

**General Specification for Fire Service Installation
in Government Buildings of the Hong Kong Special Administrative Region
2012 Edition (Incorporating Corrigendum No. GSFS01-2012)**

The 2012 edition (incorporating Corrigendum No. GSFS01-2012) of the General Specification for Fire Service Installation incorporates updates and revisions to the 2012 edition. Please refer to the summary of major changes for revisions in comparison with the 2012 edition.

Electronic version of this 2012 edition (incorporating Corrigendum No. GSFS01-2012) can be viewed on the ArchSD Internet homepage.

In view of the revisions and new additions, there will be an introductory period of 3 months in preparation for full implementation of this 2012 edition (incorporating Corrigendum No. GSFS01-2012) as contract document by 19 November 2012. In summary,

- For tenders to be invited on or after 19 November 2012, this 2012 edition (incorporating Corrigendum No. GSFS01-2012) shall be used.
- Existing contracts (including contracts using previous editions tendered before 19 November 2012) will not be affected.

**MAJOR CHANGES IN THE CORRIGENDUM (NO. GSFS01-2012) OF THE
GENERAL SPECIFICATION FOR FIRE SERVICE INSTALLATION
IN GOVERNMENT BUILDINGS OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION
2012 EDITION**

Old Ref No.	New Ref. No.	Major Changes
PART A – SCOPE AND GENERAL REQUIREMENTS		
SECTION A1 – SCOPE OF SPECIFICATION		
A1.3.2	A1.3.2	To delete the abbreviations of “FRC”, “MoA” and “MoE”.
SECTION A2 – STATUTORY OBLIGATIONS AND OTHER REQUIREMENTS		
A2.1.2 (h)	A2.1.2 (h)	To replace “Code of Practice for Energy Efficiency of Building Services Installations in Buildings issued by EMSD and all the subsequent amendments;” by “Code of Practice for Energy Efficiency of Building Services Installation issued by EMSD and all the subsequent amendments, hereinafter referred as the “Building Energy Code” or “BEC”;”.
A2.1.2 (p)	A2.1.2 (p)	To replace “Code of Practice for the Provision of Means of Escape In Case of Fire, Code of Practice for Fire Resisting Construction, and Code of Practice for Means of Access for Firefighting and Rescue published by the Buildings Department, the Government of the HKSAR;” by “Code of Practice for Fire Safety in Buildings published by the Buildings Department, the Government of the HKSAR, hereinafter referred as the “Fire Safety Code”;”.
PART B –FIRE SERVICE INSTALLATION		
SECTION B3 –AUTOMATIC SPRINKLER SYSTEM		
B3.25	B3.25	To replace “ shall meet with the relevant requirements in FSDCoP, FSD Circular Letters, Code of Practice for Fire Resisting Construction, ” by “ shall meet with the relevant requirements in FSDCoP, FSD Circular Letters, Fire Safety Code, ”.

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Old Ref No.	New Ref. No.	Major Changes
SECTION B4 –TANKS AND PUMPS		
B4.12	B4.12	To replace “Motor efficiency of jockey pumps shall comply with the Code of Practice for Energy Efficiency of Building Services Installations in Buildings issued by EMSD and all subsequent amendments, ” by “Motor efficiency of jockey pumps shall comply with the Building Energy Code, ”
SECTION B9 – ELECTRICAL INSTALLATION		
B9.14	B9.14	To replace “ shall comply with Code of Practice for Energy Efficiency of Building Services Installations in Buildings issued by EMSD and all subsequent amendments prior to the date of tender return, ” by “ shall comply with the Building Energy Code, ”.
SECTION B11 – EMERGENCY LIGHTING, EXIT SIGN AND EMERGENCY GENERATOR		
B11.2	B11.2	To replace “Exit sign shall also comply with the requirements in FSDCoP and MoE.” by “Exit sign shall also comply with the requirements in the FSDCoP and the Fire Safety Code.”.
SECTION B12 – MECHANICAL, SPECIAL AND RELATED FIRE SERVICE INSTALLATIONS		
B12.4(b)	B12.4(b)	To replace “ the system including fans, motors, drives, electrical works, ductwork linking fans etc. shall be protected by a fire resisting material or enclosure complying with the FRC.” by “ the system including fans, motors, drives, electrical works, ductwork linking fans etc. shall be protected by a fire resisting material or enclosure complying with the Fire Safety Code.”.

