bam design

Particular Specification & Plant/Equipment Schedules

for the

Electrical Services Installations

at

Kings Cross Zone B – Building B2

Project No: 4111

Project Ref: Building B2
Kings Cross Zone B
St Pancras Way
London

Date: April 2012

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BAM Design PROJECT specification

SUBJECT

Electrical Services Particular Specification & Plant/Equipment Schedules

CLIENT: Argent Estates Limited

PROJECT: Kings Cross Central – Building B2

SITE ADDRESS: Building B2, Kings Central, St Pancras Way, London

Contract no:
Prepared by: NJN

Job no: 4111
Checked by: NJN

Date: DEC 2012
Status of specification: CONTRACT

AMENDMENTS				
ref.	date	amendment	amended by	checked by
T0	Dec ' 11	Issued for Tender		NJN
T1	Feb 12	Revised Issue updated to CMT comments	MP	NJN
T2	APR 12	Revised Issue updated to CMT comments	MP	NJN
CO	AUG 12	CONTRACT ISSUE	MP	NJN
CO	DEC 12	RE ISSUED FOR CONTRACT	MP	NJN

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ELECTRICAL SERVICES PARTICULAR SPECIFICATION

Contents

A.1.0 Introduction

The scope of works are to be read in conjunction with the Grontmij Electrical Services Technical Specification, this scope is intended to elaborate on particular issues only and complementary to the Grontmij scope, so some elements are not mentioned only cross referenced back to the Grontmij scope.

A.1.1 Scope of Work

The Electrical Contractor shall include in his price for the supply delivery, installation, testing, commissioning and handing over of the complete electrical installation together with all necessary liaison and co-ordination as indicated and in accordance with the terms and conditions of the contract preliminaries and the specification.

The complete electrical installation shall be in accordance with the 17th edition of the IEE regulations BS 7671 and all relevant British Standards, Local Government and statutory requirements.

The scope of works shall comprise (but is not limited to):

H.V Switchgear
Cast Resin Transformer
Co-ordination of incoming HV supply and associated plant
Supply and Installation of Photovoltaic Panels
LV Plant and distribution
Life Safety Plant and Equipment
Distribution boards for landlord and tenant service
Power Factor Correction
Lighting installation
Emergency lighting installation
External and decorative lighting
Small power installation
Supplies to mechanical plant
Disabled Alarm system
Disabled Refuge
Security Systems
Voice and data cableways
Earthing and bonding
Lightning protection
Testing and commissioning

A.1.2 Relevant Standards

The whole of the electrical services installation works shall be carried out in accordance with the following.

- Grontmij's Electrical Technical specification
- Target Credits for BREEM 'Outstanding' 2011

The complete electrical installation shall be in accordance with the following: -

- 17th Edition the IEE Regulations BS 7671
- Local Government and Statutory Requirements.
- British Standards codes of practice
- Health and Safety at Work Act
- Electricity at Work Act
- CDM Regulations
- Part L 2A Building Regulations for England and Wales
- Testing and Commissioning Codes L&M

A.2.0 Installation Requirements

The electrical installation will be carried out flush to all occupied landlords, office and general circulation areas with services concealed within the building fabric

The Electrical Contractor will conceal all the electrical equipment within the false ceiling void and provide a flush installation to walls and partitions.

All recessed and concealed trunking and conduit will be galvanised throughout.

The Electrical services installations to the plant room areas will be carried out in surface mounted Galvanised Trunking and conduit throughout.

The Electrical Installation with the retail areas will also be surface, the installations to these areas are temporary until the units are let

Associated builders work, together with the concealment of the electrical services shall be carried out by the main contractor including chases, holes, noggins, apertures in flooring for trunking and floor boxes etc.

The Electrical Contractor is responsible for marking and setting out all these requirements to enable the main contractor to carry out his work in a timely and co-ordinated manner.

All holes under 50mm dia. shall be the direct responsibility of the Electrical Contractor/ BAM Engineering Services. This responsibility extends to providing Builders work information, setting-out and cutting.

Where it is not possible to mount equipment in accordance with the specification without the need for additional builders work, or where quantities differ. The Electrical Contractor will clearly identify and describe all necessary works at the time of tender to ensure complete and proper execution of the works.

The Electrical Contractor will produce Working drawings, including all associated builders work, bracket details and schedules.

The Electrical Contractor will state at the time of tendering if any of the above areas are, in his opinion, inadequately sized or that insufficient access to ceilings, voids etc. have been provided.

The positions indicated on tender drawings are indicative and subsequently may vary. The Electrical Contractor shall make all due allowance within the tender for the co-ordination of the electrical installation with the other contract works and all other services.

The Electrical Contractor will note that all cable lengths, mentioned in the cable schedules are for guidance only. The Electrical Contractor will be responsible for checking all cable lengths and advising the engineer if the lengths measured differ significantly from those stated.

The Electrical Contractor shall visit the site during the tender period such that all aspects associated with the contract are fully understood and appreciated and that the full extent of the contract is included in the returned tender documents.

The Electrical Contractor will ensure that before power is made available to the H.V Switch gear, transformer and subsequent main switch gear, procedures are in place for a permit to work system, ensuring that all notices and all safety signage is displayed.

These procedures are to be developed and approved by an Approved person where H.V systems are applicable.

The Electrical Contractor will also ensure that all such areas will have permanent doors and locks to restrict access.

Following the livening of the main supply, all plant areas and risers containing electrical plant will be the responsibility of the Electrical Contractor.

The permit-to-work regime; will be administered and maintained by the Electrical Contractor

The Electrical Contractor will include for all fire protection works relating to the fire stopping of trunkings, busbars and cables routed through fire divisions.

A.3.0 Incoming supply

Metropolitan will provide a new HV supply to the development terminating in a Ring Main Unit located at Basement level.

A.3.1 General Scope

H.V Containment throughout the Common Basement will be supplied and installed under the BO contract. The H.V Containment through the basement of B2 both internal and external will be supplied and installed under B2 contract. The Ring Main Unit will be supplied, installed and terminated by Metropolitan.

The 300mm² H.V Cables installed throughout the basement will be installed under BO contract. The 300mm² H.V Cables installed in basement of B2 will be installed under B2 contract. All HV cabling on the Zone B development is to be installed by a single specialist HV cable installed approved by Metropolitan to undertake utility HV cable works. H.V Cable terminations onto the RMU in the basement of B2 will be installed under B2 contract.

A.3.2 Sub station

From this location a separate metered H.V Supply will extend through the Adjacent wall, through to the Landlords Main Switch room where a packaged sub station will be established. The Electrical Contractor will supply and Install the H.V Cable from the Metropolitan RMU to the consumers sub station The H.V Cable (LSF/LSOH) will be cleated throughout its length, mounted on ladder and mechanically protected throughout its entire route with covers. The cost of the incoming supply will be borne by the Main contractor. The Electrical Contractor will provide for all necessary attendance on Metropolitan for the provision of the supply for the duration of their works.

The Electrical Contractor shall install an EPO Button as shown on the distribution schematic to isolate the HV and LV supplies in an emergency.

A.3.3 Earthing Arrangement

It is Metropolitans intention to provide an earthing ring to the Zone B development; this will be installed under the Common Basement contract. Metropolitan also require the following additional earthing arrangements to be installed within the B2 contract. An earthing rod and inspection pit in the Electrical Switchroom and an earth rod and pit in the RMU room all to be installed by the Electrical Contractor for B2. Also a connection to the structural rebar in the basement of B2 both in the RMU room and the Electrical Switchroom, all installed under B2 contract by the Electrical Contractor for B2. The Electrical Contractor shall allow for making two separate connections to the common basement earth ring at a point to be agreed, all under the B2 contract.

A.4.0 LV DISTRIBUTION

A.4.1 General

The Electrical Contractor will be responsible for the provision of the complete LV distribution system as detailed on the drawings, from the Main Switchroom. The Electrical Contractor will supply and install all necessary cable supports and mechanical protection for the L.V Cable to the Switch room. The consumers sub station will contain the following major items of equipment.

- 11kV HV Switch
- 11kV / 400V 1250 KVA Transformer
- LV Switchboards (Landlords and Tenants)
- Power Factor Correction Panel
- Segregated entrances for access to HV and LV equipment.
- Safety interlocks and switches between HV and LV equipment
- A separate distribution panel will be provided Life safety panel and changeover arrangements
- 24v Tripping battery and charger.

A.4.2 Main LV Panels

From the main LV switch panel sub-main feeder cables mounted on ladder rack / cable trays shall routed through the building to serve the following landlords and tenant services:

Tenant's risers
Lift and Escalator supplies
Mechanical and public health equipment
Distribution boards for landlord's services (lighting, small power & ancillary services)
Power Factor Correction Equipment
Fire alarm control panel
Security system
Disabled alarm call system
Disabled refuge alarm system

The Electrical Contractor will allow for all necessary supports, cabling and installation of the unit and associated installation.

The LV switchboard shall be floor mounted, front access, form 4b type 6. The Fault Level rated at 50kA for 1 sec. The main panel is to be equipped with 25% spare MCCB's. The switchboard shall incorporate electronic surge suppression.

For detailed specification of the LV switchboard refer to schedule No 2.and the Grontmij Electrical Services Technical Specification.

Supplementary sub-metering will be required to comply with Part L2A of the Building Regulations for England and Wales.

A separate section is to be provided in the panel for the controls specialist.

A.4.3 Ancillary Equipment

The Electrical Contractor will supply and install in each switch room plant location and container where electrical equipment is being supplied, the following: -

- A Framed diagram showing clearly the layout of the L.V distribution system.
- A wall chart mounted, with instructions for the treatment for electric shock.
- A rubber mat for the whole length of the switchboards.

A.4.4 Power Factor Correction

A 250 KVAR power factor correction unit will be provided adjacent the main switch panel in the L.V switch room as a stand-alone item of equipment.

The Electrical sub-contractor will allow for all necessary supports, cabling and installation of the unit and associated installation.

For detailed specification refer to the Grontmji Electrical Services Technical Specification.

A.4.5 Metering

The Switchgear specialist will provide a Power Monitoring and reporting system (PMS) to all meters, Refer to A.18.

The power monitoring meter / equipment will form part of the Electrical switchgear specialist package. All Meters are to be provided with Modbus outputs for connection to the PMS.

A.4.5.1 Tenants Metering

The Electrical Contractor will make provision for local check metering also connected to the PMS within the Tenants Lighting and Power

Meters with pulsed output to the PMS system will be provided within the Tenants distribution boards. The tenants meters of Lighting and Power for remote sub-billing will be in accordance with OFGEM and MID-003 requirements.

Meters with Modbus outputs to the PMS system will be provided within the Tenants distribution boards.

A.4.6 Distribution Cables

Unless specified to the contrary, all cables/sub-mains shall be XLPE/SWA/LSF fixed to ladder, tray. From the LV switch room, cable ladder / trays shall be routed at high level to the main electrical risers and will extend throughout the risers. All sub-main cables will be run throughout their entire route on Heavy duty cable tray / ladder rack.

All cable routes will be fully co-ordinated with the structure and other services to ensure a neat installation ensuring maintainable access. Adequately sized slots or cable ducts shall be formed within the structure where necessary. Where circuit referencing has not been specifically detailed, the Electrical Contractor will allow to provide circuits from the nearest suitable distribution board. Segregation between tenants and landlords areas is detailed herein.

Where cables pass through walls to an external environment, the electrical sub-contractor will provide weatherproof a gland complete with gasketed transitional boxes to external plant. All sub-main cabling in the Roof and exposed to direct sunlight will be covered with spaced lid throughout.

The termination of all sub-main cables shall be co-ordinated with the plant /equipment being served. The Electrical Sub contractor will be responsible for co-ordinating the cable terminations of all plant and equipment to ensure the correct termination /box is required and will be deemed to include for this.

The Electrical Contractor will ensure that the conductors can be terminated with proprietary glands direct to the equipment being served, where this is not possible, the Electrical Contractor will ensure that extension Busbars are provided as necessary to a cabling extension box.

All cable sizes, identification numbers and types are detailed on the cable schedule.

A.4 7 Distribution Busbars

Within the designated tenants electrical riser the Electrical Contractor will supply and install a complete 400 Amp, 400 volt,3 phase 4p vertical rising Busbar system including all tap-offs, brackets etc to provide a complete installation.

All conductors will be copper, and fully rated at 35 degree Celsius. Neutrals will be full sized. The conductors will be individually supported.

Only standard lengths of 3000mm or 4000mm section busbar will be accepted unless agreed with the engineer.

Building and thermal expansion joints are to be provided, to suit the manufacturer's recommendations. The Electrical Contractor will also install 2-hour fire barriers at each level.

Shuttered outlets are to be provided at every 500mm, maintaining the IP integrity throughout the system. The setting out of the busbar is to ensure that 3 No tap off points are allowed at each floor level.

Busbar sections / lengths will be fixed at no greater than 2000mm.

A.4.8 Tenants Distribution Boards

At each level in the tenant's riser, the Electrical Contractor will supply a composite pan assembly distribution centre. The distribution centre will consist of the following:-

Section A Tenants Lighting Distribution Board

Section B Tenants Power Distribution Board, this section of the board will also consist of cleaner's power and fan coil power to the net-letable areas.

Both sections will be metered independently to comply with Part L 2A.of the Building Regulations.

All boards will be complete with Type B or Type C MCB's, to BS EN60947-2 15kA, fully fitted with no blank ways unless stated. All circuits identified as being RCD protected will be fitted with integrated RCBO's

A.4.9 Main Core Landlords Distribution Boards

The Landlords riser will house only equipment which serves the circulation areas, where distribution centres are detailed, the Electrical Contractor will supply a composite Pan Assembly distribution centre. The distribution centre will consist of the following:-

Section A Landlords Lighting Distribution Board

Section B Landlords Power Distribution Board

Both sections will be metered independently to comply with Part L 2A.of the Building Regulations. All boards will be complete with Type C or Type B MCB's, to BS EN60947-2 15kA, fully fitted with no blank ways unless stated. All circuits identified as being RCD protected will be fitted with an RCBO.

A.4.10 Sub / Final Distribution Boards

All sub-distribution boards (loose) will have integral (TP&N) isolation switches. All sub-distribution boards (loose) will be 12 way TP&N unless stated to the contrary. All boards will be complete with Type C or Type B MCB's, to BS EN60947-2 15kA, fully fitted with no blank ways unless stated.

A.4.11 Supplies to Mechanical Services

The Electrical Sub Contractor will provide electrical supplies to the mechanical equipment as detailed on the schematics and the layout drawings and make all final connections to plant and equipment where necessary.
Where cables are extended to mechanical equipment located on the roof a suitable cable support infrastructure shall be provided, comprising suitable "Unistrut" supports.

Cables shall be either XLPE/SWA/LSF or LSF single core insulated enclosed in galvanised steel trunking or otherwise protected from sunlight.

The Electrical Sub Contractor is advised that certain specialist electrical installations will be undertaken by others. These specialist electrical installations include the photo voltaic equipment, air conditioning equipment, plant equipment (basement plant room), plant equipment (roof plant space), controls equipment, building management equipment and the Lightning Protection installation.

Where appropriate, the Electrical Contractor shall supply and install all necessary power supplies to this equipment for connection by others.

Any final circuit sub distribution boards located on the roof shall be enclosed in a suitable IP rated enclosure (IP 66). The Electrical Sub Contractor shall ensure that suitable thermal management is incorporated into the enclosure.

Cables will terminate in each case either adjacent to the internal unit within an isolator or directly into panel isolators with final connection to the equipment by the Electrical Contractor.

The Electrical Contractor will be responsible for electrical supplies to water heaters, over door heaters, local extract fans, and other equipment not served from mechanical control panels.

Where fused connection units, DP switches or isolators are provided for equipment by others the final connection to the equipment will also be provided, e.g. fans, control panels, etc.

A.4.12 Co-ordination study

The electrical distribution system has been designed using Merlin Gerin / Schneider devices throughout (ACB, MCCB though to MCB/RCBO) and the use of cascade protection is employed where fault levels exceed that of the MCB/RCBO. The contractor can offer equal alternatives but will be required to provide detailed calculations including protection, discrimination and fault level analysis to prove equality and suitability. These calculations will be produced on Amtech ProDesign (17th Edition) software and issued to BAM design for initial approval which on completion of the project will be revised to reflect the as installed system.

A.5.0 Fire Services to BS 9999

General Requirements:
Stair 2 and the adjacent lobby is classified as the Fire Fighting Stair, therefore all installation requirements are to comply with BS 9999.

Where panels, switches, control devices are supplying fire-fighting equipment, the cubicle enclosure shall be coloured red. All cabling shall be fire rated and conform to BS 9999 (fire fighting stairs).

Any cable supporting fire fighting equipment and smoke extract fans will comply with BS 7629, BS 6387, BS 8519-2010.
C.W.Z classification or be MICC to BS 6207 Part 1, as stated.

A.5.1 Services to Fire Fighting Stairs/Lobbies

The Electrical Contractor will supply and install all the services associated within the fire fighting core and stairs. These services are to meet the requirements of BS 9999.

The Electrical Contractor will ensure that only those services designated to serve the fire fighting lobby and stairs extend through the designated lobby and stairs.
Those services not associated with the above are not permitted to extend through the protected area.

All ceiling mounted luminaires in the Fire Lobbies are to be covered with Fire Screens to maintain the ceilings fire integrity.

The Electrical Contractor will include for all fire protection works relating to the fire stopping of trunkings, busbars and cables routed through fire divisions. Unless noted to the contrary the Electrical Contractor will allow two hours for tender purposes.

The works associated with the fire fighting stairs will include but not limited to the following:-

- All lighting and general Power in the designated cores will be served from dedicated Fire Fighting Distribution Board fed by dual supplies from the Main LV Panel and the Standby Generator

At the Ground Floor Entrance(s), allowance to be made for the following:-

- Indication within the core at ground floor of the secondary supply status.(Generator)
- Indicator to state
  - Life Safety panel supply available
  - Life Safety panel supply failed
- Indication and communication within the core at ground floor of the Disabled Refuge Alarm Status
- Mimic Fire Alarm Panel

A.5.2 Standby Generator

A standby generator will be provided under the separate basement contract to serve Life safety supplies to the development. An essential supply will be extended from the central Basement generator to the Life safety panel in the Basement of B2.by the Basement installing Electrical Contractor. The Allocated Supply from BO to support the Life Safety Generator will be 400 Amps.

The B2 Electrical Contractor is to provide Phase Failure Alarm Signals to the Central Generator Interface Panel and make all necessary connections at both ends. L.V Containment throughout the Basement will be supplied and installed under BO contract. L.V Containment through the basement of B2 both internal and external will be supplied and installed under B2 contract.

The Life Safety generator LV Cables installed throughout the basement will be installed under BO contract. The Life Safety generator LV Cables installed in basement of B2 will be installed under B2 contract. L.V Cable terminations onto the B2 Life Safety Panel of B2 will be installed under B2 contract.

The Electrical Contractor shall provide an interface panel to signal the standby generator to start in the event of a fire or mains failure (including phase failure as above).

A.6.0 General Office Floor Distribution

Distribution to the high level services will be via the ceiling void in the tenanted areas. The Electrical Contractor will extend a network of final circuit cabling on tray serving Lighting Control Modules and Chilled beam controllers. Under no circumstances will cabling be allowed to be supported from Ceiling grid, associated suspension hangers or any part of the ceiling fixings.

A.6.1 Lighting Control Module

The lighting control Module (LCM) box will be 10 way and capable of receiving a minimum of 2 No switched inputs and an emergency test circuit. The LCM's are to be fixed direct (or spaced) to the soffit in a fully accessible location.

The luminaires will be supplied inclusive of 4000mm of flex with a Weiland plug arrangement for connection to the LCM. Each of the LCM will have an emergency lighting test loop cable extended to it. This cable will be installed on basket within the ceiling void. Fire alarm cable may share this basket.
The specified LCMs are DALI protocol, LCMs are provided to ensure future tenant Flexibility .

A.7.0 Lighting Installation

A.7.1 General

The Electrical Contractor will supply all luminaires complete with lamps, lighting controllers, guards, control gear and reflectors. All luminaires will be high frequency unless stated otherwise. The luminaire types will be selected from those identified in the schedule of luminaires. All luminaires

installed will be provided with identification to denote CE registration. The Luminaire schedule offers at this stage various alternatives. The Electrical Contractor is to price all the alternatives at the tender stage for further evaluation.

The Electrical Contractor will allow for the installation of all luminaires including all necessary attendance on the false ceiling contractor. Where luminaires are recessed into the suspended ceilings, they will be supported by the ceiling suspension system using side arm support brackets.

Where luminaires are required to be independently supported the Electrical Contractor will supply all necessary supports, fixings and suspensions to facilitate the aforementioned. The Electrical Contractor will allow for fitting of the louvers and lighting diffusers to all luminaires after installation and shortly before contract completion in order to minimise the risk of damage and soiling.

The Electrical Contractor is to ensure that any Thermoplastic materials in the ceiling voids are TP(a) as defined in BS9999 class 1 rating tested in accordance with BS 476-7. The Electrical Contractor will ensure that protective gloves are worn to avoid finger marks.

Where luminaires are hard wired, they shall be loop wired phase and neutral and where installed in false ceilings, shall be connected by means of a plug and socket arrangement., accessible from an adjacent tile or via the cut-out.

Surface luminaires will be loop wired via conduit boxes in the Service area and by plug-in roses within plant rooms. The Electrical Contractor will ensure that where conduit systems are extended above solid ceilings, they are 'looped in' for easy rewiring and ensure any 'plug in' rose or conduit box is accessible

Under no circumstances will 400V potential be permitted at the same switch plate. Surface mounted fluorescent luminaires within plant rooms shall be mounted direct to trunking, to a layout consistent with the equipment located within the room.

A.7.2 Tenants Office Lighting

The General Lighting will be integrated into the chilled beam modules where the soffits are exposed. Recessed linear luminaires are provided where the false ceilings are provided to the core walls. The Lens to both recessed linear luminaires and the chilled beam is to be to the same specification. The

Electrical Contractor is to ensure that if alternative Luminaires are considered the specification of the Lens material remains the same.

A.7.3 Circulation Areas

Generally the lighting will consist of recessed down lighters with smooth satin reflectors. The circulation lighting shall be controlled via the Lighting Management system, Hard Wired Units will be located adjacent to the landlords lighting and power distribution boards.

A multi-gang control switch will be located at the Reception desk, fully engraved, stating the area/zone controlled. Generally all lighting will be controlled via Local PIR Control with overrides.

A.7.4 Stairs & Associated Lobbies

The lighting to staircases shall be surface wall mounted circular luminaires incorporating emergency lighting units where shown.

The lighting control to the staircases will be PIR control located at the entrance to each stair or associated lobby.

A.7.5 Toilets, Cleaners Cupboards

The lighting in the toilet lobbies will be PIR control with extended time out control. The lighting shall be fed from the local landlord distribution boards.

A.7.6 Lift Lobbies

The lighting in the lift lobbies shall be recessed compact fluorescent downlighters, and Perimeter Linear Lighting to the main Lift Lobbies. The lighting shall be switched via PIR's.

A.7.7 Entrance Lighting and Reception

Entrance Lighting will consist of down lighters to a central trough and suspended pendant lanterns.

A.7.8 Plantrooms

Lighting to plant rooms shall be provided by IP54 rated, corrosion resistant linear fluorescent luminaires will be controlled by local switches.

