



October 2018

**STREAT MARKETS LTD  
LINK BUILDING, CENTRE POINT  
LONDON WC1A 1DD**

**SUPPLY, ERECTION, INSTALLATION, COMMISSIONING AND SET TO WORK**

**OF**

**ELECTRICAL SERVICES INSTALLATION**

**ELECTRICAL  
INSTALLATION PACKAGE**

## **1.0 INTRODUCTION**

This project covers the installation of the electrical services to restaurant, occupying Retail Unit 01 & 02, Link Building Centre Point, 101-103 New Oxford Street, London for Streat Markets Ltd.

This building currently offers retail space and is being refurbished to enhance these facilities and allow for restaurant use.

The building has numerous heritage features which must be preserved.

The building is a multi-storey / multi tenancy building. Streat Markets Ltd restaurant demise will occupy part of ground floor, mezzanine, Basement -1 and Basement -2 of the Link Building at Centre Point. Ground floor, Mezzanine will consist of Main Bar, numerous open Kitchen units and dining areas. Basement -1 will have a small Bar area and customer toilets, plant room and Kitchen Prep and wash-up areas. Basement -2 will contain staff welfare facilities and plant rooms as well as Office. The main entrance to the client's demise is on Ground Floor level 0.

The works shall include the installation of electrical services as detailed on the drawings. The new electrical services installation shall be complete in all aspects throughout the building. The installation shall comprise of new mains power distribution, small power, data, general lighting, emergency lighting, fire alarm, mechanical services wiring, audio visual, security and associated containment.

### **1.1 CDM Regulations**

In the context of CDM Regulations the Contractor appointed for the works described in these documents is not considered Principal Contractor.

### **1.2 Contract**

The contract shall be as per the contract preliminaries.

### **1.3 Dress Code**

All contract staff shall be suitably trained prior to visiting the site and conduct of all personnel shall be to the highest standard with respect to all occupants of the development. Site personnel shall be provided with new overalls, new high visibility vests and new hard hats which should be kept clean in appearance. Smoking and foul language of site operatives shall not be permitted in any area of the premises. Failure to comply with this may result in site operatives being asked to leave the site. All personnel working on the site are required to be fluent in the English Language.

### **1.4 Co-ordination**

The Contractor shall liaise with the other sub-contractors on site (including, but not limited to, Kitchen supplier/installer, Bar supplier/installer, Mechanical, Data Specialist, Fire alarm, Security, AV, Sprinkler etc.) regarding final routes of all services. Zones shall be agreed with all parties prior to work commencing on site. Final agreement shall be issued to the consulting engineer prior to the commencement of works.

To facilitate this, section drawings are provided for the intended concept of services installations.

Each contractor shall employ a competent CAD technician for the site to prepare fully coordinated drawings, both in plan and section for issue to the consulting engineer for approval 2 weeks prior to work commencing. All fully coordinated drawings should be issued to the consulting engineer a minimum of three weeks before works commence in each zone.

Drawings shall be required for the reflected ceiling plan, ceiling void coordination & floor void coordination. All drawings are to be produced in .dwg format.

It shall be noted that existing services may be retained within the demise. If the electrical contractor deems it necessary to ensure full co-ordination, a professional survey of all existing services shall be undertaken and these shall be incorporated onto the co-ordinated CAD drawings as noted above.

The Contractor shall note that the services indicated are for tender purposes and finite setting out must be coordinated on site with the main contractor and the other specialists.

**Relevant costs associated with the above and co-ordination shall be included within the tender price.**

### **1.5 Operation and Maintenance Manuals**

The Contractor shall supply at the end of the contract, operation and maintenance manuals as noted elsewhere within the documentation.

Additional to this the Contractor shall include the following within the manual.

- Assets register
- Separate building user guide on the operation of plant etc without technical content providing operation and environmental performance of the building.

### **1.6 Maintenance**

The Contractor shall include within the tender price for the full maintenance of all electrical services during the 12 months Defects and Liability period.

On completion of the maintenance, full servicing documentation shall be forwarded along with a new maintenance agreement for our Client.

### **1.7 Fabrication Drawings**

The contractor will be required to provide fabrication drawings indicating all routes of tray, cabling, risers, roof and plant rooms. They shall also provide vertical elevation drawings for kitchen equipment. These shall be approved prior to manufacture of any equipment. The contractor shall allow one week after delivery of drawings to the Consultant Engineers office for drawing approval. This shall be allowed within the program of works for the contract. The contractor shall provide a drawing in 3D ensuring the installation of all equipment can take place. This shall be provided a minimum of 2 weeks after awarding of contract.

### **1.8 Building Works**

In addition to the works specified in this specification a Building Contractor will be engaged to carry out other aspects of the works. It is essential that the activities of all contractors involved in the project are co-ordinated. The Building contractor will be the main contractor.

### **1.9 Civil Works**

In addition to the works specified in this specification a Civil Contractor will be engaged to carry out other aspects of the works. It is essential that the activities of all contractors involved in the project are co-ordinated. The civil contractor will be the main contractor.

### **1.10 Other Works**

In addition to the works specified in this specification and the Civil Contractor a Mechanical Contractor will be engaged to carry out the mechanical installation.

### **1.11 Other Consultants**

This specification is to be read in conjunction with drawings and specifications from the following consultants:

- Architect - Macaulay Sinclair
- Structural - Thomasons
- Kitchen designer - Hallmark
- Lighting Designer - Into Lighting Ltd
- Audio Visual - TBC

These drawings and documents shall be referred to for set out location and final quantities.

## **1.12 Existing Premises**

The contractor shall take due care and diligence with respect to all works required. No deliveries will be permitted outside the allocated time periods.

## **1.13 BREEAM**

The installation shall be in accordance with the requirements outlined in "BREEAM 2011NC - Green Lease & Green Building Guide Agreement Centre Point Retail 106610/DH/05082015: Revision 08" document included within the tender package. The contractor shall note that the development has to target VERY GOOD BREEAM rating, and that installation, commissioning etc. shall strictly follow outlined guidelines.

**Listed below are a number of elements that the Electrical Contractor must include within the tender for BREEAM Assessment requirements.**

### **1.13.1 Man 01 Sustainable Procurement: Building Services Commissioning**

The electrical contractor shall ensure that their fit-out equipment will be commissioned in accordance with BREEAM requirements:

An appropriate project team member(s) is appointed to monitor and programme pre-commissioning, commissioning and, where necessary, re-commissioning on behalf of the client.

All building services are included in the commissioning schedule and commissioning is to be carried out in line with current Building Regulations, BSRIA and CIBSE guidelines and/or other appropriate standard, where applicable (where a BMS is specified relevant BMS commissioning procedures should be undertaken).

1. The principal contractor accounts for the commissioning programme, responsibilities and criteria within the main programme of works.
2. A specialist commissioning manager is appointed during the design stage (by either client or contractor) for complex systems and the scope of their responsibility includes:
  - a. Design input: commissionability design reviews;
  - b. Commissioning management input to construction programming;
  - c. Commissioning management input during installation stages;
  - d. Management of commissioning, performance testing and handover/post handover stages.
3. The following seasonal commissioning responsibilities will be completed over a minimum 12 month period, once the building becomes occupied:  
Complex systems - Specialist commissioning manager
  - a. Testing of all building services under full load conditions, i.e. heating equipment in mid-winter, cooling/ventilation equipment in mid-summer, and under part load conditions (spring/autumn);
  - b. Where applicable, testing should also be carried out during periods of extreme (high or low) occupancy;
  - c. Interviews with building occupants (where they are affected by the complex services) to identify problems or concerns regarding the effectiveness of the systems;
  - d. Re-commissioning of systems (following any work needed to serve revised loads), and incorporating any revisions in operating procedures into the O&M manuals.

