CODES OF PRACTICE

FOR

MINIMUM FIRE SERVICE INSTALLATIONS AND EQUIPMENT

AND

INSPECTION, TESTING AND MAINTENANCE OF INSTALLATIONS AND EQUIPMENT

JUNE 1998

First issue	:	February 1964
1st revision	:	March 1966
2nd revision	:	August 1970
3rd revision	:	April 1977
4th revision	:	November 1979
5th revision	:	November 1980
6th revision	:	August 1982
7th revision	:	March 1987
8th revision	:	September 1990
9th revision	:	March 1994
This revision	:	June 1998

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PART I

GENERAL

1.1 Title

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

1.2 Definitions

"Building" means

As defined in Buildings Ordinance Cap. 123.

"Cubical Extent" means

The space contained within the external surfaces of 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.

"Natural Venting of Staircases" means

As an alternative to pressurisation of staircase by provision of venting of smoke from staircase in accordance with Section 2 of BS 5588: Part 5: 1991 in particular paras. 8.4(*a*), (*b*) and (*h*) and the latest version 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 Means of Escape 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

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

1.4 Approval of plans for building works

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

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

(i) that, having regard to the purpose to which the building is intended to be put (which purpose shall be stated in the certificate), no fire service installation or equipment is necessary in connection with the building that will result from the carrying out of the building works shown on the plans; or

(ii) that the plans have been examined and are approved by him as showing all such fire service installations and equipment as in his opinion, having regard to the purpose to which the building is intended to be put (which purpose shall be stated in the certificate), comprise the minimum fire service installations and equipment necessary for the building in accordance with the Code of Practice published from time to time by the Director of Fire Services".

1.5 Provisions of emergency vehicular access and street fire hydrants

When designing their projects, the Authorized Persons should take into account the provisions of emergency vehicular access and street fire hydrants for the development in addition to the fire service installations and equipment in the building(s).

1.6 Design of fireman's lift and firefighting and rescue stairway

Whilst the requirements for fireman's lift and firefighting and rescue stairway are included in this Code, it should be pointed out that these are formulated in accordance with Reg. 41B and 41C of the Building (Planning) (Amendment) Regulations 1995 and as such are not considered as fire service installations within the meaning of para 1.2 above.

1.7 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.

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 systems

Automatic actuating devices

Automatic fixed installations other than water

Automatic fixed installations using water

Deluge systems

Drencher systems

Dust detection systems

Dynamic smoke extraction systems

Emergency generators

Emergency lighting

Exit signs

Fire alarm systems

Fire control centre

Fire detection systems

Fire hydrant/hose reel systems

Fireman's lifts

Firefighting and rescue stairways

Fixed automatically operated approved appliances

Fixed foam systems

Gas detection systems

Gas extraction systems

Portable hand-operated approved appliances

Pressurization of staircases

Ring main systems with fixed pumps

Sprinkler systems

Static smoke extraction systems

Supply tank

Ventilation/air conditioning control systems

Water spray systems

Water supplies

2.2 Definition

"Audio/visual advisory systems" means

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

"Automatic actuating devices" means

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

"Automatic fixed installations other than water" means

A system of cylinders, pipes, valves, and delivery points so designed as to automatically detect and instantaneously attack a fire with an inert medium and sound an alarm (e.g. CO_2 protection of electrical equipment).

"Automatic fixed installations using water" means

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

"Deluge systems" means

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

"Drencher systems" means

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

"Dust detection systems" means

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

"Dynamic smoke extraction systems" means

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

"Emergency generators" means

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

"Emergency lighting" means

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

"Exit signs" means

Fixed illuminated signs indicating an approved exit route.

"Fire alarm systems" means

Any manually operated system designed to give warning of fire.

"Fire control centre" means

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

"Fire detection systems" means

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

"Fire hydrant/hose reel systems" means

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

"Fireman's lift(s)" means

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

"Firefighting and rescue stairway(s)" means

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

"Fixed automatically operated approved appliances" means

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

"Fixed foam systems" means

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

"Gas detection systems" means

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

"Gas extraction systems" means

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

"Portable hand-operated approved appliances" means

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

"Pressurization of staircases" means

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

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

"Ring main systems with fixed pump(s)" means

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

"Sprinkler systems" means

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

"Static smoke extraction systems" means

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

"Supply tank" means

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

"Ventilation/air conditioning control systems" means

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

"Water spray systems" means

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

"Water supplies" means

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

PART III

CLASSIFICATION OF PREMISES AND DEFINITIONS

3.1 Definition

"Audio/Visual Production Facilities" means

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

"Basement Storeys" means

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

"Car Parking Facilities" means

See "Car Port" and "Garage".

"Car Port" means

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

"Cold Storage Area" means

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

"Commercial Building" means

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

"Composite Building" means

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

(*a*) Domestic

(*b*) Commercial

(*c*) Institutional

(*d*) Hotel

"Curtain Walled Building" means

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

"Domestic Building" means

A building constructed or intended to be used for habitation.

"Garage" means

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

"Godown" means

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

"Group I" means

A designated area of special hazard normally within a building.

"Group II" means

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

"High Rise Building" means

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

"Hotel" means

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

"Industrial Building" means

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

(*a*) the making of any article or of part of any article; or

(*b*) the altering, repairing, ornamenting, finishing, cleaning or washing or breaking up or demolition of any article; or

(*c*) the adapting for sale of any article being a building in which work is carried out by way of trade or for purposes of gain.

"Institutional Building" means

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

(*a*) Club premises

(*b*) Educational establishments

(*c*) Hostels

(*d*) Hospitals including mental institutions and clinics

(*e*) Prisons and similar corrective institutions

(*f*) Sanatoria

"Low Rise Building" means

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

"Mechanical plant rooms" means,

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

"Passenger Terminals/Station" means

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

"Refuge Floor" means

A protected floor that serves as a refuge for the occupants of the building to assemble in case of fire.

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

Lift Motor Rooms

Telephone Distribution Equipment, computer installation and similar installations

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

Aircraft Maintenance and repair facilities

Audio/Visual Production Facilities (Building(s) devoted to this purpose)

Bulk Fuel Storages

Chemical Manufacturing/Processing Plants

Cold Storage Areas (Building(s) devoted to this purpose)

Container Terminals, yards and freight stations

Curtain Walled Buildings

Dangerous Goods Stores (Range of D.G. Stores in an area devoted to this purpose)

Explosive Production and/or Storages
Mechanical Plant Room
Open Sites of Public Assembly
Petro-Chemical Complexes
Railway Marshalling Yards
Road Tunnels
Shipyards
Substation/Switchgear Buildings

Note: "Audio/Visual Production Facilities", "Cold Storage Areas" and "Dangerous Goods Stores" 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^2 of usable floor area
4.4 Basements which exceed 230 m^2 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^3 capacity)
4.12 Cold Storage Areas (Group I) Major (of and over 140 m^3 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 installations other than water

(iii) Automatic fixed installations using water

(iv) Dust detection systems

(v) Emergency generators

(vi) Emergency lighting

(vii) Exit signs

(viii) Fire alarm systems

(ix) Fire control centre

(x) Fire detection systems

(xi) Fire hydrant/hose reel systems

(xii) Fireman's lifts or firefighting and rescue stairways

(xiii) Fixed automatically operated approved appliances

(xiv) Fixed foam systems

(xv) Gas extraction systems

(xvi) Portable hand-operated approved appliances

(xvii) Ring main systems with fixed pump(s)

(xviii) Ventilation/air conditioning control systems

EXTENT

(i) As required by that equipment which needs to be automatically actuated.

(ii) To be provided to areas where the use of water is incompatible with the occupancy or trade.

(iii) In all areas excepting where covered by (ii) above, including staircases.

(iv) To be provided in all areas where there is a potential dust explosion hazard.

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

(vi) Emergency lighting shall be provided throughout the entire building and all exit routes leading to ground level.

(vii) Sufficient directional and exit signs to ensure that all exit routes from any floor within the buildings are clearly indicated as required by the configuration of staircases serving the buildings.

(viii) One actuating point and one audio warning device to be located at each hose reel point. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point should 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 to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.

(xii) As required by the Code of Practice for Means of Access for Firefighting and Rescue

(xiii) As required by occupancy.

(xiv) To be provided as an alternative to other fixed automatic systems, when required by Director of Fire Services.

(xv) Approved type for the part of building where flammable vapours may be generated, and to reduce the concentration below its lower explosive limit.

(xvi) As required by occupancy.

(xvii) To be required to cover those areas of such complexes not adequately served by public water mains.

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

ADDITIONAL REQUIREMENTS

(i) All linings for acoustic and thermal insulation purposes in ductings and concealed locations shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7 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 systems

(ii) Automatic actuating devices

(iii) Automatic fixed installations other than water

(iv) Automatic fixed installations using water

(v) Emergency generators

(vi) Emergency lighting

(vii) Exit signs

(viii) Fire alarm systems

(ix) Fire control centre

(x) Fire detection systems

(xi) Fire hydrant/hose reel systems

(xii) Portable hand-operated approved appliances

(xiii) Static or dynamic smoke extraction systems

(xiv) Ventilation/air conditioning control systems

EXTENT

(i) As required by the risk.

(ii) As required by that equipment which needs to be automatically actuated.

(iii) To be provided to areas where the use of water is undesirable for the occupancy or trade.

(iv) As required by the risk.

(v) An independently powered generator of sufficient electrical capacity to meet the essential services it is required to supply.

(vi) Emergency lighting shall be provided throughout the entire building and all exit routes leading to ground level.

(vii) Sufficient directional and exit signs to ensure that all exit routes from the premises within the buildings are clearly indicated as required by the configuration of staircases serving the building.

(viii) One actuating point and one audio warning device to be located at each hose reel point. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point should 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 to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.

(xii) As required by the risk.

(xiii) Required for any fire compartment exceeding 7 000 cubic metres where:

(*a*) the aggregate area of openable windows of the compartment does not exceed 6.25% of the floor area of that compartment, and

(*b*) the designed fire load of that compartment is likely to exceed 1 135 MJ/square metre.

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

ADDITIONAL REQUIREMENTS

(i) All linings for acoustic and thermal insulation purposes in ductings and concealed locations shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7 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 not exceeding 230 m^2 of usable floor area

REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:

(i) Automatic fixed installations other than water

(ii) Emergency lighting

(iii) Exit signs

(iv) Fire alarm systems

(v) Fire detection systems

(vi) Fire hydrant/hose reel systems

(vii) Portable hand-operated approved appliances

(viii) Ventilation/air conditioning control systems

EXTENT

(i) To be provided in areas of special risk.

(ii) Emergency lighting shall be provided throughout the entire basement area and all exit routes leading to ground level.

(iii) Sufficient directional and exit signs to ensure that all exit routes from the basement are clearly indicated as required by the configuration of staircases serving the basement.

(iv) One actuating point and one audio warning device to be located at each hose reel point. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point should 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 carparking areas, strong rooms and safe deposit vaults.

(vi) There shall be sufficient hydrants and hose reels to ensure that every part of the basement with the exception of strong rooms and safe deposit vaults can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.

(vii) As required by occupancy.

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

ADDITIONAL REQUIREMENTS

(i) All linings for acoustic and thermal insulation purposes in ductings and concealed locations shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7 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.

4.4 Basements which exceed 230 m^2 of usable floor area

REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:

(i) Audio/visual advisory systems

(ii) Automatic fixed installations other than water

(iii) Emergency lighting

(iv) Exit signs

(v) Fire alarm systems

(vi) Fire detection systems

(vii) Fire hydrant/hose reel systems

(viii) Firefighting and rescue stairways

(ix) Portable hand-operated approved appliances

(x) Pressurization of staircases

(xi) Sprinkler systems

(xii) Static or dynamic smoke extraction systems

(xiii) Ventilation/air conditioning control systems

EXTENT

(i) Required for any part or parts of building where the area occupied by any one single occupancy on any one floor exceeds 2 000 square metres AND where the occupants, due to their transient presence either as shoppers, audience or guests, are exposed to risks to require additional advice through such systems.

(ii) To be provided to areas where the use of water is undesirable for the occupancy or trade.

(iii) Emergency lighting shall be provided throughout the entire basement area and all exit routes leading to ground level.

(iv) Sufficient directional and exit signs to ensure that all exit routes from the basement are clearly indicated as required by the configuration of staircases serving the basement.

(v) One actuating point and one audio warning device to be located at each hose reel point. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point should 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 to ensure that every part of the basement with the exception of strong rooms and safe deposit vaults can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.

(viii) Required for basements of three or more levels, or as required by the Code of Practice for Means of Access for Firefighting and Rescue.

(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 Staircases in Pt. II provided that the number of pressurized staircases required shall not exceed the total number of staircases required by the Code of Practice for Means of Escape.

(xi) In all parts of the basements excepting strong rooms and safe deposit vaults and where covered by (ii) above.

(xii) Required for:

(*a*) any fire compartment exceeding 7 000 cubic metres where the designed fire load is likely to exceed 1135 MJ/m^2, or

(*b*) industrial basements, or

(*c*) basements of three or more levels except areas solely for carparking purposes.

(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.

4.5 Battery rooms and electrical charging facilities

REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:

(i) Automatic fixed installations other than water

(ii) Exit signs

(iii) Fire alarm systems

(iv) Fire detection systems

(v) Gas extraction systems

(vi) Portable hand-operated approved appliances

(vii) Ventilation/air conditioning control systems

EXTENT

(i) To be provided to areas where the use of water is undesirable for the risk.

(ii) Sufficient directional and exit signs to ensure that all exit routes from any floor within the premises are clearly indicated as required by the configuration of staircase serving the building.

(iii) One actuating point and one audio warning device to be located at all exit doorways. 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/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 installations other than water

(iii) Automatic fixed installation using water

(iv) Emergency lighting

(v) Exit signs

(vi) Fire detection systems

(vii) Fixed foam systems

(viii) Portable hand-operated approved appliances

EXTENT

(i) As required by that equipment which needs to be automatically actuated.

(ii) To be provided in gas/oil boiler rooms.

