消 防 處
防 火 總 區
香港九龍尖沙咀東部康莊道 1 號 5 樓
消防總部大廈

FIRE SERVICES DEPARTMENT
FIRE PROTECTION COMMAND
FIRE SERVICES HEADQUARTERS BUILDING,
No. 1 Hong Chong Road, 5/F.,
Tsim Sha Tsui East, Kowloon,
Hong Kong

本處檔號 Our Ref.: (60) in FP 314/07 III

來函檔號 Your Ref.:

電訊掛號 Telex: 39607 HKFSD
HX
(24 小時 Hours)

圖文傳真 Fax: 852-2723 2197

電　　話 Tel. No.:

22 October 1996

F.S.D. Circular Letter No. 4/96
F.S.D. Circular Letters

All Fire Services Department (FSD) Circular Letters issued since 1987 have been updated and consolidated in the attached set of "FSD Circular Letters 1996" except those listed in Appendix I which are to remain as stand alone Circular Letters. As a result, all other Circular Letters are to be removed and destroyed.

Listed hereunder are the major amendments incorporated into the consolidated set of Circular Letters. Summary of the updating of each circular letter is also attached at Appendix II for reference.

(a) Part I 'Annotation of Smoke Control Installations Plans' has been extracted from previous Circular Letter 1/90 and incorporated into paragraph 3.7.

(b) Part II 'Improvised Sprinkler System' has been removed from previous Circular Letter 7/90 to paragraph 9 of this Part.

(c) Part III Updated lists of approved agencies and products have been incorporated into this Part.

(d) Part IV 'Fireman's Lifts' have been deleted as such provisions have been stipulated in the Code of Practice on the Design and Construction of Lifts & Escalators issued by the EMSD and the Building (Planning) Regulations. Instead, 'Smoke Extraction Systems' have been removed from previous Circular Letter 1/90 to this Part.

(e) Part V The paragraph on 'Smoke detectors in passenger lift lobbies' which is no longer applicable has been deleted.

(f) Part VI New paragraphs have been added to describe in more detail the inspections and certification of fire service installations which were previously outlined in separate Circular Letters. A new paragraph detailing common defects found in FSI inspections has also been added to this Part. Details are the same as those appeared in our letter to The Association of Registered F.S.I. Contractors of H.K. dated 15.11.1994.

(g) Part VIII Descriptions on halogenated fire extinguishing agents have been consolidated from previous Circular Letters in paragraph 6, and consequently, some of the paragraphs have been re-numbered. Details on Clean Fire Extinguishing Agents have also been extracted from previous Circular Letters and put in paragraph 8.

(h) Part IX Numbering of the paragraphs has been updated.

(i) Part X A new paragraph detailing Fire Protection in Construction Site has been added. The details are extracted from previous Circular Letter 5/89 and Fire Protection Notice No. 13

(j) Part XI Mechanical Ventilating Systems - A new part incorporating all current F.S.D. (Ventilation) Circular Letters.

Signed
(LAM Chun-man)
for Director of Fire Services

Appendix I

F.S.D. Circular Letters
still in force and to remain as stand alone letters

Circular Letter No.	Subject
6/87	Testing of Halon Gas Flooding Systems
3/90	Discharge Test of 25-bar Halon Extinguishing System
2/94	Rules for Automatic Sprinkler Installations
1/95	Checklist for Fire Detection System in accordance with FOC Rules for Automatic Fire Alarm Installations (12th Edition)
7/95	Automatic Fire Detection System - Design and Maintenance Considerations

Appendix II

Summary of the Updating of Circular Letters

Circular Number	Subject	Remarks
1/87	FSD Circular Letters	Obsolete - Consolidated Version Updated
2/87	Automatically Operated Total Flooding Systems	Obsolete - Phasing-out of Halons
6/87	Testing of Halon Gas Flooding Systems	Still Valid - To remain as a separate Circular Letter
8/87	Fire Certificate for Temporary Occupation Permit	Obsolete - Incorporated into Part VI as paragraph 3.3
5/88	Fire Test Facility	Obsolete - List Updated and Incorporated into Part III
12/88	Fireman's Lift	Obsolete - Already Incorporated into Code of Practice published by EMSD
1/89	Access to Developments in Virgin Areas	Obsolete - Superseded by Circular Letter No. 2/95
5/89	Fire Protection in Construction Sites	Obsolete - Incorporated into Part X as paragraph 7
8/89	List of Fire Retardant Products Approved by Hong Kong Fire Services Department	Obsolete - List Updated and Incorporated into Part III
9/89	Fire Test Facility	Obsolete - List Updated and Incorporated into Part III
10/89	Revised Procedure in Approval of Fire Extinguishers containing halons	Obsolete - Incorporated into Part VIII
11/89	Revised Procedure in Issuance of Fire Service Certificate (F.S. 172)	Obsolete - Incorporated into Part VI as paragraph 3.1 &3.2
1/90	Smoke Extraction Systems	Obsolete - Incorporated into Section 5.23 of the CoP, Part I as paragraph 3.7 and Part IV
2/90	Ventilation/Air Conditioning Control System	Obsolete - Incorporated into Section 5.26 of the CoP
3/90	Discharge Test of 25-bar Halon Extinguishing System	Still Valid - To remain as a separate Circular Letter
4/90	Codes of Practice for Minimum Fire Service Installations and Equipment and Inspection and Testing of Installation and Equipment	Obsolete
5/90	Emergency Generators	Obsolete - Incorporated into Section 5.8 of the CoP
6/90	Issuance of Certificate by FSI Contractors	Obsolete - Incorporated into Part VI as paragraph 4
7/90	Improvised Sprinkler System	Obsolete - Incorporated into Part II as paragraph 9
8/90	Specification of Fire Hydrant/Hose Reel Installations	Obsolete - Incorporated into Section 5.14 of the CoP
9/90	List of Fire Retardant Products Approved by Hong Kong Fire Services Department	Obsolete - List Updated and Incorporated into Part III
1/91	Fire Test Facility	Obsolete - List Updated and Incorporated into Part III
2/91	F.S.D Circular Letters	Obsolete - Letters Updated
1/92	Specifications for Fire Hydrant/Hose Reel Installations	Obsolete - Incorporated into Section 5.14 of the CoP
2/92	Checklist for Fire Hydrant & Hose Reel Installations in accordance with Code of Practice (Inspection & Testing)	Obsolete - Incorporated into CoP (Inspection and Testing)
3/92	Application in regard to the Acceptance of Fire Resisting Doorsets	Obsolete - Acceptance to be undertaken by the Buildings

		Department

Summary of the Updating of Circular Letters

1/93	Portable Hand-Operated Approved Fire Extinguishers	Obsolete - Incorporated into paragraph 6 of Part VIII
2/93	List of Fire Retardant Solution & Products Approved by Hong Kong Fire Services Department	Obsolete - List Updated and Incorporated into Part III
3/93	List of Emergency Exit Devices Approved by Hong Kong Fire Services Department	Obsolete - List Updated and Incorporated into Part III
4/93	Codes of Practice for Minimum Fire Service Installations and Equipment and Inspection and Testing of Installations and Equipment	Obsolete
5/93	Fire Test Facility	Obsolete - List Updated and Incorporated into Part III
6/93	Alternatives for Halon-based Fixed Installations	Obsolete - Incorporated into paragraph 8 of Part VIII
1/94	Codes of Practice for Minimum Fire Service Installations and Equipment and Inspection and Testing of Installations and Equipment	Obsolete
2/94	Rules for Automatic Sprinkler Installations	Still Valid - To remain as a separate Circular Letter
3/94	Basement Plans	Obsolete - Incorporated into Part I as paragraph 5
4/94	Chinese Version of the Codes of Practice for Minimum Fire Service Installations and Equipment and Inspection and Testing of Installations and Equipment	Obsolete
5/94	CO2, FM 200, NAFS-III and Inergen Identification Symbols	Obsolete - Incorporated into paragraphs 6.2 & 8.4 of Part VIII
1/95	Checklist for Fire Detection System in accordance with FOC Rules for Automatic Fire Alarm Installations (12th Ed.)	Still Valid - To remain as a separate Circular Letter
2/95	Access for Fire Appliances and Compatibility of Occupancy	Obsolete - Incorporated into Part X as paragraphs 5 & 6
3/95	Street Fire Hydrant	Obsolete - Incorporated into Part X as paragraph 3.8
4/95	Application Form for Inspection and Testing of Fire Service Installations in New Building	Obsolete - Incorporated into Part VI as paragraph 1.1
5/95	Maintenance Label for Portable Fire Extinguisher	Obsolete - Incorporated into Part VI as paragraph 7.1
6/95	Certificate of Fire Service Installations (FSI) or Equipment in accordance with Fire Service (Installations and Equipment)Regulations	Obsolete - Incorporated into Part VI as paragraph 4.4 - 4.7
7/95	Automatic Fire Detection System - Design and Maintenance Considerations	Still Valid - To remain as a separate Circular Letter
8/95	Submission of EVA Plans	Obsolete - Incorporated into Part VI as paragraph 1.2
1/96	Prohibit the Import of BCF Fire Extinguishers	Obsolete - Incorporated into paragraph 8 of Part VIII
2/96	Fire Resisting Construction Fire Shutters	Obsolete - Incorporated into paragraph 1 of Part VIII
3/96	Signs and Markings for Emergency Vehicular Access (EVA)	Incorporated into paragraphs 5.1.8 & 5.2.12 of Part X

Remarks (i) CoP - Code of Practice for Minimum Fire Service Installations and Equipment

(ii) CoP (Inspection and Testing) - Code of Practice for Inspection and Testing of Installations and Equipment

F.S.D.

CIRCULAR LETTERS

1996

FSD Circular Letters

Index of Contents

Part I

Plans

1. Centralized Processing of Building Plans - Proposal Concerning Fire Service Installations

2. Site Plans

3. Fire Service Installation Plans

4. Reserved

5. Basement Plans

6. Building Developments Adjacent to Mass Transit Railway Vent Shafts - Submission of Building Plans

7. Common Faults Concerning Fire Service Installations Found in Building Plans

8. Amendments to Building Plans Before Development Commences

9. Revisions to Building Plans - Later Stages of Development

PART I

PLANS

1. Centralised Processing of Building Plans - Proposals Concerning Fire Service Installations

Building Authority's Practice Note for Authorised Persons and Registered Structural Engineers 30 (PNAP:30) refers. With immediate effect, the following revised procedures shall apply :-

1.1 All Plans (including New Submission, Re-submission and Amendment) shall be submitted directly to the Building Authority in accordance with PNAP:30.

1.2 The covering letter which accompanies building plans submitted to the Building Authority for approval under Section 14 of the Buildings Ordinance must be copied to FSD. Appendix B in PNAP:30 refers.

1.3 Two sets of building plans will be passed to the Fire Protection Bureau for examination in accordance with Section 16(1)(b) of the Buildings Ordinance.

1.4 After vetting, two copies of the letter without the building plans referred to in para. 1.5 below, containing FSD comments/approval will be sent to A/Ps direct, with a copy to the Buildings Department.

1.5 The A/P is required to send a messenger, bringing a copy of the letter referred to in para. 1.4 above and identification, to collect the plans from the Fire Protection Bureau at No. 1 Hong Chong Road, Tsim Sha Tsui East, Kowloon.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

2. Site Plans

It is often necessary to inspect the site of proposed development prior to the processing of building plans. Two copies of block plans should therefore be submitted, annotated with the following information :-

2.1 Names of the surrounding streets and roads.

2.2 Lot number.

2.3 Any adjacent Government or public building, church or school etc.

2.4 North indication arrow.

2.5 Nearby milestone or other appropriate location reference, particularly in respect of rural areas.

3. Fire Service Installation Plans

3.1 The submission of all fire service installation plans shall be accompanied by a certificate (FSI/314) signed:-

3.1.1 by the Authorised Person certifying that the fire service installation plans are identical to the approved building plans held by the Fire Services Department; and

3.1.2 by the appointed Fire Service Installation Contractor/Consultant certifying that the details and specifications of all installations shown thereon are as prescribed by the Fire Services Department and in accordance with all relevant rules and codes of practice as may be applicable.

N.B. where the fire service installation plans do not involve work on the building plans by an Authorised Person, the condition in 3.1.1 shall not be applicable. Examples are addition to or deletion of automatic smoke/heat detectors and sprinkler heads due to change of partitions and ceilings; and installation of improvised sprinkler systems in existing buildings.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

3.2 On receipt of fire service installation plans accompanied by the certificate, plans may or may not be examined by the Fire Services Department. However a full, detailed check will still be carried out on a percentage of submissions, hence the need to ensure that all Fire Service Installation Contractors/Consultants not only work to plans identical to the approved building plans held by the Fire Services Department but that the details and specifications of all installations shown on the plans are in accordance with the requirements prescribed by the Director of Fire Services and conform with all relevant rules and codes of practice as required and as notified by Fire Services Department. Any plans subjected to detailed examination as above, and found unsatisfactory will be returned to the Authorised Person, or Fire Service Installation Contractor or Consultant as appropriate without being chopped, together with the certificate signed by the authorised person and the Fire Service Installation Contractor/Consultant.

3.3 Except for unsatisfactory plans as mentioned in para. 3.2, fire service installation plans will be chopped "FIRE SERVICE INSTALLATION PLANS AS CERTIFIED BY THE AUTHORIZED PERSON AND FIRE SERVICE INSTALLATION CONTRACTOR/CONSULTANT", and signed and dated by the Director of Fire Services to acknowledge receipt of plans. One copy will be returned to the Authorised Person or FSI Contractor/Consultant as appropriate and the other returned for use by the Fire Services Department when carrying out the initial fire service installation inspection. It must be clearly understood that chopped plans do <u>not</u> signify that these plans have been examined and approved by Fire Services Department.

3.4 No initial inspection of any fire service installation will be carried out unless Fire Services Department holds a copy of chopped plans accompanied by the certificate (FSI/501) signed by the authorised person and the fire service installation contractor/consultant.

3.5 <u>Responsibility for errors which may subsequently come to light when completed fire service installations are inspected, and which may lead to refusal or delay in issue of FS 172, rests with the Authorised Person and/or Fire Service Installation Contractor/Consultant.</u>

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

3.6 Annotation of Fire Service Installation Plans

3.6.1 All Installations

(a) Plans and layouts shall be drawn to a ratio of not less than 1 : 100. In case of very extensive buildings, plans drawn to a ratio 1 : 200 may be accepted.

(b) All partition walls, party walls, and elements of construction shall be clearly identified and distinct from the pipings and/or equipment of the installation.

(c) If the names of the manufacturer of any equipment are shown on the drawings, relevant approval reference for such equipment shall also be included.

(d) All pipe sizes shall be identified by colours as listed hereunder, those sizes beyond this range shall be suitably indicated by numerals.

Pipe size	Colour code
20 mm	orange
25 mm	green
32 mm	red
38/40 mm	purple
50 mm	yellow
65 mm	light blue
80 mm	dark green
100 mm	light brown
150 mm	brown
200 mm	dark blue

The plan will incorporate a legend to show the size of the pipes and the colour used.

3.6.2 Fire Hydrant/Hose Reel Installations

(a) Tables/summaries of equipment shall be included.

(b) The lengths of hose reels shall be clearly indicated.

Note Check may be confined to the schematic line diagrams.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

3.6.3 Automatic Sprinkler Installations

(a) Scales of heads and equipment as per clause no. 6.3.2 of LPC Rules (or para. 5113 of the 29th Edition FOC Rules) shall be noted on plans.

Note (i) Check may be made on the spacing, locations of sprinkler heads, sprinkler pipe size, schematic diagrams, water supply arrangement (including the pressure and flow of the system) only.

(ii) Calculation on the selection of orifice plates, and pressure loss hydraulic calculations will not be checked.

(iii) Sectional and elevation drawings showing the proposed layout shall be submitted in order to avoid problems concerning locations of pipe-ranges.

3.6.4 Fire Detection Systems

Note Check may only be made on the spacing and/or locations of the detector heads and the positions of annunciator boards.

3.6.5 Fixed Installations (Gas) - i.e. CO_2, BCF, BTM, FM 200, & NAFS III & Inergen

The following details shall be included in the layout drawings:-

(a) volume of each protected compartment;

(b) design concentration of the system;

(c) quantity of extinguishing medium;

(d) operational procedure;

(e) operational device;

(f) manual operational device;

(g) isometric diagram; and

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

(h) pressure loss calculations (for engineered systems only).

Note Pressure loss calculations and size of nozzles and pipe size will not be checked, such are the responsibility of the design engineers.

EXTRA NOTE For FSIs in potentially explosive atmospheres - please refer to paragraph 6 of PART IX.

3.6.6 Fixed Installations (Water) - i.e. Drenchers, Water Spray

The following details shall be included in the layout drawings:-

(a) the total surface area to be protected;

(b) positions of heads;

(c) rate of discharge of the system;

(d) water supply arrangement;

(e) means of actuation, automatic and/or manual;

(f) operational procedure; and

(g) schematic diagrams and isometric diagram;

Note (i) Hydraulic and pressure loss calculations will not be checked.

(ii) Sectional and elevation drawings showing the proposed layout shall be submitted in order to avoid problems concerning locations of pipe-ranges.

3.7 Annotation of Smoke Control Installations Plans

3.7.1 General

3.7.1.1 The Hong Kong Government's stated policy is to use the SI Metric System for all documentation. C.G.S. Metric shall not be used.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

3.7.1.2 Accordingly all submissions shall be on the preferred "A" sizes of sheets as follows :-

A0	1189mm x 841mm
A1	841mm x 594mm
A2	594mm x 420mm
A3	420mm x 297mm
A4	297mm x 210mm

3.7.1.3 Care shall be taken on the use of units; for examples:-

millimetres = mm - not MM which means Mega Mega.

kiloPascal = kPa

centimetre is not a preferred unit for building works

3.7.1.4 All submissions shall be made in duplicate.

3.7.1.5 Plans shall be drawn and reproduced in a clear and intelligible manner on suitable durable material.

3.7.1.6 The drawings shall show only details relevant to the submission (i.e. no plumbing, architectural, electrical, etc. details unless directly relevant)

3.7.1.7 Compartmentation in accordance with the approved building plans shall be clearly shown in such a manner as to indicate the FRP value.

3.7.1.8 In view of the future use of microfilm record storage, all submissions shall be suitable for this purpose and be prepared in accordance with BS 5536. Major points from BS 5536 are :-

(a) Drawings sizes larger than AO should be avoided.
(b) Centre mark to be shown at centre of each side of the drawing frame.
(c) Matt surface necessary.
  (i) to have matt surface.
  (ii) Width of lines - 0.3mm (thin) and 0.7mm (thick)
  (iii) not less than 1mm apart.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

(e) Lettering :

(i) Capitals preferred.

(ii) Clear style.

(iii) Stroke = 0.1 times height.

(iv) approx. 0.7mm clearance between characters or parts of characters for 2.5mm high capitals. Other sizes in proportion.

(v) Minimum character height :-

		Drawing size	
(A)	dimensions & all other characters	A0	3.5mm
		A1, A2, A3 and A4	2.5mm
(B)	number & title	A0, A1, A2, A3 and A4	7.0mm

(f) All notes to be read from same direction

(g) Provide numbered scale

(h) "Clean" prints are necessary, i.e. no dark background.

3.7.2 Ventilation/Air-conditioning Control System

The following details shall be included in the ventilation/air-conditioning layout drawings :-

(a) ventilating fans which are to be tripped off;

(b) designed flow capacity of ventilating fans;

(c) method used to trip off ventilating fans;

(d) location of manual stop switch; and

(e) schematic diagram showing the air-side arrangement.

Note : ventilating fans to be tripped off shall be coloured.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

3.7.3 Smoke Extraction and Staircase Pressurisation Systems

Other than the general requirements for smoke control installation plans submission, the following additional requirements shall be followed in smoke extraction and staircase pressurisation systems plans submissions. These requirements are formulated to facilitate processing, reduce possible mistakes, increase efficiency and save overall time in plans processing, thus assisting the profession and trade.

3.7.3.1 Location, description, company, name of authorised person and consultant, name and signature of designer/engineer responsible for the design and other information shall be clearly displayed on the drawings and preferably at the right hand corner of each sheet.

3.7.3.2 Each drawing shall be signed as having been checked and approved by the designer/consultant. Revised drawings shall bear separate signatures for each amendment.

3.7.3.3 Designation of sections and details shall be clearly indicated. If such details are not on the particular drawings then the indication shall include the other drawing number, e.g. B

3.7.3.4 When drawings are amended such alterations and amendments are to be progressively and clearly indicated and summarised. Amendment indications shall clearly show the date effected.

3.7.3.5 Each drawing shall preferably carry a legend of all markings and symbols thereon on the right hand side of the sheet. For multiple drawings for one project the legend shall be in a similar position on each sheet.

Drawing contents to be clearly readable and shall be drawn to ratios of not less than :-

(a)	Block plan	1 : 500
(b)	Layout plan	1 : 100
(c)	Sections	1 : 100 or 1 : 50
(d)	Plant details	1 : 50 or 1 : 20

Note 1 : 25 is NOT an S.I. metric ratio

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

3.7.3.6 Plant room layouts shall contain sufficient detail to show that adequate maintenance and access clearances are provided.

3.7.3.7 Any schematic drawings shall be shown in the "power off" condition and a tabulation or other indications shall be provided to clearly show the various operating and/or fail safe states.

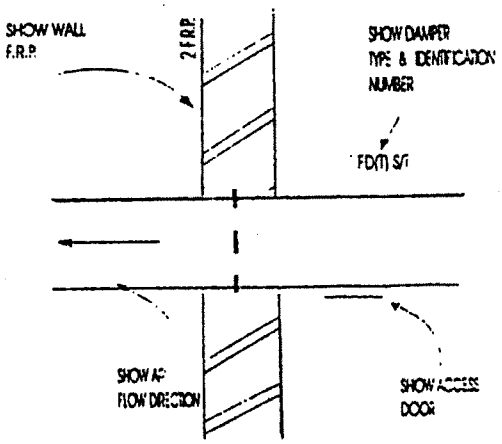
3.7.3.8 One copy of every document shall be coloured in accordance with the following (based on Appendix C of D.W. 142 "Specification for sheet metal ductwork - low, medium and high pressure/air velocity air system" issued by the Heating and Ventilation Contractors' Association, H.K.)

		B.S. 4800 colour
a)	Supply air	- Red 04.E.53
b)	Return air	- Yellow 10.E.53
c)	Exhaust air	- Light Blue 20.C.33
d)	Fresh air	- Dark Green 14.E.58
e)	Smoke extraction	- Brown 06.C.39
f)	Smoke system makeup air	- Light Green 14.C.35
g)	Fire resisting enclosure	- Yellow/Red (Orange) 06.E.51

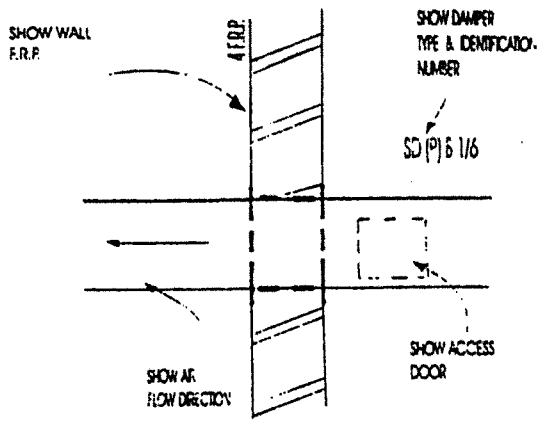
Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

3.7.3.9 Fire & smoke dampers and control dampers for Staircase Pressurisation or smoke control systems shall be distinctively indicated on the drawings as follows :-



FIRE DAMPER



SMOKE DAMPER

Nomenclature for damper types

F.D.(T)	Fire Damper with thermal link
F.D.(E)	Fire Damper with electro-thermal link
F.D.(TM)	Fire Damper with thermal link and electric motor operator
F.D.(TP)	Fire Damper with thermal link and pneumatic actuator
S.D.(M)	Smoke damper with electric motor operator
S.D.(P)	Smoke damper with pneumatic actuator
S.D.(S)	Smoke damper with electric solenoid operator
S.F.D(TM)	Combined smoke & fire damper with thermal link and electric motor operator
S.F.D.(TP)	Combined smoke & fire damper with thermal link and pneumatic actuator.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

Positions of each access door and direction of air flow for each damper must be clearly shown.

3.7.3.10 The positions of all sail switches, pressure switches, smoke detectors, etc. shall be clearly shown on all the submitted drawings. Also show withdrawal clearances as required for any devices plus access door positions.

3.7.3.11 All items of equipment i.e. fans, fire dampers, etc. shall be individually clearly identified by a suitable system of numbers, letters or other means which shall be as simple as possible.

3.7.3.12 Submissions for Smoke Extraction and Staircase Pressurisation Systems shall be made by the Architect/Consultant for the project. F.S.D. may refuse to accept submissions from any contractor if an Architect/Consultant is appointed for the project.

3.7.3.13 F.S.D. may refuse to accept submission from two or more Architects/Consultants in respect of works at the same premises without written advice/consent from the Owner.

4. Reserved.

5. Basement Plans

5.1 Use and occupancy shall be defined and no change from designed occupancy will be permitted without FSD's consent.

5.2 Ready and separated access to each level shall be provided.

5.3 Fast response type sprinkler heads shall be provided.

5.4 Proposals for three or more basement levels and industrial basements will be the subject of individual consideration. Enhanced Fire Services Requirements will be imposed as follows :-

5.4.1 Firefighting and rescue stairways to be provided in accordance with the Code of Practice for Means of Access for Firefighting and Rescue issued by the Building Authority.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

5.4.2 Dynamic smoke extraction system to be provided for each basement level except area solely for carparking purpose. For avoidance of doubt, loading/unloading area is not classified as carparking area.

5.4.3 It must be clearly understood that other requirements may be imposed as situation demands, depending on the particular case.

6. Building Development Adjacent to Mass Transit Vent Shafts - Submission of Building Plans

6.1 There are certain restraints on properties in close proximity to Mass Transit Railway (MTR) vent shafts for the obvious reason of minimising the possibility of contamination by fire or smoke. In order to assist authorized persons in the planning of building developments which are adjacent to MTR vent shafts, the following standards are given which however, merely serve as guidelines and are subject to modification due to varying factors in each case :-

6.1.1 The opening to the vent shaft irrespective of whether it is free standing or is accommodated in a building should be located not closer than 5m to any opening, e.g. openable or fixed windows, doorway, building ventilation system intake or exhaust, etc. in any building. This distance may be reduced to 2.5m provided that the exhaust air from the MTR vent shaft is directed away from and is not likely by natural convection to affect the opening.

6.2 The necessity for any clearance requirement and, if so, the details thereof, will be determined at the same time as building plans of the development are submitted to the Buildings Department for approval.

7. Common Faults concerning Fire Service Installations found in Building Plans

7.1 Certain errors and omissions concerning fire service installations shown on building plans occur more frequently than others. These are shown below. Authorized Persons and their staff are requested to note this list to avoid making similar errors or omissions in future.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

7.2 General

7.2.1 Provision of access for fire appliance not in compliance with FSD Circular Letter Pt. X,

Paragraph 5.

7.2.2 Legend and F.S. notes missing or inadequate.

7.2.3 Emergency generator not indicated.

7.2.4 Omission of Fire Control Centre.

7.2.5 Size of portable equipment incorrect.

7.2.6 Rating of fire doors/shutters not indicated.

7.2.7 Omission of portable fire fighting equipment.

7.2.8 Capacity of transformer in kVA not indicated.

7.2.9 Occupancy of individual compartment not stated.

7.2.10 Fire suppression/detection system for transformer room omitted.

7.2.11 Amendment not coloured or identified.

7.3 Fire Hydrant/Hose Reel Systems

7.3.1 Insufficient hydrants and hose reels to cover every part of each floor.

7.3.2 Minimum quantity of water required having regard to the floor area factor inadequate.

7.3.3 Siting of fire hydrants and hose reels unsatisfactory.

7.3.4 Location of inlets unsatisfactory.

7.4 Sprinkler Systems

7.4.1 Capacity of water tanks inadequate.

7.4.2 Location of sprinkler inlets unsatisfactory.

7.4.3 Omission of sprinkler annunciator panel.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

7.5 Fire Detection Systems

7.5.1 Type of detectors to be installed for a particular risk not specified e.g. sleeping accommodation.

7.6 Fireman's Lifts

7.6.1 Zoning of fireman's lift not in accordance with Code of Practice for Means of Access for Firefighting and Rescue 1995, Part IV, Paragraph 10.