### **1.13.2 Man 04 Stakeholder Participation: Building User Information**

The electrical contractor shall update the Building User Guides after their fit-out works and ensure that Building User Guides are provided and are appropriate to all users of the building (general users including staff and if applicable residents, as well as the non-technical facilities management team/building manager).

The Guides must cover all functions and uses of the building, ensuring building users are able to use the building effectively. Where relevant, the documents must describe the facilities to be shared and how access to them will be arranged for potential users.

Building and site related information shall be made readily available to all future building users, enabling them to access and use the building, site and local transport infrastructure/amenities effectively.

Building user guide needs to cover the following items:

1. The building's staff (or where relevant residents);
2. The non technical facilities management team/building manager;
3. Other building users e.g. visitors/community users.

The content of the guide will be specific to the building type, but should broadly include information on the following:

1. Overview of the building and its environmental strategy e.g. energy/water/waste efficiency policy/strategy and how users should engage with/deliver the policy/strategy;
2. Building services overview and access to controls (where to find them, what they control, how to operate effectively and efficiently etc.);
3. Pre-arrival information for visitors e.g. access and security procedures/provisions;
4. Provision of and access to shared facilities;
5. Safety and emergency information/instructions;
6. Building related operational procedures specific to building type/operation e.g. labs;
7. Building related incident reporting/feedback arrangements;
8. Building related training information/links;
9. Provision of and access to transport facilities e.g. public transport, cyclist facilities, pedestrian routes etc;
10. Provision of and access to local amenities;
11. Re-fit, refurbishment and maintenance arrangements/considerations;
12. Links, references and relevant contact details.

### **1.13.3 Hea 01 Visual Comfort**

#### **1.13.3.1 High Frequency Ballasts**

The electrical contractor shall ensure that all fit-out internal fluorescent and compact fluorescent lamps are controlled by high frequency control gear. The electronic ballasts shall raise the frequency of the lamp(s) to a minimum of 32,000Hz. The ballasts shall fulfil all international regulations for general performance and safety, BS EN 61347. Harmonic distortion shall comply with BS EN 61000 and electromagnetic interference with BS EN 55015. Where the control gear for fluorescent luminaires is specified as switch start, it shall comply with BS EN 60155, BS EN 61437 and BS EN 60921. The Tenant shall submit details of proposed luminaires and their control gear to the Landlord for approval prior to installation.

#### **1.13.3.2 Internal Lighting: Zoning & occupant control**

It is recommended that all new internal lighting complies with the relevant criteria given in the CIBSE Code for Lighting 2009 and any other relevant industry standard, and that internal lux levels and lighting design complies in full with sections 3.3, 4.6, 4.7, 4.8 and 4.9 of CIBSE Lighting Guide 7. Where the Tenant installs additional external lighting this shall comply in full with the requirements of CIBSE Lighting Guide 6. The Tenant shall submit details of their proposed lighting design to the Landlord for approval.

For areas where computer screens are regularly used, the lighting design complies with CIBSE Lighting Guide 7 sections 3.3, 4.6, 4.7, 4.8 and 4.9. This gives recommendations highlighting:

1. Limits to the luminance of the luminaires to avoid screen reflections. (Manufacturers' data for the luminaires should be sought to confirm this).
2. For up-lighting, the recommendations refer to the luminance of the lit ceiling rather than the luminaire; a design team calculation is usually required to demonstrate this.
3. Recommendations for direct lighting, ceiling illuminance, and average wall illuminance.

If any external lighting included the illuminance levels for lighting in all external area specified in accordance with BS 5489-1:2003+A2:2008 Lighting of roads and public amenity areas. The zoning of and occupant controls for internal lighting are in accordance with the criteria below for relevant areas present within the building.

1. In office areas, zones of no more than four workplaces or there is suitable zoning/control of lighting to enable a reasonable degree of occupant control over lighting in their personable work area, a lighting consultant should set out how this is to be achieved in such an instance.
2. Workstations adjacent to windows/atria and other building areas separately zoned and controlled
3. Seminar and lecture rooms: zoned for presentation and audience areas
4. Library spaces: separate zoning of stacks, reading and counter areas
5. Teaching space/demonstration area
6. Whiteboard/display screen
7. Auditoria: zoning of seating areas, circulation space and lectern area
8. Dining, restaurant, café areas: separate zoning of servery and seating/dining areas
9. Retail: separate zoning of display and counter areas
10. Bar areas: separate zoning of bar and seating areas

Areas used for teaching, seminar or lecture purposes have lighting controls provided in accordance with CIBSE Lighting Guide 5. The controls specified will depend on the size and use of the space but a typical auditorium or lecture theatre with stepped seating and a formal lectern/demonstration/performance area would typically be expected to have lighting controls as follows:

1. Full normal lighting (to allow for entry/exit, cleaning etc.)
2. Demonstration area lighting off and audience area lighting reduced to a low level (for the purpose of line slide projection, but allowing enough light for the audience to take notes)
3. All lighting off (for the projection of tone slides, colour slides, and for the purposes of visual demonstrations/performances)
4. Separate localised lectern lighting

#### 1.13.4 Ene 01: Reduction of Emissions

The Tenant shall ensure that all Fit-out plant installed meets or exceeds the efficiencies stated in the base build Building Regulations Part L2a assessment. All new installations or modifications shall be submitted to the Landlord for approval. The limiting efficiencies of these items are detailed in the table below

Plant Items	Limiting Efficiencies
LTHW Heating	LTHW boilers with a seasonal efficiency to be $\geq 92\%$ and system distribution efficiency $\geq 95\%$ . OR No lesser than that base built plant. Use Value whichever is greater or efficient.
Chilled Water Cooling	Chillers with a SEER of $\geq 6$ and system distribution efficiency $\geq 95\%$ . OR No lesser than that base built plant. Use Value whichever is greater or efficient.
Central Air Handling Units (AHUs)	Specific Fan Power (SFP) $\leq 1.7$ W//sec & Heat Recovery of $\geq 75\%$
Zonal supply system where the fan is remote from the zone (Ceiling void or roof mounted unit)	Specific Fan Power (SFP) $\leq 0.60$ W//sec (For units with Heat Recovery $\geq 75\%$ additional 0.3 W//sec)
Local Extract Fans	Specific Fan Power (SFP) $\leq 0.40$ W//sec
Fan Coil Units	Specific Fan Power (SFP) $\leq 0.25$ W//sec
Pumps	Variable speed with multiple pressure sensors across the system
Duct Work Leakage Testing to CEN Standards	CEN Classification Class B
AHU Leakage Testing Meet CEN Standards	CEN Class L2
Areas	Limiting Lighting Efficacies & Controls
Retail – Sales Areas	2.0 W/m <sup>2</sup> /100 Lux (Day light Dimming with Automatic On/off)
Meeting Rooms	1.6 W/m <sup>2</sup> /100 Lux (Day light Dimming with Automatic On/off)
Cellular Office Areas	1.6 W/m <sup>2</sup> /100 Lux (Day light Dimming with Automatic On/off)
Toilet Areas	85 lm (Automatic On/Off)
Circulation Areas	85 lm (Automatic On/off)
Storage Areas	85 lm (Automatic On/Off)

#### 1.13.4 Ene 03: External Lighting

The Tenant shall ensure that all Fit-out External Lighting if installed meets the requirements stated in table below and all new installations or modifications shall be submitted to the Landlord for approval

