

CODE OF PRACTICE FOR SAFE WORKING ON LOW VOLTAGE ELECTRICAL SYSTEMS

Context

This document applies to works carried out on all electrical distribution systems under the control of Estates and Facilities and applies to all persons undertaking works on the same.

University staff not appointed by Estates and Facilities are not permitted to work on any University fixed electrical installations.

Reference should be made to the University safety guide:-

Safety Guide 11 ‘Safe Working with Electricity.’

Amendments and Revisions

This document remains valid until January 2016, at which time it shall be reviewed.

This document is Version Number 1.4

Date	Comment	Name	Next Review Date
1/3/10	Uncontrolled issue to Contractors for information only	DGRY	
13/4/11	First controlled issue	DGRY	
MAY2015	Updated re- issue	DGRY	
June 2015	Updated re-issue following minor revisions	DGRY	June 2016

CONTENTS

1	INTRODUCTION	4
1.1	Purpose of This Code of Practice	5
1.2	LV Duty holder	5
1.3	Safety Objectives	5
1.4	The University of Reading Health & Safety Policy	5
2	DEFINITIONS	6
2.1	Electrical Installation and Components	6
2.2	System Conditions	7
2.3	Persons	8
2.4	Documentation	11
2.5	Status Labels on Electrical Equipment	12
2.6	Safety Locks	13
2.7	Statutory Regulations for Safe Working	13
3	Procedures for Safe Working	13
3.1	General Procedure for Appointing Authorised Persons	13
3.2	General Procedure for Appointing Authorising, Authorised and Competent Persons	13
3.3	Work Prior to Energisation	14
3.4	Energisation of Equipment	14
3.5	Work on Live Equipment	14
3.6	Low Voltage Permit to Work – (Initial Energisation of Supply)	15
3.7	Authorisation to Test Live form (YELLOW form Appendix 3.3)	17
3.8	Making LV Electrical Equipment Safe for Working on	17
3.9	Safety Precautions Prior to Starting Work	19
3.10	Safety Precautions After Completing Work	19

3.11 Access by Other Trades	200
3.12 Work on Live LV Electrical Equipment	20
3.13 Absence of Permit to Work Holder	21
3.14 Transfer of System Control - (RED form, Appendix 4)	22
3.15 Excavations and Groundworks	23
3.16 Electrical Inspection and Testing	23
Appendix 1 Hierarchy of Control and Authorisation	24
Appendix 2 Internal Electrical Authorisation to test live	25
Appendix 2.2 Authorisation to Work – flow diagram	27
Appendix 2.3 Authorisation to Text Live - Document	28
Appendix 3 Transfer of System Control Document	29
Appendix 4 Certificate of Isolation Document	30
Appendix 5 Permit to Work Document	31
Appendix 6 Limitation of Access Document	32
Appendix 7 Certificate of Appointment Document	33
Appendix 8 Legislation	34

1 INTRODUCTION

1.1 Purpose of This Code of Practice

This Code of Practice is intended to give guidance to any persons working on the LV electrical distribution systems within The University of Reading Estate.

It is to be implemented by all University of Reading personnel, Contractors and Sub Contractors to ensure:-

-
- The safety of all personnel engaged in electrical work.
- The adequacy and effectiveness of electrical installations.
- Compliance with Statutory Regulations.

- Compliance with relevant Codes of Practice, British Standards, Standard University Specifications and Industry Best Practice.

Any persons undertaking work on The University of Reading Estate should understand that this Code will be regarded as the minimum acceptable standard even when electrical distribution systems have been transferred to a contractor or a consultant.

1.2 LV Duty holder

The management, control, operation and maintenance of Low Voltage distribution systems in The University of Reading is the responsibility of the appointed LV duty holder who is the Senior Authorising Person (SAP,) see Appendix 1.

The duty holder will be an Electrical Engineer appointed by the Director of Estates and Facilities.

The duty holder will have sufficient technical knowledge and experience to ensure that safe working practices are in place for all works on University Electrical distribution systems.

A Deputy Duty holder will be appointed who will have delegated authority in periods of absence or unavailability of the LV duty holder.

1.3 Safety Objectives

The following objectives are basic to electrical safety:

- To develop, implement and maintain safe working practices which would prevent a person receiving electric shock.
- To prevent risk of burns by avoiding conditions under which arcing could occur.
- To ensure that operatives are fully aware of the specific working environment, working areas, the scope and nature of the work to be carried out.
- To ensure that those assigned to carry out the work are competent to undertake it.