7.6.2 Fireman's lift not discharging into protected lobby.

7.6.3 Loading and size not in compliance with Code of Practice for Means of Access for Firefighting and Rescue 1995, Part IV, paragraph 12.

7.6.4 Designated fireman's lift not indicated.

7.6.5 Separate fire-resisting lift shaft not provided.

7.6.6 Fireman's lift lobby not connected directly to staircase.

8. Amendments to Building Plans before Development Commences

8.1 In order to expedite the processing of plans and to avoid unnecessary delay, Authorized Persons are requested to cooperate by :-

8.1.1 ensuring that all F.S. requirements were marked on plans.

8.1.2 sending on receipt of a telephone request from FSD, a draftsman to carry out/mark on minor amendments to plans. A/P's representatives will be required to produce a letter of authorization from A/P to carry out amendments.

8.1.3 itemizing on the accompanying letter and to colour the amended items on plans when resubmitting amended plans.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

9. Revisions to Building Plans - Later Stages of Development

9.1 It is frequently the case that fire officers and BSIs engaged on inspection of the fire protection aspects of completed buildings prior to occupation, discover that the actual building differs from the latest set of plans approved and retained by the Fire Services Department. It is most important that such plans be accurate in all respects. Alterations may not only affect the planned fire protection of a building but also when proposals involving additions, alterations or change of usage are made at a later stage, it is essential that an assessment be made in comparison with plans which were a correct reflection of the building at time of occupation. In cases involving unauthorized alterations such plans may also be produced as evidence in case of legal action.

9.2 To avoid both unnecessary work and frustrating delays, authorized persons are advised that plans involving building amendments should be submitted for consideration well in advance of a request for final inspection. A Fire Services Certificate (FS 172) will not be issued where the building differs from the latest approved plans.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

PART II

AUTOMATIC SPRINKLER INSTALLATIONS

1. Plans
2. Water Supplies
3. Others Systems/Supplies
4. Connections from Sprinkler Systems
5. Water Supplies - General
6. Installation - Bends in Range Pipes
7. Expansion Joints
8. Fire Insurance Rebates - Water Supply Sources
9. Improvised Sprinkler System

PART II

AUTOMATIC SPRINKLER INSTALLATIONS

Introduction

Automatic sprinkler installations must conform in every detail with the FOC Rules, 29th Edition except for such variations or exemptions specifically detailed in this section. In addition to this, attention is drawn to the following rules and excerpts from the 29th Edition.

NOTE : This part shall only apply to installations in existing buildings or new buildings of which plans were submitted to this Department before 1.4.1995. For building projects submitted on or after the above date, the installations shall conform to the LPC Rules as detailed in FSD Circular Letter No.2/94 issued on 16.9.1994.

1. Plans

1.1 Rule 1410 details the information which must be provided in connection with sprinkler installations. The only exception to this is the requirement shown in sub-rule 1412.1(17) which is modified as follows :-

The summary of pressure loss calculations referred to in sub-rule 1412.1(17) need not be submitted. However a summary should be available for examination by the Fire Services Department, as necessary. For layout approval purposes it is acceptable that a written undertaking be given that pressure and flow within the completed system will comply in all respects with Rules 2300-2337, 29th Edition of the FOC Rules.

1.2 Final approval of the system will be dependent upon such an undertaking being fulfilled and the Registered FSI Contractor will be held responsible for his undertaking.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

2. Water Supplies

2.1 Mains water connections for the supply of sprinkler systems will be approved subject to the layout of the system conforming with the layout diagrammes specified against each type of connection shown below :-

2.1.1	Town Mains	-	Para. 2221 and the layout on page 21 of the Rules. See also paragraph 4 of this PART.
2.1.2	Automatic Pump	-	Para. 2223 and layout on page 23 of the Rules.
2.1.3	Two Town Mains	-	Para. 2231(i) and layout on page 24 of the Rules.
2.1.4	Automatic Pump	-	Para. 2231 (v) and (vi) and layout on page 25 of the Rules.

2.2 In view of the fact that water restrictions may from time to time be necessary in Hong Kong, direct town mains connections, unless from a 24 hours supply approved by the Water Supplies Department, will not normally be accepted as they will not ensure a continuous supply under all circumstances. However, if provision is made for at least a 30-minute supply of stored water, mains connection will be approved subject to the layout conforming to para. 2.2.1 (a) below. This should be of assistance when difficulties are encountered in providing the large capacities of water storage in elevated tanks required by the FOC Rules (29th Edition). Clarification on this and other points in regard to acceptable water supplies is given hereunder :-

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

2.2.1 (a) Town main, para. 2221 - where a town mains connection fed from both ends is chosen and such mains are not on 24 hours supply, there must be provision for at least a 30-minute supply of stored water. However as the Water Supplies Department will not permit mains and stored water to share the same pipework (see para. 3.2), the mains supply must feed the storage tank. In all such cases a fire service inlet must be provided and there must also be provision for the sprinkler alarm system to be directly connected to the Fire Services Communication Centre. Your attention however is particularly drawn to paragraph 8 "Fire insurance rebate" should this method be chosen.

(b) Town main, para. 2221 - A town main having a single water supply (24 hour) feeding both ends is acceptable for all classes except "extra high hazard" (Grade III supply under FOC Rules 2210.3 and 2210.31).

2.2.2 Automatic pump, para. 2223 - a single ended feed from town main supplying suction tank will be accepted provided the tank has a capacity not less than two-thirds of the full holding capacity required for the particular hazard class and the sprinkler alarm is directly connected to the Fire Services Communication Centre.

2.2.3 Two towns mains (para. 2231(1)) - one connection to be directly from a 24 hour main (approved by Water Supplies Department) and the other from a distribution main.

2.2.4 Automatic pump with either a pressure tank, gravity tank or elevated private reservoir (para. 2231 (v) and (vi)) - the automatic pump with pressure tank is acceptable for "extra light" and "ordinary hazard" classes.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

3. **Other System/Supplies**

3.1 The following systems/supplies are also acceptable provided they are in accordance with the FOC Rules for the hazard class :-

3.1.1 Elevated Private Reservoir - para. 2222 and layout on page 22 of the Rules.

3.1.2 Gravity Tank - para. 2222 and layout on page 22 of the Rules.

3.1.3 Pressure Tank - para. 2224 and layout on page 23 of the Rules.

3.1.4 Two Elevated Private Reservoirs or Gravity Tanks - para. 2231(vii) and layout on page 26 of the Rules.

3.1.5 Elevated Private Reservoir and Pressure Tank - para. 2231(ix) and layout on page 26 of the Rules.

3.1.6 Automatic Pump Supply Drawing from River or Canal - para. 2231 (viii) and layout on page 27 of the Rules.

3.1.7 Automatic Pump Supply from Two Limited Capacity Reservoirs para. 2231 (viii)(b) and layout on page 27 of the Rules.

3.2 The following systems/supplies are not acceptable to the Water Supplies Department as the possibility of contamination presents a real risk to the mains supply system :-

3.2.1 Town Main with either a Pressure Tank, Gravity Tank or Elevated Private Reservoir - para. 2231 (ii) and (iii) and layout on page 24 of the Rules.

3.2.2 Town Main and Automatic Pump - para. 2231(iv) and layout on page 25 of the Rules.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

4. Connections from Sprinkler Systems

4.1 Whenever a town main is used to supply any system, no branch connection(s) for any other purpose, hose reels included will be permitted.

5. Water Supplies - General

5.1 It is essential that where it is proposed that sprinklers be supplied from town mains, connection details should be agreed with the Water Authority. A copy of the Water Authority advice should accompany all plans submitted. The Water Authority will advise the location and status of the available mains, within the context of paragraph 2, and ruling mains pressures. An Authorized Person' s certified true copy of the drawings chopped by the Fire Services Department must be submitted to the Water Authority, together with Form G, for acceptance before any work is put in hand.

5.2 Direct City Water Supply to Sprinkler Systems without Storage Water Tanks. Fitting of Anti-pollution Valve

Where it is proposed that sprinkler systems without water storage tanks be supplied from a direct connection to town mains, an anti-pollution valve to Water Authority specification shall be fitted to the sprinkler installation at a point between the town mains connection and the Fire Service Inlet.

6. Installation - Bends in Range Pipes

6.1 Should a 25mm diameter pipe in an OH system exceed an equivalent length of 5.2m (allowing 1m for each 25mm 90° elbow), the pipe should be uprated to 32mm diameter with a maximum equivalent length of 20m. This refers to Ordinary Class only.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

7. **Expansion Joints**

7.1 Expansion joints in sprinkler systems are permissible providing that the Design Engineers responsible for a particular installation certify that there is no satisfactory alternative method by which expansion can be compensated for.

7.2 Where expansion joints are fitted in a sprinkler installation, the designated Engineer for the system shall certify that the joints are capable of withstanding twice the working pressure of the installation.

7.3 They are approved by the Water Authority for such usage.

8. **Fire Insurance Rebates - Water Supply Sources**

Whilst the requirements of the Fire Services in regard to the water supply for a sprinkler installation may be deemed to be met, this does not necessarily mean that such supplies will attract insurance rebates and this point should be fully considered when water supply sources are planned.

9. **Improvised Sprinkler System**

9.1 As part of the measures to protect increased fire/life risks arising from change of occupancies, the Director of Water Supplies has agreed to favourably consider applications for water supply to the retrofitting of sprinkler systems to building not originally installed with such system and which, due to constructional constraints, cannot be provided with additional water tanks.

9.2 Application for improvised sprinkler systems in accordance with the standards in Appendix A should be submitted to the New Projects Division of Fire Protection Bureau for endorsement and onward transmission to the Water Supplies Department for processing. Upon approval, the FSI contractor may proceed with the work in accordance with the procedures as described in paragraph 4.2 and 4.3 in Part VI of this Circular Letter.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

Specification for Improvised Sprinkler System
Supplied Directly from Town' s Main/Existing Water Tank

The sources of water supply for retro-fitting of the system will be accepted in order of the following preference/order :

A. Connection from Existing FH/HR System (if available)

B. Direct Town' s Main Connection

The general specifications for improvised sprinkler systems are consolidated as below :

1.	The submission of design details shall be forwarded to the Director of Water Supplies for consideration with endorsement from Fire Services Department.	A & B
2.	The sprinkler installation shall be designed to conform to the Rules of the Loss Prevention Council, U.K., wherever applicable.	A & B
3.	The flow and pressure performance together with the sprinkler pipe-works shall be provided in accordance with provisions of Ordinary Hazard Group I in the above-mentioned Rules for Automatic Sprinkler Installations.	A & B
4.	The size of range and distribution pipework shall be designed in accordance with the above-mentioned Rules for Automatic Sprinkler Installations. (This Department does not preclude the use of larger pipes in the pipework system).	A & B
5.	Should the improvised sprinkler system be provided in place of a dedicated smoke extraction system as required by the Director of Fire Services, the sprinkler heads shall be of fast response type and each spaced to protect an area of 9 square metres.	A & B
6.	The sprinkler control valve shall preferably be situated on the same floor or one floor below the premises. It may also be positioned on roof (if the establishment is on the top floor) subject to proper security measures are provided. Such sprinkler control valve shall be properly secured and locked in open position to prevent unauthorized tampering. However, the control valve must be located in a non-risk area and without causing undue obstruction to the means of escape.	A & B
7.	Upon operation of the sprinkler system, means shall be provided to operate a fire alarm bell of not less than 150 mm in diameter on street level outside the building.	A & B

Such alarm bell shall be located in a prominent position exterior of the building and within easy reach of a fire appliance parked in a thoroughfare adjacent to the building.

8. An independent sprinkler inlet to be installed on street level of the building near to the above-mentioned alarm bell. A & B

9. An anti-pollution valve to Water Authority specification shall be fitted to the system at a point below the town' s main connection and the sprinkler inlet. B

10. Independent rising main of not less than 80 mm nominal bore to be provided between the sprinkler inlet and the control valve to enable Fire Services personnel to charge water directly to the sprinkler system without jeopardizing the normal operation of the existing rising main of the fire hydrant system. (see sketch at Appendix B) A

11. The sprinkler inlet shall be of standard pattern accepted by the Director of Fire Services and not less than 600 mm or more than 1000 mm above finished floor/ground level. It shall be suitably enclosed by glazing. The exact location of the installation and the words ' SPRINKLER INLET FOR ____ /F (name of establishment)' shall be conspicuously marked in English and Chinese characters, preferably in red colour, of not less than 50 mm in height. A & B

12. In case the premises is situated on a level of more than 60m above street level, arrangements of intermediate booster pump/s similar to the FH/HR system shall be provided between the sprinkler inlet and the sprinkler control valve. A

13. A no flow sensor or other monitoring device for the protection of sprinkler pump shall be provided and installed at the suction side of the sprinkler pump/s. A

14. A by-pass pipework of not less than 80mm nominal bore shall be provided between the sprinkler pump inlet and the existing fire service water tank in order to provide a direct water intake for the sprinkler pump/s. A

15. Secondary source of electricity supply shall be provided for the sprinkler pump/s. A

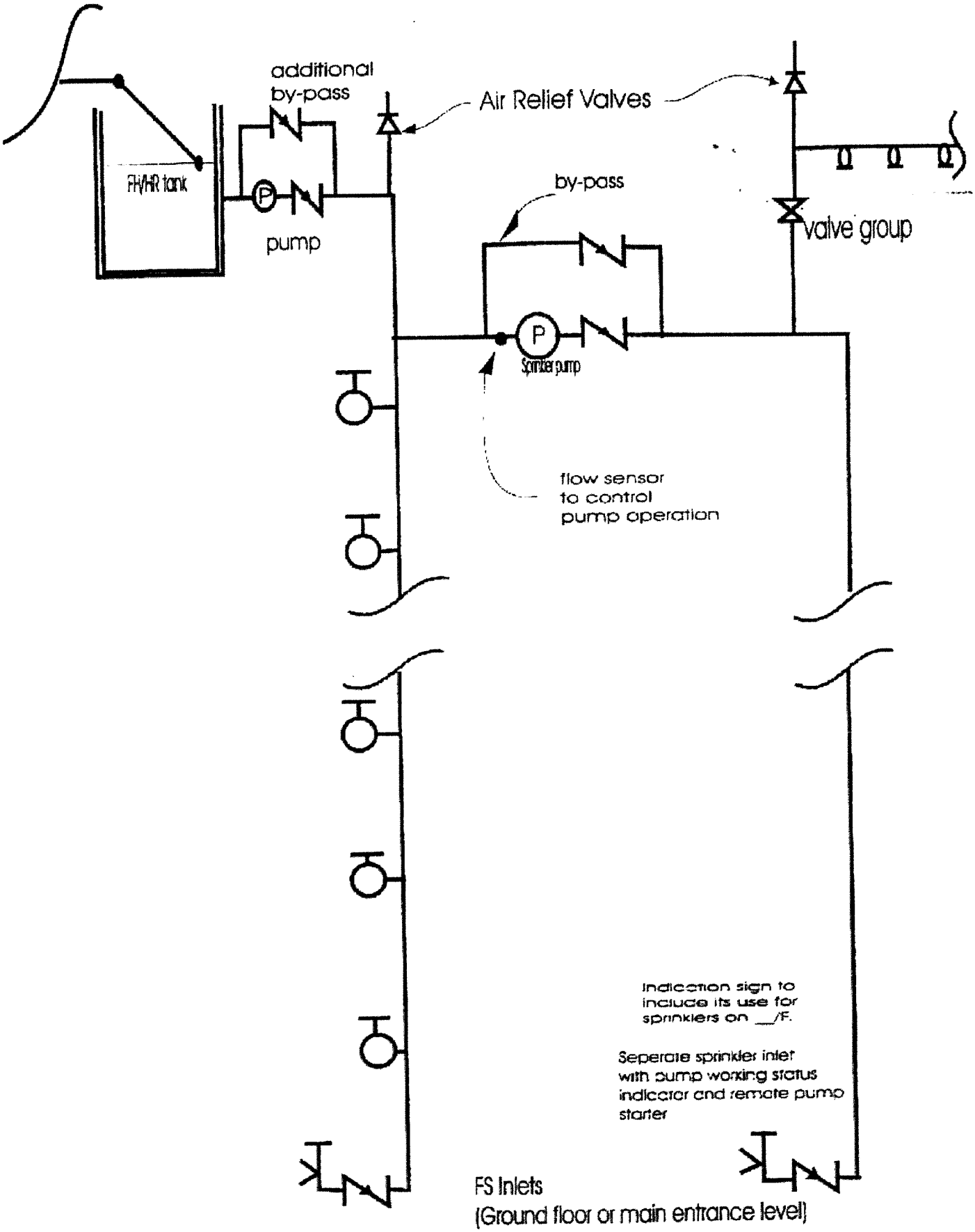
16. All sprinkler heads shall be of approved make. A & B

17. All pipings shall be at least medium grade steel tube conforming to B.S. 1387. A & B

APPENDIX B

Sketch for Improvised Sprinkler Systems

Sketch for Improvised Sprinkler Systems



PART III

LISTS OF APPROVED AGENCIES AND PRODUCTS

1. Testing Organisations Recognised by the Fire Services Department

2. Approved Fire Retardant Solutions (BS 476 : Part 7 - for decorative building materials and linings for walls and ceilings)

3. Approved Fire Retardant Solutions (BS 5867 : Part 2 - for decorative fabrics including curtains, drapes and other textile hangings)

4. Approved Fire Retardant Products

5. Approved Emergency Exit Devices

Note : Lists of approved portable equipment are published in the Gazette at least once in every year and are available for inspection by any person at all reasonable times free of charge at the offices of the Fire Services Department and at each fire station in Hong Kong.

1. List of Testing Organizations Recognized by Fire Services Department

Testing Organization / Equipment/Installations	Automatic Sprinkler System	Water Spray/ Foam Extinguishing System	Fixed Fire Extinguishing System	Automatic Fire Alarm System	Fire Extinguisher/ Blanket	BS 476 : Part 22, Clause 8 for Fire Resisting Rolling Shutter	BS 476 : Part 7 BS 5867 : Part 2 Type B for Fire Retardant Solution	NH3, C12, H2 and Electronic Gases Detection System and Detector
1 British Standards Institution (BSI), (Hemel Hempstead Centre) 389 Chriswick High Road, London W4 4AL, U.K.			X	X	X	X	X	
2 Fire Office's Committee (FOC) Melrose Avenue, Borehamwood, Herts, WD6 2BJ, U.K.) merged as the Loss Prevention Council (LPC) w.e.f. 1987	X	X	X	X	X	X		
3 Fire Insurers' Research and Testing Organization (FIRTO) Melrose Avenue, Borehamwood, Hertfordshire, WD6 2BJ, U.K.) merged as the Loss Prevention Council (LPC) w.e.f. 1987			X	X	X	X	X	
4 Timber Research and Development Association (TRADA) Hughenden Valley, High Wycombe, Bucks HP 14-4NP, Naphill, U.K.						X		
5 Yarsley Technical Centre (incorporating Yarsley Testing Laboratories) The Street, Ashtead, Surrey KT21 2AB, U.K.						X	X	
6 Building Research Establishment, Fire Research Station, Garston, Watford, WD2 7JR, U.K.						X		
7 Underwriters Laboratories, Inc. (UL) 333, Pfingsten Road, Northbrook Illinois 60062, U.S.A.	X	X	X	X	X	X		
8 Factory Mutual Research Corporation (FMRC) 1151, Boston-Providence Turnpike, Norwood, Massachusetts, 02062, U.S.A.	X	X	X	X	X	X		X
9 Underwriters Laboratories of Canada (ULC) 7 Crouse Road, Scarborough, Ontario M1R 3A9, Canada	X	X	X	X	X	X		

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October 1996

Testing Organization / Equipment/Installations	Automatic Sprinkler System	Water Spray/ Foam Extinguishing System	Fixed Fire Extinguishing System	Automatic Fire Alarm System	Fire Extinguisher/ Blanket	BS 476 : Part 22, Clause 8 for Fire Resisting Rolling Shutter	BS 476 : Part 7 BS 5867 : Part 2 Type B for Fire Retardant Solution	NH3, C12, H2 and Electronic Gases Detection System and Detector
10 Standards Association of Australia (SAA) Standards House, 80-86 Arthur Street, North Sydney, New South Wales, Australia	X	X	X	X	X	X		
11 Division of Building, Construction & Engineering, Institute of Minerals, Energy & Construction, Commonwealth Scientific and Industrial Research Organization (CSIRO) 87, Delhi Road, North Ryde, NSW 2113, P.O. Box 310, Australia				X		X		
12 Centre National de Prevention et de Protection (CNPP) 5 Rue Daunou, 75002 Paris, France					X			
13 C.T.I.C.M. Testing Laboratory Voie Romaine, 75210, Maizieres-Les-Metz, France						X		
14 Minister of the Interior of Germany Graurheindorfer StraBe 198, Postfach 170 290, 5300 Bonn 1, Germany					X			
15 Verband der Sachversicherer (VdS) Riehler Strabe 36-5000 Koln 1, Postfach 10 20 24, Germany	X	X	X	X	X			
16 Japanese Minister of Home Affairs 2-1, Kasumitaseki, Chiyoda-ku, Tokyo, Japan	X	X	X	X	X			
17 Standards of Industrial Research institute of Malaysia (SIRIM) Lot 10810, Peringkat, 3, Lebuhraya Persckutuan, Peti Surat 35, Shah Alam, Selangor, Malaysia					X			
18 Warrington Fire Research Centre (WFRC) Holmesfield Road, Warrington, WA 1 2DS, U.K.						X	X	
19 Building Research Association of New Zealand (BRANZ) Moonshire Road, Judgeford, New Zealand						X		
20 British Approvals for Fire Equipment (BAFE) 48a Eden Street, Kingston Upon Thames, Surrey, KT1 1EE, U.K.					X			

Signed

(LAM Chun-man)
for Director of Fire Services

Date : 22 October 1996

Testing Organization \ Equipment/Installations	Automatic Sprinkler System	Water Spray/ Foam Extinguishing System	Fixed Fire Extinguishing System	Automatic Fire Alarm System	Fire Extinguisher/ Blanket	BS 476 : Part 22, Clause 8 for Fire Resisting Rolling Shutter	BS 476 : Part 7 BS 5867 : Part 2 Type B for Fire Retardant Solution	NH3, C12, H2 and Electronic Gases Detection System and Detector
21 Warnock Hersey International Inc. (WHI) 1101, Loveridge Road, Pittsburgh, CA 94565 U.S.A.						X		
22 British Gypsum Limited Research & Development Department East Leake, Loughborough, Leicestershire, LE12 6JQ, England						X	X	
23 Singapore Institute of Standards and Industrial Research (SISIR) 179, River Valley Road, Singapore 0617							X	
24 The Loss Prevention Council The Technical Centre, Melrose Avenue, Borehanwood, Herts WD6 2BJ, U.K.	X		X	X	X	X	X	
25 Insurance Council of Australia Limited (ICA) 31, Queen Street, Melbourne 3000, Australia	X		X	X	X			
26 Statens Provingsanstalt Department of Fire Technology, Post Office Box 857, S-501, 15BORAS, Sweden						X		
27 SGS Yarsley Limited Trowers Way, Redhill Survey, RH1 2JN, England						X	X	
28 Scientific Services Laboratory Australian Construction Services 177, Salmon Street, Port Melbourne, Vic. Australia 3207				X				
29 Faverdale Technology Centre Limited Faverdale Industrial Estate Darlington, Co Durham DL3 OPX, England						X		
30 Building Technology Limited (BTL) Private Bag 50 908 Porirua, Moonshire Road, Judgeford, Wellington						X		
31 Warrington Fire Research (Aust) Pty Limited 2/F., 541 Blackburn Raod, Mount Waverley VIC 3149						X		

Signed
(LAM Chun-man)

for Director of Fire Services

Date : 22 October 1996

Testing Organization / Equipment/Installations	Automatic Sprinkler System	Water Spray/ Foam Extinguishing System	Fixed Fire Extinguishing System	Automatic Fire Alarm System	Fire Extinguisher/ Blanket	BS 476 : Part 22, Clause 8 for Fire Resisting Rolling Shutter	BS 476 : Part 7 BS 5867 : Part 2 Type B for Fire Retardant Solution	NH3, C12, H2 and Electronic Gases Detection System and Detector
32 British Textile Technology Group (BTTG) Wira House, West Park Ring Road, Leeds, LS16 6QL, England							X	
33 China National Fire Equipment Quality Supervision Centre No. 601 Zhong Shan Road South Two, Shanghai, China					X			
34 Sira Certification Service (SCS) Saighton Lane, Saighton, Chester, CH3 6EG, U.K.								X
35 British Approvals Service for Electrical Equipment in Flammable Atmosphere (BASEEFA) Harpur Hill, Buxton, Derbyshire, SK17 9JN, U.K.								X

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October 1996

2. List of Fire Retardant Solution
Approved by Hong Kong Fire Services Department
(BS 476 : Part 7)

	Name of Product	Substrate	The Applicant	On
1	Satin Lustre, enamel emulsion and under-coating manufacutred by Sissons Paints (East) Ltd.	Plywood	Gilman Engineering Ltd. 12/F, Canvedish Centre, 23, Yip Kan Street, Wong Chuk Hang, Hong Kong	4.10.65
2	Decadex Firecheck	Polyester, Tri-wall board, asbesto cement panels, Blaxe-shield insulation		3.1.79
3	Flame Stop	Plywood	Sierra Co. 2, Upper Albert Road, Hong Kong	15.11.67
4	Retarderkote' Intumescene emulsion based fire retardant paint	Teak board	Swire Duro Ltd. TYTL 96, Tsing Yi Island, N.T.	11.3.68
5	'Timonox' Flame-retardant Paint undercoat and enamel	Insulating board, Hardboard, chipboard Plasterboard, Soft wood,	Valspar Paints Goodlass Road, Speke, Liverpool L24 9HJ, England	20.6.72
6	Timonox' Flame-retardant Paint satin Lustre	Polystyrene		
7	Fyrexo-intrumescene emulsion paint	Soft Wood	Expandite-interswiss Ltd. Amber Commercial Building 21/F, m 70-74, Morrison Hill Road, Hong Kong	16.6.78
8	Parmastic emulsion paint	Plaster board		20.9.56
9	Jacatex	Plywood	Y. Cee Chemicals Ltd. South China Industrial Block B, Building, 4/F, 1-7, Chun Pin Street, Kwai Chung, N.T.	24.7.78
10	Jacatard Flame Retardant Coating	Plywood		24.7.78
11	Jaculite (Vermiculite coating)	Plywood		24.7.78
12	Agotex	Steel sheet, Softwood	The China Paint Mfg. Co., Ltd., 416, Kwun Tong Road, Kowloon	5.8.78

Signed

(LAM Chun-man)
for Director of Fire Services

Date : 22 October 1996

	Name of Product	Substrate	The Applicant	On
13	Fire Barrier FB-D	Asbesto board, Chenille & mohair wall covering	Hanky & partners, Room 1515, Park-in Commercial Centre, 56 Dundas Street, Kowloon	18.8.78
14	Fire Barrier FB-E	Linen material		27.9.78
15	TAF flame retardant paint	Chipboard	Mee Tak Co., Ltd. 37-39, Jervios Street, Central, Hong Kong	22.8.78
16	Leetar D	Plywood	Yue Li Engineering Co. 739, Nathan Road, 15/F, Flat G, Kingland Apartment, Kowloon	23.9.78
17	Leetar S	Plywood		23.9.78
18	TAF flame retardant paint	Wood panel, plywood, Chipboard, Acoustic fibre/ insulation board, Decorative fibre insulation board, Plain fibre board		18.5.78
19	Pyromors Transparent	Veneered & Unveneered Chip board, Veneered & Unveneered block board, Veneered panel, Plywood, Hardwood (oak), Softwood (spruse), Softwood pretreated with Xyladecord int/ext.	Desowag Bayer 4000 Dusseldorg 30, Postfach 32 02 20, Ross - strasse 76, West Germany	2.12.78
20	Crown matt emulsion	Plaster board	Hong Lee Trading Co., Ltd. 1202, Commercial House, 35, Queen' s Road Central, Hong Kong	21.3.79
21	Crown sheen emulsion	Plaster board		21.3.79
22	Crown gloss	Plaster board		21.3.79
23	Crown eggshell	Plaster board		21.3.79

