



FIRE SAFETY SYSTEMS SPECIFICATION



AMENDMENTS

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1.0 **INTRODUCTION**

This guide relates to the requirements for the supply and installation of fire safety systems.

The appropriate British Standards, in particular BS 5839, BS EN 12845:2004+A2:2009 and BS 7671 and its amendments shall be adhered to at all times.

The use and application of material covered in this guide shall be in accordance with the requirements of the University.

**ALL WORKS ARE TO BE INSPECTED BY
THE TENDERING CONTRACTOR PRIOR TO PRICING**

HEALTH AND SAFETY STATEMENT

Health and Safety precautions are required to be taken during the process of undertaking works within buildings cannot be underestimated.

Reference shall be made to the University Health and Safety Policy and Contractors Guidance documents available from the University or from the Contract Administrator.

The Health and Safety Executive (HSE) publish a series of guidance documents regarding different methods of protecting the workforce and people in general when undertaking potentially dangerous work activities.



1.1 FIRE ALARM INSTALLATION

1.2 Design and Specification

The designers of any new installations or adaptations to existing installations shall comply fully with all requirements of BS 5839-1 2013 L1 standard.

The designers may not vary this specification unless agreed in writing with PAF Operations at G9 level.

All plant and equipment must be open protocol. The University will not accept any closed protocol plant or equipment.

The work to be undertaken in this section covers the supply, installation, testing and commissioning of a fire detection and alarm system for the works. This includes all necessary upgrades to the fire graphics system.

The designers shall fully acquaint themselves with the activities which will take place in the protected area, particularly those involving materials and processes.

The installation, including all detection and interface equipment shall be analogue addressable and be installed throughout the works to give audible and visual indication of a fire in the event of a manual call point or an automatic detector being activated.

The scope of works shall include testing and setting to work and 100% out of hours demonstration to the University, of the complete system operation and control, by a qualified Engineer.

The scope of works shall include a full out of hours cause and effect demonstration to include any linked buildings.

The tools employed in the installation process and the methods of work shall also comply with the relevant Standards and Codes.

1.2.0 Installation Wiring

(a) The system shall be installed using pliable CWZ (enhanced) zero halogen, low smoke (OHLS) sheathed cables to detectors, sounders, call points, etc. from the main control panel and sub panels.

(b) Be BASEC approved.

(c) Cable sheaths or serving are to be red.

(d) Of only one manufacturer.

1.2.1 Mineral Insulated Copper Sheathed Cables (LSEZH)

(a) Generally as specified previously in this guide.

(b) Be BASEC approved BS.7629 and BS.6387 CWZ Enhanced, coloured red.

(c) Of cores and conductor sizes as detailed on the drawings.

(d) Of only one Manufacturer.



1.3.0 Segregation of Services

Independent cable tray and conduit systems shall be provided as detailed in the relevant sections of this guide.

In addition to other conduit systems, an independent galvanised installation shall be provided for fire alarms only.

1.4.0 Mains Power Supplies

All mains (230V 50Hz) power supplies associated with the fire alarm system shall be provided within the scope of this Contract. The Installer, however, shall allow for liaising with all relevant Contractors and shall ensure that all mains power requirements for their system are provided.

An isolating transformer shall be provided by the Installer between the mains input (or other source exceeding extra low voltage), and the component parts of the system which include such items as chargers and door controllers. The isolating transformer shall comply with the requirements of BS EN 61558.

Opto isolation shall be provided by the Installer between any system components operating on a voltage exceeding 'extra low', and any connection or interface with the rest of the system.

Voltages used to feed the system components shall not exceed 'extra low' except where items such as visual displays are mains powered.

1.5.0 System Overview

The installation shall comprise a network of analogue addressable fire alarm control panels and repeater panels covering all the project area.

The installation shall also be interfaced back to the Central Security Office and Maintenance Office and all display device software updated as part of the works. This is to include the fire alarm graphics system.

The fire alarm panel(s) shall be Advanced MX 4000 series or successor product and be compatible with the existing site wide system.

The design of the installation shall allow for future expansion of twenty per cent spread evenly across the system, by loop with number rounded down. Therefore if a loop has a capacity for 126 devices, the maximum number of devices that can be installed will be 100.

If the installation involves adapting an existing system then the capacity shall be reviewed by the designer and if required the design will upgrade the system to retain twenty per cent spare capacity. This includes upgrading or replacing a main panel.

1.6.0 System Operational Philosophy

The fire alarm system shall, generally, operate in the following manner:-

6.1 In the event of a fire in any section of the building the whole building shall be evacuated and the main Security Office shall automatically be alerted via a dedicated 'red-care', or equivalent monitored line.

1.7.0 Proven Performance



The Installer shall provide written evidence, at tender return stage, where at least three systems of the same size and type have been in satisfactory operation in similar applications for a minimum period of two years.

A system of the same type is defined as one that includes the same type and mark of control and indicating equipment, the same type and mark of signalling equipment and the same type and mark of detectors.

1.8.0 Main Control And Indicating Equipment

General

Control and indicating equipment shall comply with the requirements of BS EN 54-2 and BS EN 54-4. The fire alarm control panel shall comprise separate processors, cross monitoring each other's correct operation for the main functions of the panel. In particular, different processors must be used for the main control function, the detection input and alarm output functions and the display function. The panel shall operate under a multi-tasking software programme with operating programmes and configuration data contained in an easily updateable non-volatile memory (EEPROM).

The fire alarm panel shall have a minimum capacity of eight addressable loops and shall be suitable for flush mounting complete with a linen stainless steel finish.

Provision shall be made for each addressable loop to be sub-divided into a maximum of 8 geographic zones. The section wiring corresponding to each zone circuit shall be protected from faults in other sections by line isolator modules.

The fire alarm panel shall have an adjustable time delay of between 0 to 360 seconds, such that on initiation of an alarm by a single automatic device, the fire alarm panel shall register the alarm, but the system sounders and output devices shall not be activated until the pre-determined time has elapsed, or a second automatic device within the same zone activates, or any manual break glass unit or beam detector is activated.

The fire alarm panel shall be capable of operating with any of the following type of automatic detection equipment:-

- (i) Conventional Detectors
- (ii) Addressable Two-State Detectors
- (iii) Analogue Addressable Detectors

In the case of plug in addressable detectors, the address code system shall utilise soft and safe addressing techniques to prevent unauthorised and potentially dangerous reconfiguration of the system.

In addition to the system network links, the fire alarm panel shall have an RS 485 port suitable for communication up to 1000 metres to other panels, BMS or graphics systems.