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Old Ref No.	New Ref. No.	Major Changes
B12.4(c)	B12.4(c)	<p>(a) To replace “ shall be protected by enclosure or covered with fire resistant materials as required in the FRC” by “ shall be protected by enclosure or covered with fire resistant materials as required in the Fire Safety Code ”.</p> <p>(b) To replace “Apart from meeting the fire resistance requirements in the FRC” by “Apart from meeting the fire resistance requirements in the Fire Safety Code”.</p>
B12.5	B12.5	To replace “Apart from meeting the fire resistance requirements in the FRC ” by “Apart from meeting the fire resistance requirements in the Fire Safety Code ”.
B12.7	B12.7	<p>(a) To replace “RFSI and RFSP shall comply with FSDCoP, FSD Requirements and Circular Letters, MoE, FRC, MoA, and relevant statutory requirements.” by “RFSI and RFSP shall comply with FSDCoP, FSD Requirements and Circular Letters, Fire Safety Code and relevant statutory requirements.”.</p> <p>(b) To replace “ to identify any non-compliance with the requirements in FSDCoP, FSD Requirements and Circular Letters, MoE, FRC, MoA and FS_TC.” by “ to identify any non-compliance with the requirements in FSDCoP, FSD Requirements and Circular Letters, Fire Safety Code and FS_TC.”.</p>
PART D – INSPECTION, TESTING AND COMMISSIONING		
SECTION D1 – INSPECTION, COMMISSIONING AND ACCEPTANCE TEST		
D1.12	D1.12	To replace “ FSD Requirements and Circular Letters, FS_TC, EE_TC, MoE, FRC, MoA and relevant statutory requirements.” by “ FSD Requirements and Circular Letters, FS_TC, EE_TC, Fire Safety Code and relevant statutory requirements.”.

ARCHITECTURAL SERVICES DEPARTMENT
BUILDING SERVICES BRANCH

GENERAL SPECIFICATION FOR
FIRE SERVICE INSTALLATION
IN GOVERNMENT BUILDINGS OF
THE HONG KONG SPECIAL ADMINISTRATIVE REGION
2012 EDITION

Corrigendum No. GSFS01-2012
(August 2012)

The following clauses are amended in the above General Specification.

Clauses

PART A - SCOPE AND GENERAL REQUIREMENTS

SECTION A1

SCOPE OF SPECIFICATION

A1.3 TERMS, DEFINITIONS AND ABBREVIATIONS

A1.3.2 Abbreviations

ANSI	American National Standards Institute
ArchSD	Architectural Services Department, the Government of the Hong Kong Special Administrative Region
ASTM	American Society for Testing and Materials
BS	British Standards, including British Standard Specifications and British Standard Codes of Practice, published by the British Standards Institution
BSB	Building Services Branch, ArchSD of the Hong Kong Special Administrative Region
BS EN	European Standard adopted as British Standard

EE_TC	Testing and Commissioning Procedure for Electrical Installation in Government Buildings, Hong Kong, issued by the ArchSD, the HKSAR
EMSD	Electrical and Mechanical Services Department, the Government of the Hong Kong Special Administrative Region
FM	Factory Mutual, USA.
FOC	Fire Offices' Committee, UK.
FRP	Fire resistance period
FSD	Fire Services Department, the Government of the Hong Kong Special Administrative Region
FSDCoP	Codes of Practice for Minimum Fire Service Installations and Equipment and Inspection, Testing and Maintenance of Installations and Equipment published by the Fire Services Department, the HKSAR
FS_TC	Testing and Commissioning Procedure for Fire Service Installation in Government Buildings, Hong Kong, issued by the ArchSD, the HKSAR
IEC	International Electrotechnical Commission Publications
IEE Wiring Regulations	Regulations for Electrical Installations (BS 7671: 2008) published by the Institution of Electrical Engineers, UK
ISO	International Organization for Standardization Publications
NFPA	National Fire Protection Association, USA
OFTA	Office of the Telecommunications Authority of the Hong Kong Special Administrative Region
LPC	Loss Prevention Council, UK
LPCB	Loss Prevention Certification Board, UK
PAS	Publicly Available Specification published by the British Standards Institution
PNxx	Pressure Rating xx BAR at 23°C