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October 1996

	Name of Product	Substrate	The Applicant	On
24	International Paints Scheme A	Mild steel sheet	International Paint (HK) Ltd. 11/F, Hong Kong Computer Centre, 54-62, Lockhart Road, Wanchai, Hong Kong	25.7.79
25	International Red Hand Scheme 18	Steel panels		
	International Red Hand Scheme 19			
26		Shortblasted steel panel		
	International Red Hand Scheme 25			
27	Interprime CPA 039 Red	Steel panel		
	Interprime CPA 038 Yellow			
28		Shortblasted mild steel plate		
	Interprime CPA 224 ee manuve hb			
29		Shortblasted mild steel plate		
	Interprime CPA 226 ee white hb			
30		Steel plate		
	Interlac HFA 042 FR undercoat white			
31		Steel plate		
	Interlac HFB 000 FR finish white			
32		Steel plate		
33		Steel plate		
34	Flamemastic	Electrical conductors, Power cable insultation	Chevalier (HK) Ltd. 14-16/F, 45-51, Chatham Road, Kowloon	25.9.79
35	Decadex Firecheck	Polystyrene	Univic Engineering Ltd. 7/F, Amber Commercial Building, 70-74, Morrison Hill Road, Hong Kong	5.11.82
36	Nullfire ' WD'	Softwood		5.11.82
37	Pyrovatex CP	Fabric	Ciba Geigy (HK) Ltd. 61-69, Yau Ma Hom Road, Kwai Chung, N.T.	9.12.82
38	HD-3 Inorganic Fireproof Coating	Plywood	HD Fireproof products 2, Hok Yuen Street, 1/F,	22.12.82

			Hunghom, Kowloon	

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October 1996

	Name of Product	Substrate	The Applicant	On
39	Intuclear Intumescent varnish	Veneered chipboard & plywood	Topman International Ltd. Suite 705, Tower II, Silvercord, 30, Canton Road, Kowloon	9.4.84
40	Intusteel fire resisting coating	Plywood Plasterboard		9.4.84
41	Bromel flame retardant paint			12.6.84
42	Albi Clear	Plane timber, Plywood, Board materials,	Rentokil (HK) Ltd. 120, Newport Centre, 423, Tokwawan Road, Kowloon	28.3.78
43	Albi Clear fire retardant treatment with overcoat varnish	Fabric wall surfaces, Solid timber, Obeche board		18.2.81
44	Albi Clear No. 1 with Albi matt overcoat varnish	Solid timber, Obeche board		18.2.81
45	AlbiGuard	Hemlock, Obeche Hardwood, Plywood, Hardwood, Chipwood, Blockwood, Fibrewood	and	25.4.85
46	Albi-R	Insulating board, Hardboard, Acoustic tiles, Fibre insulating board, Masonite board, Douglas fir (Softwood), Gaboon plywood (Hardwood)	F.K. Lung & Co. Flat A2, 9/F, Gold Swan Commercial Building, 438-444 Hennessy Road, Hong Kong	6.10.78
47	Albi-pruf	Hessian, Cotton, Polyester, Woven viscose		25.6.85
48	Pamasuco Standard Hessian/Sisal flameproofing solution	Muraweave : a paper backed fabric wall covering	Hanky & Partners Room 1515, Park-in Commercial Centre, 56, Dundas Street, Kowloon; and Elgon (International) Ltd.	3.8.78 4.7.85

			Unit 3, Weald Hall Lane Industrial Estate, Thornwood, Common, Epping, Essex, CM6 6NR, UK	

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October 1996

	Name of Product	Substrate	The Applicant	On
49	HD Fireproof coating	Softwood	Weybridge Ltd. Room 602, H.K. & Macau Bldg., 156-157, Connaught Road Central, Hong Kong	28.8.85
50	DF Coating 101 Fire-resisting Paint	PVC sheet	Fortress Ltd. 17/F, Canvendish Centre, 23, Yip Kan Street, Wong Chuk Hang, H.K.	12.9.85
51	SF-Coat 2G	PVC sheet	Sumitomo Electric Asia Ltd. Rm. 1005, Capital Centre, 5-19, Jardine' s Bazaar, Causeway Bay, Hong Kong	7.5.88
52	Chil-Kote CP55	Rigid polyurethane foam, Rigid polyisocyanurate foam, Rigid phenolic foam, Polystyrene, Cork, Cellular glass, Glass Fibric, Mineral wool, Calcium silicate, Mangesia	Kooltherm China Limited 8/F, Kin Teck Industrial Building, 26, Wong Chuk Hang Road, Aberdenn, Hong Kong	28.2.89
53	Chil-Seal CP50	Rigid polyurethane foam, Rigid polyisocyanurate foam, Rigid phenolic foam, Spray applied urethane foam, Polystyrene, Cork, Glass fibre, Mineral wool, Calcium silicate, mangesia		28.2.89
54	Koolkote KP13	Rigid polyurethane foam, Rigid polyisocyanurate foam, Rigid phenolic foam, Spray applied urethane foam, Nitrile rubber, Cellular Glass,		28.2.89

		Polysytrene, Cork		
55	Duro Fire Retardant paint	Plywood, Steel	Swire Duro Ltd. TYTL 96, Tsing Yi Island, N.T.	2.1.87

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October 1996

	Name of Product	Substrate	The Applicant	On
56	Encacel V	Spray applied urethane foam, Nitrile rubber, Cellular plastic	Kooltherm China Limited 8/F, Kin Teck Industrial Building, 26, Wong Chuk Hang Road, Aberdeen, Hong Kong	28.2.89
57	TAF M112 Flame Retardant Paint	Hardboard, Solid timber, Chipboard, Softwood particle board, Hardwood particle board	Peral Paints Limited Severn Road, Treforest Industrial Estate, Pontypridd, Mid Glamorgan Wales, CF37 5SR, UK	11.5.89
58	Nullifire W.D. Fire Retardant Paint	Polystyrene, Softwood, Hardwood, Plywood, chipboard, Fibre insulating board	Delta Pyramax Co., Ltd. 1901, Yue Xiu Building, 160, Lockhart Road, Wanchai, Hong Kong	22.9.89
59	Flamecoat' Granyte Intumescent Paint 073-6000	Softwood, Plywood, Fibre insulating board, plaster board	Kervin Limited Rm. 1406, King' s Commercial Building, 2-4, Chatham Court, Tsimshatsui, Kowloon	29.12.89
60	Super Fire Retardant Liquid No.4	Cotton fabric	Elly Trading Company Flat I, 4/F, Haribest Industrial Building, Fo Tan, Shatin, N.T.	6.3.90
61	Copon EA-9	Aluminium Panel	Nipsea Paint (HLK) Co., Ltd. 19/F, Unit B, Southease Industrial Building,	10.8.90

			611 Castle Peak Road, Tsuen Wan, N.T.	
62	Biofax 2000	Cotton	Face Time International Ltd., Rm. 101, 1/F, Kimberley House, 35 Kimberley Road, Kowloon	29.4.91
63	Flameguard, Flame Retardant F-1	Carpet	Sanmex & Co. Rm. 1517, 15/F, shatin Galleria, 18-24, Shan Mei Street, Shatin, N.T.	15.8.91

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October 1996

III.11

	Name of Product	Substrate	The Applicant	On
64	Super Fire Retardant Paint No.2	Plywood	Wah Yuen Trading Company, 7/F, Block A, Tsat Po Street, San Po Kong, Kowloon	9.1.92
65	Unitherm 19010 Unitherm 38202 Unitherm 38203 Unitherm 38279	Plywood, Oak solid timber, Pine solid timber Chipboard, Oak solid timber, Pine solid timber Chipboard, Oak solid timber, Pine solid timber Plywood, Oak solid timber, Pine solid timber	U-Tech Engineering Co. Flat C, 15/F, Markfield Building, 8, Smithfield Road, Kennedy Town, Hong Kong	14.10.91
66	Intuclear Intumescent Varnish	Venneered Plywood painted with 3 coat at 100ml/m2/coat	Build Fame Services Ltd. 1408-9, 14/F, Leader Industrial Building, 57-59, Au Pui Wan Street, Fotan, Shatin, N.T.	29.11.91
67	Nochar' s Fire Preventer	Cedar (Hardwood)	Daiya Fukushoku (HK) Co., Ltd. Unit 2, 8/F, Sun Cheong Industrial Building, 2-4, Cheung Yee Street, Cheung Sha Wan, Kowloon	25.2.92

68	Flameguard Flae Retardant F-1	Polyester, Polypropylene fibre, Composite wallboard covered with fabric	Sanmex & Co. Rm. 1517, 15/F, Shatin Galleria, 18-24, Shan Mei Street, Shatin, N.T.	28.2.92
69	Seagull Fire Retardant Coating S900 Seagull Fire Retardant Undercoat S909	Plywood, Steel sheet Plywood, Steel sheet	Salemay Co., Ltd. 22/F, On Hong Commercial Building, 145, Hennessy Road, Wanchai, Hong Kong	25.3.92

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October 1996

	Name of Product	Substrate	The Applicant	On
70	Foster 30-36 Sealfas Coating	Glass reinforced cement board with canvas covering	Cheung Shing Yuk Tong Co., Ltd. Room 1103, Allied Kajima Building, 138 Gloucester Road, Wanchai, Hong Kong	29.5.92
71	Foster 30-80 Vapor-safe Coating	Sterling inorganic reinforced cement board		
72	Foster 81-42W Lagfas Coating	Glass reinforced cement board		
73	Perfect	Cotton fabric	Perfect Distribution Limited 12/F, The Prudential Assurance Tower, 79 Chatham Road, Tsim Sha Tsui, Kowloon	24.12.92
74	Perfect 220	Cedar Wood, Cotton	Daiya Fukushoku (HK) Co., Ltd. Unit 2, 8/F, Sun Cheong Industrial Building, 2-4, Cheung Yee Street, Cheung Sha Wan, Kowloon	4.1.93
75	Pyrosafe Flammolast KS1 Intumescent Paint	Plywood	TYW Guan Group Ltd., Room 3, 2/F, Kwong Fat Commercial Building, 582-588, Canton Road,	5.7.93

			Kowloon	
76	Mandoval F.R.C. Basecoat	Softwood		26.7.93
77	Flame Check	Timber		2.3.94
78	Quelfire	Coated decorative veneered panel		12.3.94
79	Deha Burnstop IMA 120	Cotton Fabric	Delvin Trading Limited 1101, Allied Kajima Building, 138, Gloucester Road, H.K.	8.12.93

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October 1996

	Name of Product	Substrate	The Applicant	On
80	Therma-Tech L.G.	Cellular glass insulation board	Salemay Company Limited 22/F, On Hong Commercial Building, 145, Hennessy Road, Wanchai, Hong Kong	10.5.94
81	Uni-Tech U.V.	Commercial grade aluminium alloy		
82	Wall-Tech W.B.	Reinforced cementitous board		
83	Pyro-Tech LS	Marine quality plywood		
84	Pyro-Tech CS	Brazilian mahogany		
85	Hartindo AF 21-Fire Inhibitor	Fabric labelled 100% cotton	AF Chemi HK Limited 14/F., Kam Chung Building, 54, Jaffe Road, Wanchai, Hong Kong Agent : Sing Tech International Ltd. Room 1401, Telford House, 16 Wang Hoi Road, Kowloon Bay, Kowloon	1.6.94
86	Super Shield (SS-A-003)	Cloth	Hong Kong Sight Good Ltd.	6.6.94

87 88	Super Shield (SS-A-00301) Super Shield (SS-B-006)	Paper Artificial leather	Flat E, Stage 2, 14/F, Yip Fat Factory Building, 73-75, Hoi Yuen Road, Kowloon	
89	UNO 168	Cotton	P&E Agency Company Ltd. (Hong Kong Branch) Unit 2, 8/F, Sun Cheong Industrial Building, 2-4, Cheung Yee Street, Cheung Sha Wan, Kowloon	1.8.94
90	FRY-3 Natural Fibre Incendiary Preventer	Cotton fibric Plywood	Land Hot (HK) Limited Room 602-603, Hau Qin International Building, 340, Queen' s Road Central, Hong Kong	25.10.94 25.4.95

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October 1996

	Name of Product	Substrate	The Applicant	On
91	Super Shield SS-A001	Timber	Hong Kong Sight Good Ltd. Flat E, Stage 2, 14/F, Yip Fat Factory Building, 73-75, Hoi Yuen Road, Kowloon	24.2.95
92	Flamemaster 77	Refractory board, PVC sheet on refractory board	Outline International Ltd. Rm. 1325, Profit Industrial Building, 1-15, Kwai Fung Crescent, Kwai Chung, N.T.	22.8.95
93	Flamebar N5 Flamebar S3	Pinewood, wallpaper, woven cotton fabric, Tarta fissured mineral ceiling tile	Henry Engineering & Supplies, 3/F, Cheong Tai Comm. Bldg. 287-289, Reclammation St., Kowloon	4.10.95
94	Hensotherm 1 KS	Laminated Plywood	Liberty Industries Ltd.	2.5.96

	(Intumescent Coating) Hensotherm 2 KS (Intumescent Coating)		Flat D, 6/F, Hop Hing Industrial Building, 702-704, Castle Peak Road, Lai Chi Kok, Kowloon	
95	Cranian Polymer Coating	Hardboard	Cranian Developments (HK) Ltd. Unit 3, 3/F, Harbour Centre Tower 2, 8 Hok Cheung St., Kowloon	15.10.96
96	Cranian Stucco Coating	Hardboard		

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October 1996

3. **List of Fire Retardant Solution**
Approved by Hong Kong Fire Services Department
(BS 5867 : Part 2 : Fabric Type B)

	Name of Product	Substrate	The Applicant	On
1	Fire Inhibitor (Hartindo AF21) under-costing manufactured by Sissons Paints (East) Ltd.	Canvas Tenting, Polycotton mixture	Sing Tech International Ltd. Room 1401, Telford House, 16, Wang Hoi Road, Kowloon Bay, Kowloon	5.1.96
2	Stapro Flame Retardant No. 1	100% Cotton print	Wai King Fire Engineering Co. Unit 31, 7/F, Pacific Trade Centre, Kowloon Bay, Kowloon	22.5.96
3	Strapo Flame Retardant No. 2	Cotton Nylon mix tapestry		22.5.96
		Grey Dralon		13.8.96

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October 1996

4. List of Fire Retardant Solution
Approved by Hong Kong Fire Services Department

	Name of Product	Classification	The Applicant	On
1	Tectum' acoustic ceiling panel	Class 1 (In accordance with BS 476 : Part 7 : 1987)	Perfectrade Ltd. Rm. 1401, Paliburg Plaza, 68, Yee Wo Street, Causeway Bay, Hong Kong	8.12.92
2	Omega' decorative laminate	Class 2 (In accordance with BS 476 : Part 7 : 1987)	Hopewell Plastic Laminates Ltd. G/F, 52, High Street, Sai Ying Pun, Hong Kong	18.1.93
3	Viva' brand cement bonded particle board	Class 1 (In accordance with BS 476 : Part 7 : 1971)	TYW Guan Group Rm. 3, 2/F, Kwong Fat Commercial Building, 582-588, Canton Road, Kowloon	21.1.93
4	Duraflake FR' particle board	Class 1 (In accordance with BS 476 : Part 7 : 1987)	E & V International Ltd. 14/F, Wah Koon Building, 191, Hollywood Road, Hong Kong	12.2.93
5	Medium density fibre board Fibre-reinforced cement-based board	Class 1 (Product No. 605) Class 1 (Product No. 107, 607 Face, 266 Back, 350 Face, 203 Back 355 Face, 203 Back 604 Face, 264 Back & 605 Face, 266 Back) (In accordance with BS 476 : Part 7 : 1971)	Ralph Wilson Plastices Co. 600 General Bruce Drive, P.O. Box 6110, Temple, TX 76503-6110, USA	26.2.93

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October 1996

	Name of Product	Classification	The Applicant	On
6	Impact fire board	Class 1 (In accordance with BS 476 : Part 7 : 1971)	TYW Guan Group Ltd. Rm. 3, 2/F, Kwong Fat Commercial Building, 582-588, Canton Road, Kowloon	15.5.93
7	Masterclad building board	Class 1 (In accordance with BS 476 : Part 7 : 1971)	Cape Building Products International (Far East) Ltd. 1703, Hanglung Centre, 2-20, Paterson Street, Causeway Bay, Hong Kong	7.7.93
8	Masterboard HP	Class 1 (In accordance with BS 476 : Part 7 : 1971)	Cape Building Products International (Far East) Ltd. 1703, Hanglung Centre, 2-20, Paterson Street, Causeway Bay, Hong Kong	30.7.93
9	Foamalux PVC sheet	Class 1 (In accordance with BS 476 : Part 7 : 1971)	TYW Guan Group Ltd. Rm. 3, 2/F, Kwong Fat Commercial Building, 582-588, Canton Road, Kowloon	25.8.93

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October 1996

5. List of Emergency Exit Devices Approved by Hong Kong Fire Services Department

	Product	Manufacturer	H.K. Agent
1	Assa 8562 Emergency Lock	Assa-stenman AB, Eskilstuna, Sweden	Conmat Limited 2/F, Eastern Commercial Centre, 397 Hennessy Road, Hong Kong.
2	Detex Exit Control Lock No. 230 & 2200	Detex Corporation, 4147 Ravenswood Avenue, Chicago, Illinois, 60613, U.S.A.	Guardall Security Products Ltd. The Secirity Centre, 481 Castle Peak Road, Kowloon.
3	Format 88126-162 + 4199 Emergency Exit Latch	James Gibbons Format Ltd. Colliery Road, Woiverhampton, West Midlands WV1 2QW, U.K.	William Jacks & Co. (HK) Ltd. 37, Wong Chuk Hang Road, Hong Kong.
4	Gibraltar Door-Closer	C.G.L. Engineers Ltd. Brewhouse Hill, Wheathampstead, Herts, U.K.	Viking Fire Protection (HK) Ltd. United Chinese Bank Building, 3/F, Des Voeux Road Central, Hong Kong.
5	Ingersoll Model SC 73/FS Rim Lock	Fernbank Road, Ascot Berks, SL5 8HG, U.K.	Guardforce Limited Guardforce Centre, 3 Hok Yuen Street, G/F, Hung Hom, Kowloon.
6	Lionheart Panic Bolts Series 80	Hope Works Limited Pleck Road, Walsall, WS2 9HH, U.K.	Yue Hing Machine Factory 4, Lo Lung Hang Street, G/F, Hung Hom, Kowloon.
7	Mercury Panic Latch No. 11375	Tonks (Birmingham) Limited Star Works, Moseley Street, Birmingham 12, U.K.	Shewan Tomes (Equipment) Ltd. Universal House, 10/F, Hong Kong.
8	Redlam Panic Bolt	J.E. Mercer Limited (Fire Protection Engineers) Redlam Works, Pleasington Street, Blackburn, Lances, BB2 1UG, U.K.	Viking Fire Protection (HK) Ltd. United Chinese Bank Building, 3/F, Des Voeux Road Central, Hong Kong.
9	Rixson Firemark Combination Door Closer and Holder	Rixon-Firemark, Inc. 9100W, Belmont Avenue, Franklin Park, Ill. 60131, U.S.A.	Johnson Controls H.K. Ltd. Room 1106, Block A, 11/F, Watson's Estate, Watson Road, Hong Kong.
10	Safegard 70R Panic Hardware and Safety Lock Model No. 11	Alarm Lock Corporation 33 South Service Road, Jericho, N.Y. 11753, U.S.A.	Guardforce Limited Guardforce Centre, 3 Hok Yuen Street, G/F, Hung Hom, Kowloon.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October 1996

	Product	Manufacturer	H.K. Agent
11	Secindalux Magnetic Door Release, Models W240, W24 DC, F240 & F24 DC	Dynamo & Electrical Services Ltd Pearson Street, Blackburn, Lars, BB2 2ER, U.K.	Borneo Sumatra Trading Company (HK) Ltd. Eldex Industrial Building, 2/F, 10/F & 11/F, 21 Ma Tau Wei Road, Hung Hom, Kowloon.
12	Wellington Emergency Bolt	Albert Marston & Co. Ltd. Wellington Works, Planetary Road, Wellenhall, Staffs, U.K.	Hong Kong Security Limited The Security Centre, 481-483 Castle Peak Road, Kowloon.
13	Edwards Electromagnetic Door Holders	Edwards, A Unit of General Signal Ltd. Owen Sound, Ontario N4K 1G5, Canada.	Engineered Systems Ltd. 8/F, Guardian House, 31 Oi Kwan Road, Hong Kong.
14	Chloride Gent Magnetic Door Holders, Model 4302-31 & 4302-55	Chloride Gent Ltd. Faraday Works, Temple Road, Leicester LE5 4JF, U.K.	Hutchinson-Boag Engineering Ltd. 10/F, Block C, Watson's Estate, Watson Road, Hong Kong.
15	Dorma Electromagnetic Door Holder	Dorma Far East PTE Ltd. No. 2, Jalan Terusan, Jurong, Singapore 2261.	Dorma Far East PTE Ltd. 27, Star Street, G/F, Wanchai, Hong Kong.
16	Honeywell S4003A & B Electromagnetic Holders	Honeywell Inc. 1500W, Dundee Road, Arlington Heights, IL 6004, Ontario, Canada.	Honeywell Limited 8/F, Tower A, Mandarin Plaza, Science Meseum Rd., Tsimshatsui East, Kowloon.
17 18	Briton 999 and 533 Electromagnetic Fire-door Holders Briton 376, 377/378 Panic Bolts	Newman Tonks Engineering Ltd. Hospital Street, Nirmingham B19 2YG, U.K.	Laidlaw & Thomson Asia Ltd. Room 801, No. 1, Hysan Avenue, Causeway Bay, Hong Kong.
19	AFA-Minerva DR 2824 Door Release Unit	AFA-Minerva Ltd. Security House, Grosvenor Road, Twickenham TW1 4AB, U.K.	Thorn EMI Security (HK) Ltd. Room 2011-2, Park-in Commercial Centre, 56, Dundas Street, Kowloon.
20	PADDE Electric Locking Device Model X.S.	Fire Research Pty. Ltd. P.O. Box 528, Dee Why, N.S.W. 2099, Australia.	Wormald Fire Systems Lower G/F, Kaiser Estate, Man Yue Street, Hung Hom, Kowloon.
21	Union 80121 Panic Bolt Union 80151 Panic Bolt	Josiah Parkes & Sons Ltd. Union Works, Gower Street, Willenall, West Midlands, WV131JX, England.	William Jacks & Company (HK) Ltd. 12/F, Leader Industrial Building, 37, Wong Chuk Hang Road, Aberdeen, Hong Kong.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October 1996

	Product	Manufacturer	H.K. Agent
22	Monarch 19-R, 19-V XXR, XXV Series Panic Hardware Monarch Model 18V-Rod Type Panic Hardware, Monach Model 18R-Surface Mounted Rim Type Panic Hardware	Monarch Hardware & Manufacturing Co. Inc. Shepherdsville, Kenturkey 40165, UK.	Laidlaw & Thomson Asia Ltd. Room 801, No. 1, Hysan Avenue, Causeway Bay, Hong Kong.
23	Mortice Escape Night Latch Model 9990-060	Allgood Continental Ltd. London, England.	Key Technology International Ltd. Room 2905, Yat Chau International Plaza, 118 Connaught Road West, Hong Kong.
24	Panic Deadbolt-Exitgard No. 35	Alarm Lock Corporation Pine Brook NJ07058, U.S.A.	Dextronic Limited 1/F, 7, Chatham Road, Kowloon.
25 26	A9301 Super Modric Mortice Panic Bolt A9305 Super Modric Mortice Panic Bolt Modric 9151N Electromagnetic Release Fire Hold Door Closer	G & S Allgood Ltd. 297, Eastern Road, London, NW1 3AQ, England.	Key Technologies International Ltd. 1/F, 163, Hennessy Road, Wanchai, Hong Kong.
27	LCN No. 820 Electromagnetic Door Holder LCN Electromagnetic Door Holders - Models SEM 820, SEM 840 & SEM 850 LCN Sentronic Life Safety Closer/Holder Model :- (1) 4010 SE, SEC, SED & SES Series (2) 4110 SE, SEC, SED & SES Series (3) 4310 ME, MEC & MED Series (4) 4410 ME, MEC & MED Series (5) 2310 ME & 3130 SE Series	LCN Closer Division Schlage Lock Co. P.O. Box 100, Princeton, Illinois 51356, U.S.A..	Arnhold & Co., Ltd. Victoria Centre, 6/F, 15, Watson Road, Hong Kong.
30	Xitbolt - Model AF Emergency Exit Door Lock	OEM Supplies Ltd. Room 5B, 5/F, Comfort Building, 88, Nathan Road, Tsimshatsui, Kowloon.	

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October 1996

	Product	Manufacturer	H.K. Agent
31	Russwin 692 (Vertical Rod Type) Russwin NT696 (Mortise Type and incorporates and outside)	Russwin-Hardware Division Emhart Industries Inc., 225 Episocpal Road, Berlin, CT06037, West Germany.	Builders Federal (HK) Ltd. 6/F, Printing House, 6 Duddell Street, Hong Kong.
32	Briton Model 534 Floor Mounted Electromagnetic Fire Door Holder	Newman Tonks Engineering Ltd. England	Key Technologies International Ltd. Room 2905, Yat Chau International Plaza, 118 Connaught Road West, Hong Kong.
33	Briton Model 996 Hold Open/ Free Swing Electrically Released Overhead Door Closer	Newman Tonks Engineering Ltd. England	NT Asia (HK) Ltd. Room 4, Fung Full Comm. Centre, 480 King's Road, Hong Kong.
34	Panic Hardware Emergency Exit Devices - Model ELC-8010, ELC-8010W	Detex Corporation	Guardall China Ltd. 2/F, The Security Centre, 481-483 Castle Peak Road, Kowloon.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October 1996

PART IV

SMOKE EXTRACTION SYSTEMS

1. Dynamic Smoke Extraction Systems

2. Static Smoke Extraction Systems

PART IV

SMOKE EXTRACTION SYSTEMS

Smoke Extraction Systems

The following are commentaries on the design, installation, testing and maintenance of smoke extraction systems and shall be read in conjunction with Section 5.23 of the Code of Practice for Minimum Fire Service Installations and Equipment. The paragraph numbers quoted hereunder in the contexts are referring to those under section 5.23 of the same Code.

1. Dynamic Smoke Extraction Systems

1.1 Purpose

1.1.1 The purpose of the smoke extraction system is to assist fire-fighters in attacking and controlling a fire.

1.1.2 In addition the following advantages accrue :-

(a) assisting in the provision of a clear egress for escaping persons. Generally a Smoke Free Zone of 2 m in height is to be aimed for in the design. "Smoke Free" does not imply complete elimination of smoke but that visibility is not greatly impaired;

(b) preventing, as far as practicable, the recycling of the products of combustion through the building;

(c) exhausting, as far as practicable, the products of combustion from the fire affected enclosure:

(d) maintaining the supply of outside air to the building to provide a degree of pressure balance to the exhaust action of the smoke extract fan system; and

(e) minimising the migration of the products of combustion from entering fire isolated stairways and fire isolated passageways (in conjunction with any staircase pressurisation system).

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

1.2 Innovation

It is not intended that the requirements should impose unnecessary restrictions on design and installation of systems, nor on the development and use of new, improved or unusual materials, designs or methods of construction or installation not covered by the requirements.

1.3 Designer

Under S5.23(i) para. A.1 the qualification of M.C.I.B.S.E., M.H.K.I.E. or equivalent will be acceptable providing the designer also has the appropriate experience in mechanical ventilation and air handling.

1.4 Rating of Equipment

All equipment handling smoke, as detailed in S5.23(i) para. B.20, must be capable of operating for not less than one hour at a temperature of 250°C. Submitted details of these equipment must clearly indicate, to the satisfaction of the Director of Fire Services, that this can be achieved. These details can either be in the form of individual equipment test certificates, classification ratings etc., or on individual complete system design proposals with calculations on anticipated surface temperatures, fire protection arrangements etc. Care shall be taken where "normal " extract systems serve the additional purpose of smoke extraction that sealants, gaskets, insulation, vapour barriers, etc., are suitable for the more rigorous requirements. Also note that adjacent equipment will be affected by convection and radiant heat transfer. Where silencers are installed in smoke extraction systems the internal components do not need to meet this requirement providing operation at these conditions will not cause restriction of the air stream and the owner is aware that damage may occur and require replacement of the components.

