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## 19.00 Fire Services

*The requirements of this Section are Mandatory.*

### 19.01 Generally

This Section outlines GU's minimum requirements for the following Fire Detection Systems and Passive Fire Protection;

- Automatic Fire Detection and Alarm Systems.
- Emergency Warning and Intercommunications Systems (EWIS)
- Emergency warning Systems (EWS)
- Hydrants and hose reels.
- First Attack Fire Fighting Equipment (Extinguishers & Blankets)
- Fire Hazard Indices

Each building shall be provided with a system of fire protection in accordance with the relevant Codes and Standards.

In general, all buildings shall be equipped with Automatic Fire Detection & Alarm Systems connected to the Building's Fire Indicator Panel (FIP). The building FIP shall be connected to the Site Master Panel and Site Mimic Panel(s) and the Qld Fire & Rescue Service (QFES), or as otherwise agreed to by the QFES.

### 19.02 Basic Requirements for Fire Detection & Alarm Systems

All fire detection and alarm systems shall be arranged so that in the event of an alarm condition existing in any protected zone, including the operation of a manual push button alarm, the systems shall provide, but not be limited to, the following functions;

- Illuminate an indicator light for the relevant circuit on the building fire indicator panel.
- Illuminate an indicator light for the building on the Master Panel.
- Transmit an alarm signal to the QFES, via a site Mimic Panel.
- Energise alarms.
- Shut down any integrated ventilation systems, operate smoke doors, fire doors, emergency exit doors, fire dampers, smoke exhaust systems, make up air facilities, stair pressurisation systems and flammable gas services.
- Transmit a signal to the Pager Alert System (where installed) to activate the Pager System.
- Provide a signal to visual alarms.
- Transmit signal to operate electronic door locks.

The fire alarm system shall also incorporate an emergency warning and communication system to AS 1670-1 and AS 2220-1.

Fire detection and alarm systems shall comply with the Fire & Rescue Service Act 1990 Sections 104D and 104DA, and the 'Fire Alarm and Building Design Guidelines for the Reduction of Unwanted Alarms' issued by the QFES.

### 19.03 Fire Services Contractor Qualifications

Fire Services Contractors shall provide evidence that they are duly registered with the Fire Protection Contractors Registration Board of Queensland, and have such licences as required by State legislation, before commencing any installations.

### 19.04 General Equipment Requirements

All equipment associated with Fire Alarms, EWIS and EWS shall be provided by a recognised Fire Alarm company or Manufacturer with a proven record of high standard within the Fire Protection Industry for a period of not less than 10 years.

Installation of such equipment shall not be regarded as complying with this Section unless it is carried out by the manufacturer of the equipment, or by a Contractor duly authorised by the manufacturer.

### **19.05 Fire Indicator Panels (FIP)**

Each building shall be equipped with a FIP showing all alarm circuits. Each FIP shall have a minimum provision of 10% spare space to allow for future circuit installation.

The maximum number of thermal alarms or smoke detectors that shall be provided on any circuit shall be no greater than 90% as permitted by the Code.

FIPs shall be auto testing and equipped with additional 'LED' indication for ease of circuit identification.

FIPs shall be fitted with a Check Alarm facility which shall be activated on commissioning of the panel.

All new FIPs for buildings on each of the GU campuses shall be as follows;

- **Gold Coast, South Bank & Logan** – 'Ampac' manufactured panels
- **Nathan & Mt Gravatt** – A proprietary manufactured panel (e.g. Inertia)

Where an addressable panel is installed as a 'Site Master Panel' or a 'Building Panel', a factory fitted strip type printer shall be integrated into the panel.

The panel manufacturer shall provide to CLF at no additional cost all maintenance tools and software for the servicing and upgrading of the panels.

All integrated evacuation systems shall be factory fitted.

Electronic door locking output shall **not** be connected to any auxiliary output controlled by the fire panel door switch.

The Building FIP shall be *Non Latching*.

Alterations or additions to existing fire panels shall only be carried out by the GU Fire Equipment Maintenance Contractor. Work by any other contractor is not permitted. A full impact study of the existing system shall be conducted for any alterations or additions and must be approved by the UFO.

Installation cabling from any Building FIP to the Site Master Panel FIP and Site MIMIC Panel(s) shall be connected by the GU Fire Equipment Maintenance Contractor. Sufficient cabling and information is to be made available for this connection.

All cabling to and from FIP's shall be continuous and without joints.

The Site Mimic Panel shall be upgraded to show all new buildings installed under the contract.

'Schematic Location' diagrams associated with FIP's **shall** be colour coded and of such design and contain such information as approved by the UFO. They shall be of plastic, be 'Back Engraved' and show all relevant information.

Each FIP shall also be linked via a DDC control in the building to indicate an alarm on the CCMS.