A.7.9 Roof

Lighting to roof areas shall utilise compact fluorescent lamps within square style luminaires controlled by local switches. Luminaires and switches located in external areas shall be IP65 rated. Conduits will be galvanised with lead washers and flanged couplers.

A.8.0 Lighting Controls

A.8.1 General Requirements

The Electrical Contractor will supply and Install a complete lighting management system in the office areas and throughout the building, this will include

Area Controllers	Located in risers with EM test Load Shedding Facility available
Lighting Control Modules	Tenants office to be 10 Way Plug-in LCM Unit with DALI controlled capability Landlords to be fixed based units adjacent to Landlords Boards
Sensors and Switches	Sensors are Multi sensor type combining the following functions Daylight Linking Presence / Absence Detectors Active devices

The system is to be fully addressable, with individual address per office luminaire with distributed intelligence to the Lighting Control Modules. The system is to be suitable of the operation of DALI Dimming in the Office areas and Standard H.F Luminaires in the Circulation areas.

Area Controllers will be provided at each Tenants Riser /Landlords and at each Level. The area controllers will be vertically connected via a common bus utilising the BMS Trunking. Local Emergency Lighting and Testing is to be provided via the floor controllers

The specialist is to supply a software package, which will be loaded onto the BMS Head end. The system is to be commissioned by the specialist; the specialist is also to allow for user demonstration at the completion stage.

A standard Feature of the Lighting Management system is that it is to be re-programmable without the need for further equipment.

A.8.2 Tenants Office Lighting

The lighting management system to suit Cat A will be set-up to operate as follows:-

- Central Switching to internal zones, with Presence detector override
- Notional corridor switching of Luminaires (To be determined)
- Group switching at main entrance points to each floor via a 3 gang switch for notional corridor switching and office floor lighting within three distinct groups.
  - Switch 1 Notional Corridor
  - Switch 2 Open Plan area Block switch LHS zone
  - Switch 3 Open Plan area Block switch RHS zone

To demonstrate the base build arrangement and to handover to the client at Commissioning stage, the specialist will provide 2 No hand Held Controller (key fob) per floor.

Feature:

Whilst any of the Luminaires remain in operation, then all designated notional corridor remains "Hold On together with Landlords MOE.

Feature:

All office Luminaires are dimmer able, therefore they can be set or preset at reduced levels- say 80%

Daylight Linking; To hold off / ramp down perimeter row Luminaires if lighting levels are sufficient. Daylight Linking: Can be re programmed to suit rows/:bands of Lighting.

A.8.2 Landlords Circulation Areas

All the circulation lighting shall be controlled via the Lighting Management system, Hard Wired Units will be located adjacent to the landlords lighting and power distribution boards.

A multi-gang control switch will be located at the Reception desk, fully engraved, stating the area/zone controlled. Generally all lighting will be controlled via Local PIR Control with overrides.

A.8.3 Stairs & Associated Lobbies

The lighting control to the staircases will be PIR control located at the entrance to each stair or associated lobby, with override switches at reception

First point of entry at ground floor energises associated stair, first point of exit from the stair will energise toilet lobby and Office notional corridor.

A.8.4 Toilets/ toilet Lobbies

The lighting in the toilets shall be switched via PIR's with time delay set at 20 min. The lighting in the toilet lobbies will be PIR control with extended time out control, to remain on if cubicles are engaged, this will also energise notional corridor.

A.8.5 Cleaners Cupboards

By local manual switches.

A.8.6 Lift Lobbies

The lighting shall be switched via PIR's.

Reception: Override.

A.8.7 Entrance Lighting and Reception

All switched via the reception lighting control panel.

A.8.8 External Lighting

Switched via the reception lighting control panel.

The lighting control specialist to provide /control.

Photocell on with T/C off.

Reception: Override on/off.

A.8.9 Basement Car Park

All lighting and controls will be Installed and managed by the basement landlord supplies, except where noted on the drawing.

A.8.10 Plant rooms and Risers

All controlled by local manual switches.

A.8.11 Roof

Manual switch on.
Photocell on with T/C off.

A.8.12 External Plant Lighting

All controlled by local manual switches.

A.8.13 Reception: Override on/off

Master lighting control switch in Reception.
Conventional light switching to 4 no circuits within the reception area, PIR on Entrance controlled to 1 row of lights only

A.9.0 Emergency lighting

A.9.1 General Requirements

The installation will comply with BS 5266 Pt.1-7, The CIBSE codes for Interior lighting and the requirements of building control.

Emergency lighting luminaires will comprise, unless otherwise stated, of either single point self contained, 3HR non-maintained units or incorporating into the normal operational luminaire an invertor /changeover unit to operate the mains lamp at reduced output.

All emergency luminaires will be ICEL certified and be provided complete with fixed LED indicators, which will be clearly displayed.

A key switch will be incorporated into the emergency lighting circuit at the appropriate switching centre to allow for a simulated mains failure to enable the system to be put under test.

Generally the test key switches will be incorporated within the lighting management floor controllers located within each tenants riser.

A.9.2 Exit Signs

The Electrical Contractor will provide maintained EXIT signs over each office, floor final exit door, EXIT signs in the basement car park will be Installed and managed by the basement landlord supplies, except where noted on the drawing.

A.9.3 Plantrooms, External Lighting & Stairs

The plant rooms and external lighting will contain a mixture of self-contained bulkhead and integral three hour conversion units.

Permanent live feeds (where system is not LCM controlled) will be taken from the un-switched side of the associated phase conductor.

Test key switches will be located in riser cupboards for the lobby and the reception area for the reception. Within plant rooms, key switches will be incorporated in the associated lighting switches. Test key switches for toilet areas and shower rooms will be located within the local landlords riser.

A.9.4 Offices

The emergency lighting will consist of self-contained, non-maintained, conversion units within the office Chilled beams and linear luminaires.

A separate emergency test facility shall be provided in the tenant's riser, which will be looped connected to each LCM box.

The lighting control unit (LCM) box is capable of receiving 2 No switched inputs and an emergency test circuit, such that no permanent feeds are required.

Allowance shall be made for the Electrical Contractor to supply and install 4 No. (directional) additional 'EXIT' signs to that shown on the tender drawings. These will be located at he discretion of the local authority near completion of the works.

A.10.0 Small power installation

A.10.1 General Requirements

The installation will consist of general small power to the landlord's circulation areas and cleaners power to the tenant's area. Small power will also be provided to assist maintenance and for designated electrical supplies.

The Electrical Contractor will supply and install all 13 amp socket outlets, spur units, radial supplies and electrical heating and specialist supplies as described on the drawings and to the finishes Schedule

The small power wiring will be installed in single core LSF cables in H.G. galvanised trunking and galvanised screwed conduit to all areas.

Socket outlets in car park are single, switched and will be radial wired with RCD located at the board. Where conduits are extended in the floor void, they will be installed not to restrict the future tenants fit-out.

A.10.2 Office Area

Power will be provided to the office floor via underfloor power track and grommets.
Grommets have been based on 1 per 10m ².

The power track will be served via 40 A MCB'S at the tenants distribution board. The under Floor busbars will be rated at 63 A SP+N.

It is assumed that the RCD protection to these circuits will be provided by the Tenant at the desk location as part of the Cat B Fit –out.

All Fly Lead connections from the desk module to the busbar will be provided by tenant

The Electrical Contractor will supply and Install cleaners sockets throughout, these will be floor mounted in hive outlets within the tenants area and served from the tenants distribution boards. The conduit will be routed via the floor void. All cleaners circuits will be protected by RCBO's.

The Electrical Contractor will provide power supplies to each tenants riser for future connection of BMS monitoring facility and area lighting controllers.

A.10.3 Circulation and Toilet areas

The Electrical Contractor will supply and install cleaners sockets throughout, these will be wall mounted within the landlords area served in single core LSF cables in conduit.

Landlords power to the toilet areas will consist of radial circuits to water heaters and supplies to hand dryer.

Water heaters and showers units will be supplied and installed by others. The Electrical Contractor will allow for all final connections.

Hand dryer will be supplied and fitted by others at a later date.

The hand dryer Installation will consist of radial supplies to each toilet termination in a fused connection unit at 200 mm below ceiling level.

A conduit will extend down to the back of the hand drier for final connection to the hand dryer from the rear of the unit.

A.10.4 Plant rooms

The power within the plant rooms will comprise surface mounted metal-clad socket outlets with RCD protection at the distribution board, for general maintenance.
Heater supplies to be via a radial circuit

The installation will be carried out in screwed galvanised conduit.

The Electrical Contractor will supply and install all 13 amp socket outlets, spur units, radial supplies and electrical heating as described on the drawings.

Reception Area

The following allowances will be made in the Entrance Area, final positioning and selection of equipment to be confirmed:

Disabled alarm panel	Desk Mounted
Multi gang light switch with over rides	Desk Mounted
Main fire alarm panel	Wall Mounted
Intercom to Loading Bay	Desk Mounted
Intercom to main pass doors	Desk Mounted
Induction Loop system	Desk Mounted
Disabled toilet alarm	Desk Mounted
Switched socket outlet for cleaners	
Conduits to main door for security systems.	

A.11.0 Fire alarms

Basis of Operation

The Fire Alarm System will operate on a 2 stage basis with phased evacuation.

The Phased evacuation sequence will be in accordance with BS 9999Class TYPE L2

The operation of a single detector “single knock” will initiate a first stage alarm, on the floor of initiation and adjacent floors either side.

An alert signal will be activated on the remaining floors.

The activation of a second device or any break glass unit will initiate a full evacuation.

The Investigation period between the first stage and the second stage will be 4 minutes.

First Stage Single Detector operation in an Office area.

Second Stage Operation of a second detector/device
Operation of any Break Glass Unit
Manual override of key evacuation switch.

The Fire Alarm Panel in the Fire Fighting Stairs will comply with BS 9999.

Voice alarm speakers will be provided throughout, these will be recessed ceiling speakers in all the office areas and circulation areas with a false ceiling. In Plant areas and storage areas the VA Speakers will be wall mounted surface type.

All speakers will be sealed to maintain the fire integrity of the VA unit, as such no exposed terminals/block will be acceptable.

Speakers will be provided with volume adjustment.

To comply with LPC rules Technical Bulletin 230:2008 where ceiling voids are used as air conditioning plenums, then both sprinkler protection and smoke detection are to be provided.

A.12.0 Lightning Protection

A specialist will be appointed to design, provide and fully test a lightning protection system in accordance with BS 6651 and BSEN 62305 Part 1-5 2006.

The Electrical Contractor will provide attendance on the specialist.

Refer to separate specification.

A.13.0 Voice & data cableways

The main contractor shall provide cable ducts at the service entry locations for telecom network providers. The cable ducts will enter the building at Basement level in two locations. Cable trays shall be provided between the basement level frame room location the data riser and the incoming duct locations.

Provision is to be made for the following direct lines:-

Basement	Direct Telephone BMS broad band connection (Tank room) for BMS
Ground Floor	Auto dial out for Intruder alarm and fire alarm
Reception	2 No direct telephone lines Broad band connection- General use High speed broad band Connection- CCTV
Fire Control Room	2 No direct telephone lines
Plant	Telephone lines for each Lift.

A.14.0 Security Requirements

A.14.1 General Requirements

A specialist will be appointed to supply and install the security systems. These systems will include Access Control, CCTV and Intruder Alarms.

Containment:
The Electrical Contractor will connect all the conduits back to the landlords riser in the secondary stair and the landlords riser in stair 1, where separate 100 x 100 trunking will be installed.

This will extend the entire length of the riser and then to extend to reception/ basement.

The Electrical Contractor will allow for an adjacent electrical supply and extend a separate conduit terminated in the basement car park to a Junction Box.

The trunking /conduit is to be complete with draw wire for telemetry wiring by the security specialist.

Containment will be surface mounted throughout the basement areas and concealed in all other areas All containment will be accessible from the Landlords areas.

Power supply arrangements for the various security systems will depend on the selected specialist, therefore individual power supplies for door controllers etc have not been individually identified at this stage, to suit a particular specialist.

The Electrical Contractor will make due allowance in the tender for all associated power and control cabling required from the selected specialist.

All associated power supplies will be derived from the security distribution board.

A.14.2 CCTV Installation.

This will include both Internal and external cameras.

The Electrical Contractor will appoint a specialist contractor to supply and Install CCTV PTZ and fixed cameras to the following locations.

- External and internal cameras will monitor main entrance doors.
- Means of escape doors.
- Internal cameras will also monitor the reception area and basement circulation routes to the MOE.

Split Screen monitors will be provided to suit the above mentioned camera requirements in the BMS room and at the reception desk.

A digital recorder will be provided with integrated DVD will be located in the BMS room. The unit will store images from the cameras on to the hard drive from where they can be retrieved and displayed on the local monitors.

The external cameras will be supplemented by external passive infra red sensors. The cameras images are to be colour, and be of suitable quality and recording for use as criminal evidence.

The CCTV will have the facility to be monitored at a central station out of hours, this will include remote alarm. The communication is to be a high speed broad band connection.

A.14.3 Intruder Alarm System

All the external doors will to be fitted with magnetic door contacts, supplemented with passive infra red movement detection to the adjacent circulation areas.

This will also include a panic alarm button at reception. A combined auto dial out with the Fire alarm system will be provided.

A.14.4 Access Control System

A.14.4.1 Landlords areas

An active access Control System will be provided to all landlords' areas at basement and ground floor levels.

At the reception desk the Electrical Contractor will supply and install a power supply and integrate the console into the reception desks final layout.

The Electrical Contractor will make allowance for a fire alarm interface unit from the main Fire Alarm system which will allow the system to fail open

At each entrance the following will be provided:

Unsecure side: Fob Entry
Secure side: Push to Exit

Basement level- MOE from basement

An Allowance of 1000 programmable swipe/cards will be allowed in the tender package

Part of the exit strategy from the basement is to provide means of escape from the basement shared facility through B2, therefore at these designated entry positions a green break glass unit will be provided, however, as this provides unauthorised (normal conditions) entry to the building, this will initiate a general alarm.

Lifts:
In each Lift, access control will be provided, this will be integrated into the lift control systems.

The lifts will be controlled by destination control system; the Electrical Contractor will ensure that the systems functionality is compatibility between the general access control and the lift control system.

A.14.4.2 Tenants Areas

At each entrance to the tenants area, the Electrical Contractor will supply and install a network of conduits, which will be terminated above the ceilings in a junction box and to an adjacent wall outlet, for the tenants future connection of a proximity activated access control system.

The Access control will have the future capacity to extend throughout the building, covering all entry /exits to the tenant's floors.

Unsecure side: Containment for Fob Entry
Secure side: Containment for Push to Exit.

A.14.5 Intercom System (s)

Loading Bay Entrance A 2 way Intercom System between the reception desk and the loading bay entrance.

A W.P stainless steel intercom unit will be located at the external locations. A conduit will be extended back to the reception desk, where a desk-mounted console will be located.

Main Entrance:
Allowance will be made to provide 2 way voice entry system with assistance call which will communicate between the reception area and the entrance doors. The unit will be complete with door release and DDA compliant.

The automatic over-rides from the DDA pass doors and the loading bay will operate from the

reception desk.. Stainless steel or brushed stainless with Green Disabled Insert finish

A.15.0 Disabled Alarm Systems

A.15.1 Disabled Persons Alarm System (Toilets and Showers)

The Electrical Contractor will supply and install a disabled persons alarm to each designated disabled toilet.

The system consists of a buzzer and light assembly above each disabled door, a re-set unit located inside each toilet and a pull cord as shown.

The Electrical Contractor will allow for the units to be repeated on a central control panel at the reception desk. Cancellation of the alarm signal will only be permitted at the toilet re-set unit.

A.15.2 Disabled Refuge Alarm System

The Electrical Contractor will supply and install a disabled persons Refuge alarm to each designated location on the Stairs/Lobbies.

The system consists of a speech unit at the designated location and a central control panel at the Fireman's Control Room.

Activation will only be initiated via the Fire Alarm second knock.

It has been agreed with the Brigade that the Alarm system will be used as the fire phone.

A.15.3 Induction Loops

An Induction loop system will be installed at the reception desk. .Subject To Approval

A.16.0 Earthing and Bonding

The Electrical Contractor will provide all main, supplementary and equipotential bonding in accordance with the requirements of BS 7671 IEE Wiring Regulations (17th Edition).

The Electrical Contractor will provide and install a complete solid earthing system in order to protect against indirect contact by means of automatic disconnection of the electricity supply within the time limits specified within IEE regulations.

The main earth bonding connections will be in electrical switch room and H.V RMU room.

A.17.0 BMS Requirements

A.17.1 Condition Monitoring

The Electrical Contractor will make provision for BMS condition monitoring on equipment supplied by the Electrical Contractor, as defined in the Schedules

On the LV switchgear, the following equipment will be status monitored:

- Incoming ACBs - open, closed, trip
- Multi meters with Pulsed output signals for remote metering
- Change over ACBs /MCCB's - open, closed, trip
    - (Generator and Life Safety systems)

The switchgear specialist will extend the control cabling from the above to a control section within a Separate Compartment within then switch panel.

The controls cabling will terminate onto a din rail frame, with fully numbered terminals.

The outgoing side of the connectors will provide connections for the BMS specialist to extend wiring to the BMS system.

A.18.0 Metering Requirements

The switchgear specialist will supply and install a Power metering and data collection and transmission system to all Electrical power meters shown on the Electrical Schematic.

The system will operate from pulsed output meters collected via a local area network to a head end PC, The system will also allow to be interrogated remotely via the web.

The system will comprise of the following:-

Meters
- Panel Mounted
- Pulsed Output

Measurement to report
- Phase and Total Current
- Phase / Phase and Phase to Neutral
- Frequency
- Power Factor per phase and Total
- Energy metering- KVA, KW.
- Fully Programmable RS458 Modbus Communication Port

Horizontal Range Collector
- Suitable for collection of data.
- Complete with Removable memory card
- 16 Volt Free Pulsed Inputs
- Modbus Protocol

Interconnecting Cabling

Switch Panel	RS485 Modbus Belden 8723
Network Cabling	Canbus Network Belden 8761
	Pulse Cables Belden 8761

Data Transfer
Allowance is to be made for data transfer both from MMC/SC card 1 GB Minimum and Phone Module for Web Access.

A.19.0 Photo Voltaic Installation

A specialist will be appointed by the Electrical Contractor is to design, install and fully test a Photo Voltaic Installation.

The Electrical Contractor will provide attendance on the specialist.

Refer to separate specification.

Kings Cross Zone B Building B2

APPENDIX 1 – CONTRACT DRAWING SCHEDULE

The following schedule details the tender drawings provided to accompany the Electrical services specification.

Drawing No.	Revision	Drawing Title
		ELECTRICAL SERVICES
4111/SERV/4000	C0	Electrical Symbols
4111/SERV/4010	C0	Electrical H.V Schematic
4111/SERV/4020	C1	Electrical LV Schematic
4111/SERV/4030	C0	Fire Alarm Schematic
4111/SERV/4040	C0	Earthing Schematic
4111/SERV/4050	C0	Basement Life Safety Schematic
4111/SERV/4060	C0	Disabled Refuge Alarm Schematic
4111/SERV/4070	C0	Detail sheet 1
4111/SERV/4071	C0	Detail sheet 2 Door Access Control
4111/SERV/4080	C0	Lower Basement Earthing And Lightning Protection Arrangement
4111/SERV/4081	C0	Ground Floor Lightning Protection Layout
4111/SERV/4082	C0	Roof Lightning Protection
4111-SERV/4084	C0	North and South Elevation Lightning Protection
4111-SERV/4085	C0	East Elevation Lightning Protection
4111-SERV/4091	C0	South Core Staircase (Plan Views)
4111-SERV/4093	C0	South Core Staircase (Elevation sections)
4111-SERV/4095	C0	North Core Staircase (Conduit installation)
4111-SERV/4096	C0	North Core Staircase (Conduit installation)
4111-SERV/4097	C0	North Core Staircase (Elevation sections)
4111-SERV/4098	C0	North Core Staircase (Cast In 3D View)
4111/SERV/4100	C2	Lower Basement Lighting Layout
4111/SERV/4101	C2	Upper Basement Lighting Layout
4111/SERV/4102	C2	Ground Floor Lighting Layout
4111/SERV/4103	C1	1st Floor Lighting Layout (Typical Floor)
4111/SERV/4104	C1	2nd Floor Lighting layout
4111/SERV/4105	C1	3rd Floor Lighting layout
4111/SERV/4106	C1	4th Floor Lighting layout
4111/SERV/4107	C1	5th Floor Lighting layout
4111/SERV/4108	C1	6th Floor Lighting layout
4111/SERV/4109	C1	7th Floor Lighting layout
4111/SERV/4110	C1	8th Floor Lighting Layout
4111/SERV/4112	C0	Roof – Electrical Services Layout

4111/SERV/4200	C0	Lower Basement Small Power Layout
4111/SERV/4201	C0	Upper Basement Small Power Layout
4111/SERV/4202	C0	Ground Floor Small Power Layout
4111/SERV/4203	C0	1ST Floor Small Power Layout (Typical Floor)
4111/SERV/4204	C0	2nd Floor Small Power Layout
4111/SERV/4205	C0	3rd Floor Small Power Layout
4111/SERV/4206	C0	4th Floor Small Power Layout
4111/SERV/4207	C0	5th Floor Small Power Layout
4111/SERV/4208	C0	6th Floor Small Power Layout
4111/SERV/4209	C0	7th Floor Small Power Layout
4111/SERV/4210	C0	8th Floor Small Power Layout
4111/SERV/4212	C0	Typical U/F Small Power Layout Cat B
4111/SERV/4400	C0	Lower Basement Fire Alarm & Security Layout
4111/SERV/4401	C0	Upper Basement Fire Alarm & Security Layout
4111/SERV/4402	C2	Ground Floor Fire Alarm & Security Layout
4111/SERV/4403	C0	1st Fl. Fire Alarm &Security Layout (Typical Floor)
4111/SERV/4404	C0	2nd Fl. Fire Alarm &Security Layout
4111/SERV/4405	C0	3rd Fl. Fire Alarm &Security Layout
4111/SERV/4406	C0	4th Fl. Fire Alarm &Security Layout
4111/SERV/4407	C0	5th Fl. Fire Alarm &Security Layout
4111/SERV/4408	C0	6th Fl. Fire Alarm &Security Layout
4111/SERV/4409	C0	7th Fl. Fire Alarm &Security Layout
4111/SERV/4410	C0	8th FL. Fire Alarm &Security Layout
4111/SERV/4600	C0	Lower Basement Containment Layout
4111/SERV/4601	C1	Upper Basement Containment Layout
4111/SERV/4602	C0	Ground Floor Containment Layout
4111/SERV/4603	C0	1st Fl. Containment Layout (Typical Floor)
4111/SERV/4604	C0	2nd Fl. Containment Layout
4111/SERV/4605	C0	3rd Fl. Containment Layout
4111/SERV/4606	C0	4th Fl. Containment Layout
4111/SERV/4607	C0	5th Fl. Containment Layout
4111/SERV/4608	C0	6th Fl. Containment Layout
4111/SERV/4609	C0	7th Fl. Containment Layout
4111/SERV/4610	C0	8th FL Containment layout
4111/SERV/4700	C0	Riser Details (South)
4111/SERV/4701	C0	Riser Details (North)
4111-SERV/4702	C0	Rooftop Photovoltaic Containment

