

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

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PRELIMINARY NOTE

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

This Code of Practice for Inspection, Testing and Maintenance of Installations and Equipment is published in accordance with Regulation 10 of the Fire Service (Installations and Equipment) Regulations of the Fire Services Ordinance, Cap. 95 to indicate the type and nature of inspections and tests which installations and equipment must normally pass in order to satisfy the Director of Fire Services and to give guidance as to the conduct of inspections and tests. It does not lay down any hard and fast rules. Special factors and circumstances may require variations in respect of any particular building, and in particular case the Director may require additional inspections or tests before he is so satisfied.

Part I GENERAL

- 1.1 Inspection and acceptance testing shall be carried out by a Fire Services Inspecting Officer by arrangement with the Authorized Person and the registered fire service installation contractor.
- 1.2 Applications for initial inspection and testing should be made on the prescribed form to the Director of Fire Services. The form must be signed by both the registered fire service installation contractor and the Authorized Person.
- 1.3 An application should only be submitted by the Authorized Person when the installation and equipment has been installed, completed and certified as being in efficient working order by the registered fire service installation contractor.
- 1.4 Upon receipt of an application the Fire Services Inspecting Officer will contact the Authorized Person (not the registered fire service installation contractor) at the telephone number shown on the prescribed form, and arrange a mutually convenient inspection date. The Authorized Person, as the co-ordinator of the project, should attend the inspection and it is also his responsibility to contact and inform the registered fire service installation contractor of the arrangements made.
- 1.5 A further prescribed form will be used to record the result of the inspection and will be completed and signed on site by the Fire Services Inspecting Officer. The Authorized Person and the registered fire service installation contractor will also be required to sign this form confirming that the results of the inspection have been brought to their attention.
- 1.6 In respect of minor items requiring a further inspection the Authorized Person will, after the defects have been rectified, arrange a re-inspection date with the Senior Building Services Inspector, Fire Service Installations Division. A further formal application for inspection on the prescribed form will only be required when a refusal letter has been issued subsequent to an inspection.
- 1.7 Re-inspections will be carried out as convenient, subject only to the availability of Inspecting Officer and provided that previous confirmed appointments are not affected.
- 1.8 Subsequent to a satisfactory inspection, the Authorized Person will be notified by telephone as soon as the Fire Services Certificate (F.S. 172) is ready for collection. If unable to be contacted by telephone a "ready for collection" letter will be despatched.
- 1.9 The Certification of Completion by Water Authority in respect of fire service installations requiring Government water mains connection will be sent direct to the Building Authority by the Water Authority, copied to the applicant, after the installation has been inspected and approved by the Water Authority and the fire service connection completed.
- 1.10 The fire service installations for a building for which a temporary occupation permit or occupation permit has been issued must be maintained, inspected and certified by a registered fire service installation contractor at least once in every 12 months.
- 1.11 The certificate for annual inspection of fire service installations together with a list of the fire service

- installations and equipment should be displayed in a prominent area of the building by the registered fire service installation contractor in consultation with the owner or building management.
- 1.12 Design engineers and registered fire service installation contractors should advise the owner of the building, or his agent that any fire service installation or equipment (such as the staircase pressurization system etc.), which would normally be left in idle or standby conditions except in case of fire, should be actuated and checked by the owner or his agent at an interval of not more than three months to ensure that the installation or equipment are functioning and sequencing correctly.
- 1.13 For any shut-down of building Fire Service Installations (FSI) overnight or over 24 hours, Fire Service Installation Contractors shall notify Fire Services Department by fax using the prescribed form in APPENDIX 7 preferably 7 days in advance. In addition, the following guidelines shall be observed:-
- a. Residents/occupiers/management companies to be notified beforehand and informed of any temporary measures to be taken;
 - b. Whenever possible, water tanks shall be topped up prior to commencement of repair/maintenance works;
 - c. The disruption to the normal operation of the FSI by repair/maintenance works shall be kept to the minimum. Any undue delay on the works would result in fire hazard abatement action;
 - d. As far as practicable, repair works shall be conducted in phases to ensure the building FSI remain partially functional. Avoid to shut down the whole system for a prolonged period;
 - e. In case the whole system has to be suspended, stand-by means such as fire extinguishers shall be provided at suitable locations. Fire Services Department/residents/occupiers/management company, where appropriate, shall be notified of the arrangement.

