Facilities, Residential and Commercial Services

Project Electrical Briefing Document

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**Introduction**

This document sets out the broad standards required of Electrical Design Engineers commissioned to undertake design (as defined by the Construction (Design and Management Regulations) for alteration, refurbishment, and new build works on behalf of the University of Liverpool.

The Directorate of Facilities, Residential and Commercial Services at the University of Liverpool (UoL) is responsible for maintaining the University building stock and, therefore, has an active interest in any new build or refurbishment project undertaken. This Project Electrical Briefing Document has been produced to provide guidance to Electrical Design Engineers on issues that would influence the sustainable installation, the build process, operation, and future maintainability. It also provides a useful guide to designers on how to organise various project related tasks. It is not intended to be exhaustive in its recommendations but shall be considered as a guide to standards required, and issues to be addressed during the life of any project.

This Project Electrical Briefing Document provided to aid Electrical Design Engineers and it is not intended to be exhaustive in its content. This briefing document should be read in conjunction with the University’s ‘Electrical Standards’.

Nothing contained within this guidance shall interfere with, or absolve, the Design Team from its professional responsibility for the overall design.

For the design of new facilities or modifications to existing buildings at the University of Liverpool, Electrical Design Engineers are expected to follow legislative standards, the principles of sustainability, industry best practice and their own practice standard specifications.

This document provides guidance to Electrical Design Engineers on the University's preferences for electrical installations.

The University of Liverpool manage a framework of consultants and contractors with the accrued benefits of collective knowledge retention when teams are regularly working with each other, most commonly within the structure provided within the NEC3 form of contract. To manage the design and construction processes, the University and its framework partners work under the operational leadership of a Project Manager. All the team will utilise a change control software tool called Cemar to assist in the effective management of the design and construction process.

If any deviations are intended from this guidance, the Electrical Design Engineer SHALL clarify the principles with the University’s Senior Electrical Engineer.

**Clients brief**

It is the responsibility of the Engineering Consultant to obtain a detailed brief for the work and prepare detailed room data sheets. The brief and room data sheets must be recorded in writing by the Engineering Consultant and ‘signed off’ by the client department.

In a broader based design project with a full design team, the engagement process with the client group will be usually co-ordinated by the Lead Consultant and the University Project Manager.

The 'brief and room data sheets 'will be reviewed by the University Project Manager and the University Services Engineer and approved before commencement of the drawings and specification.
With reference to ‘The Dangerous Substances and Explosive Atmospheres Regulations 2002’. During the development of the brief, any material and situation of this nature shall be immediately be raised with the Project Manager and the Construction Health & Safety advisor. UoL will engage specialist advice, if requested by the design team.

**High Voltage System**
The University operates it’s own 11,000 Volt network involving 4 ‘open’ rings supplying forty substations.

All newly installed substation equipment shall have a minimum of 50% spare capacity.

Transformers are predominantly Midel filled.

Ring Main Units are predominantly Schneider (Merlin Gerin) Ringmaster SF6 Units.

**NO** other equipment is to be installed without the expressed permission of the University’s Engineering Maintenance Manager, Bill Steadman bstead@liverpool.ac.uk.

In normal circumstances, **remote tripping** shall **NOT** be provided to ring Main Units.

**Provision of Earth Fault Relays or Restricted Earth Fault Relays** shall be discussed in every instance with University’s Senior Electrical Engineer.

**Further**
The University benefits from a system of 300Amp or 400Amp Low Voltage, interconnected, fused and switched cables that are used in certain maintenance situations to supply one location from another. The system is operated strictly by the managed by the University Authorised Person.

Please note for many years the University has not utilised Castel key systems on the majority of its installations. Operational matters are controlled by the University’s procedure’s involving the requirement for method statements and risk assessment and ultimately the issue of documentation and the formal release of keys for switch room access. This process is controlled by the University Authorised Person.

Where installations have 2 transformers supplying an LV panel with an open bus coupler, the bus coupler shall **NOT** be Castel interlocked. Operational matters are controlled by the University’s procedures by the Authorised Person.