	C0	**SUPPLEMENTARY INFORMATION**

4123/SERV/4010	C0	HV / LV Distribution Schematic
4123/SERV/4020	C0	Landlords LV Distribution Schematic
4123/SERV/4030	C0	Basement Fire Alarm Schematic
4123/SERV/4040	C0	Earthing and Lightning Protection Schematic
4123/SERV/4050	C0	Basement Life Safety Schematic

BAM Design
Centrium
Griffiths Way
St Albans
Herts
AL1 2RD

Tel No: 01727 894200

BAM Design Electrical Services Schedule

CLIENT: **BAM Construction**

PROJECT: Kings Cross Building B2 (4111)

SITE ADDRESS: Building 2, Pancras square, Kings Boulevard, London N1 (4111)

Appendix 2

PLANT/EQUIPMENT SCHEDULES

Contract no: Job no: 4111

Prepared by: N Neill Checked by: NJN Date: April 2012

Status of specification: CONTRACT

AMENDMENTS				
ref.	date	Amendment	amended by	checked by
T0	Dec ' 11	Issued for Tender		NJN
T1	Feb 12	Revised issue updated for CMT comments	MP	NJN
T2	APR 12	Revised issue updated for CMT comments	MP	NJN
C0	AUG 12	Issued CONTRACT	MP	NJN
C1	DEC 12	Re Issued For CONTRACT	MP	NJN

Kings Cross Zone B, Building B2

APPENDIX 2 – PLANT/EQUIPMENT SCHEDULES

This section provides full details of the plant/equipment being employed on this project. The plant/equipment schedules contained within this specification are as follows:-

The Schedules are collated in a separate document

Index to Schedules

Schedule No 1	H.V. Switch gear
Schedule No 2	Transformer
Schedule No 3	L.V Switchboard Schedules
Schedule No 3/1	L.V Switchboard L.V 1- Tenants Switchboard
Schedule No 3/2	L.V Switchboard LV 2 - Landlords Switchboard
Schedule No 3/3	L.V Switchboard LV 3 – Life Safety Switchboard
Schedule No 4	Composite Distribution Centres
Schedule No 5	Schedule of Finishes-Electrical Accessories
Schedule No 6	Cable Schedule
Schedule No 7	Metering and BMS Connections
Schedule No 8	Schedule of Mounting Heights
Schedule No 9	Fire Alarm Interface Schedule
Schedule No 10	Schedule of Luminaires
Schedule No 11	Distribution Board Schedules
Schedule No 12	Under Floor Small Power Cat A allowance

HV Switch Schedule

Item	Description	Ref.	H.V #1
1	Non - extensible SF6 Switch disconnector		
2	Voltage Rating	KV	11 KV
3	Quantity	No	1
4	System Voltage	KV	12/13.8
5	Fault Rating	KA	15/21
6	Current Rating	A	630
7	Frequency	Hertz	50
8	Max. Ambient Temperature	°C	40
	Optional Items to be included		
9	Operation		Non- Auto
10	Operating Handle		YES
11	Padlocks		YES
12	Gland Plate		YES
13	Lifting Lugs		Required
14	Earthing Terminal		Required
15	Cable Box (LV / HV)		Required
16	**Enclosure**		Steel cage with locks
17	**Plant Replacement**		To be removed without the need to dismantle

HV / LV Transformer Schedule

Item	Description	Ref.	Tx. # 1
	Power		
1	Rating	kVA	1250
2	Quantity	No.	1
3	Standards	IEC 726	IEC 726
4	Primary Voltage	Volts	11000
5	Secondary Voltage	Volts	400
	Vector		
6	Group		Dyn 11
7	Cooling Method		AN
8	Frequency	Hertz	50
9	Max. Ambient Temperature	°C	40
10	Lighting Pulse Withstand Volts	kV	60
11	Insulation Material Class (LV / HV)		F/ F
	Winding Temperature Rise (LV /		
12	HV)	°C	100
13	Winding Material		Cu/Cu
14	Winding Manufacturing	LV	Impregnated
		HV	Encapsulated
15	Protection Class	IP	21
16	Bidirectional Rollers		Required
17	Off Load Tap Changer (Primary)		2.5% (+ / -)
18	Lifting Lugs		Required
19	Earthing Terminal		Required
20	Winding Temperature Sensor		PT 100
	Temperature Control		
21	Unit		MT 200
22	Cable Box (LV / HV)		Required
23	Enclosure		Steel with Castell Interlocks

Switchboard ref	Life safety Switch Panel **LV 1**	**Location :**	Basement	
Supply details:	400/230 volts, 3 ph. 50 Hzs	**Upstream device:**		
Internal separation		**Ref:**	BS EN 60439-2	
Form	1 ☐ 2 ☐ 3 ☐ **4 b** ☐	**Prosp. F. C. (Ip):**	5 0 **KA**	
Type required :	2 ☐ ☐ **5** ☐ 6 ☐	**Busbar/panel f. level:**	5 0 **KA** 1 **Sec**	

Type of incoming device		**Type of outgoing device**		**Neutral busbar**	
Isolator	☐	Fuseswitch	☐	Half	☐
Fuseswitch	☐	MCCB	☐	Full	☐
MCCB	☐	ACB	☐	Double	☐
ACB	☐				

Type of access	Front ☐	Rear ☐	Both ☐	L Shp'd ☐	
Panel restrictions	Ht ☐	width ☐	manuf. std ht ☐	Plinth ☐	See Note 1
Panel Arrangement	Free stand'g ☐	wall ☐	back/back ☐	Horizontal Cabling Compartment (Gland Box) ☐	
Degree of protection	IP2X ☐ IP3X ☐	IP4X ☐	Other IP ☐		

Physical layout

			Incoming position see notes	RHS ☐	LHS ☐
Incoming cables	Btm ☐	Top ☐	**Earthing Busbar**	Btm ☐	Top ☐
Trench/duct available	Y ☐	N ☐		Int. ☐	Ext ☐
Outgoing cables	Btm ☐	Top ☐	Insulated Coverings (boots) for external Terminals	Y ☐	N ☐

Ancillary equipment

Metering	Ammeter ☐	Volt ☐	Max.D ☐	**C/T Metering** ☐	other ☐
Supply Auth.	C/T links Y ☐	N ☐		**BMS Section** Y ☐	N ☐
Surge Protection Device	Y ☐	N ☐		**Castell Key** Y ☐	N ☐

Special requirements

Colour	Manu.Std. ☐	Special BS/ RAL ☐	Spare fuse/bkr Y ☐	See Note 2

Notes

1 Plinth to be 100mm

2 Spares MCCB'S

2 x 400 Amp fitted with TMD Trips
2 x 200 Amp fitted with TMD Trips
5 x 100 Amp fitted with TMD Trips

Switchboard ref Main Switch Panel LV 2 — **Location :** Basement

Supply details: 400/230 volts, 3 ph. 50 Hzs — **Upstream device:**

Internal separation — **Ref:** BS EN 60439-2

Form 1 [ ] 2 [ ] 3 [ ] **4 b** [x] — **Prosp. F. C. (Ip):** 5 0 **KA**

Type required : 2 [ ] [ ] **5** [ ] 6 [x] — **Busbar/panel f. level:** 5 0 **KA** 1 **Sec**

Type of incoming device		**Type of outgoing device**		**Neutral busbar**	
Isolator	[ ]	Fuseswitch	[ ]	Half	[ ]
Fuseswitch	[ ]	MCCB	[x]	Full	[x]
MCCB	[ ]	ACB	[ ]	Double	[ ]
ACB	[x]				

Type of access — Front [x] Rear [ ] Both [ ] L Shp'd [ ]

Panel restrictions — Ht [ ] width [ ] manuf. std ht [x] Plinth [x] See Note 1

Panel Arrangement — Free stand'g [x] wall [ ] back/back [ ] Horizontal Cabling Compartment (Gland Box) [ ]

Degree of protection — IP2X [ ] IP3X [ ] IP4X [x] Other IP [ ]

Physical layout

Incoming position — RHS [ ] LHS [x]
see notes

Incoming cables — Btm [ ] Top [x]

Earthing Busbar — Btm [ ] Top [x]

Trench/duct available — Y [ ] N [x]

Int. [ ] Ext [x]

Outgoing cables — Btm [ ] Top [x]

Insulated Coverings (boots) for external Terminals — Y [x] N [ ]

Ancillary equipment

Metering — Ammeter [x] Volt [x] Max.D [x] — **C/T Metering** [ ] other [ ]

Supply Auth. — C/T links Y [ ] N [x] — **BMS Section** Y [x] N [ ]

Surge Protection Device — Y [x] N [ ] — **Castell Key** Y [x] N [ ]

Special requirements

Colour — Manu.Std. [x] Special BS/ RAL [ ] — Spare fuse/bkr Y [x] See Note 2

Notes

1 Plinth to be 100mm
2 Spares MCCB'S
2 x 400 Amp fitted with TMD Trips
4 x 200 Amp fitted with TMD Trips
5 x 100 Amp fitted with TMD Trips

Switchboard ref Main Switch Panel LV 3 **Location :** Basement

Supply details: 400/230 volts, 3 ph. 50 Hzs **Upstream device:**

Internal separation **Ref:** BS EN 60439-2

Form 1 [ ] 2 [ ] 3 [ ] **4 b** [■] **Prosp. F. C. (Ip):** 5 0 **KA**

Type required : 2 [ ] [ ] **5** [ ] 6 [■] **Busbar/panel f. level:** 5 0 **KA** 1 **Sec**

Type of incoming device		**Type of outgoing device**		**Neutral busbar**	
Isolator	[ ]	Fuseswitch	[ ]	Half	[ ]
Fuseswitch	[ ]	MCCB	[■]	Full	[■]
MCCB	[ ]	ACB	[ ]	Double	[ ]
ACB	[■]				

Type of access Front [■] Rear [ ] Both [ ] L Shp'd [ ]

Panel restrictions Ht [ ] width [ ] manuf. std ht [■] Plinth [■] See Note 1

Panel Arrangement Free stand'g [■] wall [ ] back/back [ ] Horizontal Cabling Compartment (Gland Box) [ ]

Degree of protection IP2X [ ] IP3X [ ] IP4X [■] Other IP [ ]

Physical layout

Incoming cables Btm [ ] Top [■] — **Incoming position** RHS [ ] LHS [■] see notes

Trench/duct available Y [ ] N [■] — **Earthing Busbar** Btm [ ] Top [■]

Int. [ ] Ext [■]

Outgoing cables Btm [ ] Top [■]

Insulated Coverings (boots) for external Terminals Y [■] N [ ]

Ancillary equipment

Metering Ammeter [■] Volt [■] Max.D [■] **C/T Metering** [ ] other [ ]

Supply Auth. C/T links Y [ ] N [■] **BMS Section** Y [ ] N [■]

Surge Protection Device Y [■] N [ ] **Castell Key** Y [■] N [ ]

Special requirements

Colour Manu.Std. [ ] Special BS/ RAL **RED** Spare fuse/bkr Y [■] See Note 2

Notes

1 Plinth to be 100mm

2 Spares MCCB'S

2 x 400 Amp fitted with TMD Trips
2 x 200 Amp fitted with TMD Trips
3 x 100 Amp fitted with TMD Trips

Switchboard ref DBs **Location :** Basement

Tenants Composite Distribution Centres

Supply details: 400/230 volts, 3 ph. 50 Hzs **Upstream device:**

Internal separation **Ref:** BS EN 60439-2

Form 1 2 3 **4 b** **Prosp. F. C. (Ip):** 2 5 **KA**

Type required : 2 **5** 6 **Busbar/panel f. level:** 2 5 **KA** 1 **Sec**

Type of incoming device	**Type of outgoing device**	**Neutral busbar**
Isolator	Fuseswitch	Half
Fuseswitch	MCBs	Full
MCCB	ACB	Double
ACB		

Type of access Front Rear Both L Shp'd

Panel restrictions Ht width manuf. std ht Plinth

Panel Arrangement Free stand'g wall back/back Horizontal Cabling Compartment (Gland Box)

Degree of protection IP2X IP3X IP4X Other IP

Physical layout

Incoming cables Btm Top **Incoming position** RHS LHS see notes

Earthing Busbar Btm Top

Trench/duct available Y N Int. Ext

Outgoing cables Btm Top

Insulated Coverings (boots) for external Terminals Y N

Ancillary equipment

Metering Ammeter Volt Max.D **C/T Metering** other

Supply Auth. C/T links Y N **BMS Section** Y N

Surge Protection Device Y N **Castell Key** Y N

Special requirements

Colour Manu.Std. Special BS/ RAL Spare fuse/bkr Y See Note 1

Notes

1 No Spare MCCB's
Refer to distribution Board Schedules for Spare MCB's

Schedule of Finishes- Electrical Accessories

The Electrical Contractor will ensure compatibility throughout the range selected.

AREA	FINISH
External Plant rooms	Metal Clad
Plant Rooms	Metal Clad
Risers	Metal Clad
Main Stairs	Satin Stainless Steel
Entrance	Satin Stainless Steel
Lift Lobbies	Satin Stainless Steel
Toilets	Satin Stainless Steel
Disabled Toilet	Satin Stainless Steel
Cleaners Room/Stores	White Plastic
BMS Room	White Plastic
Tenants Office Area- Cleaners	Satin Stainless Steel
Tenants Office Area- Cleaners Hive Outlets	Grey
Fire Alarm Equipment	
Fire Alarm Panel in reception	Stainless Steel, With Glass Cover
Fire Alarm Panel in Fire Control Room	Standard Finish
Call Point	Red
Sounders- Plant rooms	Red
Sounders- All other areas	White
Smoke Detectors	White
Voice Alarm Speakers	White
Disabled Alarm Systems	
Disabled Refuge Call Station	Stainless Steel
Disabled Refuge Main Panel In Fire Control Room	Standard Finish
Disabled Alarm Over door Unit	Stainless Steel
Disabled Alarm Main Panel	Stainless Steel

			Cable Data					Installation Method	Protective Device	Rating (A)	Setting
Ref	Connected From	Connected To	Length	Ø mm²	No/Cores	Cable Type	CPC mm²	As Table 4 A	Description	In	Ir
HV08	H.V Switch	Transformer	110	185	1 x 1 x 3c	XLPE.SWA.LSF (Red) 11 KV		31	Separate tray , fully lidded throughout	2000	1750
HV08	Transformer	Landlords switchboard	2			Busbar Connection to switch board				2000	2000
						Busbars rated at 2000 A					
G001	Generator	Life Safety Swicth Panel	80	2 x 120	1 x 1 x 4c	Pirelli FP600 Fire resistant cable cu		31			
F001	TSB	Tenants Busbar South core	30	150	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4		31- Touching	Merlin Gerin, Compact MCCB, NS400N, STRE 23SE	400	250
F002	TSB	Tenants Busbar North core	60	150	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4		31- Touching	Merlin Gerin, Compact MCCB, NS400N, STRE 23SE	400	250
F003	LSP1	Disabled Alarm Panel	65	6	1 x 1 x 3c	Pirelli FP600 Fire resistant cable Cu	10	31- Touching	Merlin Gerin, Compact MCCB, NS40SX, TM D	40	32
F004	LSP1	Disabled Refuge Panel	65	6	1 x 1 x 3c	Pirelli FP600 Fire resistant cable Cu	10	31- Touching	Merlin Gerin, Compact MCCB, NS40SX, TM D	40	32
F005	LSP1	Main Fire Alarm Panel	65	6	1 x 1 x 3c	Pirelli FP600 Fire resistant cable Cu	10	31- Touching	Merlin Gerin, Compact MCCB, NS40SX, TM D	40	32
F006	LSP1	F/F Lift Sump Pump	40	16	1 x 1 x 4c	Pirelli FP600 Fire resistant cable Cu		31- Touching	Merlin Gerin, Compact MCCB, NS40SX, TM D	40	32
F007	LSP1	Security Panel	40	10	1 x 1 x 4c	Pirelli FP600 Fire resistant cable Cu	4	31- Touching	Merlin Gerin, Compact MCCB, NS100SX, TM D	100	63
F008	LSP1	Basement Smoke Vent M2	65	6	1 x 1 x 4c	Pirelli FP600 Fire resistant cable Cu		31- Touching	Merlin Gerin, Compact MCCB, NS40SX, TM D	40	32
F009	LSP1	FF Lift	62	16	1 x 1 x 4c	Pirelli FP600 Fire resistant cable Cu	10	31- Touching	Merlin Gerin, Compact MCCB, NS100SX, TM D	100	63
F010	LSP1	8 Way TP&N DB FF Lift Lobby GF	30	35	1 x 1 x 4c	Pirelli FP600 Fire resistant cable Cu	50	31- Touching	Merlin Gerin, Compact MCCB, NS160SX, TM D	160	100
F011	LSP1	Smoke Extract MCC2	30	25	1 x 1 x 4c	Pirelli FP600 Fire resistant cable Cu	16	31- Touching	Merlin Gerin, Compact MCCB, NS100SX, TM D	100	32
F012	LSP1	400A TP&N fused switch	30	150	1 x 1 x 4c	Pirelli FP600 Fire resistant cable Cu		31- Touching	Merlin Gerin, Compact MCCB, NS400N, STRE 23SE	400	400
F013	LSP1	LandLords Switch Panel	20	185	1 x 1 x 4c	Pirelli FP600 Fire resistant cable Cu	10	31- Touching	Merlin Gerin, Compact MCCB, NS400N, STRE 23SE	400	400
F014	MSB1	FF Lift	80	16	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4		31- Touching	Merlin Gerin, Compact MCCB, NS100SX, TM D	100	100
F015	MSB1	8 Way TP&N DB FF Lift Lobby GF	30	35	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4	10	31- Touching	Merlin Gerin, Compact MCCB, NS160SX, TM D	160	100
F016	MSB1	Smoke Extract MCC2 (DUTY)	30	95	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4		31- Touching	Merlin Gerin, Compact MCCB, NS160SX, TM D	160	160
F017	MSB1	Basement Smoke Vent M2(DUTY)	20	10	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4		31- Touching	Merlin Gerin, Compact MCCB, NS100SX, TM D	100	25
F018	MSB1	F/F Lift Sump Pump (DUTY)	20	10	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4		31- Touching	Merlin Gerin, Compact MCCB, NS100SX, TM D	100	40
F019	MSB1	Ground floor Lighting and Power	30	95	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4		31- Touching	Merlin Gerin, Compact MCCB, NS400N, STRE 23SE	400	400
F020	MSB1	L/ Basment Lighting and Power	10	95	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4		31- Touching	Merlin Gerin, Compact MCCB, NS400N, STRE 23SE	400	400
F021	MSB1	8th Floor Lighting and Power	80	50	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4	25	31- Touching	Merlin Gerin, Compact MCCB, NS160SX , TMD	160	125
F022	MSB1	Passenger goods Lift 1	80	16	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4	10	31- Touching	Merlin Gerin, Compact MCCB, NS630N, STRE 23SE	630	630
F023	MSB1	Passenger goods Lift 2	80	16	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4	10	31- Touching	Merlin Gerin, Compact MCCB, NS100SX, TM D	100	100
F024	MSB1	Photo Voltaic Inverter	90	95	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4	25	31- Touching	Merlin Gerin, Compact MCCB, NS250SX , TMD	32	20
F025	MSB1	U/ Basment Lighting and Power	55	35	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4		31- Touching	Merlin Gerin, Compact MCCB, NS160SX , TMD	160	125
F026	MSB2	LL south core 8way DB 3rd floor	65	35	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4	4	31- Touching	Merlin Gerin, Compact MCCB, NS100SX, TM D	100	63
F027	MSB2	LL south core 8way DB 4th floor	65	35	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4	4	31- Touching	Merlin Gerin, Compact MCCB, NS160SX , TMD	160	125
F028	MSB2	Chiller 1	90	2 x120	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4	10	31- Touching	Merlin Gerin, Compact MCCB, NS400N, STRE 23SE	400	250
F029	MSB2	Chiller 2	90	2 x120	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4		31- Touching	Merlin Gerin, Compact MCCB, NS400N, STRE 23SE	400	250

			Cable Data					Installation Method	Protective Device	Rating (A)	Setting
Ref	Connected From	Connected To	Length	Ø mm²	No/Cores	Cable Type	CPC mm²	As Table 4 A	Description	In	Ir
F029	MSB2	FUTURE Retail Lift	30	16	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4		31- Touching	Merlin Gerin, Compact MCCB, NS100SX , TMD	100	63
F030	MSB2	MCC1 upper basement	55	35	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4		31- Touching	Merlin Gerin, Compact MCCB, NS160SX , TMD	160	125
F031	MSB2	MCC3 lower basement	45	35	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4		31- Touching	Merlin Gerin, Compact MCCB, NS160SX , TMD	160	125
F032	MSB2	M1 Mechanical Board L/Basement	55	25	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4		31- Touching	Merlin Gerin, Compact MCCB, NS100SX, TM D	100	100
F033	MSB2	MCC4 lower basement	55	25	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4		31- Touching	Merlin Gerin, Compact MCCB, NS100SX, TM D	100	100
F034	MSB2	DB Roof Plant area	90	25	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4		31- Touching	Merlin Gerin, Compact MCCB, NS100SX, TM D	100	32
F035	MSB2	MCC5 Roof Plant area	90	35	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4		31- Touching	Merlin Gerin, Compact MCCB, NS100SX, TM D	250	250
F036	MSB2	4 Way external lighting board GF	45	25	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4	25	31- Touching	Merlin Gerin, Compact MCCB, NS100SX, TM D	100	32
F037	MSB2	3rd Floor Lighting and Power DB	65	35	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4		31- Touching	Merlin Gerin, Compact MCCB, NS160SX , TMD	160	125
F038	MSB2	5th Floor Lighting and Power DB	65	50	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4		31- Touching	Merlin Gerin, Compact MCCB, NS160SX , TMD	160	125
F039	MSB2	Power factor Correction Unit	10	2 x 185	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4		31- Touching	Merlin Gerin, Compact MCCB, NS630N, STRE 23SE	630	500
F040	MSB2	LUL Escalator 1	30	25	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4		31- Touching	Merlin Gerin, Compact MCCB, NS100SX, TM D	100	32
F041	MSB2	LUL Escalator 1	30	25	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4		31- Touching	Merlin Gerin, Compact MCCB, NS100SX, TM D	100	32
F042	MSB2	8 way SP&N DB Utilities	30	25	1 x 1 x 3c	Multi Core XLPE.LSF.SWA Cu Table 4E4		31- Touching	Merlin Gerin, Compact MCCB, NS100SX, TM D	100	63
	Typical- Tap-off to Tenants Board										
T1	Busbar Tap-off	Tenants panel	1	35	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4		20 - Clipped Direct	Merlin Gerin, Compact MCCB, NS160SX, TMD	160	125
T2	Busbar Tap-off	Tenants panel	1	35	1 x 1 x 4c	Multi Core XLPE.LSF.SWA Cu Table 4E4		20 - Clipped Direct	Merlin Gerin, Compact MCCB, NS160SX, TMD	160	125

