					23.2.2c) to e)		
	(a) LED indicators	[ ]	[ ]	[ ]	.....			
	(b) Visual display units	[ ]	[ ]	[ ]	.....			
	(c) Computer graphics	[ ]	[ ]	[ ]	.....			
	(d) Other suitable means (please specify .....							
	.....)	[ ]	[ ]	[ ]	.....			

		Yes	No	N/A	Remarks	Reference	
						BS	CL
3.7.4	The wirings are compatible with the type of control panel as recommended by the panel manufacturer. (2-wire system/4-wire system/twisted pair/..... .....) .....) [ ] [ ] [ ] .....						
3.7.5	Operation of alarm silent facility should:					16.2.1g)	
	(a) require manual operation;	[ ]	[ ]	[ ]	.....		
	(b) not cancel any visual signal;	[ ]	[ ]	[ ]	.....		
	(c) if a new zone goes into alarm, sound any fire alarm sounders belonging to that alarm zone;	[ ]	[ ]	[ ]	.....		
	(d) not prevent correct operation of any control;	[ ]	[ ]	[ ]	.....		
	(e) not prevent transmission of alarm to alarm receiving centre.	[ ]	[ ]	[ ]	.....		
3.8	<u>Power Supplies</u>						
3.8.1	Connections to the mains supply is via an independent isolating protective device. .....	[ ]	[ ]	[ ]	.....	25.2a)	

	Yes	No	N/A	Remarks	Reference	
					BS	CL
<p>3.8.2 Every isolator, switch and protective device is situated in a position inaccessible to unauthorized persons or protected against unauthorized operation and is properly labelled as appropriate:</p> <p>(a) “FIRE ALARM” (火警警報); or</p> <p>(b) “FIRE ALARM. DO NOT SWITCH OFF” (火警警報, 切勿切斷電源); or</p> <p>(c) “WARNING. THIS SWITCH ALSO CONTROLS THE SUPPLY TO THE FIRE ALARM SYSTEM” (警告, 此電掣同時控制火警警報系統電源).</p> <p>All labels are engraved in white letter/character with a red background. The words “FIRE ALARM” (火警) with height of English and Chinese wordings <math>\geq 10</math> mm and 15 mm respectively.</p>					25.2f) 25.2g)	1/2009
<p>3.8.3 Circuit supplying fire alarm system is not protected by a residual current device. (unless necessary to comply with CoP for the Electricity (Wiring) Regulations)</p>						25.2h)
<p>3.8.4 The mains power supply and the standby battery are each capable of supplying the maximum alarm load of the system.</p>						25.2i) 25.3d)

		Yes	No	N/A	Remarks	Reference	
						BS	CL
3.8.5	Battery power supply is provided. (Voltage: ..... DC Volts: ..... Ahr: .....)	[ ]	[ ]	[ ]	.....		
3.8.6	Secondary (rechargeable) battery supplies should:					25.4	
	(a) be with an automatic charger;	[ ]	[ ]	[ ]	.....		
	(b) have a life of at least 4 years;	[ ]	[ ]	[ ]	.....		
	(c) have date of installation labelled;	[ ]	[ ]	[ ]	.....		
	(d) have battery charger capable of recharging the battery from fully discharged to fully charged within 24 hours; and	[ ]	[ ]	[ ]	.....		
	(e) have capacity sufficient to maintain the system operation.	[ ]	[ ]	[ ]	.....		

**IV. Testing**

4.1 Detectors

4.1.1	Upon actuation of any detector in the building, the correct audio/visual warning device is initiated.	[ ]	[ ]	[ ]	.....		
4.1.2	The sensitivity of all heat/smoke/flame detectors are correctly set in full accordance with the manufacturer's recommendations.	[ ]	[ ]	[ ]	.....		
4.1.3	The zoning of detectors is correct.	[ ]	[ ]	[ ]	.....		

4.2 Manual Call Point, Alarm Sounder and Visual Fire Alarm Installations

4.2.1	Upon actuation of the detector, alarm is given by alarm sounder installed at the building entrance near the alarm annunciation panel.	[ ]	[ ]	[ ]	.....		
-------	---	-----	-----	-----	-------	--	--

		Yes	No	N/A	Remarks	Reference	
						BS	CL
4.2.2	Background noise (N) likely to persist for a period longer than 30 seconds.	[ ]	[ ]	[ ]	at.....dB(A).....	16.2.1 a)1)	
4.2.3	For domestic building, the minimum sound level of alarm sounders is measured at 3 m from the inside of the main entrance door with all doors shut off & all windows open at all flats and the result is ..... dB(A), which is:  (a) $\geq 60$ dB(A); and (b) $\geq 5$ dB(A) + ..... (background noise, N) = .....dB(A).	[ ]	[ ]	[ ]	.....	16.2.1 a)1)	
4.2.4	For non-domestic building, the minimum sound level of alarm sounders is measured at 3 m from the inside of the main entrance door with all doors shut off & all windows open at all flats and the result is ..... dB(A), which is:  (a) $\geq 65$ dB(A); and (b) $\geq 5$ dB(A) + ..... (background noise, N) = .....dB(A).	[ ]	[ ]	[ ]	.....	16.2.1 a)1)	
4.2.5	The sound level measured right below the sounder base(s) of smoke detector and 1 m above floor level with all the guestroom/bedroom windows fully opened and doors closed is $\geq 65$ dB(A) or $> 5$ dB(A) above background noise.	[ ]	[ ]	[ ]	.....		1/2009 2/2009
4.2.6	The zoning of manual call points is correct.	[ ]	[ ]	[ ]	.....	12.2.2j), Note 5	1/2009

		Yes	No	N/A	Remarks	Reference	
						BS	CL
4.2.7	Upon actuation of any manual call point in the building, the fixed fire pump serving the corresponding block comes into operation regardless of the zoning of the manual call point.	[ ]	[ ]	[ ]	.....	Code	
4.2.8	Upon actuation of any manual call point in the building, the correct audio/visual warning device for the fire alarm and detection system is initiated.	[ ]	[ ]	[ ]	.....		
4.2.9	The delay between operation of a manual call point and the giving of an “evacuate” signal in the alarm zone does not exceed 3 seconds.	[ ]	[ ]	[ ]	.....	20.2b)	
4.2.10	All VFA flashing light is visible to normal eyesight in the required protected areas when the fire alarm system is actuated.	[ ]	[ ]	[ ]	.....	Code	
4.2.11	VFA signal is clearly distinguishable from any other non-fire services visual signals.	[ ]	[ ]	[ ]	.....		
4.3	<u>Power Supplies</u>						
4.3.1	For occupied premises, the standby battery is sufficient to maintain the system in operation for at least 24 hours, plus at least 30 min. for an “evacuate” signal in all alarm zones.	[ ]	[ ]	[ ]	.....	25.4e)1)	

		Yes	No	N/A	Remarks	Reference		
						BS	CL	
4.3.2	For unoccupied premises, the standby battery is sufficient to maintain the system in operation for at least 24 hours longer than maximum period likely to be unoccupied or for 72 hours in total, whichever is the less, after which to operate all fire alarm devices for at least 30 min.	[ ]	[ ]	[ ]	.....	25.4.e)4)		
4.3.3	In building with standby generator that serves fire alarm system, capacity is sufficient to maintain the system in operation for at least six hours, plus at least 30 min. for an “evacuate” signal in all alarm zones.	[ ]	[ ]	[ ]	.....	25.4e)1) 25.4e)2)		
4.3.4	The normal or standby supply is indicated by a green indicator at main indicating equipment.	[ ]	[ ]	[ ]	.....	25.3c)		
4.3.5	Each of the normal supply and the standby supply is capable of supplying the largest load under normal, fire and fault conditions.	[ ]	[ ]	[ ]	.....			
4.4	<u>Control and Indicating Equipment</u>							
4.4.1	Alarm is given from the alarm sounder installed at building external upon fire detection.	[ ]	[ ]	[ ]	.....			
4.4.2	Direct telephone link (DTL) to service provider’s Computerized Fire Alarm Transmission System (CFATS) is connected. (Please state DTL no.: ..... .....)	[ ]	[ ]	[ ]	.....			

		Yes	No	N/A	Remarks	Reference	
						BS	CL
4.4.3	Other panel function works properly:						
	(a) alarm silence/reset.	[ ]	[ ]	[ ]	.....		
	(b) battery supply on. (if applicable)	[ ]	[ ]	[ ]	.....		
	(c) power on/failure indicator.	[ ]	[ ]	[ ]	.....		
	(d) direct link failure indicator. (if applicable)	[ ]	[ ]	[ ]	.....		
	(e) zone alarm/fault indicator.	[ ]	[ ]	[ ]	.....		
4.4.4	Detector solely using as actuating devices for fire service systems such as fire shutter, VAC control, fixed installations other than water, fixed installation using water, pressurization system, and smoke extraction systems are linked to the Computerized Fire Alarm Transmission System (CFATS) via DTL. (Remark: This linking is not mandatory.)	[ ]	[ ]	[ ]	.....		
4.4.5	For addressable type alarm annunciation panel, a facility/provision is provided so that individual detector can be tested without either sounding an alarm or requiring the complete system to be disabled to prevent such an alarm.	[ ]	[ ]	[ ]	.....		

		Yes	No	N/A	Remarks	Reference	
						BS	CL
<b>V. Documentation</b>							
5.1	The following equipment list and catalogues are provided (where applicable):						
	(a) alarm annunciation panel;	[ ]	[ ]	[ ]	.....		
	(b) repeater panels;	[ ]	[ ]	[ ]	.....		
	(c) detectors;	[ ]	[ ]	[ ]	.....		
	(d) manual call points;	[ ]	[ ]	[ ]	.....		
	(e) alarm sounders;	[ ]	[ ]	[ ]	.....		
	(f) visual fire alarm;	[ ]	[ ]	[ ]	.....		
	(g) fire resisting cables.	[ ]	[ ]	[ ]	.....		
5.2	FSD approval/listing by product certification bodies are provided for the following equipment:						1/2007
	(a) alarm annunciation panel;	[ ]	[ ]	[ ]	.....		
	(b) repeater panels;	[ ]	[ ]	[ ]	.....		
	(c) detectors;	[ ]	[ ]	[ ]	.....		
	(d) manual call points;	[ ]	[ ]	[ ]	.....		
	(e) alarm sounders;	[ ]	[ ]	[ ]	.....		
	(f) visual fire alarm with sounder.	[ ]	[ ]	[ ]	.....		
5.3	Testing certificates are provided for the fire resistant cables.	[ ]	[ ]	[ ]	.....		
5.4	Sound level measurement (including background noise) report for alarm sounders is provided.	[ ]	[ ]	[ ]	.....		
5.5	Calculation showing the required battery capacity is provided.	[ ]	[ ]	[ ]	.....		
5.6	Letter certifying the completion of the DTL to the FSCC/authorized service provider is provided.	[ ]	[ ]	[ ]	.....		

		Yes	No	N/A	Remarks	Reference	
						BS	CL
5.7	Confirmation or certification from panel manufacturer on the compatibility between the fire alarm control panel(s) and detectors is provided.	[ ]	[ ]	[ ]	.....		
5.8	As-fitted fire service installation drawings including the following are provided:						
	(a) schematic diagrams of the fire alarm and detection system;	[ ]	[ ]	[ ]	.....		
	(b) floor layout plans showing the location of detectors, devices, alarm annunciation panel and repeater panel(s) as applicable.	[ ]	[ ]	[ ]	.....		

Test witnessed by:

Signature: .....

Name of Responsible Engineer: .....

Name of FSI Contractor: .....

Company Chop: .....

Registration No.: RC1/..... and RC2/..... Date: .....