The communication shall be bi-directional and shall support verification.

The fire alarm panel shall have a day/night operation mode.

The fire alarm panel shall have a walk test/commissioning facility. All output devices, i.e. plant shutdown, Fire Brigade link, etc. shall be isolated when fire alarm panel is in walk test/commissioning mode.



The fire alarm panel shall have a pre-alarm warning facility, to ensure the earliest possible warning of a potential fire condition without raising the full alarm condition.

The fire alarm panel shall automatically adjust the alarm and pre-alarm threshold levels to compensate for changes in detector sensitivity due to contamination.

The fire alarm panel shall have a dirty detector fault warning facility.

All Apollo / Discovery XP95 devices should have short circuit isolators fitted inside the devices.

The fire alarm panel shall incorporate a real time clock to enable events to be referenced against time and date. This clock shall be accurate to within 1 minute per year under normal operating conditions and shall have the facility to be interrogated and updated from authorised Client personnel or from a master control point.

The fire alarm panel shall have loop based sounders.

The fire alarm panel shall have volt free changeover contacts which shall activate on a fire condition. In all cases these contacts shall remain activated until the fire alarm panel is reset.

The volt free changeover contacts shall be rated at a minimum of 1A 24V DC.

The fire alarm panel shall be capable of operating loop installed output devices. It shall be possible to programme the outputs to obtain the various output functions as detailed in this guide, on the drawings and determined by the system operation strategy.

It shall be possible to programme each output device to operate from any detection device, break glass unit or zone, either individually or in any combination.

It shall be possible to programme each output device with any or a combination of the following functions:-

- (i) Time Delay
- (ii) De-Energise or Re-Energise on System Reset
- (iii) De-Energise or Re-Energise on Alarm Accept
- (iv) Double Knock and Coincidence Mode

The fire alarm panel shall operate using an open protocol system.

The fire alarm panel shall have provision to drive and monitor up to 20 repeater panels (or alpha numeric displays) per loop providing a repeat of the functions on the fire alarm panel and a repeat of main central functions.

The fire alarm panel shall be capable of interfacing directly to an electronic radio paging system.

Where required the fire alarm panel shall have an integral dot matrix printer. In operation the printer will automatically print fire and fault conditions, including time and date of event; the panel, loop and device number; and a character device location text.

1.9.0 Enclosure



All items of control and indicating equipment shall be housed in metal enclosures having protection category IP43 in accordance with BS EN 60529. The panel shall be suitable for flush or surface mounting as required.

All enclosures shall, unless otherwise indicated, be tamperproof with key access and suitable for wall mounting. A minimum of two keys, suitably labelled, shall be provided for the panel, irrespective of commonality of locks.

There shall be no securing screw heads, nuts or rivets visible on the front panels.

Wall mounted cabinets shall be provided with a minimum of three point fixings.

Electronic equipment shall be chassis, frame or front panel mounted and of such an arrangement that the cabinet can be secured to the wall or floor, and the glands made off to the cabinet, prior to the installation of the equipment.

Large cabinets shall be provided with internal trunking to carry the cables and wiring.

Cable management in all cabinets shall be neat and shall be such that the removal of PCB's, modules or other components is not obstructed.

Adequate natural ventilation shall be provided. Any louvers or holes provided for this or any other purpose shall be fitted with an internal wire mesh to prevent the ingress of foreign bodies.

Where the equipment is rack mounted, with no rear access, a swing frame shall be used to provide access to card terminals and to any terminals for outgoing cables mounted on the back of the cabinet.

Access to all outgoing terminals shall be possible with the equipment in an operational condition.

Connections to printed circuit boards shall be made either by way of screw terminals provided with a protective device to prevent the cable being damaged by the screw head, indirect edge connections, DIL connectors or 'D' connectors. Direct edge connectors are not acceptable. Connectors shall have gold plated contacts and shall carry a type approval from a recognised Approval Authority. Cable connectors shall be minimum 1.5mm².

Plugs and plug in printed circuit boards shall incorporate a locating device to prevent them being plugged in:-

- (a) the wrong way round and/or
- (b) in the wrong connector

1.9.1 Terminations

20mm knockouts or gland plates shall be provided on the top and bottom of all control and indicating equipment cabinets for the termination of incoming cables. Inside the cabinet there shall be free space of at least 40mm between the top and bottom walls of the cabinet and any internal components to allow for the termination of the incoming cables.

There shall be a free space of at least 75mm between adjacent rows or columns of terminals.

Incoming cables shall be terminated in screw connectors provided with a protective device to prevent the cable being damaged by the screw. The terminals shall be mounted in such a way as to allow easy connection of the incoming cables i.e. not between components on a printed circuit board.

All wires terminating in screw connectors shall be fitted with bootlace ferrules.

Terminals shall be identified either by wording on the PCB (if the terminals are PCB mounted) showing the function of each terminal or by a terminal number. In the event of the terminal number option being used, a permanent label must be mounted within the control equipment showing the function of each terminal.

1.9.2 Essential Manual Controls

The system operation shall be simple to understand and shall not require the use of a keyboard. Essential controls shall be clearly labelled to indicate both their function and their method of use. Touch pad controls may be used to provide the essential control functions as described in this clause, provided that their function can be ascertained without the use of an instruction manual and provided that access is via an enable key switch or they are mounted behind a lockable door.

Controls having more than one function are only acceptable if it can be shown that their use is unlikely to lead to confusion or to delay in comprehension or operation.

Essential controls shall be grouped together and shall be distinct from non-essential controls. Non-essential controls shall be hidden from view.

The following essential controls shall be available on each panel:-

(a) A 'System Reset' Switch:

- (i) This shall be biased or momentary type so that it cannot be left in the reset position, either intentionally or inadvertently. When in the reset position, a non-silenceable fault warning shall be sounded. The action of this switch shall be to reset any fire latch (providing the products of fire have cleared), and to return the system to a quiescent state. Optionally this switch may also reset any latched faults or alternatively a separate switch may be provided for this function.
- (ii) It is permissible for the reset function to be provided by multiple switches, perhaps on a zoned basis, provided the general requirements of this clause are met.

(b) An 'Alarm Control' Switch (or Switches):

- (i) An 'alarm control' switch shall be provided for each group of alarm warning devices (alarms may be taken to be audible, visual or both). The switch (or switches) shall provide the following facilities:-

- Silence
- Test alarm continuous
- Test alarm intermittent
- Evacuate

- (ii) When an 'alarm control' switch is in the silence position, a non-silenceable fault warning shall be given. Under no circumstances shall it be possible for the alarm warning devices to be energised when the switch is in this position.

