APPENDIX B

PRE-TENDER HEALTH AND SAFETY PLAN

Refer to pre-tender Health and Safety Plan by CDM Co-ordinator.

**APPENDIX C**

## PLANT ASSET NUMBER REQUEST FORM

PROJECT: _____ FILE REFERENCE: _____

BUILDING NAME: _____ BUILDING NO: _____

LOCATION IN BUILDING: _____ PLANT ACQUISITION FORM N°: _____

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| PE OF PLANT: | SYSTEM APPLICATION OF PLANT: | LOCATION OF PLANT & ANCILLARY COMPONENTS: | PLANT ASSET NUMBER: | INSTALLED COST OF PLANT : (INC VAT) | ANTICIPATED LIFE: (YEARS) | MAINTENANCE RESPONSIBILITY: |
| | | | | | | |

OJECT SUPERVISOR: _____

ATE: _____

COLUMNS 1, 2, 3 & 5 TO BE COMPLETED BY CONTRACTOR

COLUMNS 4, 6 & 7 TO BE COMPLETED BY CE

APPENDIX D

PERMIT TO ENTER/WORK PROCEDURES

Contents

PERMIT TO ENTER/WORK PROCEDURES

1.00 PERMIT 'D'

1.01 The College operates a Permit to Enter/Work Procedure in the following areas (Permit D):-

a) All laboratories;

b) All Animal Rooms;

c) All Plant Rooms, Electrical Switch Rooms, Lift Motor Rooms, Water Tank Rooms;

d) Telephone Exchange Rooms;

1.02 Before entering/working in any of the above areas the Contractor shall obtain a Permit to Enter (Permit D) and comply with the rules for its use listed below:-

a. Contractors in Plant Rooms/Switch Rooms/Lift Motor Rooms/Tank Rooms and Telephone Exchange Rooms.

i) Contractors must contact the issuing officer detailed for the issue of permit and the access keys.

ii) Prior to entering the plant room the Contractor must display the blue copy of the permit to work on the door.

iii) The permit must be displayed at all times whilst the Contractor is occupying the plant room.

iv) On completion of works or expiring the permit must be returned to the issuing officer.

v) If work in the area is interrupted or on leaving the area in the evening, the plant room must be left in a safe and tidy condition and the permit displayed in case emergency access is required If it is not possible to leave the area in a safe and tidy condition, the Engineer must be notified and a contract number provided. The Engineer must notify the issuing officer in case emergency access is required.

UCL tradesmen are not to enter restricted areas where a contractors Permit to Work is displayed, without permission of their trade supervisor.

1.03 Permits to enter Plant Rooms, Lift Motor Rooms and Water Tank Rooms will be authorised by the following College Issuing Officers:-

a) Chief Engineer
b) Senior Maintenance Engineer
c) Maintenance Engineers (Operational Maintenance)
d) Mechanical/Electrical Supervisor
e) Mechanical/Electrical Foremen Supervisor
f) Maintenance Supervisor (Inst. of Orthopaedics)
g) Maintenance Supervisor (MSSL)

1.04 Permits to enter Telephone Exchange rooms will be authorised by the following College staff:-

a) Communications Engineer
b) Telephone Technician

1.05 Permits to enter laboratories and Animal Rooms will be authorised by the Engineer.

2.00 PERMIT 'E'

2.01 The College operates a Permit to Enter Confined Spaces in the following areas (Permit 'E').

a) Boilers

b) Ventilation Flues

c) Service Ducts

d) Main Stacks

e) Enclosed Tanks

f) Sewers and Manholes

2.02 Before carrying out work in any of the above areas the Contractor shall obtain a Permit to Enter (Permit E) and comply with the rules for its use listed below:-

a) UCL personnel and Contractors must contact staff detailed for the issue of permit.

b) Prior to entering the Confined Space the blue copy of the permit to work must be displayed prominently adjacent to the Confined Space before entry.

c) The permit must be displayed at all times whilst the confined space is entered.

d) THE PERMIT IS ONLY VALID ON THE DAY OF ISSUE.

e) On completion of works or expiry the permit must be returned to the issuing officer.

f) If work in the area is interrupted, or on leaving the area in the evening, area around the item must be left in a safe and tidy condition and the permit displayed in case emergency access is required.

g) If it is not possible to leave the area in a safe and tidy condition, the Engineer must be notified and a contact number provided. The Engineer must notify the issuing officer in case emergency access is required.

2.03 Permits to enter confined spaces will be raised and authorised by the following Issuing Officers:-

a) Chief Engineer
b) Senior Maintenance Engineer
c) Maintenance Engineers (Operational Maintenance)
d) Mechanical/Electrical Supervisor
e) Mechanical/Electrical Foremen Supervisor
f) Maintenance Supervisor (Inst. of Orthopaedics)
g) Maintenance Supervisor (MSSL)

3.00 PERMIT 'F'

The College operates a Hot Work Permit where it is required to undertake the following types or work (Permit F):-

a) Welding
b) Cutting
c) Grinding
d) Gouging
e) Brazing
f) Burning
g) Hot leading
h) Roof works involving Tar Boilers and Heating Guns.

3.02 Before carrying out any of the above types of work the Contractor shall obtain a Hot Work Permit and comply with the rules for its use listed below:-

a) Personnel must contact a member of staff detailed above for the issue of a permit.

b) Prior to entering the area concerned the contractor must display the blue copy of the permit on the door.

c) The permit must be displayed at all times whilst the contractor is undertaking hot work.

d) On completion of works or expiry the permit must be returned to the Issuing Officer.

e) The Contractor shall examine the area to ensure there are no combustible liquids, vapours, gases or dust present.

f) The Contractor shall ensure that all combustible/flammable materials have been removed or protected against heat and sparks.

g) The Contractor shall provide a safety man with fire extinguishers whilst the operations are in progress.

h) The Contractor shall ensure all smoke and heat detectors in the area are isolated.

i) At completion of the work the Contractor shall inspect the work and adjacent areas to ensure that it is free from any damage or hazard which might result in a fire.

j) THE PERMIT IS ONLY VALID ON THE DAY OF ISSUE.

3.03 Hot Work Permits will be raised by the Engineer.

4.00 PERMIT 'G'

4.01 The College operates a Permit to Work on Specific Systems (Permit G) to prevent uncontrolled isolation and restoration of services which may endanger life or cause damage to College buildings or equipment. A specific system is any mechanical or electrical system that feeds whole or part of the building.

4.02 Before carrying out work on a Specific System the Contractor shall obtain a Permit (Permit G) and comply with the rules for its use listed below:

a) When an entire system is to be isolated or where isolation of a piece of equipment will necessitate a complete system to be stood down, then the person requiring such isolation shall contact an appropriate person on the authorised list depending upon whether the work is maintenance or project, mechanical or electrical, for the issue of a Permit.

b) When part of a system only is to be isolated and where it is largely only the area of works which is affected by the disconnection of service, then the person requiring such isolation shall contact an appropriate person on the authorised list depending upon whether the work is maintenance or project, mechanical or electrical, for the issue of a Permit.

c) When part of a system only is to be isolated or where isolation of a piece of equipment will entail part of a system to be stood down and where significant areas of the building outside of the area of works will be affected by the discontinuation of service, then the person authorised to issue a Permit shall be selected from the listing under Operational Maintenance irrespective of whether the work is maintenance or project.

d) It is not intended for this Permit to be issued for works of a minor nature and therefore IDO works and works where only a few rooms would be affected by the isolation of a system are generally excluded from the need to obtain permit G. If there is any doubt as to the applicability of Permit G, in particular circumstances, then the Safety Manager should be consulted.

Although Permit G does not apply to works of a minor nature, nevertheless when systems are isolated and subsequently restored an appropriate safety protocol shall be observed, especially in the case of intrinsically hazardous systems such as electrical, natural gas, laboratory gases, steam etc. Guidance on a suitable safety procedure can be obtained from the Safety Manager.

e) As much notification as possible shall be given when a system is to be isolated and the person requiring a system to be isolated should make preliminary arrangements for that event even though the exact date may be unknown at the time. When the isolation is to be carried out by Operational Maintenance on behalf of another section, the exact date must be confirmed at least 3 working days beforehand.

f) Immediately prior to isolation the issuing officer will inspect the system to ensure that all matters affecting safety have been taken into consideration.

g) The system shall be made safe by the UCL Tradesman/Contractor under the direction of the issuing officer who, when satisfied that the system is safe, shall isolate the system. All valves shall be chained, all isolators switched off and all the fuses withdrawn.

h) The issuing officer shall ensure that warning notices of isolation are fixed and Permits displayed.

i) Issuing Officers shall retain all keys and fuses as only they can restore the isolated system to service.

j) When the system is restored to service the following procedure shall be observed:-

i) The Issuing Officer shall be advised by the Engineer, if they are not the same person, that the work has been completed and inspected, that all mechanical and electrical tests have been carried out and are satisfactory, and that the new works are in a safe condition.

ii) On receipt of this information the Issuing Officer shall restore the system to normal service and at the same time witness any additional tests which may be necessary to ensure the safe working of the total system, for example, pressure testing gas systems to confirm that outlet taps have not been left open on large systems during the period of isolation.

iii) When the safe working of the system has been proved the safety notices shall be removed and the Permit cancelled.

4.03 Permits to work Specific Systems will be raised by the following College authorised persons.

1. Engineering Assistant (Mechanical)
2. Engineering Assistant (Electrical)
3. Electrical Technician

## APPENDIX E

Articles within the scope of the 'Pressure Systems and Transportable Gas Containers Regulations 1989'.

PROJECT: _____ FILE REF: _____

BUILDING NAME: _____ BUILDING NO: _____

DATE: _____

| A RTICLE | LOCATION | MANUFACTURER | DETAILS, OR REFERENCE OF ATTACHED MANUFACTURER'S DETAILS / CERTIFICATES |
|---|---|---|---|
| | | | |

UNIVERSITY COLLEGE LONDON
ELECTRICAL ENGINEERING SERVICES
REPLACEMENT EMERGENCY LIGHTING AND FIRE ALARM SYSTEMS

# 2.0 V90 PARTICULAR SPECIFICATION

## 2.0 V90 PARTICULAR SPECIFICATION

### 100.010.1 GENERAL INFORMATION

#### 100.010.1.1 Introduction

The principle contract comprises the works situated in Grade 2 listed Buildings 22-26 Gordon Square.

The works consist of disconnecting and stripping out of existing emergency lighting and fire alarm systems and removing from site, supplying and installing the new emergency lighting and fire alarm systems as indicated on the drawings and as detailed in the specification.

The Contractor shall liaise with the Engineer and also the University College London Electrical Building Services Engineer, Mr Chris Marshall, for arrangements for carrying out any shutdowns or break-ins for connecting into the existing systems.

#### 100.010.1.2 Work to be Carried Out

The Electrical Contractor shall provide the complete working installation as detailed in this specification and shown upon the drawings.

#### 100.010.1.3 Site Visit

The Contractor shall be deemed to have visited site during the tender period, acquaint themselves fully with local conditions, ascertain the extent of stripping out and obtain all information required to accurately formulate the tender.

The Contractor shall contact Chris Marshall, Electrical Building Services Engineer, at the University College London, Estates and Facilities, telephone 0207 679 1246 to arrange to visit the site during the tender period.

Any apparent discrepancies or queries shall be referred to the Consulting Engineers for clarification prior to submission of tender.

Claims for lack of knowledge in this respect shall not be considered.

#### 100.010.1.4 Programme

Commencement and completion of the works shall be as follows:

- Start on Site – 5 April 2010
- Completion on Site – 6 August 2010

The Contractor shall note that any of the above mentioned works which may have to be carried out outside normal working hours the associated costs shall be included in the tender i.e. over time or premium time.

**Items of note that will require out of hours working are the main staircases to all 5 houses and escape route corridors.**

All seminar rooms shall be pre booked with the building users to enable the works to be carried out at an agreed date.

The Contractor shall note that the building will be occupied and in operation during the extent of the contract.

**100.010.1.5 Construction (Design & Management) Regulations 2007**

The Electrical Contractor shall note that this project shall be carried out in accordance with the Health & Safety Executive Construction (Design & Management) Regulations 2007.

The Electrical Contractor shall include in the tender for complying with the CDM Regulations 2007 in full and as detailed in the Main Contract Preliminaries.

**100.010.1.6 Builder's Work**

The builder's work associated with the electrical installation works shall be executed by the Electrical Contractor.