All FIPs, and Mimic Panels shall be positioned as outlined in AS 1670 - Control and Indicating Equipment.

FIPs shall not be positioned on external walls or in sun affected locations.

Lightning surge protection shall be installed to all FIPs.

A spring return Fire Service Isolation button **shall** be fitted to the building FIP for testing purposes.

### 19.06 Detection Systems

Buildings shall be fitted with thermal and/or smoke detectors in accordance with the requirements of AS 1670 - Automatic Fire Alarms, and be interfaced with visual detectors such as flashing strobe lights to be installed in public areas and rooms with high acoustic isolation.

Detectors shall be 'Hocheki' type in accordance with the requirements of AS 1603.

Thermal detectors shall be of the electro-pneumatic, compensating rate of rise type. Thermo-pile and solid state alarms are also acceptable.

Smoke detectors (combustion type) are to be used where early warning is required in areas such as sub-stations, switch rooms, PABX and MDF rooms, TER rooms and other areas as required by Australian Standards or other Codes. Thermal detection shall be used in other areas approved by the UFO and the QFES.

Ceiling mounted detectors shall be mounted in accordance with the requirements of [Section 14.00 Ceilings](#).

Detectors **are not** to be positioned directly above transformers or other electrically energised equipment.

'VESDA' systems shall be installed in areas where nominated in the SDFs.

All thermal and smoke detectors shall have 'L.E.D.' indication. Concealed detectors in areas such as ducts, DB's, lift motor rooms and other small rooms, shall have the remote indicator mounted on the wall over the door. **Note** - Remote indication is only required for conventional flip panel installations.

Concealed space detectors shall be equipped with remote neon indicators labelled with the type and location of the detector. Concealed detectors should be grouped in the same manner as room detectors and not be installed on a complete circuit extending over the entire floor. Alarm zones shall be arranged to suit the attending Fire Service and the University Fire Officer (UFO)

All detectors shall be identified by labels fixed to the base, identifying the circuit and detector number corresponding to the numbering plan on the as installed drawings and 'Schematic Zone' diagram.

Large rooms/area may be deemed to require Remote Detector indicators for Fire Service advice. Such specific rooms/areas requiring remote indicators shall be determined by Building Surveyor and/or the UFO.

On recent projects, the QRFS has required the installation of thermal detectors not smoke detectors in laboratories and kitchenettes. Prior to designing the detection system in any such spaces, the Fire Services Consultant shall consult with and confirm the requirements of the QRFS.

### 19.07 Visual Alarm Indicators

All new buildings or any upgrade of an existing building shall have an emergency warning system installed with visual alarm indicators in accordance with AS 1603.11, comprising dual AMBER and RED flashing lights. The AMBER light shall be programmed to flash on an 'Alert' alarm, and the RED light will be programmed to flash on an 'Evacuate' alarm.

### 19.08 Fire Services Wiring

All fire alarm wiring between floors shall be run in a separate, accessible cable tray or metal duct.

Trays and the duct shall be painted RED in colour where exposed or colour banded where concealed.

Fire Alarm cables shall not run on the same cable trays as electrically energised cables or be installed in Electrical or Data cable risers.

Refer to [Section 20.00 Electrical Services](#) for wiring in ceiling spaces and riser ducts.

## **19.09 Hydraulic Fire Services**

### **19.09.01 Water Supply**

The water supply for hydrants and hose reels shall be provided via a separate water service to the building isolated by double check valves located in the Valve Room.

### **19.09.02 Hydrants**

Hydrants including signage and block plans shall be provided in accordance AS 2419.1.

Unless otherwise specified, hydrant systems shall be a 'wet pipe' system.

System designs, hydraulic calculations and variations shall be submitted and agreed to with CLF prior to installation.

Hydrant booster installations where required shall meet the requirements of AS 2419.1/2/3.

The location, colour and design of fire booster installations shall be approved by the Building Surveyor and the QFES prior to design finalisation.

The design of the enclosure must be approved by OFM. Masonry construction is preferred to metal cabinets.

Any inground spring type hydrants shall be of the A.W.E. (Associated Water Equipment) 'Maxi Flow' nylon coated type.

Where internal hydrants are installed, a safe discharge point shall be provided for the testing of the most disadvantaged fire hydrants. The discharge point shall be fitted with a 65mm round QRFS thread coupling and shall discharge to the Stormwater drainage system.

The discharge pipework shall be braced and supported to the approval of the UFO.

### **19.09.03 Hose Reels**

Fire hose reels shall be provided to serve all buildings and shall be of 'Wormald' manufacture, or an alternative approved by the UFO.

Installation of the hose reel system shall comply with Part E2 of the BCA.

### **19.09.04 Fire Sprinklers**

A fire sprinkler system shall be provided where required in accordance with Spec E1.5 of the BCA and AS 2118.4.