1. All external fittings meet the lighting requirements as given in the Table below (External lighting requirements by location)
2. External light fittings are controlled through a time switch, or daylight sensor, to prevent operation during daylight hours (Daylight sensor override on a manually switched lighting circuit is acceptable)

External Lighting Location	Light fittings measured in lamp lumens/circuit Watt, when:		LED luminaires where the lamp is integral to the fitting measured in luminaire lumens/circuit Watt, when:	
	Colour rendering index (Ra) ≥ 60	Colour rendering index (Ra) < 60	Colour rendering index (Ra) ≥ 60	Colour rendering index (Ra) < 60
Building, access ways, pathways	50	60	40	50
Car parking, associated roads, flood lighting	70	80	55	60
	Lamp wattage ≥ 25W	Lamp wattage < 25W	Lamp wattage ≥ 25W	Lamp wattage < 25W
Signs, up lighting	60	50	50	50

### 1.13.5 Pol 04 Reduction in night time light pollution

The Tenant shall ensure that all Fit-out External Lighting if installed meets the requirements stated below and all new installations or modifications shall be submitted to the Landlord for approval

1. The external lighting strategy will need to be been designed in compliance with Table 2 (and its accompanying notes) of the ( Institution of lighting Professionals) ILP Guidance notes for the reduction of obtrusive light, 2011
2. Provision for all external lighting (except for safety and security lighting) can be automatically switched off between 23:00 hr and 07:00 hr. This can be achieved by providing a timer for all external lighting set to the appropriate hours.
3. If safety or security lighting is provided and will be used between 23:00 hr and 07:00 hr, this part of the lighting system complies with the lower levels of lighting recommended during these hours in Table 2 of the ILP's Guidance notes, for example by using an automatic switch to reduce the lighting levels at 23:00 hr or earlier.
4. Illuminated advertisements, where specified, must be designed in compliance with ILE Technical Report 5 – The Brightness of Illuminated Advertisements

**Note:**

- a. Where essential lighting is provided between 23:00 hr and 07:00 hr, i.e. for 24-hour operating facility, the system is able to automatically switch to the lower levels of lighting recommended in the ILE Guidance notes for lighting during these hours
- b. Where light fittings are specified to comply with specific security standards and these conflict with above listed criteria they can be excluded.

### 1.13.6 Ene 02 Energy Monitoring

Energy meters have been specified and installed by the developer as part of the base build. The tenant should ensure:

1. The major energy consuming systems (where present) are monitored using the Building Energy Management System (BEMS) or separate accessible energy sub-meters with a pulsed output to enable future connection to a BEMS:
  - a. Space Heating
  - b. Domestic Hot Water
  - c. Humidification
  - d. Cooling
  - e. Fans (major)
  - f. Lighting
  - g. Small Power (lighting and small power can be on the same sub-meter where supplies are taken at each floor/department).
  - h. Other major energy-consuming items where appropriate.
2. The end energy consuming use should be identifiable to the building user through labelling or data outputs.
3. An accessible BEMS or accessible sub-meters has been provided covering the energy supply to all tenanted areas or departments within the building/unit.

### 1.14 EPC Rating

Design and installation shall be in accordance with the requirements outlined in "BRUKL" document to target the EPC rating suitable for targeted BREEAM VERY GOOD building.

## **2.0 DEVIATIONS FROM SPECIFICATION**

Any discrepancies in or proposed deviations from the 'Scope of Work' are to be clarified with the Engineer before commencement.



### 3.0 DRAWING LIST

#### 3.1 Project Drawings

<b>Drawing No.</b>	<b>Drawing Title</b>	<b>Current Rev</b>
E001	Power & Data - Mezzanine Level +1	
E002	Power & Data - Ground Floor	
E003	Power & Data - Basement Level -1	
E004	Power & Data - Basement Level -2	
E005	Lighting & Emergency Lighting - Mezzanine Level +1	
E006	Lighting & Emergency Lighting - Ground Floor	
E007	Lighting & Emergency Lighting - Basement Level -1	
E008	Lighting & Emergency Lighting - Basement Level -2	
E009	Fire Alarm & Security & AV - Mezzanine Level +1	
E010	Fire Alarm & Security & AV - Ground Floor	
E011	Fire Alarm & Security & AV - Basement Level -1	
E012	Fire Alarm & Security - Basement Level -2	
E013	Mech Services Wiring - Mezzanine Level +1	
E014	Mech Services Wiring - Ground Floor	
E015	Mech Services Wiring - Basement Level -1	
E016	Mech Services Wiring - Basement Level -2	
E017	Containment - Mezzanine Level +1	
E018	Containment - Ground Floor	
E019	Containment - Basement Level -1	
E020	Containment - Basement Level -2	
E021	Mains Electrical Schematic	

### 3.2 Reference Drawings

#### 3.2.1 Architects – MACAULAY SINCLAIR

PROJECT.	Theatre Food Market, Centre Point	30	7
		8	9
		18	18

DWG NO.	DRAWING TITLE	REVISIONS	
01(01)	Existing Ground Floor Plan	/	/
01(02)	Existing Mezzanine Floor Plan	/	/
01(03)	Existing Basement Floor Plan	/	/
01(04)	Existing Elevation A-A	/	/
01(05)	Existing Elevation B-B	/	/
01(06)	Existing Elevation C-C	/	/
01(07)	Existing Elevation D-D	/	/
01(08)	Existing Section A-A	/	/
01(09)	Existing Section B-B	/	/
01(10)	Existing Section C-C and D-D	/	/
01(11)	Existing Section E-E and F-F	/	/
01(12)	Existing Section G-G and H-H	/	/
02(01)	Proposed Schematic GA - Ground Floor Plan	H	I
02(02)	Proposed Schematic GA - Mezzanine Floor Plan	D	E
02(03)	Proposed Schematic GA - Basement Floor Plans	B	C
03(01)	Location and Site Plan	/	/
03(02)	Building Regs Ground Floor Plan	/	/
03(03)	Building Regs Mezzanine Floor Plan	/	/
03(04)	Building Regs Basement Floor Plan	/	/
03(05)	Demolitions Plan Ground Floor	/	/
03(06)	Demolitions Plan Mezzanine Floor Plan	/	/
03(07)	Demolitions Plan Basement Floor Plan	/	/
03(08)	Licensing Plan	/	/
03(09)	Proposed Ground Floor Retail Area	/	/
03(10)	Proposed Elevation A-A	/	/
03(11)	Proposed Elevation B-B	/	/
03(12)	Proposed Elevation C-C	/	/
03(13)	Proposed Elevation D-D	/	/
03(14)	Proposed Section A-A	/	/
03(15)	Proposed Section B-B	/	/
03(16)	Proposed Sections C-C and D-D	/	/
03(17)	Proposed Sections E-E and F-F	/	/
03(18)	Proposed Co-ordination Services Plan	/	/
03(19)	Proposed Planning Visuals 1	/	/
03(20)	Proposed Planning Visuals 2	/	/
03(21)	Proposed Planning Visuals 3	/	/
03(22)	Proposed Planning Visuals 4	/	/

### 3.2.2 Kitchen Installer – HALLMARK

DRAWING No.	REV	TITLE
HD-11890-101	C	BASEMENT LEVEL -2
HD-11890-102	G	BASEMENT LEVEL -1
HD-11890-103	M	GROUND FLOOR
HD-11890-104	G	MEZZANINE

### 3.2.3 Lighting Specialist – INTO LIGHTING LTD

DRAWING No.	REV	TITLE
12561 C01	A	PROVISIONAL LIGHTING LAYOUT - GROUND FLOOR, RCP
12561 P01	B	PROVISIONAL LIGHTING LAYOUT - GROUND FLOOR, FLOOR POWER
12561 C02	A	PROVISIONAL LIGHTING LAYOUT – MEZZANINE, RCP
12561 P02	B	PROVISIONAL LIGHTING LAYOUT – MEZZANINE, FLOOR POWER

## 4.0 ELECTRICAL SPECIFICATION

### 4.1 Introduction

This section provides an outline scope of works for the Electrical services installation. This document has been prepared to identify the principal components of the installation and is to be read in conjunction with the drawings listed previously.