In terms of new and replacement switchgear safety interlocking shall be reviewed on a case by case basis in conjunction with the Senior Electrical Engineer.

Upon request, the latest issue of the HV/LV distribution schematic No. 450E003 is available for issue to the Electrical Design Engineer. Also available are Campus plans showing ‘indicative’ positions of cables.

Any works involving the University’s High Voltage and Low Voltage, Campus Distribution Systems **MUST** be approved by University’s Engineering Maintenance Manager.

The University’s preferred High Voltage specialist contractor is
D & A Systems Ltd
Contact: Steve Slawson.
Mobile No (+44) (0)7896 525883
Tel No: (+44) (0)1244 530796

No other High Voltage contractor shall be employed without the expressed permission of the University’s Engineering Maintenance Manager.

**Voltage Optimisers**
The University has invested Voltage Optimisers (VO) across the main campus and at Leahurst. Where VO’s have been installed, the nominal single phase voltage will be between 220 and 225 volts.

**Substation / Switch room requirements**
Lighting shall be IP65 fluorescent fittings, which are wall mounted and with separate emergency luminaires.

A minimum of 2 twin, 30mA Passive RCD protected sockets shall be installed within each Substation and Main Switch room.

Substation / Switch rooms shall include the following criteria are met:
- Substation access doors are fitted with University suited lock
- Switch room access doors are fitted with University suited lock
- All relevant signs, labels, and safety notices are installed
- All HV switchgear and transformers to be fully labelled and clean
- All LV switchgear to be fully labelled and clean
- Rubber matting installed as required
- Heating of both shall be -thermostatic controlled, tubular oil filled radiators
- Distribution schematic drawings of size A0 or A1 installed in a frame on the wall including earthing arrangements and cable sizes.
- All protective devices set and commissioned.
- All pipe ducts sealed
- Test certification completed to the satisfaction of the Senior Electrical Engineer.

The room must be:
- Clear of all builders’ debris
- Adequately ventilated
- Floors shall be painted
- Walls shall be painted

No new substation shall be made live without the written approval of the Authorised Person and University’s Engineering Maintenance Manager.

Under no circumstances shall wet services be permitted to through or above HV / LV switch rooms, risers etc.

**Distribution General**
Adequate maintenance access and working space shall be allowed around all switchgear.

All newly installed distribution equipment shall have a minimum of 25% spare in capacity and the number of circuit ways.
All sub-stations and main switch rooms shall be located at ground floor or basement level and be directly accessible from outside.

All sub-switch rooms/risers etc. shall be accessible from circulation spaces.

The Standard Electrical Specification details other specific criteria required in respect of electrical sub-stations, main switch rooms, main switchgear, cabling methods, and distribution equipment.

Adjacent to each Distribution Board and Switchboard a single socket shall be installed, the socket shall be on a 20A radial circuit without RCD protection, and marked ‘Test Socket’.

The main LV switchboards for a building shall be Form 4 Type 6. In each and every case, the choice of panel boards must be approved by the University’s Senior Electrical Engineer.

- The preferred method of ‘distribution’ is to use HBC fuse gear with draw able type.
- ACBs will be Schneider, with draw able type
- Moulded Case Circuit Breakers will not in normal circumstances be installed.
- All out going ways must have ‘padlocking’ kits provided.
- A remote enclosure for power factor correction must be used.
- The switchgear is to be adapted to allow for Thermal Imaging of all connections.
- Transient over-voltage protection.
- Incorporate anti-condensation heaters.
- Data connectivity to BMS must be provided for remote monitoring and central collection.
- When installing metering within LV panel-boards and distribution boards, only the following make shall be used:

  ‘Cube 400’ Multi-Function Electricity meter with RS485/422 Modbus serial communications as supplied by
  Northern Design (Electronics) Ltd,
  228 Bolton Road,
  Bradford,
  West Yorkshire,
  BD3 0QW
  Tele 01274 729533
  Web www.ndmeter.co.uk
  Email sales@ndmeter.co.uk
  Or support@ndmeter.co.uk

  Further information can be obtained from Norman Denton, norden@liverpool.ac.uk, telephone 0151 794 3169.