### **19.09.05 Testing**

Water supply pipelines for Fire Mains and Services shall be tested at 2.1 Mpa for twelve (12) hours and generally kept charged thereafter.

Fire Hydrants and Hose Reels shall be tested for pressure and flow as required by the BCA and QFES. Such tests to be certified by the responsible design consultant.

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## 19.10 First Attack Fire Fighting Equipment

### 19.10.01 Fire Extinguishers

Fire extinguishers shall be provided to all areas in accordance with the BCA. Only extinguishers approved by SA are acceptable.

In general, the following extinguishers should be used for standardisation and shall be provided under the Contract:

General Office areas (where Hose Reels are not installed)	Air Water	9 litre
Cooking areas (commercial)	Wet Chemical CO2	7.5 litre 3.5 kg
High electrical hazard – main switchboard	Dry Powder	2.5 kg
Plant Rooms	Dry Powder	4.5 kg
Laboratories (adjacent each Fire Hose Reel or in designated "Fire Cabinets")	Dry Powder	4.5 kg
Fume Cupboards	Dry Powder	2.5 kg of 5b rating

Extinguishers should be used where the risk so demands. All extinguishers shall be provided with coded location signs and usage signs in accordance with the requirements of AS 1851.

Extinguishers shall be installed in accordance with the requirements of Australian Standard 2444 and at a height agreed with the UFO.

### 19.10.02 Fire Blankets

Fire blankets shall be installed in all commercial kitchen areas and in laboratories. Locations shall be approved by the UFO.

## 19.11 Special Fire Systems

Where required by Legislation or other reasons, provide special systems such as;

- Gas extinguishment systems
- High velocity water spray systems
- High expansion foam systems
- Sprinklers

Any proposal for any of the above systems should be discussed with CLF prior to documentation.

## 19.12 Door Hold Open Devices

The requirements for hold open devices activated by the fire alarm systems are outlined in [Section 11.00 Doors & Hardware](#).

Hold open devices on Smoke or Fire doors shall **not** be of the 'Combination hold open/Auto door closer' type. The hold open devices shall be wall mounted at 1800mm above finished floor level, and any variation to this height shall be at the discretion of the UFO.

The hold open devices shall be of a type, manufacture, configuration and design as agreed to by the UFO if they are an alternative to those nominated in [Section 11.00](#).

Electro magnetic hold open devices (EMHODs) shall be provided on all fire doors in fire isolated stairwells used for occupant circulation.

### **19.13 Door Control**

Any doors secured by electric locks must be interfaced with the fire alarm system as outlined previously in this Section.

Refer to [Section 11.00](#) for details of electric lock types.

### **19.14 Smoke Exhaust Systems**

Any smoke exhaust systems incorporated into the building design shall be in accordance with the BCA and the relevant Australian Standards.

### **19.15 Fume Cupboards**

Fire protection measures for Fume Cupboards shall comply with AS 2243-8 and with AS 3689-1 for Specialised Protection.

### **19.16 Fire Hazard Indices**

Commonwealth Fire Board Fire Safety Circular 73 'Linings for Buildings' including *Early Fire Hazard Indices* shall be used as a guide to determine acceptable materials for use in buildings.

Fire Hazard Indices information shall be provided to the UFO during the design stage.

### **19.17 Hazcem Signage**

Appropriate signage shall be determined and installed in all areas deemed to require such signage on the completion of all new buildings and refurbishments.

### **19.18 Emergency Services Vehicle Access**

Access requirements for Fire Services vehicles shall be designed to accommodate the **largest** vehicle in service of the normally attending Fire Service.

Dimensions of vehicles should be obtained from the Motor Officer or other nominated Officer of the QRFS, or from either the Superintendent or UFO.

Access requirements shall be determined at the schematic stage of design and submitted for review to the Building Surveyor and the QFES.

### **19.19 Inspections & Documentation**

**Pre Approval Inspections** - Building Fire Safety Systems shall be fully tested to the approval of the UFO **prior** to final approval inspections being carried out by QFES Community Safety Officers.

**Inspections During Construction** - The UFO and Building Surveyor, and the relevant QFES Officers shall be notified before completion and prior to covering up any Special Fire Services to allow any required inspections to be carried out.

**Final Inspections** - Authority for final inspections by QFES Community Safety Officers shall be the responsibility of the Building Surveyor and/or the UFO.

**Documentation** - The following documentation shall be available at the time of both inspections as required by QFES;

- Installation certificates (fire alarm systems, hydraulics, smoke control, etc).
- Test certificates for installed systems.
- Draft/Final Fire Alarm Zone schematic diagram.
- Draft/Final system 'Block Plan' (if applicable)

All Draft documentation **must** be provided for the Pre Approval inspections by the UFO.