1.4 The University of Reading Health & Safety Policy

This can be located at:-

<http://www.reading.ac.uk/internal/health-and-safety/hs-home-2.aspx>

2 DEFINITIONS

2.1 Electrical Installation and Components

Circuit Conductor

Any conductor in a system which is intended to carry electric current in normal conditions, or to be energised in normal conditions, and includes a combined neutral and earth conductor, but does not include a conductor provided solely to perform a protective function by connection to earth or other reference point.

Conductor

A conductor of electrical energy.

Electrical Equipment

Electrical equipment includes anything used, intended to be used or installed for use, to generate, provide, transmit, transform, rectify, convert, conduct, distribute, control, store, measure or use electrical energy.

System

System means an electrical system in which all the electrical equipment is, or may be, electrically connected to a common source of electrical energy, and includes such source and such equipment.

Extra- Low Voltage (ELV)

A voltage not exceeding 50V ac or 120V ripple free dc whether between conductors or to earth.

Low Voltage (LV) (BS7671:2008)

A voltage exceeding extra-low voltage but not exceeding 1000 volts ac or 1500 volts dc between conductors and not exceeding 600 volts ac or 900 volts dc between conductors and earth.

Low Voltage (LV) Electrical Equipment

Equipment which is normally connected to a low voltage electrical supply.

High Voltage (HV)

Any voltage exceeding low voltage.

High Voltage (HV) electrical equipment

Equipment which is normally connected to a high voltage electrical supply.

Risk Assessment

The identification and characterisation of a hazard, the severity of the harm resulting from the hazard, and the likelihood of it occurring.

2.2 System Conditions

Live

Electrically charged by being connected to a low voltage electricity supply or having a charge retained by capacitance.

Energise

To make LIVE.

Dead

Electrically discharged by being disconnected from any electrical supply and not having any charge retained by capacitance.

De-Energise

To make dead.

On

The status of a switch which is closed or electrical equipment which is live.

Off

The status of a switch which is open or electrical equipment which is dead.

Earth

The conductive mass of the earth, whose electric potential at any point is conventionally taken as zero.

Hazard

An environmental condition providing the potential to cause harm, for example, from moving objects, explosives, combustibles, insecure access, contact with hot/corrosive/noxious/solids/liquids/gases, all forms of energy, etc., which requires specific precautions to be taken.

Danger

Risk of injury or possible risk to health provided by a hazard or from contact with live electrical equipment.

Caution Notice

An approved notice warning of the need for caution against interference with electrical equipment to which it is attached, to prevent such interference causing danger to a working party.

Danger Notice

An approved notice warning of danger to persons approaching the area or interfering with the electrical equipment to which it is attached. The notice should indicate the nature of the danger by wording or by standard symbols.

Earthed

Exposed or extraneous conductive parts that have the potential to impart a touch voltage having the potential to cause harm, or the connection of a live conductor to the general mass of earth to sustain a potential difference between that conductor and earth of effectively at 0V. Connected to earth by conductors of sufficient current carrying capacity to sustain the prospective short circuit current of the equipment without damage, until the protective device has disconnected the circuit, in the event of earthed equipment becoming connected to an electrical supply.

Isolated

Electrically disconnected and separated from live electrical equipment by opening of a switch or disconnection, or removal of part of the circuit.

2.3 Persons

Appendix 1 of this document indicates the hierarchy of control and authorisation approved by The University of Reading, Estates and Facilities, along with accepted designated qualifications and abilities. Reference should be made to Appendix 1 with regards to section 2.3.

Duty holder

Any person who operates, maintains or modifies an electrical system, including equipment is deemed to be a duty holder as defined in Regulation 3 of the Electricity at Work Regulations 1989.

Senior Duty holder

The Vice Chancellor of the University shall be deemed to be the Senior Duty holder and shall make suitable and sufficient provision to comply with the requirements to meet his or her moral, legal and financial obligations.

Authorising Officer (AO)

The Authorising Officer (AO) will appoint a duty holder who is responsible for the control, monitoring, review and auditing of the policies and procedures regarding the management of the electrical systems under the control of The University of Reading.