The preferred manufacturer for electrical main switchboards is:
ABB
or equal approved.

**Distribution Boards**
MCB’s or RCBO’s are then employed within the final Distribution Board for final Sub-circuit protection.
The low voltage servicing strategy is to have separate boards for lighting, small power and mechanical supplies.
The preferred manufactures are:
MEM
Crabtree
ABB
Merlin Gerin

Cables are clearly identified within each distribution board by means of cable markers. Provide new boards in any building to match the existing.

All DBs must have ‘padlocking’ kits provided. Barrel locks are not acceptable.

RCDs / RCBOs shall be fault rated to a minimum of 10kA; small power circuits will generally be installed protected by RCBOs whether supplying fixed equipment or socket outlets. Where RCBO type devices are used for final distribution they shall be of the ‘passive’ type. (i.e. They do not trip with a loss of power)

Exceptions to this are circuits supplying medical / chemical refrigerators, fire alarms, security supplies, data racks, and similar high priority equipment.

PCs will normally be protected with RCBOs.

Lighting circuits will be protected by MCBs but in accordance with BS7671.

**Earthing, Lightning Protection and Surge Protection**
The Electrical Design Engineers shall engage a lightning protection specialist shall carry out a risk assessment in accordance with BS EN 62305:2011, in order to ascertain the required level of lightning and surge protection.

The Electrical Design Engineers shall provide resistivity tests of the ground.

The Electrical Design Engineer proposed earthing installation must comply with BSEN 50310:2010. The design shall be fully co-ordinated with:

- General equipotential bonding requirements for buildings as detailed within BS 7671 ‘IET Wiring Regulations’.

Particular emphasis will be placed on surge protection and its design to meet BSEN 62305 Part 4. All surge devices will be manufactured by Furse (ABB). Contact: Joe Ellwood email address joseph.ellwood.gb.abb.com, telephone number 07836 381 398.

**Containment**
Containment will generally be:

Galvanised steel trunking

Galvanised cable tray for power cables

Cable basket for data and phone cables
Galvanised steel conduit for ‘flush’ fitted lighting switch drops and data outlets in accordance with BS7671.

General building systems cabling including security, fire, bms and emergency lighting etc are not to be installed on or within data & voice containment.

Dado trunking will normally be MK or Mita. Careful consideration should be given to bending radii, if Cat. 6 cables are installed. Compliance with DDA with respect to colour differential will be carefully considered for the visually impaired.

‘Screw fixed’ mini-trunking complete with all manufactured bends and plastic conduit is only acceptable for data and phone cabling.

Cables shall not in normal circumstances be laid freely in any way. Cables shall be laid in or on the containment system. If no system exists and it is inappropriate to provide one, cable must be clipped or carefully tied.

**Cabling**

Single cables will be 6491B (LSF) enclosed in steel trunking and conduit and armoured cables will be XLPE SWA LSF or XLPE SWA PVC if buried in trenches.

‘Enhanced’ soft skinned cable complying with BS5839 Part 1: 2013 will be used to interface door access systems to fire alarm panels as appropriate.

Twin and earth cabling shall only be used in exceptional circumstances with the approval on a project basis by the Senior Electrical Engineer.

**Accessories**

Accessories must be of a high quality and will be MK or Crabtree.

**Labelling**

ALL accessories, switches, sockets and isolators etc for both lighting and power will be clearly labelled with a Dyno type label giving the DB and circuit reference.

**Hand Dryers**

Hand dryers will be high performance models shall be Dyson Airblade or equal approved. Exceptions when applied to child and disabled facilities.

**Lighting**

At the concept stage the lighting designer shall undertake a formal presentation including visualisations to the design team and the University user group.

Luminaires will predominantly be LED. Consideration should be given to energy savings and pay-back periods and this should be discussed in full with the Project Manager for the works.
Luminaires should be selected from ‘popular’ manufactures with replacements and spares being readily available.

The use of Tungsten Dichroic fittings, of any voltage, is expressly discouraged and alternatives shall be considered.

The provision of energy saving control to the lighting installation is a requirement on all scales of project. Standalone control is preferred against larger ‘networked’ systems.