Subject to listed building control approval the builder's work comprises the elements of building work necessary to incorporate the services installation into the building/structure, fabric and finishes including cutting of all chases, holes, forming openings and cable sleeves, provision of supports/noggins in walls to accommodate fixing of services equipment and the provision of all floor ducts.

The main riser points are indicative only and subject to final agreement on site.

The Contractor shall be responsible for producing detailed builders work drawings.

All making good and painting shall be carried out by the Electrical Contractor.

**100.010.1.7 General Information**

In certain instances, reference is made to quotations for equipment or services. The quotations are for general technical guidance only and the Contractor is required to inform manufacturers of the exact requirements of the specification when ordering.

All equipment detailed in this specification shall be supplied and installed by the Contractor, unless specifically stated otherwise.

The Contractor shall include for all works required to provide a full and complete working installation to the intent of the design. The Contractor shall include for any works detailed in the specification but not shown on the drawings, or vice versa and any works not specifically detailed which are required to provide a complete installation.

The drawings prepared in connection with the services installation indicate, diagrammatically, equipment positions, etc., for tender purposes only. Prior to commencing installation, the Contractors shall mark out proposed equipment positions on site and agree these with the Representative.

The Asbestos Survey Report is available upon request from Emma Shirbon, Safety Manager, UCL Estates and Facilities Division: Telephone Mrs Emma Shirbon on 020 7679 1963.

**100.010.1.8 Co-ordination**

At the commencement of the contract and before installing any equipment the Contractor is to agree with other trades the routes for cables, trunking, containment systems etc., in order to avoid friction between the trades.

**100.010.1.9 Equipment and Fittings**

The Contractors shall submit to the Engineer for comment details of all specified equipment prior to ordering.

The Contractor shall be satisfied of the correctness of all plant and equipment, prior to ordering, and before such plant or equipment is connected to the installation covered by this contract.

**100.010.1.10 System of Supply**

The system of supply shall be single phase 230 volt taken from the existing distribution boards as detailed on the drawings.

**100.010.1.11 Description of Works**

The following services shall be included within the contract:

1. Stripping Out Redundant Services.
2. Emergency Lighting Installation.
3. Fire Alarm Installation
4. Associated builders work
5. Containment Systems
6. Earthing and Bonding
7. Inspection and Testing
8. As Installed' Drawings and Manuals
9. Training of Staff

**100.010.1.12 Type of Installation**

a) Internal Wiring Systems (Emergency Lighting)

The emergency lighting shall be wired using single core LSF cables in white mini trunking (MK Red Alert accessories), high impact PVC conduit (white) or FP Plus Enhanced cable with white PVC sheath. The existing mains supplies for existing emergency luminaires shall be adapted/ extended where practical.

b) Fire Alarm Wiring System

Fire cables used in the installation of fire alarm systems meeting BS5839, are to meet the requirements of BS6387 and BS7629 in design, construction and installation. All cables shall be coloured **Red**, unless there is overriding aesthetic reasons for White to be used. Special attention is to be paid to the terminating of cables to ensure that earth faults are eliminated.

i) The following cables should be used in all instances:

FP Plus for Enhanced.

ii) Fixing – All fire alarm cabling is to be fixed to the structure of the building.

The Contractor shall maintain the existing systems in operation at all times until the new systems are complete and commissioned, then they shall be stripped out.

The Contractor shall include in his tender for the provision of any temporary lighting, emergency lighting or fire alarms during the contract.

d) Data monitoring cables (Emergency Lighting)

These shall be a general purpose flexible cable, 3182B LSOH insulated mains cable with a green sheath run in white mini trunking (MK Red Alert accessories) or utilising existing containment systems where possible between the luminaires and the Explorer Project Controller.

e) Luminaires

It is imperative that the luminaires are installed in the positions as indicated where luminaires are required to be moved due to **unavoidable** clashes with other services then approval must be sought from the Engineer responsible for the project.

All luminaires must be independently supported from the building structure on suspended ceilings and plastered ceilings using chain, screwed rod or conduit.

## 100.010.2 STRIPPING OUT REDUNDANT SERVICES

### 100.010.2.1 Extent of the Works

The Contractor shall strip out all redundant services taking great care to prevent inadvertent disconnection of supply or operation of any items of equipment which are required to be maintained in service.

The following main items are to be completely stripped out and removed from site, but are not exhaustive. It shall be the Contractor's responsibility to determine which items are redundant.

- Existing stand alone self-contained emergency luminaries and exit signs.
- General luminaries with integral inverters to have battery packs removed and key test facility disconnected.
- Switch plates which are engraved EM test are to have new plates fitted (un-engraved).
- Existing fire alarm control panel and associated existing fire alarm system wiring and all devices.

The Contractor shall ensure that the building fabric and fittings are not damaged during the removal of the redundant equipment and wiring. Where it is not possible to remove cable of containment systems without damage to the building fabric the cable or containment system shall be cut off flush with the building fabric.

The Contractor shall arrange to visit the site to determine the full extent of stripping out before submitting his tender.

Claims will not be accepted for lack of knowledge in this respect.

### 100.010.2.2 Removal from Site

The Contractor shall offer the stripped out equipment to the Client and dispose of any equipment not selected by the Client.

## 100.010.3 DISTRIBUTION SYSTEMS

### 100.010.3.1 Distribution Boards and Wiring

The existing distribution boards employed by the individual areas shall be used to serve the various items of equipment as detailed on the drawings.

All existing circuits shall be verified by the Contractor on site. Any unused/redundant circuits shall be stripped out as part of the works.

Final circuit devices shall be provided to match the existing device rating and circuit type.

All distribution boards shall be complete with typed circuit schedules.

In general, MCB's shall be type C for lighting circuits and type B for small power circuits.

The Contractor's attention is drawn to the fact that completion and inspection certificates, as prescribed in the IEE Regulations, must be completed and handed over to the consulting engineer on completion of the contract.

The Contractor shall give 8 days notice of any proposed electrical isolation necessary to carry out the works. Isolations using a permit to work system shall only be carried out with the full agreement of the University Estates Department.

### 100.010.3.2 Verification of Circuits

It is the Contractor's responsibility to verify all circuits (sub-main and final circuits) prior to isolation and working on the circuit. On completion of each phase of the works the Contractor shall inspect and test all circuits which have been modified, extended or renewed as part of these works. Test certificates and minor works certificates shall be issued for each section of works upon its completion.

### 100.010.3.3 Setting Out

The position of the new electrical equipment shall be determined by the Contractor and shall be presented in drawing format to the engineer for his approval.

Symmetry of arrangements shall be obtained by horizontal and vertical alignment through the centre lines and/or the edges of the equipment.

The engineer's decision on the position of items of electrical equipment and plant shall be final.

Marking out and setting out on site of all items, which shall be carried out in accordance with the requirements of the Contractor's programme, will be deemed to be part of the works.

Fixing to brickwork shall be made in the bricks and not in the bond. If it is not possible to make all the fixings in the brick then the equipment shall be positioned to enable the upper fixing to be made in the brickwork, where applicable.

### 100.010.3.4 Shutdowns and Change-overs

The Contractor shall include in his tender all shutdowns and change-overs which are necessary for the work.

The Contractor shall give the engineer eight working days notice in writing of any shutdown of existing services necessary to carry out the works. All electrical shutdown periods shall be indicated within the Contractor's programme. Adjustment within the programme will be permitted with the engineer's permission, adjusting and updating the programme accordingly and issuing to the engineer.

The contractor shall include in his tender for any works necessary to ensure that existing services are maintained during normal working hours. He shall include for any disconnections, diversion, temporary extensions, reconnections and the subsequent removal of temporary work.

All shutdowns, disconnection diversions, cutting, re-routing and jointing existing cables and change-over of services from the existing distribution equipment to the new distribution equipment shall be carried out outside normal working hours.

The Contractor shall include in his tender for all necessary out-of-hours working to maintain services and the operation of the building.

For the purpose of the tender, the Contractor shall include for carrying out all change-over works outside normal working hours.

The Contractor shall ensure that all risk assessments and method statements are in place and confirmed in writing prior to the works being carried out.

The Contractor shall liaise with the engineer and also the University Estates Department for arrangements for carrying out any shutdowns or break-ins into the existing systems.

## 100.010.4 EMERGENCY LIGHTING INSTALLATION

### 100.010.4.1 General

The Contractor shall supply and install a complete new addressable monitored emergency lighting system to comply with BS5266; 2005 Part 1 as indicated on the drawings and detailed as follows:

**100.010.4.2** The new system shall comprise the following:

a) 5No. Thorn Explorer Project XP128 control panels.
Control panel No.1 shall control 22 Gordon Square via a NPort2 modem interface.
Control panels No.2-5 shall control 23-26 Gordon Square via 2No. NPort2 modem interfaces. Each house shall have its own Thorn Explorer Project XP128 control panel and the NPort2 modem interface shall drive 2No. panels.

b) Individual 3-hour luminaires/exit signs non-maintained switched maintained manufactured by Thorn Lighting as detailed in the schedule of luminaires in Section 3.2 of the specification.

c) Contact
Mr Ajay Chander
Thorn Lighting Ltd
Silver Screens
Elstree Way
Borehamwood,
Hertfordshire
WD6 1FE
Telephone: 0208 7329800
Fax: 0208 7329825
Mobile: 07974 205614
Email: **ajay.chander@thornlighting.com**

All equipment shall generally be in accordance with Thorn Lighting quotation Ref. 21433790 for 22 Gordon Square and Ref. 21433744 for 23-26 Gordon Square sent to the Consulting Engineers dated 17 February 2010. Please check for the latest revised quotation.

The Thorn Lighting contact engineer for this project is Mr Barry Ford tel: 07733008705.

### 100.010.4.3 Wiring Installation (Mains 230 Volts)

The wiring shall be carried out as previously detailed in Clause 100.0101.12, Type of Installation.

The luminaires shall be wired from the live side of the local lighting circuits serving the relevant area or the existing emergency lighting point which is to be stripped out and shall be adapted or utilised. If this is not practical they shall be wired on new circuits from the relevant lighting circuit MCB at the distribution board serving the area.

**100.010.4.4 Data Monitoring Comms Cable**

The Contractor shall supply and install a general purpose flexible cable, 3182B LSOH insulated mains cable with a green sheath run in white mini trunking (MK Red Alert accessories) or utilising existing containment systems where possible between the luminaires and the Explorer Project Controller as indicated on the drawings to the various emergency luminaires and exit signs in a ring circuit.

**100.010.4.5 Commissioning**

The Contractor shall employ Thorn Lighting Ltd to commission the complete emergency lighting system and to carry out all software upgrading and information updating to affect a complete working system.

On satisfactory completion and commissioning of the emergency lighting installation the Contractor shall carry out a full test on each emergency luminaire in the presence of the Consulting Engineer and the UCL Electrical Building Services Engineer, Mr Chris Marshall.

The Contractor shall also include in his tender for a pre start meeting on site with the Thorn Lighting Engineer to confirm all wiring details prior to installation on site.

The Contractor shall also include in his tender for a interim meeting with the Thorn Lighting Engineer to confirm that all wiring is being installed to meet with their specification.

The Contractor shall provide as part of the "as installed" documentation all relevant test and completion certificates as described in BS5266 Part 1 1999.

**100.010.4.6 Breaking into Existing Systems/Shutdowns**

The Contractor shall ensure that all risk assessments and method statements are in place and confirmed in writing prior to the works being carried out.

The Contractor shall liaise with the Engineer and also the University College London Electrical Building Services Engineer, Mr Chris Marshall, for arrangements for carrying out any shutdowns or break-ins into the existing systems.

**100.010.4.7 Enclosures for XP128, NPort2 Controllers and fixed base data junction boxes**

Contractor shall supply and install the following enclosures fixed in the positions as indicated on the drawings.

a) XP128 controller to be din rail mounted within an MK 5704s enclosure.

b) NPort2 controller to be mounted in a 150 x 150 surface mounted adaptable box.

c) Junction boxes for the data connection to the emergency lighting to be mounted in a 100 x 100 surface mounted adaptable box.

**100.010.4.8 Proposed Emergency Lighting Addresses and Description and Addressing Format**

Contractor shall refer to Appendix A for typical proposed schedule of emergency luminaire addressing details. These shall be edited by the Contractor and provided to Thorn Commissioning Engineer.

Contractor to provide the information on an excel spreadsheet available from TGA Consulting Engineers upon request.

The format for addressing emergency lighting luminaires shall be as follows and as indicated on the proposed drawings:

**house no. / group no. / luminaire address number.**

The Contractor shall supply and install the address labels fixed to the base of the luminaire (visible) not on the diffuser.