Part II INSPECTION, TESTING AND MAINTENANCE

2.1 Audio/visual advisory system

(i) Acceptance Testing

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

(ii) Maintenance

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

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

2.2 Automatic actuating devices

(i) Acceptance Testing

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

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

(ii) Maintenance

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

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

2.3 Automatic fixed installation other than water

(i) Acceptance Testing

CO₂, FM200 and other similar clean gas extinguishing system shall be checked and tested in accordance with the checklist as laid down at APPENDIX 2 and by direct and/or remote control sequences in accordance with test procedures as laid down in the NFPA Standard 2001 or other acceptable international standard as agreed by the Director of Fire Services.

(ii) Maintenance

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

2.4 Automatic fixed installation using water

These may include:

- Deluge system
- Drencher system
- Sprinkler system
- Water mist system
- Water spray system

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

2.5 Deluge system

(i) Acceptance Testing

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

(ii) Maintenance

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

2.6 Drencher system

(i) Acceptance Testing

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

(ii) Maintenance

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

2.7 Dust detection system

(i) Acceptance Testing

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

(ii) Maintenance

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

Tests appropriate to the system should be carried out by the owner or his agent at intervals as recommended by the equipment manufacturer and agreed with the Director of Fire Services. If

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

2.8 Emergency generator

(i) Acceptance Testing

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

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

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

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

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

(ii) Maintenance

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

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

A log book should be provided, and retained in the plant room, management office or building supervisor office, and should be kept up to date by the owner or his agent. The record should be made at the time of occurrence and should include details of all operations; faults and corrective actions taken, routine servicing, maintenance and periodic operation etc.; including dates, times, hour meter readings, workers/supervisors names and signatures, etc. for the unit, batteries, compressors, etc.

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

Fuel tanks shall be refilled to full after testing.

2.9 Emergency lighting

(i) Acceptance Testing

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

(ii) Maintenance

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

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

lead acid and 1.25 volts for Nickel Cadmium battery.

- b. For emergency lighting supplied by central battery systems with control and safety devices installed, the systems should be regularly checked for the following:—
 - (1) Connections between the battery and the source of charging current should be such that in no circumstances should the battery discharge other than to the secondary lighting circuits.
 - (2) A rectifier for battery charging should be for that purpose only and should be so regulated that the battery cannot discharge appreciably under normal conditions.
- c. Voltage and hydrometer tests should be carried out weekly and recorded in a register.

2.10 Exit sign

(i) Acceptance Testing

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

(ii) Maintenance

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

2.11 Fire alarm system

(i) Acceptance Testing

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

(ii) Maintenance

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

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

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

2.12 Fire control centre

(i) Acceptance Testing

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

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

(ii) Maintenance

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

2.13 Fire detection system

(i) Acceptance Testing

The testing of fire detection system shall be carried out in accordance with the Rules of the Loss Prevention Council for Automatic Fire Detection and Alarm Systems for Buildings and BS 5839 : Part 1 : 1988. A checklist for testing of fire detection system is enclosed at APPENDIX 4.

(ii) Maintenance

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

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

2.14 Fire hydrant/hose reel system

(i) Acceptance Testing

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

(ii) Maintenance

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

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

2.15 Fire resisting cables for fire service installations

(i) Acceptance Testing

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

(ii) Maintenance

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

2.16 Fireman's lift and firefighting and rescue stairway

(i) Acceptance Testing

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

(ii) Maintenance

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

2.17 Fixed automatically operated approved appliance

(i) Acceptance Testing

These types of fire extinguishing appliances, either of self-contained operating type or of alarm

signal actuating type, shall be tested in accordance with the manufacturer's recommendations or other requirements as may be prescribed by the Director of Fire Services on account of specific features of the appliances.

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

(ii) Maintenance

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

2.18 Fixed foam system

(i) Acceptance Testing

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

(ii) Maintenance

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

2.19 Gas detection system

(i) Acceptance Testing

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

(ii) Maintenance

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

2.20 Portable hand-operated approved appliance

(i) Acceptance Testing

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

(ii) Maintenance

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

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

The guidelines on portable hand-operated approved appliances maintenance is enclosed at Appendix 8.

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

(iii) Maintenance Label

All portable extinguishers shall be provided or stick with a label after maintenance as per the sample in Appendix 8. The purpose of this maintenance label is to provide and update all relevant

information on the equipment after maintenance.

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

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

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

Notes on Portable Equipment Maintenance Label

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

1. Company Name

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

2. Registration No.

The registration number of the Class 3 Fire Service Installation Contractor responsible for the maintenance of the portable equipment should be filled in.