The Contractor shall be responsible for full supply, installation, testing and commissioning of the Electrical installation described in this document and or indicated on the drawings.

All equipment requiring maintenance shall be installed to be easily accessible and replaceable without major disruption.

**The contractor shall allow for all items/equipment not specifically noted or mentioned that are required to make a complete and functioning installation of the items/equipment indicated on the drawings and or specified within this document.**

For tendering as well as installation this specification and associated drawings must be read by a qualified and competent person who will be capable of identifying engineering details necessary to provide a complete installation.

**The contractor shall note that the finish and quality of this installation shall be of the highest order and shall allow for this in their tender.**

The design indicated on the drawings and all detail design and certification shall be verified by the successful contractor. Upon completion of the successful tender the certification shall be compliant with all local and national British standards.

The contractor shall include for all builders opening below 100mm diameter.

The contractor shall include for the removal of redundant items from site.

### 4.2 Installation Standards

The Contractor shall ensure that the installation of the Electrical Services fully complies with all the requirements and recommendations of the following:-

- a) All British Standard Specifications
- b) All British Standard Codes of Practice
- c) The Health and Safety at Work Act
- d) Recommendations of the Health and Safety at Work Executive
- e) Factories Act
- f) Office, Shops and Railway Premises Act
- g) Electricity Acts
- h) Electricity at Work Regulations
- i) Building Research Station Digest Recommendations
- j) Local Bylaws and Regulations
- k) Requirements of the Building Control Officer, Fire Officer and Environmental Health Officer
- l) The Employers Insurers
- m) Requirements of the Local Water Supply Company Electricity Supply Company and Local Authority
- n) The Institute of Electrical Engineers Regulations for Electrical Installations 18th Edition including all amendments and Appendices (BS7671)
- o) COSHH
- p) Requirements of British Telecom and other telecommunications companies whose services may be taken into the building
- q) Local Authority Regulations and Approvals

- r) All documentation, recommendations, guides, etc., produced by the Chartered Institute of Building Services Engineers including:-
  - Guides (Volumes A. B. C and D)
  - Commissioning Codes
  - Technical Memoranda
  - Practice Notes
  - Energy Notes
  - Code for Interior Lighting Design
  - Code for Exterior Lighting Design
- s) BSRIA Commissioning Codes
- t) Manufacturers stipulations and recommendations for installation, testing, commissioning and maintenance
- u) All other bodies and Authorities having jurisdiction
- v) CDM Regulations
- w) Heath Estates HTM regulations.
- x) Cabling colours to meet Harmonised / European Colour Codes – Brown/Black/Grey

**Where published documents are referred to in the above list, the Contractor shall ensure that the installation of the works comply with the latest edition current at the date of tender issue.**

#### **4.3 Installation Criteria**

The Electrical Installation shall be installed, tested and commissioned and certified in full compliance with the IEE Wiring Regulations 18th Edition.

The installation shall satisfy the Power Utility's requirements and also meet the following:-

- a) The electricity supply will be 230/400V, 3-phase, 4-wire, 50 Hz, earthed as advised by supply authority.
- b) The earth fault loop impedance at the low voltage supply terminals shall be as advised by supply authority.
- c) The prospective short circuit current at the low voltage supply terminals shall be as advised by supply authority.
- d) Method of protection against electric shock shall be earthed equipotential bonding and automatic disconnection of supply.

#### **4.4 Provisional Sums**

Provisional sums may be included in the appropriate space on the Lump Sum Form of Tender.

The Provisional Sums may be expended in whole, in part, or not at all at the sole discretion of the Consulting Engineers, and if the whole or any portion of the provisional sum has not been spent at the date of issue of the Certificates of final completion of the Contract, such amounts as have not been spent shall be deducted from the accepted contract price without having any effect on the rate of profitability of the remainder of the accepted contract price to the Contractor.

## **5.0 ELECTRICAL INSTALLATION**

The following is a description of the electrical services that shall be installed by the Electrical Contractor:

### **5.1 Temporary Services**

#### **5.1.1 Electricity**

The electrical contractor shall provide the temporary electrical supply during the fit-out process.

The electrical consumption will be sub-metered.

Step-down transformers shall be used so that 110V only can be used during the Fitting Out works.

The contractor shall issue appropriate test and NICEIC certificates to Multiplex before energizing any electrical systems.

#### **5.1.2 Fire Alarm**

The electrical contractor will be required to install a temporary smoke detection system within the demised area for the period of the Fitting Out works.

#### **Note the following extract from Landlord document Appendix A**

A comprehensive fire alarm system will be installed to all Landlords Shell & Core.

Provision will be made for the required connection of the Tenant's fire alarm systems into the main system. A fire alarm interface unit will be installed for the Tenant to connect their systems.

The associated connection and commissioning costs of achieving this will be by the Tenant.

The Fit Out Contractor will be required to install a temporary smoke detection system within the demised area for the period of the Fitting Out works. The Main Contractor will provide the wireless fire alarm system in The Fit Out demised area.

The main fire alarm will become progressively operational and subject to sequential testing and final cause & effect demonstration by the Main Contractor prior to Practical Completion.

The Fit Out Contractor will be required to cooperate with Multiplex during the testing and final demonstration of the system.

The Fit Out Contractor shall appoint the Main Contractor's fire alarm specialist to carry out the final connection and interfacing with the Landlord system

#### **5.1.3 Lighting**

The electrical contractor is responsible for all temporary & task lighting including safety, access and emergency lighting within the demised unit during the fitting out works.

### **5.2 Mains Incoming Supplies**

The landlord has provided a 400A TPN supply located on Basement -1 and a 200A TPN supply located on Basement -2.

The supplies are terminated in appropriately rated fuse switches / CT chambers located as indicated on Grontmij Drawings No. 106610/C/8011 and 106610/C/8010 respectively. The contractor shall allow for connecting new supply cables to the two new main boards located at Basement -1 level.

The client will apply to the metering company for the meter installation. The contractor shall allow for co-ordination and installation of cut outs and meters, CT chamber and CTs. This shall include liaison with UK Power Networks and the metering company.

The contractor shall allow for liaison with the Landlord and UK Power Networks in all aspects of the works involved in the above works as necessary.

### **5.3 Mains Distribution**

The contractor shall supply and install a new 400A TPN 12way MCCB distribution board as indicated on schematic drawing L2171E021. The main 400A supply cable shall terminate in this board

The contractor shall supply and install a new 200A TPN 12way MCCB distribution board as indicated on schematic drawing L2171E022. The main 200A supply cable shall terminate in this board.

The 400A Distribution board "Main DB1" shall supply Mechanical Controls Panel, all General Power and Lighting DBs and Fire Alarm panel as well as main items of plant rated at 63A TPN or more.

The 200A Distribution board "Main DB2" shall supply 8No. special distribution boards (KP1 to 8) local to each kitchen pod.

All boards shall be capable of receiving single and three phase breakers.

All live terminals and busbars shall be fully shrouded and blanking pieces shall be fitted to all spare ways. A minimum of 20% equipped spare ways shall be provided within all distribution boards for future use.

The miniature circuit breakers, busbars and integral isolating switch shall be mounted onto a completely removable internal panel assembly, which shall be adjustable to enable correct alignment with the enclosure cover.