- The Authorising Officer may cancel any Permit to Work after consulting with the Senior Authorising Person.
- The Authorising Officer may, after consulting with the Senior Authorising Person, remove any locks and safety labels applied by any party to allow the re-energising of any circuit only if it can be proved that it is safe to do so.

Low Voltage Duty holder/Senior Authorising Person (SAP) (See Appendix 1, Table A1.3)

Appointed by the Authorising Officer (AO), the Low Voltage Duty Holder for the University of Reading is the Senior Authorising Person (SAP.)

The LV Duty Holder will appoint:-

- A Deputy;
- Nominated Authorised Persons;
- Authorised Persons;
- Competent Persons.

The Senior Authorising Person and his Deputy are authorised to issue Low Voltage Permits to Work and, in exceptional circumstances, seek leave to the Authorising Officer (AO) to cancel a Low Voltage Permit to Work or reinstate isolated circuits.

Nominated Authorising Person (NAP) (See Appendix 1, Table A1.4)

A person who is authorised by the Senior Authorising Person (SAP) to undertake additional responsibilities in specific defined areas within the management system. The NAP shall have received instruction in the procedure for the implementation and issue of Low Voltage Transfer of System Control documents and Low Voltage Certificate of Isolation & Earthing to the Competent Person (CP.)

A NAP shall have the authority to review certification, design and drawings.

Authorised Person (AP) (See Appendix 1, Table A1.5)

A Competent Person (See Para 2.3.7) who is considered to have the necessary experience, personal qualities and training in order to render low voltage electrical equipment safe. Appointed by the Senior Authorised Person (SAP,) an AP has the skills to effect isolation and reinstatement on complex systems and to comply with the requirements of any Permit to Work.

Competent Person (CP) (See Appendix 1 Table A1.2)

A person who has adequate technical ability, training and experience and who is able to recognise the extent and limitation of their own ability and act appropriately.

This may include contractors who have been given approval by The University to carry out work on The University's systems.

Competent persons have the authority to isolate and reinstate final circuits and to energise circuits after verification.

They have the right to refuse to undertake any electrical work which they consider to be unsafe.

University staff planning, carrying out or supervising electrical installations testing or maintenance work are expected to have completed a minimum level of formal training examples being:-

- ONC or City & Guilds 283 Electrical Technicians courses;
- BTEC National Certificate In Electrical Engineering;
- City & Guilds 2360 Electrical Installations part C;
- NVQ Electrical Installation Engineering Level 3;
- City & Guilds 2381;
- City & Guilds 2391 or equivalent courses.

Where no such formal training exists, an individual's experience may be taken into account when assessing their competency.

Those deemed competent shall be engaged full time on electrical works and shall carry out such work with sufficient regularity so that their competence is maintained.

Contractor

A contractor is any individual or company not directly employed by The University of Reading who is to work on or near to electrical systems that are under the control of The University of Reading. Contractors in this context include Electrical Contractors, Consultants, Designers, Specialist Organisations and Allied Trades.

All electrical contractors working on University Electrical Systems must be a member of a professional body such as the National

Inspection Council for Electrical Installations Contracting (NICEIC) or the Electrical Contractors Association' (ECA.)

Where any works carried out in University owned and operated domestic installations that require notification to Local Authority Building Control, the Contractor shall be a Part P Scheme Member.

As deemed appropriate by the Senior Authorising Person or his deputies, Contractors possessing the necessary competence shall be designated the appropriate authority level necessary for the task to be undertaken.

Allied Trade

Appointed by the Senior Authorising Person, non-electrical personnel who have suitable and sufficient training in safe isolation, electrical awareness, inspection, testing and certification will be permitted to effect simple circuit isolation for the purpose of working on other services affected by electrical energy.

Isolation and resetting of devices shall be restricted to local switchgear such as 13A switch fused connection units and/or plug and socket arrangements. Allied Trades must not reset circuit breakers exceeding 10A.

Where the extent of the work is limited, such as the replacing of lamps or the replacing of plug top fuses for example, the person carrying out the works must have attended an appropriate work specific training course from The University of Reading

Allied Trades shall have familiarity with this code by referring to:-
http://www.reading.ac.uk/fmd/About_FMD/fmd-policy-procedure-guidance.aspx

2.4 Documentation

Low Voltage Permit to Work (See Appendix 6, GREEN Band)

A safety document for use on live low voltage electrical equipment which has not been proved dead.