Where energy saving system is installed, consideration should be given to providing switches that will provide local control to the user, i.e. the switch can override the system to off. This will also provide a facility to switch the fitting(s) off for maintenance.

The University prefers stand-alone technical solution:
Exor (Honeywell) or equal approved.

Presence detectors shall have a power consumption of 150mA and be complete with a relay even when controlling digital ballasts. This will ensure the quiescent power is kept to a minimum and help reduce the base load of a building overall.

Where switch override is provided then the preferred type of detection would be absence with a recovery facility. Absence recovery provides the safety feature of enabling the luminaries to switch ON automatically if the lights have timed out, negating the user having to walk to the switches to bring them back on.

Large open plan or laboratory areas shall be provided with auto absence by day with presence by night, overcoming the challenge to locate or use switches under dark conditions.

The PIR shall be provided with a minimum of a 5 year warranty

PIR’s shall be completed with a high definition lens for increased sensitivity and range with an adjustable clip on lens mask that allows infra-red programming to pass through. The lens mask should be used to avoid triggering and refreshing of timers from unwanted traffic outside a designated working zone.

Microwave detector may be required in certain instances.

If Digital Addressable Lighting Interface systems (DALI) are to be installed, surge protection in accordance with BS EN 62305:2006 must be provided. If in doubt, discuss with the University’s Senior Electrical Engineer.

**Emergency Lighting**
Emergency lighting shall be designed to BS 5266-1:2011 and most projects will not normally be central battery.
Emergi-lite 3 Hr non-maintained 3 cell SELF TEST bulkhead fittings wired from the local lighting circuit. The fittings should be semi-recessed if possible. These fittings can be bought for UoL schemes under Quotation No Q51825 Cat No STXXW23111.

Combined “lighting/emergency lighting” fittings shall NOT generally be used.
Combined “lighting/emergency lighting” fittings are acceptable for stairways.

**Fire Alarm Systems**
The electrical engineering consultant when applicable shall develop a ‘cause and effect’ schedule this shall demonstrate the interdependences and system operation.

The schedule may include:

- Zonal operation of sounders
- HVAC operations and BMS
- Smoke dampers
- Smoke extract
- Fire curtain
- Automated fire extinguishers
- Lifts
- Security
- Access Control

Advice on the level of protection for any particular scheme should be sought from the University's health & safety advisor responsible for fire risk assessment under the ‘The Regulatory Reform (Fire Safety) Order 2005’ via the Project Manager. However in principle the following is the Universities approach:

a) **Non Residential Property**

For the level of protection provided will be L4-L5 in accordance with BS 5839 Part 1: 2013.

L4 to BS5839 is the use of Automatic Fire Detection (AFD) to protect escape routes. L5 to BS 5839 Part 1: 2013 provides for additional detection to cover higher risk areas such as switch-rooms and laboratories.

AFD will be installed in voids in accordance with BS 5839, unless a specific project risk assessment undertaken by the University Health and Safety officer deems that it is **not** required.

b) **Residential Property.**

L1 must be provided. Particular care will be taken on the choice of the automatic devices and the sensitivity adjustment of the system.

Fire Alarm systems will be:

Morley analogue addressable panels with,

Apollo detectors,

KAC manual call points and,

6” red Vimpex electronic bells.

or equal approved.

Please note that ‘break glasses’ and not re-settable plastic panels should be installed.

In some student residences sounders are used instead of bells.

Cable will be ‘Enhanced’ soft skinned cables in accordance with BS 5839 Part 1: 2013.

If the designer wishes to specify MICC Red LSF sheathed, this shall first be agreed with the UoL’s Senior Electrical Engineer.

Each system signals back to Security Control room in Bedford House, Oxford Street either via a security ‘Transponder’, or increasingly over the University’s data network.
The preferred Fire Alarm contractors are Grainger Fire or equal approved.

**Security**

Security systems within the University are:

Intruder Alarm systems linked to Bedford House, Oxford Street,

‘Computer loops’ for individual PCs for computer labs and teaching centres interfaced with the intruder system,

CCTV as standalone local systems,

CCTV as Campus monitoring linked to Bedford House, Oxford Street via fibre optic cables or the University’s data network,

Card access systems that are interfaced to the fire alarm system to ‘fail-safe’ and are linked to Bedford House, Oxford Street for programming etc.