(iii) To be provided in gas/oil boiler rooms where automatic fixed installations 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 systems

(ii) Automatic actuating devices

(iii) Automatic fixed installations other than water

(iv) Emergency generators

(v) Emergency lighting

(vi) Exit signs

(vii) Fire alarm systems

(viii) Fire detection systems

(ix) Fire hydrant/hose reel systems

(x) Portable hand-operated approved appliance

(xi) Sprinkler systems

(xii) Ventilation/air conditioning control sytems

EXTENT

(i) Required for any part or parts of building where the area used for bowling alley on any one floor exceeds 2 000 square metres AND where bowlers and spectators, due to their transient presence, are exposed to risks to require additional advice through such systems.

(ii) As required by that equipment which needs to be automatically actuated.

(iii) To be provided to areas where the use of water is undesirable for the risk.

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

(v) Emergency lighting shall be provided throughout the entire premises and all exit routes leading to ground level.

(vi) Sufficient directional and exit signs to ensure that all exit routes from any floor within the building are clearly indicated as required by the configuration of staircases serving the building.

(vii) One actuating point and one audio warning device to be located at each hose reel point. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point should 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 to ensure that every part of the premises can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.

(x) As required by occupancy.

(xi) In all parts of the alleys and associated areas including staircases, 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 Institute of Petroleum

(ii) Automatic actuating devices

(iii) Automatic fixed installations other than water

(iv) Automatic fixed installations using water

(v) Emergency generators

(vi) Emergency lighting

(vii) Exit signs

(viii) Fire alarm systems

(ix) Fire control centre

(x) Fire detection systems

(xi) Fire hydrant/hose reel systems

(xii) Fixed automatically operated approved appliances

(xiii) Fixed foam systems

(xiv) Portable hand-operated approved appliances

(xv) Ring main systems with fixed pump(s)

EXTENT

(i) As considered necessary by Director of Fire Services.

(ii) As required by that equipment which needs to be automatically actuated.

(iii) To be provided to areas of special risk where the use of water is undesirable for the risk.

(iv) To be provided for the cooling and protection of products tanks, product pipelines and jetties.

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

(vi) Emergency lighting shall be provided throughout the entire building and all exit routes leading to ground level.

(vii) Sufficient directional and exit signs to ensure that all exit routes from any floor within the buildings are clearly indicated as required by the configuration of staircases serving the buildings.

(viii) One actuating point and one audio warning device to be located at each hose reel point. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point should 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 to ensure that every part of the buildings can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.

(xii) As required by occupancy.

(xiii) To be provided as an alternative to other fixed automatic systems, when required by the Director of Fire Services.

(xiv) As required by occupancy.

(xv) To be provided to cover those areas of such complexes, not adequately served by public water mains.

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

4.9 Car ports

REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:

(i) Exit signs

(ii) Fire alarm systems

(iii) Fire hydrant/hose reel systems

(iv) Fireman's lifts

(v) Portable hand-operated approved appliances

EXTENT

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

(ii) As required by the risk. If required, visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access.

(iii) As required by the risk.

(iv) As required by the Code of Practice for Means of Access for Firefighting and Rescue.

(v) 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 installations other than water

(iii) Automatic fixed installation using water

(iv) Dust detection systems

(v) Emergency generators

(vi) Emergency lighting

(vii) Exit signs

(viii) Fire alarm systems

(ix) Fire control centre

(x) Fire detection systems

(xi) Fixed automatically operated approved appliances

(xii) Fixed foam systems

(xiii) Gas detection systems

(xiv) Gas extraction systems

(xv) Portable hand-operated approved appliances

(xvi) Ring main systems with fixed pump(s)

(xvii) Special Equipment/requirements

(xviii) Ventilation/air conditioning control systems

EXTENT

(i) As required by that equipment which needs to be automatically actuated.

(ii) To be provided to areas where the use of water is undesirable for the risk.

(iii) In all areas excepting where covered by (ii) above, including staircases.

(iv) To be provided in all areas where there is a potential dust explosion hazard.

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

(vi) Emergency lighting shall be provided to all buildings within the premises and in addition, such lighting shall also be provided to ensure adequate external illumination to permit safe evacuation to the outside of the site boundary.

(vii) Sufficient directional and exit signs to ensure that all exit routes from any floor within the buildings are clearly indicated as required by the configuration of the staircases serving the buildings.

(viii) One actuating point and one audio warning device to be located at each hose reel point within the buildings. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point should 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 not adequately served by public water mains.

(xvii) As required by the Director of Fire Services.

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

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

ADDITIONAL REQUIREMENT

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

4.11 Cold storage areas (Group I) minor (under 140 m^3 capacity)

REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:

(i) Portable hand-operated approved appliances.

EXTENT

(i) As appropriate to the plant and construction.

ADDITIONAL REQUIREMENTS

(i) All linings for acoustic and thermal insulation purposes in ductings and concealed locations shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7 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^3 capacity)

REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:

(i) Automatic fixed installations using water

(ii) Fire alarm systems

(iii) Portable hand-operated approved appliances

EXTENT

(i) A dry pipe system to be provided in the cold room, as defined by Loss Prevention Council Rules.

(ii) The system provided to the building to be extended to cover the cold storage area.

(iii) As appropriate to the plant and construction.

ADDITIONAL REQUIREMENTS

(i) All linings for acoustic and thermal insulation purposes in ductings and concealed locations shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7 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 installations using water

(iii) Emergency generators

(iv) Emergency lighting

(v) Exit signs

(vi) Fire alarm systems

(vii) Fire hydrant/hose reel systems

(viii) Gas detection systems

(ix) Portable hand-operated approved appliances

EXTENT

(i) As required by that equipment which needs to be automatically actuated.

(ii) In all areas including staircases with the exception of cold storage room which should be provided with a dry pipe system in accordance with Loss Prevention Council Rules.

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

(iv) Emergency lighting shall be provided throughout the entire area.

(v) Sufficient directional and exit signs to ensure that all exit routes from any floor within the area are clearly indicated as required by the configuration of staircases serving the area.

(vi) One actuating point and one audio warning device to be located at each hose reel point. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point should include facilities for fire pump start and audio/visual warning device initiation.

(vii) There shall be sufficient hydrants and hose reels to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.

(viii) To be provided in those areas as required by the risk.

(ix) As required by occupancy.

ADDITIONAL REQUIREMENTS

(i) All linings for acoustic and thermal insulation purposes in ductings and concealed locations shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7 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 systems

(ii) Automatic actuating devices

(iii) Automatic fixed installations other than water

(iv) Emergency generators

(v) Emergency lighting

(vi) Exit signs

(vii) Fire alarm systems

(viii) Fire detection systems

(ix) Fire hydrant/hose reel systems

(x) Fireman's lifts

(xi) Portable hand-operated approved appliances

(xii) Sprinkler systems

(xiii) Static or dynamic smoke extraction systems

(xiv) Ventilation/air conditioning control systems

EXTENT

(i) Required for any part or parts of building where the area occupied by any one single occupancy on any one floor exceeds 2 000 square metres AND where the occupants, due to their transient presence either as shoppers, audience or guests, are exposed to risks to require additional advice through such systems.

(ii) As required by that equipment which needs to be automatically actuated.

(iii) To be provided to areas where the use of water is undesirable for the occupancy or trade.

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

(v) Emergency lighting shall be provided throughout the entire building and all exit routes leading to ground level.

(vi) Sufficient directional and exit signs to ensure that all exit routes from any floor within the building are clearly indicated as required by the configuration of staircases serving the building.

(vii) One actuating point and one audio warning device to be located at each hose reel point. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point should 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 to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.

(x) As required by the Code of Practice for Means of Access for Firefighting and Rescue.

(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.

(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 systems

(ii) Automatic actuating devices

(iii) Automatic fixed installations other than water

(iv) Emergency generators

(v) Emergency lighting

(vi) Exit signs

(vii) Fire alarm systems

(viii) Fire control centre

(ix) Fire detection systems

(x) Fire hydrant/hose reel systems

(xi) Fireman's lifts

(xii) Portable hand-operated approved appliances

(xiii) Pressurization of staircases

(xiv) Sprinkler systems

(xv) Static or dynamic smoke extraction systems

(xvi) Ventilation/air conditioning control systems

EXTENT

(i) Required for any part or parts of building where the area occupied by any one single occupancy on any one floor exceeds 2 000 square metres AND where the occupants, due to their transient presence either as shoppers, audience or guests, are exposed to risks to require additional advice through such systems.

(ii) As required by that equipment which needs to be automatically actuated.

(iii) To be provided to areas where the use of water is undesirable for the occupancy or trade.

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

(v) Emergency lighting shall be provided throughout the entire building and all exit routes leading to ground level.

(vi) Sufficient directional and exit signs to ensure that all exit routes from any floor within the building are clearly indicated as required by the configuration of staircases serving the building.

(vii) One actuating point and one audio warning device to be located at each hose reel point. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point should 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 to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.

(xi) As required by the Code of Practice for Means of Access for Firefighting and Rescue.

(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 Staircases in Pt. II provided that the number of pressurized staircases required shall not exceed the total number of staircases required by the Code of Practice for Means of Escape.

(xiv) Required to cover all parts of the buildings including staircases, 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.

(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:

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

4.17 Container terminal yards and freight stations

REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:

(i) Automatic actuating devices

(ii) Automatic fixed installations other than water

(iii) Automatic fixed installations using water

(iv) Emergency generators

(v) Emergency lighting

(vi) Exit signs

(vii) Fire alarm systems

(viii) Fire control centre

(ix) Fire hydrant/hose reel systems

(x) Fixed automatically operated approved appliances

(xi) Portable hand-operated approved appliances

(xii) Pressurization of staircases

(xiii) Ring main systems with fixed pump(s)

(xiv) Special equipment/requirements

(xv) Static or dynamic smoke extraction systems

(xvi) Ventilation/Air conditioning control system

EXTENT

(i) As required by that equipment which needs to be automatically actuated.

(ii) To be provided to areas where the use of water is undesirable for the occupancy or trade.

(iii) In all areas including staircases, common corridors and toilets excepting where covered by (ii) above.

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

(v) Emergency lighting shall be provided throughout the entire buildings and all exit routes leading to ground level.

(vi) Sufficient directional and exit signs to ensure that all exit routes from any floor within the buildings are clearly indicated as required by the configuration of staircases serving the buildings.

(vii) One actuating point and one audio warning device to be located at each hose reel point. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point should 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 to ensure that every part of the buildings can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.

(x) As required by occupancy.

(xi) As required by occupancy.

(xii) Required where:

(*a*) natural venting of staircase is not provided; and

(*b*) the aggregate area of openable windows of the rooms/units of the building does not exceed 6.25% of the floor area of those rooms/units, calculated on a floor by floor basis. The number of pressurized staircases to be provided shall be determined by the table stipulated under the definition of Pressurization of Staircases in Part II provided that the number of pressurized staircases required shall not exceed the total number of staircases required by the Code of Practice for Means of Escape.

(xiii) To be provided to cover those areas of such complexes not adequately served by public water mains.

(xiv) As required by Director of Fire Services.

(xv) Required for any fire compartment exceeding 7 000 cubic meters where

(*a*) the aggregate area of openable windows of the compartment does not exceed 6.25% of the floor area of that compartment, and

(*b*) the designed fire load of that compartment is likely to exceed 1 135 MJ/m^2.

(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 dangeous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.

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

4.18 Curtain walled buildings below six storeys in height

REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:

Normal requirements according to occupancy.

4.19 Curtain walled buildings of and above six storeys in height

REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:

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

e.g. LH (light hazard) becomes OH I (ordinary hazard Group I);

OH III(S) (ordinary hazard Group III special) becomes HH (high hazard).

4.20 Dangerous goods stores

REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:

(i) Automatic actuating devices

(ii) Automatic fixed installations other than water

(iii) Automatic fixed installations using water

(iv) Exit signs

(v) Fire alarm systems

(vi) Fixed automatically operated approved appliances

(vii) Fixed foam systems

(viii) Gas detection systems

(ix) Portable hand-operated approved appliances

(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. 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 appliances.

EXTENT

One per floor plus additional for car-ports.

ADDITIONAL REQUIREMENTS

(i) All linings for acoustic and thermal insulation purposes in ductings and concealed locations shall be of Class 1 or 2 Rate of Surface Spread of Flame as per British Standard 476: Part 7 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 systems

(ii) Fire hydrant/hose reel systems

(iii) Portable hand-operated approved appliances

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 should 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 each floor can be reached by a length of not more than 30 m of Fire Services hose or 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 generators

(ii) Emergency lighting

(iii) Exit signs

(iv) Fire alarm systems

(v) Fire hydrant/hose reel systems

(vi) Fireman's lifts

(vii) Protable hand-operated approved appliances

EXTENT

(i) Emergency generators of sufficient electrical capacity to supply power for the fire protection and life safety systems required to be installed in the building.

(ii) Emergency lighting shall be provided to all staircases, passages and public areas including lift lobbies on all floors and refuge areas.

(iii) Sufficient directional and exit signs to ensure that all exit routes from public areas to staircases are clearly indicated.

(iv) One actuating point and one audio warning device to be located at each hose reel point. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point should 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 each floor can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.

(vi) As required by the Code of Practice for Means of Access for Firefighting and Rescue.

(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 installations other than water

(iii) Fire detection systems

(iv) Portable hand-operated approved appliances

EXTENT

(i) As required by that equipment which needs to be automatically actuated.

(ii) To be provided in oil filled transformer rooms with capacity in excess of 1 500 kVA.

(iii) To be provided in areas not covered by automatic fixed installations 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 signs

(iv) Fire alarm systems

(v) Fire hydrant/hose reel systems

(vi) Fireman's lifts

(vii) Portable hand-operated approved appliances

(viii) Sprinkler systems

(ix) Ventilation/air conditioning control systems

EXTENT

(i) As required by that equipment which needs to be automatically actuated.

(ii) Emergency lighting shall be provided throughout the premises and all exit routes.

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

(iv) One actuating point and one audio warning device to be located at each hose reel point. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point should include facilities for fire pump start and audio/visual warning device initiation within the premises.

(v) There shall be sufficient hydrants and hose reels to ensure that every part of the premises can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.

(vi) As required by the Code of Practice for Means of Access for Firefighting and Rescue.