Issued by a Senior Authorising Person to a Competent Person in charge of work. The Permit shall detail the work to be undertaken, the isolations required and the specific precautions to be taken.

Authorisation to Test Live (See Appendix 3, YELLOW Band)

A safety document for use on or near any location or enclosure where exposed live conductors or terminals are present.

This may only be issued by a Senior Authorising Person to a Competent Person in control of the work.

Before any work of this nature is approved, a specific risk assessment of the activity will have been undertaken and the document shall detail the work to be undertaken and the specific precautions to be taken.

Limitation of Access - Low Voltage Area (See Appendix 7, WHITE Band)

This will be carried out in accordance with The University of Reading High Voltage Access Policy.

See :-

http://www.fmd.reading.ac.uk/For_University_staff/Portals/login.asp?deptKey=BLGM

Low Voltage Certificate of Isolation (See Appendix 5, BLUE Band)

A safety document issued to identify the location of circuits and equipment that have been isolated and the precautions that have been taken to prevent inadvertent re-energisation.

The party receiving the Certificate of Isolation retains the responsibility for all safety precautions and will also have to prove the circuits or systems dead to their own satisfaction.

Low Voltage Transfer of System Control (See Appendix 4, RED Band)

A safety document issued to inform others that the control and co-ordination of electrical systems as identified on the document are under the control of the organisation and therefore outside the operation of The University of Reading.

Safety precautions and safe systems of work become the responsibility of the person or organisation accepting control, and the electrical systems therefore remain hazardous. (**Note the requirement in Section 1.1, paragraph 3.*)

2.5 Status Labels on Electrical Equipment

In the University of Reading electrical systems, distribution boards, LV Switchboards, Motor Control Panels, BMS panels etc., may be fitted with a status label as detailed below :-

Red

This label indicates that a Risk Assessment has been completed and that the equipment does not satisfy the criteria necessary to perform works within it without the issue of an Authorisation to Work Live. The equipment contains exposed live connections that are accessible to those working within the equipment.

Blue

This label indicates that a Risk Assessment has been completed, and that the equipment satisfies the criteria necessary to perform works

within the enclosure without the issue of a Permit or an Authorisation to work.

***NOTE: Any electrical Distribution board, LV switchboard, Motor Control Panel, BMS panel etc., that does not display a status label shall be regarded as being categorised as RED.**

2.6 Safety Locks

A lock with a unique key, used to secure a switch mechanism in the “OFF” or “isolated” position, or to secure a cover to prevent access to live circuit conductors. Whenever safety locks are deployed, caution or danger notices shall be displayed at the same point.

(Multi Clasp/Scissors may also be applied to enable 2 or more locks from different parties to be applied to the same point of isolation. This may be necessary for complex or dependant installations.)

2.7 Statutory Regulations for Safe Working

Legislation relating to electrical safety can be found in Appendix 12.

3 Procedures for Safe Working

3.1 General Procedure for Appointing Authorised Persons

The University of Reading shall appoint Authorised Persons in accordance with the structure identified in Appendix 1.

The University of Reading will have a number of appointed electrical technicians and electricians to function as Authorised Persons.

It is essential to Safe Working that an Authorised Person is fully conversant with the work to be undertaken, has understood the Risk Assessments and recognises the appropriate procedure for the issuing of the relevant Permits and Authorisations to work.

3.2 Nominated Authorised Persons (NAP,) Authorised Persons (AP) and Competent Persons (CP)

The Authorising Officer shall appoint the Senior Authorising Person (SAP).

Suitable and sufficient numbers of Nominated Authorising Persons and Authorised Persons will be appointed by the SAP to ensure that The University of Reading’s electrical systems are operated and maintained in a consistent and safe manner.

Competent Persons will be employed based on their skill, knowledge, experience, attitude and training and the ability to recognise and act on the extent of their limitations.

3.3 Work Prior to Energisation

During the installation of LV electrical equipment the work may be carried out by competent persons as instructed by their supervisor without any specific authorisation as long as no electrical supply has been connected to that electrical equipment and made live.

Prior to initial energising of any LV electrical equipment the AP should determine that the following actions have been completed:-

- The cleaning out of the LV electrical equipment and the removal of any extraneous material;
- The tightening of all busbars and terminal connections;
- A visual inspection and electrical testing of circuits in accordance with BS 7671 Regulations for Electrical Installation, i.e. “Dead tests;”
- That all barriers and covers are in place;
- That the operation of isolators is correct and that any access doors have been secured.