**Checklist for Fire Hydrant and Hose Reel Installation**

**I. REFERENCE**

Project: ..... FSD Ref.: .....  
 Type of Building: \*Domestic/Industrial/Godown/Others .....  
 Address: .....  
 FSI Drawing Ref. ....  
 The date of initial building plan submission to Building Authority .....  
 \*Delete whichever not applicable

	Yes	No	N/A	Remarks
<b>II. FSI DRAWINGS AGAINST BUILDING PLANS</b>				
FSD File Ref. ....				
2.1 Check nos. and locations of:				
2.1.1 Fire service inlets	[ ]	[ ]	[ ]	.....
2.1.2 Fire hydrants and hose reels	[ ]	[ ]	[ ]	.....
2.1.3 Fixed fire pumps	[ ]	[ ]	[ ]	.....
2.1.4 Intermediate booster pumps	[ ]	[ ]	[ ]	.....
2.1.5 Water tank and capacity	[ ]	[ ]	[ ]	.....
<b>III. PLUMBING LINE DIAGRAM</b>				
3.1 CHECK:				
3.1.1 Pippings are suitably connected to the fire pumps, fire hydrants, hose reels and fire service inlets.	[ ]	[ ]	[ ]	.....
3.1.2 Size of the rising mains are correct.	[ ]	[ ]	[ ]	.....
3.1.3 Size of the inter-connection header pipe(s) for fire service inlets is correct.	[ ]	[ ]	[ ]	.....
3.1.4 By-pass pippings for intermediate booster pumps.	[ ]	[ ]	[ ]	.....
3.1.5 FS appliance to be provided by FSD to test the system. (to be confirmed by FSD)	[ ]	[ ]	[ ]	.....
<b>IV. ON SITE INSPECTION</b>				
4.1 FIRE HYDRANT				
4.1.1 Outlets are of: Male round thread [ ] or Female instantaneous [ ]				
4.1.2 Adaptable to FSD equipment.	[ ]	[ ]	[ ]	.....
4.1.3 Individually controlled by wheel operated screw valve designed to open by counter-clockwise rotation.	[ ]	[ ]	[ ]	.....
4.1.4 The direction of opening engraved in both English and Chinese on the wheel of the valve.	[ ]	[ ]	[ ]	.....

	Yes	No	N/A	Remarks
4.1.5 Centre of coupling not less than 800 mm nor more than 1 200 mm above finished floor level.	[ ]	[ ]	[ ]	.....
4.1.6 Prominently sited [ ] or Recessed [ ]				
4.1.7 All round clearance to permit free use.	[ ]	[ ]	[ ]	.....
4.1.8 Not obstructing any door opening, or any exit route.	[ ]	[ ]	[ ]	.....
4.1.9 Not to be concealed by the leaves of an adjacent door when that door is opened.	[ ]	[ ]	[ ]	.....
4.1.10 Water supply is fed:				
By gravity [ ]				.....
From fixed fire pump [ ]				.....
4.2 HOSE REEL				
4.2.1 Hose reel drum is painted in red.	[ ]	[ ]	[ ]	.....
4.2.2 The drum is not less than 150 mm in diameter.	[ ]	[ ]	[ ]	.....
4.2.3 Internal bore of tubing is not less than 19 mm diameter.	[ ]	[ ]	[ ]	.....
4.2.4 Length of hose reel is not exceeding 30 metres in length.	[ ]	[ ]	[ ]	.....
4.2.5 Every part of the building can be reached by a nozzle.	[ ]	[ ]	[ ]	.....
4.2.6 Capable of projecting a 6-metre jet.	[ ]	[ ]	[ ]	.....
4.2.7 Orifice of nozzle is 4.5 mm.	[ ]	[ ]	[ ]	.....
4.2.8 Nozzle is fitted with simple two-way on/off valve and the valve is not spring loaded.	[ ]	[ ]	[ ]	.....
4.2.9 Control valves are of gate type or of simple two-way ball type.	[ ]	[ ]	[ ]	.....
4.2.10 Gate valves are closed by clockwise rotation.	[ ]	[ ]	[ ]	.....
4.2.11 Rising mains and associated pipework are not less than 40 mm nominal bore.	[ ]	[ ]	[ ]	.....
4.2.12 Pipes feeding individual hose reel are not less than 25 mm nominal bore.	[ ]	[ ]	[ ]	.....
4.2.13 Control valves are adjacent to the nozzles.	[ ]	[ ]	[ ]	.....
4.2.14 Nozzle and control valves are not more than 1 350 mm from the finished floor level.	[ ]	[ ]	[ ]	.....
4.2.15 Nozzle is housed in a glass-fronted cabinet secured under lock and key.	[ ]	[ ]	[ ]	.....
4.2.16 Striker is provided in the vicinity of the cabinet.	[ ]	[ ]	[ ]	.....
4.2.17 Suitable guide ring is provided to permit easy withdrawal of the hose reel tubing.	[ ]	[ ]	[ ]	.....
4.2.18 An operation instruction is affixed prominently adjacent to each hose reel.	[ ]	[ ]	[ ]	.....

	Yes	No	N/A	Remarks
4.2.19 The notice is clearly marked with the standard wordings in English and Chinese characters of at least 5 mm high in red letters on white background or vice versa.	[ ]	[ ]	[ ]	.....
4.2.20 Manual fire alarm call points are sited at a prominent position near the hose reels.	[ ]	[ ]	[ ]	.....
4.2.21 The manual fire alarm call points are not more than 1 200 mm above the finished floor level.	[ ]	[ ]	[ ]	.....
4.2.22 Upon actuation of any manual fire alarm call point in the building, the fixed fire pump shall come into operation regardless of the zoning of the fire alarm call point.	[ ]	[ ]	[ ]	.....
4.2.23 Door fitted to the hose reel cabinet.	[ ]	[ ]	[ ]	.....
4.2.23.1 Such doors cause no undue obstruction and no interference with any exit point when in open position.	[ ]	[ ]	[ ]	.....
4.2.23.2 Such doors cause no obstruction to the hose being run out in either directions.	[ ]	[ ]	[ ]	.....
4.2.23.3 Such doors bear the words "FIRE HOSE REEL" (消防喉轆) of at least 50 mm high.	[ ]	[ ]	[ ]	.....
4.2.23.4 No locking device is fitted to such doors.	[ ]	[ ]	[ ]	.....
4.2.23.5 Control valves and nozzles are sited in a discernible and accessible position of not more than 500 mm from the surface of the doors.	[ ]	[ ]	[ ]	.....
4.2.23.6 Operation instruction notice is affixed immediately below the words "FIRE HOSE REEL" on the outer surface of the door.	[ ]	[ ]	[ ]	.....
4.2.24 Hose reel of swinging cradle type.	[ ]	[ ]	[ ]	.....
4.2.24.1 When not in use the outer face of the reel is flush with the wall.	[ ]	[ ]	[ ]	.....
4.2.24.2 When required for use the cradle can be swung freely into the corridor or passage.	[ ]	[ ]	[ ]	.....
4.3 SUPPLY TANK				
4.3.1 Correct location and adequate capacity of water tank.	[ ]	[ ]	[ ]	.....
4.3.2 Refilling system is in efficient working order.	[ ]	[ ]	[ ]	.....
4.3.3 Fire Service Completion Advice issued.	[ ]	[ ]	[ ]	.....

4.4 FIXED FIRE PUMP

	Yes	No	N/A	Remarks
4.4.1 Mode of power for driving the pump is:				
4.4.1.1 Electricity [ ] or .....				
4.4.2 Secondary power supply provided.	[ ]	[ ]	[ ]	.....
4.4.2.1 If no, diesel engine driven standby pump provided.	[ ]	[ ]	[ ]	.....
4.4.3 Where the motive power for any pump is not electricity, alternative means of starting the pump manually, in addition to manual fire alarm call points, are provided.	[ ]	[ ]	[ ]	.....
4.4.4 Starting instructions for diesel driven pump are prominently displayed in the pump room.	[ ]	[ ]	[ ]	.....
4.4.5 No automatic means of stopping the pump, other than by switching off at the pump control installed near the pump.	[ ]	[ ]	[ ]	.....
4.4.6 Manual fire alarm call points are wired for starting the pump.	[ ]	[ ]	[ ]	.....
4.4.7 The pumps are duplicated for duty and standby use.	[ ]	[ ]	[ ]	.....
4.4.8 The fire pump starters are wired through a selector switch for duty and standby pump selection.	[ ]	[ ]	[ ]	.....
4.4.9 The standby pump is energized within 15 seconds upon failure of the duty pump.	[ ]	[ ]	[ ]	.....
4.4.10 The motor/engine for the pump is rated to give 20% more power in addition to the hydraulic power required for the rated flow of the system.	[ ]	[ ]	[ ]	.....
4.4.11 Pumps are permanently primed.	[ ]	[ ]	[ ]	.....
4.4.12 Non-return valve(s) are provided to prevent water backflow into the water tank.	[ ]	[ ]	[ ]	.....
4.4.13 The status of each fire pump comprising "Power Supply On", "Pump Running" and "Pump Failed" are monitored and displayed at the pump control panel in the pump room.	[ ]	[ ]	[ ]	.....
4.4.14 Such signals are repeated to:	[ ]	[ ]	[ ]	.....
Fire control centre [ ] or				
A status panel at the main entrance of the building [ ]				

	Yes	No	N/A	Remarks
4.4.15 All fire pumps are housed in suitable enclosures and designed solely for accommodating pumps for fire service installations.	[ ]	[ ]	[ ]	.....
4.4.16 Pump enclosures are laid clear of any exit or normal communication routes through the premises.	[ ]	[ ]	[ ]	.....
4.4.17 Pump enclosures are clearly marked in English and Chinese characters.	[ ]	[ ]	[ ]	.....
4.4.18 Pumps enclosures are suitably locked to prevent unauthorized tampering of the pumps.	[ ]	[ ]	[ ]	.....
4.4.19 Flow rate and pressure tested in accordance with Figure No. .... in ANNEX I.	[ ]	[ ]	[ ]	.....
Floor level of tested hydrant .....				
Flow(1/min): .....				
Pressure (kPa): .....				
4.4.20 Running and static pressure at any hydrant outlet not exceeding 850 kPa.	[ ]	[ ]	[ ]	.....
4.5 INTERMEDIATE BOOSTER PUMP	[ ]	[ ]	[ ]	.....
4.5.1 Height between the topmost hydrant and the lowest F.S. inlet (m): .....				
4.5.2 No. of rising main: .....				
4.5.3 Required aggregate flow (l/min):.....				
4.5.4 The pumps are duplicated for duty and standby use.	[ ]	[ ]	[ ]	.....
4.5.5 The standby pump is energized within 15 seconds upon failure of the duty pump.	[ ]	[ ]	[ ]	.....
4.5.6 Intermediate booster pump arrangements:—				
4.5.6.1 One set consisting of duty and standby to feed all rising mains in the same system.	[ ]	[ ]	[ ]	.....
4.5.6.2 Two/three pumps of same capacity using sequential starting as duty pumps with one standby to achieve required flow and pressure within 30 seconds.	[ ]	[ ]	[ ]	.....
4.5.7 The motors driving the pumps are rated to give 20% more power in addition to the hydraulic power required for the rated flow.	[ ]	[ ]	[ ]	.....
4.5.8 All pumps are permanently primed and electrically driven.	[ ]	[ ]	[ ]	.....
4.5.9 Pump continues to run irrespective of power interruption when start button is activated.	[ ]	[ ]	[ ]	.....

	Yes	No	N/A	Remarks
4.5.10 Start/stop push buttons with pump running indication light and buzzer provided adjacent to the fire service inlet.	[ ]	[ ]	[ ]	.....
4.5.11 The status of each fire pump comprising "Power Supply On", "Pump Running" and "Pump Failed" are monitored and displayed at the pump control panels in the pump enclosures.	[ ]	[ ]	[ ]	.....
4.5.12 Such signals are repeated to:	[ ]	[ ]	[ ]	.....
Fire control centre [ ] or				
A status panel at the main entrance of the building [ ]				
4.5.13 All fire pumps are housed in suitable enclosures and designed solely for accommodating pumps for fire service installations.	[ ]	[ ]	[ ]	.....
4.5.14 Pump enclosures are suitably locked and laid clear of any exit or normal communication routes through the premises.	[ ]	[ ]	[ ]	.....
4.5.15 Pump enclosures are clearly marked in English and Chinese characters.	[ ]	[ ]	[ ]	.....
4.5.16 The intermediate booster pump utilized as the fixed fire pump.	[ ]	[ ]	[ ]	.....
4.5.17 Flow rate and pressure tested in accordance with Figure No. .... in ANNEX I. Floor level of tested hydrant: ..... Flow (l/min):..... Pressure (kPa): .....	[ ]	[ ]	[ ]	.....
4.5.18 Running and static pressure at any hydrant outlet not exceeding 850 kPa.	[ ]	[ ]	[ ]	.....
4.6 RISING MAIN				
4.6.1 The nominal bore of the rising main, in the case of industrial/godown buildings: Not less than 100 mm	[ ]	[ ]	[ ]	.....
Each rising main supplies two hydrant outlets per floor	[ ]	[ ]	[ ]	.....
4.6.2 The nominal bore of the rising main in other types of buildings: Not less than 80 mm	[ ]	[ ]	[ ]	.....
Each rising main supplies one hydrant outlet per floor	[ ]	[ ]	[ ]	.....