(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 systems

(ii) Automatic actuating devices

(iii) Automatic fixed installations other than water

(iv) Emergency generators

(v) Emergency lighting

(vi) Exit signs

(vii) Fire alarm systems

(viii) Fire control centre

(ix) Fire detection systems

(x) Fire hydrant/hose reel systems

(xi) Fireman's lifts

(xii) Portable hand-operated approved appliances

(xiii) Pressurization of staircases

(xiv) Sprinkler systems

(xv) Static or dynamic smoke extraction systems

(xvi) Ventilation/air conditioning control systems

EXTENT

(i) Required for any part or parts of building where the area occupied by any one single occupancy on any one floor exceeds 2 000 square metres AND where the occupants, due to their transient presence either as shoppers, audience or guests, are exposed to risks to require additional advice through such systems.

(ii) As required by that equipment which requires to be automatically actuated.

(iii) To be provided to areas where the use of water is undesirable for the occupancy or trade.

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

(v) Emergency lighting shall be provided throughout the entire building and all exit routes leading to ground level.

(vi) Sufficient directional and exit signs to ensure that all exit routes from any floor within the building are clearly indicated as required by the configuration of staircases serving the building.

(vii) One actuating point and one audio warning device to be located at each hose reel point. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point should 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; and

(*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.

(x) There shall be sufficient hydrants and hose reels to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.

(xi) As required by the Code of Practice for Means of Access for Firefighting and Rescue.

(xii) As required by occupancy.

(xiii) Required where:

(*a*) natural venting of staircase is not provided; and

(*b*) the aggregate area of openable windows of the rooms/units of the building does not exceed 6.25% of the floor area of those rooms/units, calculated on a floor by floor basis. The number of pressurized staircases to be provided shall be determined by the table stipulated under the definition of Pressurization of Staircases in Pt. II provided that the number of pressurized staircases required shall not exceed the total number of staircases required by the Code of Practice for Means of Escape.

(xiv) In all parts of the hotels including staircases, 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.

(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 systems

(ii) Automatic actuating devices

(iii) Automatic fixed installations other than water

(iv) Emergency generators

(v) Emergency lighting

(vi) Exit signs

(vii) Fire alarm systems

(viii) Fire control centre

(ix) Fire detection systems

(x) Fire hydrant/hose reel systems

(xi) Fireman's lifts

(xii) Portable hand-operated approved appliances

(xiii) Pressurization of staircases

(xiv) Sprinkler systems

(xv) Static or dynamic smoke extraction systems

(xvi) Ventilation/air conditioning control systems

EXTENT

(i) Required for any part or parts of building where the area occupied by any one single occupancy on any one floor exceeds 2 000 square metres AND where the occupants, due to their transient presence either as shoppers, audience or guests, are exposed to risks to require additional advice through such systems.

(ii) As required by that equipment which requires to be automatically actuated.

(iii) To be provided to areas where the use of water is undesirable for the occupancy or trade.

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

(v) Emergency lighting shall be provided throughout the entire building and all exit routes leading to ground level.

(vi) Sufficient directional and exit signs to ensure that all exit routes from any floor within the building are clearly indicated as required by the configuration of staircases serving the building.

(vii) One actuating point and one audio warning device to be located at each hose reel point. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point should 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; and

(*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.

(x) There shall be sufficient hydrants and hose reels to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.

(xi) As required by the Code of Practice for Means of Access for Firefighting and Rescue.

(xii) As required by occupancy.

(xiii) Required where:

(*a*) natural venting of staircase is not provided; and

(*b*) the aggregate area of openable windows of the rooms/units of the building does not exceed 6.25% of the floor area of those rooms/units, calculated on a floor by floor basis. The number of pressurized staircases to be provided shall be determined by the table stipulated under the definition of Pressurization of Staircases in Pt. II provided that the number of pressurized staircases required shall not exceed the total number of staircases required by the Code of Practice for Means of Escape.

(xiv) In all parts of the hotels including staircases, 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.

(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 installations other than water

(iii) Emergency generators

(iv) Emergency lighting

(v) Exit signs

(vi) Fire alarm systems

(vii) Fire control centre

(viii) Fire detection systems

(ix) Fire hydrant/hose reel systems

(x) Fireman's lifts or firefighting and rescue stairways

(xi) Portable hand-operated approved appliances

(xii) Sprinkler systems

(xiii) Static or dynamic smoke extraction systems

(xiv) Ventilation/air conditioning control systems

EXTENT

(i) As required by that equipment which needs to be automatically actuated.

(ii) To be provided to areas where the use of water is undesirable for the occupancy or trade.

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

(iv) Emergency lighting shall be provided throughout the entire building and all exit routes leading to ground level.

(v) Sufficient directional and exit signs to ensure that all exit routes from any floor within the building are clearly indicated as required by the configuration of staircases serving the building.

(vi) One actuating point and one audio warning device to be located at each hose reel point. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point should 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 to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.

(x) As required by the Code of Practice for Means of Access for Firefighting and Rescue.

(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.

(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 installations other than water

(iii) Emergency generators

(iv) Emergency lighting

(v) Exit signs

(vi) Fire alarm systems

(vii) Fire control centre

(viii) Fire detection systems

(ix) Fire hydrant/hose reel systems

(x) Firefighting and rescue stairways

(xi) Portable hand-operated approved appliances

(xii) Pressurization of staircases

(xiii) Sprinkler systems

(xiv) Static or dynamic smoke extraction systems

(xv) Ventilation/air conditioning control systems

EXTENT

(i) As required by that equipment which needs to be automatically actuated.

(ii) To be provided to areas where the use of water is undesirable for the occupancy or trade.

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

(iv) Emergency lighting shall be provided throughout the entire building and all exit routes leading to ground level.

(v) Sufficient directional and exit signs to ensure that all exit routes from any floor within the building are clearly indicated as required by the configuration of staircases serving the building.

(vi) One actuating point and one audio warning device to be located at each hose reel point. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point should 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 to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.

(x) As required by the Code of Practice for Means of Access for Firefighting and Rescue.

(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 Staircases in Pt. II provided that the number of pressurized staircases required shall not exceed the total number of staircases required by the Code of Practice for Means of Escape.

(xiii) In all parts of the buildings including staircases, 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.

(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 systems

(ii) Automatic actuating devices

(iii) Automatic fixed installations other than water

(iv) Emergency generators

(v) Emergency lighting

(vi) Exit signs

(vii) Fire alarm systems

(viii) Fire detection systems

(ix) Fire hydrant/hose reel systems

(x) Fireman's lifts

(xi) Portable hand-operated approved appliances

(xii) Sprinkler systems

(xiii) Ventilation/air conditioning control systems

EXTENT

(i) Required for any part or parts of building where the area occupied for institutional purposes on any one floor exceeds 2 000 square metres AND where the occupants, due to their transient presence either as guests or visitors, are exposed to risks to require additional advice through such systems.

(ii) As required by that equipment which needs to be automatically actuated.

(iii) To be provided to areas where the use of water is undesirable for the occupancy or trade.

(iv) To be provided to hospitals, prisons or as required by the risks. The independently powered generator shall have sufficient electrical capacity to meet the essential services.

(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 should 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; and

(*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.

(ix) There shall be sufficient hydrants and hose reels to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.

(x) As required by the Code of Practice for Means of Access for Firefighting and Rescue.

(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^2.

(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 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 systems

(ii) Automatic actuating devices

(iii) Automatic fixed installations other than water

(iv) Emergency generators

(v) Emergency lighting

(vi) Exit signs

(vii) Fire alarm systems

(viii) Fire control centre

(ix) Fire detection systems

(x) Fire hydrant/hose reel systems

(xi) Fireman's lifts

(xii) Portable hand-operated approved appliances

(xiii) Pressurization of staircases

(xiv) Sprinkler systems

(xv) Ventilation/air conditioning control systems

EXTENT

(i) Required for any part or parts of building where the area occupied for institutional purposes on any one floor exceeds 2 000 square metres AND where the occupants either as guests or visitors, due to their transient presence, are exposed to risks to require additional advice through such systems.

(ii) As required by that equipment which needs to be automatically actuated.

(iii) To be provided to areas where the use of water is undesirable for the occupancy or trade.

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

(v) Emergency lighting shall be provided throughout the entire building and all exit routes leading to ground level.

(vi) Sufficient directional and exit signs to ensure that all exit routes from any floor within the building are clearly indicated as required by the configuration of staircases serving the building.

(vii) One actuating point and one audio warning device to be located at each hose reel point. Visual alarm signals shall be provided where necessary in accordance with current Design

Manual: Barrier Free Access. This actuating point should 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; and

(*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.

(x) There shall be sufficient hydrants and hose reels to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.

(xi) As required by the Code of Practice for Means of Access for Firefighting and Rescue.

(xii) As required by occupancy.

(xiii) Required for hospitals where:

(*a*) natural venting of staircase is not provided; and

(*b*) the aggregate area of openable windows of the rooms/units of the building does not exceed 6.25% of the floor area of those rooms/units, calculated on a floor by floor basis. The number of pressurized staircases to be provided shall be determined by the table stipulated under the definition of Pressurization of Staircases in Pt. II provided that the number of pressurized staircases required shall not exceed the total number of staircases required by the Code of Practice for Means of Escape.

(xiv) Required for all parts of buildings including staircases, 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 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 FOR:

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

4.34 Lift motor rooms

REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:

(i) Fire detection systems.

(ii) Portable hand-operated approved appliances.

EXTENT

(i) To be provided in all lift motor rooms 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 systems

(iii) Gas detection systems

(iv) Gas extraction systems

(v) Portable hand-operated approved appliances

(vi) Ventilation/air conditioning control systems

EXTENT

(i) As required by that equipment which needs to be automatically actuated.

(ii) To be provided in areas not covered by automatic fixed installations 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 installations other than water

(iii) Emergency generators

(iv) Emergency lighting

(v) Exit signs

(vi) Fire detection systems

(vii) Fixed automatically operated approved appliances

(viii) Gas detection systems

(ix) Gas extraction systems

(x) Portable hand-operated approved appliances

(xi) Ventilation/air conditioning control systems

EXTENT

(i) As required by that equipment which needs to be automatically actuated.

(ii) To be provided to areas where the use of water is undesirable for the occupancy or trade.

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

(iv) Emergency lighting shall be provided throughout the entire building and all exit routes.

(v) Sufficient directional and exit signs to ensure that all exit routes from any floor within the building are clearly indicated as required by the configuration of staircases serving the building.

(vi) To be provided in areas not covered by automatic fixed installations.

(vii) As required by the risk.

(viii) To be provided where flammable vapours may be generated.

(ix) Approved type for the part of building where flammable vapours may be generated, and to reduce the concentration below its lower explosive limit.

(x) As required by the risk.

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

ADDITIONAL REQUIREMENT

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

4.37 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 sections 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 installations other than water

(iii) Automatic fixed installations using water

(iv) Dust detection systems

(v) Emergency generators

(vi) Emergency lighting

(vii) Fire alarm systems

(viii) Fire control centre

(ix) Fire detection systems

(x) Fixed automatically operated approved appliances

(xi) Fixed foam systems

(xii) Gas detection systems

(xiii) Gas extraction systems

(xiv) Portable hand-operated approved appliances

(xv) Ring main systems with fixed pump(s)

(xvi) Special equipment/requirements

(xvii) Ventilation/air conditioning control systems

EXTENT

(i) As required by that equipment which needs to be automatically actuated.

(ii) To be provided to areas where the use of water is undesirable for the risk.

(iii) In all areas including 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 essential services it is required to provide.

(vi) Emergency lighting shall be provided to all buildings within the complex and in addition, such lighting shall also be provided to ensure adequate external illumination to permit safe evacuation to the outside of the site boundary.

(vii) One actuating point and one audio warning device to be located at each hose reel point within the buildings. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point should 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.

(viii) Minimum of one, additional to be provided according to the layout of the complex.

(ix) To be provided in areas not covered by automatic fixed installations.

(x) As required by the risk.

(xi) As required by the risk.

(xii) To be provided in all areas of risk.

(xiii) Approved type for the part of building where flammable vapours may be generated, and to reduce the concentration below its lower explosive limit.

(xiv) As required by the risk.

(xv) To be provided to cover those areas of such complexes not adequately served by public water mains.

(xvi) As required by the Director of Fire Services.

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

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

4.39 Railway marshalling yards

REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:

(i) Automatic fixed installations other than water

(ii) Automatic fixed installations using water

(iii) Emergency generators

(iv) Emergency lighting

(v) Fire alarm systems

(vi) Fire Control Centre

(vii) Fire hydrant/hose reel systems

(viii) Portable hand-operated approved appliances

(ix) Ring main systems with fixed pump(s)

(x) Special equipment/requirements

(xi) Static or dynamic smoke extraction system.

EXTENT

(i) To be provided to areas where the use of water is undesirable for the risk.

(ii) In all areas including staircases, common corridors and toilets excepting where covered by (i) above.

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

(iv) Emergency lighting shall be provided to all buildings within the yard, and in addition, such lighting shall also be provided to ensure adequate external illumination to permit safe evacuation to the outside of the site boundary.

(v) One actuating point and one audio warning device to be located at each hydrant point on the ring main systems. Visual alarm signals shall be provided where necessary in accordance with current Design Manual: Barrier Free Access. This actuating point should 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 to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.

(viii) As required by occupancy.

(ix) To be provided to cover those areas of the yard not adequately served by public water mains.

(x) As required by the Director of Fire Services.

(xi) Required for any fire compartment exceeding 7 000 m^3 where

(*a*) the aggregate area of openable windows of the compartment does not exceed 6.25% of the floor area of that compartment, and

(*b*) the designed fire load of that compartment is likely to exceed 1 135 MJ/m^2.

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 sections of this Code shall also be extended to the Refuge Floor(s) 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 installations other than water

(ii) Closed circuit television system

(iii) Dynamic smoke extraction systems

(iv) Emergency generators

(v) Emergency lighting

(vi) Emergency power points

(vii) Exit signs

(viii) Fire alarm systems

(ix) Fire control centre

(x) Fire hydrant/hose reel systems

(xi) Fireman's communication system(s)

(xii) Fixed foam systems

(xiii) Gas detection system(s)

(xiv) Pedestrian cross over facilities

(xv) Portable hand-operated approved appliances

EXTENT

(i) To be provided to areas where the use of water is undesirable for the risk.