The contractor shall supply all MCB/MCCB/RCD/RCBOs as required to wire all devices indicated on the drawings.

Permanently fixed circuit labels and circuit charts shall be provided within the MCCB enclosure.

The contractor shall note section 'Final Wiring' when ascertaining the number of circuits within each board.

The board shall be manufactured by Schneider or equal and approved and all components shall be of the same manufacturer.

The Contractor shall allow for a computerised electric meter data collection system such as manufactured by Elcomponents.

Each of the meters on the main boards shall be connected to the BEMS system

#### **5.3.1 Sub Distribution Boards**

The contractor shall supply and install new Sub Distribution Boards as described below, as indicated on the drawings and as noted in the schedules and as per the main single line schematics L2171E021 and E022.

The Distribution Board Main DB1 shall supply the following (but not be limited to):

- **DB 'GP/L B-1' – General Power & Lighting Basement -1**  
All general power & lighting including Preparation areas fridges and freezers, dishwashing etc
- **DB 'GP/L B-2' – General Power & Lighting Basement -2**  
All general power & lighting to Basement B-2 including office.

- **DB 'GP/L GRD' – General Power & Lighting Ground Floor**  
All general power & lighting to Ground Floor
- **DB 'GP/L MEZZ' – General Power & Lighting Mezzanine Floor**  
All general power & lighting to Mezzanine Floor
- **MCC Panel – Mechanical Control Panel**  
This board will supply all mechanical items of plant. (The MCC panel will be free issue from the Mechanical Contractor). The contractor shall note that certain items of mechanical plant shall be supplied from local DB's, and will have control only wiring from the MCP.

The Distribution Board Main DB2 shall supply the following (but not be limited to):

- 8No Kitchen unit distribution boards. **KP1 to KP8**. The Contractor shall have specialist kitchen distribution boards manufactured c/w Essential and Non-Essential sections. Each DB shall have contactor operated by Emergency Shut off button local to each pod to shut down non-essential section.

Distribution boards shall be constructed of rust protected sheet steel with hinged cover doors, capable of being padlocked. All live terminals and busbar shall be fully shrouded and blanking pieces shall be fitted to all spare ways.

A minimum of 20% equipped spare ways shall be provided within all distribution boards for future use. Sub distribution boards shall be manufactured in accordance with the latest BS 5486 Part 2.

The boards shall be capable of receiving single phase breakers. The boards shall also be of the single module RCD/MCB type.

All circuits supplying socket outlets shall be complete with 30mA RCD protection or (RCBO)

All circuits supplying water heaters and kitchen/tea point equipment shall be complete with 30mA RCD protection or (RCBO)

All boards to be complete with all MCCBs/MCBs/RCDs/RCBOs etc as required.

The miniature circuit breakers, busbars and integral isolating switch shall be mounted onto a completely removable internal panel assembly, which shall be adjustable to enable correct alignment with the enclosure cover.

Permanently fixed circuit labels and circuit charts shall be provided within the MCB enclosure.

All sub distribution boards shall be manufactured by Schneider or equal and approved before purchase.

The contractor shall note section 'Final Wiring' when ascertaining the number of circuits within each board.

### **5.3.2 MCP Panel**

The MCP panel shall be free issued by the Mechanical contractor.

The electrical contractor shall allow for moving the panel into final location and installation and termination of all cables.

The final location of the panel shall be agreed on site prior to installation.



## 5.4 Cable Installation

### 5.4.1 Mains Wiring

All mains circuits where necessary shall consist of XLPE/LS0H/SWA/LS0H cables contained on galvanised cable basket/tray/ladder installed in accordance with the IET Wiring Regulations (18th Edition) BS7671.

All mains cables and all other distribution cables shall be supplemented by a separate (LS0H cable) circuit protective conductor (CPC) sized in accordance with the IET Wiring Regulations (18th Edition) BS7671

### 5.4.2 Sub Mains Wiring

XLPE/LS0H/SWA/LS0H copper conductor cables shall be used to supply sub switch boards, sub distribution boards, consumer units, items of control equipment where applicable.

All sub-mains and all other distribution cables shall be supplemented by a separate (LS0H cable) circuit protective conductor (CPC) sized in accordance with the IET Wiring Regulations (18th Edition) BS7671.

### 5.4.3 Final Wiring

*The contractor shall note that this is a general generic specification section and that all wiring / protective device costs shall be attributed to the appropriate section i.e. small power wiring to be priced in the small power section, lighting wiring to be priced in the lighting section, dist board MCB / RCBOs to be priced in the distribution board section etc.*

The contractor shall supply and install final wiring to all electrical devices - socket / lights / spurs / isolators and the like as shown on the drawings.

Final circuitry is not currently shown on the drawings, the contractor shall tender based on the below statements and principles. The contractor shall implement this information when tendering the distribution boards in relation to MCB sizes. The contractor is permitted to take guidance from the existing circuit charts.

The contractor shall provide and install all cables to provide a complete and working distribution and wiring installation. All final circuits shall be as per table below in suitable containment in accordance with the IET Wiring Regulations (18th Edition) BS7671

Final wiring shall be as follows: Note: combined device load never to exceed protection device.

	Protection	Cable size	Devices/Outlets	Notes
Lighting circuits	10A Type C MCB	1.5mm LS0H singles	10No Max	2.5mm if circuit exceeds 50m
Power 32A Ring Circuits	32A Type C RCBO (30mA)	2.5mm LS0H singles	6No Max	4.0mm if circuit exceeds 20m
Fixed Power	16A Type C MCB	4.0mm XLPE/LS0H/SWA/LS0H	1No Max	Or 4mm LS0H T/E
Fixed Power	20A Type C MCB	4.0mm XLPE/LS0H/SWA/LS0H	1No Max	Or 4mm LS0H T/E
Fixed Power	32A Type C MCB	4.0mm XLPE/LS0H/SWA/LS0H	1No Max	Or 10mm LS0H T/E
Fixed Power	40A Type C MCB	6.0mm XLPE/LS0H/SWA/LS0H	1No Max	Or 10mm LS0H singles (kitchen only)
Fixed Power	63A Type C MCB	10mm XLPE/LS0H/SWA/LS0H	1No Max	Or 16mm LS0H singles (kitchen only)

Cores to suit SP-N-E or TP-N-E as required.

The following circuits shall be complete with 30mA RCD protection or (RCBO):

- Supplying socket outlets
- All circuits supplying water heaters

- All circuits within bathroom / WC areas

The following circuits shall NOT be fitted with RCD protection:

- Saniflow units (unless within bathroom)
- Fridge / freezer dedicated circuits
- Fish tanks / incubators

There must be a minimum segregation of 100mm between communications systems and power cable systems.

All wiring shall be LS0H multi core, neatly clipped.

## 5.5 Containment

The contractor shall install a suitable primary containment system making due allowance for secondary and supplementary containment, in order for all cabling to be fully contained. Indicative primary containment routes indicated on drawings L2171E017, E018, E019, E020. The system shall be co-ordinated with all other services.

The contractor shall note that front of house exposed areas shall be galvanised conduit with radiused bends where required. The front of house areas exposed areas containment is to be kept to a minimal and the contractor shall utilise the floor void area as much as possible ensuring co-ordination with all other services.

The contractor shall make themselves fully aware of the areas of heritage features which must be retained and conserved. The contractor shall ensure all containment routes are in accordance with these requirements. All containment routes must be agreed and signed off by the engineer prior to installation.

During the installation of the containment the Contractor shall make due allowance for the installation of other aspects of the Building Services Installation within the mains distribution routes and service risers. The contractor shall co-ordinate all routes with all contractors both during the design stage and prior to commencement of installation.