1.5 Basements

The two extract plants for each compartment should each be capable of handling 50% of the required extraction rate. The supply/make up air can be provided from two supply plants which can serve up to 4 compartments with each fan capable of handling 50% of the supply/make up air requirements for any 2 compartments. (NOTE.: The supply/make up air requirement shall be based on the two largest compartments served) Where supply air plants serve more than one compartment design details of the systems shall be agreed with the Director of Fire Services in order to ensure the correct pressurisation levels in each compartment.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

1.6 Tunnels

Although Rail and Road Tunnels are not considered as buildings this technical specification is still applicable for tunnel projects.

1.7 Hazardous Processes

Care shall be taken with hazardous processes - it may be safer to provide fresh air direct to the surroundings.

1.8 Number of Compartments for Each System

With reference to S5.23(i) para. F.4., G.2.(3) and H.6, designers and owners should consider the cost of extended testing and checking necessary during initial commissioning and subsequent 6-monthly or annual testing of multi-compartment systems against the initial costs of one system for each compartment.

1.9 Distribution of Extract Point

The criteria laid down in S5.23(i) para. B.7. are to ensure an even distribution of extract points throughout the compartment. In general, it is therefore preferred that the extract point be centrally located within each 500 m^2 unit of floor area.

1.10 Actuation

Where smoke detectors are not required to be provided as a Fire Service Installation but solely for the automatic activation of the smoke extraction system there shall be a minimum number of one smoke detector for every 250m^2 of net floor area, and these smoke detectors shall be evenly spaced throughout the whole area of the entire compartment. It is also a requirement that a smoke extraction system shall have a minimum of two detectors in its actuation system. In addition the smoke extraction system shall be actuated by the sprinkler system, if provided, and any other detection/protection system in the area/floor served.

1.11 Installation, Testing & Operation

Under the Code of Practice for Minimum Fire Service Installations & Equipment these systems are deemed to be "Fire Service Installations". Thus all are required to be completed, tested and be demonstrated to F.S.D. to be correctly functioning before the necessary fire certificate (F.S. 172) will be issued.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

1.12 Effect of Other Systems

1.12.1 Owners and occupiers are reminded that the addition or removal of other ventilation and/or air conditioning systems to any areas served by a smoke extraction system WILL affect the operation of the smoke extraction system.

1.12.2 This effect must be taken into account and any necessary adjustments made to the smoke extraction systems. Any adjustments and amendments to the smoke extraction systems require full approval and testing by F.S.D. During the annual testing required under S5.23(i) para. Q.4 all other systems in the area served shall be activated as necessary to "fire" mode.

1.13 Checking and Maintenance

All checking of operation and maintenance is required to be carried out by Registered Fire Service Installation Contractor.

2. Static Smoke Extraction Systems

2.1 Installation & Maintenance

The system shall be installed and maintained by a Registered Fire Service Installation Contractor - Fire Service (Installations and Equipment) Regulations.

2.2 Resistance to the Passage of Smoke

S5.23(ii) para. A(c) draws attention to the necessity for closing joints between units. For flexible materials this will require a lap of at least 150 mm for drops of up to 1000mm. For bigger drops the lap will have to be increased. For rigid materials it may require laps or a simple form of joint - either with retention clips or catches if necessary.

2.3 Corrosion Resistance

The requirement given in S5.23(ii) para A(f) is intended to ensure that the parts will not be subject to atmosphere corrosion. The designer shall select appropriate materials and/or protection for all components to ensure reliability of operation. For example, plain steel hinges are not considered satisfactory.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

2.4 Actuators

At the present time there are no known standards for automatic actuators and S5.23(ii) para B(g) and B(h) are designed to cover this problem. Where smoke detectors are not required to be provided as a Fire Service Installation but solely for the automatic activation of the smoke extraction system then the horizontal distance between any point in the area and the detector nearest that point shall not exceed 7.5m. This is in accordance with "FOC Rules for Automatic Fire Alarm Installations for the Protection of Property" clause 3.3.1 (for flat horizontal ceilings) but in this case can be applied to any situation irrespective of depth of beams, services etc.

2.5 Quick Release

Under S5.23(ii) para. B(k) a winding crank and gear system would not be considered as "quick-release" operating devices.

2.6 Actuation Zoning

S5.23(ii) para. C(d) gives the selection of the actuation system zoning to the designer. It should be noted that if the zone consists of several smoke compartments a signal, correct or false, will actuate smoke barriers and vents in all those compartments. This may cause a nuisance to the unaffected compartments.

2.7 Owners' & Occupiers' Responsibility

(a) It is the Owners' and Occupants' responsibility to ensure that, during the course of normal usage of the space, no hindrance or obstruction shall be allowed to prevent the operation of the system. The Registered Fire Service Installation Contractor shall notify each owner and occupier, in writing, of this responsibility on completion of the installation and at the time of each annual inspection.

(b) It is also the Owners' responsibility to ensure the installation is in efficient working order at all times and to have the installation inspected annually by a Registered Fire Service Installation Contractor [Reg. 8 - Fire Service (Installations and Equipment) Regulations].

2.8 Electrical Installation

As the systems are "fail safe" when no power is available no extra requirements are made for the electrical installation serving Static Systems.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

PART V

FIRE DETECTION SYSTEMS

1. Introduction

2. Connection to Chubb Communication Centre/Fire Services Communication Centre

3. Reserved

4. Signal Integration Devices - Smoke Detection System

PART V

FIRE DETECTION SYSTEMS

1. Introduction

1.1 Plans of automatic heat or smoke detection systems in premises required to install such systems do not usually indicate the position of internal partitions, ducting and false ceilings, presumably because such facts are not normally known at the time of application for an occupation permit is made by the architect or plans for the Fire Service Installations are submitted by the Fire Service Installation Contractor.

1.2 It should be noted that required systems must comply with the FOC Rules at all times but if detector heads are obstructed in any way the Rules are contravened.

1.3 In this connection the attention of all concerned is invited to interpretations of fire hazard in Section 2 items (c) and (d) of Part I of the Fire Services Ordinance, Chapter 95, Laws of Hong Kong.

2. Connection to Chubb Communication Centre/Fire Services Communication Centre

2.1 All fire detection systems will terminate at Chubb Communication Centre/Fire Services Communication Centre.

2.2 A computerised fire alarm termination system has been installed at Chubb Communication Centre. All present and future connections shall be made by this Company.

2.3 In cases where the direct telephone line facilities are not yet available, the Fire Services Certificate (FS172) will be issued upon the receipt of a written undertaking from the owner that a 24 hour "attendant" service with normal telephone link availability will be provided until such time as the direct line is connected. This direct line must be connected to the Chubb Communication Centre/Fire Services Communication Centre within a period of three months from the date of the inspection as shown on the Fire Services Certificate, failing which legal action may be instituted to ensure compliance.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

3. **Reserved.**

4. **Signal Integration Devices - Smoke Detection System**

4.1 The integration devices should be approved in respect of design by a recognised testing authority and have written approval from this Department and in each case the signal integration or other approved device should permit the transmission of the alarm to Fire Services to be held by NOT MORE than 30 seconds.

4.2 Where such detectors terminate at a control system other than directly to Fire Services the overall holding time before transmission to Fire Services will be a matter for this Department to decide in each case.

4.3 Detectors as described above which are permitted to be installed must be of a design which allows them to be clearly identifiable when installed to the satisfaction of the Director of Fire Services. The precise locations of these detectors must be notified in writing to this Department to permit checks to be made from time to time.

4.4 The following criteria should be taken into account when considering applications for installing such detectors :-

4.4.1 Existing installations

In areas which have already proved to be affected by false/unwanted alarms.

4.4.2 New installations

In areas where it is known by experience that such false/unwanted alarms are likely to arise.

Signed

(LAM Chun-man)

for Director of Fire Services

Date : 22 October, 1996

PART VI

INSPECTIONS OF FIRE SERVICE INSTALLATIONS

1. Initial Inspections

2. Re-inspections

3. Certification of New Building FSIs

4. Certification of Alteration and Addition of FSIs

5. Common Defects Found in FSI Inspections

6. Annual Inspection

7. Labelling of Fire Extinguishers

8. Signature Endorsement

PART VI

INSPECTIONS OF FIRE SERVICE INSTALLATIONS

1. Initial Inspections

1.1 Application for Initial Inspections to FSIs for the purpose of satisfying Section 21(6)(d) of the Buildings Ordinance, Cap. 123 should be made to the Director of Fire Services using a Form FSI/501 as attached in Appendix A. Incomplete or missing information on the Form may lead to refusal or unnecessary delay in the inspections and the subsequent issuance of Certificate FS 172.

1.2 The Authorised Person , when submitting FSI/501 'Application for Inspection and Testing of Fire Service Installations and Equipment', should attach two copies of emergency vehicular access (EVA) plan if the building project is provided with designated EVA, i.e. other than access from public road/street.

1.3 Initial inspections will be carried out in accordance with the Code of Practice (Inspection and Testing of Installations and Equipment).

2. Re-inspections

2.1 In respect of minor defects identified in an initial inspection, the Authorised Person shall, 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 using the prescribed form FSI/501 will only be required when a refusal letter has been issued subsequent to an inspection.

2.2 Re-inspections will be carried out as convenient, subject only to the availability of Inspecting Officers and provided that previous confirmed appointments are not affected.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

3. Certification of New Building FSIs

3.1 Fire Services Certificate (FS 172) will be issued to certify that fire service installations and equipment stipulated under Section 16(1)(b)(ii) of the Buildings Ordinance have been provided and that in accordance with Section 21(6)(d) of that Ordinance, were found in satisfactory condition and efficient working order at the time of inspection. This certificate is one of the prerequisites for the issue of occupation permit for new buildings (including Home Ownership Scheme buildings constructed by the Housing Authority) or existing buildings involving major alterations and additions in excess of 50% by volume or new Occupation Permit is required.

3.2 For Government buildings and those owned by the Housing Authority, a memorandum will be issued to the effect that the fire service installation was tested and found in efficient working order at the time of inspection. This memorandum does not fall within the meaning of certificate under Regulation 2 of the Fire Service (Reports and Certificates) Regulations and therefore no fees are payable.

3.3 In order to standardise the administrative procedures and to avoid delays in processing applications for temporary or phased occupation permits, the practice of issuing letters of 'no objection' to temporary or phased occupation of new buildings, had been replaced by the issue of Fire Services Certificate (FS 172) since December 1987.

4. Certification of Alteration & Addition to FSI

4.1 There have been cases where fire extinguishers originally provided are replaced by a different type. In a number of instances the replacement is unacceptable (e.g. CO_2 replaced by water type). This Department must be consulted before any alterations of this nature to existing installations is undertaken.

4.2 All installation, maintenance, repair or inspection of FSI systems which do not involve major alterations and additions to the building in excess of 50% by volume will be certified by the FSI contractor in the following manner:-

4.2.1 If the work does not involve change of FSI layout or location of the fixed equipment, a Certificate of Registered FSI (F.S. 251) to the owner with copy to the Director of Fire Services will be sufficient.

4.2.2 If the work involves change of FSI layout or location of fixed equipment, a Certificate of Compliance, i.e. FSI/314A as attached in Appendix B, together with two copies of as-built FSI layout plans should be submitted to the Director of Fire Services in addition to the copy of F.S. 251 as described above.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

4.3 Under normal circumstances, the work carried out by Registered FSI contractor will not be inspected unless :

4.3.1 There are reasons to believe the work carried out does not conform to prescribed standards.

4.3.2 A request for specific fire protection advice under Section 7(c) of the Fire Services Ordinance is made. Specific advice for this purpose refers to systems of complex nature such as smoke extraction and pressurisation of staircase.

4.4 In accordance with Reg. 9(2) of the Fire Service (Installations and Equipment) Regulations, the certificate of FSI or equipment, namely FS 251, shall state the following :-

4.4.1 the address of the premises in which the work was carried out;

4.4.2 a description of the FSI or equipment concerned;

4.4.3 the date of the completion of work;

4.4.4 the nature of the work carried out; and

4.4.5 whether or not the FSI or equipment is in efficient working order.

4.5 It has been noted in many occasions that the above information is neither accurately nor precisely stated in the certificate submitted to this Department resulting in a situation that the concerned FSI or equipment is not properly certified and the Certificate fails to meet its objective. Such certificates are further found unacceptable when defective FSI and/or equipment are reported but their locations and nature of defects are not precisely specified. This has caused the Department a lot of problems and unnecessary workload when we carry out follow-up inspection and inevitably delaying law enforcement action.

4.6 Therefore, all Registered FSI Contractors are reminded of the importance in providing accurate and precise information on the FSI Certificate FS 251 to reflect the particulars of work done and the condition of concerned FSI and equipment. If the material particulars in a Certificate is found inadequate, inaccurate or misleading, actions including legal proceedings pursuant to the provisions in the Fire Service (Installations and Equipment) Regulations may have to be instituted against the respective Registered Contractor.

4.7 For reference, a sample of duly completed Certificate FS 251 is attached in Appendix C.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

5. Common Defects Found in New Building FSI Inspections

5.1 It is noted in FSI inspections that some common defects and irregularities on the completed FSIs are frequently found. In co-ordinating with the Association of Registered FSI Contractors, the common defects are summarised as follows :-

5.1.1 Fire hydrant/hose reel and manual fire alarm systems

5.1.1.1 water leakage is found from fire hose, fire hydrant and pressure reducing valve.

5.1.1.2 FH and FS inlet cannot hold the instantaneous coupler firmly.

5.1.1.3 fire hose cannot be easily drawn off from the reel for use.

5.1.1.4 handwheel of FH is installed too close to wall and cannot be operated.

5.1.1.5 twin hydrant outlet not fitted with independent handwheel.

5.1.1.6 hose reel pipe riser is less than 50mm in diameter [BS 5306: Part 1 is referred in Code of Practice (1987)]
[N.B. only 40mm riser is required in para. 5.14 of the Code of Practice]

5.1.1.7 wiring of breakglass unit not properly connected.
[N.B. provision of fault signal at FS control panel is recommended but not a requirement]

5.1.1.8 alarm bell cannot be sounded.

5.1.1.9 alarm bell concealed in hose reel cabinet with sound cannot be clearly heard when the cabinet door is in close position.

5.1.1.10 break glass unit installed higher than 1,200mm from FFL.
[N.B. 1350 mm is specified in Code of Practice (1987)]

5.1.1.11 gate valve of hose reel installed deeper than 500mm from front of cabinet.

5.1.1.12 hand wheel of hose reel found missing.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

5.1.1.13 flow rate and pressure of fixed fire pump found inadequate.

5.1.1.14 fixed fire pump cannot change over to standby pump when no flow condition of duty pump is simulated by closing the stop valve at the duty pump discharge.

5.1.1.15 fixed fire pump suddenly changed over to standby pump during normal flow test.

5.1.1.16 length of hose found inadequate to reach every part of the building.

5.1.1.17 static pressure of FH exceeds 8.5 bar limit.
[N.B. 7 bar running pressure is specified in Code of Practice (1987)]

5.1.1.18 defective HR with nozzle missing, water leaking, broken or blockage.

5.1.1.19 fixed fire pump room also houses potable/flushing pump installation.

5.1.1.20 auto air relief valve not provided at the top of FH riser.

5.1.1.21 HR cabinet door is found obstructing MOE when in open position.
[N.B. irregularity will be referred to Buildings Dept.]

5.1.1.22 height of HR nozzle installed higher than 1,350 mm.

5.1.1.23 PRV of HR system is found in close position while bypass valve is in open position.

5.1.1.24 pump running, faulty and power on indicators not provided in central FS panel.

5.1.1.25 incorrect zoning of breakglass unit, i.e. covers more than one floor level or not provided.

5.1.1.26 pump 'start/stop' control buttons for fixed FS pump are found over provided at FS inlet and control panel.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

5.1.1.27 pump 'start/stop' control button or indicators for intermediate booster pump is not provided at FS inlet. Also, alarm buzzer is not provided.

5.1.1.28 fixed fire pump can be stopped other than manually reset at local control panel.

5.1.1.29 FS inlet is not provided with independent non-return valve.

5.1.1.30 each FH riser is not provided with independent FS inlet.

5.1.1.31 multi FH risers are not interconnected or the connected pipe is not of approved size.

5.1.1.32 FH is not of twin outlet type with individual handwheel in industrial building.

5.1.1.33 intermediate booster pump in commercial building with multi-risers are not designed to 1,800 l/min.

5.1.1.34 in testing intermediate booster pump, pressure and flow at the topmost FH is less than requirement when water is pumped into FS inlet at a pressure of 8 bar.

5.1.1.35 testing of multi-risers system in industrial building (total flow : 2,700 l/min) cannot be conducted due to insufficient measuring instrument.
[N.B. at least 2 flow meters are required]

5.1.1.36 manual fire alarm is not connected to the DTL of AFA system.

5.1.1.37 lettering of fire hose reel is not properly provided.

5.1.1.38 label at FS inlet to show served area missing.

5.1.1.39 automatic pump start function is not provided.
[N.B. required for system designed to Code of Practice (1987) only]

5.1.1.40 fixed fire pump is cut-off by low level cut-off switch in FS tank or causing effective volume less than the required figure.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

5.1.1.41 rusting is found on pump sets, piping, etc. at an unacceptable level.

5.1.1.42 operation instruction notice for HR is not provided.

5.1.1.43 Priming tank is not provided for fixed fire pump with negative suction head.

5.1.1.44 FH system is not permanently primed.

5.1.1.45 Intermediate booster pump 'start' control at FS inlet fails to keep the pump running upon power changeover.

5.1.2 Fire detection system

5.1.2.1 zoning of detectors covers area more than one floor level. [N.B. excluding stairway]

5.1.2.2 coverage of detector found exceeding FOC specifications.

5.1.2.3 detector and annunciator panel are not of FSD approved type.

5.1.2.4 annunciator panel cannot function.

5.1.2.5 battery power supply and/or emergency power supply (if provided) is not connected.

5.1.2.6 battery is not fully charged.

5.1.2.7 capacity of battery (Amp-hr) is found inadequate.

5.1.2.8 battery capacity calculation is not provided.

5.1.2.9 sensing element of smoke detector is found not installed between 25mm to 600mm from soffit of ceiling.

5.1.2.10 sensing element of heat detector is found not installed between 25mm to 150mm from soffit of ceiling.

5.1.2.11 detector is not provided to area not covered by sprinkler, e.g. MDF room, pump room, etc.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

5.1.2.12 electrical earthing is not provided to the safety barrier in intrinsically-safe detector installation.

5.1.2.13 detector is not provided to void with beam depth greater than 10% of ceiling height.

5.1.2.14 detector is positioned more than 1.5m from open area or void.

5.1.2.15 wiring of detector zoning found incorrect.

5.1.2.16 labelling of detector zones is missing at control panel.

5.1.2.17 wiring fault of detector cannot be indicated on annunciator panel.

5.1.2.18 detector is not provided to ceiling void with depth greater than 800mm.

5.1.2.19 detector is not provided to void containing combustible irrespective of its depth.
[N.B. LV power cable in metal conduit/trunking is not considered as combustible]

5.1.2.20 DTL is not provided.
[N.B. undertaking letter to provide 24-hr attendant service and with normal telephone line is an acceptable alternative]

5.1.2.21 AFA is not provided to basement area (except car parking area and safe deposit vault).

5.1.2.22 smoke detector is not provided to entire floor with sleeping risk.
[N.B. heat detector may be used in kitchen]

5.1.2.23 detector is not provided for intermediate pump enclosure.

5.1.2.24 alarm bell at building external is not provided.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

5.1.3 Automatic sprinkler installation

5.1.3.1 sprinkler head provided at top of refuse chute is not of 57°C. Sprinkler is not provided underneath the platform of the chute inside refuse collection room.

5.1.3.2 changeover function of sprinkler pumps found defective.

5.1.3.3 size of suction pipe of sprinkler pump is smaller than the specifications indicated in LPC/FOC Rules where appropriate.

5.1.3.4 duplicate 'pump power supply' indicators for each phase are not provided.

5.1.3.5 audio and visual warning of pump power failure is not provided at control panel.

5.1.3.6 sprinkler pump protection is not of HRC fuse type.

5.1.3.7 thermal overload cut-off is over-provided to sprinkler pump.

5.1.3.8 sprinkler head is obstructed by ventilation duct or beam, etc.

5.1.3.9 length of sprinkler suction pipe from tank is greater than 30m.

5.1.3.10 flow velocity in sprinkler suction pipe for EHH system exceeds 1.8 m/s.

5.1.3.11 sprinkler coverage found inadequate.

5.1.3.12 hanger and support for sprinkler pipe found inadequate and not conforming to LPC/FOC Rules.

5.1.3.13 flow switch and subsidiary valve found defective.

Signed

(LAM Chun-man)

for Director of Fire Services

Date : 22 October, 1996

5.1.3.14 quick response type sprinkler is not used in staircase linking non-sprinklered domestic tower and sprinklered podium levels.

5.1.3.15 spacing of sprinkler in stage more than 3m x 3m.

5.1.3.16 sprinkler is not provided underneath ventilation duct with width greater than 800mm, or 1000mm if over 150mm from wall.

5.1.3.17 sprinkler head found contaminated by paint.

5.1.3.18 proving test found not up to the standards of the required hazard group.

5.1.3.19 no. of sprinkler heads connected to last range pipe exceed the limit in LPC/FOC Rules.

5.1.3.20 pressure switch for starting sprinkler pump is defective or not properly pre-set.

5.1.3.21 position of sprinkler head not conforming to LPC/FOC Rules for beams.

5.1.3.22 sprinkler head not provided to computer floor void according to LPC/FOC Rules.

5.1.3.23 Completion Advice from WSD is not submitted in particularly for both end fed system.

5.1.3.24 DTL is not provided where tank has been reduced by 1/3 capacity. [N.B. undertaking letter similar to AFA system is an acceptable alternative)

5.1.3.26 sprinkler provision for open cell ceiling is not supported with calculations of ceiling free area.

5.1.3.27 capacity of sprinkler tank is not conforming to FSD requirement.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

5.1.4 Street fire hydrant system

5.1.4.1 stem of ground valve is deeper than 500mm from ground level.

5.1.4.2 ground valve is not to BS 5163.

5.1.4.3 cover of ground valve pit is greater than 300 x 300mm.

5.1.4.4 pressure or flow is not conforming to FSD standard.

5.1.4.5 no. or valve open position indication is not provided.

5.1.4.6 extension spindle for ground valve is not provided or not of rigid construction.

5.1.4.7 capacity of tank cannot support one hour supply.

5.1.5 Fire shutter, fire door and fire compartmentation

5.1.5.1 sequential door closer for double leaf fire door is not provided.

5.1.5.2 door closer is not provided to fire door required by FSD, e.g. fire control centre, computer room, etc.

5.1.5.3 fire door and the ironmongeries are not of type approved by BD.

5.1.5.4 Opening is found on floor and wall requiring FRP.

5.1.5.5 expansion clearance for barrel, bottom bar, laths, etc. for fire shutter not conforming to manufacturer standards, e.g. inadequate distance from end wall, fixing slot position, etc.

5.1.5.6 fire shutter required by FSD is not operated by smoke detector.

5.1.5.7 fire shutter is found operated by cross-zoned smoke detector.
[N.B. approval from FSD will be required on project basis]

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

5.1.5.8 labelling is not provided for the manual switch of fire shutter.

5.1.5.9 installation method for fire shutter found not conforming to manufacturer standard.

5.1.5.10 smoke seal for fire shutter is not properly installed.

5.1.5.11 descending time of fire shutter greater than 1 minute as specified in checklist.
[N.B. for abnormal shutter size, closing time shall be subject to FSD' s approval on project basis]

5.1.5.12 size or type of fire shutter is not of FSD' s approved type.

5.1.6 Emergency generator, emergency lighting, exit sign and A/V advisory system

5.1.6.1 door curb for fuel tank room is not provided.

5.1.6.2 capacity of generator cannot support all FSI.

5.1.6.3 audio/visual warning indicator for emergency generator 'on/failure' is not provided at local panel and FS control panel.

5.1.6.4 cooling and exhaust duct for generator passing through compartment is provided with fire damper.
[N.B. FRP enclosure shall be provided]

5.1.6.5 essential lighting is not provided or found defective.

5.1.6.6 emergency lighting is not of battery operated type for building not provided with generator.

5.1.6.7 emergency lighting cannot be lighted up within 15 sec. after power changeover.

5.1.6.8 exit sign is not provided to the common area in high rise domestic building.

5.1.6.9 exit sign is found inadequate and cannot be easily seen.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

5.1.6.10 low level directional sign is not provided for audio/visual advisory system.

5.1.6.11 pre-recorded message has not been approved by FSD.

5.1.6.12 A/V system is not automatically actuated.

5.1.7 Gas flooding system

5.1.7.1 gas leakage from piping is found during practical discharge test.

5.1.7.2 system/components is not of FSD approved type.

5.1.7.3 gas leakage from wall opening is found.

5.1.7.4 computer calculation for system is not submitted.

5.1.7.5 manual operating device is not provided at the entrance of the protected compartment.

5.1.7.6 surveyor report for gas cylinder has not been submitted to FSD for approval.

5.1.7.7 ETL or pressure operating device is not operative.

5.1.7.8 warning notice is not provided at entrance door.

5.1.7.9 mechanical emergency manual release is not provided.

5.1.8 Miscellaneous

5.1.8.1 VAC control system is not provided according to the Code of Practice.
[N.B. undertaking letter is acceptable if VAC system has not yet been installed]

5.1.8.2 tripping of ventilating fan is not by smoke detection device.

5.1.8.3 manual override switch for ventilating fans is not provided at FS control panel.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

5.1.8.4 mounting bracket for fire extinguisher is not properly fixed on wall.

5.1.8.5 Maintenance label is not provided on fire extinguisher.

5.1.8.6 FS 251 for fire extinguisher is not submitted.

5.1.8.7 actual site layout not tally with approved building plans.

5.1.8.8 actual FSI layout not tally with endorsed FSI plans.

5.1.8.9 checklist is found inaccurate or not properly signed by contractor.

5.1.8.10 EVA is not tally with the approved building plans.

5.1.8.11 labelling or lettering for FS tank is not provided.

5.1.8.12 gas extraction system for battery room is not provided.

5.1.8.13 interlocking between gas extraction system and battery charger is not provided.

5.1.8.14 Completion advice from WSD is not available.

5.2 Project engineers/consultants and Registered FSI Contractors are advised to pay attention to the above common errors. By following the FSI Checklist stipulated in the Code of Practice (Inspection and Testing of Installations and Equipment) and making due reference to the above common defects, it is hoped that errors in design and installation of FSIs can be minimised and hence shorten the time required for initial inspections and reduce the number of re-inspections. In overall, the time for processing of Fire Services Certificate FS 172 application can be shortened.

6. Annual Inspections

6.1 Owners of FSIs are required by law to have their installations inspected every year and any contractor carrying out such an inspection is required to issue a certificate, namely F.S. 251, to the owner and a copy of this to the Director of Fire Services. Owners also commit an offence if they fail to keep their installations in efficient working order at all times. Therefore, it is most important that there be no delay in forwarding certificates otherwise legal proceedings may be commenced.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

7. **Labelling of Fire Extinguishers**

7.1 It is a standard requirement starting from 1.9.1995 that all portable extinguishers shall be provided or sticked with a label after maintenance as per attached sample in Appendix D. The purpose of this maintenance label is to provide and update all relevant information on the equipment after maintenance. All Registered FSI Contractors shall pay attention to the requirements and comply with them accordingly.

7.2 On a number of occasions it has been found that the Registered FSI Contractor installing portable equipment has affixed the label of his Company over the original label on the extinguisher, thus covering the Name, Model and Reference Number of that extinguisher.

7.3 All labels including those mentioned in para. 7.1 and 7.2 shall not cover the original manufacturers label.

7.4 Registered FSI Contractors are reminded that only portable equipment approved by this Department and listed in the Equipment List may be installed, and unless the equipment can be readily identified as being approved and listed, the Fire Services Certificate (FS 172) will not be issued.