Car park traffic barriers, pay machines with intercom are linked to Bedford House, Oxford Street for control and programming (**Parkcare**).

All security systems should be installed by **Gemini Security** who are the term maintenance contractor at the time of writing (**JANUS** system).

Gemini Security Systems
49 Whiteside Road
Haydock
St Helens
WA11 0XN
Telephone: 01744 600 483
Contact: Alan Lesbirel email address alan@gemini-security, mobile 0797 3247982

**Data and Telephones General**

Many of the buildings on campus employ a ‘structured-wiring’ system and this should be considered for any projects of significant size.

**Telephones**

In general telephone wiring and sockets may be installed locally by the electrical contractor.

All new systems are planned to be VOIP.

The University’s Telephone Services department retain strict control of termination at Distribution Points.

The University has a mixture of CW1308 cabling to local Floor Distribution Points and structured Cat. 5/6 wiring back to data cabinets.

The designer shall discuss the requirements of the scheme with the Telephone Services Manager at the earliest opportunity.
The Telephone Services Department will place charges on new connections/lines and transferring of connections/lines and these charges need to be assessed in conjunction with the Project Manager.

Important
Under no circumstances shall data cabinets be located in electrical switch rooms.

Data
Data wiring shall be installed in accordance with the Computer Service Department (CSD) “Standard Cabling Specification”. This important document clearly identifies rack and cabinet layouts.

The engineering consultant shall discuss the requirements of the scheme with the CSD Network Manager at the earliest opportunity. This will include the location(s) of the appropriate data cabinet(s) and the choice of Cat 5E or Cat 6 cable.

The engineering consultant shall plan and fully co-ordinate all containment routes for data and voice.  

A separate set of data and voice co-ordination drawings shall be produced showing what cables are enclosed or laid upon what tray and trunking. Particular emphasis is placed on the co-ordination and selection of containment below a ceiling line.

UoL has a preference for the use for the use of enclosed containment systems in areas of a building which are visible to students and staff.

The drawing must show all outlets and the position of patch panels. This containment drawing set must be approved by CSD representative and the Lead Consultant.

Wiring may be undertaken by the electrical contractor but termination at both the patch panel and the sockets, and testing must be by a specialist contractor approved by the University’s Computer Services Department (CSD).

RJ45 data sockets will normally be wired as dual sockets, with 2 No LSF cables.

CSD will place charges on new data activations and these charges need to be assessed in conjunction with the Project Manager.

Any active data socket that needs to be transferred, even from building to building will normally be re-activated by CSD free of charge. Clearly wiring will not be included in this free service.

In dedicated data rooms a new facility will be provided to an open rack.

All new installations Ethernet switches to be power over internet (POE) and WiFi.

All projects to consider the application of fibre optic cabling in consultation for CSD.

It should be noted that UoL Computer Services Department provide Design and Installation Guidance Documentation which the Design Engineer and Contractors shall comply.

Important
Under no circumstances shall data cabinets be located in Electrical Switch rooms

**Consultant Specification and Engineering Preliminaries**
University of Liverpool operates a framework agreement with a number of Engineering Services Consultants and Contractors on standard terms and conditions.

The Engineering Services Consultant shall **not** issue contract preliminaries without the approval of the Project Manager and the Senior Electrical and Mechanical Engineer.

**Design Programme**
When the Engineering Services Consultant is part of a design team. The development of the client brief will involve all consultants input.

The normal sequence of design will involve the production of Room Data sheets (RDS).

The Engineering Services Consultant will be required to issue drawings for construction and update during the construction period as changes and the project information develops. These drawings must be marked as construction issue. Terms such as contract issue are not acceptable.

The Engineering Services Consultant shall not under normal circumstances issue drawings for construction purposes to the Contractor unless the Lead Consultant (usually Architect) has issued a formal construction issue of co-ordinated ceiling plans and room elevations for review and development by the Engineering Services Consultant.