(ii) To be provided to enable clear visual observation throughout the length of the tunnel.

(iii) To be provided where the tunnel exceeds 230 m and may be incorporated into the ventilating system of the tunnel.

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

(v) Emergency lighting shall be provided throughout the entire tunnel.

(vi) 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 should 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) There shall be sufficient hydrants and hose reels to ensure that every part of the tunnel can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.

(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 system(s) to include carbon monoxide indication and alarm.

(xiv) Cross over facilities to be provided in twin tube tunnels. In respect of single tube tunnel, a small pedestrian tunnel is to be provided for escaping purposes.

(xv) As required by the risk.

4.42 Shipyards

REQUIREMENTS—SYSTEMS/INSTALLATIONS/EQUIPMENT FOR:

(i) Automatic actuating devices

(ii) Emergency generators

(iii) Emergency lighting

(iv) Fire alarm systems

(v) Fire control centre

(vi) Portable hand-operated approved appliances

(vii) Ring main systems with fixed pump(s)

(viii) Special equipment/requirements

EXTENT

(i) As required by that equipment which needs to be automatically actuated.

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

(iii) Emergency lighting shall be provided to all buildings within the yard, and in addition, such lighting shall also be provided to ensure adequate external illumination to permit safe evacuation to the outside of the site boundary.

(iv) One actuating point and one audio warning device to be located at each hydrant point on the ring main systems. Visual alarm signals shall be provided where necessary in accordance

with current Design Manual: Barrier Free Access. This actuating point should 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 installations other than water

(iii) Automatic fixed installations using water

(iv) Emergency generators

(v) Emergency lighting

(vi) Exit signs

(vii) Fire alarm systems

(viii) Fire control centre

(ix) Fire detection systems

(x) Fire hydrant/hose reel systems

(xi) Fireman's lifts or Firefighting and Rescue Stairways

(xii) Portable hand-operated approved appliances

(xiii) Ventilation/air conditioning control systems

EXTENT

(i) As required by that equipment which needs to be automatically actuated.

(ii) To be provided to areas where the use of water is undesirable for the occupancy or trade.

(iii) As required by the risk.

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

(v) Emergency lighting shall be provided throughout the entire 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 should 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 to ensure that every part of the building can be reached by a length of not more than 30 m of Fire Services hose or hose reel tubing.

(xi) As required by the Code of Practice for Means of Access for Firefighting and Rescue.

(xii) As required by occupancy.

(xiii) When a ventilation/air conditioning control systems 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 installations other than water

(iii) Automatic fixed installations using water

(iv) Emergency lighting

(v) Exit signs

(vi) Fire alarm systems

(vii) Fire detection systems

(viii) Fixed automatically operated approved appliances

(ix) Portable hand-operated approved appliances

(x) Ventilation/air conditioning control systems

EXTENT

(i) As required by that equipment which needs to be automatically actuated.

(ii) To be provided if not otherwise protected by automatic fixed installations using water.

(iii) To be provided if not otherwise protected by automatic fixed installations other than water.

(iv) Emergency lighting shall be provided throughout the entire building and all exit routes leading to ground level.

(v) Sufficient directional and exit signs to ensure that all exit routes from the premises within the buildings are clearly indicated as required by the configuration of staircases serving the building.

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

5.1 Audio/visual advisory systems

SPECIFICATION

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

AUDIO

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

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

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

VISUAL

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

(*a*) the floor/floors to be evacuated by operating the lights on that floor/those floors in flashing mode,

(*b*) the evacuation routes by following the low-level Directional Signs.

Low level directional signs shall be of self luminous types and conform to British Standard 5499: Part 2 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 section will include fire stop doors, fire dampers, fire curtains and other means of providing compartmentation/fire separation automatically in the event of fire. Automatic fire detection and fire suppression systems are not included in this section.

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

Pursuant to the Code of Practice for Fire Resisting Construction 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 detector(s) and manual control device(s) 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 the Fire Offices' Committee Rules for Automatic Fire Alarm Installations.

The descending time of a vertical shutter shall be within 15 to 60 seconds for closing/opening 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 installations other than water

SPECIFICATION

Carbon dioxide, FM200 or similar extinguishing system, shall be installed in accordance with standards acceptable to the Director of Fire Services.

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

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

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

5.4 Automatic fixed installations using water

These may include:

Deluge Systems

Drencher Systems

Sprinkler Systems

Water Spray Systems

Fixed Foam Systems

Specifications for the above are in the respective sections.

5.5 Deluge systems

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 systems

SPECIFICATION

General

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

Drencher system for refuge floors

(ii) Drencher systems shall be installed on all refuge floors to cover all external wall openings. The water flow rate should be maintained not less than 10 litres per minute per square metre of the external wall openings.

(iii) A deluge value 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.

5.7 Dust detection systems

SPECIFICATION

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

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

Each system shall:

(*a*) be automatic in action;

(*b*) close down the affected process;

(*c*) operate pressure relief vent (if appropriate);

(*d*) be connected to the fire alarm systems for the premises.

5.8 Emergency generators

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 deg. C to 40 deg. 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 I.E.E. Wiring Regulations 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 lift(s) 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.

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 lift(s) 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:—

EMERGENCY GENERATOR
應急發電機

LOADING OF FIRE SERVICE INSTALLATIONS AND FIREMAN'S LIFT(S)
消防裝置及消防升降機負荷

XXXX KVA/XXXX KV

WARNING: DO NOT OVERLOAD THE GENERATOR
警告：切勿引致發電機過量負荷

If one generator set is designed to serve more than one block, 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 all round 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 F R P as the F R P 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 except that exit signs shall be as at Section 5.10. hereof.

Emergency lighting shall be backed up by emergency power supply. If the building is not equipped with an emergency generator, the emergency lighting shall be provided with secondary battery.

In the event of power failure, the emergency lighting shall be activated within 5 seconds for all bowing 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.

(*d*) Batteries in celluloid containers shall not be installed, stored or used.

(*e*) A margin allowance of $12\frac{1}{2}\%$ of the total required battery capacity (amperehour rating not voltage) shall be provided, i.e. $100\% - 12\frac{1}{2}\% = 112\frac{1}{2}\%$.

(*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 generators.

(*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 to British Standard 88 or miniature circuit breakers to British Standard 3871: Part 1.

(*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 M.I.C.C. 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 a portable photoelectric photometer.

(*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 British Standard 4533 Section 1.13 and be permanently fixed in position.

5.10 Exit signs

SPECIFICATION

Exit signs shall be internally illuminated bearing the word in English and Chinese as shown in Figure 1 of not less than 125 mm high. 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.

Exit signs shall be connected to both mains and emergency power supply. If the building is not equipped with an emergency generator, the exit signs shall be provided with secondary battery in accordance with British Standard 5266: Part 1.

Letter Style: Modified Garamond | Letter Style: Helvetica | Letter Sytle: Marigold

FIGURE 1

COLOURS

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

Colour	*Contrasting Colour*
Green	White
Green	Black
White	Green

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

DIRECTIONAL SIGNS

If a sign is not installed immediately above an exit or if an exit is not clearly visible from normally occupied parts of the premises, an internally illuminated directional sign conforming to British Standard 5499: Part 1 with the following graphics shall be erected.

FIGURE 2

SELF LUMINOUS SIGNS

Self luminous signs to British Standard 5499: Part 2 are approved for use in Hong Kong, however, their use is not permitted where legislation specifies illuminated exit signs.

5.11 Fire alarm systems

SPECIFICATION

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

Manual fire alarm system shall comply with relevant sections of British Standard 5839: Part 1:1988.

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

Manual actuating points of a pattern conforming with standards acceptable to the Director of Fire Services may be installed as an integrated part of an automatic fire detection system. Such

manual actuating points shall be installed in compliance with the appropriate standard, in such locations within the premises, as set out elsewhere in this Code for the individual types of premises.

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 Clause 6-4 of NFPA 72, National Fire Alarm Code.

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 resisting period of one hour, and shall be large enough to house equipment, recorders, annunciators, etc. ancillary to the fire protection system installed in the building.

It shall be continuously manned by trained personnel.

Local termination/repeators 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 systems

SPECIFICATION

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

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

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

5.14 Fire hydrant/hose reel systems

SPECIFICATION

(*a*) *HYDRANT*

Each hydrant assembly shall conform with 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 counter-clockwise rotation. The direction of opening of the valve shall be clearly engraved in both English and Chinese on the wheel of the valve.

The hydrant outlet 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 fragible 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. 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 fragible 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, should be provided inside 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 fragible 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.
先開啟來水掣，再拉出膠喉

(3) TURN ON WATER AT NOZZLE AND DIRECT JET AT BASE OF FIRE.
將喉咀掣開啟，然後射向火之底部

(NOT SUITABLE FOR ELECTRICAL FIRES)
不適用於電火

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. An independent indication shall be provided at the fire control room 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 Section 5.25)

(*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 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 this fire pump.

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 1 350 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 room 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 Service 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 F.S. 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.

Each rising main shall be connected to an independent Fire Service Inlet. Where there are more than one rising main 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 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 "F.S. INLET" (消防入水掣) of at least 50 mm high.

5.15 Fireman's lifts and Firefighting and Rescue Stairways

The design and construction of fireman's lifts and Firefighting and Rescue Stairways 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 Codes of Practice for Means of Access for Firefighting and Rescue and Provision of Means of Escape In Case of Fire issued by the Building Authority.

5.16 Fixed automatically operated approved appliances

SPECIFICATION

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

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

All appliances shall be approved by the Loss Prevention Council or to other acceptable national standards.

5.17 Fixed foam systems

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.

5.18 Gas detection systems

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.

5.19 Portable hand-operated approved appliances

SPECIFICATION

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

Appliances shall have received the Loss Prevention Council or other acceptable standard approval.

5.20 Pressurization of staircases

A. *DESIGN AND SUBMISSIONS*

A. 1 The designer shall be Registered Professional Engineer under CAP 409 on Building Services and Mechanical Engineering which emphasizes mechanical ventilation and air handling.

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 of Practice.

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 of Buildings": Part 4 "Smoke Control in protected escape routes using pressurization" (latest edition) with the following changes:—

(*a*) Table 1—the minimum pressurization level of 50 Pa shall be achieved with all doors closed and all pressure relief systems operating. The maximun design pressurization level shall be such that under no circumstances shall the combined force, to overcome the pressure differential across any door and the action of the door closer, exceed 133N (13.5 kgf) when applied at the designed door opening handle or push plate position.

(*b*) Calculations shall allow for pressurization to be maintained and/or the minimum average egress velocity through 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 systems 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 Ventilation Contractor Association specification D.W. 142 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 builders work ducts or shafts or other construction, in these systems shall be pressure tested to Heating and Ventilation Contractor Association specification D.W. 143 or subsequent amendments. Retest as necessary after correcting any excessive losses. All results obtained shall be recorded and the record shall be signed by both the person carrying out the test and an independent witness. (see also Section 2.20(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 activiated. (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 deg. C and 100% R.H.

D. 4 Door sets shall be installed in such a manner as to be smoke-resistant and all joints between frames and building structure shall be provided with sealants complying with 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 para. 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 terrazo or similar finish.

D. 8 Inspection and testing of all door sets, closers, releases, etc. shall form part of the acceptance tests conducted under Section 2.20(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 para. 4 of Section 2.20(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 B.M.S. or B.A.S. prevent its operation. However, such B.M.S. or B.A.S. may monitor the operations if desired.

E. 4 No transmission of actuating signals for the staircase pressurization system shall be effected by multiplex or similar devices unless such devices have the approval or certification of one of the Testing Authorities recognised by 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.

(*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 deg. 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 British Standard 5486 from not less than 2 mm panel steel and is installed in a room having an F.R.P. (including self-closing doors) of not less than 2 hours and containing no other equipment, no further protection will be required. Also no further protection will be required for wiring, cables, or other electrical equipment.

(*b*) Sub-distribution boards and/or motor control centres constructed and installed as in (*a*) are similarly acceptable.

(*c*) 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 deg. C and 100% R.H.

F. 4 Pressure sensors and associated equipment shall be of industrial process grade to British Standard 5967 (being IEC 654). 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, 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 6.3.2. of British Standard 5588: Part 4.

5.21 Ring main systems with fixed pumps

SPECIFICATION

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

The mains may be installed aboveground 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 Section 5.27)

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.

5.22 Smoke extraction systems

(i) DYNAMIC SYSTEMS

A. *DESIGN AND SUBMISSIONS*

A. 1 The designer shall be Register Professional Engineer under CAP 409 on Building Services and Mechanical Engineering which emphasizes mechanical ventilation and air handling.

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 para. 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 and

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 para. 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 para. B.10. i.e. positive ducted system, special air inlets, low level air supply points. As stated in para. 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 Ventilation Contractor Association specification D.W.142 or subsequent amendments. Flat oval ducts wider than 1 m shall not be used. Aluminum 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 deg. 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 para. 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 Resisting Construction (1996 Edition) issued by the Buildings Department, such part shall be fire resisting to British Stardand 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 and to this end shall require to pass the hard body impact test section of British Standard 5669 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 Ventilation Contractor Association specification D.W. 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 deg. 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 British Standard 7346 Part 3 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 independant 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 independant 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 compartment 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 Systems 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 of 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 B.M.S. or B.A.S. 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 Authorities 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.

(*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 deg. 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 British Standard 5486 from not less than 2 mm panel steel and is installed in a room having an F.R.P. (including self-closing doors) of not less than 2 hours and containing no other equipment, no further protection will be required 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 P.V.C. or similar material 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 para. 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 para. M.1 above shall be provided.

(ii) STATIC SYSTEMS

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 an F.R.P. of not less than 1 hour when tested to British Standard 476: Part 8 or 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 deg. C and 100% R.H. 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 "fail safe". That is to move to the "barrier down" position on power failure or any other fault.

(*h*) For services, passing through the smoke barrier, having maximum cross-sectional dimensions of 100 mm W × 100 mm H, no fire/smoke stopping shall be required, all other services shall be fire/smoke stopped.