3. F.S. 251 No.

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

4. Maintenance Date

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

5. Next Maintenance

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

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

6. Last Pressure Test

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

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

7. Year of Manufacture

According to all standards accepted by this Department from different countries, the year of manufacture must be permanently marked or stamped on the extinguisher body. So the year of manufacture can be checked out from the body. If there is only 2 digits, it means the last 2 digits of the year of manufacture, e.g. 99 means manufactured in 1999. For those non-high

pressure extinguishers (25 bars below) manufactured according to Malaysian Standard MS1179:1990, it only requires the year of manufacture be clearly marked on the body, but for those Malaysian products manufactured according to BS EN-3, permanent marking or stamp for year of manufacture is shown on the extinguisher body.

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

8. Maintenance Result

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

Remarks :

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

2.21 Pressurization of staircase

(i) Acceptance Testing

1. Where interaction with other systems is part of the designed operational mode, all such systems shall be correctly functioning before a final fire services inspection takes place.
2. 'Completion' shall include all necessary permanent labels, instruction plaques, fully detailed operating and maintenance manuals and diagrams, record 'as built' drawings, etc.
3. Ensure tests required under para. B.4 of Section 5.21 of the Code of Practice for Minimum Fire Service Installations and Equipment are carried out, recorded and record certified.
4. All systems are to be completed and tested and the designer is to satisfy himself that they are functioning correctly before the final full test and demonstration takes place with the Fire Services Inspecting Officers in attendance. A full set of test and functional operation check records (see para. 8 hereof) shall be submitted with the request for the attendance of the Fire Services Inspecting Officers. Accompanying the records shall be a certificate signed by the designer on behalf of the design company or organization confirming or otherwise that he is satisfied that the installations are operating in accordance with his design and the requirements of the Fire Services Department.
5. Acceptance tests shall be carried out in accordance with British Standard 5588: Part 4. It is necessary for the designer to be present at the tests.
6. It is preferable that the format/method of the required operational and functional test be agreed with Fire Services Department before any such work commences.
7. Except for simple devices such as pitot-static tubes, inclined manometers, U gauges and the like all instruments, meters, etc. used for testing purposes shall:-
 - a. be provided in duplicate;
 - b. have a manufacturer's claimed accuracy of not more than plus or minus two percent of range;
 - c. be manufactured to an appropriate British Standard or recognized equal international or

national standard where appropriate and available; and

- d.* have been calibrated by a recognized testing or calibration laboratory not more than 3 months prior to the date of test. The calibration certificate provided by the laboratory shall be available during the test.
8. Full and complete records are to be taken of all the tests and the results thereof including not less than:—
- a.* records of pressure testing during construction—see para. B.4 of Section 5.21 of the Code of Practice for Minimum Fire Service Installations and Equipment;
 - b.* make, serial no., type and owner of all instruments used, with a copy of the calibration certificates;
 - c.* actual measurements taken;
 - d.* corrected measurement from (*c*) above;
 - e.* resulting air flows;
 - f.* make, serial no., type and use of every device checked;
 - g.* date and time of test;
 - h.* signature of operator/tester or supervisor and any witness for each test; and
 - i.* signature of acceptance of and by the designer.

(ii) Maintenance

1. For systems that only operate in an emergency (i.e. single stage systems), they should be actuated by the owner or his agent at an interval of not more than three months, and checked to ensure that all functions and sequences are operating correctly. (See para. 3 below)
2. For systems that operate continuously at a low level and at an increased level in an emergency (i.e. two stage systems), they should be actuated into emergency mode by the owner or his agent at not more than six monthly intervals and checked to ensure that all emergency functions sequence and operate correctly. (See para. 3 below)
3. Periodic actuation should include, at least, the following actions:-
 - a.* activate system by manual switch;
 - b.* check that indicator lights give correct signals;
 - c.* inspect staircase to ensure all doors are closed especially if magnetically held doors are utilized;
 - d.* full inspection of fan rooms including:-
 - (i) fresh air inlet to be clear of debris and area in front to be free of obstruction;
 - (ii) filters (if provided) correctly in place and not at end of useful life;
 - (iii) to check any flexible connections for deterioration;
 - (iv) motor operating satisfactorily; (not overheating, etc.)
 - (v) belt drive with correct belt tension and alignment or other type of drive functioning correctly;
 - (vi) fan bearings satisfactory;
 - (vii) electrical equipment satisfactory (no contactor hum, etc.);
 - (viii) record motor currents on each phase;
 - (ix) no significant air leaks;
 - (x) to check operation of pressure relief or fan by-pass dampers (and indirectly, pressure