PBFE	Performance based fire engineering (or performance based fire safety engineering or performance based fire protection engineering) studies, approaches, analyses, assessment, applications and/or similar works adopting fire engineering principles
RFSI	Related Fire Service Installation and shall include all fire service installations in a building or project that are carried out by others and not included in the Installations, but they are required to be inspected and accepted by the FSD on completion. Related Fire Service Installation shall include, but not limited to, water supplies, supply tanks, ring main systems, street hydrants, interfacing signals between fire service system and various electrical and mechanical systems, emergency generator, emergency lighting, exit sign, pressurisation of staircases system, smoke extraction system, and fixed automatically operated approved appliances.
RFSP	Related Fire Service Provisions and shall include all building components, fixtures, installations and provisions, but excluding Fire Service Installation, for fulfilling the fire safety requirements of a building or project, and they are required to be inspected and accepted by the FSD on completion. Related Fire Service Provisions shall include, but not limited to, fireman lifts, emergency vehicular access, fire dampers, fire doors, fire shutters, fire seals, fire insulation, fire fighting and rescue stairways, materials for separation of compartments, passive fire protection, ventilation system, exhaust system for gas flooding system, electrical installation, cubicle switchboard installation, telephone wiring, provisions for dangerous goods stores, labels and signs, etc.
UL	Underwriters' Laboratory, USA
WSD	Water Supplies Department, the Government of the Hong Kong Special Administrative Region

SECTION A2

STATUTORY OBLIGATIONS AND OTHER REGULATIONS

A2.1 STATUTORY OBLIGATIONS AND OTHER REQUIREMENTS

A2.1.2 Other Requirements

- (h) Code of Practice for Energy Efficiency of Building Services Installation issued by the EMSD and all the subsequent amendments, hereinafter referred as the “Building Energy Code” or “BEC”;

- (p) Code of Practice for Fire Safety in Buildings published by the Buildings Department, the Government of the HKSAR, hereinafter referred as the “Fire Safety Code”;

PART B – FIRE SERVICE INSTALLATION

SECTION B3

AUTOMATIC SPRINKLER SYSTEM

B3.25 DRENCHER INSTALLATION

Drencher installation shall be supplied and installed where specified. Drencher system shall be designed to provide protection for openings, to separate an area of high fire risk such as in theatre stages with safety curtain provision, for exposure protection, to protect the marine filling station and to provide protection for the refuge floors to the approval of the FSD. The drencher installation shall meet with the relevant requirements in FSDCoP, FSD Circular Letters, Fire Safety Code, licensing requirements for places of public entertainment, and other relevant codes and licensing requirements.

Drencher system shall be designed to protect the surface area with water flow rate of not less than 10.0 l/min/m^2 protected surface area at all points on the protected surface or at a flow rate agreed by the FSD. This shall be checked and verified by hydraulic calculation or computer simulation with on site acceptance tests. The system shall be designed to comply with Rules of the Fire Officers' Committee (Foreign) for the Installation of External Drenchers, FSDCoP, FSD Requirements and Circular Letters.

Drencher system shall be actuated by an automatic fire detection system or sprinklers installed in the same area. A manual release device/system with operating instructions shall also be supplied and installed near the deluge valve.

The sprinklers installed in the same area or pilot sprinklers, where provided, shall be used to actuate the drencher system. Where sprinklers are used to actuate the drencher system, the FS Contractor shall supply and install a separate local sprinkler flow switch with test facilities to the sprinklers installed in the same area as the drencher system, or to the pilot sprinkler system for actuating the drencher system. The location of the local sprinkler flow switch shall be selected such that actuation of the sprinklers in other area shall not cause the drencher system to operate.

The sprinklers for drencher actuation shall be of quick response type with a short Response Time Index (RTI) value suitable for the hazard to be protected. The RTI value shall be submitted for approval.

Where sprinkler system is not installed in the same area and where local sprinkler flow switch and pilot sprinkler system cannot be installed, heat detection system in coincidence connection shall be used to actuate the drencher system.