## 100.010.5 FIRE ALARM INSTALLATION

### 100.010.5.1 General

The Contractor shall supply and install a complete new analogue addressable fire alarm system to replace the existing system.

The system shall comply with the following requirements:

- BS5839, Part 1 2002
- Local fire authority requirements and building control
- UCL fire policy and guidance notes
- Part M of the Building Regulations
- Fully DDA compliant

The fire alarm system shall be classified as Types M and L3 (manual with life risk) and shall be "Open Apollo Protocol".

The power supply to the main fire alarm control panels shall be derived from the existing distribution system as indicated on the drawings.

The Contractor shall supply and install a key switch adjacent the fire alarm panel which shall be engraved "Fire Alarms" this shall be supplied via a lockable switch fuse (red) mounted adjacent the existing switchboard.

The fire alarm installation shall be carried out as indicated on the drawings and as detailed in the Specification.

The wiring shall be carried out using FP Plus Enhanced cable with red LSF sheath.

The fire alarm system shall incorporate interface units for inter-linking the following equipment:

- Illuminated signage/audible sounders for access between building boundaries
- Trio Security Ltd vibrating pager system for persons with impaired hearing

The following manufacturers shall be used for the fire alarm control panels and devices:

**NOTE: Fisk Fire shall be employed to decommission and commission the existing/new systems only.**

From the commencement of contract the Contractor shall allow for all detectors to be changed to rate of rise for the duration of the works. The rate of rise temporary detectors shall be red in colour.

### 100.010.5.2 Fire Alarm Addressing

The format for addressing fire alarm devices shall be as follows:

Loop no. / zone / device address number

| | | |
|---|---|---|
| a. | Building 22<br><br>Main Fire Alarm Panel (2-loop) | Morley IAS ZX2Se Type loop control panel (with Apollo loop controllers) |
| b. | Building 23 – 26<br><br>Main Fire Alarm Panel (5-loop) | Morley IAS ZX5Se Type loop control panel (with Apollo loop controllers) |
| c. | Repeater Panel (active) | Morley IAS ZXR-A repeater panel |
| d. | Break glass contacts with anti-tamperproof covers | KAC (open protocol addressable) |
| e. | Heat detectors | Apollo (Open protocol addressable) |
| f. | Smoke detectors (optical) | Apollo (Open protocol addressable) |
| g. | Intelligent base smoke detectors/ Sounder base (optical) | Apollo (Open protocol addressable) |
| h. | Intelligent base smoke detectors/ Sounder base (optical) and flashing beacon | Apollo (Open protocol addressable) |
| i. | Intelligent base heat detectors/ Sounder base (optical) | Apollo (Open protocol addressable) |
| j. | Intelligent base heat detectors/ Sounder base (optical) and flashing beacon | Apollo (Open protocol addressable) |
| k. | Interface units (input/output) control module | Apollo |

**100.010.5.3 Facilities for hearing impaired people**

The Contractor shall supply and install the following new items of equipment as indicated on the drawings for buildings 23 - 26:

a. Personal vibrating system linked to the main fire alarm system as manufactured by:

Trio Security Ltd (the existing system on the ground floor as indicated on the drawing shall be retained and linked into the new fire alarm system).

The existing system shall be commissioned by:-

Trio Security Ltd
Contact Mr Andy Halcro – telephone 01708 7644

b. The existing Trio system in building 22 shall be reused.

### 100.010.5.4 Commissioning Of Control Panels

On completion of the installation, the system shall be commissioned in accordance with the relevant standards, manufacturer guidelines and requirements of the system design. The fire alarm control panel shall have an auto learn facility that will allow the system to learn the number and type of devices that have been installed on the detection loop.

A walk test option shall be provided for convenient testing of detectors and alarm initiating devices without continually having to reset the panel. This facility shall allow selected zones only to be tested without the need to have the entire system in walk test. During the period in which the fire alarm control panel is in the walk test mode, an active scrolling message shall remain on the LDC display at all times, indicating the zones which are in test mode.

### 100.010.5.5 Detectors/Devices

All sensors shall comply with the relevant parts of BS5445.

All sensors shall be fixed via a common plug-in type base; the base to be mechanically and electrically compatible to enable any of the sensors to be inter-changed.

Removal of a sensor from its base shall not affect the integrity of the operation of other equipment in the system; indication to be given at the panel until the sensor is replaced. The activation of each sensor shall be clearly visible from the outside by a flashing red LED.

Detectors in voids etc, eg top of lift shaft and ceiling/roof voids, shall be complete with remote LED mounted on an engraved plate detailing duty, eg lift shaft detector.

Fire alarm sounders shall be surface mounted at 2200mm AFFL on a surface/flush mounted service box.

Where smoke and heat detectors are mounted to the underside of ceiling tiles, the Contractor shall provide a plywood backing sheet to the ceiling tile to ensure secure fixing of the device.

All sensors shall compensate for the effects of the dirt and dust accumulation and give indication at the panel position when they require maintenance, providing exact details of their position and the action required.

The manual break-glass contact shall be steady force types (operated by pressing glass firmly with thumb). When the glass is broken the alarm shall activate. The system shall re-set only when the glass is replaced or when the manual call point is switched by an authorised person using a special tool.

Each manual break-glass contact shall be suitable for flush or surface use and is to be designed for fail-safe operation.

Sounders shall have facility to provide voice announcement.

The fire alarm system is to be interfaced with other systems to control items of equipment as previously detailed.

Any sensor/sounders/break-glass contacts, which are replaced by an identical piece of equipment, shall automatically be given the same address without the need for manually altering the system data.

The system shall include stand-by sealed, lead acid batteries which, upon loss of mains power, will automatically maintain full operation of the system in its quiescent state, for a minimum of 72 hours.

Indication shall be given at the main panel when the system is operating on battery power, or when there is a fault on the batteries/charging/control equipment, including:

a. High and low battery voltage
b. Battery disconnection
c. Charge failure

**100.010.5.6 Commissioning and Decommissioning of the Fire Alarm Systems**

The Contractor shall include in his tender for the commissioning of the new fire alarm system and decommissioning of the existing fire alarm system to be carried out by the following UCL specialist fire alarm approved contractor:

Fisk Fire Group
The Courtyard Offices
Baddow Park
West Hanningfield Road
Great Baddow
Chelmsford
Essex CM2 7SY

Contact Managing Director, Mr Terry Fisk

Telephone 01245 477561
Fax 01245 477560
Mobile 07860 863255
Email **terryFisk@FiskFire.co.uk**

The Contractor shall note that a "Permit to Work" on fire alarm systems is required to prevent the unwanted automatic calling of the Fire Brigade.

The Contractor shall liaise with Fisk Fire Group and UCL Electrical Building Services, Engineer Mr Chris Marshall, and also the UCL security control room supervisor, Mr Paul Hayden.

| | | |
|---|---|---|
| Telephone Nos: | Chris Marshall | 0207 679 1246 |
| | Paul Hayden | 0207 679 3333 |

The Contractor shall arrange with Fisk Fire Group before any works commence on site for all existing smoke detectors to be changed to rate of rise heat detectors for the duration of the works until the complete new fire alarm system has been installed and commissioned by Fisk Fire Group.

The new fire alarm system shall be put on full soak test for a minimum of a 2 week period to run in conjunction with the existing fire alarm system. Following successful completion of soak test the Contractor shall isolate and strip out existing fire alarm system and make good any damage to the building fabric.

**100.010.5.7 Commissioning, Programming and Acceptance Certificates**

The Contractor shall include the following in his tender for installation and commissioning to comply with BS5839 Part 1 2002 Annex G (G1-G4) as appropriate.

a) <u>Programming</u>

i) The Contractor shall ensure the correct programming of all device addresses to ensure they match the location/room they serve.

ii) A fire alarm zone chart shall be provided in A4 Word format in a suitable position in a frame positioned adjacent each fire alarm panel.

iii) As installed drawings are to be provided as detailed in Clause 3.9.

b) Commissioning Certificates

i) All original inspection, testing, completion and commissioning certificates shall be incorporated into the operating and maintenance manual.

ii) A copy of each certificate to be issued to the UCL Chief Engineer.

iii) A copy of each certificate to be issued to the UCL Fire Officer for the Buildings Fire Certificate and Fire Strategy documents.

iv) Any additional copies required by authorised persons.

v) The Contractor shall provide an installation certificate on completion of the installation stage.

vi) The Contractor shall provide a commissioning certificate on completion of the testing and commissioning stage of the fire alarm installation (generally by Fisk Fire Group Ltd).

c) Acceptance Certificates

The acceptance certificate will be issued by the Engineer/Design Consultant and witnessed by a nominated UCL engineer on behalf of the Director of Estates and Facilities.

Only on completion of the "Acceptance Certificate" witnessed by UCL, will the fire alarm system be the primary "Warning in Case of Fire" for the building or where the fire alarm system has been replaced, the old system may be switched off and decommissioned.

The new system may then become the primary "Warning in Case of Fire" for the building.

## 100.010.6 ASSOCIATED BUILDERS WORK

### 100.010.6.1 General

The builder's work associated with the electrical installation works shall be executed by the Electrical Contractor.

Subject to listed building control approval the builder's work comprises the elements of building work necessary to incorporate the services installation into the building/structure, fabric and finishes including cutting of all chases, holes, forming openings and cable sleeves, provision of supports/noggins in walls to accommodate fixing of services equipment and the provision of all floor ducts.

The main riser points are indicative only and subject to final agreement on site.

The Contractor shall be responsible for producing detailed builders work drawings.

All making good and painting shall be carried out to match existing finishes by the Electrical Contractor.

**Contractor to allow for fire stopping of all holes and shall bring to the project manager 's attention any existing holes that fall outside the Contract works that require fire stopping.**

**Contractor to liaise with UCL specialist Contractor Checkmate for the specification of all fire stopping works required generally in accordance with UCL document:-**

**Hppt://www.ucl.ac.uk/efd/maintenance/fire/documents/UCLFire TN 066.pdf.**

**100.010.7 CONTAINMENT SYSTEMS**

The Contractor shall supply and install the following containment systems:

**100.010.7.1 Emergency Lighting Wiring Systems**

High impact PVC conduit (white).

Note: Existing wiring systems to be adapted/extended where practical to accommodate new circuit wiring.

Monitoring Cables

Wihte mini trunking (Red Alert accessories) fixed to the building structure or utilise the existing containment system where practical.

**100.010.7.2 Fire Alarm Wiring Systems**

- Surface fixed FP Plus Enhanced cable
- Enclosed in suitable cable trunking systems where applicable.

## 100.010.8 EARTHING AND BONDING

The whole of the installation and all equipment connected thereto shall be effectively earthed and bonded in accordance with the current edition (including all amendments) of BS 7671 17th Edition 2008 of the IEE Regulations and Supply Authority Regulations.

## 100.010.9 INSPECTION AND TESTING

The Contractor shall employ an independent Specialist Contractor to execute all testing and commissioning works.

Before energising any part of the installation, the Contractor shall fully inspect and test the sections of the installations which have been modified or extended as part of the works to verify that the requirements of this specification and BS 7671, 2008 (17th Edition of the IEE Regulations) have been fully met.

The Contractor shall provide all the necessary instruments for testing the installation, in accordance with the Regulations, and any extra tests called for in this specification. Evidence of accuracy shall be provided by the Contractor for all test instruments. Failure to provide such evidence will invalidate the test.

Final testing shall be carried out in the presence of the Employer and three copies of the test results, the completion certificate and the inspection certificate, as described in the Regulations, shall be supplied to the Contractor.

The installation shall not be accepted until such certificates have been approved.

Tests required are as follows:

i) Continuity of radial circuit conductors

ii) Continuity of protective conductors

iii) Measurement of insulation resistance

iv) Measurement of earth fault loop impedance

v) Measurement of prospective short circuit currents at the locations of all protective devices.

## 100.010.10 "AS INSTALLED" DRAWINGS AND MAINTENANCE MANUALS

### 100.010.10.1 General

The "As Installed" manuals form part of the overall installation and the handover will not be accepted without a full issue of 3 No. copies of the approved manuals. These manuals to include full information on the equipment installed at the property.

"As Installed" drawings are to be provided on hard copy A1 sheets and in electronic Autocad 2007 format, Scale 1:100 on disc. The disc should also have an electronic copy of the manual.

### 100.010.10.2 Maintenance Manual

The manuals to be issued for comment 2 weeks prior to the completion of the works; this issue to give an indication on how the manual is intended to be arranged and also include all the information required at handover (ie., schedule of outstanding items/documents) so that realistic approval can be given.