Cable Ref:	Conection Point	Connected From	Connected To	Meter / Function	Notes	Meter Ref No	Other BMS reqd outputs
S001	ACB 1	Incomer	MSB2	Multi functional Meter with output to PMS	Notes 1- 4	EM001	Note 6
					Note 5, 6		Note 8
F001		TSB	Tenants Busbar TBB1	Multi functional Meter with output to PMS	Notes 1- 4	EM002	
F002		TSB	Tenants Busbar TBB2	Multi functional Meter with output to PMS	Notes 1- 4	EM003	
Essential Section							
G001		Generator	LSP 1				
F003		LSP 1	Disabled Alarm Panel				
F004		LSP 1	Disabled Refuge Alarm Panel				
F005		LSP 1	Main Fire Alarm Panel				
F006		LSP 1	Fire fighting Lift Sump Pump				
F007		LSP 1	Security Panel	Multi functional Meter with output to PMS	Notes 1- 4	EM004	
F008		LSP 1	Basement smoke vent Panel				
F009		LSP 1	Fire fighting Lift				
F010		LSP 1	Fire Fighting Lift Lobby DB	Multi functional Meter with output to PMS	Notes 1- 4	EM005	
F011		LSP 1	Smoke extract M2				
F012		MSB1	Changeover connection				
F013		S001	Life Safety By Pass	Multi functional Meter with output to PMS	Notes 1- 4	EM006	
F014		MSB1	Fire fighting Lift				
F015		MSB1	Fire Fighting Lift Lobby DB	Multi functional Meter with output to PMS	Notes 1- 4	EM007	
F016		MSB1	Smoke Extract M2				
F017		MSB1	Basement smoke vent Panel				
F018		MSB1	Fire fighting Lift Sump Pump				
F019		MSB1	Landlords Ground Floor LTG & Power				
F020		MSB1	Landlords L/ Basement LTG & Power				
F021		MSB1	Lighting and Power DB 8th floor	Multi functional Meter with output to PMS	Notes 1- 4	EM008	
F022		MSB1	Passenger Lift 1				
F023		MSB1	Passenger Lift 2				
F024		MSB1	Photovoltaic system	Multi functional Meter with output to PMS	Notes 1- 4	EM009	
F025		MSB1	Landlords U/ Basement LTG & Power				

Cable Ref:	Conection Point	Connected From	Connected To	Meter / Function	Notes	Meter Ref No	Other BMS reqd outputs
F026		MSB2	Landlords 3rd floor Lobby LTG DB	Multi functional Meter with output to PMS	Notes 1- 4	EM010	
F027		MSB2	Landlords 4th floor Lobby Power DB	Multi functional Meter with output to PMS	Notes 1- 4	EM011	
F028		MSB2	Chiller 1	Multi functional Meter with output to PMS	Notes 1- 4	EM012	
F029		MSB2	Chiller 2	Multi functional Meter with output to PMS	Notes 1- 4	EM013	
F030		MSB2	Future Tenants Lift	Multi functional Meter with output to PMS	Notes 1- 4	EM014	
F031		MSB2	MCCP 1	Multi functional Meter with output to PMS	Notes 1- 4	EM015	
F032		MSB2	MCCP 3	Multi functional Meter with output to PMS	Notes 1- 4	EM016	
F033		MSB2	12 way Mech DB M1	Multi functional Meter with output to PMS	Notes 1- 4	EM017	
F034		MSB2	MCCP 4	Multi functional Meter with output to PMS	Notes 1- 4	EM018	
F035		MSB2	Roof Lighting and Power DB	Multi functional Meter with output to PMS	Notes 1- 4	EM019	
F036		MSB2	MCCP 5	Multi functional Meter with output to PMS	Notes 1- 4	EM020	
F037		MSB2	4 way External Lighting DB	Multi functional Meter with output to PMS	Notes 1- 4	EM021	
F038		MSB2	Landlords 2nd floor LTG & Power DB	Multi functional Meter with output to PMS	Notes 1- 4	EM022	
F039		MSB2	Landlords 5th floor LTG & Power DB	Multi functional Meter with output to PMS	Notes 1- 4	EM023	
F040		MSB2	Power Factor Correction Unit	Multi functional Meter with output to PMS	Notes 1- 4	EM024	
F041		MSB2	Escalator 1	Multi functional Meter with output to PMS	Notes 1- 4	EM025	
F042		MSB2	Escalator 2	Multi functional Meter with output to PMS	Notes 1- 4	EM026	
Tenants Supplies							
Rising Busbar 1		TA1/L	Tenants Board	Multi functional Meter with output to PMS	Notes 1-4	EM027	
Rising Busbar 1		TA1/P	Tenants Board	Multi functional Meter with output to PMS	Notes 1-4	EM028	
Rising Busbar 1		TA2/L	Tenants Board	Multi functional Meter with output to PMS	Notes 1-4	EM029	
Rising Busbar 1		TA2/P	Tenants Board	Multi functional Meter with output to PMS	Notes 1-4	EM030	
Rising Busbar 1		TA3/L	Tenants Board	Multi functional Meter with output to PMS	Notes 1-4	EM031	
Rising Busbar 1		TA3/P	Tenants Board	Multi functional Meter with output to PMS	Notes 1-4	EM032	
Rising Busbar 1		TA4/L	Tenants Board	Multi functional Meter with output to PMS	Notes 1-4	EM033	
Rising Busbar 1		TA4/P	Tenants Board	Multi functional Meter with output to PMS	Notes 1-4	EM034	
Rising Busbar 1		TA5/L	Tenants Board	Multi functional Meter with output to PMS	Notes 1-4	EM035	
Rising Busbar 1		TA5/P	Tenants Board	Multi functional Meter with output to PMS	Notes 1-4	EM036	
Rising Busbar 1		TA6/L	Tenants Board	Multi functional Meter with output to PMS	Notes 1-4	EM037	
Rising Busbar 1		TA6/P	Tenants Board	Multi functional Meter with output to PMS	Notes 1-4	EM038	
Rising Busbar 1		TA7/L	Tenants Board	Multi functional Meter with output to PMS	Notes 1-4	EM039	
Rising Busbar 1		TA7/P	Tenants Board	Multi functional Meter with output to PMS	Notes 1-4	EM040	
Rising Busbar 1		TA8/L	Tenants Board	Multi functional Meter with output to PMS	Notes 1-4	EM041	
Rising Busbar 1		TA8/P	Tenants Board	Multi functional Meter with output to PMS	Notes 1-4	EM042	

Cable Ref:	Conection Point	Connected From	Connected To	Meter / Function	Notes	Meter Ref No	Other BMS reqd outputs
Tenants Supplies							
Rising Busbar 2		TB1/L	Tenants Board	Multi functional Meter w ith output to PMS	Notes 1-4	EM043	
Rising Busbar 2		TB1/P	Tenants Board	Multi functional Meter w ith output to PMS	Notes 1-4	EM044	
Rising Busbar 2		TB2/L	Tenants Board	Multi functional Meter w ith output to PMS	Notes 1-4	EM045	
Rising Busbar 2		TB2/P	Tenants Board	Multi functional Meter w ith output to PMS	Notes 1-4	EM046	
Rising Busbar 2		TB3/L	Tenants Board	Multi functional Meter w ith output to PMS	Notes 1-4	EM047	
Rising Busbar 2		TB3/P	Tenants Board	Multi functional Meter w ith output to PMS	Notes 1-4	EM048	
Rising Busbar 2		TB4/L	Tenants Board	Multi functional Meter w ith output to PMS	Notes 1-4	EM049	
Rising Busbar 2		TB4/P	Tenants Board	Multi functional Meter w ith output to PMS	Notes 1-4	EM050	
Rising Busbar 2		TB5/L	Tenants Board	Multi functional Meter w ith output to PMS	Notes 1-4	EM051	
Rising Busbar 2		TB5/P	Tenants Board	Multi functional Meter w ith output to PMS	Notes 1-4	EM052	
Rising Busbar 2		TB6/L	Tenants Board	Multi functional Meter w ith output to PMS	Notes 1-4	EM053	
Rising Busbar 2		TB6/P	Tenants Board	Multi functional Meter w ith output to PMS	Notes 1-4	EM054	
Rising Busbar 2		TB7/L	Tenants Board	Multi functional Meter w ith output to PMS	Notes 1-4	EM055	
Rising Busbar 2		TB7/P	Tenants Board	Multi functional Meter w ith output to PMS	Notes 1-4	EM056	
Rising Busbar 2		TB8/L	Tenants Board	Multi functional Meter w ith output to PMS	Notes 1-4	EM057	
Rising Busbar 2		TB8/P	Tenants Board	Multi functional Meter w ith output to PMS	Notes 1-4	EM058	

	Accessories/ item	M. Ht (mm)	Sheet 1
Lighting	General Lighting switches	1150	
	General Lighting switches in plant areas	1150	
	Multi gang lighting Switches	1150	
	D.P Switches	1150	
	Hand-lamp transformer units	1150	
	Bracket lighting points (general)	2000 (min)	
	Medical room inspection lamp	1500	
	Exit Luminaire	above Door	
Small Power	Socket outlets (general)	500	
	Socket outlets above worktops	1150	
	Socket outlets below worktops	500	
	Socket outlets (plantroom areas)	1150	
	Socket outlets (car park areas)	500	
	Flex outlet plates (general)	500	
	Switch connection unit (hand dryers)	200mm below ceiling	
	Switched connection unit (general)	1150	
	Shaver sockets	1150	
	Dado trunking	1000 (approx)	
	Skirting trunking	-	
	Hand Drier	1100 to U/S	
	Thermostat	1350 (TBC)	
Distribution	Main / Sub -main Distribution boards	1500	
	Switch Disconnectors/Isolators	1350	
	Isolators	1350	
	Meters	1000	
	REC Service Head	500 to U/S	
	H.V Knock Off Button- EPO	1350	
Fire Alarms	Fire Alarm Panel	1500	
	Fire Alarm Panel- Repeater / Mimic	1500	
	Fire alarm BGU	1150	
	Fire alarm sounders	2300	or 200mm below ceiling
	Fire alarm detectors	Soffit mounted	
	Xenon Beacon	2300	or 200mm below ceiling
	Lamp Buzzer Units	1500 or on desk	
	Beam Detectors	TBA	
	Smoke Vent BGU Yellow	1150	
	Door Release Unit - DRU	200	
	Firemans Override Unit- Internal	1500	
	Firemans Override Unit- External	2500	
Tele/Data	Telephone/data outlets (general)	500	
	Telephone/data outlets (plantroom area)	1150	
	Pay Phone	1150	
	Clocks	2400	or 200mm below ceiling
Radio T.V.	T.V Aerial outlet	500	
	Aerial	roof mounted	
Disabled Alarm	Panic Strip	500	
	Reassurance / Reset Unit	1150	
	Overdoor visual & audible Alarm	above Door	

	Indicator Panel	1500	
	Refuge Alarm Station	1150	
	Refuge Alarm Indicator Panel	1500	

	Accessories/ item	**M. Ht (mm)**	Sheet 2
Heating	Fan Heater	2300	
	Tubular Heater	300	
Access Control	Card Reader / swipe	1150	
	PSU	H/L	
	Door release	1150	
	Intercomm call Unit	1150	
	Interface Unit	H/L	
Intruder Alarm	Indicator Panel	1500	
	Movement Detector	2300	
	Door Contact	Head Of Door	
	External Sounder	3000 approx	
	Key Pad (entry/exit)	1150	
CCTV System	Camera Fixed- Internal	3000	
	PTZ - Internal	3000	
	Camera Fixed- External	4000	
	PTZ - External	4000	
	Main Console	Desk Mounted	
Public Address	Recessed Speaker	Ceiling Mounted	
	Surface Speaker Wall	2300	or 200mm below ceiling
	Recessed Speaker- Wall	2300	or 200mm below ceiling
	Horn Type	2300	or 200mm below ceiling
	Main Console	Desk Mounted	
Miscellaneous	Urinal Outlets-Water Saver	2300	
	Emergency Stop Button	1350	
	Earthing Connection Outlets	300	
	Lightning Protection Test Clamp	300	

Notes

Heights are to centre unless stated otherwise.

In designated disabled rooms /areas special consideration will apply.

Adjacent electrical accessories shall be aligned both horizontally and vertically to provide an acceptable visual appearance.

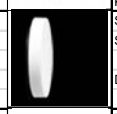
Distribution Switch-gear - No operating handle, fuse or other protective device shall be located more than 2000mm or less than 300mm above finished floor level.

For Hand Dryers See standard Detail Sheet

Ref		Location	Use/ Function	
MCCP 1		Upper Basement	Shutdown Plant	
MCCP 2		Upper Basement	Shutdown Plant	
MCCP 3		Upper Basement	Shutdown Plant	
MCCP 4		Upper Basement	Shutdown Plant	
MCCP 5		8th Floor	Shutdown Plant	
Gas Valve		Upper Basement	Shutdown valve	
Lift LF1	Life Safety	8th Floor	Ground Lift	Open doors
Lift LP1		8th Floor	Ground Lift	Open doors
Lift LP2		8th Floor	Ground Lift	Open doors
LUL Disabled Lift		Ground Floor	Ground Lift	Open doors
Escalator 1		Ground Floor	Initiates Shutdown	
Escalator 2		Ground Floor	Initiates Shutdown	
Fire Fighting Lift Entrance		Fire Curtain	Initiates activation	
		Required at each level - 8 No		
Entrance Doors		Ground Floor	Fail Open	
Security Barriers		Ground Floor Reception	Fail Open	
Retail 1+ store rooms		Ground Floor	Initiates Alarm on retail panels	
Retail 1+ store rooms		Ground Floor	Initiates Alarm on retail panels	
Basement BO		Basement Control Room	Initiates indication of Alarm Status	
Fire Alarm Panel		Fire Control Room	Main alarm/fault indicating panel. Reset function	
Access Control System		Ground Floor Reception	Initiates Shutdown of Equipment	
			1 No interface located at each door	
Smoke Extract Panel		Fire Control Room	Initiates Alarm Signal	
Auto Dial		Fire Control Room	Red Care Dial out	
Disabled Refuge Panel		Fire Control Room	Activates Panel	
Main Sprinkler Panel		Fire Control Room	Initiates Alarm Signal	
Sprinkler Valve Set		Sprinkler Intake	Initiates alarm	
	Zone valves	Basement 1	2 No	See Note 1
		Basement 2	2 No	See Note 1
		Retail Unit 1	2 No	See Note 1
		Retail Unit 2	2 No	See Note 1
		Ground Floor	2 No	See Note 1
		1st Floor	2 No	See Note 1
		2nd Floor	2 No	See Note 1
		3rd Floor	2 No	See Note 1
		4th Floor	2 No	See Note 1
		5th Floor	2 No	See Note 1
		6th Floor	2 No	See Note 1
		7th Floor	2 No	See Note 1
		8th Floor	2 No	See Note 1

Note 1	Each Interface Unit have 2 No Inputs to the Following Events	
	1	Flow Switch Activation
	2	Valve-Open/Shut (manual Activation)
	Interface Units to be Located in the landlords Sprinkler Pipework Riser	

Ref		Description	Manufacturer	Type / Cat No	Lamp / Colour	Notes
A		Chilled Beam lighting			4 x 21 w att seamless	
		Office Area	SAS	SAS ISM	4 x 28 w att seamless	High Frequency
AE			TROX	TROX Chilled Beam	White	
		Dims :2100 x 850			C.Temp : 4000° K	Polycarbonate
		AE = 3 hr emergency				Opal Diffuser TPa rated
B		Linear recessed fluorescent (OFFICE LIGHTING)				
		Office Area	Luxonic	Xtra lux flat panel linear	fluorescent	High Frequency
BE		Layin Ceiling grid			White	
		Dims : 1500 x 300			C.Temp : 4000° K	
		BE = 3 hr emergency			1 x 35w att linear	Opal Diffuser TPa rated
C		Toilet vanity Linear light	Thorn	Arrow slim	fluorescent	High Frequency
					White	
		Toliets			C.Temp : 4000° K	
					1 x 21 w att linear	Linear Fluorescent
D		Circular recessed dow nlighter version	DAL	DAL minitempo	1 x18 w att compact	Low height version
		Toilet Recessed dow nlighter/Staircase Lobby areas			fluorescent	148 mm
DE		Dims : 160 Ø			Fine trim	
		Cut -out :145 Ø			C.Temp : 4000° K	
		DE = 3 hr emergency				
G		Wall mounted 200w flood light	Cooper	Cooper lighting MX1W	2 x 100w halogen	Tungsten
		Future Tenants Area (Temporary)				Halogen
					White	
H		Wall/Column mounted Outdoor luminaire	Thorn	Thorn Piazza II	1 x 42 w att compact	IP65 Rated
		Rooftop Plant area				
HE						Integrated self test
						Emergency
		HE = 3 hr emergency			C.Temp : 4000° K	
J		Cylindrical Dow nlighter Recessed mounted	Iguzzini	Iguzzini Reflex	1 x 70 w att	Metal Halide
		Ground floor reception			HIT	

Ref		Description	Manufacturer	Type / Cat No	Lamp / Colour	Notes
K		External/internal Lighting pendant	Litex	Suspended pendant	1 x 20 w att	Metal Halide
		Surface Mounted /External internal			HIT	
KE		Colonade				
		Dims upto 2500 x 230				
		KE = 3 hr emergency				
L		Surface mounted Circular Bulkhead (Emergency)	Litex	Circular Bulkhead	2 x 38 w att TC-D	High Frequency
		Staircase Lighting			White	
					C.Temp : 4000° K	
		Dims : 450 x 100				
M		Tw in linear fluorescent (Corrosion resistant)	Luxonic	Luxonic corrosion resistant	2 x 35w T5	High Frequency
		Plant rooms	Whitecroft	Whitecrift ACF	White	
ME					C.Temp : 4000° K	
		ME = 3 hr emergency				
N		Emergency exit sign				3hr Non-Maintained
		Exit doors				Emergency
			Whitecroft	Whitecroft EX1	3 x 1w att LED	
Q		Tw in spot emergency w all mounted fitting	Channel	Channel Lighting (Maxi Flood)	2 x 20w att	Halogen Lamps
		Futre Tenants Area				3hr Emergency
R		Reception Gimble Lighting	Compact	Tw in Gimble	2 x 35w CDM-T	CDM T
					White	
		Rotational and Angled lighting			C.Temp : 4000° K	
		Narrow beam			840 lamp	
S		Recessed IP rated dow nlight	Whitecroft	Whitecroft lighting	1 x 26w Dow nlighter	IP rated ,3hr Emergency
		Show ers		Circo IP65	White	
					C.Temp : 4000° K	

Ref		Description	Manufacturer	Type / Cat No	Lamp / Colour	Notes
T		Tenants Balcony	Bega	Bega 2277	1 x 20 w att	Metal Halide
					HIT	
		Directional Fixed Beam Lighting				70 degree beam
W		Wall Mounted Bulkhead (Emergency)	Channel	Channel Illustrious	1 x 28w 2D Lamp	3 hour maintained
		Large riser Ground floor				sw itchable
XE		GAS Intake Room	Thorlux	Flameproof	1 35w T% lamp	3 hour maintained
						sw itchable
		Zone 1 (Flame Retardent Light)			C Temp 3000k	

Reference : DB LP/LB

Location :Landlords Electrical Switchroom
Serving :Lower Basement Landlords area

Board Rating : 100 A
Board Size : 12 way
Phase: TP &N

Incoming Cable Reference : SMALL POWER DB
Cable Size :35mm SWA LSF

Way	Line	In	Ib	Type Note 3 P	Load (watts) L1	L2	L3	Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
	L1	20		P1	500			Door Controller (Main exit route)	4	T1	42
1	L2	20		P1		500		Door Controller (Stairs)	4	T1	42
	L3	32						Spare			
	L1	20		P1	500			PTZ CCTV camera(External)	4	T1	42
2	L2	32		P2		1500		Hand Dryer	4	T1	42
	L3	32		P2			1500	Cleaners sockets	4	T1	42
	L1	20		P1	1000			BMS supply	4	T1	42
3	L2	20		P2		1500		Double switched socket outlets (Plant)	4	T1	42
	L3	32		P2			1500	Double switched socket outlets (Plant)	4	T1	42
	L1	20		P2	1500			Cleaners sockets	4	T1	42
4	L2	20		P2		1500		Cleaners sockets	4	T1	42
	L3	20		P2			1500	Cleaners sockets	4	T1	42
	L1	32		P2	1500			Double switched sockets outlets (Plant)	4	T1	42
5	L2	32		P2		500		Heat Maintenance tape	4	T1	42
	L3	20		P1			500	PTZ CCTV camera(Corridor)	4	T1	42
	L1	20		P1	300			Water sensor	4	T1	42
6	L2										
	L3										
	L1										
7	L2										
	L3										
	L1										
8	L2										
	L3										
	L1										
9	L2										
	L3										
	L1										
10	L2										
	L3										
	L1										
11	L2										
	L3										
	L1										
12	L2										
	L3										
		Total Phase			5300	5500	5000	Watts			
		Loading			23	23.9	21.7	Amps			

Notes

1 Fitted with Integral Incoming Switch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse with separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference :	DB/LL/LB-2			Location :	BASEMENT LV SWITCH ROOM						
				Serving :	LOWER BASEMENT LANDLORDS LIGHTING						
Board Rating :	100 A										
Board Size :	12 way			Incoming Cable		Reference :					
Phase:	TP &N					Cable Size :	35MM 4 CORE SWA				

				Type Note 3	Load (watts)			Serving	Cable c.s.a (mm^2)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	10		P1	210			LV SWITCHROOM	2.5	T1	42
1	L2	10		P1		210		LV SWITCHROOM	2.5	T1	42
	L3	10		P1			140	METEROPOLITAIN SWITCH ROOM	2.5	T1	42
	L1	10		P1	70			COMMS ROOM	2.5	T1	42
2	L2	10		P1		70		LIFE SAFETY ROOM	2.5	T1	42
	L3	10		P1			140	BASEMENT CORRIDOR	2.5	T1	42
	L1	10		P1	315			BASEMENT CORRIDOR	2.5	T1	42
3	L2	10		P1		280		REFUSE AREA	2.5	T1	42
	L3	10		P1			104	STAIRCASE LOBBY	2.5	T1	42
	L1	10		P1	280			AHU PLANTROOM	2.5	T1	42
4	L2	10		P1		295		AHU PLANTROOM	2.5	T1	42
	L3	10		P1			280	BASEMENT CORRIDOR	2.5	T1	42
	L1	10		P1				SPARE	2.5	T1	42
5	L2	10		P1		210		WATER STORAGE TANKS	2.5	T1	42
	L3	10		P1			175	EXTRACT ROOM	2.5	T1	42
	L1	10		P1				SPARE	2.5	T1	42
6	L2	10		P1		140		LIFT LOBBY STORE ROOM AREA	2.5	T1	42
	L3	10		P1			175	LIFT LOBBY	2.5	T1	42
	L1	10		P1	105			BASEMENT EXTRACT SUPPLY	2.5	T1	42
7	L2	10		P1		315		EXTERNAL LIGHTING	2.5	T1	42
	L3	10		P1			78	STAIRCASE LOBBY	2.5	T1	42
	L1	10		P1	64			STAIRCASE LTG	2.5	T1	42
8	L2	10		P1		64		STAIRCASE LTG	2.5	T1	42
	L3	10		P1			64	STAIRCASE LTG	2.5	T1	42
	L1	10		P1	208			LUL BULKHEAD	2.5	T1	42
9	L2	10		P1		208		LUL BULKHEAD	2.5	T1	42
	L3	10		P1			200	BREAKOUT CORRIDOR	2.5	T1	42
	L1										
10	L2										
	L3										
	L1										
11	L2										
	L3										
	L1										
12	L2										
	L3										
		Total Phase			1252	1792	1356	Watts			
		Loading			5.44	7.79	5.9	Amps			