3.4 Energisation of Equipment

The energisation of LV electrical equipment will be authorised at the appropriate level.

Once the electrical supply to LV electrical equipment has been made live, a caution notice shall be attached to the LV electrical equipment.

This notice will be retained in place until the installation, extension or modification work on the LV electrical equipment has been completed and the system returned to normal service.

Outgoing circuits shall be prevented from unauthorised energisation by locking off or the removal of fuses or the fuse transport etc.

3.5 Work on LV Equipment

Work on LV electrical equipment shall only be carried out while it is dead

The following works are specifically prohibited:-

- Disconnection & removal of live incoming supply cables to distribution boards, isolators, etc.
- Any modifications to LV electrical equipment which could give access to live circuit conductors.

- Connection/disconnection of outgoing circuit conductors in LV electrical equipment which gives access to live exposed busbars or terminals.
- Cable jointing on live low voltage cables.

The following switching operations may be carried out by a competent person as instructed by his Authorised Person:-

- Opening of a switch or operation of a control device for functional disconnection of an electrical supply.
- Closing of a switch or operation of a control device for functional connection of an electrical supply.

The following switching operations may be carried out only by an Authorised Person or by a competent person under the personal supervision of a Nominated Authorised Person:

- Opening of a switch and applying a safety lock in the “OFF” or “isolated” position to make a circuit dead for safe working on LV electrical equipment in that circuit.
- Removal of safety locks and closing of a switch to re-energise a circuit after working on LV electrical equipment in that circuit.

Any work to be carried out on LV electrical equipment after it has been made live, which involves the removal of covers, opening of doors, removal of barriers or in any other way makes possible contact with live terminals or conductors, shall be the subject of a suitable and sufficient risk assessment and shall be carried out only under the authority of one of the following:-

- A Low Voltage Permit to Work;
- A Transfer of System Control;
- An Authorisation to Test Live;
- A Certificate of Isolation and Earthing.

3.6 Low Voltage Permit to Work

(GREEN form, Appendix 6)

The LV Permit to Work will be issued by the SAP, who will have ensured that the LV electrical equipment has been made safe. The Permit must be clearly displayed at the point of Isolation during the course of the works.

The circumstances where a Low Voltage Permit to Work must be issued following initial energisation of supplies are as follows:-

- Works associated with the low voltage side of HV transformer, including cables and/or bus-duct to LV switchboard.

- Works on Generators including stored power packs, prime movers for generator, cables and/or bus-duct to LV switchboard.

Works on UPS, supplies including stored power packs, cables and/or bus duct to LV switchboard.

Works on low voltage switchboards inclusive of the incoming bus-section and outgoing circuit breakers, fuse switches, miniature circuit breakers etc.

- Outgoing cables from low voltage switchboard to remote motors, distribution boards, control panels, etc.
- Any work within plant control panels including incoming or outgoing supply and control circuits that give access to exposed live terminals.
- Any construction/maintenance work by other trades in switchrooms where either low voltage and/or high voltage supplies are present.
- Connection, disconnection or maintenance work on plant, distribution boards or panels where local isolator facilities are provided adjacent to or forming part of the equipment.
- Connection/disconnection of outgoing sub-circuit cables from sub distribution equipment with means of isolation by withdrawing local fuses and/or miniature circuit breakers.
- Connection, disconnection, testing or maintenance of sub-circuit cables and connected apparatus associated with lighting, power and motor supplies etc. This also includes lamp replacement. Special precautions may also need to be taken where unusual hazards exist such as separate emergency lighting circuits or where 400 volts (i.e. different phases) may be present at lighting switches.
- Work on sub-circuits for the purpose of low voltage tests, subject to the appropriate live working precautions being taken.

**The foregoing includes new or maintenance work on main switch panels requiring switching operations, locking-off to make safe, fitting of protective barriers, etc. Permits are therefore required when the competent person or the appropriate level of Authorised Person considers that he/she is not in full control of the area due to factors such as:*

- *Equipment to be isolated is outside the room, building, or location of the supply disconnection point.*
- *Undertakings by third parties within the area to be worked on.*
- *Any other reasons as determined by the competent or Authorised Person.*

The issue of LV Permits to Work for the items above are at the discretion of the Authorised Person or Nominated Authorised Person who is responsible for ensuring that the all the risks have been adequately assessed and a suitable methods are in place for the works to take proceed.