The only information not expected at this time will be the testing and commissioning certificates which may not have been completed at this stage of the project, however, reference to be made to these in the schedule of outstanding items.

Information provided within the manuals to be project specific ie., complete manufacturers catalogues showing products not incorporated within the project will not be accepted.

Upon practical completion or sectional completion of the works, copies of the maintenance manual to be provided as stated in Section 2. This manual shall be of loose leaf type, A4 size, having stiff covers, cardboard sub-divisions for each section, a ready means of reference and a detailed index.

A front sheet is to be included within each manual to contain the following information:

Operating and Maintenance Manuals

- This document is to be retained at:
  *Details of site address and actual location of the manual*
- This document is controlled by:
  *Name and designation of the person responsible for the manual*
- This document is to be read in conjunction with the following Health & Safety File:
  *Health and Safety File details listed ie., number of, location etc.*
- A copy of this manual is held at:
  *Details of where copies of the Operating and Maintenance Manual are kept as applicable.*

## 100.010.11 TRAINING OF STAFF

On a date agreed with the Project Engineer, the Contractor is to provide training on all equipment he has installed. The training shall be levelled to the Estates and Facilities Department and the Maintenance Department of the University College London who will be occupying the premises. The training shall include the following

- Use and operation of distribution boards, when circuits have tripped
- Action to take if circuit will not re-energise, ie., report fault to maintenance
- Use of the "As Installed" manuals including storage and control of issue etc.
- Operation of new emergency lighting system
- Operation of new fire alarm system

## 200.000 GENERAL LIGHTING AND POWER

200.010 REGULATIONS:

Comply with:

- Requirements for electrical installations (the IEE Wiring Regulations) BS 7671
- Including Amendment 2.

200.030 ARRANGEMENTS OF CIRCUITS:

Divide the installation into separately controlled circuits as described below, further subdividing where necessary to ensure compliance with BS 7671 (the IEE Regulations).

See drawings for circuits.

200.040 INSPECTION AND TEST PROCEDURE:

Comply with BS 7671 (IEE Regulations). Provide completion certificates in accordance with BS 7671 (IEE Regulations). Provide information to fulfil BS 7671 (IEE Regulation) 711-01-02.

- Carry out site testing and inspection and provide test certificates for specialist installations. Record all results and readings. Provide copies of any test and inspection result.
  Check correct operation of devices. Confirm interlocks and sequences operate correctly. Provide test equipment and consumables to complete tests and retest any failed installations following corrective measures. Check and confirm correct sequence in multiphase circuits.

200.050 TESTING FIRE ALARM SYSTEM:

Test the complete installation in accordance with BS 7671 (the IEE Wiring Regulations), BS 5839 and appropriate standards. Record all tests.

200.060 IDENTIFICATION - GENERAL:

Apply identification notices in accordance with the BS 7671 (IEE Wiring Regulations) Clause 514 to all electrical cables plant and equipment.

- Phase colour
- Brown, Black, Grey.

Fix using materials compatible with the notices and fixing surface.

- Obtain approval prior to manufacture of all notices.
- Provide sample for approval.
  Apply identification markers in accordance with the BS 7671 (IEE Wiring Regulations), Clause 514 to all conductor termination points.

- Phase marking
- L1, L2, L3.

200.070 LABELS

Label all electrical plant and equipment using safety sign 8.A.0044 of BS 5499-5, where voltages above ELV exist.

- Fit labels and notices as shown on
- Materials
- Materials
- Engraved thermosetting plastic laminate.
- Colour
- Background White

- Lettering Black
- Fixing
- Bolted through complete with washer nut and locking device, size 4ba

200.080 ENGRAVED ACCESSORY PLATES:

Engrave accessory plates and specialist items as shown in the Schedules or on the Drawings.

- Use 6mm high letters with engraving coloured red.

200.090 SCHEMATIC DIAGRAMS:

Provide a purpose made schematic diagram permanently fixed showing the connections of the equipment and plant.

200.100 DISTRIBUTION BOARDS IDENTIFICATION:

Identify every outgoing way with a renewable circuit chart in a transparent plastic envelope permanently fitted inside distribution board cover. Clearly indicate in typed script, circuit identification number, cable size, fuse or circuit breaker rating and a description of item supplied and area supplied by circuit.

200.110 CABLE IDENTIFICATION:

Provide all cables, other than final sub-circuit wiring with labels fixed at each end of cable, either side of wall and floor penetrations and at approximately 10m intervals. Ensure labels show reference number of cable.

200.140 FIXING TO BUILDING FABRIC - PREPARATION:

Mark-out using manufacturer's drawings and templates and fix all items.

Ensure structure and fixings are suitable for items to be fixed. Use largest size of fixing permitted by diameter of hole in item to be fixed.

200.150 PLUGS AND SCREWS:

Use plugs of material, size and length, in accordance with the manufacturer's instructions. Use screws to BS 1210. Generally use sherardized steel screws. In damp or exposed situations use brass screws.

200.160 FIXING - WORKMANSHIP:

Drill holes squarely. Use drills of correct size and type. Do not flame-cut holes in metalwork. Comply with manufacturer's instructions for all fixings. Avoid fixing through reinforcement. Do not fix to unsound material.

200.170 FIXING TO THE STRUCTURE:

- Obtain approval to:-
- Cut holes in the structure.
- Weld to structural steelwork.

200.180 OFF-SITE PAINTING AND ANTI-CORROSION TREATMENTS - GENERAL REQUIREMENTS:

Protect all equipment and ancillaries against corrosion. Protect ferrous metals with coatings at works. Provide all items for decorative finishing primed to suit base material and finish.

200.210 ELECTRICAL EQUIPMENT SCHEDULES:

- Schedule reference See schedule of luminaires in specification
- Location Clause 3.2

## 300.000 CONDUIT AND TRUNKING, LV CABLES AND WIRING - MATERIALS

300.010 STEEL CONDUIT AND FITTINGS:

- Application Lighting
- Standard
- BS EN 61386-21.
- Ends
- Plain threadable.
- Size in accordance with BS 7671 (IEE regulations).
- Fittings
- Use adaptable boxes of 100mm x 100mm x 50mm minimum size.
- Use couplers and externally screwed brass bushes to connect conduit to loop-in circular conduit boxes.
- Use washers with flanged couplers.
- Protection class/finish BS EN 61386-1, Table 10
- Class 4 hot dipped galvanized.
- Mounting/support Saddles fixed to building structure
- Installation

Use maximum practical lengths to minimise number of joints. Form bends by machine and remove burrs from cut ends.

Use bends and/or junction boxes at changes of direction. Do not use elbows or tees of any sort without approval.

Fix securely with boxes fixed independently of conduit.

Tightly screw all joints to ensure electrical continuity, with no thread showing. Use expansion couplings where conduit crosses movement joints in structure.

300.020 PVC CONDUIT AND FITTINGS:

- Type High impact
- Application Lighting
- Standard - BS EN 61386-21.
- Strength
- High impact.
- Size in accordance with BS 7671 (IEE regulations).
- Shape
- Round.
- Colour
- White.
- Jointing
- Push fit and solvent welded.
- Fittings
- Provide boxes with earthing terminal.
- Provide weatherproof boxes.
- Mounting/support Fixed to building structure
- Installation

Use maximum practical straight lengths to minimise number of joints.

Use proprietary bends and/or junction boxes at changes of direction. Do not use elbows, tees or site formed bends without approval.

Fix securely with boxes fixed independently of conduit.

Form secure joints, using expansion couplings where recommended by manufacturer, and connectors at equipment, terminal fittings, etc.

300.030 STEEL SURFACE TRUNKING:

- Type As required
- Application Lighting
- Type
- Standard cable trunking.
- Standard
- BS 4678-1.
- BS EN 50085
- Size in accordance with BS 7671 (IEE regulations).
- Fittings
- PVC covers.
- Hanger brackets.
  Fire barriers.
- Protection class
- Class 1.
- Finish
- Colour Galvanized
- Mounting/support Fixed to building structure
- Installation

Use proprietary units to form junctions and changes of direction wherever possible.

Use mechanical fastenings/fixings; do not weld.

Fit a copper link at each joint to ensure electrical continuity.

Fit grommets, bushes or liners to holes through which cables pass.

300.040 PVC SURFACE TRUNKING:

- Type As required
- Application Lighting
- Standard - BS 4678-4.
- Type
- Standard cable trunking.
- Size in accordance with BS 7671 (IEE regulations).
- Fittings
- Bends.
- Stop ends.
- Strength
- Medium duty.
- Colour
- White
- Mounting/support Fixed to building structure
- Installation

Use proprietary units to form junctions and changes of direction wherever possible.

300.090 FIRE STOPPING OF TRUNKING/DUCTING:

Where trunking or ducting pass through fire resisting floors, ceilings, cavity barriers, etc., seal internally with

- Proprietary intumescent material.

300.100 FLEXIBLE CORDS:

- Application Lighting
- BASEC certified.
- Standard
- Sheathed 300/500V 90$^0$C to BS 6500

300.110 INSULATED CABLES:

- Type FP PLUS ENHANCED
- Application Fire Alarms
- Manufacturer and reference Pirelli
- Or approved equivalent.
- BASEC certified.
- Type
- Copper conductors.
- Multi-core
- Sheathed.
- LSF.
- Cable glands
- BS 6121-2.
- BS EN 50262.
- Type
- Complete with earthing lug.
- Electrical bond for metallic sheath.
- Fire performance to BS 5839-1
- Enhanced.

300.120 MINERAL INSULATED LV CABLES:

- Type MICC/LSF
- Application Fire Alarms
- Manufacturer and reference BICC
- Or approved equivalent.
- BASEC certified.
- Type
- Sheathed Red LSF
- Standard
- 500V light duty to BS EN 60702-1 Section 14.
- Fire performance to BS 5839-1.
- Standard.
- Enhanced.
- Cable glands

Use seals and glands to BS EN 60702-2.

- Type
- Internally threaded.
- Earth continuity conductor.
- Seal temperature rating
- 150°C.

300.130 POLYETHYLENE INSULATED TELECOMMUNICATIONS CABLES:

- Type Beldon
- Application Emergency Lighting
- Manufacturer and reference 8760 Twin Twisted Pair
- Or approved equivalent.

- BASEC certified.
- Standard
- Size 0.5mm to BS 3573.

300.180 PERFORATED CABLE TRAY:

Support all cables throughout their length using cable tray, firmly fixed to building fabric.

Ensure cable tray allows for spacing in accordance with BS 7671 for the design current of the cable.

- Standard BS EN 61537

Type

- Return flanged.

Perforations and thickness

- Manufacturer's standard pattern and thickness.

Fittings

Use factory made fittings throughout of same material, type, pattern, finish and thickness as cable tray.

300.190 CABLE CLIPS AND CLEATS:

- Standard BS EN 50368
- Material Metallic PVC Covered
- Impact resistance IK05

## 400.000 CONDUIT AND TRUNKING, LV CABLES AND WIRING - WORKMANSHIP

400.020 INSTALLING TRUNKING:

Remove burrs from cut trunking ends.

400.030 DRAINAGE OF CONDUIT:

Provide drainage outlets at lowest points in conduit installed externally and in locations where condensation may occur.

400.040 APPEARANCE:

Arrange conduit and trunking, plumb where vertical, neatly parallel with other service runs and the structure.

400.050 EXPANSION AND SETTLEMENT JOINTS:

Make provision at expansion and settlement joints for movement. Use manufactured expansion couplings.

400.060 SPACING:

Install conduit, trunking and equipment clear of other services with minimum spacings:-

- To steam - 300mm, other services - 150mm and above radiators - 1000mm. Ensure trunking and conduit is independently supported from building fabric. Obtain approval for supports.

400.070 ACCESS:

Locate covers on top or sides of trunking to allow access to wiring.

400.080 CABLE ROUTES:

- Ensure cable routes are
- Straight, vertical or horizontal and parallel to walls.
- In approved locations where exposed to view. Conceal cables wherever possible.
- Positioned at least 150 mm clear of other services. Locate cables running parallel and adjacent to heating pipes below pipes.

400.090 CABLE INSTALLATION - GENERAL:

- Install cables neatly and securely, adequately protected against accidental damage, adverse environmental conditions, mechanical stress and deleterious substances.
- Install cables without joints other than at equipment and terminal fittings. Do not use junction boxes without approval.
- Sleeve cables passing through masonry walls with conduit bushed at both ends.
- Do not run cables in spaces where they will be surrounded or covered by insulation.