Notes

1 Fitted with Integral Incoming Switch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse with separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference :	DB/LL/UB-2	Location :	UPPER BASEMENT SERVICES RISER
		Serving :	UPPER BASEMENT LANDLORDS LIGHTING
Board Rating :	100 A		
Board Size :	12 way	Incoming Cable	Reference :
Phase:	TP &N		Cable Size : 35MM 4 CORE SWA

				Type Note 3	Load (watts)			Serving	Cable c.s.a (mm^2)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	10		P1	515			TENANTS FUTURE AREA	2.5	T1	42
1	L2	10		P1		280		BASEMENT CORRIDOR	2.5	T1	42
	L3	10		P1			183	SHOWERS SOUTH CORE	2.5	T1	42
	L1	10		P1	105			RAINWATER HARVESTING ROOM	2.5	T1	42
2	L2	10		P1		240		OFFICE AREA /BACK ROOM	2.5	T1	42
	L3	10		P1			105	RECECPTION AHU PLANTROOM	2.5	T1	42
	L1	10		P1	315			BASEMENT CORRIDOR	2.5	T1	42
3	L2	10		P1		130		STAIRCASE LOBBY	2.5	T1	42
	L3	10		P1			104	BASEMENT CORRIDOR	2.5	T1	42
	L1	10		P1	210			LTHW PLANT ROOM	2.5	T1	42
4	L2	10		P1		140		GAS WATER AND COMMS	2.5	T1	42
	L3	10		P1			105	FUTURE TENANTS SPACE	2.5	T1	42
	L1	10		P1	183			SHOWERS NORTH CORE	2.5	T1	42
5	L2	10		P1		130		STAIRCASE LOBBY	2.5	T1	42
	L3	10		P1			175	EXTRACT ROOM	2.5	T1	42
	L1	10		P1	1200			LUL ESCALATORS	2.5	T1	42
6	L2	10		P1		1200		LUL ESCALATORS	2.5	T1	42
	L3	10		P1			175	LIFT LOBBY	2.5	T1	42
	L1	10		P1	105			BASEMENT EXTRACT SUPPLY	2.5	T1	42
7	L2	10		P1				SPARE	2.5	T1	42
	L3	10		P1			64	STAIRCASE LTG	2.5	T1	42
	L1	10		P1	64			STAIRCASE LTG	2.5	T1	42
8	L2	10		P1		64		STAIRCASE LTG	2.5	T1	42
	L3	10		P1			64	STAIRCASE LTG	2.5	T1	42
	L1										
9	L2										
	L3										
	L1										
10	L2										
	L3										
	L1										
11	L2										
	L3										
	L1										
12	L2										
	L3										
		Total Phase			2697	2184	975	Watts			
		Loading			11.7	9.5	4.24	Amps			

Notes

1 Fitted with Integral Incoming Switch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse with separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Board Rating : 100 A
Board Size : 12 way Incoming Cable Reference : SMALL POWER DB
Phase: TP &N Cable Size :35mm SWA LSF

Way	Line	In	Ib	Type Note 3 P	Load (watts) L1	L2	L3	Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
	L1	20		P1	500			Door Controller (Showers)	4	T1	42
1	L2	20		P1		500		Door Controller (Stairs)	4	T1	42
	L3	32		P2			1500	Cleaners sockets	4	T1	42
	L1	20		P1	500			Door Controller (Stairs)	4	T1	42
2	L2	32		P2		1500		Cleaners sockets	4	T1	42
	L3	32		P2			1500	Cleaners sockets	4	T1	42
	L1	20		P1	300			Water sensor	4	T1	42
3	L2	20		P1		300		Water sensor	4	T1	42
	L3	32		P2			1500	Cleaners socket	4	T1	42
	L1	20		P2	1500			Hand Dryer	4	T1	42
4	L2	20		P1		500		BMS Outlet	4	T1	42
	L3	20		P2			1500	Hand Dryer	4	T1	42
	L1	32		P2	1500			Double switched sockets outlets (Plant)	4	T1	42
5	L2	32		P2		1500		Cleaners sockets	4	T1	42
	L3	20		P1			500	Door Controller (Showers)	4	T1	42
	L1	20		P1	500			PTZ CCTV camera	4	T1	42
6	L2	20		P1		500		Heat Maintenance tape	4	T1	42
	L3	20		P1			500	Heat Maintenance tape	4	T1	42
	L1										
7	L2										
	L3										
	L1										
8	L2										
	L3										
	L1										
9	L2										
	L3										
	L1										
10	L2										
	L3										
	L1										
11	L2										
	L3										
	L1										
12	L2										
	L3										
	Total Phase				4800	4800	7000	Watts			
	Loading				20.9	20.9	30.4	Amps			

Notes

1 Fitted with Integral Incoming Switch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse with separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference :	DB/LL/G 2	Location :	GROUND FLOOR SERVICES RISER
		Serving :	GROUND FLOOR INTERNAL LIGHTING
Board Rating :	100 A		
Board Size :	8 way	Incoming Cable	Reference :
Phase:	TP &N		Cable Size : 35MM 4 CORE SWA

Way	Line	In	Ib	Type Note 3 P	Load (watts) L1	L2	L3	Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
	L1	10		P1				SPARE			
1	L2	10		P1				SPARE			
	L3	10		P1			119	STAIRCASE LOBBY	2.5	T1	42
	L1	10		P1	32			SERVICE RISER GF	2.5	T1	42
2	L2	10		P1		145		STAIRCASE LOBBY	2.5	T1	42
	L3	10		P1			32	SUPPLY AND EXTRACT RISER GF	2.5	T1	42
	L1	10		P1				SPARE	2.5	T1	42
3	L2	10		P1				SPARE	2.5	T1	42
	L3	10		P1			1420	ESCALATOR LIGHTING	2.5	T1	42
	L1	10		P1	680			TENANTS FUTURE RETAIL	2.5	T1	42
4	L2	10		P1		240		TENANTS FUTURE RETAIL	2.5	T1	42
	L3	10		P1				SPARE	2.5	T1	42
	L1	10		P1	140			RECEPTION LIGHTING CIRCUIT 1	2.5	T1	42
5	L2	10		P1		350		RECEPTION LIGHTING CIRCUIT 2	2.5	T1	42
	L3	10		P1			350	RECEPTION LIGHTING CIRCUIT 3	2.5	T1	42
	L1	10		P1	280			RECEPTION LIGHTING CIRCUIT 4	2.5	T1	42
6	L2	10		P1							
	L3	10		P1							
	L1	10		P1							
7	L2	10		P1							
	L3	10		P1							
	L1	10		P1							
8	L2	10		P1							
	L3	10		P1							
		Total Phase			1132	735	1921	Watts			
		Loading			4.92	3.2	8.35	Amps			

Notes

1 Fitted with Integral Incoming Switch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse with separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference : DB LP/G

Location :Landlords electrical riser cupboard
Serving :Ground floor Landlords area

Board Rating : 100 A
Board Size : 8 w ay
Phase: TP &N

Incoming Cable Reference : SMALL POWER DB
Cable Size :35mm SWA LSF

Way	Line	In	Ib	Type Note 3 P	Load (watts) L1	L2	L3	Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
	L1	32		P2	1500			Cleaners sockets	4	T1	42
1	L2	20		P1		500		low level trench heater	4	T1	42
	L3	20		P1			500	low level trench heater	4	T1	42
	L1	20		P1	300			Door controller	4	T1	42
2	L2	20		P1		1000		Reception security barriers	4	T1	42
	L3	32		P2			1000	Floor boxes(Reception Desk)	4	T1	42
	L1	20		P1	500			Access gate reception	4	T1	42
3	L2	20		P1		300		Reception Desk lighting	4	T1	42
	L3	20		P1			1000	Reception security barriers	4	T1	42
	L1	20		P1	500			low level trench heater	4	T1	42
4	L2	20		P1		500		low level trench heater	4	T1	42
	L3	20		P1			500	Fire alarm mimic panel	4	T1	42
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	L1										
7	L2										
	L3										
	L1										
8	L2										
	L3										
		Total Phase			2800	2300	3000	Watts			
		Loading			12.2	10	13	Amps			

Notes

1 Fitted w ith Integral Incoming Sw itch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse w ith separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference :	DB/EXT 1	Location :	GROUND FLOOR SERVICES RISER
		Serving :	EXTERNAL LIGHTING
Board Rating :	63 A		
Board Size :	4 way	Incoming Cable	Reference :
Phase:	TP &N		Cable Size : 35MM 4 CORE SWA

Way	Line	In	Ib	Type Note 3 P	Load (watts) L1	L2	L3	Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
	L1	10		P1	249			EXTERNAL LIGHTING NORTH FACE	2.5	T1	42
1	L2	10		P1		143		EXTERNAL LIGHTING NORTH/EAST FACE	2.5	T1	42
	L3	10		P1			143	EXTERNAL LIGHTING NORTH/WEST FACE	2.5	T1	42
	L1	10		P1	143			EXTERNAL LIGHTING SOUTH/EAST FACE	2.5	T1	42
2	L2	10		P1		143		EXTERNAL LIGHTING SOUTH FACE	2.5	T1	42
	L3	10		P1			143	EXTERNAL LIGHTING SOUTH/WEST FACE	2.5	T1	42
	L1										
3	L2										
	L3										
	L1										
4	L2										
	L3										
	Total Phase				392	286	286	Watts			
	Loading				1.7	1.24	1.24	Amps			

Notes

1 Fitted with Integral Incoming Switch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse with separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference : DB Fire fighters F1 Location :Ground floor Riser North core
Serving : Fire fighting core area

Board Rating : 100 A
Board Size : 8 way Incoming Cable Reference : SMALL POWER DB
Phase: TP &N Cable Size :35mm SWA LSF

Way	Line	In	Ib	Type Note 3 P	Load (watts) L1	L2	L3	Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
	L1	32		P2	1500			Cleaners sockets	4	T1	42
1	L2	32		P2		1500		Cleaners sockets	4	T1	42
	L3	10		P1			400	Lower basement- Ground lighting lobby	2.5	T1	42
	L1	10		P1	400			First- Fourth floor lighting lobby	2.5	T1	42
2	L2	10		P1		400		Fifth - Eighth floor lighting lobby	2.5	T1	42
	L3	10		P1			400	Lower basement - ground stairs lighting	2.5	T1	42
	L1	10		P1	400			Fire fighting stairs lighting	2.5	T1	42
3	L2	10		P1		400		Fire fighting stairs lighting	2.5	T1	42
	L3	32		P1			1000	Fire Lift Curtain 1st -4th floor	4	T1	42
	L1	32		P1	1000			Fire Lift Curtain 5th -8th floor	4	T1	42
4	L2	10		P1		400		Fire fighting stairs lighting	2.5	T1	42
	L3	10		P1			400	Fire fighting stairs lighting	2.5	T1	42
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	L1										
7	L2										
	L3										
	L1										
8	L2										
	L3										
	Total Phase				3300	2700	2200	Watts			
	Loading				14.3	11.7	9.57	Amps			

Notes

1 Fitted with Integral Incoming Switch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse with separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference :	DB/TA1/L	Location :	FIRST FLOOR TENANTS SERVICES RISER
		Serving :	FIRST FLOOR TENANTS A LIGHTING LIGHTING
Board Rating :	100 A		
Board Size :	6 way	Incoming Cable	Reference : FOO2
Phase:	TP &N		Cable Size : 35MM 4 CORE SWA

				Type Note 3	Load (watts)			Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
1	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
2	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
3	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	BULKHEAD LIGHTING	2.5	T1	31
	L1	10		P1	80			BALCONY LIGHTING	2.5	T1	31
4	L2	32		P1		500		FUSED CONECTION UNIT CHILLED BEAMS 4.0	4	T1	31
	L3	32		P1			500	FUSED CONECTION UNIT CHILLED BEAMS 4.0	4	T1	31
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	Total Phase				890	1310	1310	Watts			
	Loading				3.87	5.7	5.7	Amps			

Notes

1 Fitted with Integral Incoming Switch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse with separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference : DB TPA/1 — Location :Tenants electrical riser cupboard

Serving :Tenants A 1st Small pow er

Board Rating : 100 A

Board Size : 8 w ay — Incoming Cable — Reference : FOO2

Phase: TP &N — Cable Size :35mm SWA LSF

				Type Note 3	Load (w atts)			Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	32		P1				Spare	4	T1	42
1	L2	32		P2		1500		Cleaners sockets	4	T1	42
	L3	32		P2			1500	External balcony socket	4	T1	42
	L1	20		P1				Spare	4	T1	42
2	L2	20		P1				Spare	4	T1	42
	L3										
	L1										
3	L2										
	L3										
	L1										
4	L2										
	L3										
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	L1										
7	L2										
	L3										
	L1										
8	L2										
	L3										
		Total Phase			0	1500	1500	Watts			
		Loading			0	6.52	6.52	Amps			

Notes

1 Fitted w ith Integral Incoming Sw itch

2 Cable Types-Legend

- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device

- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse w ith separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference :	DB/TA2/L			Location :	Second FLOOR TENANTS SERVICES RISER						
				Serving :	Second FLOOR TENANTS A LIGHTING LIGHTING						
Board Rating :	100 A										
Board Size :	6 way			Incoming Cable		Reference : FOO2					
Phase:	TP &N					Cable Size :	35MM 4 CORE SWA				
				Type Note 3	Load (watts)			Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
1	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
2	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
3	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	BULKHEAD LIGHTING	2.5	T1	31
	L1	10		P1	80			BALCONY LIGHTING	2.5	T1	31
4	L2	32		P1		500		FUSED CONECTION UNIT CHILLED BEAMS 4.0	4	T1	31
	L3	32		P1			500	FUSED CONECTION UNIT CHILLED BEAMS 4.0	4	T1	31
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	Total Phase				890	1310	1310	Watts			
	Loading				3.87	5.7	5.7	Amps			

Notes

1 Fitted with Integral Incoming Switch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse with separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference :	DB/TA3/L	Location :	THIRD FLOOR TENANTS SERVICES RISER
		Serving :	THIRD FLOOR TENANTS A LIGHTING LIGHTING
Board Rating :	100 A		
Board Size :	6 way	Incoming Cable	Reference : FOO2
Phase:	TP &N		Cable Size : 35MM 4 CORE SWA

				Type Note 3	Load (watts)			Serving	Cable c.s.a (mm^2)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
1	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
2	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
3	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	BULKHEAD LIGHTING	2.5	T1	31
	L1	10		P1	80			BALCONY LIGHTING	2.5	T1	31
4	L2	32		P1		500		FUSED CONECTION UNIT CHILLED BEAMS 4.0	4	T1	31
	L3	32		P1			500	FUSED CONECTION UNIT CHILLED BEAMS 4.0	4	T1	31
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	Total Phase				890	1310	1310	Watts			
	Loading				3.87	5.7	5.7	Amps			

Notes

1 Fitted with Integral Incoming Switch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse with separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference :	DB/TA4/L			Location :	FOURTH FLOOR TENANTS SERVICES RISER		
				Serving :	FOURTH FLOOR TENANTS A LIGHTING LIGHTING		
Board Rating :	100 A						
Board Size :	6 way			Incoming Cable	Reference : FOO2		
Phase:	TP &N				Cable Size : 35MM 4 CORE SWA		

				Type Note 3	Load (watts)			Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
1	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
2	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
3	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	BULKHEAD LIGHTING	2.5	T1	31
	L1	10		P1	80			BALCONY LIGHTING	2.5	T1	31
4	L2	32		P1		500		FUSED CONECTION UNIT CHILLED BEAMS 4.0	4	T1	31
	L3	32		P1			500	FUSED CONECTION UNIT CHILLED BEAMS 4.0	4	T1	31
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	Total Phase				890	1310	1310	Watts			
	Loading				3.87	5.7	5.7	Amps			

Notes

1 Fitted with Integral Incoming Switch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse with separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference :	DB/TA5/L	Location :	FIFTH FLOOR TENANTS SERVICES RISER
		Serving :	FIFTH FLOOR TENANTS A LIGHTING LIGHTING
Board Rating :	100 A		
Board Size :	6 way	Incoming Cable	Reference : FOO2
Phase:	TP &N		Cable Size : 35MM 4 CORE SWA

				Type Note 3	Load (watts)			Serving	Cable c.s.a (mm^2)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
1	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
2	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
3	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	BULKHEAD LIGHTING	2.5	T1	31
	L1	10		P1	80			BALCONY LIGHTING	2.5	T1	31
4	L2	32		P1		500		FUSED CONECTION UNIT CHILLED BEAMS 4.0	4	T1	31
	L3	32		P1			500	FUSED CONECTION UNIT CHILLED BEAMS 4.0	4	T1	31
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	Total Phase				890	1310	1310	Watts			
	Loading				3.87	5.7	5.7	Amps			

Notes

1 Fitted with Integral Incoming Switch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse with separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference :	DB/TA6/L			Location :	SIXTH FLOOR TENANTS SERVICES RISER		
				Serving :	SIXTH FLOOR TENANTS A LIGHTING LIGHTING		
Board Rating :	100 A						
Board Size :	6 way			Incoming Cable	Reference : FOO2		
Phase:	TP &N				Cable Size : 35MM 4 CORE SWA		

				Type Note 3	Load (watts)			Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
1	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
2	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
3	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	BULKHEAD LIGHTING	2.5	T1	31
	L1	10		P1	80			BALCONY LIGHTING	2.5	T1	31
4	L2	32		P1		500		FUSED CONECTION UNIT CHILLED BEAMS 4.0	4	T1	31
	L3	32		P1			500	FUSED CONECTION UNIT CHILLED BEAMS 4.0	4	T1	31
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	Total Phase				890	1310	1310	Watts			
	Loading				3.87	5.7	5.7	Amps			

Notes

1 Fitted with Integral Incoming Switch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse with separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference :	DB/TA7/L			Location :	SEVENTH FLOOR TENANTS SERVICES RISER						
				Serving :	SEVENTH FLOOR TENANTS A LIGHTING LIGHTING						
Board Rating :	100 A										
Board Size :	6 way			Incoming Cable	Reference : FOO2						
Phase:	TP &N				Cable Size : 35MM 4 CORE SWA						
				Type Note 3	Load (watts)			Serving	Cable c.s.a (mm^2)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
1	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
2	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
3	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	BULKHEAD LIGHTING	2.5	T1	31
	L1	10		P1	80			BALCONY LIGHTING	2.5	T1	31
4	L2	32		P1		500		FUSED CONECTION UNIT CHILLED BEAMS 4.0	4	T1	31
	L3	32		P1			500	FUSED CONECTION UNIT CHILLED BEAMS 4.0	4	T1	31
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	Total Phase				890	1310	1310	Watts			
	Loading				3.87	5.7	5.7	Amps			

Notes

1 Fitted with Integral Incoming Switch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse with separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference :	DB/TA8/L	Location :	EIGHTH FLOOR TENANTS SERVICES RISER
		Serving :	EIGHTH FLOOR TENANTS A LIGHTING
Board Rating :	100 A		
Board Size :	6 way	Incoming Cable	Reference :
Phase:	TP &N		Cable Size : 35MM 4 CORE SWA

				Type Note 3	Load (watts)			Serving	Cable c.s.a (mm^2)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
1	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
2	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1				315			LIGHTING IN BULKHEAD AREA	2.5	T1	31
3	L2					80		BALCONY LIGHTING	2.5	T1	31
	L3										
	L1										
4	L2										
	L3										
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	L1										
7	L2										
	L3										
	L1										
8	L2										
	L3										
		Total Phase			855	620	540	Watts			
		Loading			3.72	2.7	2.35	Amps			

Notes

1 Fitted with Integral Incoming Switch

2 Cable Types-Legend

- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device

- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse with separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference :	DB/TB1/L	Location :	FIRST FLOOR TENANTS SERVICES RISER
		Serving :	FIRST FLOOR TENANTS B LIGHTING LIGHTING
Board Rating :	100 A		
Board Size :	6 way	Incoming Cable	Reference : FOO1
Phase:	TP &N		Cable Size : 35MM 4 CORE SWA

				Type Note 3	Load (watts)			Serving	Cable c.s.a (mm^2)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
1	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
2	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
3	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	BULKHEAD LIGHTING	2.5	T1	31
	L1	10		P1	80			BALCONY LIGHTING	2.5	T1	31
4	L2	32		P1		500		FUSED CONECTION UNIT CHILLED BEAMS	4	T1	31
	L3	32		P1			500	FUSED CONECTION UNIT CHILLED BEAMS	4	T1	31
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
		Total Phase			890	1310	1310	Watts			
		Loading			3.87	5.7	5.7	Amps			

Notes

1 Fitted with Integral Incoming Switch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse with separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference :	DB/TB2/L	Location :	SECOND FLOOR TENANTS SERVICES RISER
		Serving :	SECOND FLOOR TENANTS B LIGHTING LIGHTING
Board Rating :	100 A		
Board Size :	6 way	Incoming Cable	Reference : FOO1
Phase:	TP &N		Cable Size : 35MM 4 CORE SWA

				Type Note 3	Load (watts)			Serving	Cable c.s.a (mm^2)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
1	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
2	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
3	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	BULKHEAD LIGHTING	2.5	T1	31
	L1	10		P1	80			BALCONY LIGHTING	2.5	T1	31
4	L2	32		P1		500		FUSED CONECTION UNIT CHILLED BEAMS	4	T1	31
	L3	32		P1			500	FUSED CONECTION UNIT CHILLED BEAMS	4	T1	31
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
		Total Phase			890	1310	1310	Watts			
		Loading			3.87	5.7	5.7	Amps			

Notes

1 Fitted with Integral Incoming Switch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse with separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference :	DB/TB3/L	Location :	THIRD FLOOR TENANTS SERVICES RISER
		Serving :	THIRD FLOOR TENANTS B LIGHTING LIGHTING
Board Rating :	100 A		
Board Size :	6 way	Incoming Cable	Reference : FOO1
Phase:	TP &N		Cable Size : 35MM 4 CORE SWA

				Type Note 3	Load (watts)			Serving	Cable c.s.a (mm^2)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
1	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
2	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
3	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	BULKHEAD LIGHTING	2.5	T1	31
	L1	10		P1	80			BALCONY LIGHTING	2.5	T1	31
4	L2	32		P1		500		FUSED CONECTION UNIT CHILLED BEAMS	4	T1	31
	L3	32		P1			500	FUSED CONECTION UNIT CHILLED BEAMS	4	T1	31
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
		Total Phase			890	1310	1310	Watts			
		Loading			3.87	5.7	5.7	Amps			

Notes

1 Fitted with Integral Incoming Switch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse with separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference :	DB/TB4/L			Location :	FOURTH FLOOR TENANTS SERVICES RISER						
				Serving :	FOURTH FLOOR TENANTS B LIGHTING LIGHTING						
Board Rating :	100 A										
Board Size :	6 way			Incoming Cable	Reference : FOO1						
Phase:	TP &N				Cable Size : 35MM 4 CORE SWA						

				Type Note 3	Load (watts)			Serving	Cable c.s.a (mm^2)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
1	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
2	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
3	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	BULKHEAD LIGHTING	2.5	T1	31
	L1	10		P1	80			BALCONY LIGHTING	2.5	T1	31
4	L2	32		P1		500		FUSED CONECTION UNIT CHILLED BEAMS	4	T1	31
	L3	32		P1			500	FUSED CONECTION UNIT CHILLED BEAMS	4	T1	31
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	Total Phase				890	1310	1310	Watts			
	Loading				3.87	5.7	5.7	Amps			