	Yes	No	N/A	Remarks
4.6.3 Provision of by-pass for intermediate booster pump.	[ ]	[ ]	[ ]	.....
4.6.4 All rising and down-coming mains are permanently primed.	[ ]	[ ]	[ ]	.....
4.6.5 Suitable air relief valves provided.	[ ]	[ ]	[ ]	.....
4.6.6 Each rising main is connected to a fire service inlet.	[ ]	[ ]	[ ]	.....
4.6.7 Header pipe(s) provided to connect the fire service inlets to the rising mains.	[ ]	[ ]	[ ]	.....
4.6.8 The diameter of the header pipe is:				
For industrial/godown buildings not less than 150 mm nominal bore	[ ]	[ ]	[ ]	.....
For other buildings not less than 100 mm nominal bore	[ ]	[ ]	[ ]	.....
4.6.9 For godown/industrial buildings, a rising main provided for each staircase with a fire service inlet.	[ ]	[ ]	[ ]	.....
4.6.10 Number and location of fire service inlets are conforming to latest approved building plan.	[ ]	[ ]	[ ]	.....
4.7 FIRE SERVICE INLET				
4.7.1 Suitably enclosed and protected.	[ ]	[ ]	[ ]	.....
4.7.2 Readily accessible by Fire Services personnel.	[ ]	[ ]	[ ]	.....
4.7.3 Centre of coupling not less than 600 mm nor more than 1 000 mm above ground level.	[ ]	[ ]	[ ]	.....
4.7.4 A non-return valve provided for each inlet.	[ ]	[ ]	[ ]	.....
4.7.5 Each inlet is affixed with a metal identification plate raised or engraved with English and Chinese characters.	[ ]	[ ]	[ ]	.....
4.7.6 The frontage of each inlet enclosure is clearly and permanently indicated in English and Chinese characters "FS INLET" (消防入水掣) of not less than 50 mm high.	[ ]	[ ]	[ ]	.....

V. *GENERAL COMMENTS & REMARKS*

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Test witnessed by:—

..... (Signature)

..... (Signature)

..... (Name in block letters)

FSI Contractor's Representative

..... (Name in block letters)

Fire Services Inspecting Officer

Date .....

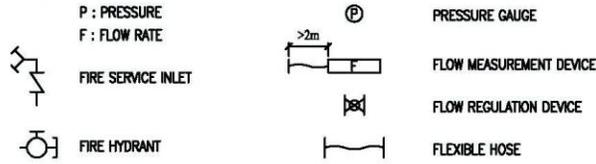
Date .....

## ANNEX I – FIGURES FOR EQUIPMENT ARRANGEMENT FOR TESTING OF FIRE PUMPS

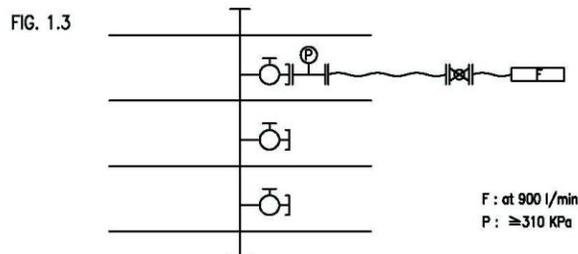
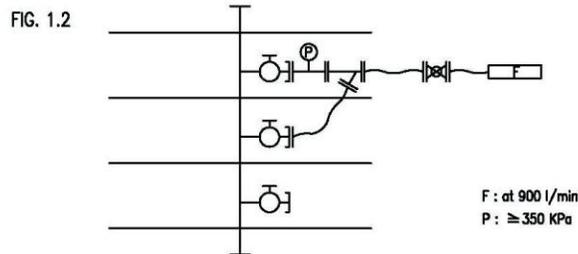
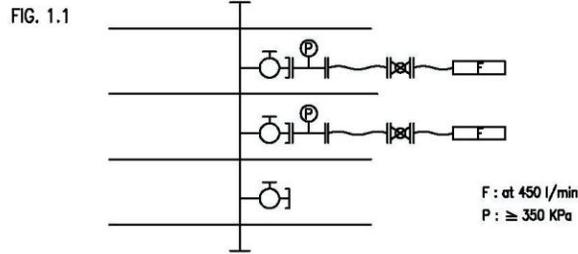
**GENERAL NOTES : –**

- (i) THE FLOW MEASURING DEVICE(S) MAY BE PLACED AT ROOF LEVEL FOR CONVENIENT DISCHARGE OF WATER.
- (ii) ALL HYDRANTS UNDER TEST SHALL BE FULLY OPENED.
- (iii) THE PRESSURE GAUGE SHALL BE SITUATED ADJACENT TO THE HYDRANT OUTLET UNDER TEST.

**LEGEND :**

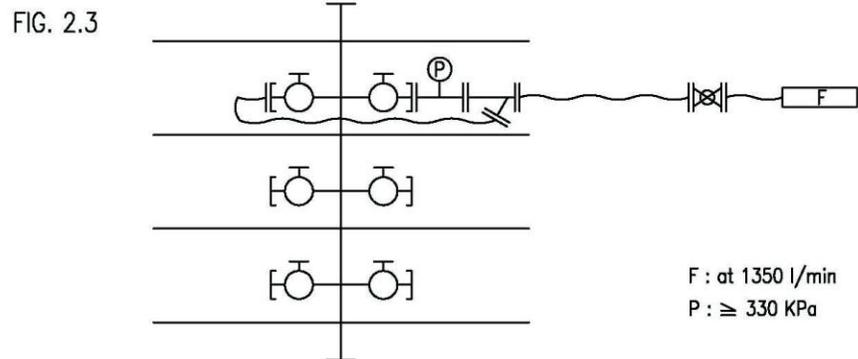
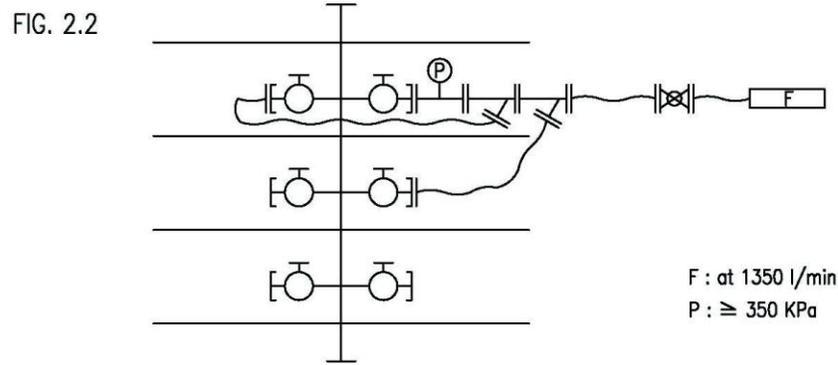
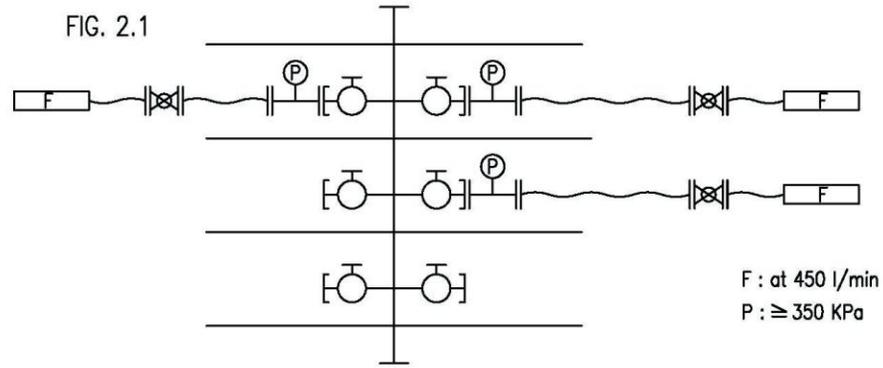


**1. FIXED FIRE PUMP** (BUILDINGS OTHER THAN INDUSTRIAL/ GODOWN – I.e. 900 l/min)  
(ANY OF THE FOLLOWING ARRANGEMENTS SHALL BE FOLLOWED)



## 2. FIXED FIRE PUMP (INDUSTRIAL / GODOWN BUILDINGS)

(ANY OF THE FOLLOWING ARRANGEMENTS SHALL BE FOLLOWED)



### 3. INTERMEDIATE BOOSTER PUMP (BUILDINGS OTHER THAN INDUSTRIAL/ GODOWN)

FIG. 3.1 DOMESTIC AND OTHER BUILDINGS WITH SINGLE RISING MAIN (900 l/min)  
TESTING EQUIPMENT TO BE ARRANGED IN ACCORDANCE WITH (1)

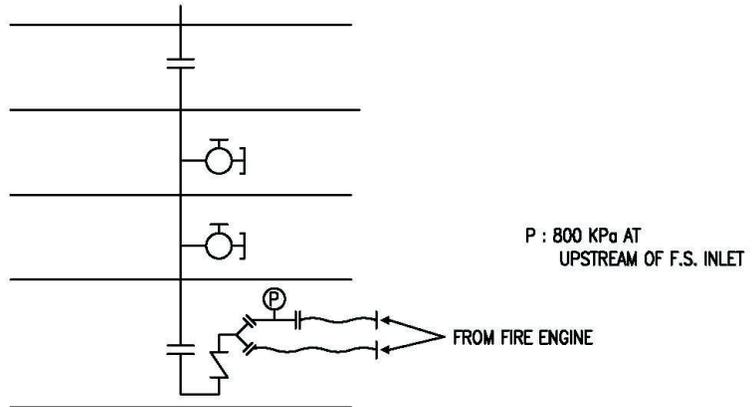
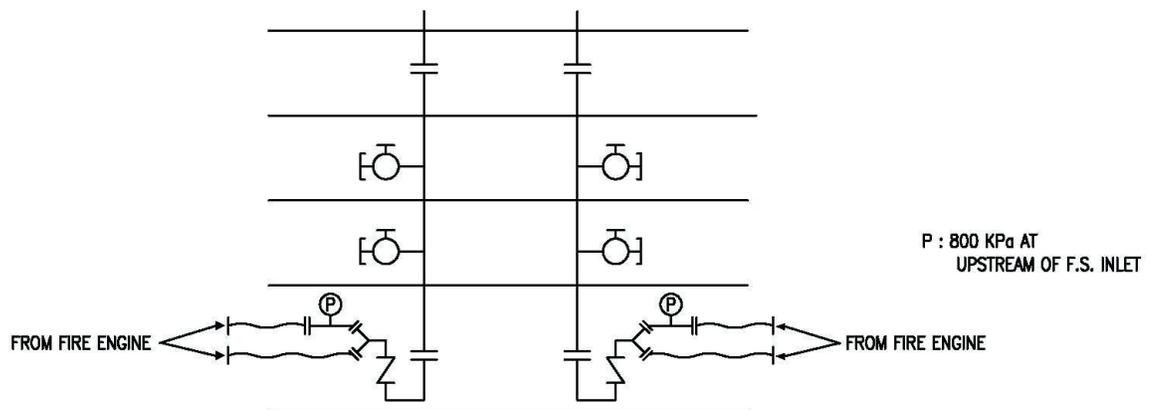


FIG. 3.2 OTHER BUILDINGS WITH TWO OR MORE RISING MAINS (1800 l/min)

TWO SETS OF RISING MAIN SHALL BE TESTED SIMULTANEOUSLY IN ACCORDANCE WITH (1)



4. INTERMEDIATE BOOSTER PUMP (INDUSTRIAL / GODOWN BUILDINGS)

FIG. 4.1 SINGLE RISING MAIN (1350 l/min)  
 TESTING EQUIPMENT TO BE ARRANGED IN ACCORDANCE WITH (2)

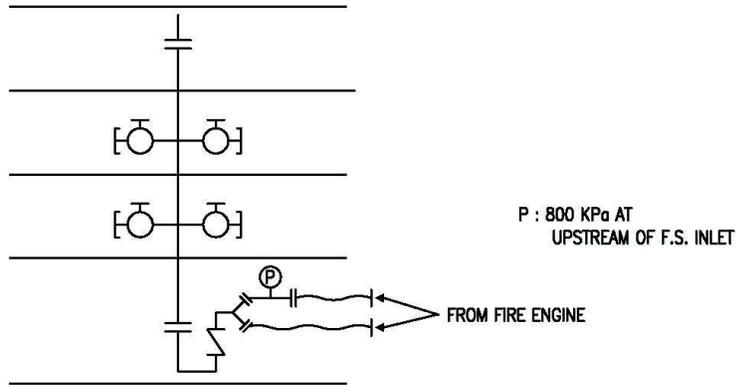
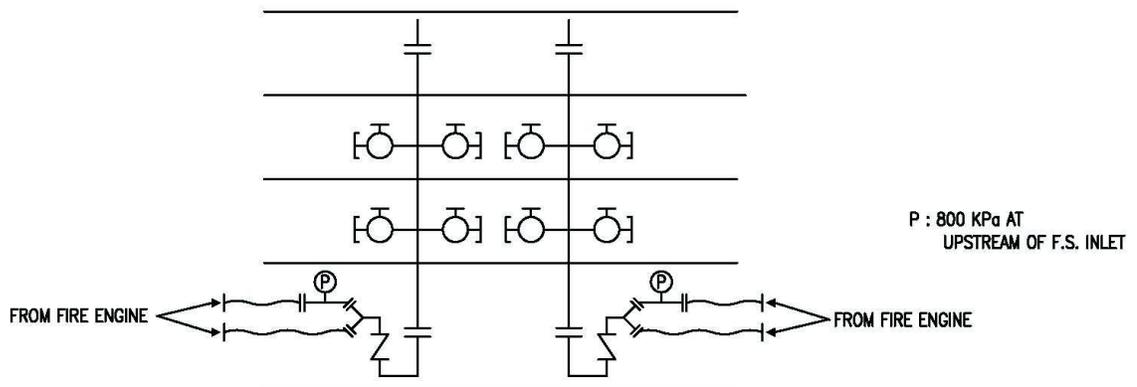


FIG. 4.2 TWO OR MORE RISING MAINS (2700 l/min)  
 TWO SETS OF RISING MAIN SHALL BE  
 TESTED SIMULTANEOUSLY IN ACCORDANCE WITH (2)



### Checklist for Staircase Pressurization System

#### Reference

Address: ..... FSD Ref.:  
 ..... FP 19/20/43/47/78\*.....