400.100 PROTECTIVE CONDUCTORS:

Use cable conductors throughout; do not use conduit or trunking as protective conductors.

400.120 CABLE INSTALLATION - PVC SHEATHED CABLES:

Do not install cables when temperature is near or below freezing.

Do not install in cavities of external walls.

Fit insulating cable glands at entries to equipment.

Terminate cable sheaths within boxes.

400.130 CABLE INSTALLATION - MICC CABLE:

Neatly and carefully dress cable into position using tools recommended by cable manufacturer. Avoid corrugating sheath when bending.

Connect to equipment and boxes with shrouded glands.

Fix cables with clips recommended by manufacturer ensuring that cable is fixed within 150 mm of bends and connections.

As soon as a length of cable has been installed, fit permanent seals and immediately carry out an insulation test between conductors or between any conductor and cable sheath. Repeat test between 24 and 48 hours later. Only infinity readings will be accepted. Replace any cable which fails and repeat tests.

400.170 CABLES IN VERTICAL TRUNKING/DUCTS:

Support with pin racks or cleats at each floor level or at 5m vertical centres, whichever is less.

Provide and fix heat barriers at not more than 5m centres where fire resisting barriers are not indicated.

400.180 CABLES IN ACCESSIBLE ROOF SPACES:

Cables running across ceiling joists to be fixed to timber battens nailed to joists.

## 500.000 LIGHTING AND POWER - PRODUCTS/MATERIALS

500.010 LIGHTING AND POWER SCHEDULES:

- Supply lamps and luminaires as
- schedule reference As per schedule of luminaires in clause 3.2 of specification
- drawing reference Refer to schedule of drawings in clause 3.1
- Supply electrical accessories as
- schedule reference MK

500.050 ISOLATING SWITCHES:

- Application Local isolation devices
- Manufacturer and reference MK
- Or approved equivalent.
- Standard

Utilisation category and making capacity to BS EN 60669-1, with earth terminal in enclosure.

- Switch type
- Rocker bar.
- Rating
- 16A.
- Pole configuration
- DP.
- Ancillaries
- Neon indicator with red lens.

500.060 LUMINAIRES:

- Application Emergency Lighting
- Manufacturer and reference Thorn Lighting as per luminaire schedule
- Standard
- BS 4533
- Part 1

Ensure luminaires of same types have same photometric performance.

- Accessories
- Provide secondary support for all components so they are retained when their primary fixing is released.

500.090 LAMPS:

- Type Linear Fluorescent
- Application Emergency Lighting
- Manufacturer and reference supplied with luminaires
- Or approved equivalent.
- Standard
- Fluorescent lamps, BS EN 60081.

Ensure that lamps of each type are from the same manufacturer.

500.100 LUMINAIRE CONNECTORS:

- Rating
- 5A.
- Connector type
- Captive cord grip type plug/socket (3 or 4 pin), to BS 5733.

500.110 SUPPORT SYSTEM:

- Application Emergency lighting
- Minimum 20mm conduit as main conduit.
- 10mm diameter threaded rod.
- Chain Steel

500.140 ENCLOSURES FOR ELECTRICAL ACCESSORIES:

- Manufacturer and reference MK
- Or approved equivalent.
- Standard, BS 4662 or BS 5733
- Pattern
- Surface.
- Mounting
- Adjustable steel grid.
- Direct to enclosure.
- Material and finish
- Pressed steel.
- Cover plate pattern
- Surface type.
- Engraving As per specification and drawings

500.150 LIGHTING SWITCHES:

- Type
- Application External lighting
- Manufacturer and reference MK
- Or approved equivalent.
- Standard - BS EN 60669-1, with earth terminal in enclosure.
- Switch type
- Gang As drawings
- Rocker bar White
- Dolly
- Rating
- 15A.
- Pole configurations
- Single pole.
- 2 way.

500.160 SWITCHED FUSE CONNECTION UNITS:

- Application Local isolation devices
- Manufacturer and reference MK
- Or approved equivalent.
- Standard
- BS 1363-4.
- Double pole switching.
- Unit type
- Rocker bar White
- Dolly.
- Ancillaries
- Red indicator lamp.
- Fuses to BS 1362, sized To suit user equipment

500.190 TELEPHONE OUTLET SOCKETS:

- Application Local data points for linking Fire Alarms and Emergency Lighting to network system
- Manufacturer and reference MK
- Or approved equivalent.
- Standard - BS 6312.
- Size
- Standard.
- Circuit configurations
- Master.

500.250 ACCESSORIES MOUNTING HEIGHTS:

Provide switches and socket outlets for lighting and other equipment in habitable rooms at appropriate heights between 450mm and 1200mm from finished floor level, in accordance with Building Regulations Approved Document M and BS 8300.

## 600.000 LIGHTING AND POWER - WORKMANSHIP

600.010 LAMPS AND LUMINAIRES INSTALLATION:

Install luminaires in horizontal plane unless otherwise shown.

Ensure luminaires are clean.

Ensure classification of luminaires is appropriate.

- Install wall mounted luminaires at height 2000mm above floor level
- Support and fixing
- Where luminaire is supported from conduit, provide a conduit box forming an integral part of conduit system at each point of suspension. Where conduit enters luminaire, use backnuts and washers to secure luminaire to conduit.
- Where luminaire is supported from trunking, use appropriate clamps or brackets.
- Use washers, nut and lock-nut at top and bottom of rod for rod suspensions.
- Use hook cover for suspension of chain from circular conduit box.
- Use manufacturer's recommended chain hook for connection to luminaires .
- Suspend flexible cord from ceiling rose.
- Support luminaires directly from building fabric

Do not support luminaires directly from any flammable non-metal or heat sensitive materials.

Ensure suspensions are vertical unless otherwise shown.

600.020 CONNECTIONS TO LUMINAIRES:

Connect circuit wiring to luminaires. Use grommet where cables enter luminaire body.

Connect the earthing terminal of Class 1 luminaires to the circuit protective conductor of the supply circuit.

Clip loose wiring within luminaire, at 300mm intervals.

- Conduit, rod or chain suspension.
- Application Where fixed to a false ceiling to be independently supported from the main building structure
- Terminate in terminal block within supporting conduit box. Use flexible cord from terminal block to luminaire, installed within tube of conduit suspension. Secure cord to rod or chain without weaving cord through chain.
- Terminate at supply terminals of luminaire.
- MICS Cable
- Application External Emergency lighting luminaires
- Fix cable gland to luminaire and continue conductors to supply terminals of luminaire.
- Direct fixing
- Luminaire supporting coupler to BS 7001.

600.030 ELECTRICAL ACCESSORY INSTALLATION:

Provide CPC between earth lug on metal box and accessory except for plastic accessories.

Ensure there is no damage to accessories during installation.

Protect surface mounted accessories from painting. Install front plates of flush mounted accessories after painting.

Align accessories to building finishes. Mount grouped accessories in line, parallel and equidistant.

## 800.000 SPECIALIST SYSTEMS

800.010 EMERGENCY LIGHTING SYSTEM:

- Manufacturer and reference Thorn Lighting Limited
- Standards
- BS 5266.
- BS EN 50171.
- BS EN 50172.
- BS EN 60598-2-22.
- ICEL 1006.
- CIBSE TM 12.
- The requirements of the Local Authority.
- Manufacturer's instructions.
- Mode of operation
- Self contained luminaire.
- Non-maintained operation.
- Maintained.
- Combined.
- Type
- Luminaire.
- Illuminated sign As per luminaire schedule
- Conversion unit.
- Lamps
- Fluorescent Linear
- Illumination of signs

Illuminate exit, emergency exit and escape route signs so that they are legible at all times, with:-

- Luminaires external to sign.
- Lamps contained within sign.

800.150 FIRE ALARM SYSTEM:

- Specialist Morley IAS

Develop design, supply and install fire alarm system to

- BS 5839-1.

Provide fire alarm system to

- Enhance safety of occupants.

800.160 CONNECTION TO LOCAL AUTHORITY FIRE BRIGADE:

Provide connection to local authority fire brigade:-

- Via new UCL Data connection

800.170 FIRE ALARM SYSTEM - ZONES:

- Install system with zones as drawing number 6888E-001 to 6888E-020
- Indicate the location of zones by
- Specially prepared plan of building.

800.180 FIRE ALARM SYSTEM - STANDBY POWER SUPPLIES:

- Manufacturer and reference Morley IAS
- Or approved equivalent.

- Standard
- BS 5839-1.
- BS EN 54-4.
- Standby
- Secondary batteries and battery charger.

800.190 FIRE ALARM SYSTEM - MANUAL CALL POINTS:

- Type Break glass
- Application As per drawings
- Manufacturer and reference KAC
- Or approved equivalent.
- Standard
- BS EN 54-11
- Mounting
- Surface.
- Protection against accidental operation Anti tamper covers

800.200 FIRE ALARM SYSTEM - HEAT DETECTORS, POINT TYPE:

- Application As per drawings
- Manufacturer and reference Apollo
- Or approved equivalent.
- Standard
- BS 5446-2.
- BS EN 54-5.
- Heat sensitive element
- Fixed temperature (static) element.

800.210 FIRE ALARM SYSTEM - SMOKE DETECTORS:

- Application As per drawings
- Manufacturer and reference Apollo
- Or approved equivalent.
- Standard
- BS 5446-1.
- BS EN 54-7.
- Type
- Sampling.
- Class
- Optical detectors.

800.220 FIRE ALARM SYSTEM - SOUNDERS:

- Type Electronic
- Application As per drawings
- Manufacturer and reference Apollo
- Or approved equivalent.
- Standard - BS EN 54-3.
- Type
- Electronic
- Colour
- Fire red.
- Finish
- Weather proof.
- Internal.

800.225 FIRE ALARM CONTROL PANEL:

- Type Addressable
- Application As per drawings
- Manufacturer and reference Morley IAS
- Or approved equivalent
- Standard
- BS 5839-1.
- BS EN 54.
- Mounting Surface
- Power supply
- Integral.
- Zone indication
- Integral with CIE.
- General
- Microprocessor based.
- Modular software 5 Loop
- System configuration
- Capable of operating
- Analogue addressable detectors.
- Interfacing With repeater panel

800.230 FIRE ALARM SYSTEM - RECORD DRAWINGS AND OPERATING INSTRUCTIONS:

Provide instructions on use of installation to person responsible for use of premises. Supply the user with a logbook certificate of installation and commissioning and record drawings in accordance with BS 5839-1.

- Circuit diagrams of fire alarm system.

800.240 EXISTING INSTALLATIONS EARTHING AND BONDING:

Check earth continuity conductors and loop impedance values of existing installation. Report defects and elements not in accordance with BS 7671 (IEE Regulations 17th

800.250 ELECTRICAL INSTALLATION METALWORK:

Bond together all exposed conducting parts with joints of negligible impedance. Carry out work in accordance with BS 7671 (IEE Regulations), BS 7430, Electricity Safety Quality and Continuity Regulations, and Local Electricity Supply Authority Requirements.

- Comply with the requirements of BS EN 50310.

800.270 PROTECTIVE CONDUCTORS:

- Application

Provide protective and equipotential bonding conductors. Size in accordance with the BS 7671 (IEE Wiring Regulations).

- Material
- Copper LSF to BS 7211.
- Armouring or sheathing of cables.
- Protective conductor of multi-core cable.