The operation of a 'test alarm control' switch shall not call the Fire Brigade or switch off ventilation etc.

(c) An 'Accept Fire Alarm' Switch:

- (i) The 'accept fire alarm' switch shall be of a biased type so that it can neither intentionally nor inadvertently be left in the 'accept' position. When in the 'accept' position a non-silenceable fault warning shall be output. The function of this switch is to silence the alarm warning devices when, and only when, they are energised with the alarm control switch in the 'automatic' position.

The action of this switch shall be updating so that a fire signal from a previously quiescent zone will cause the alarm warning devices to be re-energised. It shall be possible to repeat the silence and re-energise cycle for as many times as there are zones on the system.

(d) A 'Fault Warning Silence' Switch:

- (i) The 'fault warning silence' switch shall have an updating action so that even though one or more faults have been accepted (silenced), a new fault will cause the fault sounder to re-energise. When nominally silenced, the fault sounder shall sound for a period of two seconds every two minutes.

(e) 'Zone Isolate' Switches:

- (i) A 'zone isolate' switch shall be provided for each zone of detectors or sensors whether or not the zone is hard wired or software generated. The switch shall have the effect of disconnecting all the detectors or sensors associated with the zone in question, from the system. The switch shall be of a type where it is possible to see which state it is in. When a zone of detectors is isolated, a 'zone isolation fault' LED shall specifically identify the isolated state of the zone in question, and a buzzer shall sound.
- (ii) The requirement for a 'zone isolate' facility is not intended to exclude the isolation of detectors or sensors, on an individual basis. Where detectors or sensors are individually isolated, an 'isolation fault' LED shall specifically identify the isolated state of the device in question. The fault signal may be displayed on a visual display unit specifically reserved for this function, in which case there is no requirement for individual 'isolation fault' LED's.

1.9.3 Indicating Equipment

The following indicating equipment shall be provided as a minimum on the panel:-

1. Main Fire Indicator:

- (a) The indicating equipment shall include a main fire indicator consisting of at least two red LED's that flash in response to new fire signals. When the accept fire switch is operated, they shall change to a state of continuous illumination but shall automatically revert to the flashing state in response to fire signals from previously quiescent zones.

2. Fire Zone Indication:

- (a) Whether or not equipment such as visual display units, alpha numeric displays or printers are included as part of the system, signals from each zone of the system shall be specifically identified by the illumination to two red zone fire LED's per zone. Where there are no hard wired zones in the traditional sense, software generated zones shall be employed to give the same general type of indication. The zone LED's shall be updating, such that fire signals from previously quiescent zones come in as pulsing indications until accepted, whereupon they become steady. Zone fire LED's associated with fire signals that have been accepted, shall remain steady until reset.
- (b) Zone fire LED's shall be labelled by name/number so that the zone with which they are associated can be identified.
- (c) Where indicated the zone fire LED's shall be placed in a mimic floor plan.
- (d) Zone fire repeater panels shall be provided where indicated.

3. 'Power On' Indication:

- (a) A green 'power on' light emitting diode shall be included on the front panels of all items of control and indicating equipment to show that they are active. The light source shall be continuously illuminated under normal condition but may be turned off or pulsed under mains failure conditions.

4. 'Main Fault' Indication:

- (a) The indicating equipment shall include a main fault indicator that shall consist of at least two amber or yellow light emitting diodes that flash in response to new fault signals. When the fault warning silence switch is in operation they shall change to a stage of continuous illumination but shall automatically revert to the flashing state in response to fault signals from previously quiescent circuits.

5. Subsidiary Fault Indicators:

- (a) Notwithstanding the possible presence of such items of equipment as visual display units, alpha numeric displays or printers, faults from individual monitoring circuits that are required either by other clauses in this guide or BS 5839 and BS EN 54-2, BS EN 54-4, shall be individually identified by the illumination of at least one amber or yellow LED. New faults shall cause the appropriate LED to flash but when the fault warning silence switch is operated, they shall change to a state of continuous illumination. Faults from previously quiescent circuits shall not cause the fault indicators identifying previously accepted faults to revert to the flashing stage.
- (b) All 'subsidiary fault' indicators shall be grouped together.
- (c) The function of each 'subsidiary fault' indicator shall be identified by a label.

The panel shall provide a facility to manually check all the discrete LED indicators. This shall be clearly marked 'Lamp Test' and be accessible at all times.

The panel shall be capable of accepting the following technical alarms as minimum:-

- Air Handling Plant
- Gas Isolating Valves
- Lift Monitoring Systems
- Beam Detector Systems
- Gas Extinguishing Systems
- VESDA Detection Systems

The signals for the above shall be via interface units installed on the detection loops.

In addition to discrete visual indication, all indicating functions shall be shown on a large character vacuum fluorescent and supertwist backlit LCD display at the panel simultaneous with control operation. The display will, under normal quiescent conditions, show the current date and time. In an alarm or fault condition, the display will identify the panel, device loop, address and zone number, and a minimum of 40 character user definable location text.

Memory Devices and Fault Monitoring

The following requirements apply to the type and use of memory:-

- (a) The main control program and detection algorithms shall be held in non-volatile and non-corruptible memory. The algorithms shall perform a trend analysis of the signal received from addressable devices in order that non-fire events may be differentiated.
- (b) Non-essential program information, such as the code necessary to drive graphics displays, may be held on disc and down loaded into volatile memory, as required.

The panel shall include a hardware based monitoring (watchdog) circuit that is polled at least once every 10 seconds

In the event of the circuit failing to be polled within the required time period, an automatic hardware based restart procedure shall commence. If the restart procedure fails and the watchdog procedure unsuccessfully attempts to restart the system three times, further restart attempts shall cease and a hardware generated fault signal shall be annunciated at the main control and indicating panel. The failure of outstation software control components need not necessarily result in a watchdog restart procedure, but shall result in a fault signal at the main control and indicating panel.

If two addressable devices have the same address, a fault warning identifying the shared address shall be given.

If an addressable device is not of the type anticipated by the system configuration, a fault warning identifying the device concerned shall be given.

All addressable devices shall be scanned at least once every 10 seconds. If a device fails to response to three successive scans, a fault warning shall be given identifying the device concerned.

A fault warning shall be given when the output of a sensor drifts outside its normal operating range. The warning shall specifically identify the type of fault and the sensor concerned. It



shall be given before the extent of the drift renders the sensor non-functional for fire detection purposes.

A special scanning sequence shall be available so that designated manual break glass contacts provide alarm indication and warning within one second of operation.