Smoke detection system could also be used where specified. Where the drencher system is used to separate an area of high fire risk for life safety protection or to protect a compartment forming part of an escape route as indicated or where specified, the drencher system shall be actuated by smoke detection system in coincidence connection.

Drencher system for refuge floor shall be actuated by heat detection system with coincidence connection where sprinkler system is not provided on the refuge floor.

For the detectors arranged with coincidence connection (cross-zone operation), the detectors shall be arranged each on either side of the drencher heads. The activation of one detector shall energise an alarm with visual and audible warnings on the control panel. The activation of any two detectors arranged in coincidence connection shall operate the drencher installation. Where required by the FSD and approved by the Architect, activation of the detectors provided solely for the drencher system shall not activate the general fire alarm and shall not send the fire signal via the fire alarm direct link and alarm transmitter.

The drencher heads shall be designed to provide an even sideward and downward throw of water to protect the whole vertical surface. The FS Contractor shall calculate the number of drencher heads, select the type of drencher heads, their separation and their arrangement to provide an even flow of water over the entire vertical surface of the openings protected by the drencher system. The FS Contractor shall take due consideration on the effect of wind and air movement in surrounding environment of the protected area in the design and selection of equipment for drencher system.

The FS Contractor shall check and verify the sizing of pipework by hydraulic calculation and submit fully calculated results to the Architect for approval. The FS Contractor shall calculate and check the size of the water storage tank which shall be adequate for not less than 30 minutes of operation of all the drencher installations that are required to be operated simultaneously. All calculations shall be included in the submission to the Architect and FSD for approval.

For safety curtain provision in stage and auditorium, the drencher shall be designed to provide a protection of not less than 1 hour FRP with the use of safety curtain. The water storage shall be enough for not less than 1-hour operation.

Where specified, foam drencher system shall be supplied and installed with quick response sprinkler heads for areas with special hazard.

SECTION B4

TANKS AND PUMPS

B4.12 JOCKEY PUMPS

Jockey pumps complete with TEFC driven motor for maintaining hydraulic pressure shall be of the multi-stage horizontal or vertical centrifugal type having construction generally in compliance with Clauses B4.5 and B4.8 with stainless steel shaft and impellers. Alternatively, reciprocating pumps capable of performing the same duty may be acceptable. Reciprocating pumps shall be with stainless steel piston rod and piston, synthetic rubber seals and oil bath lubrication, mounted on a common base plate with the electric motor drive. Motor efficiency of jockey pumps shall comply with the Building Energy Code, except for pump motor which is component of approved package equipment.

SECTION B9

ELECTRICAL INSTALLATION

B9.14 LAMPS

All lamps used for exit signs and emergency lighting installation shall comply with the Building Energy Code, unless otherwise approved by the Architect. LED lamps of approved type, size, brightness and colour shall be used for all exit signs for energy saving purpose.

All lamps for the visual indications on the control and indication panels and repeater panels shall be LED lamps of approved type, size, brightness and colour unless otherwise specified or approved by the Architect.

All LED lamps used shall comply with General Electrical Specification.

SECTION B11

EMERGENCY LIGHTING, EXIT SIGN AND EMERGENCY GENERATOR

B11.2 EXIT SIGN

Exit sign shall conform to BS 5499-1: 2002, BS 5499-4: 2000, BS EN 60598-1: 2008, BS EN 60598-2-22: 1998+A2: 2008, BS 5266-1: 2011, BS EN 50172: 2004 and BS EN 1838: 1999. Exit sign shall also comply with the requirements in the FSDCoP and the Fire Safety Code. Exit sign shall be visible and conspicuous from any position within the premises to ensure that exit routes can be easily recognised and followed in an emergency and in fire and smoke conditions. The provision of exit sign shall deem to include all related directional signs or series of signs for the exit routes as specified in Clause 4.2 in BS EN 50172: 2004 to assist progression towards the exit as indicated by the exit sign.

LED lamps of approved type, size, brightness and colour shall be used for all exit signs for energy saving purpose, as specified in Clause B9.14.