(*i*) Smoke curtain systems used shall comply with the British Standard 7436 Part 3 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 lesser.

(*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 para. 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 be to 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 para. (*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.

5.23 Sprinkler systems

SPECIFICATION

Such systems shall be designed and installed in accordance with the Loss Prevention Council Rules for Automatic Sprinkler Installations (with suitable modification pertinent to Hong Kong) or other standards acceptable to the Director of Fire Services.

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

(See Water Supplies—Section 5.27)

5.24 Supply tank

SPECIFICATION

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

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

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

The minimum 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^2	9 000 L (9 m^3)
Over 230 m^2 but not exceeding 460 m^2	18 000 L (18 m^3)
Over 460 m^2 but not exceeding 920 m^2	27 000 L (27 m^3)
Over 920 m^2	36 000 L (36 m^3)

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

5.25 Ventilation/air conditioning control systems

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 Systems and Smoke Extraction Systems.

(*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, 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.

If the designer wishes the override control can, in addition, also be actuated by the sprinkler system.

In addition to Method "A", Method "B" or Method "C", 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 Department 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.

5.26 Water spray systems

SPECIFICATION

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

5.27 Water supplies

SPECIFICATION

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

The types of supply as listed in 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 a transfer pump is required to relay water to the tank, the pump capacity shall be able to refill the tank to its full capacity within 6 hours. The transfer pump 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.

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 registered fire service installation contractor 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 registered fire service installation contractor.

1.4 Upon receipt of an application the Fire Services Inspecting Officer will contact the Authorized Person (not the registered fire service installation contractor) 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 registered fire service installation contractor 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 registered fire service installation contractor 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 Water Authority in respect of fire service installations 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 fire service installations for a building for which a temporary occupation permit or occupation permit has been issued must be maintained, inspected and certified by a registered fire service installation contractor at least once in every 12 months.

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 registered fire service installation contractor in consultation with the owner or building management.

1.12 Design engineers and registered fire service installation contractors 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.

Part II INSPECTION, TESTING AND MAINTENANCE

2.1 Audio/visual Advisory Systems

(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 Installations other than Water

(i) Acceptance Testing

CO_2, 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 Standard 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 Installations using Water

These may include:

Deluge Systems

Drencher Systems

Sprinkler Systems

Water Spray Systems

Fixed Foam Systems

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

2.5 Deluge Systems

(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 Systems

(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 Systems

(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 Generators

(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 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. For emergency lighting supplied by central battery systems with control and safety devices installed, the systems should be regularly checked for the following:—

(1) Connections between the 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.

(2) 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.

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

2.10 Exit Signs

(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 signs 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 signs should be tested whenever an emergency lighting system is tested.

2.11 Fire Alarm Systems

(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.

(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 Resisting Period shall be required. Appropriate certificate by the Authorized Person for the Fire Resisting Period 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 Systems

(i) Acceptance Testing

The testing of fire detection system shall be carried out in accordance with the FOC Rules for Automatic Fire Alarm Installations (12^{th} Edition). 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 Systems

(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 Fireman's Lifts and Firefighting and Rescue Stairways

(i) Acceptance Testing

Fireman's lifts shall be tested by a registered lift contractor in accordance with the requirements stipulated in the Code of Practice on the Design and Construction of Lifts and Escalators issued by the Director of Electrical and Mechanical Services.

(ii) Maintenance

Fireman's lifts shall be maintained in efficient working order at all times and in accordance with the requirements stipulated in the Code of Practice on the Examination, Testing and Maintenance of Lifts and Escalators issued by the Director of Electrical and Mechanical Services.

2.16 Fixed Automatically Operated Approved Appliances

(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.

2.17 Fixed Foam Systems

(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.

2.18 Gas Detection Systems

(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.

2.19 Portable Hand-operated Approved Appliances

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

The tests for hand appliances and other preventive media shall be carried out periodically as specified by the Director of Fire Services from time to time and in accordance with the appropriate standard and the manufacturer's recommendations.

Pamphlets describing testing procedure can be obtained from the Director of Fire Services.

2.20 Pressurization of Staircases

(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 para. B.4 of Section 5.20 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. 8 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. Acceptance tests shall be carried out in accordance with British Standard 5588: Part 4. It is necessary for the designer to be present at the tests.
6. It is preferable that 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 equal 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 para. B.4 of Section 5.20 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 systems that only operate in an emergency (i.e. single stage systems), 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 systems that operate continuously at a low level and at an increased level in an emergency (i.e. two stage systems), 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 or 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 2.20(*i*) hereof, by a registered fire service installation contractor and a maintenance certificate 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 or his representative.

2.21 Ring Main Systems with Fixed Pumps

(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.

2.22 Smoke Extraction Systems

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 para. B.17 of Section 5.22 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 equal 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 para. B.17 of Section 5.22 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. Where dedicated systems are installed they should be actuated by the owner or his agent at intervals not exceeding three months and checked to ensure that all functions sequence and operate correctly.
2. Where dual purpose systems are provided they should be actuated into smoke extraction mode by the owner or his agent at intervals not exceeding 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 2.22 (A) (i) hereof, by a registered fire service installation contractor and a maintenance certificate 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 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 2.22 (B)(*i*) hereof.

2.23 Sprinkler Systems

(i) Acceptance Testing

The system should be tested in accordance with the Loss Prevention Council Rules on 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.

2.24 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.

2.25 Ventilation/Air Conditioning Control Systems

(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.

2.26 Water Spray Systems

(i) Acceptance Testing

The system shall be tested in accordance with all the technical requirements as stipulated in NFPA Standard 15 for Water Spray Fixed System, 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.

2.27 Water Supplies

(i) Acceptance Testing

The water supplies 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 supplies 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 The 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.

APPENDIX 1

Checklist for Fire Shutters

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

I. *REFERENCE*

Project ..... F.S.D. Ref. .....

Address ..... Location .....

....

Construction Standard ..... Maker's Name .....

II. *TYPE*

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

III. *WALL OPENING*

	Yes	No	Remarks
3.1 Does location tally with approved building plans?	[ ]	[ ]	.....
3.2 Is the doorway not exceeding 15.6 sq. m. in area?	[ ]	[ ]	.....
3.3 Is the doorway not exceeding 4.27 m in width?	[ ]	[ ]	.....
3.4 Is the doorway not exceeding 3.66 m in height?	[ ]	[ ]	.....
3.5 Are sill and jambs constructed of approved materials?	[ ]	[ ]	.....
3.6 Is the head constructed of reinforced concrete of at least 125 mm in depth?	[ ]	[ ]	.....
3.7 Where steel lintel is provided, is it protected by brickwork/concrete not less than 50 mm thick?	[ ]	[ ]	.....
3.8 Is a minimum bearing of 100 mm at each end provided on the jambs to support the barrel enclosure?	[ ]	[ ]	.....
3.9 Is adequate expansion clearance provided to barrel enclosure and enclosing jambs?	[ ]	[ ]	.....
3.10 Are chases with nominal dimension of 115 mm × 115 mm provided to house the channel guides?	[ ]	[ ]	.....
3.11 Are chases set back at least 100 mm from the front of the jambs?	[ ]	[ ]	.....
3.12 Is the barrel enclosure housed completely within the wall opening?	[ ]	[ ]	.....
3.13 Is the clearance between the sill and shutter, when closed, not exceeding 6 mm?	[ ]	[ ]	.....
3.14 Is there a minimum gap of 225 mm between the inner faces of double rolling shutters when they are in a closed position?	[ ]	[ ]	.....
3.15 Are barrels of double shutters installed at the same level?	[ ]	[ ]	.....

	Yes	No	Remarks
3.16 Are projecting jambs of a width not less than 225 mm provided?	[ ]	[ ]	.....
3.17 Are projecting jambs of at least 100 mm in width provided to enclose the ends of the barrel enclosure?	[ ]	[ ]	.....
3.18 Is the projecting head constructed of reinforced concrete of not less than 125 mm thick?	[ ]	[ ]	.....
3.19 Does the projecting head rest on projecting jambs?	[ ]	[ ]	.....
3.20 Does the projecting head extend the full width and projections of the projecting jambs?	[ ]	[ ]	.....
3.21 Where wall opening is to be used for the passage of powered vehicles, is adequate protection provided to prevent mechanical damage to the shutter assembly, frame and wall opening?	[ ]	[ ]	.....

IV. *CONSTRUCTION OF CURTAIN*

4. 1 Is the curtain formed from rolled steel lath of 1.2 mm thick?	[ ]	[ ]	.....
4.2 Is steel of the appropriate class used for the laths?	[ ]	[ ]	.....
4.3 Do laths have sheared parallel edges?	[ ]	[ ]	.....
4.4 Do laths curl on both edges to form quirks of not more than 10 mm outside diameter?	[ ]	[ ]	.....
4.5 Does each quirk form a continuous, fully-interlocking hinge with that on the adjacent lath?	[ ]	[ ]	.....
4.6 Is a minimum engagement of 2 mm provided between 2 adjacent laths?	[ ]	[ ]	.....
4.7 Are centres of interlocks not less than 45 mm apart?	[ ]	[ ]	.....
4.8 Are centres of interlocks not more than 75 mm apart?	[ ]	[ ]	.....
4.9 Does the curtain have sufficient width to extend at least 64 mm (75 mm when the wall opening exceeds 2.44 m in width) into channel guides?	[ ]	[ ]	.....
4.10 Does the curtain have sufficient length to extend from the sill to the top of the barrel and thence round at least a quarter of the barrel circumference before fixing?	[ ]	[ ]	.....
4. 11 Are steel or malleable cast iron end locks fitted to the ends of each lath?	[ ]	[ ]	.....
4.12 Do end locks have a minimum thickness of 3 mm?	[ ]	[ ]	.....
4.13 Are end locks riveted to the lath by 2 mild steel rivets of not less than 3 mm diameter?	[ ]	[ ]	.....
4.14 Do end locks fit the contour of the curtain laths and fill the channel guides closely?	[ ]	[ ]	.....
4.15 Is the bottom lath fitted with a bottom rail of one of the following methods of construction?	[ ]	[ ]	.....

	Yes	No	Remarks
4.15.1 a steel Tee section of at least 75 × 5 × 3* mm section with a backing strip of at least 64 × 6 mm.	[ ]	[ ]	.....
4.15.2 2 steel flats of at least 38 × 6 mm.	[ ]	[ ]	.....
4.15.3 2 steel angles of at least 38 × 38 × 3* mm section.	[ ]	[ ]	.....
* 5 mm for shutters in opening in excess of 2.44 m in width.	[ ]	[ ]	.....
4.16 Does the curtain extend at least 32 mm between the Tee section, flats or angles?	[ ]	[ ]	.....
4.17 Are Tee section, flats or angles welded, bolted or riveted to the laths by at least 8 mm diameter steel bolts or steel peened rivets?	[ ]	[ ]	.....
4.18 Do the above fixings apace not more than 300 mm apart?	[ ]	[ ]	.....
4.19 Does the bottom rail extend the full width of the curtain except for the portion housed within the channel guides?	[ ]	[ ]	.....
4.20 Do expansion clearances of at least 12.5 mm per metre run provided for the bottom rail relative to the channel guides?	[ ]	[ ]	.....
4.21 Does bottom rail make flush contact with the sill when the shutter is closed?	[ ]	[ ]	.....
4.22 Are steel lifting handles bolted, riveted or welded to the bottom rail on each side of the curtain?	[ ]	[ ]	.....
4.23 Do the lifting handles space not more than 750 mm apart?	[ ]	[ ]	.....
4.24 Do the handles interfere with the correct opening or closing of the shutter?	[ ]	[ ]	.....
4.25 Is the curtain secured to the barrel by steel screws or steel bolts at least 6 mm in diameter?	[ ]	[ ]	.....
4.26 Are screws/bolts passing through laterally elongated horizontal holes (nominally 50 mm in length) in the top lath into drilled and tapped holes in the barrel?	[ ]	[ ]	.....
4.27 Do screws/bolts space not more than 250 mm apart?	[ ]	[ ]	.....
4.28 Does a screw/bolt provided to within 125 mm from each end of the top lath?	[ ]	[ ]	.....
4.29 Are screws/bolts located at centres of elongated holes?	[ ]	[ ]	.....
4.30 Are fusible metal and steel washers fitted to each screw/bolt?	[ ]	[ ]	.....
V. *CHANNEL GUIDES*			
5.1 Do channel guides extend continuously from within the barrel enclosure to the sill?	[ ]	[ ]	.....
5.2 Does the top of the channel guide locate such as to permit upward expansion?	[ ]	[ ]	.....

	Yes	No	Remarks
5.3 Are guides fabricated from steel sections of at least 3 mm thick (5 mm when the doorway exceeds 3 m in width or 3 m in height)?	[ ]	[ ]	.....
5.4 Are steel peened rivets or steel bolts not less than 6 mm in diameter or 3 mm fillet welds used in fabrication of the guides?	[ ]	[ ]	.....
5.5 Do centres of rivets/bolts space not more than 150 mm apart?	[ ]	[ ]	.....
5.6 Is the length of the fillet welds not less than 50 mm and spaced not more than 150 mm apart?	[ ]	[ ]	.....
5.7 Do guides form a channel of sufficient depth to accommodate at least 64 mm (75 mm when the wall opening exceeds 2.44 m in width) of the curtain together with sufficient clearance to permit unrestricted expansion of the curtain?	[ ]	[ ]	.....
5.8 Are guides set back as far as possible within the chases provided in the jambs?	[ ]	[ ]	.....
5.9 Are they fitted as close as possible to the front side of the chases?	[ ]	[ ]	.....
5.10 Are they wholly contained within the chases so as not to project beyond the faces of the jambs?	[ ]	[ ]	.....
5.11 Are guides fixed to jambs by steel expanding anchor bolts of at least 6 mm diameter?	[ ]	[ ]	.....
5.12 Are centres of fixings not more than 600 mm apart?	[ ]	[ ]	.....
5.13 Is there a fixing bolt within 150 mm of the barrel enclosure and one within 150 mm of the sill?	[ ]	[ ]	.....
5.14 With the exception of the lowest one, are fixings provided with vertically elongated bolt holes (nominally 50 mm in length)?	[ ]	[ ]	.....
5.15 Are bolts fitted with fusible metal washers?	[ ]	[ ]	.....
5.16 Are bolts fitted with steel washers?	[ ]	[ ]	.....
5.17 Are bolts fixed at the highest positions of the slots to allow expansion of the guides in an upward direction?	[ ]	[ ]	.....