FSD Acceptance Letter/Approval Date: .....

FSI Working Drawing Ref. : .....

Approved Building Plan Ref.: ..... Dated: .....

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

##### 1.1 Measuring and testing instrument / equipment calibration

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

	<u>Type</u>	<u>Model No.</u>	<u>Serial No.</u>	<u>Calibration Cert. No.</u>	<u>Remarks</u>
a.	.....	.....	.....	.....	.....
b.	.....	.....	.....	.....	.....
c.	.....	.....	.....	.....	.....
d.	.....	.....	.....	.....	.....
e.	.....	.....	.....	.....	.....
f.	.....	.....	.....	.....	.....
g.	.....	.....	.....	.....	.....
h.	.....	.....	.....	.....	.....
i.	.....	.....	.....	.....	.....
j.	.....	.....	.....	.....	.....

##### 1.2 Documentation

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

##### 1.3 Staircase pressurization working drawings against building plans

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

*\* Delete as appropriate*

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

**2.1 Description**

- a. Designation of pressurized staircase  
 (The designation should be the same as building plan & FSI drawing & test report.) .....
- b. Pressurized space :- (Please tick as appropriate)
- Escape staircase; or
  - Fire fighting staircase
- c. Equipment to be provided :-
- Single fan with motor; or
  - Duplicate fans complete with motors; or
  - Single fan with duplicate motors
- d. Design air velocity passes through the door between pressurized space and accommodation area ..... m/s
- e. Design differential pressure between the pressurized space and accommodation ..... Pa
- f. Design door opening force ..... N ( $\leq 100N$ )

**2.2 Test report**

(All systems should be tested and endorsed by registered professional engineer before final test with Fire Services Inspecting Officer.)

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

**2.3 Visual inspection**

	Yes	No	N/A	Remarks
a. <u>Air intake</u> (Item a.1 to a.5 for air intake not located at roof floor )				
a.1 Notice in English & Chinese characters “Staircase pressurization intake for (pressurized space)” ((增壓空間)的樓梯增壓入風口) is provided.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	.....
a.2 Position of air intake is located away from any potential fire hazards (such as basement smoke vent).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	.....
a.3 Air duct is provided from the intake to the fan when air intake is distant from the fan.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	.....
a.4 A smoke detector of a type suitable for use in air duct / plenum is installed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	.....
a.5 Pressurization system can be shut down when the duct type smoke detector is activated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	.....
(Items a.6 to a.13 for air intake located at roof floor)				
a.6 Two air intakes, which spaced apart and facing different directions, are provided.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	.....

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

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

	Yes	No	N/A	Remarks
e. <u>Over pressure relief system</u>				
Type of over pressure relief system				
- Automatic opening of the external exit doors on operation of the fan (go to e1 – e2);	[ ]	or		
- Barometric pressure relief vents / damper (go to e3 – e5);	[ ]	or		
- Mechanical exhaust (go to e6 – e7).	[ ]			
e.1 Door lock, latch, bolt, push bar & etc. are not provided at the external exit doors	[ ]	[ ]	[ ]	-----
e.2 Warning label: “Over pressure relief door. Do not obstruct” (超壓時放壓門，不要阻塞) is provided in English and Chinese characters at the external exit doors	[ ]	[ ]	[ ]	-----
e.3 Wire mesh is provided at the external opening of relief vent / damper.	[ ]	[ ]	[ ]	-----
e.4 Relief vent / duct passed through other fire compartment is enclosed by fire rated material; the FRR should be same of pressurized space or the compartment through it passes, whichever is greater.	[ ]	[ ]	[ ]	-----
e.5 Free area of relief vent / damper “ $A_x \geq 0.16 \text{ m}^2$ x (total required airflow (m <sup>3</sup> /s) through the open doors – air supply satisfying the pressure differential requirement (m <sup>3</sup> /s) in pressurized space) *See equation (24) of section 14 of BS 5588: Part 4: 1988*	[ ]	[ ]	[ ]	-----
e.6 Fan can be activated by differential pressure sensor	[ ]	[ ]	[ ]	-----
e.7 Fan directly discharges to external or the discharge ductwork is constructed with fire rated material when passing through other fire compartment. The FRR of ductwork should be same as that of pressurized space or fire compartment passed, whichever is greater.	[ ]	[ ]	[ ]	-----
f <u>Electrical &amp; control</u>				
f.1 Electrical supplies for all equipment (such as fans, air relief damper, over pressure device, controller, supervisory panel & etc.) are fed from the same essential source.	[ ]	[ ]	[ ]	-----
f.2 Requirement of main switchboard and/or local control panel :-				
- Construction is complied with BS 5486 from not less than 2 mm panel steel and is installed in a room having ..... hour FRR (including self-closing doors) without other equipment installed therein; or	[ ]	[ ]	[ ]	-----
- All controls, starters, relays, etc. shall be suitable for continuous operation at 250°C for not less than 1 hour.	[ ]	[ ]	[ ]	-----
f.3 Requirement of power supply cable for pressurized system, controller, pressure sensor & etc.:-				
- BS 6387 Cat. CWZ ; or	[ ]			
- BS 6207 or BS EN 60702; or	[ ]			
- Other international standards acceptable to the Director of Fire Services; or	[ ]			
- Specification complying with criteria for exemption in Appendix 6 of FSD COP for Inspection, Testing and Maintenance of Installations and Equipment. (Items ----- )	[ ]			
f.4 Separate pressure differential system is provided for each pressurized system.	[ ]	[ ]	[ ]	-----
f.5 End of pressure sensing tube is properly terminated at the pressurized space and accommodation.	[ ]	[ ]	[ ]	-----
f.6 End of sensing tube is mechanically protected.	[ ]	[ ]	[ ]	-----

	Yes	No	N/A	Remarks
f.7 Label of “Sensing point of staircase pressurization system” (樓梯增壓系統感應點) is clearly indicated in English and Chinese characters.	[ ]	[ ]	[ ]	
f.8 Protection is provided along the sensing tube.	[ ]	[ ]	[ ]	
f.9 Power supplies for the differential pressure sensor, control, over pressure device, air release device are distributed from sub-circuit of staircase pressurization system.	[ ]	[ ]	[ ]	
f.10 Manual override switch provided on local fan control panel is locked in “Automatic control” position.	[ ]	[ ]	[ ]	
f.11 An indication signal is transmitted to supervisory control panel, when local fan control panel is in manual control mode.	[ ]	[ ]	[ ]	
g. <u>Construction work</u>				
g.1 Installations of door sets providing access to or from any pressurized space satisfy Building Authority’s requirements.	[ ]	[ ]	[ ]	
g.2 All doors, closers, hardware, etc. are capable of use in an atmosphere of 35°C & 100% R.H.	[ ]	[ ]	[ ]	
g.3 No supplementary gasket is provided to assist in preventing smoke leakage.	[ ]	[ ]	[ ]	
g.4 Door sets are installed in such a manner to be smoke leakage proof.	[ ]	[ ]	[ ]	
g.5 All joints between frames & building structure are provided with sealants in compliance with BS 476: Part 23.	[ ]	[ ]	[ ]	
g.6 Self-closing door closers are provided for all doors.	[ ]	[ ]	[ ]	
g.7 Finished sill under the closed doors is wear resistant.	[ ]	[ ]	[ ]	
h. <u>Functional test</u>				
h.1 Performance test is carried out and the result is satisfactory.	[ ]	[ ]	[ ]	
h.2 Measurement of door opening force is carried out and result is satisfactory.	[ ]	[ ]	[ ]	
h.3 Measurement of differential pressure across the pressurized space and accommodation is carried out and the result is satisfactory.	[ ]	[ ]	[ ]	
h.4 Measurement of pressurized air flow is carried out and the result is satisfactory.	[ ]	[ ]	[ ]	
h.5 Air intake fire/smoke damper is closed when the duct type smoke detector is activated;	[ ]	[ ]	[ ]	
or	[ ]	[ ]	[ ]	
Staircase pressurization system is shut down when the duct smoke detector at air intake is activated (for air intake only facing in one direction).	[ ]	[ ]	[ ]	
h.6 In order to prevent over pressure in pressurized space, fail safe protection for over pressure release is provided on conditions of :-				
- Failure of controller.	[ ]	[ ]	[ ]	
- Failure of pressure switch.	[ ]	[ ]	[ ]	
- Failure of wiring of pressure switch.	[ ]	[ ]	[ ]	
- Failure of actuator of by-pass damper.	[ ]	[ ]	[ ]	
- Failure of wiring of actuator (by-pass damper).	[ ]	[ ]	[ ]	
- Failure of over pressure exhaust fan.	[ ]	[ ]	[ ]	

	Yes	No	N/A	Remarks
h.7 Functional test of actuation				
- by building fire alarm system is in order. (Note: Manual fire alarm is not recommended for air relief system which is automatically controlled in the fire zones)	[ ]	[ ]	[ ]	
- by smoke detection system is in order.	[ ]	[ ]	[ ]	
- by sprinkler system is in order.	[ ]	[ ]	[ ]	
- by point type smoke detector mounted in the accommodation area adjacent to the doors (within 1 m) leading to the protected space at each storey served by the system is in order.	[ ]	[ ]	[ ]	
- by supervisory control panel when selected in manual mode is in order.	[ ]	[ ]	[ ]	
h.8 Functional test of response time				
The system is capable of achieving between 90% & 110% of the new volumetric requirements within 5 sec. of a door being opened or closed (for the over pressure release system by using variable supply fans or dampers).	[ ]	[ ]	[ ]	
h.9 Changeover from the duty equipment to the standby equipment is automatically operated when failure occurred in duty equipment.	[ ]	[ ]	[ ]	

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

3.1 The checklist is totally ..... pages (including attached copies of Section II for each additional staircase pressurization system).

3.2 Attached ..... number(s) of appendix.

Tested by :

Signature : .....

Name of Installation Contractor : .....

Company Chop : .....

Date : .....

Certified by :

Signature : .....

Full Name of Registered Professional Engineer : .....

Register Number of Engineer : .....

Company Chop : .....

Date : .....

### Checklist for Street Fire Hydrant System

#### I. REFERENCE

Project ..... FSD Ref. ....  
 Address ..... Location .....  
 ..... .....

#### II. TYPE OF SYSTEM

	Yes	No	N/A	Remarks
2.1 Supplied Directly from Town Main	[ ]	[ ]	[ ]	.....
2.2 Supplied from Gravity Tank	[ ]	[ ]	[ ]	.....
2.3 Supplied from Pumps and Tank	[ ]	[ ]	[ ]	.....
2.4 Supplied from Sea Water Pumps	[ ]	[ ]	[ ]	.....

#### III. LAYOUT CHECKING AGAINST APPROVED BUILDING PLANS

FSD Ref. of Approved Building Plans.....

	Tally with drawings?			Remarks
	Yes	No	N/A	
3.1 Quantity of street hydrants	[ ]	[ ]	[ ]	.....
3.2 Location of street hydrants	[ ]	[ ]	[ ]	.....
3.3 Location of pump room/enclosure	[ ]	[ ]	[ ]	.....
3.4 Location of tank	[ ]	[ ]	[ ]	.....
3.5 Tank capacity	[ ]	[ ]	[ ]	.....