800.320 BUILDING SERVICES:

Bond to protective conductor system, all metallic building services in:-

- The area covered by the contract

## BS APPENDIX

BS 1210:1963 – Specification for wood screws – Current, Work in Hand, Obsolescent

BS 1362:1973 – Specification for general purpose fuse links for domestic and similar purposes (primarily for use in plugs)

BS 1363-4:1995 – 12A plugs, socket-outlets and adaptors. Part 4 Specification for 13A fused connection units switched and unswitched

BS 3573:1990 – Specification for polyolefin copper-conducted telecommunications cables

BS 3924:1978 – Specification for pressure-sensitive adhesive tapes for electrical insulating purposes. Current but partially replaced by Parts of BS EN 60454-3

BS 4533-102.1:1990 – Luminaires. Particular requirements. Part 102.1 Specification for fixed general purpose luminaires

BS 4662:1970 – Specification for boxes for the enclosure of electrical accessories

BS 5225-3:1982 – Photometric data for luminaires. Part 3 Method of photometric measurement of battery-operated emergency lighting luminaires

BS 5266-1:2005– Emergency lighting. Part 1 Code of practice for the emergency lighting of premises other than cinemas and certain other specified premises used for entertainment. Partially replaced by the dual numbered standards BS EN 50172:2004, BS 5266-8:2008

BS 5446-1:2000 – Fire detection and fire alarm devices for dwellings. Part 1 Specification for smoke alarms

BS 5446-2:2003 – Fire detection and fire alarm devices for dwellings. Part 2 Specification for heat alarms

BS 5467:1997 – Electric cables. Thermosetting insulated, armoured cables for voltages of 600/1000V and 1900/3300V

BS 5499-1:2002 – Graphical symbols and signs. Part 1 Safety signs, including gfire safety signs. Specification for geometric shapes, colours and layout

BS 5499-3:1990 – Fire safety signs, notices and graphics symbols. Part 3 Specification for internally-illuminated fire safety signs

BS 5499-5:2002 – Graphical symbols and signs. Safety signs, including fire safety signs. Part 5 Signs with specific safety meanings

BS 559:1998 – Specification for design, construction and installation of signs

BS 5733:1995 – Specification for general requirements for electrical accessories

BS 5839-1:2002 – Fire detection and alarm systems for buildings. Part 1 Code of practice for system design, installation, commissioning and maintenance

BS 5839-3:1988 – Fire detection and alarm systems for buildings. Part 3 Specification for automatic release mechanisms for certain fire protection equipment

BS 5839-6:2004 – Fire detection and alarm systems for buildings. Part 6 Code of practice for the design, installation and maintenance of fire detection and fire alarm systems in dwellings

BS 6004:2000 – Electric cables, PVC insulated, non-armoured cables for voltages up to and including 450/750 V, for electric power, lighting and internal wiring

BS 6121-2:1989 – Mechanical cable glands. Part 2 specification for polymeric glands

BS 6150:1991 – Code of practice for painting of buildings

BS 6500:2000 – Electric cables. Flexible cords rated up to 300/500 V, for use with appliances and equipment intended for domestic, office and similar environments

BS 67:1987 – Specification for ceiling roses

BS 6724:1997 – Electric cables. Thermosetting insulated, armoured cables for voltages of 600/1000V and 1900/3300 V, having low emission of smoke and corrosive gases when affected by fire

BS 7211:1998 – Electric cables. Thermosetting insulated, non-armoured cables for voltages up to and including 450/750 V, for electric power, lighting and internal wiring, and having low emission of smoke and corrosive gases when affected by fire

BS 7430:1998 – Code of practice for earthing

BS 7629-1:1997 – Specification for 300/500 V fire resistant electric cables having low emission of smoke and corrosive gases when affected by fire. Part 1 Multicore cables

BS 7671:2008 – Requirements for electrical installations. IEE Wiring Regulations. Seventeenth edition

BS 8300:2001 – Design of buildings and their approaches to meet the needs of disabled people. Code of practice

BS 8436:2004 – Electric cables. 300/500 V screened electric cables having low emission of smoke and corrosive gases when affected by fire, for use in wall, partitions and building voids. Multicore cables.

BS EN 50085-1:1999 – Cable trunking and cable ducting systems for electrical installations. Part 1 General requirements

BS EN 50262:1999 – Metric cable glands for electrical installations

BS EN 50310:2000 – Application of equipotential bonding and earthing in buildings with information technology equipment

BS EN 50368:2003 – Cable cleats for electrical installations

BS EN 54-1:1996 – Fire detection and fire alarm systems. Part 1 Introduction

BS EN 54-11:2001 – Fire detection and fire alarm systems. Part 11 Manual call points

BS EN 54-2:1998 – Fire detection and fire alarm systems. Part 2 Control and indicating equipment

BS EN 54-3:2001 – Fire detection and fire alarm systems. Part 3 Fire alarm devices. Sounders

BS EN 54-4:1998 – Fire detection and fire alarm systems. Part 4 Power supply equipment

BS EN 54-5:2001 – Fire detection and fire alarm systems. Part 5 Heat detectors. Point detectors

BS EN 54-7:2001 – Fire detection and fire alarm systems. Part 7 Smoke detectors. Point detectors using scattered light, transmitted light or ionisation

BS EN 60400:2000 – Lamp holders for tubular fluorescent lamps and starter holders

BS EN 60454-1:1995 – Specification for pressure-sensitive adhesive tapes for electrical purposes. Part 1 General requirements

BS EN 60529:1992 – Specification for degrees of protection provided by enclosures (IP code)

BS EN 60598-1:2004 – Luminaires. Part 1 General requirements and tests

BS EN 60598-2-22:1999 – Luminaires. Part 2-22. Particular requirements. Luminaires for emergency lighting

BS EN 60702-1:2002 – Mineral insulated cables and their terminations with a rated voltage not exceeding 750 V. Part 1 Cables

BS EN 60702-2:2002 – Mineral insulated cables and their terminations with a rated voltage not exceeding 750 V. Part 2 Terminations

BS EN 60921:2004 – Specification for ballasts for tubular fluorescent lamps. Performance requirements

BS EN 60929:2004 – AC supplied electronic ballasts for tubular fluorescent lamps. Performance requirements

BS EN 60947-2:2003 – Specification for low voltage switch gear and control gear. Part 2 Circuit-breakers

BS EN 60947-3:1999 – Specification for low voltage switch gear and control gear. Part 3 Switches, disconnectors, switch disconnectors and fuse-combination units

BS EN 60347-2-3:2001 – Lamp control gear. Part 2-3 Particular requirements for ac supplied electronic ballasts for fluorescent lamps

BS EN 61347-2-8:2001 – Lamp control gear. Part 2-8 Particular requirements for ballasts for fluorescent lamps

BS EN 61558-1:1998 – Safety of power transformers, power supply units and similar devices. Part 1 General requirements and tests.

# 3.0 SCHEDULES

## 3.1 SCHEDULE OF DRAWINGS

| Drawing Number | Title |
|---|---|
| 6888E((60)-001 | Electrical Engineering Services<br>Replacement Fire Alarm and Emergency Lighting Systems Site Plan<br>Scale: A1 - 1:1250 |
| 6888E(61)-002 | Electrical Engineering Services - 22 Gordon Square<br>Replacement Fire Alarm and Emergency Lighting Schematic<br>Scale: A1 – N.T.S |
| 6888E(61)-003 | Electrical Engineering Services - 23-26 Gordon Square<br>Replacement Emergency Lighting Schematic<br>Scale: A1 – N.T.S |
| 6888E(61)-004 | Electrical Engineering Services - 23-26 Gordon Square<br>Replacement Fire Alarm Schematic<br>Scale: A1 – N.T.S |
| 6888E(67)-005 | Electrical Engineering Services - 22 Gordon Square<br>Basement, Ground & First Floor Replacement Fire Alarm System<br>Scale: A1 - 1:50 |
| 6888E(67)-006 | Electrical Engineering Services - 22 Gordon Square<br>Second, Third & Fourth Floor Replacement Fire Alarm System<br>Scale: A1 - 1:50 |
| 6888E(67)-007 | Electrical Engineering Services - 23-26 Gordon Square<br>Basement Plan Replacement Fire Alarm Layouts<br>Scale: A1 - 1:50 |
| 6888E(67)-008 | Electrical Engineering Services - 23-26 Gordon Square<br>Ground Floor Plan Replacement Fire Alarm Layouts<br>Scale: A1 - 1:50 |
| 6888E(67)-009 | Electrical Engineering Services - 23-26 Gordon Square<br>First Floor Plan Replacement Fire Alarm Layouts<br>Scale: A1 - 1:50 |
| 6888E(67)-010 | Electrical Engineering Services - 23-26 Gordon Square<br>Second Floor Plan Replacement Fire Alarm Layouts<br>Scale: A1 - 1:50 |
| 6888E(67)-011 | Electrical Engineering Services - 23-26 Gordon Square<br>Third Floor Plan Replacement Fire Alarm Layouts<br>Scale: A1 - 1:50 |
| 6888E(67)-012 | Electrical Engineering Services - 23-26 Gordon Square<br>Fourth Floor Plan Replacement Fire Alarm Layouts<br>Scale: A1 - 1:50 |
| 6888E(63)-013 | Electrical Engineering Services - 22 Gordon Square<br>Basement, Ground & First Floor Replacement Emergency Lighting System<br>Scale: A1 - 1:50 |
| 6888E(63)-014 | Electrical Engineering Services - 22 Gordon Square<br>Second, Third & Fourth Floor Replacement Emergency Lighting System<br>Scale: A1 - 1:50 |
| 6888E(63)-015 | Electrical Engineering Services - 23-26 Gordon Square<br>Basement Plan Replacement Emergency Lighting Layouts<br>Scale: A1 - 1:50 |
| 6888E(63)-016 | Electrical Engineering Services - 23-26 Gordon Square<br>Ground Plan Replacement Emergency Lighting Layouts<br>Scale: A1 - 1:50 |
| 6888E(63)-017 | Electrical Engineering Services - 23-26 Gordon Square<br>First Plan Replacement Emergency Lighting Layouts<br>Scale: A1 - 1:50 |

| Drawing Number | Title |
|---|---|
| 6888E(63)-018 | Electrical Engineering Services - 23-26 Gordon Square<br>Second Plan Replacement Emergency Lighting Layouts<br>Scale: A1 - 1:50 |
| 6888E(63)-019 | Electrical Engineering Services - 23-26 Gordon Square<br>Third Plan Replacement Emergency Lighting Layouts<br>Scale: A1 - 1:50 |
| 6888E(63)-020 | Electrical Engineering Services - 23-26 Gordon Square<br>Fourth Plan Replacement Emergency Lighting Layouts<br>Scale: A1 - 1:50 |

**Tender Drawings**

The drawings in the Schedule of Tender Drawings constitute part of the tender documents and shall be called the tender drawings. These drawings when read in conjunction with the Particular and Standard Specification provide information for tendering.

**Installation Drawings**

Installation Drawings shall be produced which, in the opinion of the Services Engineer, are necessary for the proper execution of the works and the co-ordination of all trades.

The following constitute the main requirements but do not reduce the Services Engineers right to call for additional information if this is shown to be necessary.

- Co-ordination drawings
- Layouts showing all tray and trunking runs
- Manufacturers working drawings
- Comprehensive wiring diagrams of/and for all electrical equipment and installations
- Layout of all plant rooms
- Routes of main cables
- All builders work requirements

The production of the installation drawings must suit the contract programme.

The drawings shall be produced at a time to allow a period of two weeks for initial consideration by the Design Team and a further one week for formal issue of the drawings. Work shall not be commenced until drawings have been formally issued.

Any work commenced prior to issue of satisfactory installation drawings will be carried out entirely at the Contractors own risk.

During the programme of works the installation drawings are to be marked up by the Contractor to reflect the progress being made on site, incorporating any variations and alternations etc.

These marked up drawings which will form the basis of the "As Installed" drawings to be made available for inspection upon request.

No claims will be entertained for abortive work caused by failure to issue satisfactory installation drawings at the relevant time.

The installation drawings must be fully co-ordinated with the other services including the mechanical services, drainage system, structural and building details.

## 3.2 SCHEDULE OF EMERGENCY LUMINAIRES AND EXIT SIGNS

| Type | Description |
|---|---|
| E1 | Self-contained internal individual addressable (non maintained) emergency luminaire Thorn Lighting Voyager LED Series<br><br>Ref: 96503726 VOYAGER LED AREA MCE E3TX WHI |
| E2 | Self-contained external individual addressable (non-maintained) emergency bulkhead luminaire Thorn Lighting EyeKon<br><br>Ref: 96206459 EYE VS 1X28W TC-DDEL HF E3TX OP L BL<br><br>Requires lamps to be ordered separately. |
| E3 | Self-contained internal individual addressable (maintained) emergency exit sign ((box type) Thorn Lighting Voyager Sigma<br><br>Ref: 96233815 VOYAGER SIGMA LED E3TX WHI<br><br>Complete with LED strip.<br><br>Requires running man down legend panels. |

## 3.3 SCHEDULE OF INCLUDED SUMS – EMERGENCY LIGHTING INSTALLATION

The Contractor shall note that the following sums shall be included in the Summary of Tender:

1. Provisional Sums: **22 Gordon Square**

| | |
|---|---|
| i) VIR cables/blocked conduits | £ 1,000.00 |
| ii) Reduced building user co-operation | £ 1,000.00 |
| iii) Asbestos | £ 500.00 |
| iv) Data link and additional connections | £ 500.00 |
| v) Additional builders work (listed building consent) | £ 1,000.00 |
| TOTAL TO SUMMARY OF TENDER 'A' | £ 4,000.00 |

2. Contingency Sum TOTAL TO SUMMARY OF TENDER 'A' £ 2,000.00

3. Schedule of Day Work Rates

Items of additional work authorised at Day Work Rate shall be priced at net cost plus a percentage addition for overheads, profit and MC discount in accordance with the RICS/ECA Definition of Day Work – latest edition.