To ensure the visibility and conspicuousness of the exit sign at all times including fire and smoke conditions, exit signs shall conform to all the following requirements as the minimum: -

- (a) Exit signs shall be internally illuminated bearing one of the designs that specified in the FSDCoP and the FSD Circular Letter 5/2008. Single type of exit sign shall be installed within the same development in order to maintain uniformity, unless otherwise approved by and acceptable to the FSD.

Colour contrast for translucent surrounds to lettering/graphical symbol shall be either one of the following combinations or as specified: -

<u>Colour</u>	<u>Contrasting Colour</u>
Green	White
White	Green

The colour combination selected shall be consistent throughout the same development. The colour shall not deteriorate or become faint throughout the service life and shall last for at least ten years.

- (b) The viewing distance of exit sign shall be not less than 25 m under ambient no smoke condition with and without normal lighting. The words shall be easily legible. Uniformity of luminance is the critical factor. The ratio of the maximum to the minimum luminance within either white or green colour area shall be not greater than 10:1.
- (c) The exit sign shall be easily visible and conspicuous in fire and smoke conditions. The viewing distance shall not be greatly reduced in the presence of smoke. Brightness of exit sign is the critical factor for visibility in fire and smoke conditions. The exit sign shall produce an average luminance of not less than 100 cd/m² unless otherwise specified. The ratio of the luminance at white area of the exit sign to the luminance at green area shall be not less than 5:1 and not greater than 15:1.

For exit sign of lower average luminance but which is capable of achieving equivalent or better viewing distance, visibility and legibility as the 100 cd/m² LED exit sign in smoke condition (at optical density not less than 1 m⁻¹) with and without normal lighting, test reports carried out and certified by approved independent laboratory/testing body shall be provided for substantiation and approval.

The exit sign shall be capable of operating satisfactorily in the emergency mode at an ambient temperature of 70°C for at least half of the rated duration or at least 1 hour in according to BS EN 60598-2-22: 1998+A2: 2008, whichever is longer, in emergency mode as specified in EN 60598-2-22.

The average luminance of the exit sign shall not decrease by more than 30% of its initial design value throughout its rated life in continuous operation when operated at an ambient temperature between 5°C and 40°C.

Where it is shown on the Drawings that a sign cannot be installed immediately above an exit or when an exit sign is not easily visible from all positions within the premises served by the exit sign, additional internally illuminated directional signs or other signs conforming to BS 5499-1: 2002, BS 5266-1: 2011 and BS EN 50172: 2004 shall be supplied and installed at conspicuous locations to indicate the route to the exit. The graphic design of directional sign shall conform to FSDCoP, FSD Requirements and Circular Letters.

For illuminated exit signs supplied and installed in places like theatres, cinemas, etc. and other specified premises used for entertainment with normal operation and performance mostly conducted in dark environment, the maximum luminance of any patch on the exit sign shall not exceed 80 cd/m^2 . The average luminance shall however be not less than 25 cd/m^2 . In addition, the size of the wording of the exit sign in English and Chinese shall not be less than 175mm. Adequate number of exit signs and directional signs shall be provided in these places to enable the signs indicating the exit routes and progressing towards the exit to be seen at all positions. Where approved, exit signs can have built-in lamps with two-stage controls providing different illumination level for normal and dark environment. Black and green exit signs shall not be used except with the approval of the FSD and the Architect.

Exit sign shall be safe in construction and use. It shall not create any harmful effect and not generate any additional risk and liability to the building occupants, workers, and public visitors during the whole period of use.

The construction details, finishes, appearance and performance data of exit signs shall be submitted to the Architect for approval before fabrication. The FS Contractor shall allow modifying the appearance and details of the exit signs to the satisfaction of the Architect.

Illuminated exit signs shall be connected to the mains supply, and to the emergency power supply where available in the building and where indicated. All wirings for the exit signs commencing from the power supply points as shown on the Drawings shall be supplied and installed by the FS Contractor.

The luminaires for exit signs shall be of type for maintained operation. The number of LED lamps for each internally illuminated sign shall be not less than two. The failure of one or more lamps shall not interrupt the charging current to the battery and shall not cause an overload.

The input current to each LED lamp shall be set at no more than the manufacturer's recommended design value for continuous operation in order to achieve the rated operation life. Exit sign shall be manufactured under quality control standard such as ISO9000/9002 or equivalent and approved.