The panel shall be substantially immune to the effects of electrical interference. This is to be achieved to the satisfaction of the University by the use of such techniques as parity checking and block bit counts. The system shall not take a decision on the basis of data received before signals have been validated.

The system shall keep track of the numbers of errors detected and shall output a fault where these continue for more than 20 seconds.

The Installer shall supply a description of the signalling protocol to be used on the proposed system at the time of tender. Particular reference shall be made to the methods employed to avoid data corruption.

No facility or control shall be provided by which the user can modify the stored program.

The University shall approve a limited list of the Installer's personnel who will be authorised to change the stored program. The names shall be entered in the Operation Manual.

No changes to the stored program shall be made without the written approval of the University.

The University shall agree with the Installer a method by which person(s) authorised to modify the stored program can be controlled. This shall be written into the Operation Manual.

Printers

Printers are not to be used as the only source of essential information, but where indicated may be used as a source or supplementary information. As such they need have no standby supply but, where fitted, shall produce fault warnings in response to the following contingencies:-

- (a) Disconnection
- (b) Supply failure
- (c) Out of paper
- (d) Permanently busy
- (e) Out of ribbon (where appropriate)

Printers shall be wired with cable that is suitable for the purpose and is mechanically robust. Where used plug-in connectors shall be fitted with retainers.

QWERTY (typewriter) keyboards (whether or not they are of the key or touch pad type) shall be used only as a diagnostic tool and their use shall be restricted to approved engineers.

The following requirements apply to the use of QWERTY keyboards:-

- (a) They shall not be accessible to the operator.
- (b) They shall be accessed by a password.
- (c) They shall not be capable of modifying the control program or detection algorithm.

1.10.0 Power Supply and Batteries

Power Supply Design

Batteries and battery chargers shall be provided for the fire alarm panel.

Prior to the installation of the battery charger(s) and batteries, the Installer shall submit full design calculations (to be subsequently included in the Operation Manual) showing that the power supplies provided for the fire alarm and any associated systems will comply with the British Standard requirements, under normal and mains failure conditions, when the following factors are taken simultaneously into account:-

- (a) Battery capacity de-rated to a level that would be anticipated after 50% of its operational life.
- (b) Battery temperature at the lowest limit that would be anticipated for the environment in which it is to be situated.
- (c) Battery re-charge characteristic considered to be only 66% efficient.

The capacity of the main and the standby supplies shall be adequate to supply any current drawn to maintain the operational requirements during normal conditions and during periods of mains failure, for the specified standby time.

Ventilation control systems shall not draw current from the fire alarm system.

The battery charger arrangement shall be of the float charge type.

The maximum output current from the charger shall be less than the maximum recharge current shown in the battery manufacturer's data.

The recharge period from an exhausted state for the battery to reach a state where it could support the system for the full standby period (noted previously) shall be not more than 24 hours.

Fault Monitoring

The following conditions shall be shown as a power supply fault both at the affected power supply and at the associated control and indicating equipment:-

- (a) Loss of mains supply
- (b) Loss of charger (primary supply) output
- (c) Battery disconnection
- (d) Rupture of any fuse
- (e) Earth leakage faults
- (f) Low battery voltage (equivalent to one cell shorted out)

Tertiary Supply

Unless otherwise indicated, a tertiary supply in the control and indicating equipment, derived from a dry cell, shall power a fault sounder and LED indicating total loss of primary and standby supplies. The tertiary supply shall be capable of operating the associated fault warnings for a period of not less than 72 hours. No silencing facility shall be available for this fault warning. The tertiary supply shall be rechargeable.

Standby Period

The Installer shall provide a standby supply to all parts of the fire alarm system capable of maintaining the system in normal operation for a period of 24 hours after which there shall be sufficient capacity to operate all sounders in evacuation mode for 30 minutes. A low battery

disconnect circuit shall be provided to ensure system automatic disconnection should the battery voltage drop below a pre-set level.

Batteries

Batteries fitted as standby supplies to fire alarm system shall be of the sealed lead acid type.

Unless otherwise indicated, the selected batteries shall have an operational life of not less than 5 years at the ambient temperature in which they are installed.

Where remote battery cabinets are used, they shall be of a steel construction and may be wall or floor mounted, subject to any load bearing restrictions that may apply. The cabinet shall have a lockable, hinged front door bearing a label 'Fire Alarm Batteries'. Where the batteries are of an open type, ventilation shall be provided and the cabinets shall be treated with a corrosion resistant finish.

The batteries may share the same cabinet as the charger and need not be mounted behind a lockable hinged door. Access shall not be possible, however, without the use of a special tool (not a screwdriver).

The battery, when installed in its housing, shall be suitable for the indicated temperature range of the environment (nominal 25°C). Any heating effect due to power dissipating components within the battery cabinet shall be taken into account.

All batteries shall be labelled with a 'Replace by' date.

Battery Chargers

Battery chargers shall be housed in metal cabinets provided with adequate natural ventilation. They may be wall or floor mounted subject to the load bearing capacity of the floor or wall. They shall be secure from unauthorised access and shall be clearly labelled 'FIRE ALARM BATTERY CHARGER'. Additionally, they shall bear a BS label warning that mains voltages are present inside.

Internally, any cables carrying voltages in excess of 'Extra Low' shall be mechanically segregated from 'Extra Low' voltage cables. Terminal blocks carrying voltages in excess of 'Extra Low' shall be separate from terminal blocks carrying 'Extra Low' voltage and shall be provided with a protective cover and warning label.

All terminals shall be clearly marked to indicate their function and the charger shall carry a label indicating:-

- (a) The input voltage range
- (b) The maximum output current
- (c) The output voltage
- (d) The type of battery for which the charger is suitable

Fuse holders shall have a protective cover and shall be marked to identify the function of the associated fuse and its rating.

The charger shall include a fault sounder, accept button and front panel mounted twin LED fault indicator together with at least one set of voltage free, changeover, relay contacts to signal a loss of output to a remote location.

The fault sounder shall be continuously energised in the event of new faults, but may change to a two second pulse every minute when an accept button is pressed.

The fault LED's shall pulse in the event of a new fault, but shall change to continuous when an accept button is pressed.

The fault relay contacts shall remain in their fault position regardless of the state of the fault accept facility.

The accepted fault warning shall automatically reset when the fault disappears. An unaccepted fault shall continue to be displayed until the accept button is pressed, even though the casual condition may have disappeared.

A green LED power on indicator shall be provided on the front panel to show that the mains supply is reaching the charger.