Notes

1 Fitted with Integral Incoming Switch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse with separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference :	DB/TB5/L	Location :	FIFTH FLOOR TENANTS SERVICES RISER
		Serving :	FIFTH FLOOR TENANTS B LIGHTING LIGHTING
Board Rating :	100 A		
Board Size :	6 way	Incoming Cable	Reference : FOO1
Phase:	TP &N		Cable Size : 35MM 4 CORE SWA

				Type Note 3	Load (watts)			Serving	Cable c.s.a (mm^2)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
1	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
2	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
3	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	BULKHEAD LIGHTING	2.5	T1	31
	L1	10		P1	80			BALCONY LIGHTING	2.5	T1	31
4	L2	32		P1		500		FUSED CONECTION UNIT CHILLED BEAMS	4	T1	31
	L3	32		P1			500	FUSED CONECTION UNIT CHILLED BEAMS	4	T1	31
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
		Total Phase			890	1310	1310	Watts			
		Loading			3.87	5.7	5.7	Amps			

Notes

1 Fitted with Integral Incoming Switch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse with separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference :	DB/TB6/L	Location :	SIXTH FLOOR TENANTS SERVICES RISER
		Serving :	SIXTH FLOOR TENANTS B LIGHTING LIGHTING
Board Rating :	100 A		
Board Size :	6 way	Incoming Cable	Reference : FOO1
Phase:	TP &N		Cable Size : 35MM 4 CORE SWA

				Type Note 3	Load (watts)			Serving	Cable c.s.a (mm^2)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
1	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
2	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
3	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	BULKHEAD LIGHTING	2.5	T1	31
	L1	10		P1	80			BALCONY LIGHTING	2.5	T1	31
4	L2	32		P1		500		FUSED CONECTION UNIT CHILLED BEAMS	4	T1	31
	L3	32		P1			500	FUSED CONECTION UNIT CHILLED BEAMS	4	T1	31
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
		Total Phase			890	1310	1310	Watts			
		Loading			3.87	5.7	5.7	Amps			

Notes

1 Fitted with Integral Incoming Switch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse with separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference :	DB/TB7/L	Location :	SEVENTH FLOOR TENANTS SERVICES RISER
		Serving :	SEVENTH FLOOR TENANTS B LIGHTING LIGHTING
Board Rating :	100 A		
Board Size :	6 way	Incoming Cable	Reference : FOO1
Phase:	TP &N		Cable Size : 35MM 4 CORE SWA

				Type Note 3	Load (watts)			Serving	Cable c.s.a (mm^2)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
1	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
2	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
3	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	BULKHEAD LIGHTING	2.5	T1	31
	L1	10		P1	80			BALCONY LIGHTING	2.5	T1	31
4	L2	32		P1		500		FUSED CONECTION UNIT CHILLED BEAMS	4	T1	31
	L3	32		P1			500	FUSED CONECTION UNIT CHILLED BEAMS	4	T1	31
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
		Total Phase			890	1310	1310	Watts			
		Loading			3.87	5.7	5.7	Amps			

Notes

1 Fitted with Integral Incoming Switch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse with separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference :	DB/TB8/L			Location :	EIGHTH FLOOR TENANTS SERVICES RISER		
				Serving :	EIGHTH FLOOR TENANTS B LIGHTING		
Board Rating :	100 A						
Board Size :	6 way			Incoming Cable	Reference :		
Phase:	TP &N				Cable Size :	35MM 4 CORE SWA	

				Type Note 3	Load (watts)			Serving	Cable c.s.a (mm^2)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
1	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			270	CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L1	10		P1	270			CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
2	L2	10		P1		270		CHILLED BEAM LIGHTING AND BULHEAD	2.5	T1	31
	L3	10		P1			60	BALCONY LIGHTING	2.5	T1	31
	L1										
3	L2										
	L3										
	L1										
4	L2										
	L3										
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	Total Phase				540	540	330	Watts			
	Loading				2.35	2.35	1.43	Amps			

Notes

1 Fitted with Integral Incoming Switch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse with separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference : DB TPA/1

Location :Tenants electrical riser cupboard
Serving :Tenants A 1st Small pow er

Board Rating : 100 A
Board Size : 8 w ay
Phase: TP &N

Incoming Cable
Reference : FOO2
Cable Size :35mm SWA LSF

				Type Note 3	Load (w atts)			Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	32		P1				Spare	4	T1	42
1	L2	32		P2		1500		Cleaners sockets	4	T1	42
	L3	32		P2			1500	External balcony socket	4	T1	42
	L1	20		P1				Spare	4	T1	42
2	L2	20		P1				Spare	4	T1	42
	L3										
	L1										
3	L2										
	L3										
	L1										
4	L2										
	L3										
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	L1										
7	L2										
	L3										
	L1										
8	L2										
	L3										
		Total Phase			0	1500	1500	Watts			
		Loading			0	6.52	6.52	Amps			

Notes

1 Fitted w ith Integral Incoming Sw itch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse w ith separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference : DB TPA/2 Location :Tenants electrical riser cupboard
Serving :Tenants A 2nd floor Small pow er

Board Rating : 100 A
Board Size : 8 w ay Incoming Cable Reference : FOO2
Phase: TP &N Cable Size :35mm SWA LSF

				Type Note 3	Load (w atts)			Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	32		P1				Spare	4	T1	42
1	L2	32		P2		1500		Cleaners sockets	4	T1	42
	L3	32		P2			1500	External balcony socket	4	T1	42
	L1	20		P1				Spare	4	T1	42
2	L2	20		P1				Spare	4	T1	42
	L3										
	L1										
3	L2										
	L3										
	L1										
4	L2										
	L3										
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	L1										
7	L2										
	L3										
	L1										
8	L2										
	L3										
	Total Phase				0	1500	1500	Watts			
	Loading				0	6.52	6.52	Amps			

Notes

1 Fitted w ith Integral Incoming Sw itch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse w ith separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference : DB TPA/3 Location :Tenants electrical riser cupboard
Serving :Tenants A 3rd floor Small pow er

Board Rating : 100 A
Board Size : 8 w ay Incoming Cable Reference : FOO2
Phase: TP &N Cable Size :35mm SWA LSF

				Type Note 3	Load (w atts)			Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	32		P1				Spare	4	T1	42
1	L2	32		P2		1500		Cleaners sockets	4	T1	42
	L3	32		P2			1500	External balcony socket	4	T1	42
	L1	20		P1				Spare	4	T1	42
2	L2	20		P1				Spare	4	T1	42
	L3										
	L1										
3	L2										
	L3										
	L1										
4	L2										
	L3										
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	L1										
7	L2										
	L3										
	L1										
8	L2										
	L3										
		Total Phase			0	1500	1500	Watts			
		Loading			0	6.52	6.52	Amps			

Notes

1 Fitted w ith Integral Incoming Sw itch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse w ith separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference : DB TPA/4 — Location :Tenants electrical riser cupboard
Serving :Tenants A 4th floor Small pow er

Board Rating : 100 A
Board Size : 8 w ay — Incoming Cable — Reference : FOO2
Phase: TP &N — Cable Size :35mm SWA LSF

Way	Line	In	Ib	Type Note 3 P	Load (watts) L1	L2	L3	Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
	L1	32		P1				Spare	4	T1	42
1	L2	32		P2		1500		Cleaners sockets	4	T1	42
	L3	32		P2			1500	External balcony socket	4	T1	42
	L1	20		P1				Spare	4	T1	42
2	L2	20		P1				Spare	4	T1	42
	L3										
	L1										
3	L2										
	L3										
	L1										
4	L2										
	L3										
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	L1										
7	L2										
	L3										
	L1										
8	L2										
	L3										
		Total Phase			0	1500	1500	Watts			
		Loading			0	6.52	6.52	Amps			

Notes

1 Fitted w ith Integral Incoming Sw itch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse w ith separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference : DB TPA/5

Location :Tenants electrical riser cupboard
Serving :Tenants A 5th floor Small pow er

Board Rating : 100 A
Board Size : 8 w ay
Phase: TP &N

Incoming Cable
Reference : FOO2
Cable Size :35mm SWA LSF

				Type Note 3	Load (w atts)			Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	32		P1				Spare	4	T1	42
1	L2	32		P2		1500		Cleaners sockets	4	T1	42
	L3	32		P2			1500	External balcony socket	4	T1	42
	L1	20		P1				Spare	4	T1	42
2	L2	20		P1				Spare	4	T1	42
	L3										
	L1										
3	L2										
	L3										
	L1										
4	L2										
	L3										
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	L1										
7	L2										
	L3										
	L1										
8	L2										
	L3										
		Total Phase			0	1500	1500	Watts			
		Loading			0	6.52	6.52	Amps			

Notes

1 Fitted w ith Integral Incoming Sw itch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse w ith separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference : DB TPA/6

Location :Tenants electrical riser cupboard
Serving :Tenants A 6th floor Small pow er

Board Rating : 100 A
Board Size : 8 w ay
Phase: TP &N

Incoming Cable Reference : FOO2
Cable Size :35mm SWA LSF

				Type Note 3	Load (w atts)			Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	32		P1				Spare	4	T1	42
1	L2	32		P2		1500		Cleaners sockets	4	T1	42
	L3	32		P2			1500	External balcony socket	4	T1	42
	L1	20		P1				Spare	4	T1	42
2	L2	20		P1				Spare	4	T1	42
	L3										
	L1										
3	L2										
	L3										
	L1										
4	L2										
	L3										
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	L1										
7	L2										
	L3										
	L1										
8	L2										
	L3										
		Total Phase			0	1500	1500	Watts			
		Loading			0	6.52	6.52	Amps			

Notes

1 Fitted w ith Integral Incoming Sw itch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse w ith separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference : DB TPA/7 Location :Tenants electrical riser cupboard

Serving :Tenants A 7th floor Small pow er

Board Rating : 100 A

Board Size : 8 w ay Incoming Cable Reference : FOO2

Phase: TP &N Cable Size :35mm SWA LSF

Way	Line	In	Ib	Type Note 3 P	Load (watts) L1	L2	L3	Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
	L1	32		P1				Spare	4	T1	42
1	L2	32		P2		1500		Cleaners sockets	4	T1	42
	L3	32		P2			1500	External balcony socket	4	T1	42
	L1	20		P1				Spare	4	T1	42
2	L2	20		P1				Spare	4	T1	42
	L3										
	L1										
3	L2										
	L3										
	L1										
4	L2										
	L3										
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	L1										
7	L2										
	L3										
	L1										
8	L2										
	L3										
		Total Phase			0	1500	1500	Watts			
		Loading			0	6.52	6.52	Amps			

Notes

1 Fitted w ith Integral Incoming Sw itch

2 Cable Types-Legend

- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device

- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse w ith separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference : DB TPA/8 — Location :Tenants electrical riser cupboard
Serving :Tenants A 8th floor Small pow er

Board Rating : 100 A
Board Size : 8 w ay — Incoming Cable — Reference : FOO2
Phase: TP &N — Cable Size :35mm SWA LSF

Way	Line	In	Ib	Type Note 3 P	Load (watts) L1	L2	L3	Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
	L1	32		P1				Spare	4	T1	42
1	L2	32		P2		1500		Cleaners sockets	4	T1	42
	L3	32		P2			1500	External balcony socket	4	T1	42
	L1	20		P1				Spare	4	T1	42
2	L2	20		P1				Spare	4	T1	42
	L3										
	L1										
3	L2										
	L3										
	L1										
4	L2										
	L3										
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	L1										
7	L2										
	L3										
	L1										
8	L2										
	L3										
	Total Phase				0	1500	1500	Watts			
	Loading				0	6.52	6.52	Amps			

Notes

1 Fitted w ith Integral Incoming Sw itch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse w ith separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference : DB TPB/1 — Location :Tenants electrical riser cupboard
Serving :Tenants B 1st Small pow er

Board Rating : 100 A
Board Size : 8 w ay — Incoming Cable — Reference : FOO1
Phase: TP &N — Cable Size :35mm SWA LSF

Way	Line	In	Ib	Type Note 3 P	Load (watts) L1	L2	L3	Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
	L1	32		P1				Spare	4	T1	42
1	L2	32		P2		1500		Cleaners sockets	4	T1	42
	L3	32		P2			1500	External balcony socket	4	T1	42
	L1	20		P1				Spare	4	T1	42
2	L2	20		P1				Spare	4	T1	42
	L3										
	L1										
3	L2										
	L3										
	L1										
4	L2										
	L3										
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	L1										
7	L2										
	L3										
	L1										
8	L2										
	L3										
		Total Phase			0	1500	1500	Watts			
		Loading			0	6.52	6.52	Amps			

Notes

1 Fitted w ith Integral Incoming Sw itch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse w ith separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference : DB TPB/2 — Location :Tenants electrical riser cupboard
Serving :Tenants B 2nd Small pow er

Board Rating : 100 A
Board Size : 8 w ay — Incoming Cable — Reference : FOO1
Phase: TP &N — Cable Size :35mm SWA LSF

Way	Line	In	Ib	Type Note 3 P	Load (watts) L1	L2	L3	Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
	L1	32		P1				Spare	4	T1	42
1	L2	32		P2		1500		Cleaners sockets	4	T1	42
	L3	32		P2			1500	External balcony socket	4	T1	42
	L1	20		P1				Spare	4	T1	42
2	L2	20		P1				Spare	4	T1	42
	L3										
	L1										
3	L2										
	L3										
	L1										
4	L2										
	L3										
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	L1										
7	L2										
	L3										
	L1										
8	L2										
	L3										
		Total Phase			0	1500	1500	Watts			
		Loading			0	6.52	6.52	Amps			

Notes

1 Fitted w ith Integral Incoming Sw itch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse w ith separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference : DB TPB/3

Location :Tenants electrical riser cupboard
Serving :Tenants B 3rd Small pow er

Board Rating : 100 A
Board Size : 8 w ay
Phase: TP &N

Incoming Cable Reference : FOO1
Cable Size :35mm SWA LSF

				Type Note 3	Load (w atts)			Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	32		P1				Spare	4	T1	42
1	L2	32		P2		1500		Cleaners sockets	4	T1	42
	L3	32		P2			1500	External balcony socket	4	T1	42
	L1	20		P1				Spare	4	T1	42
2	L2	20		P1				Spare	4	T1	42
	L3										
	L1										
3	L2										
	L3										
	L1										
4	L2										
	L3										
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	L1										
7	L2										
	L3										
	L1										
8	L2										
	L3										
		Total Phase			0	1500	1500	Watts			
		Loading			0	6.52	6.52	Amps			

Notes

1 Fitted w ith Integral Incoming Sw itch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse w ith separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference : DB TPB/4

Location :Tenants electrical riser cupboard
Serving :Tenants B 4th Small pow er

Board Rating : 100 A
Board Size : 8 w ay
Phase: TP &N

Incoming Cable Reference : FOO1
Cable Size :35mm SWA LSF

				Type Note 3	Load (w atts)			Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	32		P1				Spare	4	T1	42
1	L2	32		P2		1500		Cleaners sockets	4	T1	42
	L3	32		P2			1500	External balcony socket	4	T1	42
	L1	20		P1				Spare	4	T1	42
2	L2	20		P1				Spare	4	T1	42
	L3										
	L1										
3	L2										
	L3										
	L1										
4	L2										
	L3										
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	L1										
7	L2										
	L3										
	L1										
8	L2										
	L3										
		Total Phase			0	1500	1500	Watts			
		Loading			0	6.52	6.52	Amps			

Notes

1 Fitted w ith Integral Incoming Sw itch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse w ith separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference : DB TPB/5 — Location :Tenants electrical riser cupboard
Serving :Tenants B 5th Small pow er

Board Rating : 100 A
Board Size : 8 w ay — Incoming Cable — Reference : FOO1
Phase: TP &N — Cable Size :35mm SWA LSF

Way	Line	In	Ib	Type Note 3 P	Load (watts) L1	L2	L3	Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
	L1	32		P1				Spare	4	T1	42
1	L2	32		P2		1500		Cleaners sockets	4	T1	42
	L3	32		P2			1500	External balcony socket	4	T1	42
	L1	20		P1				Spare	4	T1	42
2	L2	20		P1				Spare	4	T1	42
	L3										
	L1										
3	L2										
	L3										
	L1										
4	L2										
	L3										
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	L1										
7	L2										
	L3										
	L1										
8	L2										
	L3										
		Total Phase			0	1500	1500	Watts			
		Loading			0	6.52	6.52	Amps			

Notes

1 Fitted w ith Integral Incoming Sw itch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse w ith separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference : DB TPB/6 — Location :Tenants electrical riser cupboard

Serving :Tenants B 6th Small pow er

Board Rating : 100 A

Board Size : 8 w ay — Incoming Cable — Reference : FOO1

Phase: TP &N — Cable Size :35mm SWA LSF

Way	Line	In	Ib	Type Note 3 P	Load (watts) L1	L2	L3	Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
	L1	32		P1				Spare	4	T1	42
1	L2	32		P2		1500		Cleaners sockets	4	T1	42
	L3	32		P2			1500	External balcony socket	4	T1	42
	L1	20		P1				Spare	4	T1	42
2	L2	20		P1				Spare	4	T1	42
	L3										
	L1										
3	L2										
	L3										
	L1										
4	L2										
	L3										
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	L1										
7	L2										
	L3										
	L1										
8	L2										
	L3										
		Total Phase			0	1500	1500	Watts			
		Loading			0	6.52	6.52	Amps			

Notes

1 Fitted w ith Integral Incoming Sw itch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse w ith separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference : DB TPB/7 — Location :Tenants electrical riser cupboard

Serving :Tenants B 7th Small pow er

Board Rating : 100 A

Board Size : 8 w ay — Incoming Cable — Reference : FOO1

Phase: TP &N — Cable Size :35mm SWA LSF

Way	Line	In	Ib	Type Note 3 P	Load (watts) L1	L2	L3	Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
	L1	32		P1				Spare	4	T1	42
1	L2	32		P2		1500		Cleaners sockets	4	T1	42
	L3	32		P2			1500	External balcony socket	4	T1	42
	L1	20		P1				Spare	4	T1	42
2	L2	20		P1				Spare	4	T1	42
	L3										
	L1										
3	L2										
	L3										
	L1										
4	L2										
	L3										
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	L1										
7	L2										
	L3										
	L1										
8	L2										
	L3										
		Total Phase			0	1500	1500	Watts			
		Loading			0	6.52	6.52	Amps			

Notes

1 Fitted w ith Integral Incoming Sw itch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse w ith separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference : DB TPB/8 — Location :Tenants electrical riser cupboard

Serving :Tenants B 8th Small pow er

Board Rating : 100 A

Board Size : 8 w ay — Incoming Cable — Reference : FOO1

Phase: TP &N — Cable Size :35mm SWA LSF

Way	Line	In	Ib	Type Note 3 P	Load (watts) L1	L2	L3	Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
	L1	32		P1				Spare	4	T1	42
1	L2	32		P2		1500		Cleaners sockets	4	T1	42
	L3	32		P2			1500	External balcony socket	4	T1	42
	L1	20		P1				Spare	4	T1	42
2	L2	20		P1				Spare	4	T1	42
	L3										
	L1										
3	L2										
	L3										
	L1										
4	L2										
	L3										
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	L1										
7	L2										
	L3										
	L1										
8	L2										
	L3										
		Total Phase			0	1500	1500	Watts			
		Loading			0	6.52	6.52	Amps			

Notes

1 Fitted w ith Integral Incoming Sw itch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse w ith separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference :DB/LP/2C
Location :Second Floor Toilet Riser
Serving :Small Pow er Toilet Core

Board Rating : 100 A
Board Size : 12 w ay
Phase: TP &N

Incoming Cable
Reference :F038 LV schematic
Cable Size :35mm SWA/ LSF

Way	Line	In	Ib	Type Note 3 P	Load (watts) L1	L2	L3	Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
	L1	20		P1	500			Heat Maintenance tape 1st floor toilets	4	T1	42
1	L2	32		P2		1500		Hand Dryers 1st Floor	4	T1	42
	L3	32		P2			1500	Hand Dryers 1st Floor	4	T1	42
	L1	32		P2	1500			Hand Dryers 1st Floor	4	T1	42
2	L2	32		P1		1000		BMS outlet 1st-4th Floor	4	T1	42
	L3	32		P1			1000	Water sensor 1st-4th floor	4	T1	42
	L1	20		P1	300			PSU Disabled toilet alarm 1st Floor	4	T1	42
3	L2	32		P2		1500		Cleaners Socket 1st-4th Floor	4	T1	42
	L3							SPARE			
	L1	20		P1	500			Heat Maintenance tape 2nd floor toilets	4	T1	42
4	L2	32		P2		1500		Hand Dryers 2nd Floor	4	T1	42
	L3	32		P2			1500	Hand Dryers 2nd Floor	4	T1	42
	L1	32		P2	1500			Hand Dryers 2nd Floor	4	T1	42
5	L2	20		P1		300		PSU Disabled toilet alarm 2nd Floor	4	T1	42
	L3							SPARE			
	L1	20		P1	500			Heat Maintenance tape 3rd floor toilets	4	T1	42
6	L2	32		P2		1500		Hand Dryers 3rd Floor	4	T1	42
	L3	32		P2			1500	Hand Dryers 3rd Floor	4	T1	42
	L1	32		P2	1500			Hand Dryers 3rd Floor	4	T1	42
7	L2	20		P1		300		PSU Disabled toilet alarm 3rd Floor	4	T1	42
	L3							SPARE			
	L1	20		P1	500			Heat Maintenance tape 4th floor toilets	4	T1	42
8	L2	40		P2		1500		Hand Dryers 4th Floor	4	T1	42
	L3	32		P2			1500	Hand Dryers 4th Floor	4	T1	42
	L1	32		P2	1500			Hand Dryers 4th Floor	4	T1	42
9	L2	20		P1		300		PSU Disabled toilet alarm 4th Floor	4	T1	42
	L3										
	L1										
10	L2										
	L3										
	L1										
11	L2										
	L3										
	L1										
12	L2										
	L3										
		Total Phase			8300	9400	7000	Watts			
		Loading			36.1	40.9	30.4	Amps			

Notes

1 Fitted w ith Integral Incoming Sw itch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse w ith separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference :	DB/LL/3S	Location :	THIRD FLOOR FIRE LOBBY SOUTH CORE
		Serving :	THIRD FLOOR INTERNAL LIGHTING
Board Rating :	100 A		
Board Size :	8 way	Incoming Cable	Reference :
Phase:	TP &N		Cable Size : 35MM 4 CORE SWA