VI. *BARREL*

6.1 Is the barrel formed from mild steel tube of not less than 114 mm outside diameter?	[ ]	[ ]	.....
6.2 Is the mild steel tube not less than 5.4 mm thick?	[ ]	[ ]	.....
6.3 Is the barrel mounted on mild steel axle of not less than 25 mm diameter?	[ ]	[ ]	.....
6.4 Does the axle extend the full length of the barrel?	[ ]	[ ]	.....
6.5 Is a minimum bearing of 25 mm provided in each axle support bracket?	[ ]	[ ]	.....
6.6 Does the axle project not more than 100 mm beyond each end of the barrel?	[ ]	[ ]	.....

	Yes	No	Remarks
6.7 Is expansion clearance provided between the axle and the ends of the barrel enclosure?	[ ]	[ ]	.....
6.8 Does barrel enclose helical steel spring for counterbalancing the curtain?	[ ]	[ ]	.....
6.9 Is the barrel mounted on rigid or self-aligning bearings?	[ ]	[ ]	.....
6.10 Is it fitted with mild steel spring charging device to enable the spring to be adjusted after the curtain is in position?	[ ]	[ ]	.....
6.11 Are axle support brackets made of steel or malleable cast iron?	[ ]	[ ]	.....
6.12 Do they support and enclose the axle at each end?	[ ]	[ ]	.....
6.13 Are they fixed to the ends of the barrel enclosure by at least 2 steel peened rivets or steel bolts at least 8 mm in diameter or 6 mm fillet welds?	[ ]	[ ]	.....
6.14 Are they of sufficient size to accommodate the axle and fusible metal packings?	[ ]	[ ]	.....

VII. *BARREL ENCLOSURE*

7.1 Are barrel and axle enclosed completely by an enclosure pressed or fabricated from steel at least 6 mm thick?	[ ]	[ ]	.....
7.2 Are steel peened rivets, steel bolts not less than 8 mm in diameter or 6 mm fillet welds not less than 50 mm in length being used for the fixings?	[ ]	[ ]	.....
7.3 Are centres of fixings not more than 150 mm apart?	[ ]	[ ]	.....
7.4 Does the fabrication extend completely along each edge of the enclosure?	[ ]	[ ]	.....
7.5 Does the front edge of the bottom enclosure form a 40 mm wide flange?	[ ]	[ ]	.....
7.6 Is the distance between the flange and the face of the curtain not more than 15 mm?	[ ]	[ ]	.....
7.7 Where a drop bar is used, is the distance between the flange and the face of the curtain not more than 50 mm?	[ ]	[ ]	.....
7.8 Is the barrel enclosure bolted to each enclosing jamb by 2 steel expanding anchor bolts of not less than 10 mm diameter?	[ ]	[ ]	.....
7.9 If fixed vertically, are elongated fixing holes provided?	[ ]	[ ]	.....
7.10 Are fusible metal washers provided to the fixing bolts?	[ ]	[ ]	.....
7.11 Are steel washers provided to the fixing bolts?	[ ]	[ ]	.....
7.12 Where double shutters are fitted and barrels are accommodated in the same enclosure, is dividing plate made of steel at least 6 mm thick provided to separate the barrels?	[ ]	[ ]	.....

	Yes	No	Remarks
7.13 Is a fascia plate of 6 mm steel provided to form the front of the barrel enclosure?	[ ]	[ ]	.....
7.14 Does the fascia plate overlap the opening by at least 100 mm at the top and at each end?	[ ]	[ ]	.....
7.15 Is the fascia plate made of steel of at least 6 mm thick?	[ ]	[ ]	.....
7.16 Does the bottom edge of the fascia plate form a channel of a depth not less than 100 mm?	[ ]	[ ]	.....
7.17 Does the channel extend to within 15 mm of the face of the curtain?	[ ]	[ ]	.....
7.18 Does the channel have a flange not less than 40 mm wide next to the face of the curtain?	[ ]	[ ]	.....
7.19 Is the fascia plate fixed independently of the barrel enclosure by bolting to the head and jambs?	[ ]	[ ]	.....
7.20 Are steel expanding bolts of not less than 10 mm diameter used for the fixings?	[ ]	[ ]	.....
7.21 Are fixing bolts located as follows:—			
7.21.1 25 mm from top edge spaced at not more than 600 mm centres?	[ ]	[ ]	.....
7.21.2 50 mm from ends?	[ ]	[ ]	.....
7.21.3 50 mm from bottom edge?	[ ]	[ ]	.....
7.21.4 at mid-height of the fascia?	[ ]	[ ]	.....
7.22 Are elongated bolt holes provided to the fascia plate?	[ ]	[ ]	.....
7.23 Are bolts located in the centre of the elongated holes?	[ ]	[ ]	.....
7.24 Are bolts fitted with fusible metal washers?	[ ]	[ ]	.....
7.25 Are bolts fitted with steel washers?	[ ]	[ ]	.....
7.26 Where an opening is provided for the adjustment of the barrel springs, does the opening not exceed 250 mm × 150 mm?	[ ]	[ ]	.....
7.27 Is it covered by a 6 mm steel plate at least 50 mm longer and wider than the opening?	[ ]	[ ]	.....
7.28 Is the cover plate fixed by not less than six steel screws/bolts not less than 8 mm diameter?	[ ]	[ ]	.....
VIII. *MECHANICAL GEARING*			
8.1 Is mechanical gearing provided to doorway exceeding 5.2 sq. m. in area?	[ ]	[ ]	.....
8.2 Is mechanical gearing provided when the height of the bottom of the barrel enclosure above floor level exceeds 2.2 m?	[ ]	[ ]	.....
8.3 Is the gearing system so arranged that the shutter could be manually opened and closed from either side of the wall opening?	[ ]	[ ]	.....
8.4 Where double shutters were provided, do they operate simultaneously?	[ ]	[ ]	.....

	Yes	No	Remarks
8.5 Is the gearing system made of steel mounted on self-lubricating bushes and/or rigid self-aligning ball or roller bearings?	[ ]	[ ]	.....
8.6 Are gears machine cut from a suitable grade of steel?	[ ]	[ ]	.....
8.7 Are gears connected by shafts not less than 19 mm in diameter?	[ ]	[ ]	.....
8.8 Where gearing mechanism is housed in a chase, does the chase have a minimum dimension of 114 × 114 mm with side walls each at least 114 mm thick and the rear wall not less than 150 mm thick?	[ ]	[ ]	.....
8.9 Is the chase covered by steel plate at least 6 mm thick?	[ ]	[ ]	.....
8.10 Is the cover plate fixed by steel expanding bolts of not less than 6 mm diameter?	[ ]	[ ]	.....
8.11 Are centres of fixings not exceeding 600 mm?	[ ]	[ ]	.....
8.12 Are anchor bolts fitted with steel washers?	[ ]	[ ]	.....
8.13 Where chases are enclosed by brickwork/blockwork, does the latter have a minimum thickness of 100 mm?	[ ]	[ ]	.....
8.14 Is brickwork/blockwork keyed into the wall?	[ ]	[ ]	.....
8.15 Are steel maintenance covers provided and installed adjacent to the gearing?	[ ]	[ ]	.....
8.16 Where gearing mechanism is enclosed in a casing, is the casing fabricated from steel at least 6 mm thick?	[ ]	[ ]	.....
8.17 Are steel peened rivets or steel bolts not less than 8 mm in diameter or 6 mm fillet welds at least 50 mm in length used for the fabrication of the casing?	[ ]	[ ]	.....
8.18 Do centres of rivets/bolts/welds not more than 150 mm?	[ ]	[ ]	.....
8.19 Is the casing fixed to the face of the wall by expanding anchor bolts?	[ ]	[ ]	.....
8.20 Is the diameter of the anchor bolts not less than 8 mm?	[ ]	[ ]	.....
8.21 Are steel washers fitted to the anchor bolts?	[ ]	[ ]	.....
8.22 Do centres of anchor bolts within 600 mm?	[ ]	[ ]	.....
8.23 Is access opening for maintenance incorporated in the casing?	[ ]	[ ]	.....
8.24 Is it covered by at least 6 mm thick steel plate at least 50 mm longer and wider than the opening?	[ ]	[ ]	.....
8.25 Is cover plate attached to casing by steel screws/bolts at least 8 mm in diameter?	[ ]	[ ]	.....
8.26 Are screws/bolts spaced at not more than 150 mm centres?	[ ]	[ ]	.....

	Yes	No	Remarks
8.27 Where the barrel enclosure, fascia plate or dividing plate are perforated to permit passage of gearing system, are size and number of perforations kept to a minimum consistent with the satisfactory operation of the gearing?	[ ]	[ ]	.....
8.28 Are perforations so arranged that there is no exposed opening into the barrel enclosure?	[ ]	[ ]	.....
8.29 Are they so arranged that lateral expansion of barrel enclosure and fascia plate is not restricted?	[ ]	[ ]	.....
8.30 Are operating wheels spokeless?	[ ]	[ ]	.....
8.31 Are operating wheels non-detachable?	[ ]	[ ]	.....
8.32 Are they located adjacent to the wall opening?	[ ]	[ ]	.....
8.33 Are they located not less than 750 n ≤ m, nor more than 1 200 mm above the floor?	[ ]	[ ]	.....
8.34 Where handles on the operating wheels are provided, are they so arranged as to close within the wheel when not in use?	[ ]	[ ]	.....

IX. *INSTALLATION*

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

X. *SHUTTER OPERATION*

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

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

XI. *GENERAL COMMENTS & REMARKS*

Test witnessed by:—

..... (Signature)	..... (Signature)
..... (Name in block letters) F.S.I. Contractor's Representative	..... (Name in block letters) F.S.D. Inspecting Officer
Date	Date .....

APPENDIX 2

Checklist for CO_2/Halocarbon Agent Extinguishing System

I. *REFERENCE*

Project ..... F.S.D. Ref. .....

Address ..... Location/Room .....

....

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

II. *TYPE OF SYSTEM*

	CO_2	FM200	NAFSIII
	[ ]	[ ]	[ ]

Total Flooding	[ ]	Local Application	[ ]
Modular	[ ]	Cylinder	[ ]
Pre-engineered	[ ]	Engineered	[ ]
High Pressure	[ ]	Low Pressure	[ ]
Single Hazard	[ ]	Multiple Hazard	[ ]
Primary Bank Only	[ ]	With Reserve Bank	[ ]

III. *PROTECTED AREA*

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

3.6 Does the following components:—

	Tally with drawings?		If not, whether the as-fitted location/position acceptable?		
	Yes	No	Yes	No	Remarks
3.6.1 Audio Alarm—Bell/Buzzer etc.	[ ]	[ ]	[ ]	[ ]	.....
3.6.2 Visual Alarm—Light/Strobe etc.	[ ]	[ ]	[ ]	[ ]	.....
3.6.3 Detector	[ ]	[ ]	[ ]	[ ]	.....
3.6.4 Manual Release	[ ]	[ ]	[ ]	[ ]	.....

	Tally with drawings?		If not, whether the as-fitted location/position acceptable?		
	Yes	No	Yes	No	Remarks
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_2 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?	[ ]	[ ]	.....

VI. *FUNCTIONAL TEST (DYNAMIC TEST)*

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

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

By Designed Agent [ ]

By Approved Substitute [ ]

7.1 Does agent discharge time within the limit specified by F.S.D.?	[ ]	[ ]	.....
7.2 Are pipings securely installed to prevent pipe displacement or hazardous movement during discharge?	[ ]	[ ]	.....
7.3 Is mechanical tightness of pipings and associated equipment in order?	[ ]	[ ]	.....

VIII. *REINSTATEMENT OF SYSTEM AFTER DISCHARGE (STATIC CHECK)*

8.1 Is replacement cylinder/container of the correct type with sufficient pressure and content provided?	[ ]	[ ]	.....
8.2 Is cylinder/container properly mounted?	[ ]	[ ]	.....
8.3 Is cylinder/container properly connected?	[ ]	[ ]	.....
8.4 Is control/indication panel properly reset?	[ ]	[ ]	.....
8.5 Is ETL properly replaced/reinstated?	[ ]	[ ]	.....
8.6 Is actuating solenoid properly linked/ connected?	[ ]	[ ]	.....

IX. *GENERAL COMMENTS & REMARKS*

Test witnessed by:—

..... (Signature)	..... (Signature)
..... (Name in block letters) F.S.I. Contractor's Representative	..... (Name in block letters) F.S.D. Inspecting Officer
Date	Date .....

APPENDIX 3

Checklist for Emergency Generator Installation

I. Reference

Project: ..... F.S.D. Ref.: .....

Address: .....

II. Installations and Equipment Connected (for record purpose)

Name of buildings
being protected: .....

	Peak Starting Current (I_L)	Rated Input Power	Starting Method
(A) Fire service installation			
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	
.....	A	kW	
.....	A	kW	Remarks:
.....	A	kW	D.O.L.
.....	A	kW	Star-delta
.....	A	kW	Auto-tx.
.....	A	kW	or others
Estimated maximum simultaneous starting and running load		kW/ kVA	

III. Emergency Generator Set Details

	Alternator	Prime Mover
3.1 Make	.....	.....
3.2 Model	.....	.....
3.3 Serial No.	.....	.....

3.4 Rated Capacity Power ..... kVA Voltage: 380/220 Power ..... kW Speed: ..... rpm
Current ..... A Power factor ..... 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 rate at full load: ..... litres/hour

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	Remark
4.6 Fuel tank room has been inspected and approved by Regional Office. (N.B.: Supporting document is attached)	[ ]	[ ]	[ ]	.....
4.7 Surveyor report for fuel tank has been obtained as required by Regional Office.	[ ]	[ ]	[ ]	.....
4.8 DG licence for fuel tank room holding more than 2,500 litres diesel has been obtained. (N.B.: Supporting document is attached)	[ ]	[ ]	[ ]	.....