When preparing drawings for construction, prior approval from the Lead Consultant, University Project Manager, and Senior Electrical Engineer shall be requested before formal distribution.

**Project Milestones**
The Engineering Consultant will follow the RIBA work stage process to develop the design. The following are key milestones to be developed within his programme.

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<td>Discrimination and co-ordination study</td>
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<td>Fire, BMS, Control and Security Strategy</td>
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<th><strong>Development</strong></th>
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<td><strong>Development of commissioning strategy for the project.</strong></td>
<td><strong>Approval required by the Project Manager and Senior Mechanical &amp; Electrical Engineer.</strong></td>
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**Construction deliverables**

| **Review changes from tender to construction issue.** | **Approval required from Project Manager and Senior Electrical Services Engineer to issue.** |
| **Construction issue updates** | **Review and appreciate reasons for change.** |

**Training, Commissioning and handover**

| **Review and comment on contractor commissioning results.** | **Consultant approval milestone. UoL to approve stage contractor payment.** |
| **Produce snagging list.** | **Consultant approval milestone. UoL to approve contractor stage payment.** |
| **Review and comment on the Contractors as fitted drawings-status. When the review process complete advise UoL.** | **Consultant approval milestone. UoL to approve contractor stage payment.** |
| **Review and comment on the Contractor operation and maintenance documentation. When the review is complete and advise UoL.** | **Consultant approval milestone. UoL to approve contractor stage payment.** |
| **Completion of the Training Programme** | **Joint Consultant and University sign off.** |

**12 month defects**

| **Final snagging** | **Retention release dependant on Consultant approval.** |

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**Drawings**

New drawings will be in accordance with the University’s CAD standards; however, exceptions for the Consultants own QA processes can be made on formal request to the University Document Control Manager.

‘Existing’ electrical drawings may be available.

Please contact the University Document Control Manager Duncan Lambert
Telephone 0151 795 9030 Ext. 59030, email address is dlambert@liverpool.ac.uk

**Design Drawings**
Design drawings must be of sufficient standard and detail, so they can be used in most circumstances as installation s/working drawings.

Exceptions to this may be ductwork drawings or other specialist works but in every case this must be agreed between the Designer and the Project Manager.

Issues of co-ordination of buildings and services are in the first instance the responsibility of the Design Team.

Design development drawings should be submitted to the project manager and engineer for comments in adequate time for their review and amendment.

**Working/ Installation Drawings**

The practice of requiring the contractor to produce ‘working drawings’ for approval is not permitted by the University without the prior approval of the Project Manager and the Senior Electrical and Mechanical Services Engineer.

**As Fitted Drawings**

As fitted drawings must be in accordance with the University’s CAD standards. Within his specification the engineering consultant shall make reference to that the Services Contractor producing a set of as fitted drawings. The engineering consultant will release his last set construction issue CAD files to enable the contractor to complete this task.

The drawings must be provided in paper form and on disk as part of the Handover Information at the completion of the scheme.

**O&M Information**

The Engineering Services Consultant Specification will identify the requirement for the Contractor to provide as follows:

The Engineering Services Consultant shall include a specification for the contractor to produce a set of O&M deliverables in SEARCHABLE digital format.

The manuals shall comply with The Building Research and Information Association (BSRIA) publication ‘Operating and Maintenance Manuals for building services Installations’. Unless otherwise stated the manuals shall be prepared to Class ‘D’.

The manuals shall include:-

- Full set of ‘As Fitted Record Drawings’ in paper and searchable Auto-Cad electronic formation for a CD/ DVD.
- Full description and commentary for each system
- Schedule of all equipment including luminaires.
- Maintenance schedules (quantity, location and the frequency of intervention for planned preventative maintenance).
- Recommended spares.
- Health & Safety File.
- User Guide.

The commissioning test results, as applicable, shall include:

- Documentation required under ‘Dangerous Substances and Explosive Atmospheres Regulations 2002’.
Discrimination and Co-ordination study (Consultant Information).
Cable Schedule
Breaker setting schedule
Distribution board charts
Electrical certification
All relevant fire alarm certification
Emergency lighting certification.
Lightning protection test results.
Specialist equipment certification.