3.7 Authorisation to Test Live (YELLOW form Appendix 3.3)

This form shall be used when there is no alternative other than to work in a compartment where live terminals are present.

Before a decision is made to authorise the work the following criteria must be met:-

- It is unreasonable in all the circumstances for the conductor to be dead and;
- It is reasonable in all the circumstances for the person to be at work on or near that conductor while it is live and;
- Suitable precautions (including the provision of personal protective equipment) have been taken to prevent injury.

There are circumstances where it is unreasonable to make equipment dead because of the difficulties it would cause, however if it has been decided that it is unreasonable for the work to be done dead, a risk assessment is necessary in which case this must be carried out by someone with comprehensive knowledge and experience of the type of work and the means of controlling the risks.

3.8 Making LV Electrical Equipment Safe

The Authorising Person shall:-

- Identify the work to be done and any LV electrical equipment and circuit conductors which may be exposed.
- Isolate all circuit conductors, fit safety locks and apply caution notices at all points of isolation, indicating that men are working.
- Where LV electrical equipment may be exposed but cannot be isolated, securely fix barriers to prevent accidental contact and apply Danger Notices indicating the presence of exposed live circuit conductors.
- Demonstrate to the working party that the circuit conductors to be worked on are dead
- Show the working party where any temporary barriers have been applied and indicate the live circuit conductors which have been exposed.

- Issue the appropriate permit detailing the nature of the work and the locations where isolation has or has not been affected, advise where the caution/danger notices are applied and record the name of the person in charge of the working party.
- If issuing a Certificate of Isolation, this must detail the location of isolation points the system etc.
- Confirm that the person who is to receive the permits a fully understands the content and that they sign and receive a copy of the documents

The person receiving the permit should verify that the circuit is dead prior to signing.

The keys to any safety locks applied shall be retained by the person controlling the works.

If the works are of a complex nature involving numerous points of isolation, a permit must be issued for each part of the installation.

Where more than one working party is covered by common circuit isolations, a separate permit will be issued to each working party and all permits will be cleared and cancelled before the removal of all caution and danger notices, removal of safety locks and re-energisation of any circuit conductors.

3.9 Safety Precautions Prior to Starting Work

The person in charge of the working party shall ensure that all safety precautions are established prior to starting work:-

- Any automatic fire extinguishing equipment is switched to manual control, caution notices applied and University Security Control are informed.
- Instructions for the treatment of electric shock are displayed.
- The working party is advised of the location and correct use of the firefighting apparatus.
- Working spaces and access ways in the working area are free from obstruction.
- All electrical equipment to be worked on has been isolated and proved dead by the Authorised Person and caution notices displayed.
- All necessary drawings and specifications required for the work are available.
- All members of the working party are fully briefed and understand the work to be undertaken.

- Members of the working party are competent to perform the tasks assigned to them.
- Should the working area be subject to environmental hazards the permit will identify the same and the specific precautions to be taken.
- All permits have been issued and received at the place at the location, covering the work to be undertaken.
- The working party understand the conditions and parameters of the permits and are made aware that these must not be altered, varied or exceeded.

The person in charge of operatives or a working party shall display at the location of work all permits issued to him until the completion of the relevant work including any necessary testing and the restoration of covers and barriers.

In the instance of a permit covering a large workplace and where there is no single point of work, the person who issues the permit will dictate the location at which the permit should be displayed, including if necessary any duplicates.

3.10 Safety Precautions on completion of works

The person in charge of the working party shall ensure that the following restoration work has been carried out:-

- Waste materials, tools and any other extraneous materials have been removed from inside equipment.
- All terminations are correctly tightened.
- All barriers and covers are in place and secured.
- All LV electrical equipment doors are closed.
- A tool check is carried out and all tools and materials have been removed from the work area.
- All tests have been completed and documented.
- Any automatic fire extinguishing equipment is returned to automatic control, the relevant caution notices removed and the Security Control informed.
- All members of the working party have ceased work.
- All access doors to work area are locked as necessary.

- All permits and other control documents have been signed as cleared and returned to the originator.

The Senior Authorising Person may then close out the Permit to Work, remove the caution / danger notices and remove safety locks.

The circuit may then be energised and the equipment returned to normal service.