1.11.0 Automatic Detectors

General

All automatic detectors shall be analogue addressable Apollo / Discovery XP95 protocol and shall be installed in the location shown on the drawings. Automatic detectors shall meet the requirements of BS EN 54 series and shall be approved and listed by the Loss Prevention Council Board.

All automatic detectors shall be mounted on plug in addressable bases and shall have integral zone isolating facility.

A red indicator LED shall be provided on the detector which shall illuminate when the detector reaches a pre-set alarm level. The indicator shall be operated independently of the detector from the fire alarm panel and shall only be reset by means of a key operated switch at the panel.

All LED indicators shall be installed such that they face the nearest entrance doorway to the area protected.

An output shall be provided on the detector suitable for operating a remote indicator, without modification.

It shall be possible to lock the automatic detectors in place, once the detectors are plugged into the base.

It shall be possible to install and remove the automatic detectors by the use of a proprietary pole changer. The removal of one or more detectors shall not inhibit the correct operation of the remaining detectors, and shall result in a fault signal at the fire alarm panel identifying the zone concerned, address and type of fault.

All automatic detectors shall be located such that free access can be obtained with pole changers i.e. clear of all obstructions and ductwork etc.

All automatic detectors shall be capable of operating within a temperature range of -20°C to +60°C, and a humidity range of 0% to 95% RH.

All automatic detectors shall be supplied fully tested and calibrated.



Where indicated automatic detectors, plug in bases, and short circuit isolators shall be intrinsically safe. The system shall be able to support analogue addressable intrinsically safe devices.

All bases shall have a label showing the type of device fitted and a reference identifying the location of the device within the system. The address of the device and zone and loop number shall be identified. The device label shall be neatly presented and the Installer should note that hand written labels will be unacceptable.

Where an algorithm used to determine the fire state varies with sensor type, means shall be provided to ensure that the sensors and algorithms are correctly matched.

In the event of the wrong type of detector being connected to a base, a fault signal shall be generated.

The design of the detector shall, as far as is practicable, inhibit the entry of insects and shall include measures for repelling insects.

All automatic detectors shall include RFI screening and feed through connecting components to minimise the effect of radiated and conducted electrical interference.

All ceiling mounted fire alarm equipment shall be suitable for fixing to a standard conduit box which shall be supported from the building structure by suitable, rigid means.

Unless surface mounted, or indicated otherwise, bases shall be complete with the manufacturer's purpose made special flush mounting kit.

The scope of works shall include any necessary detection devices required for ventilation systems.

Multiple Technology Smoke Detectors

Multiple technology detectors shall meet the functional requirements of BS EN 54 Series and (BS EN 54 Part 7), and shall have a sensitivity classification 'B' or better, as defined in BS EN 54: Part 9 Test Fires TF2 to TF5 inclusive, and as 'C' in Test Fire TF1. All detectors shall be Apollo / Discovery XP95 protocol.

Multiple technology detectors shall react to the whole range of fire products from slow smouldering fires to open flaming fires, sensing the characteristic phenomena of fire (heat, smoke or flame) by optical scattering technique. Multiple technology smoke detectors shall be self-verifying.

Unless indicated otherwise, multi criteria smoke detectors shall be used throughout.

Heat Detectors

Heat detectors shall meet the requirements of BS EN 54 Part 5 and Part 8.

Heat detectors of a fixed temperature variety shall operate at an upper temperature of 60°C/65°C/90°C.

Heat detectors of a rate of rise variety shall operate if there is a sudden large rise in ambient temperature.

Unless indicated otherwise, heat detectors of the dual sensing variety combining rate of rise and fixed temperature monitoring shall be employed. The upper temperature of the fixed element shall be 60°C/65°C/90°C.

Heat detectors shall utilise solid state electronics.

All detectors shall be Apollo / Discovery XP95 protocol.

Beam Detectors

Beam detectors shall consist of transmitter and receiver units.

The transmitter unit shall transmit a modulating infra-red beam to the receiving unit. The receiver signal shall be analysed and in the event of smoke being present for a pre-determined period, an alarm condition shall be activated.

The fire alarm output of the detector shall be activated in the event of smoke reducing signal strength between 40% and 90% for a period of approximately 5 seconds.

The transmitter/receiver units shall be installed between 300mm and 600mm below, and parallel to the roof/ceiling, and at a maximum range of 100m.

The detector shall have an automatic gain control to compensate for ageing and build-up of dirt, with the receiver unit also incorporating an alignment/fault lamp, clearly visible from the outside, to provide indication of both alignment and fault conditions.

In the event of a power failure at the transmitter or if the signal is reduced by more than 94% for a period in excess of 1 second, a fault shall be activated. Approximately 5 seconds after a fault condition is indicated, the control panel shall automatically reset if the fault is no longer present.

On detection of a fire by the beam detectors, a fire signal shall be transmitted to the fire alarm panel. On reset of the fire alarm panel, the beam detector shall be automatically reset.

The transmitter and receiver units shall be powered from the detection loops, and shall possess vibration sensitivity control.

All fire alarm devices shall be accessible for maintenance. No devices shall be obscured by other services.

Where devices need to be installed in awkward locations, the scope of works shall include any necessary permanent access platforms.

1.12.0 Output Interface Relay Units

Addressable output interface units shall provide volt free changeover contacts for plant shutdown, emergency lighting operation etc. and shall be operated by the fire alarm panel.

It shall be possible to programme the operation of the changeover contacts as detailed on the drawings and this guide.

The changeover contacts shall be rated at 1A minimum at 24V DC.

The output interface units shall be monitored for open circuit and shall be capable of transmitting a fault signal to the fire alarm panel. Double or multiple relay units shall be used, in agreement with the University, where proved beneficial.



A red indicator LED shall be provided on the output interface unit which shall illuminate when the device has operated.

The output interface unit shall derive its power from the detection loop unless indicated otherwise on the drawings.

Relays shall be suitably labelled to indicate their exact function, zone loop and identity.

1.12.1 Input Interface Relay Units

Addressable input interface units shall monitor either normally open or normally closed volt free contacts on auxiliary equipment i.e. air handling equipment control panels, infra-red beam detector control panels, sprinkler isolation valves/flow switches etc. and shall signal to the fire alarm panel via the detection loops.

The input interface units shall be monitored and shall be capable of transmitting a fault signal to the fire alarm panel.

A red indicator LED shall be provided on the input interface unit which shall illuminate when the device detects the operation of monitored contacts. Double or multiple relay units shall be used, in agreement with the University, where proved beneficial.