The Engineering Services Consultant will be responsible for checking that the O&M package including drawings accurately records his design, accuracy, statutory requirements and the University requirements. The documents will include sufficient information to operate and maintain the services installation before issuing to the University.

In addition, the Engineering Services Consultant will upload the final project commissioning data as list above to the appropriate folder on the UoL electrical test share point site page.

Link below:
https://vocal.liv.ac.uk/sites/electricaltesting/Project%20As%20Fitted%20Test%20Sheets%20and%20Distribution%20Boa/Forms/AllItems.aspx
Access to the site can be arranged by contacted the Senior Electrical Engineer.

On completion of all documentation, the Engineering Services Consultant shall raise a formal approval note to inform the University to release payment to the Services Contractor.

Training
The Electrical Design Engineer shall ensure that training is provided as part of the works for the University of Liverpool staff and maintenance contractor teams. Typical systems may include:

- The timing of training shall be included and clearly flagged as part of the main project programme.
- BMS, alarms and plant conditioning.
- Optimisation and management of systems
- Lighting controls.
- Fire systems and Emergency Lighting.
- Energy monitoring
- Cabinet’s configuration.
- Mechanical plant.
- Electrical setting of protective devices and automatic change over.
- Generator and load banks.
- Security and access systems.

Health and Safety General
Information on the University’s H&S policy can be found on www.liv.ac.uk/safety/.
The health and safety adviser for construction works can be contacted for further information at crowes@liverpool.ac.uk on telephone 0151 794 3172
Asbestos
The University has an on-going programme of surveying, recording and mitigation of asbestos issues. Much Management Survey information (Type 2 Survey) and Demolition Survey information (Type 3 Survey) is available in electronic format. Enquiries should be made as a matter of routine for each scheme as early as possible in the project with appropriate investigation and surveys being undertaken in liaison with the project manager.

The University has a Policy document on asbestos which must be adhered to.

Further information is available from Facilities Management’s asbestos specialist shall@liverpool.ac.uk on telephone 0151 795 9098.

Access to Electrical Engineering Facilities
Permission for access to electrical switch rooms and substation shall must be sought only from the University’s Authorised Persons. The consultant and contractor will follow the documented procedures.

Contact details below:
Dale Marshall Site Senior Authorised Person 07970 247605
Rob Henharen Site Authorised Person 07970 247233

Lifts
A Permit to Work is required to access and work in any Lift Motor Room.

Electrical Shutdowns
Electrical shutdowns of buildings can be extremely disruptive, if they are not well planned, and it is essential that faculty communication and arrangements are put in place which often require the provision of temporary supplies by the Consultant and Contractors.

Project Managers / Contractors are required to submit a request for a Permit to Work for an electrical shutdown to the Authorised Person.

The formal request shall be submitted with a minimum of 14 working days’ notice (for certain buildings this period maybe much longer) to the Authorised Person.

Out of Hours working
If out of hours working becomes necessary in the execution of the project it may be necessary to arrange for a University Building Manager to be in attendance. This will incur an internal charge of approximately £35 per hour which must be accounted for within the scheme budget.

Definitions
Project Manager – University appointed design and construction lead.
Lead Consultant – On multi-disciplinary projects, usually the Architect.
Electrical Design Engineers – Engineering Services Consultant or Design & Build Contractor undertaking design of electrical services on behalf of UoL.
University Services Engineer - Mechanical & Electrical.
Notes
The Electrical Design Engineers attention is drawn to the following:

1. **BS7671 Regulation 341.1 – Maintainability**
The Electrical Design Engineer shall make a formal assessment in accordance with 341.1

2. **BSEN 50310:2010 – IT Installation.**
   ‘Application of equipotential bonding and earthing in buildings with information technology equipment’

3. **BS7671 Regulation 521.11.201 – Wiring Systems to Escape Routes**
   Wiring systems in escape routes shall be supported such that they will not be liable to premature collapse in the event of fire. The requirements of Regulation 422.2.1 shall also apply, irrespective of the classification of the conditions for evacuation in an emergency.