8. **Signature Endorsement**

8.1 It has been noted that from correspondence that certain Registered FSI Contractors have been using a facsimile signature, which is not acceptable to this Department. All letters, certificates, etc. must bear the original signature of the responsible person concerned. This also means that copies of Certificate (FS 251) must bear an original signature and not a carbon copy thereof.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

FSI/501 (5/95)

PART VI
Appendix A

Section 21(6)(d) of Buildings Ordinance
Application for Inspection and Testing of
Fire Service Installations and Equipment

To : Director of Fire Services

Date : .....
FPB Ref. No. 43/8/.....
43/19/20 .....

Description of Fire Service Installations/Equipment

Part A :

The above installations/equipment have been installed at (address of premises) .....
.....
and the installation work was completed on .....I hereby certify that such installations/equipment in accordance with the FSI drawings endorsed on ..... have been inspected and is in efficient working order. *Copies of completed checklist, equipment test reports and catalogue/data sheets are attached herewith for your information.

Signature of
FSI Contractor : .....

Name in Full : .....

Office/Chop : ..... Registration No. : .....

Tel : ..... Class : ..... Date : .....

Part B :

I, ..., Authorized Person, certify that the above installations have been installed in accordance with the approved building plans stamped by FSD on ..... and, in my opinion they are ready for inspection.

The Fire Service Completion Advice from Water Supplies Department in respect of Fire Service Installations (*copy attached) requiring Government water mains connection has been *issued/applied for.

*An undertaking letter/memo from building owner for providing 24 hour attendant service with normal telephone provision pending the connection of direct telephone link for the fire service installation(s) is attached herewith.

I request that a *Certificate FS 172, required under S21(6) (d) of the Buildings Ordinance/acceptance memo/letter be issued to me. I can be contacted on telephone no. .....For collection of the certificate.

Singed : .....

Full Name of
Authorized Person : .....

Office : .....

Tel. No. : .....

Date : .....

Delete where appropriate

PART VI
Appendix B

FSI/314A

To : Director of Fire Services

Fire Service Installation Plans for Buildings at

_____

_____

_____

This is to certify that the details and specification of all installations shown on the attached fire service installation plans are as prescribed by the Fire Services Department and in accordance with the relevant Rules and Codes of Practice, as may be applicable, e.g.

Rules of the Loss Prevention Council/Fire Offices' Committee for -

Automatic Sprinkler Installations
Automatic Alarm Systems
Roller Shutters/Fire Doors
External Drenchers

Codes of National Fire Protection Association for -

Carbon Dioxide Extinguishing Systems (NFPA 12)
Halogenated Extinguishing Agent Systems Halon 1301 (NFPA 12A)
Halogenated Extinguishing Agent Systems Halon 1211 (NFPA 12B)
Clean Agent Systems (NFPA 2001)
Water Spray Fixed Systems for Fire Protection (NFPA 13)

Codes of Practice (Minimum Fire Service Installations & Equipment), Fire Service Department

Signed _____

_____

_____

Full name of FSI Contractor/Consultant

Date _____

SAMPLE

FSD Ref.: FPB 19/12345
消防處檔號

A1166001

FIRE SERVICE (INSTALLATIONS AND EQUIPMENT) REGULATIONS
消防(裝置及設備)規例
(Regulation 9(1))
(第九條(1)款)
CERTIFICATE OF FIRE SERVICE INSTALLATIONS AND EQUIPMENT
消防裝置及設備證書

Name of Client: ABC Management Co. Ltd.
顧客姓名

Address: 地址

Name of Building 樓宇名稱: Tai Man Commercial Building

St. No. 門牌號數: 123 | Street/Road Name 街道名稱: Tai Man Street | Town Lot & No. 市地段及號碼: KCTL no. 4

Flat/Room 室: - | Block 座: - | Floor 樓: G-20/F | District/Area 區分: Kwai Chung

PART 1 第一部

Item No. 項目編號	Type of Installation 裝置類型	Nature of Work Carried out 完成之工作內容	Comment on Condition 狀況評述
1.	Fire hydrant/hosereel system	Annual maintenance	in working order
2.	Manual fire alarm system	"	see Part 2
3.	Sprinkler system	Add 2 sprinklers in rm. 1202	in working order

PART 2 第二部

Item No. 項目編號	Outstanding Defects 未修缺點		Comment on Defects 缺點評述
1.	Manual fire alarm system	Location	
	a. main alarm panel	G/F	need servicing
	b. 2 breakglass units	2/F & 3/F corridor	need replacement

The works listed in Part 1 above were completed on 14.8.1995 and the above installations/equipment have been tested and found to be in efficient working order in accordance with the Code of Practice for Minimum Fire Service Installations and Equipment published from time to time by the Director of Fire Services. Exceptions are listed in Part 2.

第一部所列的工程已於 _____ 年 _____ 月 _____ 日完成，並經試驗，證明性能良好，符合消防處處長不時公布的最低限度消防裝置及設備守則的規格。未修妥項目列於第二部。

Signature 簽名: Signed

Name 姓名: CHAN Tai-man

FSD/RC No. 消防處註冊號碼: RC 2/999

for: Chan Tai Man Engg. Co. Ltd.
(Firm's Name) (公司名稱)

Date 日期: 16.8.1995

F.S. 251 (Rev. 1/92)

Contractor Name 承建商名稱	:	_____
Registration No. 註冊編號	:	RC3/_____
Maintenance Date 保養日期	:	_____
Valid until 有效日期至	:	_____
Date of Hydraulic Pressure test 壓力試日期	:	_____ _____ _____ _____
FS251 Serial No. 保養證書編號	:	_____

PART VII

FIRE HAZARDS IN 'PROTECTED AREAS'

1. There is a growing tendency for staircase enclosures, smoke lobbies and similar 'protected' areas to be used to facilitate the provision of rising mains, switchgear and a variety of Building Services. This should be avoided as far as practicable.

2. Staircase enclosures, smoke lobbies, balcony approaches and similar areas are provided to ensure safe and speedy egress for occupants in the event of a fire. Accordingly, any misuse of these areas may constitute a fire hazard if there are services present which could materially increase the likelihood of fire or danger to life and property which would result from the outbreak of a fire.

3. The need to design out such undesirable features is obvious, particularly considering that the majority of the problems can be totally eliminated by the provision of structural ducts for the environmental services that modern buildings require.

4. The degree of fire resistance offered by the duct or shaft (i.e. compartment) must conform to the FRP of the surrounding structure. Incombustible fire resisting materials must be used and only those of not less than half hour FRP may be used at access points. Where it is necessary to provide access it must be done on a "self-closing" basis and secured by lock and key or similar means wherever possible. A 100 mm single brick wall is by far the most satisfactory method and removal, plus replacement, probably the most economic means in the long term.

5. The FSD is prepared as an interim measure only to accept compartmentation on abnormal standards (e.g. ducts in staircases) provided the full objective is achieved, and shown in plan form.

6. The "Developer" must accept the fact that space will be required to contain all services i.e. electrical risers, switch/distribution boards, telephone services, ventilation, water supply, drainage etc., in their own or suitably compatible structural ducts.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

PART VIII

MISCELLANEOUS EQUIPMENT

1. Fire Break Doors and Shutters

2. Dry Rising Main Outlets in Existing Buildings

3. Hose Reels

4. Zoning of Operation of Manual Fire Alarms

5. Tank Sizes for Water Spray/Drencher Systems for Risk other than Oil Tank Farms and Similar Complexes

6. Halogenated Fire Extinguishing Agents in Existing Installations and Equipment

7. Halon Modular Systems in Existing Buildings

8. Clean Fire Extinguishing Agents

PART VIII

Miscellaneous Equipment

1. Fire Break Doors and Shutters

1.1 In accordance with the Code of Practice for Fire Resisting Construction 1996 which took effect on 1 August 1996, all fire shutters should be constructed, installed and assembled to the satisfaction of the Building Authority. Fire dampers and the operation of fire shutters and fire dampers should be designed, installed, tested and maintained to the satisfaction of the Director of Fire Services. Accordingly, the Building Authority had taken over from the Director of Fire Services as the authority to accept the construction, installation and assembly of fire shutters in private building works. All application for approval of fire shutters shall be referred to BD for processing. With regard to the inspection of fire shutters, the role of Fire Services Department (FSD) will be confined to checking and testing of all activating devices as well as the operation of the fire shutters.

2. Dry Rising Main Outlets in Existing Buildings

2.1 Due to problems of theft of valves made of brass it is permissible to install outlets made of cast iron in dry rising mains only.

2.2 Locally made products of this type should be submitted to and receive approval from the Fire Services Department prior to installation.

3. Hose Reels

3.1 Hose Reel Nozzles

A number of Registered Fire Service Installation Contractors have installed hose reels with a 'spray/jet' type nozzle both in metal and plastic. This type of nozzle is regarded as unsatisfactory as they are particularly subject to blockage due to sediment in the FSI pipes and tanks, as well as being prone to seizure from corrosion. The required type of nozzle is clearly defined in the current Code of Practice and it is intended that only nozzles conforming to this pattern will be accepted.

3.2 Hose Reel Notices

Where hose reels are located in recesses to which doors are fitted and can only be opened by pushing in first, the doors shall be annotated "Push to Open".

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

4. Zoning of Operation of Manual Fire Alarms

Manual fire alarms, on actuation, are to sound as follows :-

4.1 Domestic Buildings above 3 storeys

(a) If no refuge floor is provided, on all floors.

(b) If refuge floors are provided , floors between refuge areas.

4.2 Composite Buildings

(a) Less than 30m in height, on all floors.

(b) Over 30m where separation with a fire resisting period of not less than 2 hours between domestic and commercial occupancies exists, then :-

(i) For domestic accommodation, as at 4.1 above.

(ii) For commercial area, on all floors of such commercial occupation,

If no separation exists, all floors.

4.3 Commercial Buildings and Hotel Buildings

(a) Sprinklered buildings :- On the floor below and two floors above the floor involved.

(b) Non-sprinklered buildings :- On all floors.

4.4 Industrial Buildings

(a) If fire resisting separation appropriate to the occupancy is not provided between zones, then all floors of the particular block/tower.

(b) If such separation is provided (say between podium and tower), then only in the zone affected.

4.5 Institutional Buildings including Schools

All floors of the particular block.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

5. **Tank Sizes for Water Spray/Drencher Systems, for Risks other than Oil Tank Farms and similar Complexes**

5.1 In the majority of cases it is not possible to provide an "unlimited supply" of water for water spray/drencher system. Where only a limited supply of water is possible, the capacity of emergency supply tanks for water spray/drencher systems must be capable of providing a supply for a minimum duration of 30 minutes.

5.2 Water supply calculations for these systems are therefore to be as follows :-

5.2.1 Water spray system : Total Protected Area in m^2 x Rate of Application as per NFPA Standard 15, paragraph 4.4 x 30 minutes.

5.2.2 Drencher system : Total Protected Area in m^2 x 10 l/m^2 per minute x 30 minutes.

5.3 Authorised persons should ensure that such calculations are indicated on any drawings submitted to the Fire Services Department for processing.

6. **Halogenated Fire Extinguishing Agents in Existing Installations & Equipment**

Bromochlorodifluoromethane (BCF) Halon 1211
Bromotrifluoromethane (BTM) Halon 1301

6.1 The following decisions have been taken in respect of fire extinguishing media using the above agents :-

6.1.1 Portable Hand-operated Approved Fire Extinguishers for Class 'B' and 'Electric' Fires

BCF fire extinguishers were acceptable for Class 'B' and Electric' fires, however, subsequent to dispensing with BCF type portable hand-operated fire extinguishers, the following types of portable hand-operated fire extinguishers, according to the risk to be protected, are acceptable as an alternative :-

6.1.1.1 CO_2 fire extinguishers;

6.1.1.2 Foam fire extinguishers; or

6.1.1.3 Dry powder fire extinguishers.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

6.1.2 BTM hand extinguishers are **not** approved for use in Hong Kong.

6.1.3 Automatically Operated Total Flooding Systems

6.1.3.1 BCF and BTM were acceptable alternative extinguishing media to CO_2 and can therefore be used in automatic systems. Installation design must be in accordance with the NFPA Standard 12B (Halon 1211) and NFPA Standard 12A (Halon 1301).

6.1.3.2 As halons have been prohibited from importing into Hong Kong for local consumption since January 1994, this Department has ceased imposing requirement of halon-based fixed installations for building protection. The following alternative fire suppression systems are considered acceptable to replace halon-based fixed installations :-

(a) CO_2 System
(b) Water Spray System
(c) Sprinkler System
(d) Foam Water Sprayer System
(e) Dry Powder System

However, application of the above alternatives should be considered in conjunction with the intended use, available fire service installations and floor areas of the premises.

6.1.4 Fixed Sprayer Units (BCF)

Self contained, automatically operated sprayer units were marketed by several manufacturers. These units were accepted in certain circumstances as an alternative to automatic CO_2, BCF or BTM installations up to a maximum of 14kg in a single unit to cover 42 m^3. They were regarded as being particularly suitable for protection of both small enclosed flammable liquid stores and certain types of electrical fire risk.

6.1.5 Calculations of the amount of BCF required to protect any particular risk was made on the basis of 5kg BCF to cover 14 m^3 up to a maximum of 14kg BCF to cover 42 m^3 above which an automatic system must be used.

6.1.6 Layout plans for both total flooding systems and fixed sprayer units are to be submitted to this Department for consideration prior to installation.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

6.2 All premises protected by CO_2, BCF or BTM fixed installations or sprayer units shall be suitably marked with the appropriate symbol on, or near the entrance door. These symbols are to be of the design, colour and size as shown on the diagram at Appendix A.

7. Halon Modular Systems in Existing Buildings

7.1 Types and Standards

7.1.1 Halon 1301 modular system shall be installed in accordance with NFPA Standard 12A.

7.1.2 Halon 1211 modular system shall be installed in accordance with NFPA Standard 12B.

7.2 Approvals

7.2.1 All such systems shall be tested and approved by an organisation recognised by the Fire Services Department. Enquiries concerning these organisations should be made to the Fire Protection Bureau.

7.2.2 Any ancillary equipment used shall be of the approved type and accepted by this Department.

7.3 Containers

7.3.1 Containers should preferably be located outside protected areas. However, containers may be located within the protected areas when it is possible to do so in a manner that is unlikely to impair system performance when exposed to fire.

7.3.2 When containers are located within protected areas or in places where they may not be readily accessible during a fire, provision shall be made for manual control (preferably mechanical) in a readily accessible location outside the protected areas.

8. Clean Fire Extinguishing Agents

FM 200 (Heptafluoropropane)
NAFS-III (HCFC Blend A)
Inergen (Nitrogen, Argon and Carbon Dioxide)
HCFC-123 (Dichlorotrifluoroethane)
HCFC-124 (Chlorotetrafluoroethane)
CEA-410 (Perfluorobutane)

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

8.1 Portable Hand-Operated Approved Fire Extinguishers for Class 'B' and 'Electric' Fires

Subsequent to dispensing with BCF type portable hand-operated fire extinguisher, the HCFC-123 type portable hand-operated fire extinguisher is acceptable as an alternative to the BCF type fire extinguisher.

8.2 Automatically Operated Total Flooding Systems

FM 200, NAFS-III, Inergen and CEA-410 systems are acceptable for use in automatic systems. Installations design must be in accordance with NFPA Standard 2001 and UL Standard 1058.

8.3 Fixed Sprayer Units (NAFS-III and HCFC-124)

NAFS-III and HCFC-124 automatic type fire extinguishers are acceptable for use for protection of small Category 5 Dangerous Goods Stores, certain types of electrical installations and in certain circumstances as an alternative to automatic CO_2 and BTM installations with volume less than 36.1m^3.

8.3.1 Calculation of the amount of NAFS-III and HCFC-124 required to protect any particular risk is made on the following basis :-

NAFS-III : 1 kg to cover 2.75m^3
2 kg to cover 5.5m^3
4 kg to cover 11.0m^3
9 kg to cover 24.76m^3

HCFC-124 : 1.1 kg to cover 2.1m^3
1.9 kg to cover 3.5m^3
3.1 kg to cover 5.7m^3
4.1 kg to cover 7.5m^3
5.7 kg to cover 10.5m^3
7.2 kg to cover 13.5m^3
10.7 kg to cover 19.8m^3
13.8 kg to cover 25.5m^3
15.3 kg to cover 28.3m^3
19.5 kg to cover 36.1m^3

8.3.2 Layout plans for both total flooding systems and fixed sprayer units are to be submitted to this Department for consideration prior to installation.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

8.4 All premises protected by FM 200, NAFS-III, Inergen and CEA-410 fixed installations or NAFS-III and HCFC-124 fixed sprayer units shall be suitably marked with the appropriate symbol on or near the entrance door. These symbols are to be of the design, colour and size as shown on the diagrams as Appendices B to D.

8.5 Clean Agent Modular System

8.5.1 FM 200 modular system shall be installed in accordance with NFPA Standard 2001 and UL Standard 1058.

8.5.2 Requirements for approvals and the location of containers are same as for the Halon modular systems in paragraph 7.

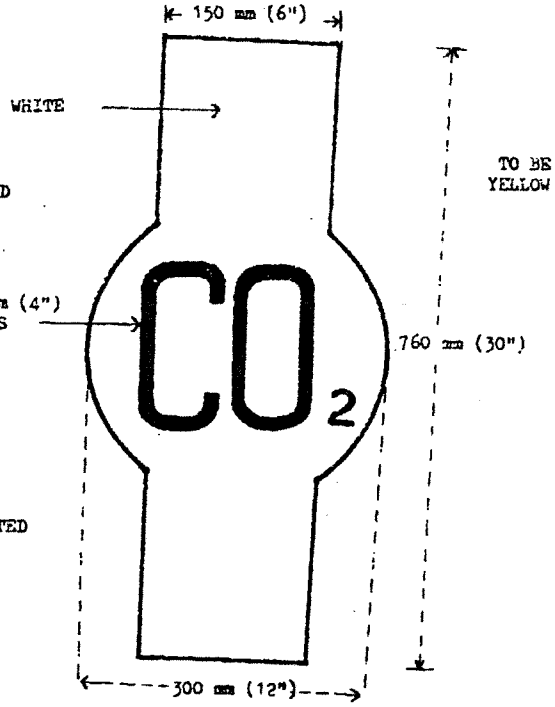
Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

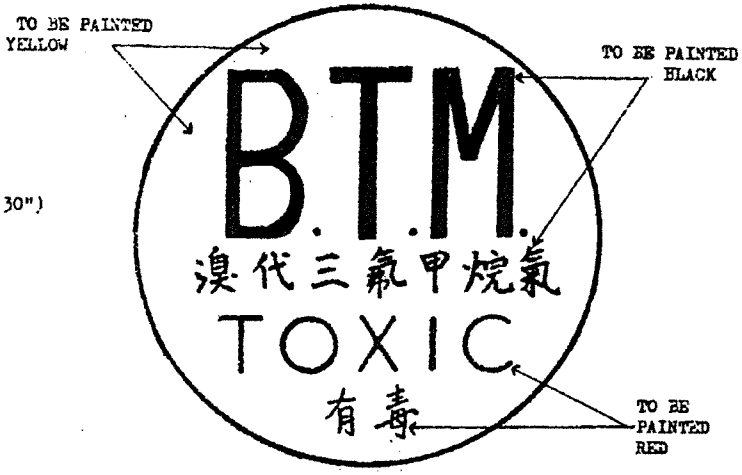
B.C.F. IDENTIFICATION SYMBOL

ITEM	COLOUR	SIZE
CIRCLE	YELLOW	300 mm (12") DIAMETER
"B.C.F."	BLACK	100 mm (4") HIGH
"TOXIC"	RED	35 mm (1.5") HIGH
CHARACTERS	BLACK/RED	35 mm (1.5") HIGH

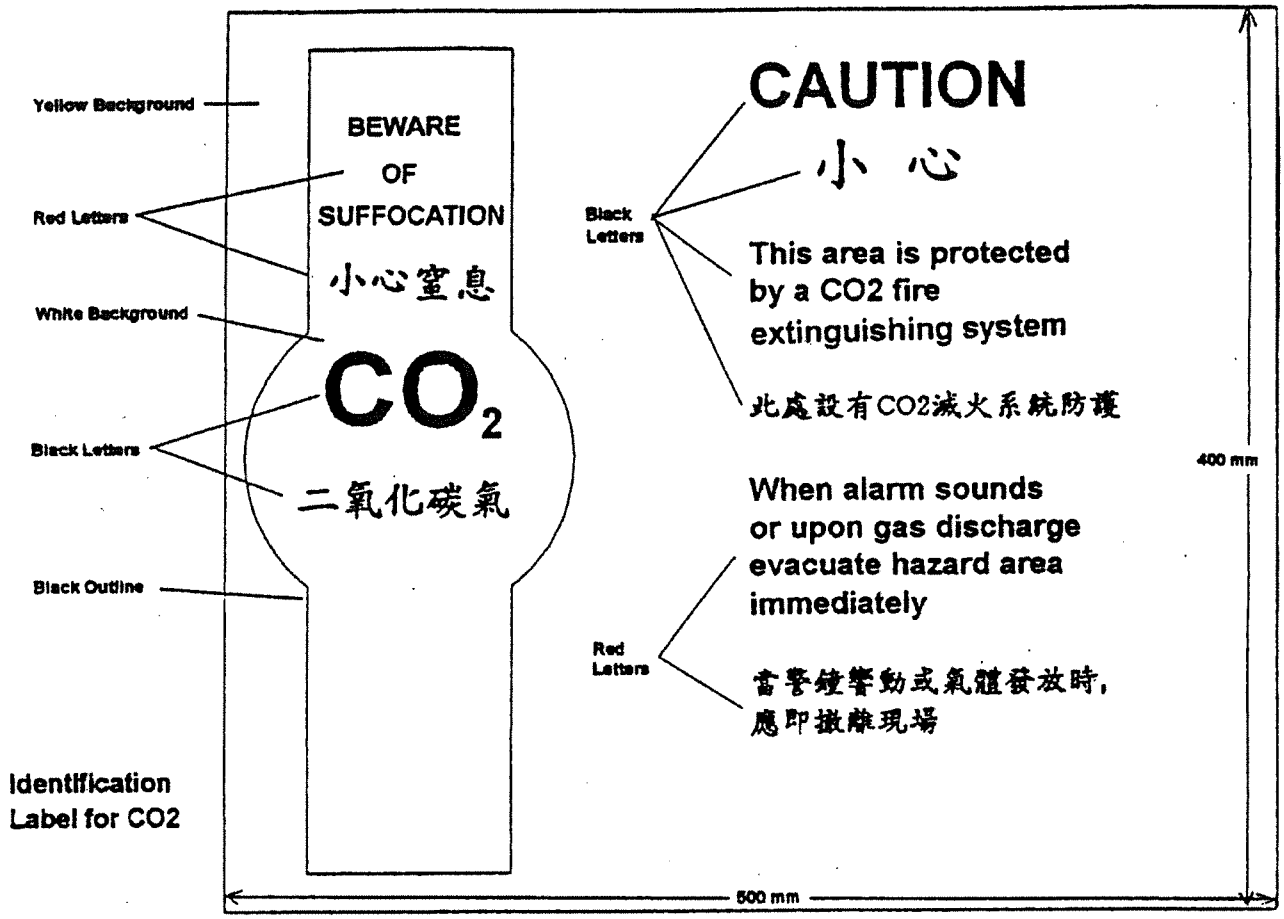
CO2 IDENTIFICATION SYMBOL



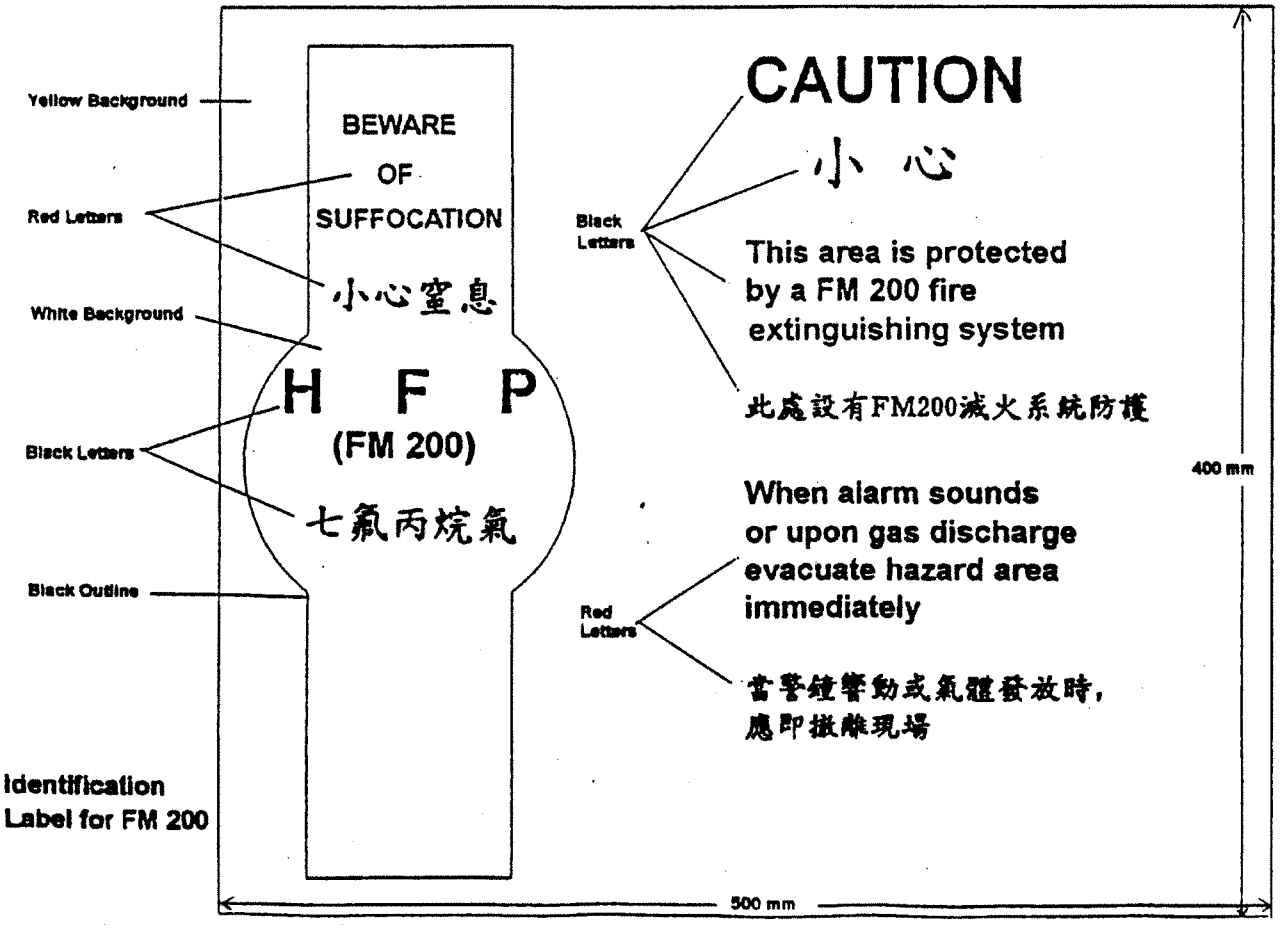
B.T.M. IDENTIFICATION SYMBOL



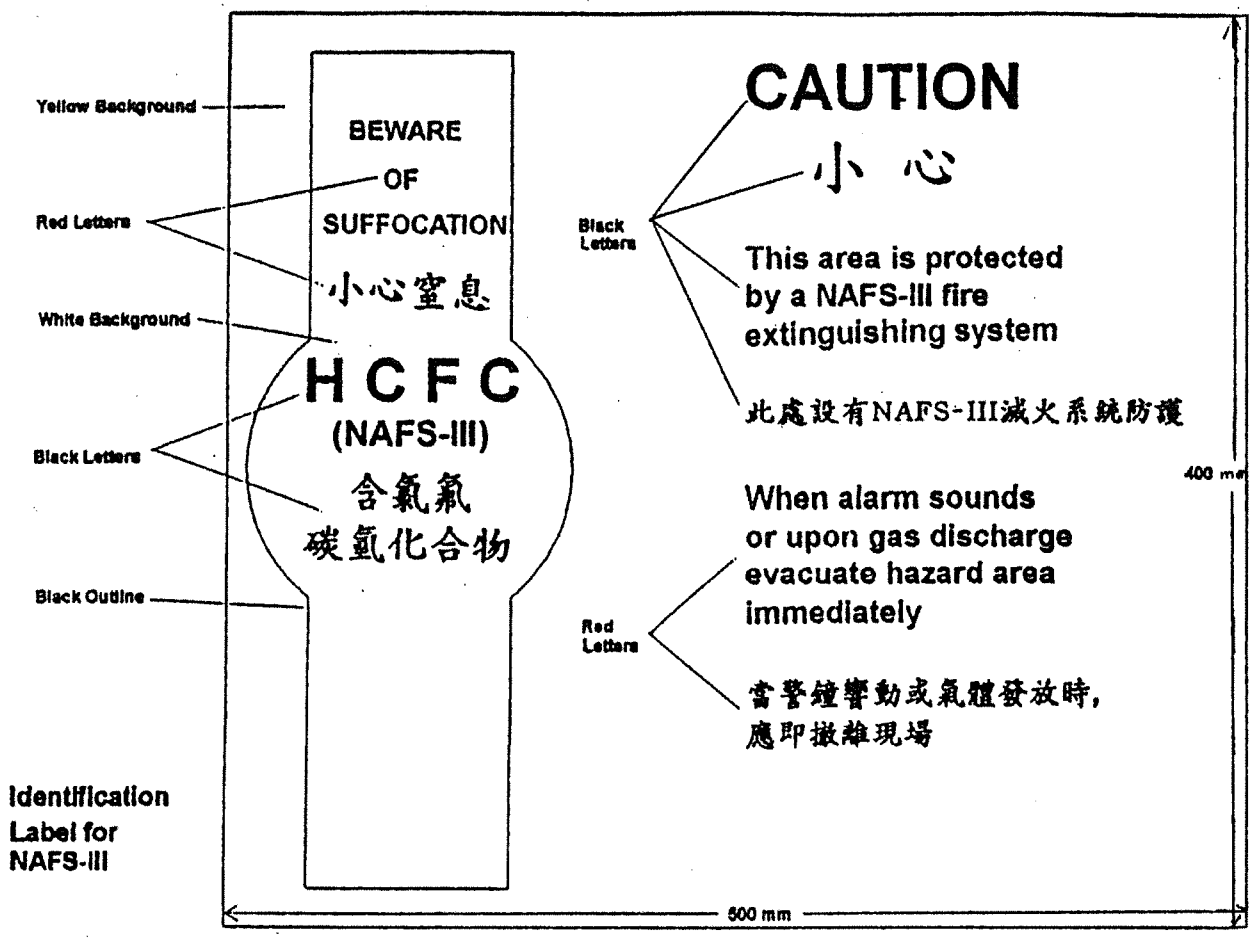
ITEM	COLOUR	SIZE
CIRCLE	YELLOW	300 mm (12") DIAMETER
"B.T.M."	BLACK	100 mm (4") HIGH
"TOXIC"	RED	35 mm (1.5") HIGH
CHARACTERS	BLACK/RED	35 mm (1.5") HIGH