#### IV. ON SITE INSPECTION

##### 4.1 GENERAL

4.1.1 Hydrant body is painted in red for fresh water system and in yellow for sea water system (with white band when fed directly from government trunk main).	[ ]	[ ]	[ ]	.....
4.1.2 For hydrant not in service, cap for 100mm outlet is painted in blue.	[ ]	[ ]	[ ]	.....
4.1.3 Each hydrant is equipped with a control valve.	[ ]	[ ]	[ ]	.....
4.1.4 Each hydrant is equipped with an isolating valve (applicable to system fed directly/indirectly from government main).	[ ]	[ ]	[ ]	.....
4.1.5 Spindle of underground hydrant valve is within 250 mm to 500 mm below valve pit cover.	[ ]	[ ]	[ ]	.....
4.1.6 Size of underground control valve pit cover is not greater than 300 mm x 300 mm with "FH" marking engraved on the surface.  (Remarks: Isolating valve pit cover shall conform to WSD standard.)	[ ]	[ ]	[ ]	.....

	Yes	No	N/A	Remarks
4.1.7 The valve pit of control valve is located between 1.5 m to 3 m from the street hydrant.	[ ]	[ ]	[ ]	.....
4.1.8 The valve pit of control valve is located outside the designated emergency vehicular access.	[ ]	[ ]	[ ]	.....
4.1.9 V-shaped arrow head (100 mm high and 50 mm wide) pointing toward the control valve is painted on hydrant top (yellow arrow for red hydrant and red arrow for yellow hydrant).	[ ]	[ ]	[ ]	.....
4.1.10 The hydrant number with size not less than 75 mm is painted at the hydrant (in yellow for red hydrant and in red for yellow hydrant).	[ ]	[ ]	[ ]	.....
4.1.11 There is no obstruction within 1.5 m in front and on two sides of the hydrant.	[ ]	[ ]	[ ]	.....
4.1.12 Tank refilling system is in efficient working order (applicable to system with tank).	[ ]	[ ]	[ ]	.....
4.1.13 The number assigned for the hydrant shall be painted on the body facing the roadway with size not less than 75 mm (in yellow for red hydrant and in red for yellow hydrant).	[ ]	[ ]	[ ]	.....
4.2 PUMP (if provided)				
4.2.1 Duplicate pumps are provided for duty and standby use.	[ ]	[ ]	[ ]	.....
4.2.2 Mode of power for driving the pump is:				
4.2.2.1 Electricity [ ] or .....				
4.2.2.2 Secondary power supply provided.	[ ]	[ ]	[ ]	.....
4.2.2.3 If no, diesel engine driven standby pump provided.	[ ]	[ ]	[ ]	.....
4.2.2.4 Starting instruction for diesel engine driven pump are prominently displayed in the pump room enclosure.	[ ]	[ ]	[ ]	.....
4.2.3 No automatic means of stopping the pump other than by switching off at the pump room/enclosure.	[ ]	[ ]	[ ]	.....
4.2.4 For duplicate electric motor driven pump arrangement, the pump starters are wired through a selector switch for duty and standby pump selection.	[ ]	[ ]	[ ]	.....
4.2.5 The motor/engine for the pump is rated to give 20% more power in addition to the hydraulic power required for the rated flow of the system.	[ ]	[ ]	[ ]	.....
4.2.6 Pumps are permanently primed.	[ ]	[ ]	[ ]	.....

	Yes	No	N/A	Remarks
4.2.7 Non-return valve(s) are provided to prevent water backflow into the water tank if provided.	[ ]	[ ]	[ ]	.....
4.2.8 All pumps are housed in suitable room/enclosure designed solely for accommodating pumps or equipment for fire service installations.	[ ]	[ ]	[ ]	.....
4.2.9 Pump room/enclosure are laid clear of any exit or normal communication routes through the premises.	[ ]	[ ]	[ ]	.....
4.2.10 Pump room/enclosure is clearly marked in English and Chinese characters.	[ ]	[ ]	[ ]	.....
4.2.11 Pump room/enclosure is suitably locked to prevent unauthorised tampering.	[ ]	[ ]	[ ]	.....
4.3 SUPPLY TANK (if provided)				
4.3.1 Water tank and its capacity are clearly marked in English and Chinese characters.	[ ]	[ ]	[ ]	.....
4.3.2 Fire Service Completion Advice issued.	[ ]	[ ]	[ ]	.....
4.3.3 For system where the tank bottom is more than 20m above the outlet coupling of the lowest street hydrant, a bypass pipe (of the same size as the pump suction pipe) is provided at the pump suction and discharge pipe. (Please see Figure C in Annex I)	[ ]	[ ]	[ ]	.....

## V. SYSTEM TESTING

(applicable to system with pumps)

5.1 The pump starts automatically upon opening of any hydrant outlet.	[ ]	[ ]	[ ]	.....
5.2 Other than the jockey pump, the pump can only be stopped manually at the pump room, once started.	[ ]	[ ]	[ ]	.....
5.3 The standby pump is energized within 15 seconds upon failure of the duty pump.	[ ]	[ ]	[ ]	.....
5.4 For diesel engine driven pump, the operation of the pump starting pressure switch is not affected by mains power failure.	[ ]	[ ]	[ ]	.....
5.5 The status of each pump comprising "Power Supply On", "Pump Running" and "Pump Failed" are monitored and displayed at the pump room.	[ ]	[ ]	[ ]	.....
5.6 The pump status signals are repeated to: Fire control centre	[ ]	or		
A status panel at the building main entrance	[ ]	or		.....

	Yes	No	N/A	Remarks
5.7 Tank refilling system is in efficient working order (applicable to system with tank).	[ ]	[ ]	[ ]	.....

VI. FIELD MEASUREMENTS

- 6.1 Flow rate and pressure tested in accordance with Figure ..... in Annex I.
- 6.2 When discharging at two 65mm outlets simultaneously:  
 Flow at one 65mm outlet (l/min) : .....  
 Running Pressure (kPa) : .....

VII. GENERAL COMMENTS & REMARKS

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Test witnessed by:

.....(Signature)

.....(Signature)

.....(Name in block letters)

.....(Name in block letters)

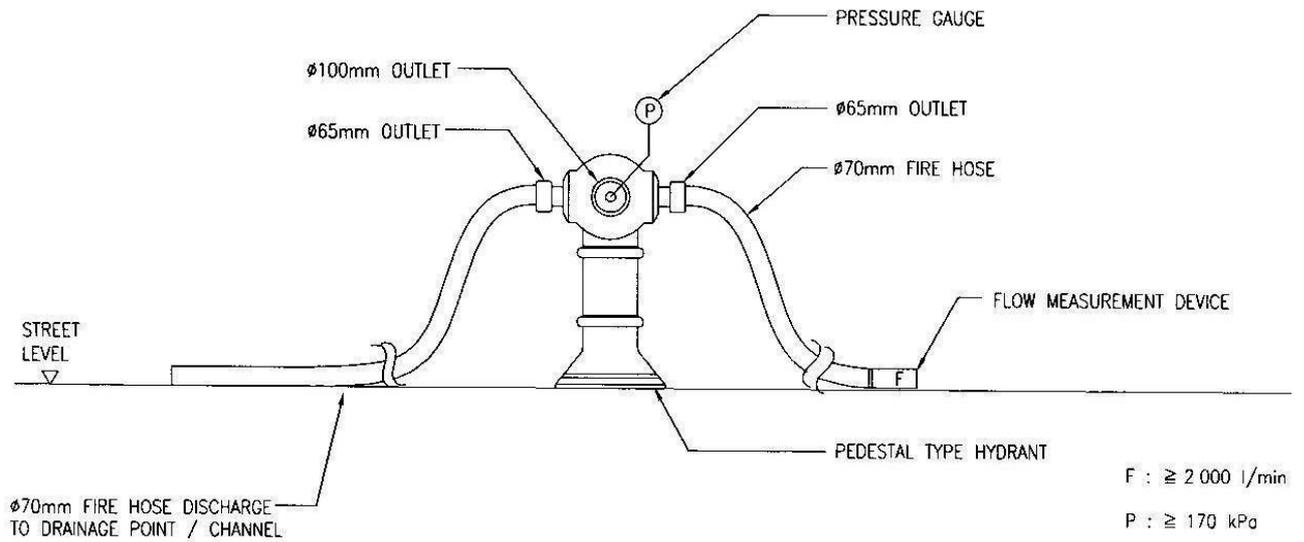
FSI Contractor's Representative

Fire Services Inspecting Officer

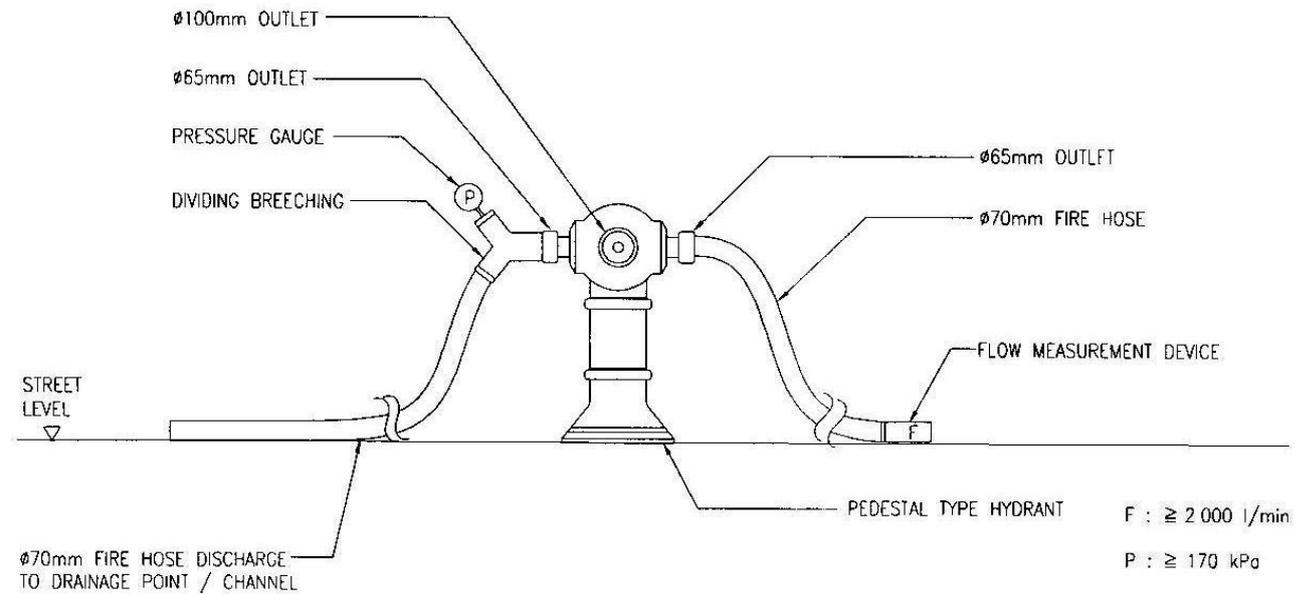
Date.....

Date.....