- sensor) by opening and closing staircase entry door or door(s);
- (xi) to check plant room for free of debris, stored materials, etc., and
 - (xii) to check fan room entry door self closers.
- e. throughout the staircase, a check should be conducted to ensure that air is discharging from all outlets and that pressure sensor is clean and free from obstruction.
 - f. to deactivate the manual switch and restore automatic mode;
 - g. to record actions progressively, and to complete and sign record logs.
4. In addition to the foregoing, at intervals not exceeding 12 months, the system shall be actuated and a full test shall be carried out as described under Section 2.21(i) hereof, by a registered fire service installation contractor and a maintenance certificate shall be sent to the Director of Fire Services; and
 5. A record log should be maintained by the owner or his agent for each and all systems providing a complete record of the actions carried out under para 1 to 4 hereof and the results thereof under signature of the supervisor and witness. Records should be retained for a period of at least seven years and shall be made available at any reasonable time at the request of the Director of Fire Services or his representative.

2.22 Ring main system with fixed pump(s)

(i) Acceptance Testing

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

(ii) Maintenance

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

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

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

2.23 Smoke extraction systems

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

a. Salient points for the test:-

- (i) The temperature of simulated hot air plume should be maintained at about 10 °C below the temperature rating of the ceiling sprinklers to avoid any unwanted actuation of sprinklers or damage to building structures and finishes;
- (ii) The size of the test fire should be at least 1 MW or of such size as agreed by the Director of Fire Services;
- (iii) Non-contaminating industrial grade methylated spirit may be used subject to the agreement of the Director of Fire Services;
- (iv) Non-toxic oil based smoke produced by smoke generator may be used subject to the agreement of the Director of Fire Services;
- (v) The test will be conducted with reference to the Australian Standard AS 4391-1999 or other equivalent international standards.

- b. Safety measures to be observed during the Hot Smoke Test:-
 - (i) Adequate safety measures should be provided to prevent any possible spread of fire during the test;
 - (ii) Adequate fire extinguishers should be provided at scene;
 - (iii) The standing-by of a fire appliance may be required if considered necessary.
- c. The smoke extraction system will be considered acceptable if the following points are complied with during the hot smoke test:-
 - (i) The designed smoke clear height should be maintained;
 - (ii) The low level fresh air make-up and the high level air extract should be formed in such a pattern that the smoke flow paths shall have a “scouring” effect in all areas within the smoke compartment. The make-up fresh air should not have any impact on the stability of the smoke layer;
 - (iii) The smoke extraction system should actuate promptly in response to a fire alarm signal;
 - (iv) No significant disperse of smoke should occur at adjoining smoke compartment(s);
 - (v) No deflection exceeding the design limit should be observed at hanging smoke curtains;
 - (vi) No significant smoke should be built up in ‘stagnant corners’ beneath the smoke layer;
 - (vii) No smoke should re-enter into the building through building openings or fresh air intake louvers.

A. Dynamic smoke extraction system

(i) Acceptance Testing

1. Where interaction with other systems is part of the designed operational mode, all such systems shall be correctly functioning before a final fire services inspection takes place.
2. ‘Completion’ shall include all necessary permanent labels, instruction plaques, fully detailed operating and maintenance manuals and diagrams, record ‘as built’ drawings, etc.
3. Ensure tests required under para. B.17 of Section 5.23 of the Code of Practice for Minimum Fire Service Installations and Equipment are carried out, recorded and record certified.
4. All systems are to be completed and tested and the designer is to satisfy himself that they are functioning correctly before the final full test and demonstration takes place with the Fire Services Inspecting Officers in attendance. A full set of test and functional operation check records (see para. 7 hereof) shall be submitted with the request for the attendance of the Fire Services Inspecting Officers. Accompanying the records shall be a certificate signed by the designer on behalf of the design company or organization confirming or otherwise that he is satisfied that the installations are operating in accordance with his design and the requirements of the Fire Services Department.
5. The format/method/apparatus of the required operational and functional tests (including hot smoke test) shall be agreed with Fire Services Department before any such tests commence.
6. Except for simple devices such as pitot-static tubes, inclined manometers, U gauges and the like, all instruments, meters, etc. used for testing purposes shall:—
 - a. be provided in duplicate;
 - b. have a manufacturer’s claimed accuracy of not more than plus or minus two percent of range;
 - c. be manufactured to an appropriate British Standard or recognized equal international or