In general the Mechanical and Air conditioning service take precedence when setting out services, however adequate 100mm separation must always be achieved between LV services and mains voltage services.

Where sensitive (services – electronic noise) cables cross mains voltages cables, earthed separation bridges / conduits / trunking must be provided, and these must be approved by the engineer. It is the contractor's responsibility to ensure that crossings are kept to a minimum and that the 100mm separation is always maintained.

The contractor must ensure that adequate separation is achieved between the various types of circuits. The contractor must ensure that electronic noise is not induced between the various systems.

The contractor shall install a complete wiring containment system to all points, both indicated and not. The entire installation shall be surface mounted unless otherwise noted.

The quality of the containment installation shall be excellent; in particular setting out of back boxes shall be completed with attention to detail to ensure consistency in the height and location of sockets, switches, lights etc.

**The contractor shall note that misalignment / incorrect height / location / skewed faceplates / proud faceplates will not be accepted and shall be redone at the contractors expense including all consequential works. The contractor shall inspect and sign off the builder tracking / back box suppression following completion of first fix, thus problems caused by poor builders works is not an acceptable excuse at a later stage in the project and shall be resolved at the first fix stage.**

The containment system shall be installed in accordance with BS7671.

Containment to be galvanised, recessed; surface mounting only acceptable with specific approval by the Engineer.

All conduits to thermostats must be plugged to prevent a draught forming through the conduit. Conduit to be surface mounted galvanised.

Conduits shall be LSOH with the exception of Plant areas to be galvanised.

All cable trays/ladders/baskets shall be galvanised.

In general all containment shall have 30% spare capacity upon completion.

## **5.6 Small Power Installation**

The electrical contractor shall supply, install, wire, test, commission and set to work the small power as detailed on the drawings L2171E001, E002, E003, E004.

All circuits shall be provided with high integrity protective conductors as necessary to comply with BS7671. In such cases the high integrity protective conductors shall comprise wholly of cable installations i.e. cable containment systems shall not form part of any high integrity protective conductor.

The contractor shall allow for final connection of an item of electrical equipment for all isolators and spurs.

All fused connection units, isolators and double pole switches shall be engraved to denote function and be of the indicating type.

All circuits supplying socket outlets shall be complete with 30mA RCD protection or (RCBO)

All circuits supplying water heaters and kitchen/laundry equipment shall be complete with 30mA RCD protection or (RCBO).

### **5.6.1 Hand Driers**

The electrical contractor shall supply, install, wire, test and commission hand driers as detailed on the drawings. The hand driers are to be Xelerator XL-SB brushed stainless steel finish.

The switched fused connection units supplying the hand drier to be mounted at 2000mm AFFL, supplying a recessed BESA outlet behind the hand drier mounted 1050mm to the top of the unit. Switches shall be engraved to denote function and be of the indicating type.

All circuits supplying hand driers shall be complete with 30mA RCD protection or (RCBO)

### **5.6.2 DDA Accessible WC Alarm**

A DDA compliant WC alarm system shall be provided for each DDA WC, linked to an audible/visual indicator panel discreetly mounted as indicated on drawing L2171E002. Each indicator shall be provided with a suitably engraved indicator lamp for each DDA WC. There shall also be a local indicator mounted outside each toilet above the door.

The installation shall operate at extra low voltage and shall be manufactured by Wandsworth Limited or equal and approved.

### **5.6.3 DDA Refuge Call System**

A complete DDA refuge communication system shall be installed as indicated on drawing L2171E001 and in accordance with BS 5839 Part 9 and BS 5588. The system shall be fully monitored and battery backed up connecting all disabled refuge points to a panel located adjacent to the main fire alarm panel.

The disabled refuge/call system shall be cabled in red sheathed 4 Core 'FP 200 Gold' or equivalent in accordance with BS 5839. Cables shall generally be installed on a common independent cable way (where possible) all routes shall be perpendicular to the building structure. Protective cable sleeves shall be provided at all building penetrations and at locations where services cross. Any cables that are clipped direct or 'tied' shall be fixed using a proprietary metallic fixing to ensure integrity during any potential fire. The entire installation shall be run in galvanised containment.

#### **5.6.4 Induction Loops**

The contractor shall install induction loop systems for the hard of hearing at Main entrance host stations.

The systems shall be a free standing portable transmitter.

As – DAT – Handy Loop  
Deaf Awareness Technology - 01202 682795  
Products – LOP23, MIC-10, LOP25, LTX00

The installed system shall comply with BS7594.

#### **5.7 Accessories**

*Accessories shall be as per below but priced in the relevant section of their function / system.*

All front of House areas shall be as per interior designer's specification.

General back of house areas to be MK Prestige Logic Plus– FLUSH – NO SURFACE MOUNTING.

All Internal Plant Areas and Kitchens – MK METALCLAD - Surface (KITCHENS to be flush).

All external plant areas – MK Commando IP65 rated, c/w local isolators.

**The contractor shall note that misalignment / incorrect height / location / skewed faceplates / proud faceplates will not be accepted and shall be redone at the contractors expense including all consequential works. The contractor shall inspect and sign off the builder tracking / back box suppression following completion of first fix, thus problems caused by poor builders works is not an acceptable excuse at a later stage in the project and shall be resolved at the first fix stage.**

#### **5.8 IT Structured Wiring Installation**

The electrical contractor shall employ a specialist structured wiring installer to supply, install, terminate and test and commission a structured wiring system as indicated on drawings L2171E001, E002, E003, E004.

All cables shall be Cat 6, and shall be terminated in an appropriate module compatible with the face plate range of the accessories. The specialist structured wiring contractor shall supply and install new 42U 800x1000 rack complete with Cat 6 patch panels to suit the number of field points +40% spare capacity, power modules and fan tray etc. All cables shall be suitably terminated in the patch panel racks as provided above. A patch lead shall be provided at the rack for each field point.

The electrical contractor shall manage and control the specialist sub-contractor in line with the overall contract.

The electrical contractor shall install all containment required for the structured wiring system.

The entire installation shall be flush and all wire ways shall be recessed into the building fabric.

All final data connections to be carried out by IT installer.

Any ambiguous locations of accessories are to be verified on site with the engineer / client.

The contractor shall include for a fibre connection between the 2no. cabinets.

Refer to "Appendix – IT cabling Standards", included in this package, for general compliance criteria for installation.

## **5.9 Lighting**

The contractor shall supply, install and wire all light fittings as indicated on the drawings L2171E005, E006, E007, E008 unless otherwise noted.

### **5.9.1 General / Back of House Lighting**

General Lighting / Back of house areas to be wired direct from the local distribution board via appropriate light switches / PIRs as indicated on the drawings.

The contractor shall supply and install all lighting switching controls as indicated on the drawings.

The contractor shall supply all lights, drivers, transformers, accessories and wiring to all points as indicated on the drawings.

All light fittings to be equal and approved to specification / finishes schedule and are subject to approval by the client / engineer. Contractor to submit all equal light fitting datasheets in pdf format for approval.

A sample of every type of light fitting shall be made available 2 weeks following contract award. Final purchase of fittings shall not commence until approval of samples has been received from the services consultant and the interior designer.

All lighting shall be complete with lamps, and a selection equivalent to 5% of each quantity of lamps installed shall be provided (boxed) upon completion of the contract. . In addition 2No spare of each type of LED driver is to be provided together with instructions on replacement procedure.

All lighting shall be wired in LSOH singles and fully contained.

### **5.9.2 Front of House Lighting**

The following PC Sums have been allowed in the Tender in regards Front of House lighting design by Into Lighting Ltd. Installation shall be as detailed in the various sections below.