V. Visual Inspection

5.1 Adequate space (not less than 600 mm) is provided all round emergency generator for maintenance/cleaning.	[ ]	[ ]	[ ]	.....
5.2 Air supply and discharge ductworks (if any) are provided free from obstruction.	[ ]	[ ]	[ ]	.....
5.3 Air supply and discharge ductworks running in compartment other than emergency generator room are enclosed with proper fire resisting material.	[ ]	[ ]	[ ]	.....
5.4 Service fuel tank in generator room is made of 3 mm steel construction and of capacity less than 500 litres.	[ ]	[ ]	[ ]	.....
5.5 Generator built-in fuel tank is not greater than 500 litres.	[ ]	[ ]	[ ]	.....
5.6 Fuel tank is electrically earthed.	[ ]	[ ]	[ ]	.....

		Yes	No	N/A	Remark
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 FRP construction of generator room and the door is intact.	[ ]	[ ]	[ ]	.....
5.14	The notices "Emergency Generator" and "No Smoking" in 120 mm English and Chinese characters are provided at the entrance to the emergency generator room.	[ ]	[ ]	[ ]	.....

VI. Functional Testing

6.1	The manual starting facilities of the emergency generator can operate satisfactorily.	[ ]	[ ]	[ ]	.....
6.2	Upon failure of normal electricity supply, emergency generator:—	[ ]	[ ]	[ ]	.....
6.2.1	automatically starts when the duration of power failure exceeds 1 second; and	[ ]	[ ]	[ ]	.....
6.2.2	transfers to FS loads within 15 seconds.	[ ]	[ ]	[ ]	.....
6.3	Emergency generator is capable of re-starting upon failure of first attempt in starting.	[ ]	[ ]	[ ]	.....
6.4	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.	[ ]	[ ]	[ ]	.....

	Yes	No	N/A	Remark
6.5 After one hour of running test, all instruments, safety devices, etc. indicate "normal" condition.	[ ]	[ ]	[ ]	.....
6.6 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.	[ ]	[ ]	[ ]	.....
6.7 All testing are carried out with the generator room doors kept closed.	[ ]	[ ]	[ ]	.....
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

_____

_____

_____

_____

_____

_____

Tested by:

Signature: .....

Full name of
installation engineer: .....

Name of
installation contractor: .....

Company Chop: .....

Date: .....

Witnessed by:

Signature: .....

Full name of
design engineer: .....

Name of
design consultant: .....

Company Chop: .....

Date: .....

APPENDIX 4

Checklist for Fire Detection System

I. Reference

Project: ..... F.S.D. Ref.: .....

Address: .....

Type of building: Domestic/Industrial/Godown/Commercial/Office/Composite/Hotel/Hospital/
Others with/without basement .....

II. Type of Equipment

2.1 Alarm annunciation panel

2.1.1 Manufacturer/Model No. of alarm annunciation panel: (Main panel) .....

(Sub-panel, if any) .....

2.1.2 F.S.D. approved type Yes/No

2.1.3 Conventional (electronic) type [ ]

Addressable type [ ]

2.2 Detectors

2.2.1 Heat detector : Manufacturer/model No. : .....

: F.S.D. approved type Yes/No

: Type Fixed temperature [ ]

Rate of temperature rise [ ]

Combination [ ]

Linear cable [ ]

Others

.....

2.2.2 Smoke detector : Manufacturer/model No. : .....

: F.S.D. approved type : Yes/No

: Type : Ionization [ ]

Photoelectric [ ]

Beam [ ]

Self-aspirating [ ]

Others

.....

2.2.3 Flame detector : Manufacturer/model No. : .....

: F.S.D. approved type : Yes/No

: Type : Infrared [ ]

Ultra-violet [ ]

Others

.....

2.2.4 Others : Manufacturer/model No. : .....

: F.S.D. approved type : Yes/No

: Type : .....

	Yes	No	N/A	Remark
III. Visual Inspection				
3.1 Detector and alarm sounder installations				
3.1.1 Detectors are provided in areas as indicated on approved building plans.	[ ]	[ ]	[ ]	.....
3.1.2 Detectors are provided in areas as indicated on endorsed F.S.I. plans.	[ ]	[ ]	[ ]	.....
Heat detector : ..... nos.				
Smoke detector : ..... nos.				
Flame detector : ..... nos.				
Others : ..... nos.				
3.1.3 Detectors are accessible for inspection and maintenance.	[ ]	[ ]	[ ]	.....
3.1.4 In the floor where sleeping risk exists (e.g. hotel, hospital, etc.),:—				
(i) fixed temperature type heat detector is used in kitchen.	[ ]	[ ]	[ ]	.....
(ii) smoke detector is used in other areas.	[ ]	[ ]	[ ]	.....
3.1.5 Detectors are provided to entire basement (except car parking area, strong room & safe deposit vault).	[ ]	[ ]	[ ]	.....
3.1.6 Intrinsically safe detector is used in environment with presence of explosive or flammable gas.	[ ]	[ ]	[ ]	.....
3.1.7 The floor area covered by a detection zone is less than or equal to 2 000 sq. m.	[ ]	[ ]	[ ]	.....
3.1.8 Area covered by a detection zone is in the same floor.	[ ]	[ ]	[ ]	.....
3.1.9 External indicators are provided for detectors installed inside rooms where travel distance exceeds 30 metres of reach within a zone.	[ ]	[ ]	[ ]	.....
3.1.10 Detector is provided to ceiling void of depth greater than 800 mm.	[ ]	[ ]	[ ]	.....
3.1.11 Detector is provided to void containing combustible material irrespective of its depth. (Remark: LV power cable in metal conduit/trucking is not considered as combustible)	[ ]	[ ]	[ ]	.....
3.1.12 A minimum of 300 mm clearance is provided below detector.	[ ]	[ ]	[ ]	.....
3.1.13 Smoke detector is installed within 15 m ceiling height limit (Remark: Not more than 10% of ceiling height shall exceed this limit, but in any event the height shall not exceed 18 m).	[ ]	[ ]	[ ]	.....

		Yes	No	N/A	Remark
3.1.14	Heat detector is installed within 13.5 m (Grade 1), 12.0 m (Grade 2), or 10.5 m (Grade 3) ceiling height limit. (Remark: Not more than 10% of ceiling height shall exceed these limits, but in any event the height shall not exceed 15 m.)	[ ]	[ ]	[ ]	.....
3.1.15	Horizontal separation between any point in the area requires protection and a heat detector is less than 5.3 m.	[ ]	[ ]	[ ]	.....
3.1.16	Horizontal separation between any point in the area requires protection and a smoke detector is less than 7.5 m.	[ ]	[ ]	[ ]	.....
3.1.17	Horizontal separation between any point in corridor and a heat detector is less than [5.3 + (5 – W)/2] m where W is the width of corridor.	[ ]	[ ]	[ ]	.....
3.1.18	Horizontal separation between any point in corridor and a smoke detector is less than [7.5 + (5 – W)/2] m where W is the width of corridor.	[ ]	[ ]	[ ]	.....
3.1.19	Coverage of any heat detector is within a max. of 50 sq. m.	[ ]	[ ]	[ ]	.....
3.1.20	Coverage of any smoke detector is within a max. of 100 sq. m.	[ ]	[ ]	[ ]	.....
3.1.21	Horizontal distance between detector and unenclosed floor opening, openings to lift, chute, etc. is within a maximum of 1.5 m.	[ ]	[ ]	[ ]	.....
3.1.22	Beam > 150 mm and < 10% of ceiling height are treated as wall in detector installation.	[ ]	[ ]	[ ]	.....
3.1.23	Heat detector protection distance is within (5.3 – 2 × D) m limit for beam (D) > 150 mm but < 10% of ceiling height.	[ ]	[ ]	[ ]	.....
3.1.24	Smoke detector protection distance is within (7.5 – 2 × D) m limit for beam (D) > 150 mm but < 10% of ceiling height.	[ ]	[ ]	[ ]	.....
3.1.25	Sensing element of heat detector is installed between 25 mm to 150 mm below ceiling.	[ ]	[ ]	[ ]	.....
3.1.26	Sensing element of smoke detector is installed between 25 mm to 600 mm below ceiling.	[ ]	[ ]	[ ]	.....
3.1.27	Alarm sounder (weatherproof type) is installed at building external.	[ ]	[ ]	[ ]	.....
3.2	Alarm annunciation panel				
3.2.1	The alarm annunciation panel is located near entrance or in Fire Control Centre.	[ ]	[ ]	[ ]	.....

	Yes	No	N/A	Remark
3.2.2 The panel is compatible with the model/type of detectors installed.	[ ]	[ ]	[ ]	.....
3.2.3 Detection zonings are properly labelled. (no. of zones: .....)	[ ]	[ ]	[ ]	.....
3.2.4 The wirings are compatible with the type of control panel. (2-wire system/4-wire system/twisted pair/ .....)	[ ]	[ ]	[ ]	.....
3.3 Power supply arrangement				
3.3.1 Permanent electricity supply is connected.	[ ]	[ ]	[ ]	.....
3.3.2 Secondary electricity supply is connected. i.e.				
(*a*) battery	[ ]	[ ]	[ ]	.....
(*b*) emergency generator	[ ]	[ ]	[ ]	.....
3.3.3 Battery power supply is provided. (Voltage: DC volts: Amp-hour)	[ ]	[ ]	[ ]	.....
3.3.4 The capacity of battery supply is sufficient to maintain the system in alarm condition for 30 minutes.	[ ]	[ ]	[ ]	.....
3.3.5 Calculation on the battery capacity is attached.	[ ]	[ ]	[ ]	.....
3.3.6 The battery shall be able to operate the system at normal condition for not less than 24 hours, or for 6 hours if emergency generator is installed.	[ ]	[ ]	[ ]	.....
3.3.7 The battery charger is capable of recharging the batteries from fully discharged to fully charged with 24 hours.	[ ]	[ ]	[ ]	.....
3.4 As installed zoning schedule and a log book are provided adjacent to the alarm annunciation panel.	[ ]	[ ]	[ ]	.....
IV. Testing				
4.1 The sensitives of all heat/smoke/flame detectors are correctly factory adjusted/set and checked.	[ ]	[ ]	[ ]	.....
4.2 The zoning of detectors are correct.	[ ]	[ ]	[ ]	.....
4.3 The panel is in normal working condition.	[ ]	[ ]	[ ]	.....
4.4 Audio and visual alarms for system/detector fault are given at the panel.	[ ]	[ ]	[ ]	.....
4.5 Alarm is given from the bell installed at building external upon "in-situ" actuation of detector.	[ ]	[ ]	[ ]	.....
4.6 Direct telephone link (DTL) to FSCC/Chubb Centre is connected. (please state DTL no.: .....)	[ ]	[ ]	[ ]	.....

	Yes	No	N/A	Remark
4.7 Other panel function works properly:—				
4.7.1 alarm silence/reset.	[ ]	[ ]	[ ]	.....
4.7.2 normal supply/battery supply. (if applicable)	[ ]	[ ]	[ ]	.....
4.7.3 power on/failure indicator.	[ ]	[ ]	[ ]	.....
4.7.4 direct link failure indicator. (if applicable)	[ ]	[ ]	[ ]	.....
4.7.5 zone alarm/fault indicator.	[ ]	[ ]	[ ]	.....
4.8 Detector solely using as actuating devices for fire service systems such as fire shutter, VAC control and smoke extraction systems are isolated from the Computerized Fire Alarm Transmission System (CFATS). (Remark: it is not mandatory.)	[ ]	[ ]	[ ]	.....

Test witnessed by:

Signature : .....

Name of Responsible Engineer : .....

Name of F.S.I. Contractor : .....

Company Chop : .....

Registration No. : RCI /..... Date: .....

APPENDIX 5

Checklist for Fire Hydrant and Hose Reel Installations

I. *REFERENCE*

Project: ..... F.S.D. Ref.: .....

Type of Building: *Domestic/Industrial/Godown/Others

Address: .....

F.S.I. Drawing Ref. .....

The date of initial building plan submission to Building Authority .....

*Delete whichever not applicable.

	Yes	No	N/A	Remarks
II. *F.S.I. DRAWINGS AGAINST BUILDING PLANS*				
F.S.D. 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	[ ]	[ ]	[ ]	.....
III. *PLUMBING LINE DIAGRAM*				
3.1 CHECK:				
3.1.1 Pipings 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 pipings for intermediate booster pumps.	[ ]	[ ]	[ ]	.....
3.1.5 F.S. appliance to be provided by F.S.D. to test the system. (to be confirmed by F.S.D.)	[ ]	[ ]	[ ]	.....
IV. *ON SITE INSPECTION*				
4.1 FIRE HYDRANT				
4.1.1 Outlets are of:				
Male round thread [ ] or				
Female instantaneous [ ]				
4.1.2 Adaptable to F.S.D. 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.	[ ]	[ ]	[ ]	.....
4.1.5 Not less than 800 mm nor more than 1200 mm above finished floor level.	[ ]	[ ]	[ ]	.....

		Yes	No	N/A	Remark
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	The drum is not less than 150 mm in diameter.	[ ]	[ ]	[ ]	.....
4.2.2	Internal bore of tubing is not less than 19 mm diameter.	[ ]	[ ]	[ ]	.....
4.2.3	Length of hose reel is not exceeding 30 metres in length.	[ ]	[ ]	[ ]	.....
4.2.4	Every part of the building can be reached by a nozzle.	[ ]	[ ]	[ ]	.....
4.2.5	Capable of projecting a 6-metre jet.	[ ]	[ ]	[ ]	.....
4.2.6	Orifice of nozzle is 4.5 mm.	[ ]	[ ]	[ ]	.....
4.2.7	Nozzle is fitted with simple two-way on/off valve and the valve is not spring loaded.	[ ]	[ ]	[ ]	.....
4.2.8	Control valves are of gate type or of simple two-way ball type.	[ ]	[ ]	[ ]	.....
4.2.9	Gate valves are closed by clockwise rotation.	[ ]	[ ]	[ ]	.....
4.2.10	Rising mains and associated pipework are not less than 40 mm nominal bore.	[ ]	[ ]	[ ]	.....
4.2.11	Pipes feeding individual hose reel are not less than 25 mm nominal bore.	[ ]	[ ]	[ ]	.....
4.2.12	Control valves are adjacent to the nozzles.	[ ]	[ ]	[ ]	.....
4.2.13	Nozzle and control valves are not more than 1 350 mm from the finished floor level.	[ ]	[ ]	[ ]	.....
4.2.14	Suitable guide ring is provided to permit easy withdrawal of the hose reel tubing.	[ ]	[ ]	[ ]	.....
4.2.15	An operation instruction is affixed prominently adjacent to each hose reel.	[ ]	[ ]	[ ]	.....
4.2.16	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.	[ ]	[ ]	[ ]	.....
4.2.17	Manual fire alarm call points are sited at a prominent position near the hose reels.	[ ]	[ ]	[ ]	.....