LED luminaires in exit sign shall comply with the radiated disturbance limit requirements that specified in the CISPR 15 standard on “Limit and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment” issued by the International Electrotechnical Commission (IEC) and all relevant requirements of OFTA.

Self-contained exit signs shall be provided with secondary battery(s). Centrally supplied exit signs shall be connected to the central battery set of emergency lighting installation provided on the same floor or in the same premise.

Where batteries are provided, the design operating life of the batteries shall be not less than four years. In emergency mode without mains and emergency power supply, the batteries shall be capable of maintaining the operation of exit signs and related directional signs for not less than the period specified for emergency lighting installation in Clause B11.1 and in any case shall be not less than 2 hours after mains failure.

The battery, battery charger, wiring, testing facilities, automatic changeover switch, accessories and related provisions of exit signs shall comply with relevant requirements of emergency lighting installation and the requirements as specified in Clause B11.1, BS 5266-1: 2011, BS EN 50172: 2004 and BS EN 1838: 1999. Internal wiring and electronic circuits shall be protected from excessive current that may occur during fault conditions by incorporation of safety devices between the batteries and the electronic circuits. There shall be no switch between the batteries and the emergency lighting lamps other than the changeover device. Changeover from normal to emergency supply mode shall be set at 0.85 times rated supply voltage or below.

SECTION B12

MECHANICAL, SPECIAL AND RELATED FIRE SERVICE INSTALLATIONS

B12.4 SMOKE EXTRACTION SYSTEM

(b) Smoke Extraction / Supply Air Fan

The FS Contractor shall supply and install smoke extraction and supply air fans which shall meet all specified requirements including construction, capacity, efficiency, motor size, sound rating, and constraints on physical dimensions as may be imposed by the design and to suit the smoke extraction requirements.

All smoke extraction fans shall be constructed or coated with finishing materials capable of withstanding exposure to an ambient temperature of at least 250 °C for a period of not less than 1 hour, without producing smoke or any sort of toxic fumes. The respective manufacturer shall certify with substantiation that such coating finishes shall be factory-applied with specified requirement complied. The fans shall be connected directly to outside by non-combustible ductwork including flexible connection, if installed. When smoke extraction / make-up air fans are installed within the served compartment, the system including fans, motors, drives, electrical works, ductwork linking fans etc. shall be protected by a fire resisting material or enclosure complying with the Fire Safety Code.

The motor for the ventilating fans (extraction or make-up) shall provide nominal rating of minimum 20 % higher than the motor operating power input under nominal operating requirement. The motor windings shall be insulated to permit motor operation at design conditions for a period of 1 hour in an ambient temperature of at least 250 °C. The fan motor shall be installed outside the hot air stream where possible.

In order to prevent re-circulation of smoke, the discharge points of smoke shall be separated by not less than 5 metres in any direction from all air inlets or other openings into any buildings. The discharge of smoke into any means of escape or a fireman's staircase is strictly prohibited.

The FS Contractor shall note the following requirements: -

- (i) The smoke shall not be discharged at the underside of any canopy or overhang; and
- (ii) No discharges shall be at a height less than 3 metres measured from the surrounding horizontal surface to the bottom of the outlet and where the height is below 6 metres, the smoke shall not be discharged downwards.

(c) Ductwork and Fittings

The FS Contractor shall supply and install ductwork and associated fittings for smoke extraction system installation as shown on the Drawings and as required to suit the smoke extraction requirements. The fabrication and testing of all ductworks shall conform to DW 143 & DW 144, industrial grade, and the requirements stipulated in this General Specification. All ductwork shall be fabricated from galvanised sheet steel and aluminium sheets shall not be accepted.

The smoke extraction system ductwork shall not be provided with fire or smoke dampers and any other restrictions in the ductworks unless otherwise accepted by the FSD. Exceptions will be where only one extraction or supply system is used to serve several compartments where motorized fire and smoke dampers complying with FSD's requirements may be required. Also, motorized fire and smoke dampers complying with FSD's requirements shall be required at the main exhaust outlet louver and main supply intake louver. If smoke extraction system ductworks passes through compartments, all parts of the ductwork outside the served compartment shall be protected by enclosure or covered with fire resistant materials as required in the Fire Safety Code, such part shall be fire resisting to BS 476-24: 1987 or to be totally enclosed by fire resistant construction to BS 476-20: 1987 having fire resistance period not less than that of the wall or floor of the served compartment or the compartment containing the ductwork whichever is higher.