The input interface unit shall derive its power from the detection loop unless indicated otherwise on the drawings.

Relays shall be suitably labelled to indicate their exact function, zone loop and identity.

1.13.0 Manual Break Glass Units

Manual break glass call points shall comply with the requirements of BS EN 54-11.

Manual break glass units shall be analogue addressable and shall be manufactured from ABS Engineering plastic, red in colour.

All manual break glass units shall be of XP95 KAC Type, Apollo Part No. 58100-908 or Discovery range.

The break glass units shall be suitable for surface or semi-recessed mounting.

Every manual break glass call point shall incorporate a short circuit isolator so that no devices are lost for a single short circuit fault. Contacts shall have a minimum current carrying capacity of 5A at 24V DC.

Addressable manual break glass call points shall incorporate a mechanism to interrupt the normal addressable loop scan to provide an alarm response within less than 1 second.

Addressable break glass call points shall be field programmable to trigger either an alert or an evacuate response from the fire alarm panel.

Addressable manual break glass call points shall be capable of being tested using a special 'key' without the need for shattering the glass.

Where indicated on the drawings, the break glass units shall have a protection category of IP65.

The break glass units shall be capable of being operated by means of thumb pressure applied to the glass.

The unit shall retain the glass and also protect the operator from injury by means of a clear adhesive film on the front of the glass.

A red indicator LED shall be provided on the break glass units which shall illuminate when the break glass units have been activated.

Intrinsically safe manual call points shall be certified to BASEEFA, suitable for classification EEx ia IIC T4, and shall be used in conjunction with a shunt diode safety barrier for use with safe area circuits.

Where required, intrinsically safe manual call points shall come complete with all necessary interface units to ensure correct operation on an addressable system.

1.14.0 Audible and Visual Alarms

General

Visual and audible alarm devices shall be selected and installed in compliance with the recommendations of BS EN 5839-1 and in particular:-

- (a) Cables serving visual and audible alarm devices shall be monitored against open and short circuit faults.
- (b) A single open or short circuit cable fault shall not inhibit the correct operation of the alarm devices.
- (c) Where the signal to energise the alarm devices is carried over a communications ring or spur, the ring or spur shall be subject to the same requirements as other cables serving alarm devices.
- (d) A minimum of two alarm circuits shall be provided in each zone, unless indicated otherwise. The two circuits shall carry, in approximately equal numbers, the alarm devices required for the system. The alarm devices and circuits serving them shall interlace, so that failure of one circuit will not cause a total alarm loss in a major section of the system.
- (e) The arrangement of sounders shall be such that conditions are suitable for normal conversation at the main control and indicating equipment when the sounder adjacent to the equipment has been silenced but the other sounders on the system have not.
- (f) It shall be possible to manually control all sounder circuits and sounder groups, which form part of the total system (including outstation equipment), from the master control and indicating panel(s).
- (g) Beacons shall have a minimum life of 300,000 pulses (suitable for a weekly test over a 10 year period).

Combined Sounder Beacon

Combined sounder beacons shall provide audio visual warning. They shall be Apollo / Discovery XP95 compatible. The sounder shall have a minimum output of 101dBA at 1m, adjustable to a dBA level suitable for critical operating environments. (Minimum volume control of -20dBA shall be available).

The beacon shall consist of a high efficiency xenon discharge lamp, which shall pulse at a rate of 1 per second, with a maximum current consumption of 100mA. The lens shall be available in the following colours – red, blue and amber. The colour required shall generally be red,

unless indicated otherwise. Combined sounder beacons enclosed in plant rooms shall have an ingress protection rating of IP54.

The operating environment of the unit shall be -10°C to +50°C, and it shall be reverse polarity protection to prevent damage if incorrect voltage is applied.

Addressable Sounder Module

The addressable sounder module shall be capable of monitoring and driving a circuit of alarm sounders, and shall be complete with power supply unit. Units shall be Apollo / Discovery XP95 compatible.

The sounder module shall have an output rated at a minimum of 1A.

The sounder module shall be capable of operating the sounders as defined in this guide.

The sounder module shall monitor the wiring to the sounder for open/short circuit or power supply failure and transmit the necessary fault signal to the fire alarm panel.

A red indicator LED shall be provided on the sounder module, which shall illuminate when the sounder module has been activated.

Power Supply Units

Power supply units shall be provided for all zone sounder modules.

The power supply unit shall consist of an AC supply operated charger, a standby sealed lead acid battery enclosed in a ventilated housing.

Under normal conditions the charger shall provide all the sounder system power and maintain the battery in a charge condition. When the AC supply fails, the standby battery shall take over.

The power supply unit shall provide a minimum output current of 4A. The standby battery shall be rated to meet the requirements for primary fire alarm panel standby batteries, as identified previously in this guide.

The power supply unit enclosure shall be suitable for wall mounting and shall be of a minimum IP43 rating in accordance with BS EN 60529.

Each enclosure shall incorporate an ammeter and volt meter with supply on, charger fault and battery fault indicators fitted. The fault indicators shall be duplicated at the fire alarm panel which shall monitor the power supply unit status and identify a charger or battery fault through the system network at the master control panel(s).

Remote Indicator

All detectors installed in voids or other positions not easily and directly visible shall have remote indicators in directly visible positions.

Remote indicators shall provide a remote indication of an automatic detector that is in an alarm condition. Each indicator shall consist of an LED (red) mounted onto a flush white single gang high impact ABS plastic plate.

Remote indicators shall be driven directly by the associated detector, as shown on the drawings, and shall be engraved with their reference detector and a brief description of equipment served location.

The remote indicator shall be monitored for open and short circuit.

Ceiling mounted remote indicators shall have their back box adequately supported from the building structure.

1.15.0 Short Circuit Isolator

Short circuit isolator (SCI) shall provide protection to the loop by automatically isolating the section of the loop where the fault has occurred.

Short circuit isolators shall be located as required by BS.5839-1, with all latest amendments, with a maximum of 20 addressable points between short circuit isolators.

Short circuit isolators shall derive their power directly from the detection loop.

A red indicator LED shall be provided on the short circuit isolators which shall illuminate when the short circuit isolators have tripped.

1.16.0 Connection To Ancillary Equipment

The Installer shall provide signals to ancillary equipment from the fire alarm panel as identified in the Appendices and/or on the drawings.

Signals to ancillary services shall be available in the form of one relay for each service to be controlled. Each relay shall provide at least two sets of voltage free changeover contacts which shall be suitable to switch the load.