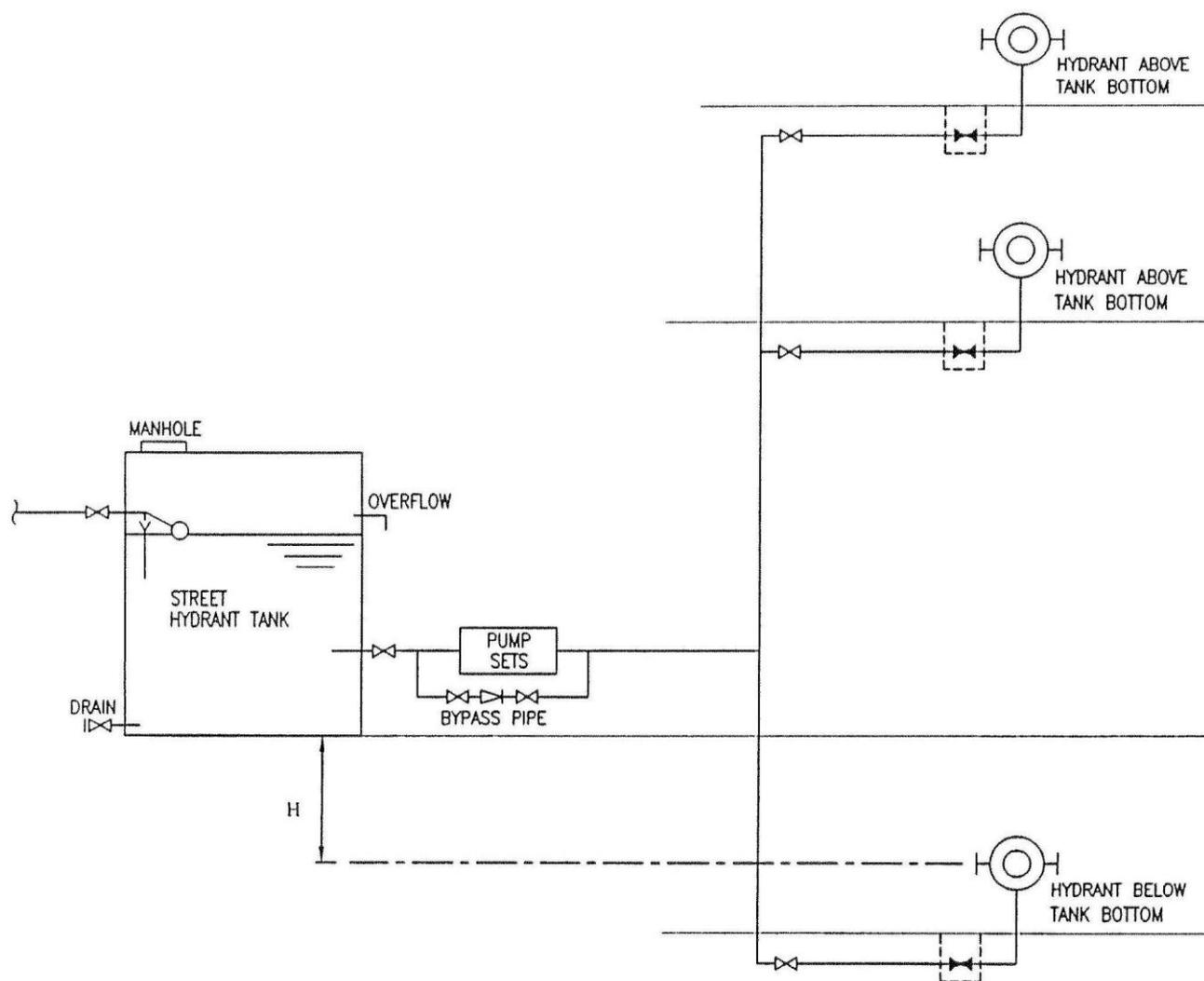
**FIGURES FOR EQUIPMENT ARRANGEMENT FOR TESTING OF PEDESTAL STREET HYDRANT  
(2 OPTIONS TO SUIT SITE CONDITIONS)**



**FIGURE A**



**FIGURE B**



**FIGURE C**

(SCALE: N.T.S.)

**NOTES:**

- (1) "H" IS THE HEIGHT DIFFERENCE BETWEEN THE TANK BOTTOM AND THE CENTRE LINE OF THE OUTLET COUPLING OF THE LOWEST STREET HYDRANT IN THE SYSTEM.
- (2) IF  $H > 20\text{m}$  , THEN A BYPASS PIPE IS REQUIRED AT THE PUMP SETS.

### Minimum Fire Resisting Cable Requirements for Fire Service Installations

Item	Type of Fire Service Installations	Minimum Cable Requirements
1.	Audio/visual advisory systems	Power supply cables to conform with: (a) BS 6387 Cat. AWP or SWX; or (b) BS 6207 or BS EN 60702; or (c) Other international standards acceptable to the Director of Fire Services.
2.	Automatic fixed installations (other than sprinkler systems) using water	
3.	Deluge systems	
4.	Drencher systems	
5.	Fire alarm systems	
6.	Fire hydrant/hose reel systems	
7.	Fixed foam systems	
8.	Ring main systems with fixed pumps	
9.	Water spray systems	
10.	Emergency generators	Power supply cables (from emergency generator to main switchboard) to conform with: (a) BS 6387 Cat. CWZ; or (b) BS 6207 or BS EN 60702; or (c) Other international standards acceptable to the Director of Fire Services.
11.	Fireman's lifts	Power supply cables (from the main switchboard to the main switch for lift power circuit and car lighting etc., in the lift machine room) to conform with: (a) BS 6387 Cat. CWZ; or (b) BS 6207 or BS EN 60702; or (c) Other international standards acceptable to the Director of Fire Services.
12.	Pressurization of staircases	Power supply cables to conform with: (a) BS 6387 Cat. CWZ; or (b) BS 6207 or BS EN 60702; or (c) Other international standards acceptable to the Director of Fire Services.

Item	Type of Fire Service Installations	Minimum Cable Requirements
13.	Smoke extraction systems	<p>Power supply cables to conform with:</p> <p>(a) BS 6387 Cat. CWZ; or</p> <p>(b) BS 6207 or BS EN 60702; or</p> <p>(c) Other international standards acceptable to the Director of Fire Services.</p> <hr/> <p>Control cables to conform with:</p> <p>(a) BS 6387 Cat. AWX or SWX; or</p> <p>(b) BS 6207 or BS EN 60702; or</p> <p>(c) Other international standards acceptable to the Director of Fire Services.</p>

Remarks:

Cables under any of the following conditions may be exempted from the above minimum requirements:-

- (a) Cables installed and terminated in switch/plant room;
- (b) Cables inside concealed metallic or PVC conduits which are embedded by plaster/concrete to a depth of at least 12 mm;
- (c) Cables inside underground cable ducts or reinforced concrete cable trenches;
- (d) Cables embedded in the soil to a depth of at least 300 mm;
- (e) Cables within fire resisting cable ducts and are not mixed with other services (e.g. switchgear, etc); the fire resistance rating of cable ducts to be not less than that of the building compartment; or
- (f) Cables inside metallic flexible conduits not exceeding 2 m for final connection to fire service equipment.

## **Shutdown of Fire Service Installations for Inspection, Maintenance, Modification or Repair**

### Reporting of shutdown of fire service installations (FSI) for inspection, maintenance, modification or repair

1. When a Registered Fire Service Installation Contractor (RFSIC) is employed to repair defective FSI and the repair is expected to be carried out *overnight or for more than 24 hours continuously*, the RFSIC should notify the Fire Services Department (FSD) of the defect(s) as soon as possible after the defect(s) is/are identified literally within 24 hours.
2. When a RFSIC is employed to maintain, modify or repair an FSI which has to be shut down *overnight or for more than 24 hours continuously*, the RFSIC should notify the FSD at least 7 calendar days prior to the commencement of work. Should the period between the date of confirmation that the RFSIC has been employed to carry out the work and the date of commencement of work be less than 7 calendar days, the RFSIC should notify the Fire Services Department (FSD) within 24 hours after such confirmation.
3. If extension of the shutdown period is required, the RFSIC should issue a fresh notification to the FSD before the previous scheduled date of completion. However, if there are changes in the extent and/or portion of the affected system(s), the notification procedure as stated in paragraphs 1 and 2 should be followed.
4. Notification to the FSD as mentioned in paragraphs 1, 2 and 3 should be made by fax using the form attached in **Annex I**. The date of commencement, the anticipated date of completion of the work and the reason(s) for the shutdown of the FSI should be provided. The Fire Services Communications Centre (FSCC) will upon receipt of the form, stamp an FSD serial number on the form and send a copy of the stamped form to the RFSIC. A sample is in **Annex II**.

### Preventative measures to mitigate the risk during the works period when any FSI is defective or shut down for inspection, maintenance, modification or repair

5. In addition to the notification mechanism set out in paragraphs 1, 2 and 3, the

following guidelines should be observed by the RFSIC concerned when an FSI is expected to be shut down *overnight or for more than 24 hours continuously* for the purpose of work:

- (a) The residents / occupants / property management company should be notified of the shutdown of the FSI, the date of commencement and the anticipated date of completion of the maintenance / modification / repair.
- (b) Simple and standardized graphical notices detailing the shutdown of the FSI should be posted at prominent locations. A sample of such notice is attached in **Annex III** for compliance.
- (c) The disruption to the normal operation of the FSI caused by maintenance, modification or repair should be kept to the minimum. A systematic approach should be adopted in carrying out the work. The affected FSI should be shut down by sections and be resumed normal as soon as practicable. The impact on the protection afforded by the system should be reduced to the minimum and kept as low as reasonably practicable. If the affected portion of the system cannot be reinstated to normal working condition by the end of a working shift, arrangements should be made for the portion to be isolated and the remainder of the system to be reinstated. Shutting down the whole system for a prolonged period should be avoided.
- (d) Stand-by means\* should be provided at suitable locations. The local fire station should be consulted on the scale of such provision. The local fire station / residents / occupiers / property management company, where appropriate, should be notified of the arrangements.  
*\*Stand-by means such as fire extinguishers, standalone smoke detectors, temporary firefighting water supply system, etc. should be provided according to the extent of fire risk and the area(s) being affected.*
- (e) Shutting down both fire hydrant/hose reel system and sprinkler system simultaneously should be avoided.
- (f) Whenever possible, water tanks of the affected / unaffected systems should be topped up prior to the commencement of work.
- (g) Advice, where appropriate, should be given to the property management company concerned to:
  - (i) formulate an emergency plan;
  - (ii) patrol the affected areas (e.g. 24-hour manning, patrol at 15-minute intervals evidenced by making entries in a record book provided thereat);
  - (iii) designate named personnel to undertake specified tasks, including

monitoring the progress of repair work, report to the Police / FSD upon the detection of a fire, etc.;

- (iv) place / install additional fire fighting and/or detection equipment with an alarm sounding function such as fire extinguishers, standalone smoke detectors, temporary firefighting water supply system, etc in the affected area(s);
- (v) arrange sufficient trained staff for operating the FSI / portable equipment and executing the emergency plan;
- (vi) inspect and review passive and active fire protection measures, including fire doors, gaseous extinguishing systems and portable fire extinguishers. Neither obstruction nor impairment of the available FSI should be allowed;
- (vii) display suitable notices at prominent locations about the shutdown of the systems;
- (viii) reduce the stock level of goods, in particular, those highly combustible ones (e.g. flimsy paper products, paints, etc);
- (ix) suspend any activities that generate sparks, hot molten droplets in the affected areas; and
- (x) maintain good house keeping.

for official use:-  
 fax to FSITF/LC  
 fax to Fire Station

To : FSCC  
 致 : 消防通訊中心  
 Fire Services Department 消防處  
**Fax No. : 2311 0066**  
 傳真號碼

Date: \_\_\_\_\_  
 日期  
 FSD File No. : \_\_\_\_\_  
 消防處檔案編號 (If known 如果知道)

## Notification to FSD on the Occasion that Building FSI is Shut Down for Work

### 樓宇消防裝置因工程而關閉通知書

#### Part I 第一部

Building Name 樓宇名稱	:	_____
Building Address 樓宇地址	:	_____
(Hong Kong 香港 / Kowloon 九龍 / New Territories 新界)		
Incorporated Owners (I.O.):	YES / NO	I.O. Tel. No. : _____
業主立案法團	有 沒有	業主立案法團電話
FSI Required to be Shut Down 需關閉的消防裝置 :		
<input type="checkbox"/> Fire Hydrant / Hose Reel System 消防栓 / 喉轆系統	<input type="checkbox"/> Street Fire Hydrant 街上消防栓(私家街井)	<input type="checkbox"/> Fire Detection System (AFA) 火警偵測系統
<input type="checkbox"/> Automatic Sprinkler System 花灑系統	<input type="checkbox"/> Water Spray System 噴水系統	<input type="checkbox"/> Manual Fire Alarm System 火警警報系統
<input type="checkbox"/> Others 其他 (Please specify 請註明): _____		
Reason for Shutdown 關閉原因 :	<input type="checkbox"/> Defective 損壞	<input type="checkbox"/> Others 其他 (Please specify 請註明): _____
Brief Description of Work 工程簡述 : _____		
Portion(s) of FSI Involved : 受影響消防裝置部份	_____	Portion(s) of Building Involved : 受影響樓宇部份: _____
Date Commenced : 開始日期	_____	Estimated Completion Date : 預計完工日期 _____
Date of Contract for Repair/Maintenance 獲得維修/保養合約的日期 : _____		
The following standby measures will be provided at the following locations 以下備用設備將會放置在下列位置 :		
The following parties have been notified of the arrangement 有關安排已通知下列人士 :		
<input type="checkbox"/> Residents 居民 <input type="checkbox"/> Occupiers 佔用人 <input type="checkbox"/> Management Company 物業管理公司 <input type="checkbox"/> Incorporated Owners 業主立案法團		
Name of FSI / Work Contractor : 消防裝置 / 工程承辦商名稱	_____	<b>Signature &amp; Company Chop</b> 簽名及公司印
Registration No. (FSI Contractor Only) : 承辦商級別 / 編號 (祇適用於消防裝置承辦商)	_____	
Contact Tel. No. : 聯絡電話	_____ (Office 寫字樓) _____ (Mobile Phone 手提電話 / Pager 傳呼機)	
Fax No. 傳真號碼 :	_____	
* The local fire station will contact you for arrangement of inspection and discussion of the proposed contingency measures. 有關消防局將會聯絡你, 安排巡查及討論建議的應變措施。		