				Type Note 3	Load (watts)			Serving	Cable c.s.a (mm^2)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	10		P1	64			STAIRCASE LTG 1ST -4TH FLOOR	2.5	T1	42
1	L2	10		P1		64		STAIRCASE LTG 1ST- 4TH FLOOR	2.5	T1	42
	L3	10		P1			64	STAIRCASE LTG 5TH- 8TH FLOOR	2.5	T1	42
	L1	10		P1	64			STAIRCASE LTG 5TH- 8TH FLOOR	2.5	T1	42
2	L2	10		P1		120		STAIRCASE LOBBY AREA 1ST FLOOR	2.5	T1	42
	L3	10		P1			120	STAIRCASE LOBBY AREA 2ND FLOOR	2.5	T1	42
	L1	10		P1	120			STAIRCASE LOBBY AREA 3RD FLOOR	2.5	T1	42
3	L2	10		P1		120		STAIRCASE LOBBY AREA 4TH FLOOR	2.5	T1	42
	L3	10		P1			120	STAIRCASE LOBBY AREA 5TH FLOOR	2.5	T1	42
	L1	10		P1	120			STAIRCASE LOBBY AREA 6TH FLOOR	2.5	T1	42
4	L2	10		P1		120		STAIRCASE LOBBY AREA 7TH FLOOR	2.5	T1	42
	L3	10		P1			120	STAIRCASE LOBBY AREA 8TH FLOOR	2.5	T1	42
5											
6											
7											
8											

Total Phase	368	424	424	Watts	3 Protective Device
Loading	1.6	1.84	1.84	Amps	P1 -MCB Type C
					P2 -RCBO
					P3 - MCB / Fuse with separate 30 mA RCD
					P4 - HRC
					P5 -MCB Type User Defined

Notes

1 Fitted with Integral Incoming Switch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference :DB/LP/4S
Location :Fourth Floor South Core Riser
Serving :Small Pow er Toilet Core

Board Rating : 100 A
Board Size : 4 w ay
Phase: TP &N

Incoming Cable
Reference :F027 LV schematic
Cable Size :35mm SWA/ LSF

Way	Line	In	Ib	Type Note 3 P	Load (watts) L1	L2	L3	Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
	L1	32		P2	1500			Cleaners sockets 1st -4th floor	4	T1	42
1	L2	32		P2		1500		Cleaners sockets 5th -8th floor	4	T1	42
	L3	10		P1			300	Lobby Lighting 1st -3rd Floor	2.5	T1	42
	L1	10		P1	300			Lobby Lighting 4th -6th Floor	2.5	T1	42
2	L2	10		P1		300		Lobby Lighting 7th -8th Floor	2.5	T1	42
	L3	10		P1			324	Stair Lighting 1st -3rd Floor	2.5	T1	42
	L1	10		P1	324			Stair Lighting 4th -6th Floor	2.5	T1	42
3	L2	10		P1			216	Stair Lighting 7th -8th Floor	2.5	T1	42
	L3										
	L1										
4	L2										
	L3										
	Total Phase				2124	1800	840	Watts			
	Loading				9.23	7.83	3.65	Amps			

Notes

1 Fitted w ith Integral Incoming Sw itch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse w ith separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference :DB/LP/5C
Location :Fifth Floor Toilet Core Riser
Serving :Fifth -Eighth Floor Small Pow er toilet Core

Board Rating : 100 A
Board Size : 12 w ay
Phase: TP &N
Incoming Cable Reference :
Cable Size :35mm2 SWA/LSF

				Type Note 3	Load (w atts)			Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	20		P1	500			Heat Maintenance Tape 5th floor toilets	4	T1	42
1	L2	32		P2		1500		Hand Dryers 5th floor	4	T1	42
	L3	32		P2			1500	Hand Dryers 5th floor	4	T1	42
	L1	32		P2	1500			Hand Dryers 5th floor	4	T1	42
2	L2	32		P1		1000		BMS outlet 5th-8th Floor	4	T1	42
	L3	32		P1			1000	Water sensor 5th-8th Floor	4	T1	42
	L1	20		P1	1000			PSU Disabled toilet alarm 5th Floor	4	T1	42
3	L2	32		P1		1500		Cleaners Socket 5th-8th Floor	4	T1	42
	L3							SPARE			
	L1	20		P1	500			Heat Maintenance tape 6th floor toilets	4	T1	42
4	L2	32		P2		1500		Hand Dryers 6th floor	4	T1	42
	L3	32		P2			1500	Hand Dryers 6th floor	4	T1	42
	L1	32		P2	1500			Hand Dryers 6th floor	4	T1	42
5	L2	20		P1		300		PSU Disabled toilet alarm 6th Floor	4	T1	42
	L3							SPARE			
	L1	20		P1	500			Heat Maintenance Tape 7th floor toilets	4	T1	42
6	L2	32		P2		1500		Hand Dryers 7th floor	4	T1	42
	L3	32		P2			1500	Hand Dryers 7th floor	4	T1	42
	L1	32		P2	1500			Hand Dryers 7th floor	4	T1	42
7	L2	20		P1		300		PSU Disabled toilet alarm 7th Floor	4	T1	42
	L3							SPARE			
	L1	20		P1	500			Heat Maintenance tape 8th floor toilets	4	T1	42
8	L2	32		P2		1500		Hand Dryers 8th floor	4	T1	42
	L3	32		P2			1500	Hand Dryers 8th floor	4	T1	42
	L1	32		P2	1500			Hand Dryers 8th floor	4	T1	42
9	L2	20		P1		300		PSU Disabled toilet alarm 8th Floor	4	T1	42
	L3										
	L1										
10	L2										
	L3										
	L1										
11	L2										
	L3										
	L1										
12	L2										
	L3										
		Total Phase			9000	9400	7000	Watts			
		Loading			39.1	40.9	30.4	Amps			

Notes

1 Fitted w ith Integral Incoming Sw itch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse w ith separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference : DB M1								Location :Lower Basement Plantroom			
								Serving: Mechanical Small Power and Ancillaries			
Board Rating :		250 A									
Board Size :		24 way						Incoming Cable	Reference : F033 LV schematic		
Phase:		TP &N							Cable Size :50mm SWA LSF		
				Type Note 3	Load (watts)			Serving	Cable c.s.a (mm^2)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	32		P1	4000						
1	L2	32		P1		4000		CAT 1 BOOSTER SET	10	T2	31
	L3	32		P1			4000				
	L1	32		P1	3000						
2	L2	32		P1		3000		CAT 2 BOOSTER SET	10	T2	31
	L3	32		P1			3000				
	L1	32		P1	3000						
3	L2	32		P1		3000		RAINWATER HARVESTING SYSTEM	10	T2	31
	L3	32		P1			3000				
	L1	32		P1	1000			CAT 5 BOOSTER SET	4	T2	31
4	L2	32		P1		100		HWS RETURN PUMP	4	T2	31
	L3	32		P1			100	HWS CALORIFIER PUMP	4	T2	31
	L1	20		P1	200			HEAT METERS 1ST FLOOR	4	T2	31
5	L2	20		P1		200		HEAT METERS 2ND FLOOR	4	T2	31
	L3	20		P1			200	HEAT METERS 3RD FLOOR	4	T2	31
	L1	20		P1	200			HEAT METERS 4TH FLOOR	4	T2	31
6	L2	20		P1		200		HEAT METERS 5TH FLOOR	4	T2	31
	L3	20		P1			200	HEAT METERS 6TH FLOOR	4	T2	31
	L1	20		P1	200			HEAT METERS 7TH FLOOR	4	T2	31
7	L2	20		P1		200		HEAT METERS 8TH FLOOR	4	T2	31
	L3	20		P1			200	CHILLED WATER METERS 1ST FLOOR	4	T2	31
	L1	20		P1	200			CHILLED WATER METERS 2ND FLOOR	4	T2	31
8	L2	20		P1		200		CHILLED WATER METERS 3RD FLOOR	4	T2	31
	L3	20		P1			200	CHILLED WATER METERS 4TH FLOOR	4	T2	31
	L1	20		P1	200			CHILLED WATER METERS 5TH FLOOR	4	T2	31
9	L2	20		P1		200		CHILLED WATER METERS 6TH FLOOR	4	T2	31
	L3	20		P1			200	CHILLED WATER METERS 7TH FLOOR	4	T2	31
	L1	20		P1	200			CHILLED WATER METERS 8TH FLOOR	4	T2	31
10	L2	20		P1		2000		DX UNIT G/FLOOR CONTROL ROOM	4	T2	31
	L3	20		P1			1500	DX UNIT CONDENSER BASEMENT	4	T2	31
	L1	40		P1	10000						
11	L2	40		P1		10000		HV ROOM DX UNIT 1	10	T2	31
	L3	40		P1			10000				
	L1	40		P1	10000						
12	L2	40		P1		10000		HV ROOM DX UNIT 1	10	T2	31
	L3	40		P1			10000				

	L1	50		P1	12000						
13	L2	50		P1		12000		HV ROOM CONDENSER 1	10	T2	31
	L3	50		P1			12000				
	L1	50		P1	12000						
14	L2	50		P1		12000		HV ROOM CONDENSER 2	10	T2	31
	L3	50		P1			12000				
	L1	20		P1	100			UV STERILISATION LAMP	4	T2	31
15	L2	20		P1		500		WATER CONDITIONER	4	T2	31
	L3	20		P1			1000	GREY WATER RECYCLING SYSTEM	4	T2	31
	L1	63		P1	6000			Water cylinder 1	10	T2	31
16	L2	63		P1		6000		Water cylinder 1	10	T2	31
	L3	63		P1			6000	Water cylinder 2	10	T2	31
	L1	63		P1	6000			Water cylinder 2	10	T2	31
17	L2										
	L3										
	L1										
18	L2										
	L3										
	L1										
19	L2										
	L3										
	L1										
20	L2										
	L3										
	L1										
21	L2										
	L3										
	L1										
22	L2										
	L3										
	L1										
23	L2										
	L3										
	L1										
24	L2										
	L3										

	Total Phase	68300	63600	63600	Watts
	Loading	297	276.5	276.5	Amps

Notes

1 Fitted with Integral Incoming Switch

2 Cable Types-Legend

- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device

- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse with separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Note: Water cylinders will only run when both Duty and Standby Primary heating pumps fail

Reference : DB M2/ESSENTIAL
Location :Upper Basement Smoke Extract
Serving: Mechanical Small Pow er and Ancillaries

Board Rating : 100 A
Board Size : 12 w ay
Phase: TP &N

Incoming Cable
Reference : F011 LV schematic
Cable Size :35mm SWA LSF

				Type Note 3	Load (w atts)			Serving	Cable c.s.a (mm^2)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
	L1	20		P1	1500			BRE VENT SHAFT	4	T2	31
1	L2	20		P1							
	L3	20		P1							
	L1	20		P1	2000						
2	L2	20		P1		2000		REFUGE AREA DRAIN PUMP	4	T2	31
	L3	20		P1			2000	(Panel Feed)			
	L1	20		P1	2000						
3	L2	20		P1		2000		AHU PLANT DRAIN PUMP	4	T2	31
	L3	20		P1			2000	(Panel Feed)			
	L1	20		P1	2000						
4	L2	20		P1		2000		RWH PLANT BASEMENT DRAIN PUMP	4	T2	31
	L3	20		P1			2000	(Panel Feed)			
	L1	20		P1	2000						
5	L2	20		P1		2000		FIREFIGHTING DRAIN PUMP	4	T2	31
	L3	20		P1			2000	(Panel Feed)			
	L1	20		P1	2000						
6	L2	20		P1		2000		ESCALATOR DRAIN SUMP PUMP	4	T2	31
	L3	20		P1			2000	(Panel Feed)			
7											
8											
9											
10											
11											
12											
		Total Phase			11500	10000	10000	Watts			
		Loading			50	43.48	43.48	Amps			

Notes

1 Fitted w ith Integral Incoming Sw itch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
- P3 - MCB / Fuse w ith separate 30 mA RCD
- P4 - HRC
- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference : DB Roof/L/P

Location :Ground floor Riser North core
Serving : Roof Lighting and Pow er

Board Rating : 100 A
Board Size : 8 w ay
Phase: TP &N

Incoming Cable Reference : FO34
Cable Size :35mm SWA LSF

Way	Line	In	Ib	Type Note 3 P	Load (watts) L1	L2	L3	Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
	L1	32			1500			Weather proof socket /Plant Area	4	T1	42
1	L2	32				500		Plant Area Lighting	2.5	T1	42
	L3	10					1500	Cleaners socket Lobby	4	T1	42
	L1	10			150			Lobby Lighting 3 no Lights	2.5	T1	42
2	L2	10				100		MCC Area Lighting /2 No	2.5	T1	42
	L3										
	L1										
3	L2										
	L3										
	L1										
4	L2										
	L3										
	L1										
5	L2										
	L3										
	L1										
6	L2										
	L3										
	L1										
7	L2										
	L3										
	L1										
8	L2										
	L3										
		Total Phase			1650	600	1500	Watts			
		Loading			7.17	2.61	6.52	Amps			

3 Protective Device
P1 -MCB Type C
P2 -RCBO
P3 - MCB / Fuse w ith separate 30 mA RCD
P4 - HRC
P5 -MCB Type User Defined

Notes

1 Fitted w ith Integral Incoming Sw itch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Reference :	**DB Utilities**			Location :	RMU ROOM		
				Serving :	Utilities Lighting and Pow er		
Board Rating :	100 A						
Board Size :	8 w ay			Incoming Cable	Reference :	F42	
Phase:	SP &N				Cable Size :	25 mm² 3 c XLPE / SWA/ LSF	

				Type Note 3	Load (w atts)			Serving	Cable c.s.a (mm²)	Cable Type Note 2	Install Method Note 5
Way	Line	In	Ib	P	L1	L2	L3				
1	L1										
2	L1										
3	L1										
4	L1										
5	L1										
6	L1										
7	L1										
8	L1										
		Total Phase			0	0	0	Watts			
		Loading			0	0	0	Amps			

Notes

1 Fitted w ith Integral Incoming Sw itch

2 Cable Types-Legend
- T1 LSF Single Core Cables in Conduit / Trunking
- T2 LSF / SWA / XLPE cable
- T3 MICC / LSF Cables
- T4 XLPE / SWA/ PVC cable
- T5 User Defined

3 Protective Device
- P1 -MCB Type C
- P2 -RCBO
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- P5 -MCB Type User Defined

4 Loads noted for Ring Circuits [RC] are nominal

5 Installation method based on Table 4 A 2

6 Separate CPC to be same c.s.a as Line conductor

7 B Fitted blank

Busbar Ref:	Busbar Rating	Bus Bar Lengths			Circuit Protective	Cable Type / Size to	Phase		
		3.6	2.4	Total	Device In	Busbar	L1	L2	L3
Served From Tenants									
Distribution Board **1**									
BB 1	63 A SP& N	2		7.2	40 A	10mm² 2c Multi Core XLPE.LSF.SWA Cu Table 4E4			BB1
BB 2	63 A SP& N	3		10.8	40 A	10mm² 2c Multi Core XLPE.LSF.SWA Cu Table 4E4	BB2		
BB 3	63 A SP& N	3		10.8	40 A	10mm² 2c Multi Core XLPE.LSF.SWA Cu Table 4E4	BB3		
BB 4	63 A SP& N	3		10.8	40 A	10mm² 2c Multi Core XLPE.LSF.SWA Cu Table 4E4		BB4	
BB 5	63 A SP& N	3		10.8	40 A	10mm² 2c Multi Core XLPE.LSF.SWA Cu Table 4E4		BB5	
BB 6	63 A SP& N	3		10.8	40 A	10mm² 2c Multi Core XLPE.LSF.SWA Cu Table 4E4			BB6
BB 7	63 A SP& N	3		10.8	40 A	10mm² 2c Multi Core XLPE.LSF.SWA Cu Table 4E4			BB7
Served From Tenants									
Distribution Board **2**									
BB 8	63 A SP& N	2		7.2	40 A	10mm² 2c Multi Core XLPE.LSF.SWA Cu Table 4E4			BB8
BB 9	63 A SP& N	3		10.8	40 A	10mm² 2c Multi Core XLPE.LSF.SWA Cu Table 4E4	BB9		
BB 10	63 A SP& N	3		10.8	40 A	10mm² 2c Multi Core XLPE.LSF.SWA Cu Table 4E4	BB10		
BB 11	63 A SP& N	3		10.8	40 A	10mm² 2c Multi Core XLPE.LSF.SWA Cu Table 4E4		BB11	
BB 12	63 A SP& N	3		10.8	40 A	10mm² 2c Multi Core XLPE.LSF.SWA Cu Table 4E4		BB12	
BB 13	63 A SP& N	3		10.8	40 A	10mm² 2c Multi Core XLPE.LSF.SWA Cu Table 4E4			BB13
BB 14	63 A SP& N	3		10.8	40 A	10mm² 2c Multi Core XLPE.LSF.SWA Cu Table 4E5			BB14
Notes									
	All Cables Laid Direct on floor Slab					Use Power Plan/Ackermann or equal approved			
	Allow **68 No** Grommets per typical floor					No allowance to be made for tap-offs or leads to grommets			
	Assume all RCD Protection will be on deck modules					All SP+N Busbars to be Standard earth arrangement			

Kings Cross Zone B Building B2

APPENDIX 3 –RECOMMENDED MANUFACTURERS & SUPPLIERS

Plant/ Equipment	Type	Preferred Supplier
Accessories	Metal Clad sockets , Light switches	MK Electrical Ltd Crabtree
Air Circuit Breakers	2000 A	Schneider Electric
BS 88 Fuses	Red Spot	Bill GEC MEM
Cable supports	Steel Cable ties	Legrand or equal approved
Cable Tray /Ladder/ Comms Basket	Perforated Cable tray Fibre and Data Basket	Legrand Armourduct Systems Ltd Lenson UK Ltd
Cables	LSF /SWA FP200 FP600	BASEC PIRELLI DRAKA
Composite Distribution Centres	Refer to Schedule 4	Schneider Electric ICW Switchgear Underwood Switch gear Eaton
Conduit and conduit accessories		Any BEMA manufacturer or equal approved
Dado Trunking	2-3 compartment	MK Electrical Ltd MITA TRUNKING Marshall Tufflex
Disabled Alarm Systems/Refuge Alarm Systems		Wandsworth Baldwin Boxall
Distribution Boards	200A, 100A	Schneider Electric
Fire alarm Panels	Addressable Networking	Morley Ias Gent GE electrical
Generator	Standby	DALE AVK POWERTECHNIQUE
Hearing Equipment	Induction Loops	Hearing Loop LTD AMPETRONIC FORCE TEN Co Vivid Acoustics
Lighting	Refer to Luminaire schedule	WHITECROFT LIGHTING CONCORD MARLIN LUXONIC
Lighting Controls	LCMs PIRs and Lighting control panels	SIMMTRONIC PROLOJIK IS LIMITED
L.V Switch Panels	Refer to Schedule No 3	AF Switchgear Underwood Switchgear GE Switchgear ICW Switchgear ALAN Electrical

Plant/ Equipment	Type	Preferred Supplier
Lightning Protection	Earth Pits , Down conductors and Earth Bonding included	Omega Stone Lightning Thor Sentinel
Meters	All Tenants and Landlords meters	Auto meters Schneider Electric
Miniature Circuit Breakers	C60 H 15 KA	Schneider Electric Eaton GE
Moulded Case Circuit Breakers	NSX 250 A 25 KA	Schneider Electric Eaton GE
Power Factor Correction	250 KVA	Schneider Electric
RCD+RCBO	30 MA	Schneider Electric Eaton GE
Security and CCTV	Control Room Monitored . 24 port DVR 2 terra bit 25 frames per second real time Fixed and PTZ cameras	Sony LG Samsung Panasonic
Surface Fuse Switches/ Isolators	Various , surface mounted	MEM Lucy Schneider Electric Bill
Trunking /Floor boxes Under floor Power track 40amp	Underfloor and Above ceiling Mounted	Legrand / Electrak MEM MK Electrics Honeywell / Ackerman CMD / Powerplan
Rising Busbar and End feed Units	315 amp , 3 Tap offs per floor	MEM Schneider Electric Siemans Legrand

BAM Design
Centrium
Griffiths Way
St Albans
Herts
AL1 2RD

Tel No: 01727 894200

BAM Design Electrical Services Schedule

CLIENT: **BAM Construction**

PROJECT: Kings Cross Building B2 (4111)

SITE ADDRESS: Building 2, Pancras square, Kings Boulevard, London N1 (4111)

Appendix 4

Electrical Commissioning Specification

Contract no: Job no: 4111

Prepared by: N Neill Checked by: NJN Date: February 2011

Status of specification: TENDER

AMENDMENTS				
ref.	date	Amendment	amended by	checked by
T0	Dec ' 11	Issued for Tender		NJN
T1	Feb 12	Revised Issue updated to CMT comments	MP	NJN

APPENDIX 4 Electrical Commissioning Specification

BUILDING SERVICES: COMMISSIONING PROCEDURES

ELECTRICAL SERVICES

GENERAL INDEX

Page No.

Part 1 : GENERAL REQUIREMENTS

Part 1 - General Requirements

Testing and Commissioning

The Electrical Contractor shall fully test and commission the electrical installations in accordance with the Conditions of the Sub-Contract detailed in this Specification.

The Electrical Contractor shall provide all necessary labour, instruments, materials, tools, plant and equipment required to carry out the pre-commissioning and the performance testing of the systems to comply with the Commissioning Procedures within this Specification.

All plant and equipment shall be tested at the Electrical Contractors or Suppliers premises, prior to despatch. Test Certificates in duplicate shall be submitted to the BAM Engineer for approval.

The BAM Engineer shall have powers to test at the Electrical Contractors or Suppliers premises any item of equipment used, to ensure conformity with the Specification. The results of such tests shall, in no way, relieve the Electrical Contractor of his responsibilities to ensure that all materials and equipment installed in the works are entirely suitable for the applications and conditions of operation.

The testing of systems under the various Sections of the Specification may be required to be carried out in parts, or as a whole.

All tests shall be carried out to the complete satisfaction of the BAM Engineer and the Client's representative.

The Electrical Contractor shall demonstrate to the complete satisfaction of the BAM Engineer and the Client's representative that the installation or any portion thereof, which has been set to work and complies with the requirements of this Specification.

Any defect of workmanship, materials, performance, mal- adjustments, non-compliance with this Specification or other irregularities which become apparent during the tests, shall be rectified by the Electrical Contractor at no additional cost to the Contract. Where tests are repeated they shall be at the at the Electrical Contractor's expense until the whole is proved free from defects and in complete working order, to the complete satisfaction of the BAM Engineer and the Client's representative.

Commissioning of the Electrical Services and the specialist works will be carried out by an independent specialist Commissioning Company, which the Electrical Contractor shall allow for in his Tender.

Commissioning by the Electrical Contractor's own Commissioning Staff, as an alternative to the employment of an Independent Specialist Commissioning Company may be undertaken, providing particular permission by the BAM Engineers has been given at the time of tender.

The Electrical Contractor, unless otherwise provided for in the Specification, shall make allowances for all gas, solid fuel, oil fuel and electricity consumed during the period of testing, commissioning and demonstration of the works.

The Electrical Contractor shall submit for approval a detailed commissioning programme, which shall logically incorporate all commissioning activities and their duration. All commissioning programmes shall be submitted for approval on or prior to 12 weeks before the commissioning start date.

Approvals and Acceptance

Services shall be tested in accordance with this specification and to the requirements of the relevant Service Authority. Proof of compliance with any Service Authority requirements shall be supplied to the BAM Engineer.

Upon receipt of the Test and Commissioning Reports, the BAM Engineer shall check that the claimed results are within the specified tolerances and shall authorise the Electrical Contractor to proceed with the system performance demonstration tests.

The Electrical Contractor shall give the Engineer a minimum of 48 hours written notice of his intention to demonstrate and seek a witnessed Test Certificate for any item or system for site works and 5 working days for factory tests.

BAM Engineers and the Client's representative shall witness commissioning tests of equipment and systems.