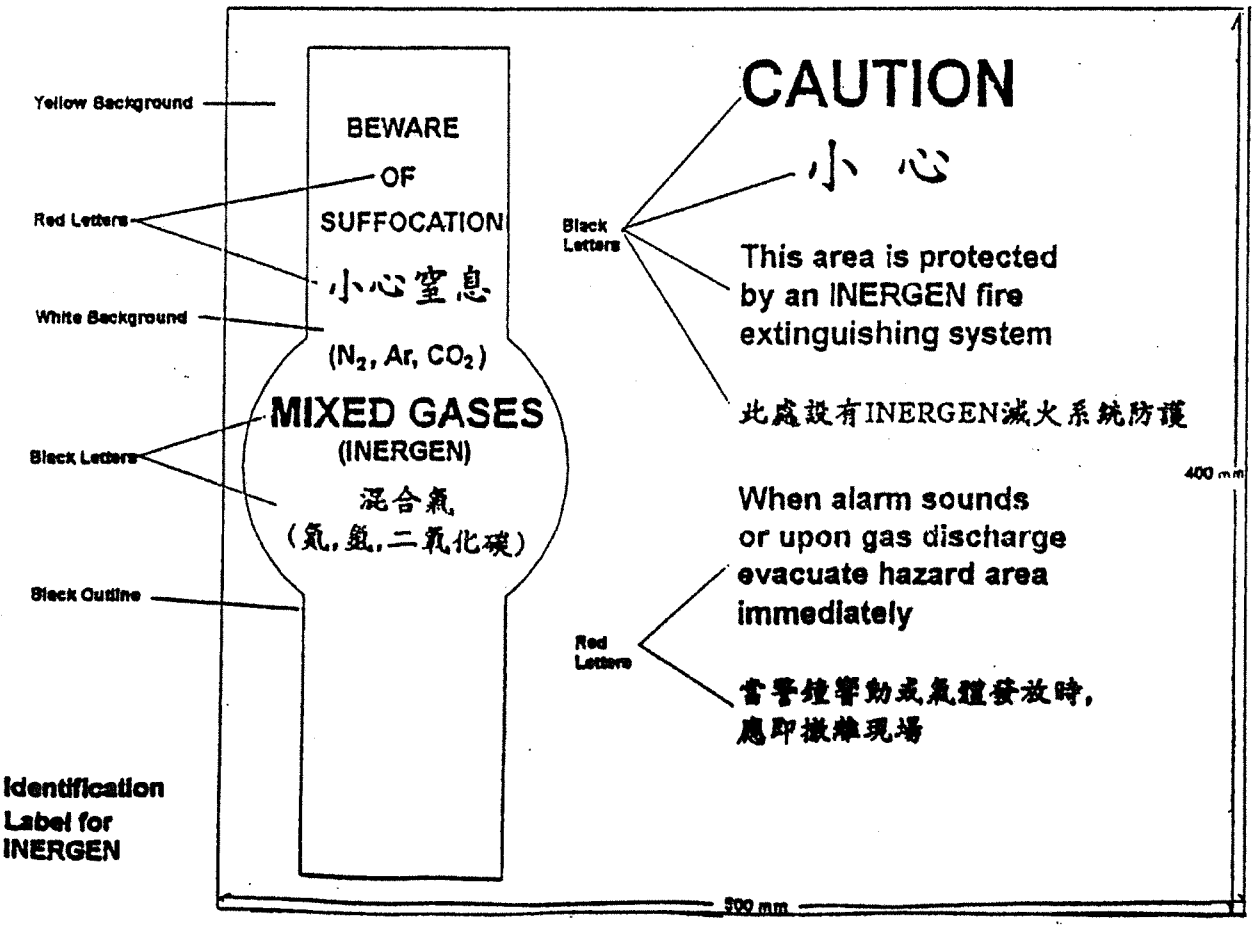
Identification Label for CO2



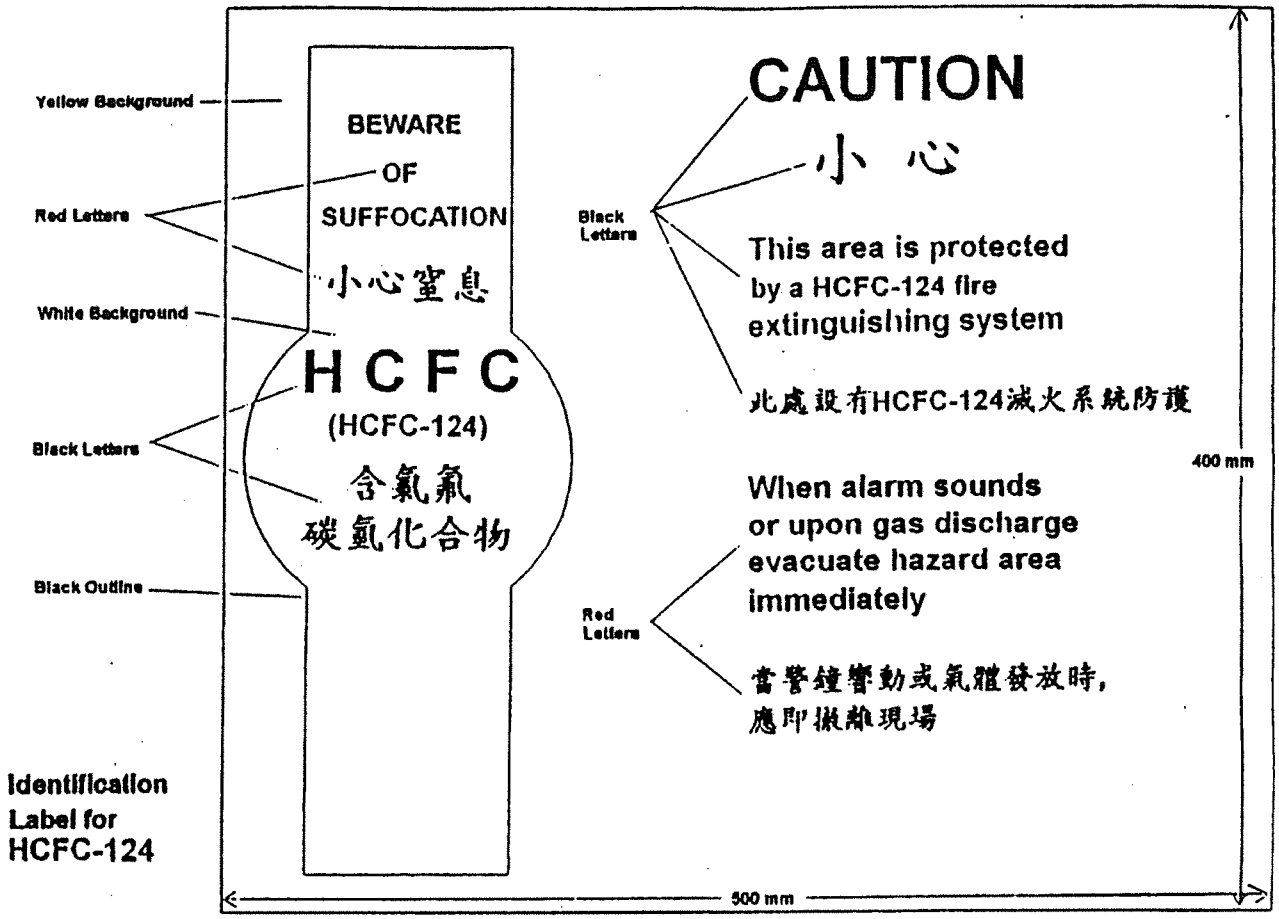
Identification Label for FM 200



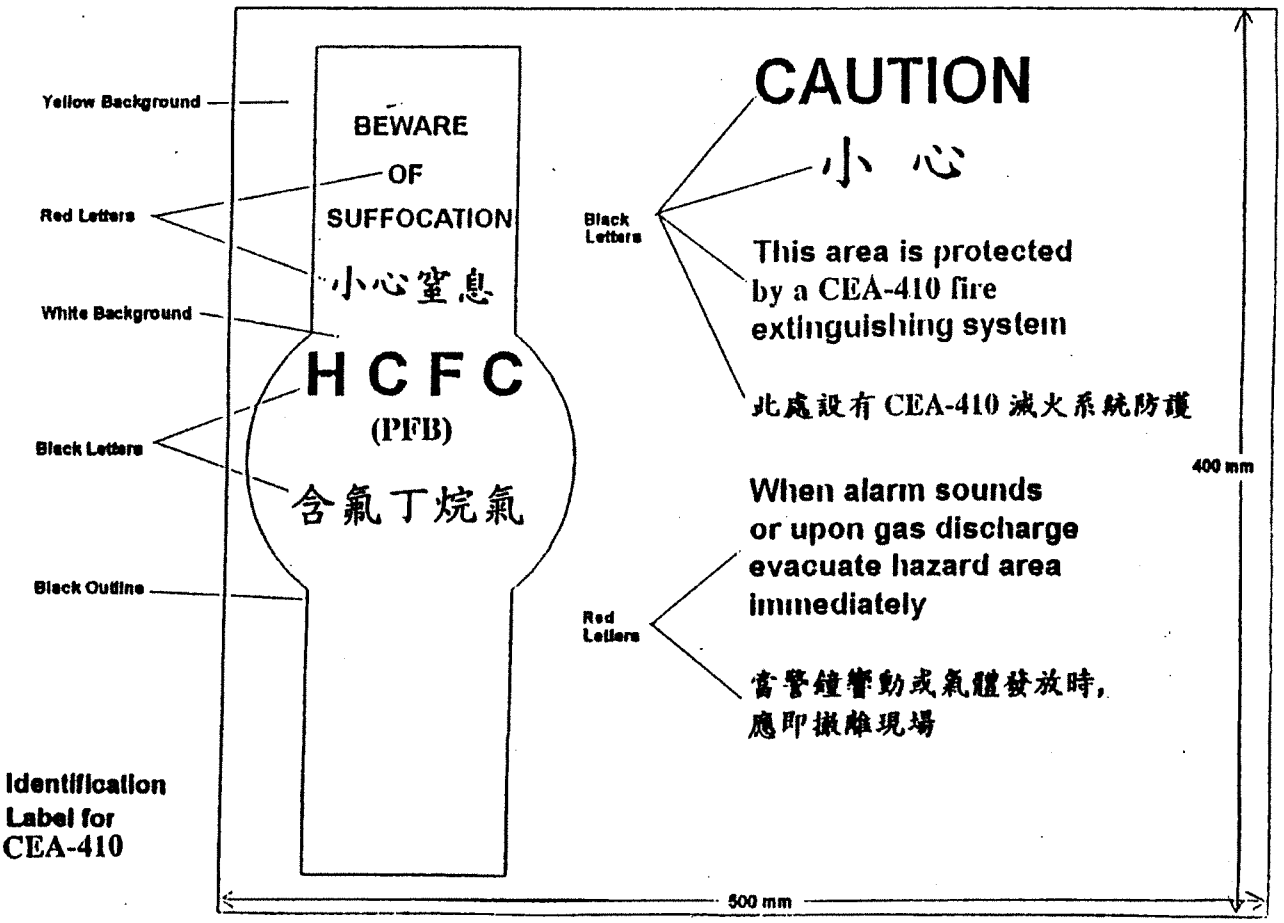
Identification Label for NAFS-III



Identification Label for INERGEN



Identification Label for HCFC-124



Identification Label for CEA-410

PART IX

ELECTRICAL SUPPLIES FOR FIRE SERVICE INSTALLATIONS

1. Sources of Supply

2. Cable

3. Specification and Requirements

4. General

5. Application

6. Hazardous Area Protection

7. Special Note - Non-FSI Electrical Apparatus

PART IX

Electrical Supplies for Fire Service Installations

1. Sources of Supply

1.1 Where an electrical installation is required to comply with the Code of Practice for Minimum Fire Service Installations and Equipment, a primary and secondary source of supply shall be provided to the satisfaction of the Director of Fire Services and all electrical devices shall be fed from both the primary and secondary source of supply.

1.2 Where the secondary source of supply is in the form of a fixed, independently powered electrical generator, it shall be of sufficient electrical capacity to meet essential services, including all fireman' s lifts.

1.3 The diagram in Appendix A titled "Schematic Wiring Diagram for Fire Service Installations" shows an acceptable electrical layout, including provision for an emergency generator, which complies with the Code of Practice for Minimum Fire Service Installations and Equipment.

2. Cable

2.1 Cables meeting the following specification are hereafter referred to as "the cable".

3. Specification and Requirements

3.1 The cable shall be mineral-insulated and manufactured in accordance with BS 6207 : Part 1; or

3.2 The cable shall be of a type accepted by LPC (or FOC) for such purposes.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

4. **General**

4.1 The cable shall be installed in accordance with the manufacturer's specifications and instructions.

5. **Application**

5.1 The cable is suitable for use for fire detection systems and other fire service installations, including emergency lighting systems.

5.2 Mineral-insulated cables to BS 6207 : Part 1 are also approved for use in installations which are required to meet flame-proof specification.

6. **Hazardous Area Protection**

6.1 A hazardous area is any area or place wherein a potentially flammable or explosive atmosphere may be present.

6.2 The electrical components of all FSI equipment which are installed in a hazardous area must be of a type which are approved for use in such an area. This requirement extends to the use of smoke or heat detector heads, bases and wiring, all of which must be appropriately rated. Approval for use of such equipment will be provided in the same manner as approval for any other item of FSI.

7. **Special Note - Non-FSI Electrical Apparatus**

7.1 It is very likely that hazardous areas will be subject to control under legislation additional to the Buildings Ordinance - e.g. Dangerous Goods Ordinance. Where this is so, A/Ps are advised to contact the appropriate authority as soon as possible. Requirements made under that legislation will normally include the standard of electrical apparatus, other than FSI, which is to be installed.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

Schematic Wiring Diagram for Fire Service Installations

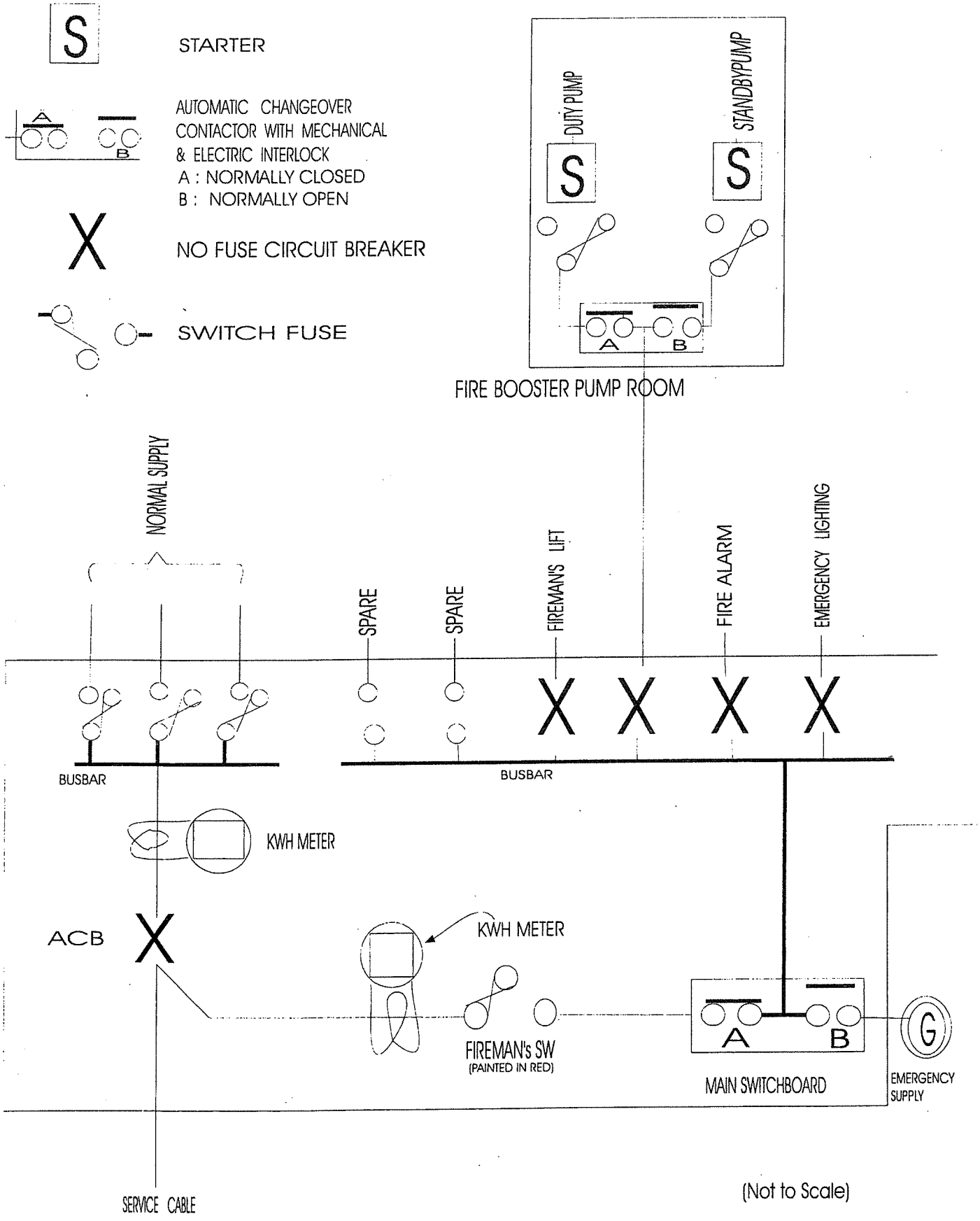
LEGEND :

S — STARTER

AUTOMATIC CHANGEOVER CONTACTOR WITH MECHANICAL & ELECTRIC INTERLOCK
A : NORMALLY CLOSED
B : NORMALLY OPEN

X — NO FUSE CIRCUIT BREAKER

SWITCH FUSE



(Not to Scale)

PART X

MISCELLANEOUS TOPICS

1. Transformers

2. Protection of Openings Linking Compartments and Buildings

3. Street Fire Hydrants

4. Petrol Filling Stations in Industrial/Carpark Buildings

5. Access for Fire Appliances

6. Compatibility of Occupancy

7. Fire Protection in Construction Sites

PART X

MISCELLANEOUS TOPICS

1. Transformers

There is no objection to the use of the following types of transformer in multi-storey buildings, subject to observations of the conditions shown under each type listed.

1.1 SF6 (Sulphur Hexafluoride); Formel NF-Filled Transformer

1.1.1 Above Ground Level

(a) No restriction on height.

(b) F.R.P. to be in accordance with Building Regulations.

(c) Adjacent/adjoining occupancies and exposure hazards to be taken into account.

(d) No storage of SF6 cylinders or Formel NF in the Transformer Room or Consumer Switch Room.

(e) Gas leakage alarm to be provided (visual and audible) with Trip Circuit.

(f) Standard FSD Requirements for Transformer Room to be complied with as stipulated.

1.1.2 In Basement

(a) F.R.P. to be in accordance with Building Regulations.

(b) Separate and independent staircases and mechanical ventilation to open air and complete separation from the main building.

(c) Adjacent/adjoining occupancies and exposure hazards to be taken into account.

(d) No storage of SF6 cylinders or Formel NF in the Transformer Room or Consumers Switch Room.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

(e) Gas leakage alarm to be provided (visual and audible) with Trip Circuit.

(f) Standard FSD Requirements for Transformer Room to be complied with as stipulated.

1.2 Midel 7131 (Pentaerythritol Ester) Filled; Silicone Fluid-Filled, R-Temp (Mixtures of paraffinic hydrocarbons and additives) Filled and Dry Type Transformers

1.2.1 Above Ground Level

(a) Transformer Room shall be located at the periphery of the building. Windows must be provided on the external wall, such windows shall be capable of being opened when required to supplement ventilation.

(b) Mechanical ventilation in form of an individual air-conditioning system shall be provided for the Transformer Room.

(c) A lobby shall be provided outside the Transformer Room.

(d) A 4.5kg CO_2 fire extinguisher or its appropriate equivalent alternative type of fire extinguisher is to be provided.

(e) Standard FSD Requirements for Transformer Room shall be complied with as stipulated.

1.2.2 In Basement

(a) An independent and separate staircase (leading to open air at ground level) solely for the Transformer Room is to be provided.

(b) Mechanical ventilation in form of an individual air-conditioning system shall be provided for the Transformer Room.

(c) A lobby shall be provided outside the Transformer Room.

(d) A 4.5kg CO_2 fire extinguisher or its appropriate equivalent alternative type of fire extinguisher is to be provided.

(e) Standard FSD Requirements for Transformer Room shall be complied with as stipulated.

(LAU Shu-lam)
for Director of Fire Services

Date : 22 October, 1996
(Revised on 16 December, 1998)

1.3 Replacement Procedures

Where an existing oil-filled transformer is replaced by one of the transformers listed in this paragraph with a capacity or total capacity exceeding 1500 kVA, a FIXED AUTOMATIC EXTINGUISHING SYSTEM shall be provided to the satisfaction of this Department, unless the associated oil-filled switch-gear is also replaced to be compatible with the type of transformer tested.

2. Protection of Openings Linking Compartments and Buildings

2.1 All connections, be they enclosed pedestrian ways or direct connections by breaching party walls between separate buildings, shall be protected by roller shutters or fire doors to the required degree of fire resistance, automatic in operation plus manual control. Normal method of automatic actuation should be by smoke detectors rather than heat.

2.2 In certain circumstances other methods of connection such as "open air" breaks (i.e. connections which are permanently and naturally ventilated) may be considered on their merits.

3. Street Fire Hydrants

3.1 Street fire hydrants provided within private developments will be regarded as Fire Service Installations required under the provision of Section 16(1)(b) of the Buildings Ordinance, Cap. 123, Laws of Hong Kong. This street fire hydrant system shall be subject to the provisions of the Fire Service (Installations and Equipment) Regulations, Section 25, Cap. 95, Laws of Hong Kong and shall be installed, maintained, repaired or inspected in accordance with the said Regulations.

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

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

3.4 The minimum output at para. 3.3 above should where possible be made available from two 65mm outlets of a system delivering at the same time, i.e. a total output of not less than 4,000 litres per minute (66.7 l/sec.).

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

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

3.6 All hydrants should be installed in accordance with the Water Supplies Department Standard Mainlaying Practice.

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

3.8 The following procedure shall be adopted to identify newly installed street fire hydrants not yet put in commission and existing hydrants out of service :-

(a) Hydrant body will be painted red or yellow according to the source of water supply i.e. fresh or salt water respectively;

(b) the 100mm outlet of pedestal hydrant will be fitted with a blue blank cap; or

(c) the 70mm outlet of swan neck hydrant will be fitted with a blue blank cap.

4. Petrol Filling Stations (PFSs) in Industrial/Carpark Buildings

4.1 Petrol Filling Stations (PFSs) may be permitted on ground floor of an industrial or carpark building, however each application will be dealt with on its merits and subject to compliance with the following requirements and any other additional requirements considered necessary :-

4.1.1 The PFS and tanks to be completely separated laterally and vertically from other parts of the building by elements of construction having an F.R.P. of not less than 4 hours;

4.1.2 The provision of a suitable "buffer zone" between the ground floor PFS and the industrial/carpark floors. Normally such zone will consist of the floor or that part of the floor immediately above the PFS and which shall be used for non-hazardous purposes, such as car parking;

4.1.3 All building staircases to be remote from the PFS;

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

4.1.4 Vehicular access to ground floor industrial premises (parking and unloading area) to be remote from the PFS;

4.1.5 The entire building to be fully protected by automatic sprinkler system;

4.1.6 An automatic foam/water spray system with manual operation to be installed to protect the product delivery and dispensing areas of the PFS;

4.1.7 The face of the building for three levels (floors) directly above the PFS to be a blank wall devoid of windows and other openings; and

4.1.8 The provision of a canopy along the periphery of the PFS at roof (ceiling) level.

4.2 The requirement in paragraph 4.1.6 above may be waived if the PFS is in a private premises which supplies only diesel and the filling point of storage tanks is sited at least 4.25m from the entrances/exits of any nearby buildings and/or source of ignition.

4.3 The requirements in paragraphs 4.1.7 and 4.1.8 above may be waived if a drencher system is installed along the periphery of the PFS at roof (ceiling) level.

5. Access for Fire Appliances

Requirements in respect of access for fire appliances to developments and redevelopments of properties are contained in the paragraphs below. Paragraph 5.1 deals with access to developments in virgin areas while paragraph 5.2 deals with access to properties under redevelopment with or without a change in lease condition.

5.1 Access to Developments in Virgin Areas

The minimum criteria are as follows:

5.1.1 For industrial sites the standard specified in the "Minimum Standard Industrial Access Roads" (Appendix A) as laid down in the Hong Kong Planning Standards and Guidelines should be adopted.

5.1.2 For occupancies where there are statutory access requirements, such as Cinemas and Theatres, the provisions of the legislation will be adopted.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

5.1.3 Emergency access will not normally be required for domestic buildings of 3-storey or below, unless they form part of a major development venture, in which case access for a pumping appliance to reach within 30m travel distance from any building on the lot must be provided.

5.1.4 In case of all other types of occupancy, direct access for fire appliances must be available to at least one principal face of each and every building with the exception of special developments in remote areas with minimal life/fire risk such as microwave transmitter station, beach houses, etc. which can be subject to special consideration.

5.1.5 Access roads should normally be not less than the minimum standard of a road/street, i.e. 7.3m. For areas where no purpose-built roads are designed, emergency access lanes of not less than 6m wide must be provided. If there is any overhead structure, a clear headroom of not less than 4.5m must be maintained.