The system shall be configured so that upon receipt of a fire signal at a fire alarm panel, either from an automatic or manual service in the system, a sensing relay shall be activated in the panel to simultaneously trigger a signal to ancillary services which shall effect an instantaneous operation.

The system configuration shall allow for ancillary services activation on a zoned release basis, a sector release basis or a complete building release basis through selectable system software.

The undernoted ancillary services functions shall, in general, be interfaced to the fire alarm system (reference should be made to the Appendix and/or drawings for specific panel and zone interface/activation requirements):-

- (a) Isolation of air handling units.
- (b) Disengagement of access controlled doors.
- (c) Release of all held open and power operated doors.
- (d) Isolation of gas supplies.
- (e) Isolation of lifts, allowing them to return to their terminal stop (a secondary interface shall also be provided, allowing the lifts to move to an alternative stop should the terminal stop have a fire within).
- (f) Release of Security Locks.

Any test control or other facility present on the fire alarm system shall not initiate ancillary service activation, unless it is the ancillary interface that is under test. Extinguishing system interfaces shall be isolated during maintenance and tests, with a fault signal given at the fire alarm panel to confirm and identify the extinguishing system isolation.

The design of the fire alarm system shall be such that no signal to release an ancillary service (particularly extinguishing systems) can be generated by any abnormal condition of a power supply unit. An abnormal condition includes the total or partial loss of either the mains or the standby batteries, any transient voltage spikes, surges or dips.

The Installer shall provide Fire Officer key switch control of ancillary services at the fire alarm panel.

1.17.0 Closing Of Smoke And Fire Doors and Powered Opening of Common Room Smoke Vents

Where indicated, the Installer shall provide an addressable fire alarm relay module and transformer rectifier unit to release smoke and fire stop doors on the detection of a fire. Unless otherwise indicated, the signal to initiate release of the door shall come from detectors immediately either side of the door only.

Unless otherwise indicated, fire and smoke stop doors shall close in the event of a failure of the mains supply.

The automatic vents shall be supplied and installed within the scope of works.

1.17.1 Plant Modules

The Installer shall supply and fix fire detection equipment within the various plant modules as indicated. Where packaged units are used, designated points/areas have been allocated for the mounting of fire alarm items. In the event that additional/alternative locations are required, these shall be discussed and agreed with the University before fixing commences.

1.18.0 End Of Line Devices

The locations of all 'end of line' devices shall be clearly marked on all "As-Fitted" Drawings, with a red disc mounted on the device containing the 'EOLD'.

1.19.0 Schematic Diagrams

The Installer shall further provide a specialist wiring diagram of the actual wiring arrangement as part of their Working Drawing information.

1.19.1 Mimics, Instructions, Charts And Labels

The location, content and presentation of all permanently mounted drawings, instructions, charts and labels shall be agreed by the University prior to fixing into position.

The Installer shall provide and mount on or adjacent to all main control and indicating equipment, the following items:-

- (a) An instruction chart detailing the actions that the Operator should take in the event of fire and fault alarms. This shall include the following items (where appropriate):-
 - (i) Evacuation procedures
 - (ii) Procedures to call the Fire Brigade
 - (iii) Procedures to control ancillary services
 - (iv) Fire fighting procedures
- (b) A set of operating instructions that are adequate to explain the use and function of the control and indicating facilities.

- (c) As the building is split into zones for detector/sensor identification purposes, a drawing of the building shall be provided identifying the zones and the positions of the detectors/sensors therein.
- (d) As the building is split into sounder groups for alert and/or evacuation purposes, a layout drawing of the building shall be provided to identify the sounder groups and their location.
- (e) Where the sensors are identified by a displayed number, a chart shall be provided describing the location of each sensor in terms of its number, its location within a major fire compartment of the building. This chart shall be provided notwithstanding the presence of any system components such as printers, visual display units or alpha numeric displays.

A drawing shall be provided showing the installation boundaries.

- (f) A label which shall include a 'write on' section to be filled in by Maintenance Engineers shall be provided to show when the system's next service is due (interval as appropriate for the agreed maintenance plan for the building). This label shall be clearly visible to the users of the building.
- (g) A label shall state the name, telephone number and address of the organisation responsible for servicing and maintaining the fire alarm system. If other arrangements have been made to cover call-outs, these shall be shown.
- (h) A label shall be provided with a 'write on' section to show the name and telephone number (home and work) of the person responsible for the day to day operation of the system. The label shall be in such a position as to be clearly visible to the Brigade personnel.

All batteries supplied as part of the system shall be fitted with a label stating when they are to be replaced.

1.19.2 Label Specification

Where labelling is required by this guide, or by a reference (direct or implied) to other Standards, it shall meet the following requirements:-

- (a) Labels are to be physical entities (not software generated messages on a display).
- (b) Labels shall be of the engravable coloured laminate type or shall be screen printed onto front panels.
- (c) Letter size shall be 3mm high, or larger.
- (d) Colour is optional except where otherwise specified.
- (e) Labels when not directly engraved or screen printed shall be clamped to front panels by a process with which the head of the securing device is not visible. Adhesives are not permitted.
- (f) Where labels are of a type that requires updating, they shall be provided with a section that has adequate space to enable them to be used for their intended purpose, for a period of not less than five years. They shall be suitable for use with an indelible pen.



The Installer shall submit a schedule detailing all proposed equipment to be labelled, together with label details, to the University for approval 28 days prior to commencement of labelling.

1.20.0 Building Management System Interface

The fire alarm system shall incorporate software interfacing facilities to allow system operating conditions to be transmitted to the BMS. This information shall be in the form of standard serial data with an open protocol allowing bi-directional data transfer. To facilitate this integration feature the fire alarm system shall comply with the requirements of BS EN 50133-1.

This protocol shall be fully documented and made available, at no cost, to the Mechanical Installer.

1.21.0 System Configuration Files And Master Software Disks

The Installer shall list at the tender stage and subsequently provide a complete back-up set of all system configuration files and master software disk supplied in an appropriate lockable storage facility.

All system and data files shall be current at the handover date, disks to be suitably identified and directories and files cross-referenced in the Maintenance Manuals. The storage unit and key shall be handed to the University at handover. The original files and software disks shall be held by the Installer for a minimum of 25 years.

1.22.0 Future Expansion Capabilities

The Installer, at tender stage, shall describe the expansion capability of the proposed system. This shall include the incorporation of addition I/O capacity within the intelligent devices and additional communication lines to future intelligent devices. The equipment described shall be from the same family as that proposed for this system and by fully compatible with it.

The Installer shall describe the potential of the proposed system to support future connections to the future external systems. In particular, trouble call, training simulator, wall diagram display and local report PC's shall be considered.