The Electrical Contractor shall allow for giving such notice and making adjustments, setting up and other preparations for testing and for BAM and the Client's representative s attendance in witnessing such tests.

In addition to the satisfactory demonstration and acceptance that the items of equipment or systems are in accordance with the requirements of the Specification, the Electrical Contractor shall also allow in this Tender for any additional demonstrations ad witnessing which are required by the Engineer, to the Client, in the presence of BAM Engineers.

Personnel

A specialist commissioning company will carry out testing and commissioning of the electrical installation and associated specialist plant.

The Specialist Commissioning Company will be employed by the Electrical Contractor and shall be identified at tender stage for approval.

Where the Electrical Contractor has agreed with BAM, that the commissioning works may be carried out by the Electrical Contractor's own Commissioning Staff ,the Electrical Contractor will demonstrate to BAM Engineers that the Commissioning Engineers proposed are trained, experienced and competent Commissioning Engineers, who are conversant with the system types being commissioned.

Where required, the Electrical Contractor will ensure that their commissioning personnel are H.V Authorised.

The Electrical Contractor shall ensure that the management and co-ordination of all commissioning activities and specialist are carried out by suitably qualified competent personnel.

Test Equipment and Instruments

The Electrical Contractor shall supply and fix all necessary testing apparatus and instrumentation for carrying out the tests, as required in the Specification.

The Electrical Contractor shall submit for approval to the Engineer, a list of the equipment which is intended for use in the testing and commissioning of the works.

All instruments intended for use shall have a Current Calibration Certificate. If, in the opinion of the Engineer, instruments should be rechecked for accuracy because of damage or any other reason, this shall be carried out at the Electrical Contractor's expense.

Current copies of the Calibration Certificates should be submitted in duplicate to the Engineer, prior to the instruments being used to commission the works.

Should the Electrical Contractor consider that the installation of additional equipment shall facilitate the carrying out of the works, allowance shall be made in the Tender for temporary installation of such equipment. The Electrical Contractor shall obtain the Engineer's permission before proceeding to install any such equipment. No such equipment shall be left in the system after completion of the testing and commissioning work without the express permission of the Engineer or the client.

Snagging

The Electrical Contractor will carry out a self - snagging regime on a weekly basis. The Electrical Contractor will record all such snags complete with actions and rectification dates.

The Electrical Contractor will issue to the Main Contractor on a weekly basis the self-snagging and rectification sheets.

The Electrical Contractor will retain an up to date file on site of self - snagging sheets and this will be available for BAM Engineers to inspect at any time.

The Electrical Contractor will nominate a competent engineer to carry out the self- snagging of the Installation and advise BAM Engineers.

Pre-Commissioning and Verification Checks

In order to ensure that the appropriate system is in a satisfactory and safe condition before starting up, Pre commissioning and verification checks shall be carried out in accordance with the relevant CIBSE Codes, and Part 6 of the 17th Edition of the IEE Regulation BS 7671 together with checks detailed within this Specification.

Prior to setting to work, the Electrical Contractor shall demonstrate to the Engineer that the relevant pre-commissioning checks that have been carried out.

The Electrical Contractor shall log all defects highlighted during pre-commissioning. When completed, pre-commissioning check lists shall be issued to the BAM Engineer. The Electrical Contractor shall demonstrate, as required by the BAM Engineer, that pre-commissioning checks have been carried out and any remedial works highlighted during these checks have been completed to the satisfaction of the Engineer.
At this stage the Electrical Contractor will issue to BAM a verification certificate in accordance with Part 6

Commissioning Procedures

All testing and commissioning shall be carried out in accordance with the Commissioning and Testing Procedures included in this Specification.

Should the Electrical Contractor wish to modify the specified Commissioning Procedures, the Electrical Contractor will submit to BAM approval the alternative procedures. No variance from the specified procedures shall be accepted unless written approval from BAM Engineers has been granted.

The Electrical Contractor will give BAM Engineers 2 working week s notice in order that the suggested alternatives are fully evaluated.

Where procedures are not included under Section D of the Specification, then the testing and commissioning shall be to the procedures and tolerances in accordance with the relevant current Commissioning Codes issued by the Chartered Institute of Building Services and in accordance with the Requirements of BS 7671:2008

Commissioning of Specialist Plant

The Electrical Contractor shall include in his tender for the commissioning of specialist plant by the equipment supplier and/or manufacturer, both at works and to fully replicate those tests on site.

1. Specialist equipment includes:-
2. H.V Switchgear
3. Power Transformers
4. L.V Main and Sub-Main Switch Gear.
5. Standby and Emergency systems / Plant
6. Fire alarms and Controls.

The Contractor should obtain in writing from each Supplier, Commissioning and Testing Procedures and specimen of Testing and Commissioning Documentation.

Copies of the Procedures and Documentation are to be forwarded to BAM Engineers for approval on or before 8 weeks prior to the programmed commissioning start date.

The Commissioning Tests shall only be acceptable upon approval of the procedures and Documentation by BAM Engineers.

The Electrical Contractor shall include in his Tender for adequate management and supervision of the various Commissioning Specialists.

The Electrical Contractor shall give 48 hour s notice to the BAM Engineers, as he requires each item of plant to be witnessed. Prior to giving such notice, the Contractor must have satisfied himself that the item of plant has been commissioned correctly and that it complies with the requirements of the Specification in all respects.

Copies of the completed Test Documentation shall be submitted to the Engineer when notice is given of a demonstration.

The Electrical Contractor shall include within his Tender for returning to site to carry out Commissioning Tests, in order to demonstrate the performance of equipment and plant at design ambient conditions.

The Electrical Contractor shall ensure that all the specialist's commissioning activities are correctly and logically programmed.

Where testing and commissioning tests require to be rescheduled and the BAM Engineer is already on site/at works for that pre-arranged activity the Electrical Contractor will reimburse all associated time costs and expenses for the rescheduled visit(s).

Test Certificates and Commissioning Records

The Electrical Contractor shall provide duplicate pro-forma copies of blank Test and Commissioning Report Sheets, intended for use when commissioning the work. The format and contents shall be such that all test and commissioning data can be accurately recorded.

The Test and Commissioning Report Sheets shall serve as a certified record that the item referred to has been tested and commissioned in accordance with the requirements of the Specification, together with British Standards, Statutory and Local Authority Regulations and the like, wherever applicable.

All Test and Commissioning Report Sheets shall be dated, numbered and indexed in a logical manner. They shall be referenced to the item tested by means of serial, chassis or other Manufacturer's reference number permanently marked in a conspicuous position on the item concerned. The instrument type and reference number should also be entered on the Test Certificates.

The Electrical Contractor shall make complete records of the Commissioning Tests carried out and, when completed they shall be issued to the Engineer in the form as indicated in this Specification.

The records shall include the following:

Immediately upon completion of the commissioning work, the Electrical Contractor shall forward to the Engineer the following completed Record Sheets for each system:

(i) Oil Levels
(ii) Fuel Levels
(iii) Ratio Settings
(iv) Schedule of electrical equipment, application, types, full load currents and overload settings and timer settings
(v) Schedule of all automatic control settings
(vi) Schedule of all fixed metering equipment

Results of Testing and Commissioning

Result of Test

If the results demonstrate that the plant and equipment have not been installed and/or functioning in a satisfactory manner. The BAM Engineer will decide whether this is due to incorrect or faulty work by the

Contractor and, if this is proven, the Electrical Contractor will, when called upon, carry out at his own expense remedial measures and/or adjustments as may be required. The BAM Engineer's decision as to the parameters and what constitutes a satisfactory test shall be final.

Test and Commissioning Forms

1. System Acceptance Certificate

2. Commissioning and Testing Instrument List

PART 2 - TESTING AND COMMISSIONING PROCEDURES FOR ELECTRICAL SERVICES

Introduction

The purpose of this section of the Document is to establish a set of procedures and particular requirements for the testing and commissioning of the Electrical Services Installation.

Testing and Inspection of Systems

During installation and on completion, the systems are to be checked for safe and correct operation in the following stages:

1. Visual Inspection and Testing
2. Verification of Systems
3. Demonstration of System Operation

Testing

The electrical installation is to be tested in accordance with the 17th Edition of the Regulations for Electrical Installations BS 7671 :2008, published by the Institution of Electrical Engineers and British Standards. All personnel carrying out the testing to systems shall be qualified to BS 2391 Level 3 Certificate in Inspection, Testing and Certification of Electrical Installation.

These tests are detailed in the above Regulations and are generally carried out as the various installations are completed. All test results are to be recorded.

See following Test Schedule, Items 1-10:

Item	**Test**
1	Continuity of ring final circuit conductors
2	Continuity of protective conductors
3	Earth electrode resistance
4	Insulation resistance of the fixed installation
5	Provision of basic protection by barriers or enclosures
6	Resistance of non - conducting floors and walls
7	Polarity
8	Earth loop impedance
9	Functional Testing, which will include operation of RCB'S, RCCB'S and RCBO'S
10.	Record of mains load characteristics, which will include

i. Verification of Voltage Drop
ii. Prospective Short circuit Current
iii. Prospective Earth Fault Current

Checking Procedures

Prior to testing and commissioning of the electrical installation, the following building works are to be completed:

The building is dry and the installation not exposed to water ingress, all building debris and scaffolding has been cleared from the relevant areas applicable to the installation.

All doors maintaining access to areas to 'live' equipment are locked and the keys are retained for safe keeping by the designated responsible person who will only issue the keys to authorised persons. (The usual security access to such areas is one of a 'permit to work' arrangement).

All curtain walling, block work, dry linings, painting and general building finishes have been completed and builders- work holes for electrical services have been made good.

All ceiling works are complete, except for access areas to be left down for commissioning of other trades.

All dust generating activities by other trades are generally completed and all relevant areas of the building have been cleaned.

In the electrical riser cupboards all slabs are back filled and doors in place and lockable.

Where the Electrical Services pass through a fire wall or floor all fire barriers have been installed.

Testing and Commissioning Procedures: Main Switchgear and Control Gear

Testing of Electrical Switchgear and control will be carried out at both works and site level.

a) Factory Inspections

All Main Electrical Switchgear will be inspected and tested at works prior to delivery on site.

The Switchboard(s) will be factory tested, fully assembled in its final form with all functional components fitted and operational.

The Electrical Contractor will ensure that the Electrical Switchgear will be ready for such inspections and receive written confirmation from the supplier that the panels are complete for testing purposes. Prior to any works visit, all factory test results will be submitted to the BAM Engineer for inspection.

BAM Engineers will attend all panel inspections and due allowance is to be made within the Electrical Contractors costs at the time of tendering for associated expenses.

The following is intended as an agenda for all works inspections:-

Review the Main Electrical Schematic

Review the supplier’s drawings, ensuring that the panels have been built to the latest and approved drawings

Review the Specification to ensure compliance with the as built panels

Check that the test area has been secured and any testing will be conducted in a controlled manner.

Review of instrumentation used and Calibration dates

Check all busbars are securely mounted and all insulated supports are in place. Check that all of the

following connections are secure and tight:

1. Terminations, connecting links and jointing sections of busbars to be 'torqued' to the required bolt manufacturers settings

2. Between the main incoming terminals and incoming circuit breakers or switches

3. Between incoming circuit breakers and main busbar

4. Between main busbar and outgoing circuit breakers and main busbar link bolts

5. Between outgoing circuit breakers and outgoing terminals

6. Incoming and outgoing cables to the respective terminals

Check that all panels are fixed and all fixings are complete.

Doors are hanging true, labels are fitted and Earth Tags with associated leads are securely connected

Check that the outgoing cables can be effectively routed and working space is afforded.

Check that the outgoing cables can be effectively earthed.

Check that the main earth bar is continuous and connected to frame.

Check that the panel's instrumentation fuses are correctly rated and fitted.

Check the mounting of, and terminations of factory wiring and connections to all components.

Check equipment is free from dampness, foreign matter and dust.

Check for provision and fitting of arc shields, operation of shutters and door interlocks.

Check overload trips are in accordance with required thermal and magnetic settings.

Check that all safety barriers are in place and that no live parts are exposed on opening panel doors to gain access to circuit breakers.

Check ratings of circuit breakers or fuses of respective loads.

All main switchgear to have the following tests carried out after the above checks have been completed.

1. 2.5KV for 10 seconds.
2. 1000 v insulation test.
3. Multi meter Circuit continuity and connections.
4. Flash Test at 2.5 K.V

Documentation

a) Torque settings
b) Test certificates
c) Calibration Certificates for equipment used.
d) Inspection report

Check the delivery requirements, ensuring that the panels are provided with lifting lugs, that they are protected both for transportation and for site positioning.

b) Site Installation

The Electrical Contractor will make due allowance for the specialist Panel Manufacturer to re-assemble the panel on site and to fully replicated on site all the factory tests as mentioned in 1-4 above. The Electrical Contractor will also ensure that all associated documentation as mentioned in a) – d) above is fully completed and submitted.

All switchgear shall have the following checks carried out before energising:

Check all busbars are securely mounted and all insulated supports are in place. Check that the following connections are secure and tight:

(a) Terminations, connecting links and jointing sections of busbars to be 'torqued' to the required bolt manufacturers settings

(b) Between the main incoming terminals and incoming circuit breakers or switches

(c) Between incoming circuit breakers and main busbar

(d) Between main busbar and outgoing circuit breakers and main busbar link bolts

(e) Between outgoing circuit breakers and outgoing terminals

(f) Incoming and outgoing cables to the respective terminals

Check that all panels are fixed and all fixings are complete,

Doors are hanging true, labels are fitted and Earth Tags with associated leads are securely connected

Check that the cable armouring has been effectively earthed.

Check that the main earth bar is continuous and connected to the external earth system.

Check that the panel's instrumentation fuses are correctly rated and fitted.

Check mounting of and terminations of factory wiring and connections to all components.

Check equipment is free from dampness, foreign matter and dust.

Check for provision and fitting of arc shields, operation of shutters and door interlocks.

Check overload trips are in accordance with required thermal and magnetic settings.

Check that all safety barriers are in place and that no live parts are exposed on opening panel doors to gain access to circuit breakers.

Check ratings of circuit breakers or fuses of respective loads.

Ensure that rubber mats, electric shock notices and voltage danger labels are installed in accordance with the requirements of the Specification and that a copy of the single line diagram is installed within each Switch room in a framed enclosure complete with plastic cover.

All main switchgear and main cables shall have the following tests carried out after the checks are complete.

A 500V insulation resistance test shall be applied at the main incoming terminals of each panel with the main incoming breaker closed and the outgoing breakers open. (Tests made between poles and to earth).

A 500V insulation resistance test is applied to the outgoing cables after ensuring that the load and ends of the cables are properly terminated and are safe for test purposes.

One pole of each outgoing cable is connected to the cable armouring and a continuity tester applied at the other end of the cable to prove initial earth continuity prior to earth loop impedance tests.

1. One- minute power frequency withstand voltage.

2. Phase out across bus-section and check phase rotation.

3. Secondary injection, test all protection circuits.

Upon completion of the above, when the electrical installation is finally completed, load tests (where practical) are carried out on individual supplies, to ensure that loading meet the design calculations and that the meters on the panels are reading accurately.

Re-adjust trips, overloads as required and repeat load test.

Testing and Commissioning Procedures: Distribution Boards
Power and Lighting

Clean exterior of all units and inter-linking metalwork.

Clean out interconnections, check for sign of arcing or overheating of contacts.

Check all fuse-bridges and carriers for sign of arcing. Check that correct grade of HRC fuse link is fitted.

Check correct siting of MCB's/ RCDS/RCBO'S ratings and type numbers.

Verify by Functional testing all RCDS/RCBO'S

Check that phase barriers and safety covers are fitted correctly.

Check all wiring connections for security and cleanliness.

All small power and fixed equipment circuits shall be tested as previously stated.

Check Schedule of Circuits.

Carry out procedures as defined, for checking and testing sub distribution panels and distribution boards.

Ensure that all fire barriers are correctly located and fitted.

Testing and Commissioning Procedures: Lighting Installation

Carry out a general examination of all luminaires for cleanliness.

Check controllers, diffusers and reflectors are clean and correctly adjusted.

Check fixings and suspension for security.

Check all cable connections, internally and externally for security.

Check condition of flexible leads.

Check fuse rating in luminaire.

After insulation and earth continuity tests have been carried out on each circuit, the system shall be energised and the earth loop impedance test carried out at the end of each circuit.

The operation of the lighting control switches shall be checked in accordance with the current Contract Issue Drawings.

Check that correct types and colour of fluorescent lamps are fitted.

Check fluorescent tubes and tungsten lamps for signs of deterioration.

Lighting Levels

In all areas, the Electrical Contractor will measure and record lighting levels and compare with design levels. All recorded results are to be submitted to BAM Engineers for comment.

The Procedure for recording lighting levels will be in accordance with CIBSE recommendations.
The method of measurement will be to use the full grid method of recording results, the minimum number of points based on the room index of the space.

The Electrical Contractor will also complete prior to carrying out the detailed recorded levels a pre-commissioning completion certificate, which will be submitted to BAM Engineers

The Electrical Contractor will complete and submit to BAM Engineers a System Commissioning Completion Certificate, after all results have been reviewed and accepted.

Related Documents:- CIBSE Commissioning Code L :2003
CIBSE Code for Interior lighting

Testing and Commissioning Procedures: Small Power Installation

Check exterior of distribution board and interlocking metalwork.

Check cable armouring is effectively earthed.

Check wiring terminations for tightness, signs of arcing or overheating.

Check correct siting of MCB's, ratings and type numbers.

Check correct siting of RCD's, ratings and type numbers.

Ensure cable identification markers are fitted to all sub-circuit Phase/ Line
Neutral and Earthing Conductors.

Ensure Circuit Chart Schedule is provided at each distribution board.

Check for cross referencing between circuit chart and circuit ways.

Ensure phase/ Line discs provided.

Ensure adequate labelling is provided and fixed.

A 500 volt insulation resistance test to be applied to outgoing cables after ensuring that the load and ends of cables are properly terminated and safe for testing.

Check security of wiring terminations on small power and fixed equipment connections.

Check correct type of finish to outlet provided.

Ensure that correctly rated fuses fitted to fixed equipment circuits.

Check connections to Earthing and bonding of all portable equipment and check
for mechanical damage.

Check flexible leads to small power accessories.

Check operation of all spur units and correct size fuses are fitted.

Check operation of all switched socket outlets and ensure switches and shutters are working correctly.

Check that all fire barriers are correctly located and fitted.

Check operation of all fixed equipment.

Carry out electrical tests as previously defined.

Testing and Commissioning Procedures: Emergency Lighting

Check exterior condition of battery and charger cubicles.

Check visual condition of batteries and level of electrolyte.

Check that external ventilation provided and operating in Battery Rooms.

Check security and tightness of all terminations and links on batteries.

Check that correctly rated fuses are fitted in all sub- circuit distribution boards.

Check that cable identification markers are fitted to all sub-circuit-wiring terminations in distribution boards..

Check that all luminaires are correctly positioned.

Ensure that the L.E.D of all conversion units are visible.

Check that correct lamps are installed in luminaires.

Check the main 230V emergency lighting power source batteries are charged and simulate supply mains failure to ensure correct operation.

Ensure that the installation meets with the minimum requirements for Luminance, Uniformity and duration.

Ensure 'boost' charging facility and automatic change to 'float' charging condition operational.

Check for correct 'Test Key' switch operation of self- contained luminaires.

Ensure that on return to mains supply, charging indicator lamp is illuminated.

Emergency Lighting Completion Certificate

NICEIC Certificate based on Model in Annex B
BS 5266: Part 1: 1999.

The Electrical Contractor will complete the above certificate and provide all provide all related data and documentation in order that the designer can counter sign the relevant section.

This related relevant documentation consists of:

Measurement of all areas in accordance with Annex A of BS 5266

Photometic design data.

Test Instruments used

Testing and Commissioning Procedures : External Lighting

Check security of cut-out in column.

Check security of wiring and terminations in cut-out.

Check access covers of columns are located on hard standing side and fully accessible.

Check support of wiring sheathing in lantern.

Check security of wiring terminations in lantern.

Check for correct colour coding of wiring between base of column and lantern.

Check for security of all Earthing cables.

Check correct capacity of fuse fitted.

Check condition of column and lantern.

Check lanterns are correctly orientated with road.

Check operation of lighting and correct switching.

Check operation of photo-cell units.

Check operation of time switch controls.

Measure and record lighting levels and compare with design levels. Record all results.

Testing and Commissioning Procedure: Fire Alarm Installation

Upon completion of the installation and associated zone wiring, carry out electrical tests as previously defined in previous Section.

The Equipment Specialist shall carry out commissioning of the fire alarm system. in accordance with the Equipment Manufacturer's commissioning procedures.

Upon completion, the following checks shall be made:

Check correct positioning of equipment.

Check security of wiring terminations.

Check zone chart provided.

Check operation of complete system:

Test each break glass unit.

Check operation of each smoke detector, duct probe using approved manufactures smoke injection equipment.

Test each heat detector.

Check operation of remote indicator lights.

Ensure correct labelling provided adjacent to remote indicator lights.

Check operation of each sounder.

Test sequential operation of interfacing with heating and ventilation control equipment.

Test operation of Fireman's override switch.

Check operation of repeater panels.

Test operation of auto-dial unit to remote central station.

On completion, the Local Fire Authority are to be invited to site to witness the operation of the system to achieve final approval of the fire alarm system.

Their final Approval Certificate shall be obtained confirming acceptance.

Testing and Commissioning Procedures:

Disabled Person Alarm / Refuge Call Systems

Upon completion of the installation and associated wiring, carry out electrical tests as previously defined.

The Equipment Specialist shall carry out commissioning of the call alarm system. in accordance with the Equipment Manufacturer's commissioning procedures..

Upon completion, the following checks will be made:

Check the operation of each alarm and call point.

Check for correct sound audibility.

Check security of control panel wiring terminations/connections.

Ensure adequate labelling provided.

Ensure mains power supply to equipment is correctly fused.

Check remotely mounted equipment for correct siting.

Check wiring terminations/connections on remotely mounted equipment.

All checks and results to be recorded.

Testing and Commissioning Procedures: Lightning Protection

On completion of the lightning protection installation, the resistance to earth of the whole installation and of each earth termination and each earth electrode should be measured and the electrical continuity of all conductors, bonds and joints and their mechanical condition verified and the results recorded.

1. Check of all conductors, bonds and joints and security to building fabric.

2. The resistance to earth of the lightning protective system shall not exceed 10 ohms.

3. The method of testing the installation is as defined in BSEN 62305 2006

Testing & Commissioning Procedures: Earthing Systems

Upon completion of the various Earthing systems, carry out electrical tests as previously defined.

Testing & Commissioning Procedures:

Electrical Supplies associated with Mechanical Services

Upon completion of the installations to motor control centres and items of mechanical equipment, electrical tests are to be carried out as previously defined.

The Specialist shall carry out commissioning of the Mechanical Control Panels in accordance with the Specialist's commissioning procedures.

Testing & Commissioning Procedures:

Electrical Supplies: Lifts

Upon completion of the installations to motor control centres and items of mechanical equipment, electrical tests are to be carried out as previously defined.

The Lift Specialist shall carry out commissioning of the installation in accordance with the Specialist's commissioning procedure

APPENDIX 5 – KINGS CROSS BUILDING B2 ELECTRICAL TECHNICAL SPECIFICATION (AS PRODUCED BY GRONTMIJ)