#### Part II 第二部 - Extension of the Shutdown Period for Work 工程延期通知

The above FSI has to be shut down until _____ (date) due to _____ 以上消防裝置需關閉至_____ (日期)。原因: _____	<b>Signature &amp; Company Chop</b> 簽名及公司印
---	---

#### Part III 第三部 (To be completed upon full or partial completion of work and faxed to FSCC again) 在全部或部份完工時請填寫此欄, 然後再傳真到消防通訊中心

#Full/Partial Completion of Work #全部/部份完工 (#Delete whichever not applicable 刪除不適用) Date 日期 : _____ FSI 消防裝置 : _____	<b>Signature &amp; Company Chop</b> 簽名及公司印
---	---

Remark: FSCC will confirm receipt of this notification by returning it by fax which is stamped with an FSD serial number.  
 備註: 消防通訊中心會以加上編號蓋印的回覆傳真確認收妥這份通知書。

RECEIVED

S/N : \_\_\_\_\_

FSCC/FSD

for official use:-  
 fax to FSITF/LC  
 fax to Fire Station

Annex II

To : FSCC  
 致 : 消防通訊中心  
 Fire Services Department 消防處

Fax No. : 2311 0066

傳真號碼

Date : \_\_\_\_\_  
 日期  
 FSD File No. : \_\_\_\_\_  
 消防處檔案編號 (If known 如果知道)

## Notification to FSD on the Occasion that Building FSI is Shut Down for Work

### 樓宇消防裝置因工程而關閉通知書

#### Part I 第一部

Building Name 樓宇名稱	:	_____
Building Address 樓宇地址	:	_____
(Hong Kong 香港 / Kowloon 九龍 / New Territories 新界)		
Incorporated Owners (I.O.) : YES / NO	I.O. Tel. No. :	_____
業主立案法團 有 沒有	業主立案法團電話	_____
FSI Required to be Shut Down 需關閉的消防裝置 :		
<input type="checkbox"/> Fire Hydrant / Hose Reel System 消防栓 / 喉轆系統	<input type="checkbox"/> Street Fire Hydrant 街上消防栓(私家街井)	<input type="checkbox"/> Fire Detection System (AFA) 火警偵測系統
<input type="checkbox"/> Automatic Sprinkler System 花灑系統	<input type="checkbox"/> Water Spray System 噴水系統	<input type="checkbox"/> Manual Fire Alarm System 火警警報系統
<input type="checkbox"/> Others 其他 (Please specify 請註明): _____		
Reason for Shutdown 關閉原因 :	<input type="checkbox"/> Defective 損壞	<input type="checkbox"/> Others 其他 (Please specify 請註明): _____
Brief Description of Work 工程簡述 : _____		
Portion(s) of FSI Involved : 受影響消防裝置部份	_____	Portion(s) of Building Involved : 受影響樓宇部份: _____
Date Commenced : 開始日期	_____	Estimated Completion Date : 預計完工日期 _____
Date of Contract for Repair/Maintenance 獲得維修/保養合約的日期 : _____		

The following standby measures will be provided at the following locations 以下備用設備將會放置在下列位置 :

The following parties have been notified of the arrangement 有關安排已通知下列人士 :

Residents 居民  Occupiers 佔用人  Management Company 物業管理公司  Incorporated Owners 業主立案法團

Name of FSI / Work Contractor : 消防裝置 / 工程承辦商名稱	_____	<b>Signature &amp; Company Chop</b> 簽名及公司印
Registration No. (FSI Contractor Only) : 承辦商級別 / 編號 (祇適用於消防裝置承辦商)	_____	
Contact Tel. No. : 聯絡電話	_____ (Office 寫字樓)	
Fax No. 傳真號碼 : _____	_____ (Mobile Phone 手提電話 / Pager 傳呼機)	

\* The local fire station will contact you for arrangement of inspection and discussion of the proposed contingency measures.  
 有關消防局將會聯絡你，安排巡查及討論建議的應變措施。

#### Part II 第二部 - Extension of the Shutdown Period for Work 工程延期通知

The above FSI has to be shut down until _____ (date) due to _____	<b>Signature &amp; Company Chop</b> 簽名及公司印
以上消防裝置需關閉至_____ (日期)。原因: _____	

#### Part III 第三部 (To be completed upon full or partial completion of work and faxed to FSCC again) 在全部或部份完工時請填寫此欄，然後再傳真到消防通訊中心

#Full/Partial Completion of Work #全部/部份完工 (#Delete whichever not applicable 刪除不適用)	<b>Signature &amp; Company Chop</b> 簽名及公司印
Date 日期 : _____ FSI 消防裝置 : _____	

Remark: FSCC will confirm receipt of this notification by returning it by fax which is stamped with an FSD serial number.  
 備註: 消防通訊中心會以加上編號蓋印的回覆傳真確認收妥這份通知書。

← 不少於 30 厘米 →

## 消防裝置維修工程通告



由 年 月 日至 年 月 日  
將進行消防裝置維修／檢查工程，  
下列消防裝置須暫停操作。

承辦商名稱： \_\_\_\_\_

緊急聯絡電話： \_\_\_\_\_

下列消防裝置將暫停操作（請刪除不適合項目）：

不少於  
42 厘米

- 消防栓／喉轆系統  （涉及樓層／部份 \_\_\_\_\_）
- 花灑系統  （涉及樓層／部份 \_\_\_\_\_）
- 火警警報系統  （涉及樓層／部份 \_\_\_\_\_）
- 火警偵測系統  （涉及樓層／部份 \_\_\_\_\_）
- 應急照明系統  （涉及樓層／部份 \_\_\_\_\_）
- 其他（請註明） \_\_\_\_\_

如發生火警，請立即致電999及通知物業管理處職員

**Statutory Requirements for Maintenance, Inspection and Repair of FSI and Examination, Testing and Certification of Gas Cylinders Used as FSI**

<b>Installation / Equipment</b>	<b>Type of Maintenance Work</b>	<b>Person Authorized by FSD for Maintenance Work</b>
FSI (other than portable equipment)	Annual inspection	RFSIC
	Maintenance / Repair	Class 1 <i>and/or</i> Class 2
Pressure cylinder <sup>1</sup> of an FSI	Hydraulic pressure test every 5 years	Approved Person <sup>3</sup> for examination, testing and certification of gas cylinders
	Charging	Person holding a licence for the manufacture of relevant dangerous goods
Portable equipment <sup>2</sup>	Annual inspection	RFSIC Class 3
	Hydraulic pressure test every 5 years	
	Refilling of extinguishing agent and/or charging of fire extinguishers <i>other than</i> CO <sub>2</sub> gas and clean agent fire extinguishers	
	Charging of CO <sub>2</sub> gas and clean agent fire extinguishers	Supplier of portable equipment (Person holding a licence for the manufacture of relevant dangerous goods)

**Remarks:**

1. Required to be approved by FSD under r.64 of the Dangerous Goods (General) Regulations, Cap. 295B
2. Required to be approved under r.3 of the Fire Service (Installations and Equipment) Regulations, Cap. 95B
3. List of Approved Persons for examination, testing and certification of gas cylinders to be referred to FSD webpage :  
*[http://www.hkfsd.gov.hk/home/eng/source/approved\\_person\\_66\\_67\\_DGO.pdf](http://www.hkfsd.gov.hk/home/eng/source/approved_person_66_67_DGO.pdf)*

**Notes on Fire Extinguishers, Fire Blankets and Sand Buckets  
(Suitability and Maintenance)**

**I. CARBON DIOXIDE TYPE EXTINGUISHERS**

Use:

On electrical fires, flammable liquids, delicate equipment, important documents, or fires in confined spaces.

Note:

Vapours will asphyxiate. Withdraw to open air after use.

Maintenance:

This type of extinguisher should be examined every 12 months and the following maintenance carried out:-

- (i) The total weight should be checked against that recorded when the extinguisher was put into service. If a loss of weight of more than 10 per cent is detected, the extinguisher should be discharged and returned to the supplier for examination, test and recharging.
- (ii) The body of the extinguisher should be examined and, if there are signs of damage or extensive external corrosion, the extinguisher should be discharged and returned to supplier for examination, test and recharging.
- (iii) The discharge horn and hose should be checked to see that it moves freely and should be replaced if damaged is detected.
- (iv) Hydraulic pressure test should be carried out every five years on the cylinder in accordance with the manufacturer's instructions. Extreme care should be exercised when preparing and conducting the test.
- (v) Unserviceable extinguisher should be discharged prior to disposal.

## II. WATER TYPE EXTINGUISHERS

Use:

On fires involving woods, textiles and paper.

Never:

On fires involving electrical or flammable liquids or metals.

Maintenance:

This type of extinguisher should be examined every 12 months and the following maintenance carried out:-

(GAS-CARTRIDGE TYPE)

- (i) The vent holes in the cap should be checked for cleanliness and free from obstruction.
- (ii) Remove the headcap to check the liquid level. The liquid should be topped up as necessary.
- (iii) The nozzle, strainer and internal discharge tube should be checked for cleanliness and free from obstruction. Defective items shall be replaced.
- (iv) The gas cartridge should be weighed and the weight checked against that marked on the cartridge. The cartridge should be renewed if a loss of more than 10 per cent of the contents is recorded.
- (v) No corrosion, damage or rust should be visible either externally or internally. Special attention should be paid to the concealed parts of the container.
- (vi) Before the headcap is replaced and while the gas cartridge is unscrewed therefrom, the plunger or other operating device should be checked to see that it operates freely. The washer should be examined and replaced if necessary. The cap should then be tightly screwed to the container to form a gas-tight joint.
- (vii) Test 50 per cent of extinguishers by discharge every year in rotation so that all extinguishers are tested by discharge every two years. Should any extinguisher fail in the test, all cartridges in the remainder should be replaced. Extreme care should be exercised during preparing and conducting discharge test. Prior to discharging, the container should be ensured in good condition such as no corrosion, damage or rust should be visible externally or internally on any part of the container; otherwise hydraulic pressure test should then be carried out to confirm the container structurally sound. Should there be doubt about the condition of the container, hydraulic pressure test shall be conducted instead.
- (viii) Corroded parts should be cleaned up and refinished after the hydraulic pressure test.
- (ix) Hydraulic pressure test should be carried out every five years on the container in accordance with the manufacturer's instructions. Extreme care should be exercised when preparing and conducting the test.

- (x) Before carrying out hydraulic pressure test, remove the headcap, disconnect the gas cartridge and clear the contents. Never empty the contents by discharging the extinguisher.
- (xi) Also, before disposal of unserviceable fire extinguisher, remove the headcap, disconnect the gas cartridge and clear the contents. Never empty the contents by discharging the extinguisher.

(STORED-PRESSURE TYPE)

- (i) The pressure indicating device should be checked to see the correct pressure is being maintained within the extinguisher body.
- (ii) The nozzle or branch-pipe (if fitted) and the pressure releasing valve in the cap should be checked for cleanliness and free from obstruction. Defective items shall be replaced.
- (iii) No corrosion, damage or rust should be visible externally on any part of the container. Special attention should be paid to the concealed parts of the container.
- (iv) Test 50 per cent of extinguishers by discharge every year in rotation so that all extinguishers are tested by discharge every two years. Should any extinguisher fail in the test, all extinguishers should be overhauled and recharged.
- (v) Prior to recharging, the container should be ensured in good condition such as no corrosion, damage or rust was noted; otherwise hydraulic pressure test should be conducted to confirm the container structurally sound.
- (vi) Hydraulic pressure test should be carried out every five years on the container in accordance with the manufacturer's instructions. Extreme care should be exercised when preparing and conducting the test.
- (vii) Unserviceable extinguisher should be discharged prior to disposal.

### III. DRY POWDER TYPE EXTINGUISHERS

Use:

On most fires, flammable liquids, metal fires or electrical fires.

Maintenance:

This type of extinguisher should be examined every 12 months and the following maintenance carried out:-

(GAS-CARTRIDGE TYPE)

- (i) The vent holes in the cap should be checked for cleanliness and free from obstruction.
- (ii) The extinguisher should be weighed to check that it contains the correct weight of powder. The weight when fully charged should be recorded at the time of charging. If the weight is found to have dropped by more than 10 per cent, the dry powder should be replaced by a fresh charge. Care should be taken not to mix different types of dry powder because they could react with one another.
- (iii) The powder should be agitated to ensure it is free from caking.
- (iv) Remove the headcap to check the condition of powder. The chemical should be renewed if it is not in good condition.
- (v) The nozzle and discharge control (if fitted) should be checked for cleanliness and free from obstruction. Defective items shall be replaced.
- (vi) The gas cartridge should be weighed and the weight checked against that marked on the cartridge. The cartridge should be renewed if a loss of more than 10 per cent of the contents is recorded.
- (vii) No corrosion, damage or rust should be visible either externally or internally. Special attention should be paid to the concealed parts of the container.
- (viii) Before the headcap is replaced and while the gas cartridge is unscrewed therefrom, the plunger or other operating device should be checked to see that it operates freely. The washer should be examined and replaced if necessary. The cap should then be tightly screwed to the container to form a gas-tight joint.
- (ix) Test 50 per cent of extinguishers by discharge every year in rotation so that all extinguishers are tested by discharge every two years. Should any extinguisher fail in the test, all cartridges in the remainder should be replaced. Extreme care should be exercised during preparing and conducting discharge test. Prior to discharging, the container should be ensured in good condition such as no corrosion, damage or rust should be visible externally or internally on any part of the container; otherwise hydraulic pressure test should then be carried out to confirm the container structurally sound. Should there be doubt about the condition of the container, hydraulic pressure test shall be conducted instead.
- (x) Corroded parts should be cleaned up and refinished after the hydraulic pressure test.