This information shall also be provided at tender return stage.

1.23.0 Functional Design Specification

In order to facilitate a structured project plan for both the hardware and software design and implementation phase, the Installer shall provide a Functional Design Specification (FDS) at an early stage of the project.

This document shall provide the definition of the full fire alarm and detection system functionality and list the items that are to be included. Details of all fire alarm and detection system set-ups shall be incorporated with information relating to intelligent device configurations and database information highlighted. Fire alarm and detection system configurations to co-ordinate the various system operating and interface modes identified, shall also be provided.

This document shall be submitted to the University who will review and approve it within an agreed period.

1.24.0 System Co-Ordination

The Installer shall allow for any necessary relay units to facilitate systems interface and compatibility.



Where necessary, this shall include the free issue of fully documented protocols.

The Installer shall allow for liaising with, passing information to and attendance on all other installers, as necessary, to ensure correct system operation and cabling installation.

This shall include confirmation of suitable signals and operation of ancillary services as specified and detailed on the drawings.

All attendance and information requirements shall be as agreed and controlled by the University.

1.25.0 Auto-Dialler

An auto dialling facility shall be supplied and installed as part of the installation.

The auto-dialler shall, on receipt of the appropriate signal from the fire alarm panel, connect through to the supervising location.

The Installer shall be responsible for arranging, organising and programming the necessary Red Care line required to work in conjunction with the Auto-Dialler.

1.26.0 Spare Parts

The following spare parts are to be supplied:-

- 5 - Smoke Detectors
- 5 - Heat Detectors (Rate of Rise)
- 2 - Heat Detectors (Fixed Temperature)
- 5 - Glass for Break Glass Call Points
- 5 - Fire Alarm Sounders
- 1 - Fire Alarm Log Book

1.27.0 Commissioning and Demonstrations

After all equipment has been installed and connected the complete system must be tested and commissioned by the Manufacturer's Representative, any connection charges by the Manufacturer must be included in the Tender Cost.

Triplicate copies of working instructions and literature must be provided in bound folders and a demonstration arranged with the Manufacturer of the complete installation on completion.

A minimum of two demonstrations will be required for the number of staff involved.

1.28.0 Information to be supplied with Tenders

The following information shall be given with the Tender:

- (a) Delivery period required.
- (b) General description of the equipment and controls with illustrations and drawings where available.
- (c) Weight of major items of equipment.

1.29.0 Service



The Installer shall include for the Specialist Fire Alarm Equipment supplier attending site four times during the 12 months defects liability period at three monthly periods to carry out full inspections and testing of the complete fire alarm system including remote monitoring. The last inspection and test visit shall include a full overhaul of the equipment and associated apparatus.

1.30.0 Manufacturers

All fire alarm equipment must be obtained from one of the Specialist Manufacturers as detailed in Appendix 1, including all panels, detectors, alarms, break glass contacts, batteries and relays to provide a complete fire alarm installation to comply with the "Operation of the System".

Any variation required to the internal wiring (a two wire system for alarm and two wire for contacts and all detectors has been included) in number of cores allowed or cable sizing must be clearly stated at the time of tendering, and all batteries included for must be capable of catering for the alarm loads detailed with the sizes of cables included.



1.40.0 Components

Part Description.	Part number.
Discovery Optical smoke detector	58000-600
XP95 Optical smoke detector	55000-600
Discovery Ionisation smoke detector	58000-500
XP95 Ionisation smoke detector	55000-500
Discovery Multi sensor detector	58000-700
XP95 Multi sensor detector	55000-885
Discovery Red call point with isolator	58100-908-Note KAC test key type
XP95 Red call point with isolator	55100-908-Note KAC test key type
Discovery Heat detector	58000-400
XP95 Heat detector	55000-400
Discovery Red call point waterproof IP67 with isolator	58100-951-Note KAC test key type
Detector base with expert card	45681-210
Discovery Sounder/Beacon base with isolator	45681-393
Discovery open area Sounder/Beacon with isolator	58000-005
XP95 Integrated base with isolator	45681-277
XP95 Integrated sounder/beacon base with isolator	45681-330
XP95 I/O unit	55000-847
Advanced MX4000 fire panels	MX-4404 (4 loop version)

Alternative components will only be accepted with the PRIOR written agreement of the City, University of London, Operations Department Operations Manager or Chief Engineer.



APPENDIX 1 : UNIVERSITY SPECIFIC MANUFACTURERS / REQUIREMENTS

ITEM	MANUFACTURER / REQUIREMENT
Level of Protection L1	
Requirement for Link Back to a Central Security Office and Maintenance Office	
Panel Manufacturer	Advanced 4400 / MX series.
Protocol shall be Open	
Fire Extinguisher Brackets Water Foam etc.	Checkfire Ltd.WB08/NS
Fire Extinguisher Brackets CO ₂	Checkfire Ltd.WB09/NS
Fire Extinguishers (Standard)	Commander Range
Fire Extinguishers (Stainless)	Commander Range
Emergency Exit signs (single sided)	Jalite 405J Rigid PVC Photo Luminescent
Emergency Exit signs (double sided)	Jalite 430DSJ Rigid PVC Photo Luminescent
Fire Action Notice Signs (Perspex)	Perspex Fire Action Notice c/w Locators: Product Code: 402PX/BES/CUL Size: 200 x 300mm As supplied by CheckFire
Fire Action Notice Signs (Brushed Aluminium)	Brushed Aluminium Fire Action Notice: Product Code 402BA/BES/CUL Size: 150 x 200mm As supplied by CheckFire



2.1 Fire Extinguishers

The designer and contractor shall agree with the University Safety Office the location of all fire extinguishers and produce a drawing showing this for sign off by the Safety Office.

The designer and contractor shall agree with the City University Project Manager whether fire extinguishers are to be standard or stainless steel finish.

The contractor shall ensure that walls in the fire extinguisher positions are adequately constructed to support the designated brackets in Appendix 1 above.

2.2 Fire Exit Signs

The designer and contractor shall agree with the University Safety Office the location and type (left, right etc.) of all emergency fire exit signs and produce a drawing showing this for sign off by the Safety Office.

The contractor shall ensure that all signs are adequately constructed and comply with the requirements of Appendix 1 above.

2.3 Fire Action Notice Signs

The designer and contractor shall agree with the University Safety Office the location of all Fire Action Notice Signs and produce a drawing showing this for sign off by the Safety Office.

The contractor shall ensure that all signs are adequately constructed and comply with the requirements of Appendix 1 above.