5.1.6 The following figures of the largest fire appliance (50m Turntable Ladder) should be taken as a standard :-

Weight	20 tonnes
[illegible]	[illegible]
Length	11.35 metres

5.1.7 The designed gradient of a ramp on an access road should not exceed 1 in 10, especially when it leaves the horizontal plane, which may be increased to a maximum of 1 in 6 after having reached the horizontal plane.

5.1.8 To indicate the extent of the designated Emergency Vehicular Access (EVA) in a development, the following signs shall be positioned accordingly with effect from 1 January 1997 :-

(a) <u>For EVA of driveway design</u>

(i) an EVA Layout sign shall be erected at the entrances of the EVA (see sample at Appendix B);

(ii) EVA Indication signs shall be positioned at an interval of not more than 100m along the EVA (see sample at Appendix C); and

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

(iii) "No Parking" signs with standard conforming to the Road Traffic (Parking on Private Roads) Regulations and the Code of Practice for Private Roads shall be erected along the EVA at 50m intervals except where designated carparks are marked (see sample at Appendix D).

(b) For EVA not of driveway design

(i) the EVA Layout sign to be erected at entrance as described in (a)(i) above shall still be provided; and

(ii) as an alternative for the EVA Indication signs described in (a)(ii) above, Emergency Route signs may be fixed to the curb stones, planters, or other similar objects as appropriate at an interval of not more than 100m to mark the EVA. Such signs could be painted, engraved or made of metal (see sample at Appendix E).

The signs shall be designed in accordance with the examples provided in order to maintain a consistent standard.

5.2 Access to Redevelopment Areas with or without a Change in Lease Condition

The minimum criteria are as follows :-

5.2.1 Commercial Buildings - Low and High Rise

Direct vehicular access for fire appliances must be provided to a major face of the building. The street or road serving such major face of the building shall have a minimum carriageway width of 6.0m to permit the efficient manoeuvring of fire appliances for rescue and fire fighting purposes.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

5.2.2 Domestic Buildings (Over 3 Storeys in Height)

(a) Buildings Served by One Staircase

Direct vehicular access for fire appliances must be provided to a major face of the building. The street or road serving such major face of the building shall have a minimum carriageway width of 6.0m to permit the efficient manoeuvring of fire appliances for rescue and fire fighting purposes. Provided this shall not apply to temporary buildings and dwelling houses for occupancy by one family.

(b) Buildings Served by Two or More Staircases

Provision must be made for a pumping appliance to reach within 30m travel distance from Fire Service Inlet of the premises, but this can be varied within reason by the approving officer to take into account of special features.

5.2.3 Domestic Buildings - High Rise

Provision must be made for a pumping appliance to reach within 30m travel distance from the Fire Service Inlet of the premises, but this can be varied within reason by the approving officer to take into account of special features.

5.2.4 Hotels - Low and High Rise

Direct vehicular access for fire appliances must be provided to a major face of the building. The street or road serving such major face of the building shall have a minimum carriageway width of 6.0m to permit the efficient manoeuvring of fire appliances for rescue and fire fighting purposes.

5.2.5 Institutional Buildings - Low and High Rise

As for 5.2.4.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

5.2.6 Places of Public Entertainment within a Low Rise Building

(a) Cinemas and Theatres

Direct vehicular access for fire appliances must be provided in accordance with the provisions in Places of Public Entertainment Ordinance and Subsidiary Legislation, Chapter 172, Laws of Hong Kong.

(b) Other Places of Public Resort

As for 5.2.4.

5.2.7 Place of Public Entertainment within a High Rise Building

(a) Cinemas and Theatres

Direct vehicular access for Fire Services appliances must be provided in accordance with the provisions in Places of Public Entertainment Ordinance and Subsidiary Legislation, Chapter 172, Laws of Hong Kong.

(b) Other Places of Public Resort

As for 5.2.4.

5.2.8 Shipyards (including a Site Area of more than 2 300 m^2)

Each case shall be subject to individual consideration.

5.2.9 Composite Buildings

Requirements shall be determined by the maximum requirement of any particular type of usage as defined in the relevant paragraphs of this Circular Letter. However, buildings described in paragraph (a) below will be regarded as domestic buildings, and access requirements will be as stated for domestic Buildings - High Rise", paragraph 5.2.3 refers.

(a) Buildings served by two or more staircases with lowest floor/s as carparks and used exclusively by residents and all upper floors used as domestic.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

5.2.10 Industrial-Office, Industrial and Godown Buildings - Low and High Rise

Vehicular access for various building site areas will be as set out on the diagram at Appendix A.

5.2.11 Gradient and Ramp Requirements

Any gradient or ramp on access roads delineated for fire appliance use should not exceed 1:10 when leaving the horizontal plane. The gradient may be increased thereafter to a maximum of 1:6.

5.2.12 Signs for Emergency Vehicular Access

Same as for 5.1.8

5.3 Interpretation

5.3.1 "Commercial Building" means a building used wholly or in part for the purpose of the following :-

(a) Banks;

(b) Garages and car parks for commercial enterprise not elsewhere;

(c) Offices;

(d) Restaurants; and

(e) Shops.

5.3.2 "Composite Building" means a building which is a combination of domestic buildings, commercial buildings, institutional buildings, hotels, places of public assembly but specifically excluding industrial and godown buildings and other special risks.

5.3.3 "Domestic Building" means a building used solely for the purpose of habitation (may have residential car ports/parks on lower floor/s).

5.3.4 "High Rise Building' means a building in which the floor of the uppermost storey is at a height of 30m or more above a point of discharge of a staircase to a place of ultimate safety.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

5.3.5 "Hotel" means a building used wholly or in part primarily for the purposes of accommodation on a commercial basis.

5.3.6 "Industrial Building" means a 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 part of any article;

(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.

5.3.7 "Institutional Building" means a 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.

5.3.8 "Low Rise Building" means a building in which the floor of the uppermost storey is less than 30m above a point of discharge of a staircase to a place of ultimate safety.

5.3.9 "Place of Ultimate Safety" means a street or any open area having unobstructed access, not less in width than the total required width of exit routes discharging into such an area, to a street. Where private service lanes and private streets form a place of ultimate safety or a part thereof, these will not be accepted unless it can be shown that they are not built upon or otherwise obstructed and their integrity will at all times be maintained to the satisfaction of the Building Authority.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

6. **Compatibility of Occupancy**

Compatibility of Occupancy Chart	
Occupancy	Non-Permitted
Industrial (As defined in Sect. 2 Factories and Industrial Undertakings Ordinance, Cap. 59)_	All other occupancies with the exception of:- i. offices which do not attract unreasonably large number of persons who could be exposed to risks which they would neither be aware of nor prepared to face. These persons include the old, infirm, children and those whose nature of work is unrelated to the activities in the buildings but exclude regular office workers; ii. car parking facilities for benefit of employees or on commercial basis; iii. bank use on ground/first floor of an industrial building (See note (v)); iv. workers/staff canteens; v. fast food counters (See note (vi)); vi. Electrical Shop (See note (vii)); vii. Local Provisions Store (See note (viii)); viii. Manufacturing/building materials; auto parts supplies; ix. Showroom in connection with the main industrial use.
Composite Industrial-Office Building	Same as those specified for an industrial building described above. However, more extensive commercial developments can be allowed in the low zone if such developments are completely separated from the I-O portion by a buffer of non-hazardous occupancy, such as a carparking floor. There shall be no restriction as to the type and extent of the commercial portion/activities.
Domestic Building (As defined in Section 2 of Buildings Ordinance, Cap.123)	Industrial (Building Services Excepted):- Occupancies as covered by Regulation 49 of the Building (Planning) Regulations, Cap. 123. Buildings with single staircases to be treated as covered by para. 6(2)(b) of the Code of Practice on Provision of Means of Escape in Case of Fire and Allied Requirements.

Signed

(LAM Chun-man)

for Director of Fire Services

Date : 22 October, 1996

Occupancy	Non-Permitted
Composite Building (As defined in Section 2 of Buildings Ordinance, Cap.123)	Industrial (Building Services Excepted):- Occupancies as covered by Regulation 49 of the Building (Planning) Regulations, Cap. 123. Buildings with single staircases to be treated as covered by para. 6(2)(b) of the Code of Practice on Provision of Means of Escape in Case of Fire and Allied Requirements.
Domestic and Composite Buildings Containing a Cinema or Theatre (PPE Regulations will apply)	Industrial (Building Services Excepted):- Occupancies as covered by Regulation 49 of the Building (Planning) Regulations, Cap. 123. Schools. Child Care Centres.
Purpose-built Institutional Building (e.g. School, Hospital, Church, etc.)	All other occupancies with the exception of those ancillary to the particular Institution.

Notes (i) FRP requirements to comply with Part XV of the Building (Construction) Regulations, Cap. 123.

(ii) Dangerous Goods Legislation and FPB Policies adequately cater for all possible permutations of occupancies involving licensed D.G. Storage and Manufacture.

(iii) To be read in conjunction with current Government policies on factories in domestic, schools, restaurants, etc.

(iv) Petrol Filling Stations on G/F of an Industrial /Carpark Buildings (Paragraph 4 refers).

(v) Bank and industrial occupancies to be completely separated from each other by suitable FRP and design.

(vi) Sited at street level only and licensed as food factories.

(vii) Electrical Shop - Any premises used for the selling of electrical accessories. In most cases repairing services are also provided.

(viii) Local Provisions Store (previously termed as Food Store) - Any premises used for the selling of cigarettes, drinks, canned food, and other local convenience goods.

Date : 22 October, 1996

7. Fire Protection in Construction Sites

7.1 For the protection of life and property, and to assist the Fire Services to deal with fires occurring in high-rise buildings under construction, water relaying facilities should be provided in construction sites for this purpose and to supply all floors above 30m with a minimum flow of 900 litres/minute. These facilities can either be :-

(a) temporary commissioning of the fire hydrant system required under Section 16(1)(b)(ii) of the Buildings Ordinance, and extended as the construction of the building progresses, or

(b) installation of electrical pump(s) on floor(s) to be determined by practical tests conducted jointly by the building contractors and Fire Services Officers. The number and capacity of pump(s) will be at the discretion of the former provided the pumps are fitted with standard 65mm instantaneous coupling inlets/outlets and capable of delivering 900 litres of water per minute, or

(c) placing of portable pump(s) on floors to be determined by practical tests conducted jointly by the building contractors and FSD Officers. The number and capacity of the pumps will be at the discretion of the former provided the pumps are fitted with standard 65mm instantaneous coupling inlets/outlets and capable of delivering 900 litres of water per minute. These portable pumps shall have a fuel tank of adequate capacity for the continuous running of the pump for not less than one hour.

7.2 If provision of facilities described in paragraph 7.1(b) above is to be employed, the following guidelines should be observed :-

(a) Fixed fire pump(s) shall be provided to relay water for all floors above 30m.

(b) The pump set shall be located close to staircase but not cause any obstruction to means of escape.

(c) Each pump shall be fitted with inlet/outlet of standard 65mm instantaneous coupling conforming to BS 336. The inlet/outlet shall be individually controlled by 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.

Date : 22 October, 1996

(d) The pump shall be provided with an air-relief valve.

(e) The pump set shall be able to produce a flow of not less than 900 l/min at a running pressure of not less than 350 kPa but not more than 850 kPa at the fire hydrant outlet.

(f) A plan showing the location(s) of the fixed fire pump(s) shall be provided at a prominent position at the entrance of the construction site.

(g) Directional signs indicating the access to the fixed fire pump(s) shall be displayed at a prominent position immediate outside the ground level entrance of the staircase(s) and at suitable intervals.

(h) Each fixed fire pump shall be connected to the main electricity supply of the construction site.

(i) The electricity supply shall have enough capacity to cater for the simultaneous operation of all fixed fire pump(s) installed in each building under construction.

(j) The power cables shall be properly fixed on wall. Each pump shall be provided with duplicated power cables separately routed to avoid complete power failure resulted from mechanical damage. Preferably, metal conduit or trunking is provided to protect the cables and in such case separate routing will not be required.

k) The duplicated power cables shall comprise a cable connected from electricity mains and the other teed off before the main switch. They shall be terminated at an automatic changeover switch installed next to each fixed fire pump. The pump power supply shall be automatically switched to the secondary power if the normal power fails for whatever reason.

(l) Schematic diagrams showing the typical arrangements of electricity supply are shown in Appendices F & G.

7.3 To ensure building contractors are aware of the above requirements FSD Officers will visit construction sites to give advice under Section 7(c) of the Fire Services Ordinance, and to confirm this in writing.

Date : 22 October, 1996

7.4 After a reasonable period of time, FSD Officers will make further visits to conduct practical tests and to ensure these facilities are provided, failing which Fire Hazard Abatement Notices may be served to the building contractors concerned.

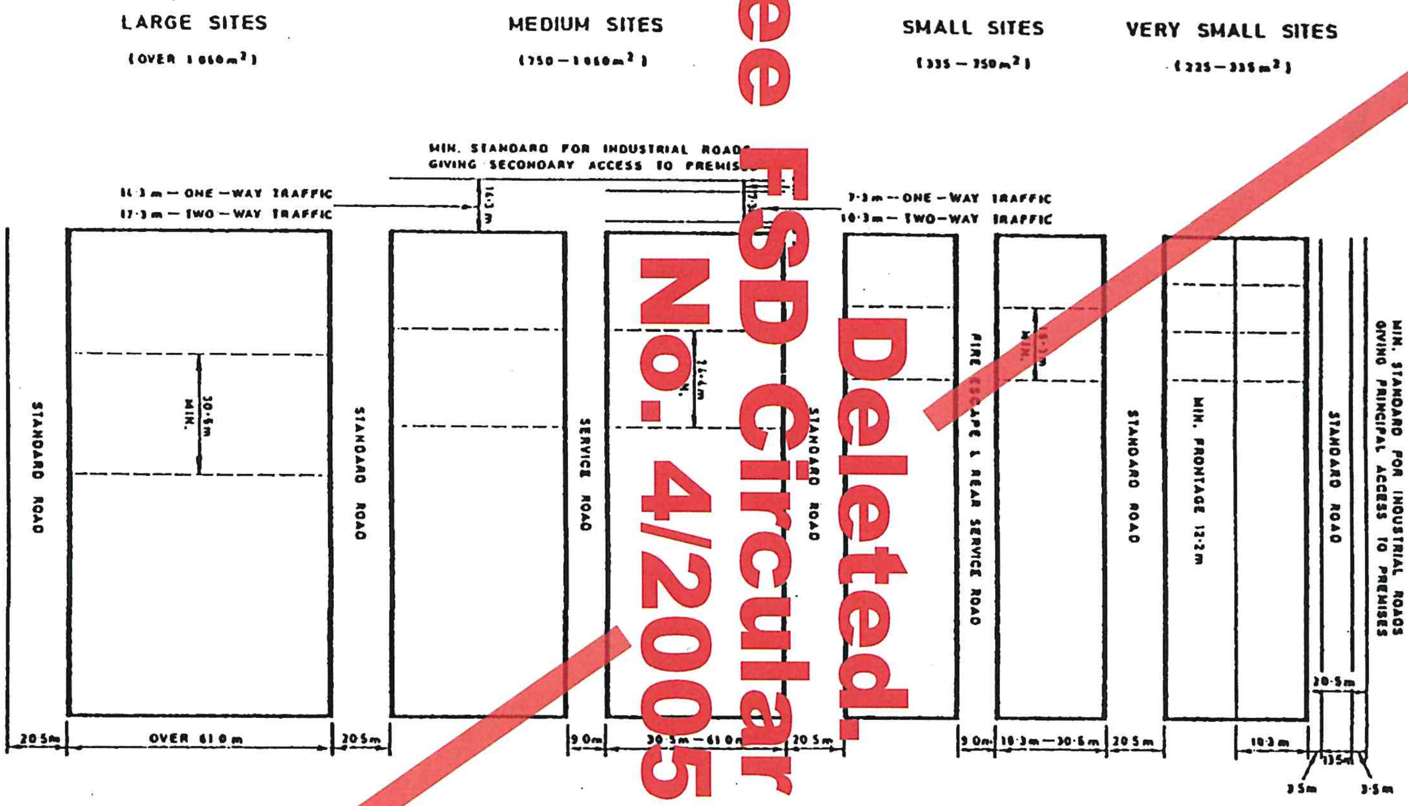
7.5 The significance of these new procedures is that instead of refusing to issue the certificate under Section 16(1)(b)(ii) of the Buildings Ordinance as in the case of processing building plans, the Fire Hazard Abatement Notices served under Section 9 of the Fire Services Ordinance are enforceable by law and offenders are liable to be prosecuted.

Signed
(LAM Chun-man)
for Director of Fire Services

Date : 22 October, 1996

See FSD Circular Letter No. 4/2005

Deleted.



NOTE : LOT DEPTHS IN RELATION TO ROAD STANDARDS SHOULD TAKE INTO ACCOUNT FIRE SAFETY REQUIREMENTS AND SHOULD NOT BE EXCEEDED EXCEPT IN CONSULTATION WITH THE FIRE SERVICES DEPARTMENT.

NOT TO SCALE

SOURCE		
PLANNING DEPARTMENT	MINIMUM STANDARD INDUSTRIAL ACCESS ROADS	PLANNING DEPARTMENT; DATE APR 90; FIG. No. 1

EMERGENCY VEHICULAR ACCESS

◆ LAYOUT SIGN AT ENTRANCE OF EVA ◆

0 50 100 150mm

Note:
The precise colours are defined in British Standards BS873 Part 6 Table 4

EMERGENCY VEHICULAR ACCESS

♦ INDICATION SIGN ALONG EVA OF DRIVEWAY DESIGN ♦

0 50 100 150mm

Note:
The precise colours are defined in British Standards BS873 Part 6 Table 4

EMERGENCY VEHICULAR ACCESS

♦ NO PARKING SIGN ♦

0 50 100 150mm

Notes :

1) The specifications of "No Parking" signs shall follow the provisions in Road Traffic (Parking on Private Roads) Regulations, Cap. 374, Laws of Hong Kong and the Code of Practice for Private Roads.

2) The diameter of the "No Parking" sign to be erected at both ends of the EVA shall be 450mm whereas for those in between signs of 200mm or 300mm diameter may be employed.

3) The precise colours are defined in British Standards BS873 Part 6 Table 4.

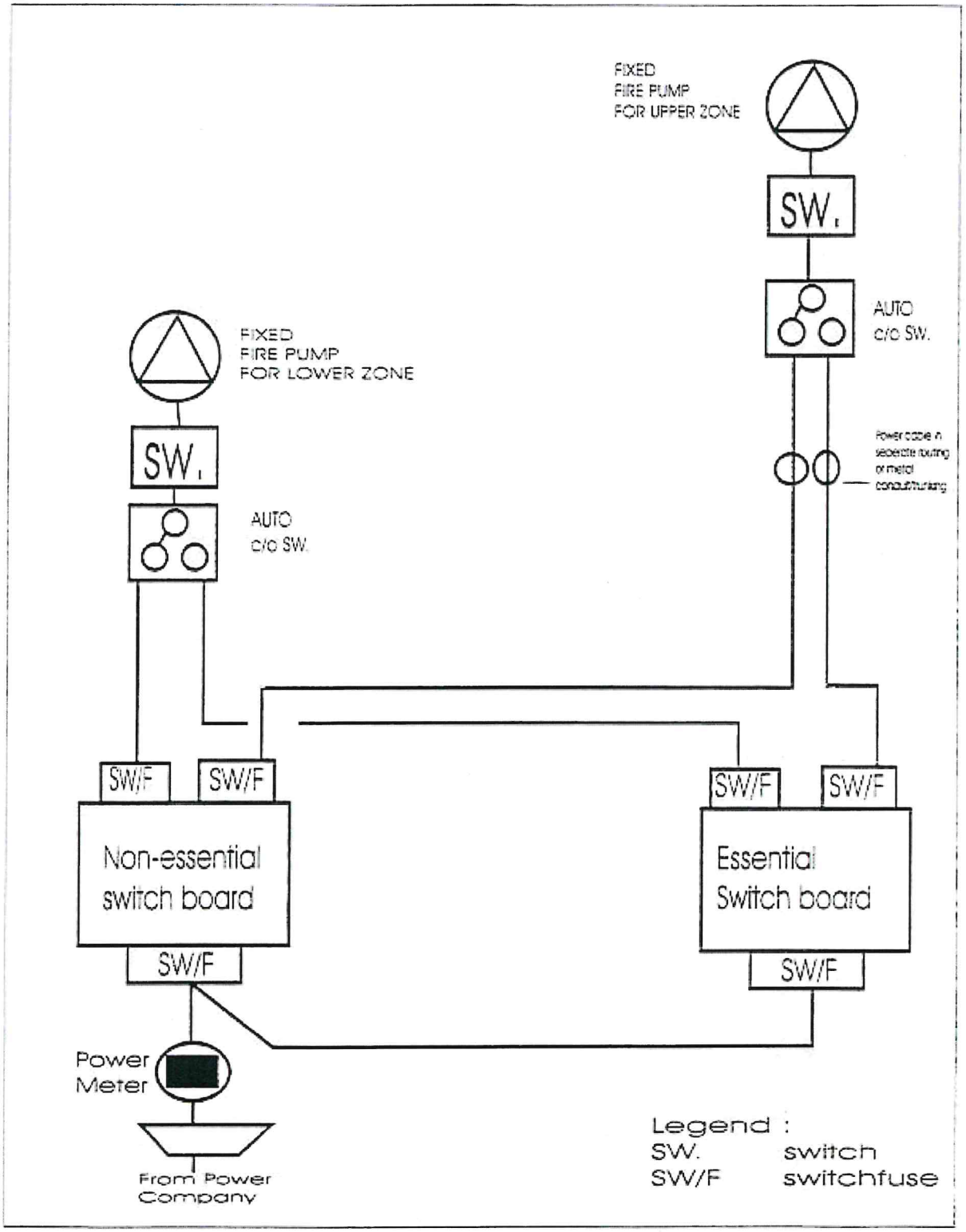
Deleted. See FSD Circular Letter No. 4/2005

EMERGENCY VEHICULAR ACCESS

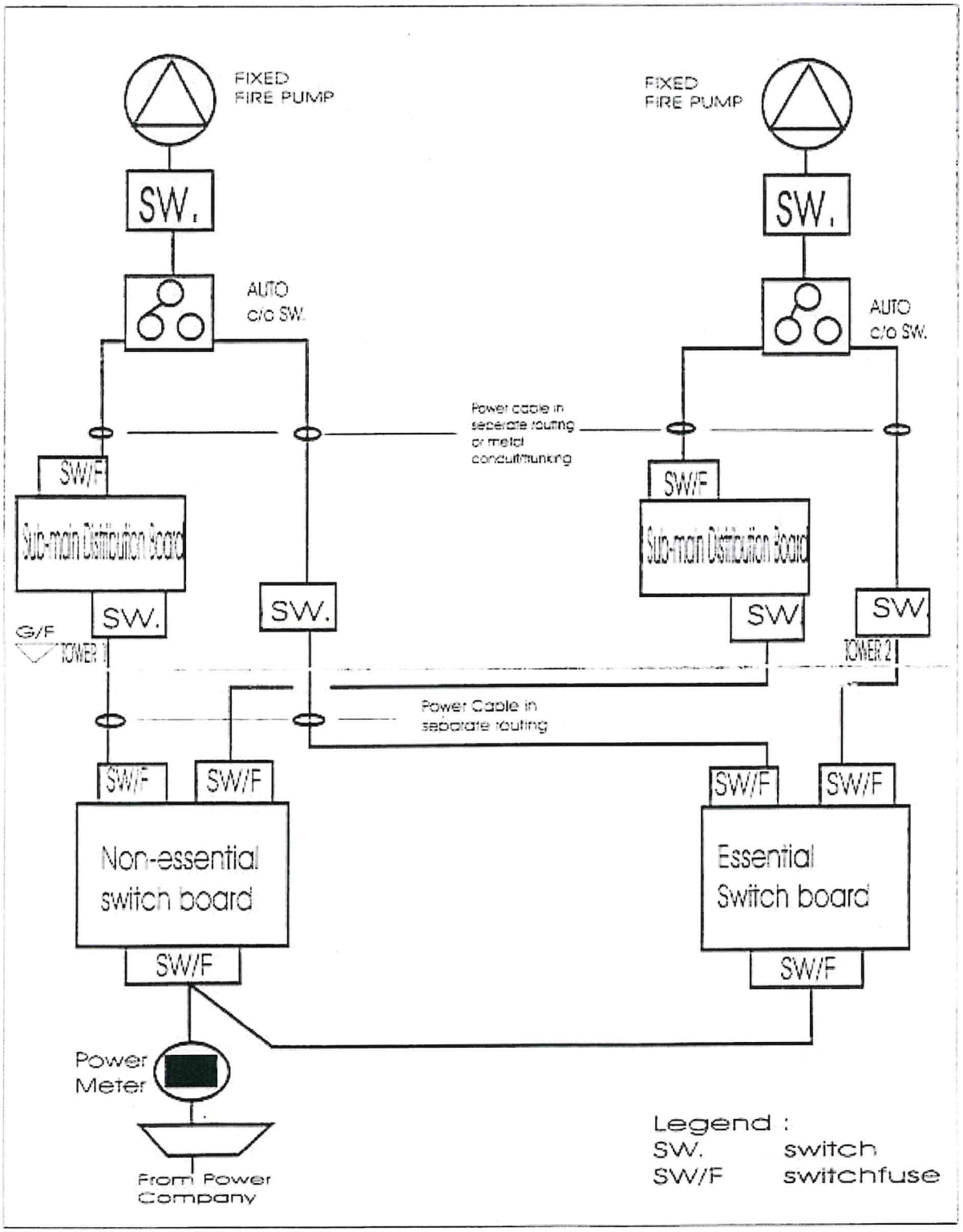
◆ ROUTE SIGN ALONG EVACUATION OF DRIVEWAY DESIGN ◆

0 50 100 150mm

Note:
The precise colours are defined in British Standards BS873 Part 6 Table 4



Schematic Diagram of the Electricity Supply
for Fixed Fire Pumps (Single Tower)



Schematic Diagram of the Electricity Supply
for Fixed Fire Pumps (Multiple Towers)

PART XI

1. Electric Heating Elements Used in Mechanical Ventilating Systems
2. Fire Dampers Used in Mechanical Ventilating Systems
3. Use of Ceiling Void or Elevated Floor as air Plenum
4. Insulation for use with Ductwork or Pipework
5. Protection Requirements against Fire and Smoke in Protected Areas
6. Filters Used in Mechanical Ventilating Systems
7. Flexible Ducts Used in Mechanical Ventilating Systems
8. Battery Rooms Mechanical Ventilating Systems
9. Ventilation of Cat. 5 Dangerous Goods Areas
8. Checklist for Mechanical Ventilating Systems

PART XI

MECHANICAL VENTILATING SYSTEMS

1. Electric Heating Elements Used in Mechanical Ventilation Systems

1.1 Electric Heating Elementxs Assemblies

1.1.1 Electric heating elements shall be evenly spaced across the sectional area of the duct at the plane where the heating elements are installed.

1.2.1 Heating elements shall be sheathed and of 'black' heat type with 'cold' extensions for cable connections. Heating elements shall be secured to fixtures construCt6d of fire resistant materials. End supports shall be provided for heating elements exceeding 800 mm in length.

1.3.1 An external terminal box made of fire resistant material shall be provided for all connections. Warning notice in both English and Chinese '**DANGER - LIVE Terminals**' shall be marked on the front cover of the external terminal box.

1.4.1 Internal Wiring shall be of heat resistant take and of rating compatible to the normal working temperature of the heating elements.

1.5.1 Duct internal insulation for either acoustic or thermal purposes shall not be installed within I metre of the heating element assembly.

1.6.1 Access door(s) shall be provided for the heating element assembly for maintenance and cleaning purposes. A small hole for inserting a testing thermometer shall be provided for the air duct and approximately at 150 nun on top of the elements.

Signed
(LAM Chun-man)
for Director of Fire Services

Date: 22 October, 1996

1.2 Control and Sequence Interlocking

1.2.1 The fan motor shall be controlled by an electromagnetic tape contactor complete With suitable thermal overload protection device, manual reset on/off push buttons, main and auxiliary contacts for sequence interlockng control with the electric heating elements and a time delay device of heavy duty type having an operational time setting of three minutes minimum for the fan motors stop control.