<b>5.9.2.1</b>	Purchase of luminaires and associated drivers and equipment. (including FOH emergency luminaires)	£ 120,000.00
<b>5.9.2.2</b>	Supply, installation, wiring, testing and commissioning of Lighting Controls Panels; including scene setting.	£ 15,000.00
<b>5.9.2.3</b>	Wiring, installation, testing & commissioning.	£ 60,000.00

The contractor shall allow for purchase of all Front of House luminaires, associated drivers and equipment as per Specialist lighting consultants Into Lighting Ltd as indicated in their drawings and schedules included for information.

### **5.9.3 Front of House Lighting – Wiring, Installation, Testing and Commissioning**

The contractor shall allow for the provision of all wiring to all lighting points as per design by Into Lighting Ltd.

These points will typically be wall / ceiling / track mounted / on free standing furniture within the restaurants / bars or within the toilet areas.

The contractor shall assume that free standing furniture lighting circuits will be wired from below.

Luminaires to be dimmable.

Lighting is to be controlled by dimming racks as specified by Into Lighting Ltd and as detailed in the Lighting Control Panel section below.

#### **5.9.4 Lighting Controls Panels**

The contractor shall allow for installation dimming panels or equal and approved within the Basement B-1 to control / dim all circuits. The contractor shall allow for a 2 core 1-10V dimming control cable to all front-of-house fittings / drivers.

The dimming system shall be complete with 365 day astrological time clock.

The electrical contractor shall co-ordinate with the dimming system supplier in relation to the final selection of dimming racks to suit the circuitry and the applicable type of dimming technology for the above.

It is the contractors' responsibility to supply and install the lighting control panels, including the detail selection of these panels. The contractor shall note that dependant on the selection of panels (no. of channels) supplementary secondary protection of circuits may be required.

Central digital touch screen control panels shall be provided, allowing easy programming of scenes.

Where panels are installed in individual rooms/offices, these shall control the specific office only.

The contractor shall allow for an engineer to set the scenes upon completion, this shall include 2 individual full day sessions.

#### **5.10 Emergency Lighting**

The contractor shall supply, install and wire all emergency lights as indicated on the drawings L2171E005, E006, E007, E008.

Note: Front of House emergency lighting is to be part of the Into Lighting Ltd design, consequently purchase & installation costs are included in the above PC Sums.

All emergency lighting shall be installed and wired in accordance with the wiring regulations and BS5266, pr EN1838.

All emergency lighting shall be provided to operate under emergency conditions for a minimum of three hours. The contractor shall provide all emergency test results and logs. A complete 3hr drain down test shall be completed and witnessed by the engineer.

Emergency test switches to be provided to all areas locally.

Emergency lighting shall be in the form of integral self-contained inverter packs.

The contractor shall label all emergency light fittings on site and on all relevant as-built documentation. The contractor shall prepare full emergency lighting test logs.

#### **5.11 Fire Alarm System**

The contractor shall appoint a specialist fire alarm contractor to install a fire alarm system to cover all areas to L1 category as indicated on drawings L2171E009, E010, E011, E012.

The points shown on the drawing are for pricing and coordination purposes only.

The systems shall be certified as required by BS 5839.

The electrical contractor shall engage a specialist sub-contractor to install the fire alarm system.

The system shall allow for 3min search and find prior to activation of Alarms. Break glass, Ansul interfaces shall bypass search and find delay and force system into instant full alarm.

The demise shall be provided with a standalone system complete with fire alarm panel and relevant devices.

The fire alarm system shall be monitored with auto dial facility. The fire alarm panel shall be installed with remote communication linked to the nearest fire brigade or call centre; the communication shall be via a monitored telephone line with auto dial facility.

The system shall be installed to achieve (but not be limited to) the following objectives:

- To provide early warning of the presence of fire, by use of automatic and manual fire detection devices.
- To provide audible alarms via fire alarm sounders and visual beacons.
- To interface with lifts to ensure the achievement of appropriate plant shut down.
- To release, to enable closure, of the appropriate magnetic hold open doors.
- To interface with the appropriate automatic doors to open in the event of an evacuation.

The system shall be interfaced with the following to ensure automatic shutdown in the event of fire:

- MCP Panel
- Kitchen Extract
- Gas Shutdown
- Fire Suppression systems
- Sprinkler Flow Switches
- Music Player / Audio Visual systems
- Lighting Dimming systems – lighting levels to 100%
- Door hold open devices
- Access control in fire escape corridors
- Fire shutters
- Landlord's fire alarm systems – bi-directional interfaces

The installation of the system will be in accordance with the recommendations set out in BS 5839 and BS 7671.

All fire alarm cable to be Loop Cables : Standards PH120 Soft Skin 2C 1.5mm RED. (subject to specialist installer approval)

All cable routes shall be perpendicular to the building structure and routes shall be in a common independent cable way where possible. Protective cable sleeves shall be provided at all building penetrations and at locations where services cross. Adequate earthing shall be provided. The entire installation shall be run concealed.

Any cables that are clipped direct or 'tied' shall be fixed using a proprietary metallic fixing to ensure integrity during any potential fire.

All detectors/sounders/visual alarms/beacons etc. shall be terminated in approved galvanised BESA or MI clamp type junction boxes. All other devices forming part of the system shall utilise dedicated back boxes.

All detectors, combined detectors/sounders and bases shall be installed in accordance with guidelines set out in BS 5839, BS 7671 and the installation instruction provided by the manufacturer. All ceiling mounted devices shall be securely fixed to BESA boxes and non-combustible supporting pattresses behind ceiling tiles, allowing for easy fitting and removal of devices.

All control devices (e.g. call points, sounders, interfaces etc.) shall be installed in accordance with the guidelines set out in BS 5839, BS 7671 and the installation instructions provided by the manufacturer. All devices and associated modules shall be securely fixed and marked with appropriate notices, warnings, signs etc.

All devices shall be complete with bases / accessories and the like to form a fully functioning device.

The Contractor will be responsible for programming the complete fire alarm system in accordance with the fire consultants fire strategy document contained in Appendix 'Fire Strategy' provided to illustrate the proposals for activation of 'alert' and 'evacuate' signalling and the operation of fire alarm interfaces, during and upon receipt of a fire alarm activation.

The alarm system will be tested and commissioned including for full integrated performance testing, carried out to verify the system performance with the agreed fire strategy document. The integrated performance testing will include all co-ordinated interface testing with third party equipment/system providers such as lifts, BEMS, etc.

The fire controller and associated devices and modules will be tested in accordance with the guidelines set out in BS 5839 and the testing instructions provided by the manufacturer. The fire alarm system will be fully tested to ensure that it operates in accordance with the requirements of the design specification and relevant standards.

Temporary detection must be connected during periods of no occupation within the area but may be isolated when hot works are being carried out.

## **5.12 Security & CCTV Systems**

### **5.12.1 Intruder Alarm System**

The contractor shall install a fully compliant intruder alarm system as indicated on drawings L2171E009, E010, E011, E012. The system shall conform to EN50131 Part 1:2004 and PD6662:2004. The system shall be Honeywell Galaxy based. The system shall be approved by the Landlord's specialist.

The grade shall be Grade 2 or as specified by Landlord's specialist.

The contractor shall engage a specialist installer who shall be responsible for the final design and certification. Indicative device locations are as per drawings. **The specialist shall be responsible for achieving the intended grade of system in the final design.**

The installation shall include all wiring and devices.

Devices are to be discrete, high-end quality and include all keypad, sensors, alarms and all power supplies, control panel and accessories to suit.

Intruder alarm system to be submitted for approval.