Motor operated fire and smoke dampers shall comply with UL 555S: 1999 Class I, and where relevant ISO 10294 Part 1-5, and other international standards approved by the Architect and the FSD. Motor operated fire and smoke dampers shall be failsafe design. The damper shall be complete with electric motor actuator enclosed with suitable fire rated enclosure. Damper module installations shall be fully sealed by gaskets or approved materials between the module frame and the mounting frame. Apart from meeting the fire resistance requirements in the Fire Safety Code, the gasket material shall be capable of withstanding exposure to an ambient temperature of at least 250 °C for not less than 1 hour without producing smoke or any toxic fumes. Damper manufacturer shall certify that the assembled dampers, including all accessories and controls, can withstand 250°C for the duration of 1 hour without distortion, buckling, damage to seals, bearings, or any deleterious effect.

B12.5 AUTOMATIC ACTUATING DEVICES AND DAMPERS

Automatic actuating devices controlled by fire/smoke/explosion detection system, fire alarm system and automatic facilities such as sprinkler flow switches etc. where indicated on the Drawings for protection of compartment, for closing an area for gas flooding system, for licensed areas and where required, shall be supplied and installed by the FS Contractor. All power, controls and wiring shall be included. The automatic actuating devices shall be of approved type and shall be suitable for the hazard class in the area protected.

Automatic actuating devices for fire shutters shall be operated by smoke detectors and complete with manual controls on both sides except for fire shutters located in car park areas and in kitchens which shall be operated by heat detectors or special approved devices with manual controls.

For the dampers installed on a door, the automatic actuating device shall be connected to an electromagnetic remote damper release unit. The electromagnetic remote damper release unit shall be suitable for mounting outdoor for remote actuation of the dampers. The actuating mechanism shall be durable and reliable. The unit shall be of fail-safe design such that the damper shall be released at no power supply, and shall be reliable in operation and meeting with all the related requirements of FSD. The unit shall consist of a sheathed steel wire connected to the electromagnetic remote damper release unit at one end and the fire damper locking device at the other end or a similar approved facility. The sheathed steel wire shall be anchored at strategic points such that the steel wire can move freely relative to the outer skin. A fire signal shall actuate the unit by spring return mechanism or similar that will pull the steel wire and release the damper. The design shall be such that none or only a small section of the sheathed wire is located outside the room for good appearance and the unit installed outdoor shall be mounted inside a dust and moisture proof stainless steel box recessed in the external wall. The electromagnetic remote damper release unit shall be complete with power on indication and damper reset facilities.

Fire dampers shall be provided at locations and constructed to standards as required by the FSD and Buildings Department to comply with the Buildings Regulations for compartments and openings. Where specified, fire dampers shall also be designed and constructed to comply with UL555S Class I, or equivalent approved international standard for smoke dampers, to restrict the spread of smoke. The combined fire and smoke damper shall be complete with electric motor actuator enclosed with suitable fire rated enclosure and shall be able to close completely at design air pressure and flow during fire. Apart from meeting the fire resistance requirements in the Fire Safety Code, damper manufacturer shall certify that the assembled fire and smoke dampers, including all accessories and controls, can withstand 250 °C for the duration of 1 hour without distortion, buckling, damage to seals, bearings, or any deleterious effect. In addition to the fusible link, the fire and smoke dampers shall be operated by the building fire alarm system provided in the same building zone which includes manual fire alarm, flow switches in sprinkler system and detectors in the VAC control system.

An inspection door shall be provided for each damper and associated fusible link for regular inspection and for each automatic actuating devices for maintenance purpose.

When required by the FSD and approved by the Architect, activation of detectors provided solely for the automatic actuating devices shall not sound the general fire alarm and shall not send the fire signal via the fire alarm direct link and alarm transmitter. However, an alarm with visual and audible warnings shall be provided on the control panels. The detectors for the automatic actuating devices shall be wired in coincidence connection when two or more detectors are provided.