national standard where appropriate and available; and

- d.* have been calibrated by a recognized testing or calibration laboratory not more than 3 months prior to the date of test. The calibration certificate provided by the laboratory shall be available during the test.
7. Full and complete records are to be taken of all tests and the results thereof including not less than:—
 - a.* records of pressure testing during construction— see para. B.17 of Section 5.23 of the Code of Practice for Minimum Fire Service Installations and Equipment;
 - b.* make, serial no., type and owner of all instruments used, with a copy of the calibration certificates;
 - c.* actual measurements taken;
 - d.* corrected measurement from (*c*) above;
 - e.* resulting air flows;
 - f.* make, serial no., type and use of every device checked;
 - g.* date and time of test;
 - h.* signature of operator/tester or supervisor and any witness for each test; and
 - i.* signature of acceptance of and by designer.

(ii) Maintenance

1. Where dedicated systems are installed they should be actuated by the owner or his agent at intervals not exceeding three months and checked to ensure that all functions sequence and operate correctly.
2. Where dual purpose systems are provided they should be actuated into smoke extraction mode by the owner or his agent at intervals not exceeding six months and checked as in para. 1 above.
3. Where systems are mixed types the shorter intervals should apply.
4. In addition to the foregoing, at intervals not exceeding 12 months the systems shall be actuated and a full test shall be carried out as described in Section 2.23 (A) (i) hereof, by a registered fire service installation contractor and a maintenance certificate shall be sent to the Director of Fire Services.
5. The owner or his agent should ensure that all routine oiling, greasing, etc. is carried out from time to time to ensure reliable operation.
6. Any fire/smoke dampers installed should be maintained regularly by the owner or his agent.
7. A record log should be maintained by the owner or his agent for all systems, providing a complete record of the actions carried out under para. 1 to 6 hereof and the results thereof under signature of the supervisor and witness.

(B) Static smoke extraction system

(i) Acceptance Testing

1. On completion of the installation the whole shall be inspected by a registered fire service installation contractor. For installations with permanent barriers and/or exhaust openings, it shall be ensured that all barriers and openings are properly provided and all labels are supplied and fixed.
2. For systems without permanent fixed barriers and openings, all devices shall be checked in the non-operated positions; the actuation system shall then be operated and all devices checked to ensure they have operated correctly.

3. All components shall be reset to the non-operated position and then with the electrical power source removed. All devices shall again be checked to ensure that they have all correctly performed the 'fail-safe' function, i.e. all in their fire positions.
4. Ensure all labels and instructions are provided.

(ii) Maintenance

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

2.24 Sprinkler system

(i) Acceptance Testing

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

(ii) Maintenance

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

2.25 Street fire hydrant system

(i) Acceptance Testing

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

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

(ii) Maintenance

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

2.26 Supply tanks

(i) Acceptance Testing

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

(ii) Maintenance

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

2.27 Ventilation/air conditioning control system

(i) Acceptance Testing

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

(ii) Maintenance

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

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

2.28 Water mist system

(i) Acceptance Testing

The system shall be tested in accordance with all the technical requirements as stipulated in NFPA 750/2000 Edition for Water Mist System, and other requirements as may be prescribed by the Director of Fire Services on account of the specific features of the system.

(ii) Maintenance

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

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

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

2.29 Water spray system

(i) Acceptance Testing

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

(ii) Maintenance

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

2.30 Water supply

(i) Acceptance Testing

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

(ii) Maintenance

The water supply piping system should be checked for leakage by the owner or his agent periodically. The transfer pump shall be maintained in efficient working order at all times and be inspected by a registered fire service installation contractor at least once in every 12 months.

Part III MISCELLANEOUS

- 3.1 The Code deals only with the inspection, testing and maintenance of fire service installations and equipment after the same have been provided for a building. The general requirements as to what installations and equipment are to be provided in buildings are dealt with in another Code called the Code of Practice for Minimum Fire Service Installations and Equipment published by the Director of Fire Services.
- 3.2 For the avoidance of doubt it is hereby declared that the Director of Fire Services, in his absolute discretion, may, in any particular case, vary any of the requirements of this Code and in particular may require different inspections or tests in regard to any installation or equipment other than the inspections or tests indicated in this Code, either in addition to or in substitution of the inspections and tests so indicated.

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