		Yes	No	N/A	Remark
4.2.18	The manual fire alarm call points are not more than 1 200 mm above the finished floor level.	[ ]	[ ]	[ ]	.....
4.2.19	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.	[ ]	[ ]	[ ]	.....
4.2.20	Door fitted to the hose reel cabinet.	[ ]	[ ]	[ ]	.....
4.2.20.1	Such doors cause no undue obstruction and no interference with any exit point when in open position.	[ ]	[ ]	[ ]	.....
4.2.20.2	Such doors cause no obstruction to the hose being run out in either directions.	[ ]	[ ]	[ ]	.....
4.2.20.3	Such doors bear the words "FIRE HOSE REEL" (消防喉轆) of at least 50 mm high.	[ ]	[ ]	[ ]	.....
4.2.20.4	No locking device is fitted to such doors.	[ ]	[ ]	[ ]	.....
4.2.20.5	Control valves and nozzles are sited in a discernible and accessible position of not more than 500 mm from the surface of the doors.	[ ]	[ ]	[ ]	.....
4.2.20.6	Operation instruction notice is affixed immediately below the words "FIRE HOSE REEL" on the outer surface of the door.	[ ]	[ ]	[ ]	.....
4.2.21	Hose reel of swinging cradle type.	[ ]	[ ]	[ ]	.....
4.2.21.1	When not in use the outer face of the reel is flush with the wall.	[ ]	[ ]	[ ]	.....
4.2.21.2	When required for use the cradle can be swung freely into the corridor or passage.	[ ]	[ ]	[ ]	.....
4.2.21.3	Striker provided inside the cabinet.	[ ]	[ ]	[ ]	.....
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				
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.	[ ]	[ ]	[ ]	.....

	Yes	No	N/A	Remark
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 room [ ] or				
A status panel at the main entrance of the building [ ]				
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.	[ ]	[ ]	[ ]	.....

		Yes	No	N/A	Remark
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 (1/mm):				
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.	[ ]	[ ]	[ ]	.....
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.	[ ]	[ ]	[ ]	.....

		Yes	No	N/A	Remark
4.5.12	Such signals are repeated to:	[ ]	[ ]	[ ]	.....
	Fire control room [ ] 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/mm):.....				
	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	[ ]	[ ]	[ ]	.....
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.	[ ]	[ ]	[ ]	.....

	Yes	No	N/A	Remark
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 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 "F.S. Inlet" (消防入水掣) of not less than 50 mm high.	[ ]	[ ]	[ ]	.....

V. *GENERAL COMMENTS & REMARKS*

_____

_____

_____

_____

_____

_____

Test witnessed by:—

..... (Signature)

..... (Name in block letters)
F.S.I. Contractor's Representative

Date .....

..... (Signature)

..... (Name in block letters)
F.S.D. Inspecting Officer

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 :

P : PRESSURE

F : FLOW RATE

FIRE SERVICES INLET

FIRE HYDRANT

PRESSURE GAUGE

FLOW MEASUREMENT DEVICE

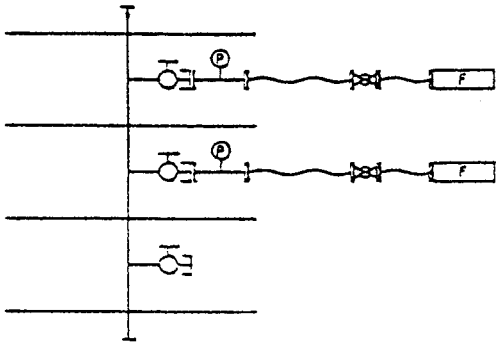
FLOW REGULATION DEVICE

FLEXIBLE HOSE

1. FIXED FIRE PUMP (BUILDINGS OTHER THAN INDUSTRIAL/ GODOWN - i.e 900 l/min.)

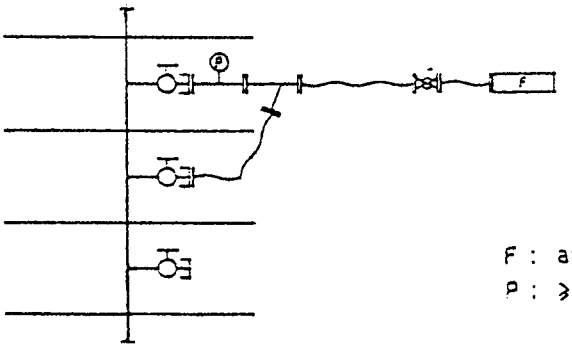
(ANY OF THE FOLLOWING ARRANGEMENTS SHALL BE FOLLOWED)

FIG. 1.1



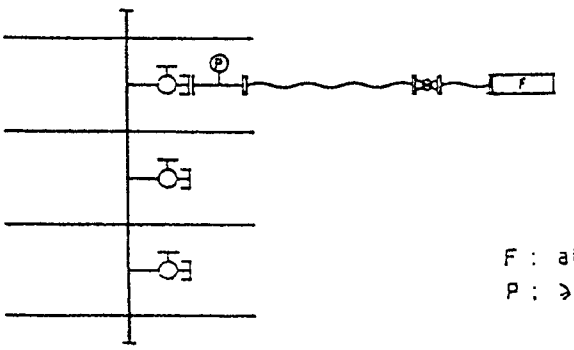
F : at 450 l/min
P : ≥ 350 KPa

FIG. 1.2



F : at 900 l/min
P : ≥ 350 KPa

FIG. 1.3

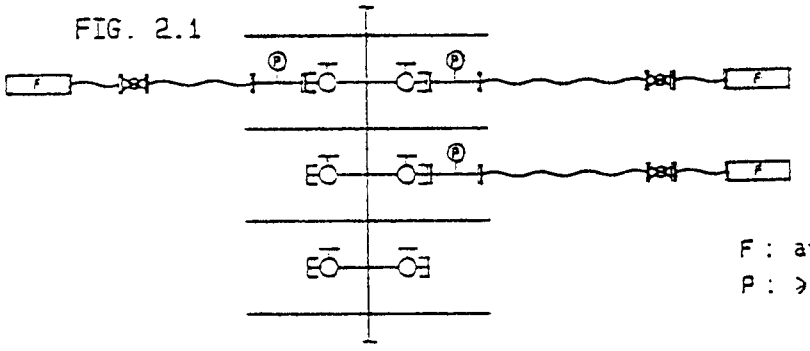


F : at 900 l/min
P : ≥ 310 KPa

2. FIXED FIRE PUMP (INDUSTRIAL / GODOWN BUILDINGS)

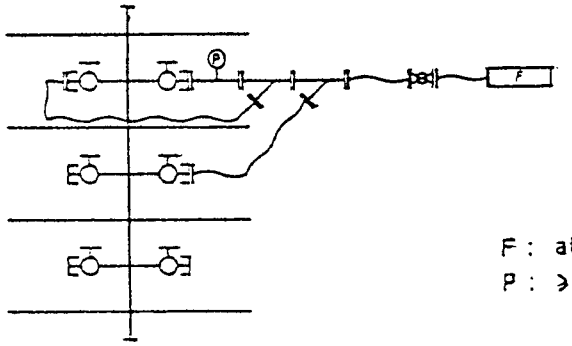
(ANY OF THE FOLLOWING ARRANGEMENTS SHALL BE FOLLOWED)

FIG. 2.1



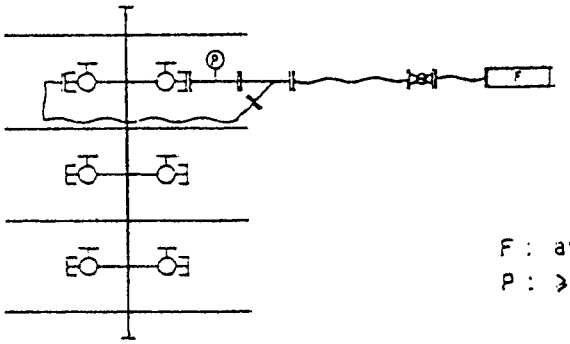
F : at 450 l/min
P : ≥ 350 KPa

FIG. 2.2



F : at 1350 l/min
P : ≥ 350 KPa

FIG. 2.3



F : at 1350 l/min
P : ≥ 330 KPa

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)

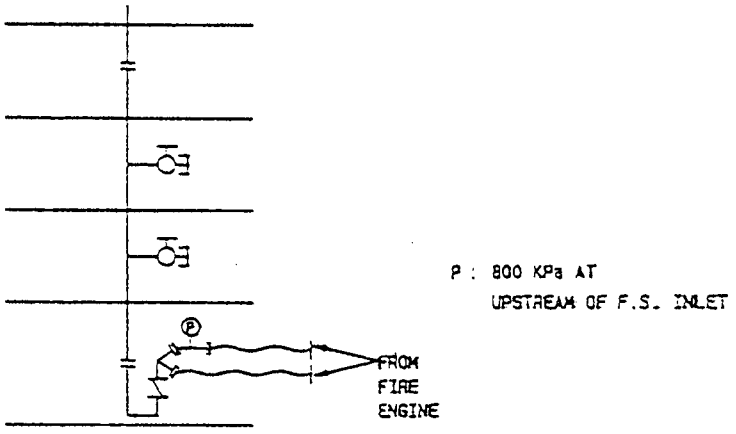
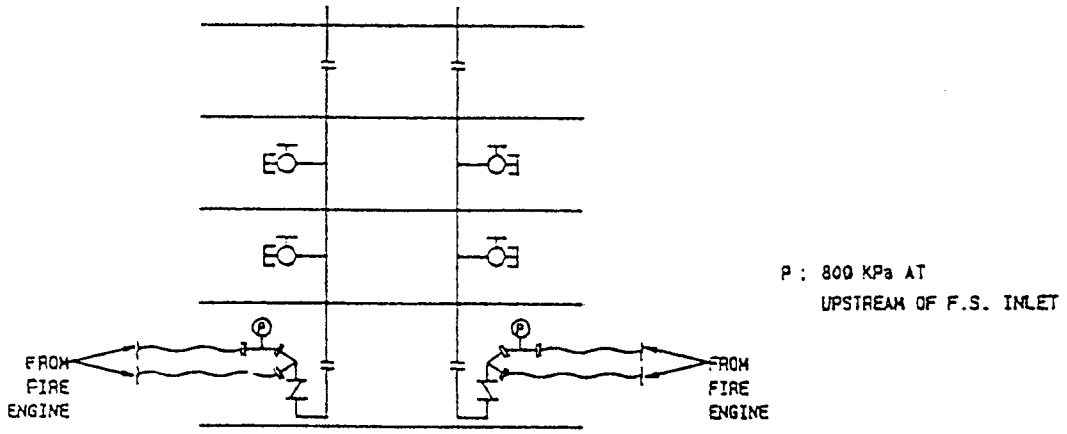


FIG. 3.2 OTHER BUILDINGS WITH TWO OR MORE RISING MAINS (1800 l/min)

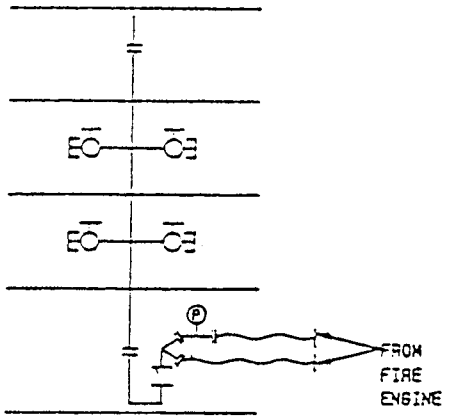
TWO SETS OF RISING MAIN SHALL BE
TESTED SIMULTANEOUSLY IN ACCORDANCE WITH (1)



4. INTERMEDIATE BOOSTER PUMP (INDUSTRIAL / GODOWN BUILDINGS)

FIG. 4.1 SINGLE RISING MAIN (1350 l/min)

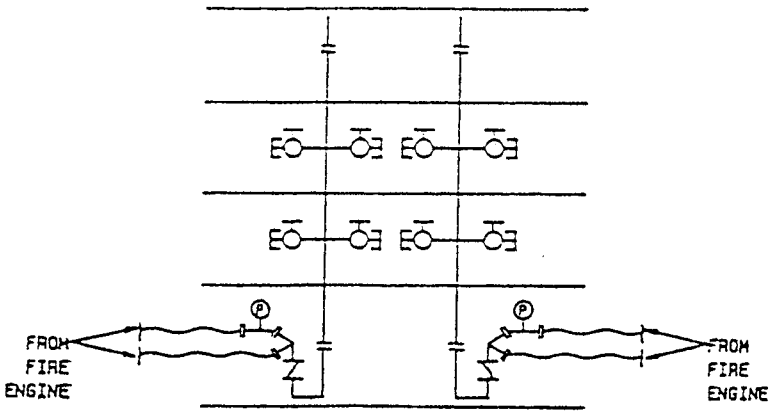
TESTING EQUIPMENT TO BE ARRANGED IN ACCORDANCE WITH (2)



P : 800 KPa AT
UPSTREAM OF F.S. INLET

FIG. 4.2 TWO OR MORE RISING MAINS (2700 l/min)

TWO SETS OF RISING MAIN SHALL BE
TESTED SIMULTANEOUSLY IN ACCORDANCE WITH (2)



P : 800 KPa AT
UPSTREAM OF F.S. INLET

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