The Electrical Contractor shall insert below the percentage addition he will require against each item and carry the total forward to the SUMMARY OF TENDER.

| | | | |
|---|---|---|---|
| Labour | £ 500.00 | | £ |
| Percentage addition | | % | £ |
| Materials | £ 500.00 | | £ |
| Percentage addition | | % | £ |
| **TOTAL TO SUMMARY OF TENDER 'A'** | | | **£** |

1. Provisional Sums: **23 – 26 Gordon Square**

| | |
|---|---|
| i) VIR cables/blocked conduits | £ 4,000.00 |
| ii) Reduced building user co-operation | £ 4,000.00 |
| iii) Asbestos | £ 2,000.00 |
| iv) Data link and additional connections | £ 1,000.00 |
| v) Additional builders work (listed building consent) | £ 4,000.00 |
| TOTAL TO SUMMARY OF TENDER 'B' | £ 15,000.00 |

2. Contingency Sum TOTAL TO SUMMARY OF TENDER 'B' £ 10,000.00

3. Schedule of Day Work Rates

Items of additional work authorised at Day Work Rate shall be priced at net cost plus a percentage addition for overheads, profit and MC discount in accordance with the RICS/ECA Definition of Day Work – latest edition.

The Electrical Contractor shall insert below the percentage addition he will require against each item and carry the total forward to the SUMMARY OF TENDER.

| | | | |
|---|---|---|---|
| Labour | £ 500.00 | | £ |
| Percentage addition | | % | £ |
| Materials | £ 500.00 | | £ |
| Percentage addition | | % | £ |

**TOTAL TO SUMMARY OF TENDER 'B' £**

## 3.4 SCHEDULE OF INCLUDED SUMS – FIRE ALARM INSTALLATION

The Contractor shall note that the following sums shall be included in the Summary of Tender:

1. Provisional Sums: **22 Gordon Square**
   i) Additional builders work (listed building consent) £ 1,000.00

   TOTAL TO SUMMARY OF TENDER 'A' £ 1,000.00

2. Contingency Sum TOTAL TO SUMMARY OF TENDER 'A' £ 3,000.00

3. Schedule of Day Work Rates

Items of additional work authorised at Day Work Rate shall be priced at net cost plus a percentage addition for overheads, profit and MC discount in accordance with the RICS/ECA Definition of Day Work – latest edition.

The Electrical Contractor shall insert below the percentage addition he will require against each item and carry the total forward to the SUMMARY OF TENDER.

| | | | |
|---|---|---|---|
| Labour | £ 500.00 | | £ |
| Percentage addition | | % | £ |
| Materials | £ 500.00 | | £ |
| Percentage addition | | % | £ |

**TOTAL TO SUMMARY OF TENDER 'A'** £

1. Provisional Sums: **23 – 26 Gordon Square**
   i) Additional builders work (listed building consent) £ 4,000.00

   TOTAL TO SUMMARY OF TENDER 'B' £ 4,000.00

2. Contingency Sum TOTAL TO SUMMARY OF TENDER 'B' £ 10,000.00

3. Schedule of Day Work Rates

Items of additional work authorised at Day Work Rate shall be priced at net cost plus a percentage addition for overheads, profit and MC discount in accordance with the RICS/ECA Definition of Day Work – latest edition.

The Electrical Contractor shall insert below the percentage addition he will require against each item and carry the total forward to the SUMMARY OF TENDER.

| | | | |
|---|---|---|---|
| Labour | £ 500.00 | | £ |
| Percentage addition | | % | £ |
| Materials | £ 500.00 | | £ |
| Percentage addition | | % | £ |

**TOTAL TO SUMMARY OF TENDER 'B'** £

UNIVERSITY COLLEGE LONDON
ELECTRICAL ENGINEERING SERVICES
REPLACEMENT EMERGENCY LIGHTING AND FIRE ALARM SYSTEMS

HAZARD IDENTIFICATION SHEETS

ELECTRICAL ENGINEERING SERVICES
POTENTIAL HAZARDS DURING CONSTRUCTION

| Hazard Ref. | Hazard Description | Category E / R / U | Date Entered | Sign |
|---|---|---|---|---|
| E001 | Stripping out and removal of redundant materials and services throughout the site area and installation of new systems | R | February 2010 | ED |
| E002 | Reconnecting into existing services etc. | R | February 2010 | ED |
| E003 | Working at high level in rooms and service plant areas to install electrical services, etc. | R | February 2010 | ED |
| E004 | Working in floor ducts and service risers | U | February 2010 | ED |
| E005 | Existing services cable routes | R | February 2010 | ED |
| E006 | Plant access and handling | R | February 2010 | ED |
| E007 | Working in occupied areas | R | February 2010 | ED |
| E008 | Tripping | U | February 2010 | ED |
| E009 | Fire | U | February 2010 | ED |
| E010 | Harmful substances | U | February 2010 | ED |
| E011 | Working in confined spaces | R | February 2010 | ED |
| E012 | Working external on roof and escape stairs | U | February 2010 | ED |

E : Eliminate by design R : Reduce by design U : Unavoidable in design

| azard Reference | Hazard Description |
|---|---|
| 001 | Stripping out and removal of redundant materials and services throughout the site area and installation of new services. |

**ategory of Severity** (S): H(3), ~~M(2), L(1)~~ **Likelihood that harm will occur** (L): ~~H(3), M(2)~~, L(1) **Assessment of Risk** (S x L): H(4+), M(3), L(1-2): M (3)

**azard Control: Design Actions**

Ensure that all existing services to other locations in the establishment are maintained in operation.

Design team has attempted to discover hazardous materials through visual survey.

Minimum requirements for stripping out etc allowed for in contract.

The existing emergency lighting and fire alarm systems stripped out and replaced with new as indicated on the drawings and detailed in the specification.

**azard Control: Instruction to Principal Contractor.**

The Principal Contractor is cautioned that hazardous materials may still exist on site. The Contractor shall satisfy himself that the contract area is free from hazardous materials.

Any hazardous materials found should be immediately notified to the engineer and works in that area stopped pending appropriate action.

Appropriate disposal of hazardous and stripped redundant materials as defined under current legislation to be used.

| | |
|---|---|
| **azard Sheet Prepared by:** ED | **Date Prepared:** February 2010 |

| azard Reference | Hazard Description |
|---|---|
| 002 | Reconnecting into existing electrical etc. |

**ategory of Severity** (S): H(3), ~~M(2), L(1)~~ **Likelihood that harm will occur** (L): ~~H(3)~~, M(2), ~~L(1)~~ **Assessment of Risk** (S x L): H(4+), M(3), HL 1-2): H(4)

**azard Control : Design Actions**

- Careful programming of connection/services shutdown to reduce disruption.

**azard Control : Instructions to Principal Contractor**

- Careful programming with the Engineer and also the UCL Engineer at Estates and Facilities regarding shutdown of services etc.
- Location of connection points identified on drawings and routes of cabling established.

| | |
|---|---|
| **Hazard Sheet Prepared by:** ED | **Date Prepared:** February 2010 |

| zard Reference | Hazard Description |
|---|---|
| 003 | Working at high level in rooms and service plant areas to install electrical services |

**egory of Severity** (S): H(3), ~~M(2)~~, ~~L(1)~~ **Likelihood that harm will occur** (L): ~~H(3)~~, ~~M(2)~~, L(1) **Assessment of Risk** (S x L): H(4+), M(3), L(1-2): M(3)

**zard Control : Design Actions**

Electrical services to new emergency lighting and fire alarm wiring systems.
High temperature heating services.
Existing plant in operation.
Existing LV cabling.

**zard Control : Instructions by Principal Contractor**

Safe access platforms/ladders, etc, to be provided to facilitate works at high level.
Adequate temporary lighting to be provided.
Head and eye protection to be provided and worn.
Working drawings to be produced by contractors for co-ordination.

| **zard Sheet Prepared by:** ED | **Date Prepared:** February 2010 |
|---|---|

| zard Reference | Hazard Description |
|---|---|
| 004 | Working in floor ducts and service risers. |

**ategory of Severity** (S): H(3), ~~M(2), L(1)~~ **Likelihood that harm will occur** (L): H(3), M(2), L(1) **Assessment of Risk** (S x L): H(4+), M(2), L(1-2), M(3)

**azard Control :Design Actions**

Working in existing floor ducts which have existing cabling installed.
High temperature (existing) heating pipework.

**azard Control : Instructions to Principal Contractor**

Contractor to provide method statements for works associated with cabling installation.
All works complying with Health and Safety legislation and associated British standards (supplied and installed by contractor unless noted otherwise).
The Contractor shall adopt safe working practices and adopt and ensure use of safety harnesses as necessary, safety rails to be provided on completion for safe maintenance access.

| **zard Sheet Prepared by:** ED | **Date Prepared:** February 2010 |
|---|---|

| azard Reference | Hazard Description |
|---|---|
| )05 | Existing services cable routes |

**tegory of Severity** (S): H(3), ~~M(2), L(1)~~ **Likelihood that harm will occur** (L): ~~H(3), M(2)~~, L(1) **Assessment of Risk** (S x L): H(4+), M(3), L(1-2): M(3)

**azard Control :Design Actions**

Unidentified concealed services.
Live cables.
Heating pipework and high temperature plant.

**zard Control : Instructions to Principal Contractor**

Undertake all works in accordance with the Industries Standard Code of Working Practice.
Contractor to maintain access for work and movement in spaces, hazardous to be fenced and appropriately marked. Contractor to operate a permit to work system and obtain University College London permit to work.
Contractor to allow for survey of all existing concealed cabling with cable/pipe detector prior to commencing, due to lack of record drawings and marking on record drawings, any services retained in addition to the new services provided.

| azard Sheet Prepared by: ED | **Date Prepared:** February 2010 |
|---|---|

| azard Reference | Hazard Description |
|---|---|
| 006 | Plant access and handling. |

ategory of Severity (S): H(3), M(2), L(1) Likelihood that harm will occur: H(3), M(2), L(1) Assessment of Risk (S x L): H(4-), M(3), L(1-2), (M3)

**zard Control : Design Actions**

Delivery and installation of items of electrical plant, eg cable and cable support systems and lighting fittings and control panels and detectors.

**zard Control : Instructions to Principal Contractor**

Safe access facilities to be provided through access areas to allow for delivery of materials to site. (Material deliveries should only be arranged when University College London is clear of members of the Public and Staff and arranged with University College London security).
All personnel to be provided with adequate safety equipment which shall be worn at all times during construction.
Adequate methods of protection for preventing dust contamination of area and services etc. to be provided.
All fire exits and safety equipment, fire alarms etc. to remain clear and operational at all hours during works.
Safe working platforms, scaffolding, tools and equipment, ladders etc. to be utilised on site.

| azard Sheet Prepared by: ED | Date Prepared: February 2010 |
|---|---|

| zard Reference | Hazard Description |
|---|---|
| 8 | Tripping |

**egory of Severity** (S): H(3), ~~M(2), L(1)~~ **Likelihood that harm will occur** (L): ~~H(3)~~, ~~M(2)~~, L(1) **Assessment of Risk** (S x L): H(4+), M(3), L(1-2): M(3)

**zard Control : Design Actions**

Cable/conduit and Trunking installations.
Cables lying on floors etc ready to be installed/pulled in.

**azard Control : Instructions to Principal Contractor**

Keep walkways, corridors, stairs clean and clutter free.
Provide warning notices and barriers.

| **zard Sheet Prepared by:** ED | **Date Prepared:** February 2010 |
|---|---|

| Hazard Reference | Hazard Description |
|---|---|
| E009 | Fire |

**Category of Severity** (S): H(3), M(2), L(1) **Likelihood that harm will occur** (L): H(3), M(2), L(1) **Assessment of Risk** (S x L): H(4+), M(2), L(1-0), M(2)

**Hazard Control : Design Actions**

- Fire alarms
- Fire extinguishing methods

**Hazard Control : Instructions to Principal Contractor**

Protect building fabric against fire damage while cutting and welding equipment.
Provide manual detection.
Provide suitable extinguishing methods.
Existing fire alarm system to be maintained in operation at all times.

| **Hazard Sheet Prepared by:** ED | **Date Prepared:** February 2010 |
|---|---|

| azard Reference | Hazard Description |
|---|---|
| 010 | Harmful substances |

**ategory of Severity** (S): H(3), ~~M(2), L(1)~~ **Likelihood that harm will occur** (L): ~~H(3)~~, ~~M(2)~~, L(1) **Assessment of Risk** (S x L): H(4+), M(3), L(1-2): M(3)

**azard Control : Design Actions**

Fluorescent lamps and tubes.