B12.7 RELATED FIRE SERVICE INSTALLATIONS AND PROVISIONS

RFSI and RFSP shall comply with FSDCoP, FSD Requirements and Circular Letters, Fire Safety Code and relevant statutory requirements.

Where there are RFSI in the same building to be inspected by the FSD, the FS Contractor shall co-ordinate with others, inspect, check and witness the final functional and performance tests on all RFSI by others to identify any non-compliance with the requirements in FSDCoP, FSD Requirements and Circular Letters, Fire Safety Code and FS_TC. Any works found not complying with the fire service requirements of the FSD shall be rectified by the FS Contractor when they are included in the Installations or be reported to the Architect when such works are carried out by others before arranging inspection with the FSD. Upon witnessing the satisfactory completion of all final tests and inspections after rectification of non-conformities related to fire service, the FS Contractor shall then arrange inspection by the FSD on all the Installations in the building including RFSI by others.

Where there are RFSP in the same building to be inspected by the FSD, the FS Contractor shall co-ordinate with others, obtain and check the information and certification from relevant parties on all RFSP by others to confirm their completion and readiness for inspection by the FSD.

The FS Contractor shall co-ordinate and check that all RFSI and RFSP by others to be inspected by the FSD are tested, rectified where necessary and certified by relevant parties before arranging the inspection with the FSD.

The FS Contractor shall collect information from relevant parties and include the RFSI in the submissions such as Form 314 and 501 to the FSD. The FS Contractor shall also submit the drawings with calculation on the RFSP where necessary to the FSD for approval.

The FS Contractor shall employ a commissioning engineer in charge approved by the Architect as required in the Clause D1.1.2 to co-ordinate and oversee the completion of all Installations in a building or project required to be inspected by the FSD irrespective of whether the installation of such works are included in the Installations or by others. All RFSI and RFSP by others shall be included. The FS Contractor shall in particular pay attention to the interfacing works and signal transmission to different installations as well as the communication link with outside.

Where certificates and licences are required by the FSD for completion of the fire service inspections, the FS Contractor shall co-ordinate with relevant parties, check and confirms that all the licences and certificates are obtained before arranging the inspection with FSD. The licences and certificates may include, but not limited to, licences for emergency generator rooms, fuel tank rooms and dangerous goods stores, certificates for gas cylinders, certificates for radioactive substances, and other statutory licences as required.

In licensed premises, the FS Contractor shall use approved equipment of appropriate types such as explosive proof, flameproof, weatherproof, corrosive resistance, spark-proof, intrinsically safe etc. to suit the applications. Where mechanical ventilation systems in licensed premises are included in the Installations, all necessary fire dampers and smoke dampers shall be provided. The ventilation system shall also be interlinked with the gas detection system and other detection systems, when they are supplied and installed in the licensed premises as required by the FSD.

PART D – INSPECTION, TESTING AND COMMISSIONING

SECTION D1

INSPECTION, COMMISSIONING AND ACCEPTANCE TEST

D1.12 TESTING OF FIRE SERVICE INSTALLATIONS AND PROVISIONS INSTALLED BY OTHERS

Where indicated that there are Fire Service Installations, RFSI and RFSP installed in the same building or project by others, the FS Contractor shall co-ordinate with relevant parties, inspect, check, and witness the final functional and performance tests of the Installations, RFSI and RFSP by others on their compliance with FSDCoP, FSD Requirements and Circular Letters, FS_TC, EE_TC, Fire Safety Code and relevant statutory requirements. The inspection, checking and witnessing of the final tests on installations by others shall confine to those items and aspects that are required for inspection by the FSD and/or required to satisfy the requirements of the FSD only.

The FS Contractor shall follow the requirements in Clauses B11.1.12, B11.3, B12.1 and B12.7.

Upon completion of the tests carried out and certified by others and with no non-compliance found by the FS Contractor, the FS Contractor shall include all the Fire Service Installation of a building or project in the submission to the FSD for inspection. The FS Contractor shall co-ordinate, obtain the drawings and information from the relevant parties and include all Fire Service Installations in the submission to the FSD for comment and inspection.