### **5.12.2 CCTV Installation**

The contractor shall allow for (Cat6) flood wiring of all points as indicated on the drawings L2171E009, E010, E011, E012. The cabling shall terminate in a RJ45 male connector and a 1m looped tail left in the ceiling void or where indicated on the drawings. All CCTV cabling to be routed back to CCTV RACK located in the office at Basement -2.

All equipment shall be housed in the new 42U rack as detailed on the drawings.



The contractor shall allow for employing a specialist CCTV contractor to supply, install, put to work and commission cameras, display and recording equipment as indicated on the drawings. The electrical contractor shall manage and control the specialist sub-contractor in line with the overall contract.

A PC Sum of £15,000.00 has been included for the CCTV installation.

### **5.13 Mechanical Plant & Controls Wiring**

The contractor shall supply and install all small power, associated connections and control wiring required for the entire mechanical and air conditioning installation as indicated on drawings L2171E013, E014, E015, E016.

The contractor shall note that the power supply for major items of plant is derived directly from the main switchboard.

All Fans are wired from the MCC which shall be complete with inverters.

The contractor shall allow for wiring fans, controllers, meters etc. supplied under the mechanical section of this contract.

This shall include glanding / termination and testing of all wiring. Where isolation is required for power devices these shall be supplied and installed by the electrical contractor as spurs or isolators. The final connection between isolator/spur and equipment shall be supplied and installed by the electrical contractor.

The contractor shall be responsible for obtaining wiring diagrams from the mechanical contractor during commissioning of the mechanical services installation.

The contractor shall liaise with the mechanical contractor regarding accurate positioning of the equipment.

Where items of plant are complete with remote controllers / panels, these shall be free issued from the mechanical contractor to the electrical contractor. The electrical contractor shall mount these and complete all wiring from the BEMS panel to the controller / panel and also all wiring from the controller / panel to the item of plant.

Cabling for the Mechanical wiring shall be as follows where not specifically indicated on drawings. All wiring specifications to be verified with engineer and control company prior to purchase and installation.

Screened Cable. – VDE LI-YYP 2x0.75mm Sq Twisted pair, Screened, LS0H

Other Control Cable. – Multicore 1.0mm sq XLPE/LS0H/SWA/LS0H, cores as applicable.

Mains Cables to be as per sub mains section, sized as per final wiring requirements.

The electrical contractor shall provide wireways for the AC controllers.

### **5.14 Leak Detection & Controls Wiring**

The electrical contractor shall supply leak detection systems in the floor voids as indicated on the drawings. This shall consist of a 1-, 2- or 4-zone “Leakstopper” panel connected to leak detection cabling / tape run in two locations. The panel shall be located in the main office.

The system shall be interfaced to the building security system via an interface supplied and installed by the Security contractor under this contract. The panel shall be further connected to the Mechanical Control Panel.

### **5.15 AV Installation**

The contractor shall supply and install all containment, cabling and connection outlet points for an audio visual system as indicated on the drawings L2171E009, E010, E011, E012 and in accordance with the specialist installer.

The contractor shall allow for wiring only (screened 1.5mm<sup>2</sup> figure 8 copper) of all future speaker points as indicated on the drawings. Cabling shall be terminated at the speaker location in a backbox above the ceiling nearest the location shown. They shall be terminated in the 42U Data rack.

#### **5.16 Internet Installation**

Contractor to liaise with BT / Openreach under this contract to supply and install, test and commission all PSTN, Broadband, Fibre & Redcare lines. All wiring to terminate adjacent to the comms cabinet in office at Basement -2 level.

Contractor to supply and install a basket to facilitate BT lines from incoming BT location to comms cabinet..

All costs arising from BT are to be paid direct by the Client.

#### **5.17 Earthing and Bonding**

Earthing and bonding shall be provided to comply with the relevant British Standard and the requirements of the IET Wiring Regulations 18th Edition BS7671 and with the ETCI National Rules for Electrical Installations (4th Edition) ET101:2008.

This shall include, but not be limited to: Building steel work, ducting, piping, suspended ceiling grid etc

#### **5.18 Testing and Commissioning**

All testing and commissioning shall be in accordance with the manufacturer's instructions, and the requirements of the IET Wiring Regulations 18th Edition BS7671.

A complete programme of testing and commissioning shall be provided for approval prior to commencement of works. All test results and commissioning data shall be provided in a presentable format for verification by the client before acceptance.

All commissioning shall be completed as per the L2171T007 Commissioning document included in this Tender package.

#### **5.19 Labelling and Identification**

The contractor shall fit engraved labels to all switchboards, distribution boards, cables, fire alarm points, isolators etc.

All labels are to be trifoliate or laser in-printable type, no other type will be accepted by the client, plastic fixing studs will not be permitted. Adhesive labels will not be accepted.

Equipment tag numbers shall be incorporated into the as built drawings prior to inclusion in the document.

All circuits are to be identified and clearly labelled.

#### **5.20 Fire Stopping**

The contractor shall allow for fire stopping where services penetrate fire compartments as detailed on the architectural drawings. A certificate of completion by an authorised contractor must be provided prior to handover.

The contractor shall note that all fire stopping required around services shall be included under this contract. The fire stopping shall be ASTRO flame product meeting BS 476 pt 20, PR EN1366-4 achieving minimum 2 hours fire rating.

Large hole - ASTRO FM COMPOUND Fire Resistant Mortar to be used

Small holes – ASTRO INTU MASTIC Intumescent Acoustic Mastic

This includes fire stopping of all builders' openings through walls / floors and voids.

### 5.21 Warranty & Maintenance

The contractor shall provide one year's warranty on all plant/equipment and the entire electrical installation.

The contractor shall allow for all required maintenance visits to maintain the systems in recommendation with the manufacturer's instructions and any relevant British Standards. A preventative maintenance schedule shall be provided prior to handover indicating dates and proposed maintenance to be undertaken. There must be a minimum of quarterly visits to site to perform routine preventative maintenance.

During the warranty period the following facilities shall be available to the client:

- Call-out within 24 hours and same day if before 10.00am
- Replacement and labour for defective parts.
- Fault diagnosis and rectification.
- Two support visits each of one full working day to advise operation, check system tuning and generally ensure the plant is operating to specification.

### 5.22 As Built Documentation & Training

The contractor will be responsible for demonstrating the operation of all of the provided systems to the client's representative and the client's architect/engineer prior to building handover. The demonstration shall be undertaken with all specialist contractors, the format and timing proposals shall be forwarded to the client for approval. All demonstrations shall be undertaken with the approved Operation & Maintenance Manuals for reference. The contractor shall allow for all full time attendance throughout handover and training period.

The contractor shall provide three complete Operation and Maintenance Manuals containing but not limited to the following:

- As Installed Drawings
- Operation procedures for all systems and items of plant.
- Description of system operation.
- Details of **all** equipment used.
- Maintenance procedures for all equipment.
- All commissioning certificates and test results.
- Drawings and manuals also to be provided in electronic format

The Operation and Maintenance Manuals shall be submitted one week prior to building handover for approval by the client's engineer.

### 5.23 Contingency Sums

There shall be included in the appropriate space on the Lump Sum Form of Tender the following Provisional Sums;

Provisional Sum for unforeseen works	£ 15,000.00
TOTAL	£ 15,000.00

This Provisional Sum may be expended in whole, in part, or not at all at the sole discretion of the Consulting Engineers, and if the whole or any portion of the provisional sum has not been spent at the date of issue of the Certificates of final completion of the Contract, such amounts as have not been spent shall be deducted from the accepted contract price without having any effect on the rate of profitability of the remainder of the accepted contract price to the Contractor.