- (xi) Hydraulic pressure test should be carried out every five years on the container in accordance with the manufacturer's instructions. Extreme care should be exercised when preparing and conducting the test.
- (xii) Before carrying out hydraulic pressure test, remove the headcap, disconnect the gas cartridge and the dry powder should be collected for subsequent re-cycling/disposal. Never empty the contents by discharging the extinguisher.
- (xiii) Also, before disposal of unserviceable fire extinguisher, remove the headcap, disconnect the gas cartridge and the dry powder should be collected for subsequent re-cycling/disposal. Never empty the contents by discharging the extinguisher.

(STORED-PRESSURE TYPE)

- (i) The extinguisher should be weighed to check it contains the correct weight of powder. If the weight is found to have dropped by more than 10 per cent, the dry powder should be replaced by a fresh charge. Care should be taken not to mix different types of dry powder because they could react with one another.
- (ii) The pressure indicating device should be checked to see the correct pressure is being maintained within the extinguisher body.
- (iii) The nozzle or branch-pipe (if fitted) and the pressure releasing valve in the cap should be checked for cleanliness and free from obstruction. Defective items shall be replaced.
- (iv) No corrosion, damage or rust should be visible externally on any part of the container. Special attention should be paid to the concealed parts of the container.
- (v) Test 50 per cent of extinguishers by discharge every year in rotation so that all extinguishers are tested by discharge every two years. The dry powder should be discharged to an enclosure for collection and subsequent re-cycling/disposal. Should any extinguisher fail in the test, all extinguishers should be overhauled and recharged.
- (vi) Prior to recharging, the container should be ensured in good condition such as no corrosion, damage or rust was noted; otherwise hydraulic pressure test should be conducted to confirm the container structurally sound.
- (vii) Hydraulic pressure test should be carried out every five years on the container in accordance with the manufacturer's instructions. Extreme care should be exercised when preparing and conducting the test.
- (viii) Unserviceable extinguisher should be discharged prior to disposal. The dry powder should be discharged to an enclosure for collection and subsequent re-cycling/disposal.

NOTE:

- (a) Dry powder extinguishers must be thoroughly dry internally before they are recharged.
- (b) Advice should be obtained from the Fire Services Department as to the possible reaction between the powder or expellant and the material protected.

#### IV. CLEAN AGENT FIRE EXTINGUISHERS

Use:

On electrical fires, flammable liquids, delicate equipment, important documents.

Maintenance:

This type of extinguisher should be examined every 12 months and the following maintenance carried out:-

##### (PORTABLE TYPE)

- (i) The pressure indicating device should be checked to see the correct pressure is being maintained within the extinguisher body.
- (ii) The extinguisher should be weighed to check against the total weight record when it is put into service. If a loss of weight of more than 10 per cent is detected, the extinguisher should be discharged to a closed recycling system and returned to the supplier for examination, test and recharging.
- (iii) The nozzle or branch-pipe (if fitted) and the pressure releasing valve in the cap should be checked for cleanliness and free from obstruction. Defective items shall be replaced.
- (iv) No corrosion, damage or rust should be visible externally on any part of the container. Special attention should be paid to the concealed parts of the container.
- (v) If there are signs of damage or external corrosion, the extinguisher should be discharged to a closed recycling system and returned to the supplier for examination, test and recharging.
- (vi) Hydraulic pressure test should be carried out every five years on the container in accordance with the manufacturer's instructions. Extreme care should be exercised when preparing and conducting the test.
- (vii) Unserviceable extinguisher should be discharged to a closed recycling system prior to disposal.

##### (FIXED SPRAYER UNIT)

- (i) The pressure indicating device (if fitted) should be checked to see the correct pressure is being maintained within the extinguisher body.
- (ii) The extinguisher should be weighed to check against the total weight record when it is put into service. If a loss of weight of more than 10 per cent is detected, the extinguisher should be discharged to a closed recycling system and returned to the supplier for examination, test and recharging.
- (iii) The deflector and the sensing element should be checked and cleaned.
- (iv) No corrosion, damage or rust should be visible externally on any part of the container. Special attention should be paid to the concealed parts of the container.

- (v) If there are signs of damage or external corrosion, the extinguisher should be discharged to a closed recycling system and returned to the supplier for examination, test and recharging.
- (vi) Hydraulic pressure test should be carried out every five years on the container in accordance with the manufacturer's instructions. Extreme care should be exercised when preparing and conducting the test.
- (vii) Unserviceable extinguisher should be discharged to a closed recycling system prior to disposal.

## V. FOAM (CHEMICAL) TYPE EXTINGUISHERS

Use:

On fires involving flammable liquids.

Never:

On electrical fires.

Maintenance:

This type of extinguisher should be examined every 12 months and the following maintenance carried out:-

- (i) The nozzle and the vent holes in the cap should be checked for cleanliness and free from obstruction.
- (ii) Remove the headcap to check the liquid levels in the body and in the inner container. Any slight loss may be made up with water; otherwise a new charge should be used.
- (iii) No corrosion, damage or rust should be visible either externally or internally. Special attention should be paid to the concealed parts of the container.
- (iv) Before the headcap is replaced, the plunger, the headcap lever for the sealing device or other operating device should be checked to see that it operates freely. The washer should be replaced if necessary and the cap should then be tightly screwed to the container to form a gas-tight joint.
- (v) Test 50 per cent of extinguishers by discharge every year in rotation so that all extinguishers are tested by discharge every two years. Should any extinguisher fail in the test, all should be tested by discharge. Extreme care should be exercised during preparing and conducting discharge test. Prior to discharging, the container should be ensured in good condition such as no corrosion, damage or rust should be visible externally or internally on any part of the container; otherwise hydraulic pressure test should then be carried out to confirm the container structurally sound. Should there be doubt in the condition of the container, hydraulic pressure test shall be conducted instead.
- (vi) Corroded parts should be cleaned up and refinished after the hydraulic pressure test.
- (vii) Hydraulic pressure test should be carried out every five years on the outer container in accordance with the manufacturer's instructions; the inner container should be examined to ensure it is in good condition and not leaking. Extreme care should be exercised when preparing and conducting the test.
- (viii) Before carrying out hydraulic pressure test, remove the headcap and clear the contents. Never empty the contents by discharging the extinguisher.
- (ix) Also, before disposal of unserviceable extinguisher, remove the headcap and clear the contents. Never empty the contents by discharging the extinguisher.

NOTE:

Inverted type chemical foam extinguishers have ceased production and not permitted for sale. However, products already sold may continued to be used.

## VI. FOAM (MECHANICAL) TYPE EXTINGUISHERS

Use:

On fires involving flammable liquids.

Never:

On electrical fires.

Maintenance:

This type of extinguisher should be examined every 12 months and the following maintenance carried out:-

(GAS-CARTRIDGE TYPE)

- (i) The vent holes in the cap should be checked for cleanliness and free from obstruction.
- (ii) Remove the headcap to check the liquid level. If the liquid level was found to have dropped by more than 10 per cent, the foam concentrate or foam solution as appropriate should be replaced by a fresh charge.
- (iii) The branchpipe, strainer and internal discharge tube should be checked for cleanliness and free from obstruction. Defective items shall be replaced.
- (iv) The gas cartridge should be weighed and the weight checked against that marked on the cartridge. The cartridge should be renewed if a loss of more than 10 per cent of the contents is recorded.
- (v) No corrosion, damage or rust should be visible either externally or internally. Special attention should be paid to the concealed parts of the container.
- (vi) Before the headcap is replaced and while the gas cartridge is unscrewed therefrom, the plunger or other operating device should be checked to see that it operates freely. The washer should be examined and replaced if necessary. The cap should then be tightly screwed to the container to form a gas-tight joint.
- (vii) Test 50 per cent of extinguishers by discharge every year in rotation so that all extinguishers are tested by discharge every two years. Should any extinguisher fail in the test, all cartridges in the remainder should be replaced. Extreme care should be exercised during preparing and conducting discharge test. Prior to discharging, the container should be ensured in good condition such as no corrosion, damage or rust should be visible externally or internally on any part of the container; otherwise hydraulic pressure test should then be carried out to confirm the container structurally sound. Should there be doubt about the condition of the container, hydraulic pressure test shall be conducted instead.
- (viii) Corroded parts should be cleaned up and refinished after the hydraulic pressure test.
- (ix) Hydraulic pressure test should be carried out every five years on the container in accordance with the manufacturer's instructions. Extreme care should be exercised when preparing and conducting the test.

- (x) Before carrying out hydraulic pressure test, remove the headcap, disconnect the gas cartridge and clear the contents. Never empty the contents by discharging the extinguisher.
- (xi) Also, before disposal of unserviceable fire extinguisher, remove the headcap, disconnect the gas cartridge and clear the contents. Never empty the contents by discharging the extinguisher.

(STORED-PRESSURE TYPE)

- (i) The pressure indicating device should be checked to see the correct pressure is being maintained within the extinguisher body.
- (ii) The nozzle or branch-pipe (if fitted) and the pressure releasing valve in the cap should be checked for cleanliness and free from obstruction. Defective items shall be replaced.
- (iii) No corrosion, damage or rust should be visible externally on any part of the container. Special attention should be paid to the concealed parts of the container.
- (iv) Test 50 per cent of extinguishers by discharge every year in rotation so that all extinguishers are tested by discharge every two years. Should any extinguisher failed in the test, all extinguishers should be overhauled and recharged.
- (v) Prior to recharging, the container should be ensured in good condition such as no corrosion, damage or rust was noted; otherwise hydraulic pressure test should be conducted to confirm the container structurally sound.
- (vi) Hydraulic pressure test should be carried out every five years on the container in accordance with the manufacturer's instructions. Extreme care should be exercised when preparing and conducting the test.
- (vii) Unserviceable extinguisher should be discharged prior to disposal.

## VII. FIRE BLANKETS

Use:

On fires involving flammable liquids, such as small fires in the kitchen and laboratory.

Method for Use:

Drape the blanket over the flames to seal off air. Switch off heat and leave in position until cool.

Maintenance:

This blanket should be examined every 12 months or after use in fire. The following maintenance should be carried out:-

- (i) Check for any deterioration.
- (ii) Cleaning in accordance with the manufacturer's instructions as when necessary.
- (iii) If manufacturer's instructions are not available, fire blanket can be washed (soak overnight in detergent, gently hand rinse in warm water). Do not machine wash or dry clean.

REMARKS:

- (i) Fire blankets are classified into two categories, namely:-  
    “Heavy Duty” fire blankets (BS 7944:1999); and  
    “Light Duty” fire blankets (BS EN 1869:1997)
- (ii) Only “Heavy Duty” and “reusable” fire blankets will be approved as a Fire Services standard requirement.
- (iii) “Light Duty” fire blankets may be accepted for use on a private basis and should be disposed of after use.

## **VIII. SAND BUCKETS**

Use:

On fires involving flammable liquids.

Method for Use:

Pour the content in the bucket over spilled flammable liquids to control the flow of spilled flammable liquids.

Maintenance:

Sand bucket should be examined every 12 months or after use in fire. The following maintenance should be carried out:-

### **(METAL SAND BUCKET)**

- (i) The condition of metal sand bucket together with its cover should be examined.
- (ii) Repaint in red colour and re-label in English and Chinese where necessary.
- (iii) Seriously corroded unit should be replaced.
- (iv) Check the sand level inside the bucket and refill the bucket where necessary.
- (v) Wet sand should be dried up.

### **(PLASTIC SAND BUCKET)**

- (i) The condition of plastic sand bucket together with its cover should be examined.
- (ii) Re-label in English and Chinese where necessary.
- (iii) Deteriorated unit should be replaced.
- (iv) Check the sand level inside the bucket and refill the bucket where necessary.
- (v) Wet sand should be dried up.

**IX. SAMPLE MAINTENANCE LABEL (保養標籤樣本)**