**zard Control : Instructions to Principal Contractor**

Provide safe storage and handling methods.
Provide safe methods of disposal of redundant materials.

| **ard Sheet Prepared by:** ED | **Date Prepared:** February 2010 |
|---|---|

| zard Reference | Hazard Description |
|---|---|
| 011 | Working in confined spaces |

tegory of Severity (S): H(3), M(2), L(1) Likelihood that harm will occur (L): H(3), M(2), L(1) Assessment of Risk (S x L): H(4+), M(3), L(1-2), M(3)

**zard Control : Design Actions**

Service ducts
Around existing plant in switch rooms, plant rooms and lift motor rooms
Working around operating plant and high temperature heating pipes/plant

**lazard Control : Instructions to Principal Contractor**

Ensure operatives are comfortable working in enclosed spaces
Operatives must not work alone
Contractor to provide method statements

| azard Sheet Prepared by: ED | **Date Prepared:** February 2010 |
|---|---|

| azard Reference | Hazard Description |
|---|---|
| 012 | Working externally on roof and escape stairs |

**ategory of Severity** (S): H(3), ~~M(2), L(1)~~ **Likelihood that harm will occur** (L): ~~H(3)~~, ~~M(2)~~, L(1) **Assessment of Risk** (S x L): ~~H(4+),~~ M(3), L(1-2): M(3)

**zard Control : Design Actions**

Working at high level/exposed to elements
Exposed to elements
Falls from height

**zard Control : Instructions to Principal Contractor**

Contractor to provide method statements for works associated with cabling installation to plant on external roof areas
All works complying with Health and Safety legislation and associated British Standards (supplied and installed by Main Contractor unless noted otherwise)
The Contractor shall adopt safe working practices and adopt and ensure use of safety harnesses as necessary, safety rails to be provided on completion for maintenance access

| **azard Sheet Prepared by:** ED | **Date Prepared:** February 2010 |
|---|---|

UNIVERSITY COLLEGE LONDON
ELECTRICAL ENGINEERING SERVICES
REPLACEMENT EMERGENCY LIGHTING AND FIRE ALARM SYSTEMS

# 4.0 SUMMARY OF TENDER

UNIVERSITY COLLEGE LONDON
ELECTRICAL ENGINEERING SERVICES
REPLACEMENT EMERGENCY LIGHTING AND FIRE ALARM SYSTEMS

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## 22 GORDON SQUARE

## SUMMARY OF TENDER 'A' EMERGENCY LIGHTING AND FIRE ALARM INSTALLATION

| | | | |
|---|---|---|---|
| 1.0 | Preliminaries and Conditions of Contract | | £ |
| 2.0 | V90 Particular Specification (**Emergency Lighting**) | | |
| | 1 | General Information | £ |
| | 2 | Stripping Out Redundant Services | £ |
| | 3 | Emergency Lighting Installation | £ |
| | 4 | Associated Builders Work | £ |
| | 5 | Containment Systems | £ |
| | 6 | Earthing and Bonding | £ |
| | 7 | Inspection, Testing and Commissioning | £ |
| | 8 | 'As Installed' Drawings and Maintenance Manuals | £ |
| | 9 | Training of Staff | £_____ |
| | | Sub Total | £ |
| 3.0 | V90 Particular Specification (**Fire Alarm**) | | |
| | 1 | General Information | £ |
| | 2 | Stripping Out Redundant Services | £ |
| | 3 | Fire Alarm Installation | £ |
| | 4 | Fisk Fire Commission and De-commission cost | £ |
| | 5 | Associated Builders Work | £ |
| | 6 | Containment Systems | £ |
| | 7 | Earthing and Bonding | £ |
| | 8 | Inspection and Testing | £ |
| | 9 | 'As Installed' Drawings and Maintenance Manuals | £ |
| | 10 | Training of Staff | £_____ |
| | | Sub Total | £ |
| 4.0 | Included Sums | | |
| | Provisional Sums | | £ 5,000.00 |
| | Contingency Sum | | £ 5,000.00 |
| | Day Works | | £_____ |
| | TOTAL to Final Grand Summary of Tender | | £_____ |

**UNIVERSITY COLLEGE LONDON**
**ELECTRICAL ENGINEERING SERVICES**
**REPLACEMENT EMERGENCY LIGHTING AND FIRE ALARM SYSTEMS**

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**23-26 GORDON SQUARE**

**SUMMARY OF TENDER 'B' EMERGENCY LIGHTING AND FIRE ALARM INSTALLATION**

| | | | |
|---|---|---|---|
| 1.0 | Preliminaries and Conditions of Contract | | £ |
| 2.0 | V9O Particular Specification (**Emergency Lighting**) | | |
| | 1 | General Information | £ |
| | 2 | Stripping Out Redundant Services | £ |
| | 3 | Emergency Lighting Installation | £ |
| | 4 | Associated Builders Work | £ |
| | 5 | Containment Systems | £ |
| | 6 | Earthing and Bonding | £ |
| | 7 | Inspection, Testing and Commissioning | £ |
| | 8 | 'As Installed' Drawings and Maintenance Manuals | £ |
| | 9 | Training of Staff | £_____ |
| | | Sub Total | £ |
| 3.0 | V90 Particular Specification (**Fire Alarm**) | | |
| | 1 | General Information | £ |
| | 2 | Stripping Out Redundant Services | £ |
| | 3 | Fire Alarm Installation | £ |
| | 4 | Fisk Fire Commission and De-commission cost | £ |
| | 5 | Associated Builders Work | £ |
| | 6 | Containment Systems | £ |
| | 7 | Earthing and Bonding | £ |
| | 8 | Inspection and Testing | £ |
| | 9 | 'As Installed' Drawings and Maintenance Manuals | £ |
| | 10 | Training of Staff | £_____ |
| | | Sub Total | £ |
| 4.0 | Included Sums | | |
| | Provisional Sums | | £ 19,000.00 |
| | Contingency Sums | | £ 20,000.00 |
| | Day Works | | £_____ |
| | TOTAL to Final Grand Summary of Tender | | £_____ |

UNIVERSITY COLLEGE LONDON
ELECTRICAL ENGINEERING SERVICES
REPLACEMENT EMERGENCY LIGHTING AND FIRE ALARM SYSTEMS

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**GRAND SUMMARY OF TENDER**

| | |
|---|---|
| **SUMMARY OF TENDER 'A' – 22 GORDON SQUARE** | **£** |
| **SUMMARY OF TENDER 'B' – 23-26 GORDON SQUARE** | **£** |
| **TOTAL TENDER SUM** | **£** |

It is important that the Summary is completed accurately to indicate the costs associated with the various headings.

DECLARATION

We hereby submit our Fixed Price Summary of Tender, being the sum total for the works defined in the Specification and on the drawings.

We have not deviated or alternatively priced, in any way, from the specified articles, nominated suppliers, subcontractors or materials, or the manner in which they are specified to be fixed.

Signed ..... Date .....

For & On Behalf Of

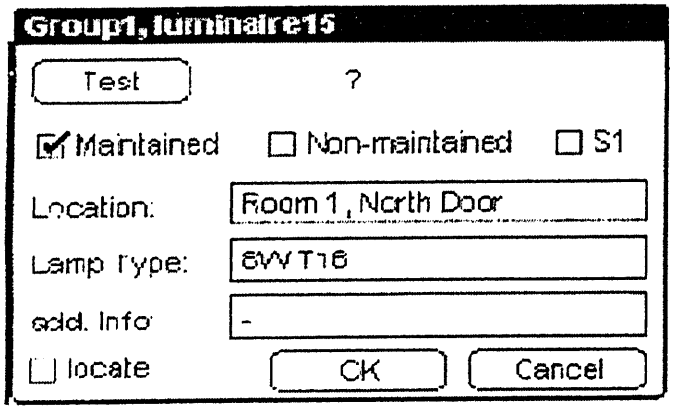
.....

.....

UNIVERSITY COLLEGE LONDON
ELECTRICAL ENGINEERING SERVICES
REPLACEMENT EMERGENCY LIGHTING AND FIRE ALARM SYSTEMS

# APPENDIX A

## PROPOSED EMERGENCY LIGHTING ADDRESS SCHEDULE


Group1, luminaire15
Test
?
Maintained
Non-maintained
S1
Location:
Room 1, North Door
Lamp type:
8W T16
add. info
-
locate
OK
Cancel

*Proposed schedule of Emergency lights addressing details, to be edited by Contractor and provided to Thorn Commissioning Engineer.*

**22 - 26 GORDON SQUARE HOUSES**

PROPOSED EMERGENCY LIGHTING ADDRESSES AND DESCRIPTIONS

**22 GORDON SQUARE :**

| | | *Location* | | *Lamp Type* | *add. Info.* | | | *Maint / N-Maint* |
|---|---|---|---|---|---|---|---|---|
| Group (Add Circuit) | Addresses | Floor | Room / Area | Lamp Type | Luminaire Ref | Inverter type | Comments | NM or M |
| Group 1: | 22/1/01 | | | | | | | |
| | 22/1/02 | | | | | | | |
| | 22/1/03 | | | | | | | |
| | 22/1/04 | | | | | | | |
| | 22/1/05 | | | | | | | |
| | 22/1/06 | | | | | | | |
| | 22/1/07 | | | | | | | |
| | 22/1/08 | | | | | | | |
| | 22/1/09 | | | | | | | |
| | 22/1/10 | | | | | | | |
| | 22/1/11 | | | | | | | |
| | 22/1/12 | | | | | | | |
| | 22/1/13 | | | | | | | |
| | 22/1/14 | | | | | | | |
| | 22/1/15 | | | | | | | |
| | 22/1/16 | | | | | | | |
| | 22/1/17 | | | | | | | |
| | 22/1/18 | | | | | | | |
| | 22/1/19 | | | | | | | |
| | 22/1/20 | | | | | | | |
| | 22/1/21 | | | | | | | |
| | 22/1/22 | | | | | | | |
| | 22/1/23 | | | | | | | |
| | 22/1/24 | | | | | | | |
| | 22/1/25 | | | | | | | |
| | 22/1/26 | | | | | | | |
| | 22/1/27 | | | | | | | |
| | 22/1/28 | | | | | | | |
| | 22/1/29 | | | | | | | |
| | 22/1/30 | | | | | | | |
| | 22/1/31 | | | | | | | |
| | 22/1/32 | | | | | | | |

| | | Location | | Lamp Type | add. Info. | | | Maint / N-Maint |
|---|---|---|---|---|---|---|---|---|
| Group (Add Circuit) | Addresses | Floor | Room / Area | Lamp Type | Luminaire Ref | Inverter type | Comments | NM or M |
| Group 2. | 22/2/01 | | | | | | | |
| | 22/2/02 | | | | | | | |
| | 22/2/03 | | | | | | | |
| | 22/2/04 | | | | | | | |
| | 22/2/05 | | | | | | | |
| | 22/2/06 | | | | | | | |
| | 22/2/07 | | | | | | | |
| | 22/2/08 | | | | | | | |
| | 22/2/09 | | | | | | | |
| | 22/2/10 | | | | | | | |
| | 22/2/11 | | | | | | | |
| | 22/2/12 | | | | | | | |
| | 22/2/13 | | | | | | | |
| | 22/2/14 | | | | | | | |
| | 22/2/15 | | | | | | | |
| | 22/2/16 | | | | | | | |
| | 22/2/17 | | | | | | | |
| | 22/2/18 | | | | | | | |
| | 22/2/19 | | | | | | | |
| | 22/2/20 | | | | | | | |
| | 22/2/21 | | | | | | | |
| | 22/2/22 | | | | | | | |
| | 22/2/23 | | | | | | | |
| | 22/2/24 | | | | | | | |
| | 22/2/25 | | | | | | | |
| | 22/2/26 | | | | | | | |
| | 22/2/27 | | | | | | | |
| | 22/2/28 | | | | | | | |
| | 22/2/29 | | | | | | | |
| | 22/2/30 | | | | | | | |
| | 22/2/31 | | | | | | | |
| | 22/2/32 | | | | | | | |
| Group 3 | NA | | | | | | | |
| Group 4 | NA | | | | | | | |