1.2.2 The heating element electricity supply assembly shall be controlled by contactor(s) and if required, step controller and interlocked with the fan motor in the manner as described in 1.2.3 to 1.2. 10 below.

1.2.3 A sequence interlocking control shall be provided so that the heating elements shall not be energized before the fan motor.

1.2.4 A sail switch/differential pressure switch with fail-safe feature shall be provided to de-energize the heating elements in case of air flow failure inside the duct.

1.2.5 A duct type overheat thermostat, with fail-safe feature and manual reset, shall be provided at a distance of 600 nun maximum from the heating element to switch off the elements. When the mean temperature inside the air duct exceeds 50℃ +/- 10% and within 90 seconds of reaching this temperature.

1.2.6 For the purpose of l.2.4 and l.2.5, 'fail-safe' refers to the J' ability of the sail switch/differential pressure switch/overheat thermostat to switch off the heating elements at 'no power' State, i,e. when the power supply to the sail switch/ differential pressure switch/ overheat thermostat is 'OFF'.

1.2.7 The time delay device shall be so arranged that on switching off the fan motor, the power supply to the heating elements shall be cut off instantly but the fan shall be allowed to run continuously for a minimum of three minutes to dissipate the residual heat inside the duct system.

1.2.8 An emergency stop push button for the fan motor shall be provided and located adjacent to the fan motor and the circuit shall be designed to override the time delay device to enable the fan motor to be switched off instantly once this button is pressed. This emergency stop push button shall be of mushroom head with manual reset type.

Signed
(LAM Chun-man)
for Director of Fire Services

Date: 22 October, 1996

1.2.9 If a summer/Winter switching arrangemellt is provided, the timer delay control for fan motor shall remain functional When heating or reheating facilities are provided in the summer mode.

1.2.10 Control circuit voltages shall not exceed 220 volts.

1.3 Fan Coil Unit Installations

1.3.1 Fan coil units with electric heating elements at a total rating not exceeding 2 kW may be exempted from the requirements of paragraphs 1.2.4, 1.2.7, 1.2.8, and 1.2.9. Sequence interlocking and overheat thermostat control shall be provided in accordance with paragraphs 1.2.3 and 1.2.5.

1.4 Proprietary Made Electric Duct Heaters

1.4.1 The use of proprietary made factory-assembled electric duct heaters shall be petitted but only if this has been submitted and included in F. S.D. 's list of acceptable items prior to installation.

2. Fire Dampers Used in Mechanical Ventilating Systems

This paragraph details the manufacturing standards and installation requirements of fire dampers for mechanical ventilating/air conditioning systems which are subject to the provisions of either the Building (Ventilating Systems) Regulations or the Ventilation of Scheduled Premises (Urban Council/Regional Council) By-laws. Paragraph 2.1 covers locally made blade type fire dampers, paragraph 2.2 covers proprietary made fire dampers, paragraph 2.3 covers the general requirements, and paragraph 2.4 covers air transfer openings which breach F.R.P. enclosures.

2.1 Locally Made, Blade type Fire Dampers

2.1.1 For any air duct passing through any floor or ceiling requiring the provision of a fire damper, the fire damper blades shall be constructed from bald steel plate of 6nun thickness. The associated casing shall also be constructed to this standard.

Signed
(LAM Chun-man)
for Director of Fire Services

Date: 22 October, 1996

2.1.2 For any air duct passing through any ed requiring the provision of a fire damper, the fire damper shall be constructed ' from :-

(a) mild steel plate of 3mm thickness When the wall in which the fire damper is mounted has a F.R.P. value of less than two hours,

(b) mild steel plate of 6mm thickness when the wall in which the fire damper is mounted has a F.R.P. value of two hours or more,

The associated casing shall also be constructed to this standard.

2.1.3 Angle section steel or similar structural members shall be employed in the construction of the fire dampers casing framework to provide structural rigidity, i.e. to prevent deforming of the damper casing and to maintain clearance in all operating conditions between fixed and moving parts.

2.1.4 The lateral clearance between the moving blades and the damper. casing shall not exceed I .smm. For multiple-blade fire dampers each blade shall be arranged to come into contact and overlap the adjacent ones by a minimum of smm when the damper is in the closed position. Suitable Stops shall be proVided at the casing to maintain the damper blades in a stable position when the damper is closed.

2.1.5 Bushes made from brass or similar bearing materials shall be provided for all the blade spindles of the fire damper.

2.1.6 The closing action of the fire damper shall be achieved solely by the weight of the damper blade(s). Closing action powered by springs or other dead weight shall not be allowed.

2.1.7 To avoid sagging of the damper under its own weight, the length of each damper blade shall not exceed 600 mm. Structural opening with width exceeding this dimension shall be protected by multiple fire damper units. In special cases where it is not possible to keep Within this licit of 600mm, a slight extension beyond this shall be allowed but it must be demonstrated to the Director of Fire Services that the smooth operation and the function of the fire damper will not be impaired.

Signed
(LAM Chun-man)
for Director of Fire Services

Date: 22 October, 1996

2.2 Proprietary Made Fire Dampers

2.2.1 As an alternative to the locally-made fire damper as specified in paragraph 2.1, proprietary made fire dampers, with construction and mounting method approved by a recognised testing authority, may be used, provided the fire damper possesses a rating equivalent to the fire resistance of the structure it protects. Acceptable national or international standards include:-

(a) BS 476 Part 20 for Integrity only (i.e. Excluding Insulation and Loadbearing Performance Criteria).

(b) Underwriters Laboratories Inc. (UL) 555.

2.3 General Requirements

The location of the fusible link shall be so arranged that it will not impede the closing action of the fire damper;

2.3.1 Fire dampers shall be installed in such a manner that the air flow will not impede the closure of the fire damper;

2.3.2 Fire dampers shall be securely installed in the plane of the fire separation so as to stay in place should the duct be dislodged during a fire;

2.3.3 An adequately sized and properly located inspection door or panel shall be provided to facilitate maintenance of each fire damper;

2.3.4 Air duct internal lining shall not be installed within 1000mm of the fire damper. (The reason for this requirement is that in a fire situation the damper, although closed, will be at an elevated temperature and may cause flame spread along the internal lining inside the duct in the adjoining compartments);

2.3.5 The length of fire damper casing shall exceed that of the fire damper assembly by not less than 30mm when the fire damper is in the open position, i.e. not less than 15mm at either end;

2.3.7 In no case shall the temperature rating of the fusible link exceed 69° C.

Signed
(LAM Chun-man)
for Director of Fire Services

Date: 22 October, 1996

2.4 Air Transfer Opening Breaching F.R.P. Enclosures

2.4.1 All air transfer openings breaching the walls, floor or ceiling of a F.R.P. enclosure, shall be protected by fire dampers to the same construction standard.

3. The Use of False Ceilings and Elevated Floors as Air Ducts (Excluding Computer Room Installations)

3.1 The voids created between a false ceiling and the building structure, or between the building structure and an elevated floor, shall only be used as an air duct associated with a mechanical ventilating system if the conditions as laid down in paragraph 3.2 below are satisfied. Note: Naturally ventilated spaces are exempted so long as fire separation between compartments is maintained.

3.2 Specially and purposely designed non-combustible false ceilings or ventilated ceilings or elevated floors can be used as a means for conveying air subject to the following conditions :-

3.2.1 The materials used in the construction of the false ceiling or ventilated ceiling or elevated floor shall be in compliance with BS 476: Part 4 or equivalent national or international standards, and approved by recognised testing authorities.

3.2.2 Compartmentation shall be maintained by provision of fire and smoke dampers which should be operated by a smoke detector system (Probe type).

3.2.3 All electrical mains distribution and control wiring in the voids must be contained in heavy gauge metal cable ducts and/or screwed metal conduits terminated in accordance with the relevant British Standard Specifications and are to comply with I.E.E. Regulations (current edition).

3.2.4 All pipes within the void shall be metallic. All insulation within the void shall comply with the requirements as stipulated in paragraph 4.

Signed
(LAM Chun-man)
for Director of Fire Services

Date: 22 October, 1996

3.2.5 Pneumatic control lines for air conditioning systems within the void shall be of copper. Flexible tubes will be allowed only at the final connections from the copper pneumatic lines to the air conditioning terminals. The flexible tubes shall not exceed 300mm in length and each shall be of an approved flame retardant type.

3.2.6 The false ceiling, ventilated ceiling or elevated floor shall not be used to contain any services other than essential services and services exclusively for the area.

3.2.7 Access to the void shall be provided for cleaning and inspection.

4. Insulation for use with Ductwork or Pinework

4.1 Definitions

The following terms are defined :-

4.1.1 "Ductwork" means all types of ductwork for conveying air;

4.1.2 "Pipework" means all types of pipework.

4.2 Application

4.2.1 This Section is on the requirements for acoustic and thermal insulation for ductwork and pipework.

4.3 Internal Insulation for Ductwork

4.3.1 The fire property requirement for internal insulation for ductwork is that the insulation material, including the associated fasteners, adhesives, tapes etc. shall comply with BS 476: Part 6 with the index of overall performance ("I") not exceeding 12, of which not more than 6, index ("i_1") shall derive from the initial period of the test. Equivalent national or international standards shall also be accepted.

4.4 External Insulation for Ductwork and Pipework

4.4.1 The fire property requirement for internal insulation for ductwork is that the insulation material, including the associated fasteners, adhesives, tapes etc. shall comply with BS 476: Part 7 or equivalent national or international standard, or be brought up to that standard by use of an approved fire retardant product.

Signed
(LAM Chun-man)
for Director of Fire Services

Date: 22 October, 1996

4.4.2 For the purpose of paragraph 4.4.1, "approved fire retardant product" refers to any one of the following :-

(a) Aluminium foil vapour barrier (for mineral wool and fibre glass insulating materials only);

(b) Plastering of minimum thickness 12mm;

(c) Metal (aluminum, galvanized steel, etc.,) cladding.

4.5 External Insulation for Ductwork and Pipework at Points of Penetration through Compartment Walls, Floors or Ceilings

4.5.1 Where ductwork passes through a structure and is provided with a fire damper' the external insulation shall not be allowed to pass through the structure and is required to stop at a suitable fire barrier securely fixed to the external casing of the fire damper and the structure.

4.5.2 Insulation for pipework passing through a structure shall also be required to stop at a suitable fire barrier securely fixed to the pipe external surface and the structure.

4.5.3 For the purpose of paragraphs 4.5.1 and 4.5.2, the fire barrier shall have the same fire resisting period as the structure through which the ductwork or pipework passes. It should be noted that the authority in respect of fire resistance is the Building Department.

5. Protection Reauirements aeainst Fire and Smoke in Protected Areas

5.1 Services such as air ducts, drain pipes, chilled water pipes and electrical cables/switchgears etc. are not allowed to be installed in the protected areas. Any of these services found installed inside the protected areas shall be removed either by physical removal, or be encased in an F.R.P. enclosure having an F.R.P. value equivalent to the structural F.R.P. of the protected area inside which the services are installed. It should be noted that the F.R.P. enclosure for this purpose shall not reduce the effective dimensions of the protected area and consequently cause obstruction to safe egress. The arrangement shall be acceptable to the Buildings Department.

5.2 Ventilation/air conditioning (excluding staircase pressurization) to the protected area can be provided subject to the following conditions :-

Signed
(LAM Chun-man)
for Director of Fire Services

Date: 22 October, 1996

5.2.1 All ventilation openings, either supply or exhaust (exclude direct to open air) shall be protected by **fire and smoke** dampers actuated by smoke detectors located at the protected area and adjoining compartments which communicate on the air-side with the protected area;

5.2.2 Fire and Smoke dampers installed for the purpose of paragraph 5.5.1 shall comply with UL 555S and UL 555 or other equivalent national or international standards.

5.2.3 Self-contained fan coil units serving only the protected area and are wholly situated within the structural F.R.P. can be installed provided that :-

(a) The fan coil volute casing, fan blades, fan coil enclosure, etc., shall be all constructed from non-combustible materials (i.e. in compliance with BS 476: Part 4).

(b) All electrical wirings shall be run inside metal conduits and/or enclosures.

(c) Insulating materials for the fan coil and the associated pipework shall meet the requirements as stipulated in paragraph 4.

5.3 All ventilation/air-conditioning systems in rooms with direct access from a staircase, staircase approach lobby or Fireman's Lift lobby shall comply with requirements of paragraph 5.2 as long as fire doors of appropriate F.R.P. are installed, or requirements of paragraph 5.1 if no fire doors of appropriate F.R.P. are provided.

6. Filters Used in Mechanical Ventilating Systems

6.1 Air Filter Cells

6.1.1 Air filters cells (i.e. media plus media enclosure) shall be constructed from materials which conform to the fire property requirements of one of the following standards :-

BS 476: Part 4	Non-combustibility Test for Materials;
BS 476: Part 6	Method of Test for Fire Propagation for products with indices "I"$\leq$ 12 and "i_1"$\leq$6;
UL 900	Test Performance of Filter Units, Class 1 or Class 2,
DIN 53438 Pt. 3	Response to Ignition by a Small Flame, Surface Ignition, Class F1.

Signed
(LAM Chun-man)
for Director of Fire Services

Date: 22 October, 1996

6.2 Filter Cell Support Framework

6.2.1 Filter cell support framework for individual and multiple cell installations shall be constructed from non-combustible materials conforming to BS 476 Part 4 and have a mechanical strength equivalent to 1 mm thick galvanised sheet steel.

6.2.2 All gaskets, seals, etc., between the air filter cells and the filter cell(s) support framework shall have the same fire property requirements as the air filter cells, as detailed in paragraph 6.1 above.

6.3 Metallic Filter Cells

6.3.1 Filter cells fully constructed in metal shall not be subject to the requirements of this Circular Letter i.e. where the filter media is formed from a grid or mesh of metal such as stainless steel, aluminium, etc..

Note: Steel wool is not permitted (see 4(1)(g) of Building (Ventilating Systems) Regulations)

6.3.2 If however the metallic media is coated with combustible substance, it shall be regarded as a special filter and be subject to conditions in paragraph 6.4.

6.4 Special Filter Installations

6.4.1 For special filter applications such as the removal of smell by activated carbon filters, submissions should be made to the Director of Fire Services for relaxation of the requirements of this paragraph and for clarification on any specific additional fire safety precautions that may be necessary.

6.5 Filter Identification

6.5.1 All filter cells except those listed in paragraph 6.3 shall, at the place of manufacture, have the following information clearly marked or stamped in a readily accessible location :-

(a) Manufacturer's Name;
(b) Place of Manufacture;
(c) Filter type and model number; and
(d) The standard to which the filter has been type-tested.

Signed
(LAM Chun-man)
for Director of Fire Services

Date: 22 October, 1996

6.5.2 The Director of Fire Services may require a copy of the "Certificate of Type Test" for the filter cell, issued by a recognised independent testing authority, to be submitted. Failure to produce the certificate will result in rejection of the filter installation.

7. Flexible Ducts Used in Mechanical Ventilating Systems

7.1 General

7.1.1 The flexible duct used in mechanical ventilating systems shall comply fully with one of the following standards :-

(a) UL 181, Class 1
Note: Where ducts tested to UL 1 8 1 Class 1, are constructed of composite layers of materials, these materials shall be permanently bonded, one to the other. Where these materials are not bonded each material shall be separately tested for flame spread and smoke developed, and each shall comply to UL 181 Class 1. Also the internal lining must pass the puncture test as described in paragraph 7.1.2 below.

or

(b) BS 476: Part 6 with indices of performance "I"$\leq$ 12 **and** "I"$\leq$6 and pass the following puncture test as described in paragraph 7.12 below.

7.1.2 Puncture Test

(a) Principles of the Puncture Test

This puncture test shall be carried out using testing equipment employing the principle of the free fall of a plunger on to the surface of the sample flexible duct. If the flexible duct is provided with an external removable insulation layer, the test shall be carried out on the duct surface with this insulation layer removed. If the flexible duct comes with a spiral wire the impact position of the plunger shall be on the duct pitch surface between 2 consecutive wires.

Signed
(LAM Chun-man)
for Director of Fire Services

Date: 22 October, 1996

(b) Details of the Puncture Test

The plunger shall consist of a 10mm diameter steel rod having a steel head of 15mm diameter with a flat impact end with rounded edges. The length of the plunger assembly shall be sufficient to provide a 1 kg. weight. The surface of the rod and head shall be smooth.

Guides shall be provided and arranged to allow for an essentially frictionless fall of the plunger. A means for measuring the height of fall shall also be provided.

Two samples of duct of 600mm in length when fully stretched shall be subjected to this test. The sample shall be provided with a firm support below and throughout its complete length. This sample shall also be secured at both ends to maintain the duct in a fully stretched position throughout the test. Each sample shall be puncture tested at three equally spaced points on the duct periphery by rotation through 120° after each test.

(c) Acceptance/Failure Criterion for the Puncture Test

The flexible duct sample shall prevent the complete penetration through the surface of the duct by the plunger head when the plunger head has fallen through a distance of not less than 500mm as measured to the top surface of the sample. Complete penetration of the plunger at any one of the six test points shall indicate failure of the duct samples.

7.2 In addition to paragraph 7.1 above, all flexible ducts used in mechanical ventilating systems shall not exceed 4 metres in length for each connection or final connection from the rigid duct to the outlet grilles, VAV boxes, etc.. In special cases where it is impossible to keep within this 4-metre limit due to engineering or building constraints, a slight extension beyond this shall be allowed but only with the agreement of the Director of Fire Services and this shall be obtained before installation.

7.3 Flexible ducts shall not be permitted for use as main air distribution ducts.

7.4 Flexible ducts shall not be allowed to penetrate through fire resisting walls, fire resisting floors, fire resisting ceilings and fire resisting partitions.

Signed
(LAM Chun-man)
for Director of Fire Services

Date: 22 October, 1996

8. Battery Rooms Mechanical Ventilating Systems

8.1 Purpose

8.1.1 The purpose of providing mechanical ventilation to battery rooms is to maintain the average concentration of hydrogen gas, which may evolve during a recharge of the battery, within safe limits in the battery rooms.

8.1.2 The safety limit of hydrogen gas concentration inside the battery room is 1% by volume maximum.

8.2 Design Calculation

8.2.1 Designers shall ensure that adequate mechanical ventilation shall be provided to battery rooms to keep the hydrogen concentration below the safety limit. The design of the mechanical ventilating system for this purpose shall follow the guidelines in BS 6133. In accepting battery room mechanical ventilating systems the Director of Fire Services may require a set of design calculations to be submitted to substantiate that the mechanical ventilating system has been properly designed to meet the above requirement.

8.3 Mechanical Ventilating System Technical Requirements

8.3.1 The ventilating fan shall be in the extraction mode and the fan motor shall be of totally enclosed fan cooled (TEFC) type.

8.3.2 The mechanical ventilating system for the battery room shall be independent to all other systems in the building.

8.3.3 Extraction points shall be located at the highest level of the room while air inlets shall be at low level. Extraction points and air inlets shall be so arranged that a "cross-flow" effect shall occur in all areas within the room.

8.3.4 The ventilating fan motor shall be electrically interlocked with the battery charger so that the charger cannot be in operation when the ventilating fan is not running. Electricity supply for the ventilating fan(s) shall be from an independent circuit other than that of the battery charger, and the interlock control relay shall be protected by an independent fuse.

Signed
(LAM Chun-man)
for Director of Fire Services

Date: 22 October, 1996

8.3.5 If due to the functional requirement of the batteries, the condition in paragraph 8.3.4 cannot be met, alternative safety measures may be accepted but these must be agreed by the Director of Fire Services before installation.

8.3.6 All components of the mechanical ventilating systems shall be made of corrosion resistant materials.

8.4 Requirements for Separate Battery Room

8.4.1 All open type batteries regardless of size shall be accommodated in separate battery rooms meeting the conditions in paragraphs 8.1, 8.2 and 8.3 above.

8.4.2 For enclosed type batteries constructed to BS 6133 with capacity above 400 ampere-hours, separate battery rooms meeting the condition in paragraph 8.1, 8.2 and 8.3 above, are required.

8.4.3 For enclosed type batteries constructed to BS 6133 with capacity not exceeding 400 ampere-hours, separate battery rooms are not required provided the safety requirements of BS 6133 are followed.

8.4.4 For valve regulated sealed type cells and batteries to BS 6290: Part 4, separate battery rooms are not required for all battery sizes.

9. Ventilation of Cat. 5 Dangerous Goods Areas

9.1 Cat. 5 Dangerous Goods (D.G.) areas are those areas where flammable liquids or gases are manufactured, stored and/or conveyed.

9.2 All enclosed Cat. 5 D.G. areas shall be provided with a mechanical ventilating system capable of providing a minimum ventilation rate of 5 litres per second per square metre of D.G, floor area.

9.3 The arrangement of the mechanical ventilating system ductwork shall provide a "cross-flow" effect to eliminate stagnant points within the area.

9.4 The points of extraction/supply shall be arranged such that the flammable vapours are extracted at locations where they usually accumulate, e.g. for flammable vapours heavier than air the extraction points shall be at low level.

9.5 The electrical installations for the mechanical ventilating system shall be of explosive proof type conforming to the requirements of BS 5345.

Signed
(LAM Chun-man)
for Director of Fire Services

Date: 22 October, 1996

10. Checklist for Mechanical Ventilating Systems

The Checklist in Appendix A is designed to provide guidelines for ventilation contractors when carrying out acceptance inspection and testing of mechanical ventilating systems. It will assist design engineers and contractors to verify that the equipment and systems are in conformity with the specified standards before requesting inspection from the Authority.

Signed
(LAM Chun-man)
for Director of Fire Services

Date: 22 October, 1996

VENTILATING SYSTEMS INSPECTION CHECKLIST

Address _____

_____

_____

_____

FSD Ref _____

Type of premises _____

DESCRIPTION

1 AIR INTAKE

a. Wire mesh constructed of corrosion resistant material having mesh opening not 12mm is provided. (Y/N/NA)
b. Away from areas with potential fire hazard. (Y/N/NA)

2 AIR FILTERS

a. Filters installed (Y/N/NA)
b. Comply with approved standard (documentary proof attached). (Y/N/NA)
c. Metal filters provided. (Y/N/NA)
d. Filter is clean. (Y/N/NA)
e. Filter frame constructed of non-combustible material (Y/N/NA)

3 AIR DUCTS

a. Constructed of non-combustible material having a strength and durability not less than that of galvanised sheet iron or steel (Y/N/NA)
b. Internal duct surfaces are clean. (Y/N/NA)
c. Flexible connector in compliance with BS 476 Part 6 with indices 'I' = 12, 'i_1' = 6 (Y/N/NA)

4 FIRE DAMPERS

A. General Requirements

a. Damper operation matches the air flow direction. (Y/N/NA)
b. Fusible link does not impede damper from closing. (Y/N/NA)
c. Damper properly secured to structure. (Y/N/NA)
d. Adequate access for maintenance purposes. (Y/N/NA)
e. No internal lining within 1 m of damper (Y/N/NA)
f. Approved fusible link installed (Y/N/NA)
g. Damper with correct fire resisting rating. (Y/N/NA)
h. Casing exceeds the blade width (in open position) by 15 mm at each end (Y/N/NA)
i. Damper closes properly when fusible link disconnected. (Y/N/NA)
j. Builder's work around fire damper casing properly made good. (Y/N/NA)

DESCRIPTION

B. Local Made Fire Damper

k. Bearing made of brass or equivalent. (Y/N/NA)
l. Blade overlap by 5 mm minimum. (Y/N/NA)
m. Blade and casing lateral clearance 1.5mm (Y/N/NA)
n. Sound structural rigidity of casing. (Y/N/NA)
p. Suitable stoppers provided. (Y/N/NA)
q. Closing action solely by the weight of blade(s) (Y/N/NA)
r. Length of blade not 600mm. (Y/N/NA)

C. Proprietary Made Fire Dampers

s. Approved by a FSD recognised testing authority to BS 476 Part 20 for integrity, or UL 555. (documentary proof attached) (Y/N/NA)
t. Installed according to manufacturer's recommendations (details attached). (Y/N/NA)

5. INSULATION

a. Internal insulation associated fixing assembly in compliance with BS 476 Pt 6 with indices 'I' = 12, 'i_1' = 6 (documentary proof attached). (Y/N/NA)
b. External insulation and associated fixing assembly in compliance with BS 476 Pt 7 (documentary proof attached). (Y/N/NA)
c. Mineral wool or fibre-glass insulating material used. (Y/N/NA)
d. Minimum 12 mm thick plastering. (Y/N/NA)
e. Metal cladding. (Y/N/NA)
f. No external insulation passing through a fire separation structure (Y/N/NA)

6. FLEXIBLE DUCTS

a. Fully comply with UL 181, Class 1 or BS 476 Pt. 6 with indices 'I' = 12, 'i_1' = 6 and the puncture test. (documentary proof attached). (Y/N/NA)
b. Not exceeding 4 m in length (Y/N/NA)
c. Not used as main air distribution duct. (Y/N/NA)
d. Not penetrating through fire compartment. (Y/N/NA)

DESCRIPTION

7. PROTECTED AREAS

a. Fire & smoke dampers actuated by approved smoke detectors are provided. (Y/N/NA)
b. Fire & smoke dampers approved by a FSD recognized testing authority to UL 555 and UL 555S (documentary proof attached). (Y/N/NA)
c. Fire & smoke dampers installed according to manufacturer's recommendations (details attached). (Y/N/NA)
d. Fan coil units serving the protected areas are in compliance with BS 476 Pt.4. (Y/N/NA)

8 DUCT HEATER

a. Black heat type with 'cold' extension. (Y/N/NA)
b. Heater element evenly spaced in duct and securely fixed to fire resisting fixtures. (Y/N/NA)
c. Support provided for heating elements > 800 mm in length. (Y/N/NA)
d. External terminal box provided for all connections with warning notice in both English and Chinese. (Y/N/NA)
e. A small hole provided for inserting a test thermometer. (Y/N/NA)
f. Heat resistant internal wiring. (Y/N/NA)
g. Heater and blower fan interlocked. (Y/N/NA)
h. Timer fitted for blower fan control. (Y/N/NA)
i. Timer setting at 3 minutes minimum. (Y/N/NA)
j. Fail-safe flow sensing device fitted. (Y/N/NA)
k. Fail-safe overheat thermostat fitted with manual reset. (Y/N/NA)
l. Overheat cut-out operates within 90 sec. at 50 °C +/- 10%. (Y/N/NA)
m. Manual reset on/off push buttons provided. (Y/N/NA)
n. No internal insulation within 1 m from heater. (Y/N/NA)
p. Control circuit of single phase. (Y/N/NA)
q. An emergency stop push button is provided. (Y/N/NA)
r. Access panel for maintenance purposes. (Y/N/NA)

DESCRIPTION

9 VENTILATED FALSE CEILING or ELEVATED FLOOR

a. False ceiling or elevated floor materials approved by a FSD recognized testing authority to BS 476 Pt.4 (documentary proof attached). (Y/N/NA)
b. Compartmentation maintained by fire & smoke damper operated by an approved smoke damper operated by an approved smoke detector system (probe type) (Y/N/NA)
c. Fire & smoke dampers approved by a FSD recognized testing authority to UL555 and UL 555S (documentary proof attached). (Y/N/NA)
d. All electrical mains/wiring in the void are contained in heavy metal cable ducts and/or screwed metal conduits to the relevant standards. (Y/N/NA)
e. All pipes within the void are metallic. (Y/N/NA)
f. All insulation within the void in compliance with para.4 in Part XI of the FSD Circular Letter. (Y/N/NA)
g. Pneumatic control lines are made of copper. (Y/N/NA)
h. Pneumatic control flexible tubes do not exceed 300 mm and are of flame retardant type. (Y/N/NA)
i. No other services in the void except essential services and services exclusively for the areas. (Y/N/NA)
j. Access for cleaning and inspection provided. (Y/N/NA)

10 OTHERS

a. Fire dampers installed for all air transfer openings and air ducts breaching fire compartments. (Y/N/NA)
b. No combustible material in the fresh/supply return/exhaust air duct/air plenum. (Y/N/NA)
c. No exhaust fan discharges into seating accommodation / corridor / false ceiling void / staircase. (Y/N/NA)
d. No A/C plant room used as storage purposes. (Y/N/NA)

Inspected and verified by:-

_____ (Signature)

_____ (Name in block letters)

Ventilation contractor's representative

_____

Company chop

_____

Name of ventilation contractor company

Date _____

Where Y = Yes
N = No
NA = Not Applicable