3.11 Access by Other Trades

Where works are required on or near High Voltage enclosures access will only be permitted by the issue of a Limitation of Access Permit issued by the High Voltage Senior Authorised Person.

The permit will detail the nature and limits of the work, specific precautions to be taken and record the limits of date and time.

3.12 Work on Live LV Electrical Equipment

Live working shall not be undertaken except where the Senior Authorising Person has issued written instructions to the contrary.

Where such instruction is given an Authorisation to Test Live (ATL) certificate is to be issued to ensure that the working party is fully aware of all possible direct contact with live conductors is possible.

The ATL will only be issued where:-

- When it is not practicable or it is unreasonable to carry out the work with the circuit conductors dead.
- Where other hazards are created by making the conductors dead.
- Where the level of risk involved in working live and effectiveness of the precautions available are set against the need to perform such work whilst recognising the experience and skill of the assigned operatives as directed by the Senior Authorising Person.

Should live work be the only course of action, the following safeguards must be effected by the Senior Authorising Person:

- the use of people who are properly trained and competent to work on live LV electrical equipment safely;

- the provision of adequate information to the person carrying out the work regarding the live LV electrical conductors involved, the associated electrical system and the foreseeable risks;
- the use of suitable tools, including insulated tools, equipment and personal protective equipment (PPE);
- the use of suitable insulated barriers or screens and appropriate warning signage;
- the use of suitable instruments and test probes;
- Ensuring that the working party is accompanied by another person(s) if the presence of such persons would contribute significantly to ensuring that injury is prevented and/or provide assistance in the event of an emergency;
- the restriction of routine live test work (e.g. product testing) to specific areas and the use of special precautions within those areas, such as isolated power supplies, non-conducting locations, etc.;
- Ensuring that there is effective control of any area where there is danger from live electrical conductors.

3.13 Absence of Permit to Work Holder

Should the named person to whom a LV Permit to Work is issued leave the workplace whilst work is in progress then the work must cease.

If it is intended that work should continue after the LV Permit to Work holder has left the workplace, then the LV Permit to Work must be returned to the Senior Authorising Person who will cancel that LV Permit to Work and issue a new LV Permit to Work to the person who will subsequently be in charge of the work.

Should an LV Permit to Work holder leave the workplace without returning the LV Permit to Work for cancellation and it is required that the named work should continue, the Authorising Officer acting on the information provided by the Senior Authorising Person must review the circumstances and the Authorised Person shall review safety procedures detailed in sections 3.8 and 3.9.

The Authorising Officer will then clear and cancel the record copy of the LV Permit to Work himself and record the reason for doing so. A replacement LV Permit to Work will then be issued to the working party in the normal manner detailed in section 3.9.

Every effort must be made to ensure that should the original LV Permit to Work holder return to the workplace, he is made aware that his LV Permit to Work has been cancelled and that no further work must be undertaken in relation to that LV Permit to Work.

The replacement LV Permit to Work must be returned to the Senior Authorising Person for cancellation.

3.14 Transfer of System Control - (RED form, Appendix 4)

This form may be used as may be necessary for operational reasons or to enable construction works to be carried out by Contractors or others working on the University's LV systems. The Senior Authorising Person, his Deputies or Nominated Authorising Person(s) may issue this document.

On issuing a Transfer of System Control the Authorising Person shall be satisfied that the recipient and their delegates have such training, knowledge and resources to operate within the confines of legislation, so that they can safely and without detrimental effect to other parts of the system carry out installation, modification or maintenance work under their own control.

Periodically the issuing person shall conduct site inspections to satisfy themselves that work is being completed in a safe manner and to the satisfaction of The University of Reading Estates and Facilities.

If in the opinion of the Senior Authorising Person, his deputies or a Nominated Authorising Person work is being carried out in a dangerous manner or not in accordance with The University of Reading 'Standard Technical Specification for Electrical Services', the Transfer of System Control may be retracted and control returned to The University of Reading.

At any time, the Senior Authorising Person, his nominated deputies or a Nominated Authorising Person may undertake such actions as deemed necessary to safeguard the safety, health and welfare of employees, Contractors, students, and the general public.

Note By virtue of Section 3 of the Health and Safety at Work (etc) Act 1974, Regulation 3 and Regulation 4 of the Electricity at Work Regulations 1989, the transfer of system control does not absolve The University of Reading or its delegates from their duties and responsibilities imposed or implied by legislation.

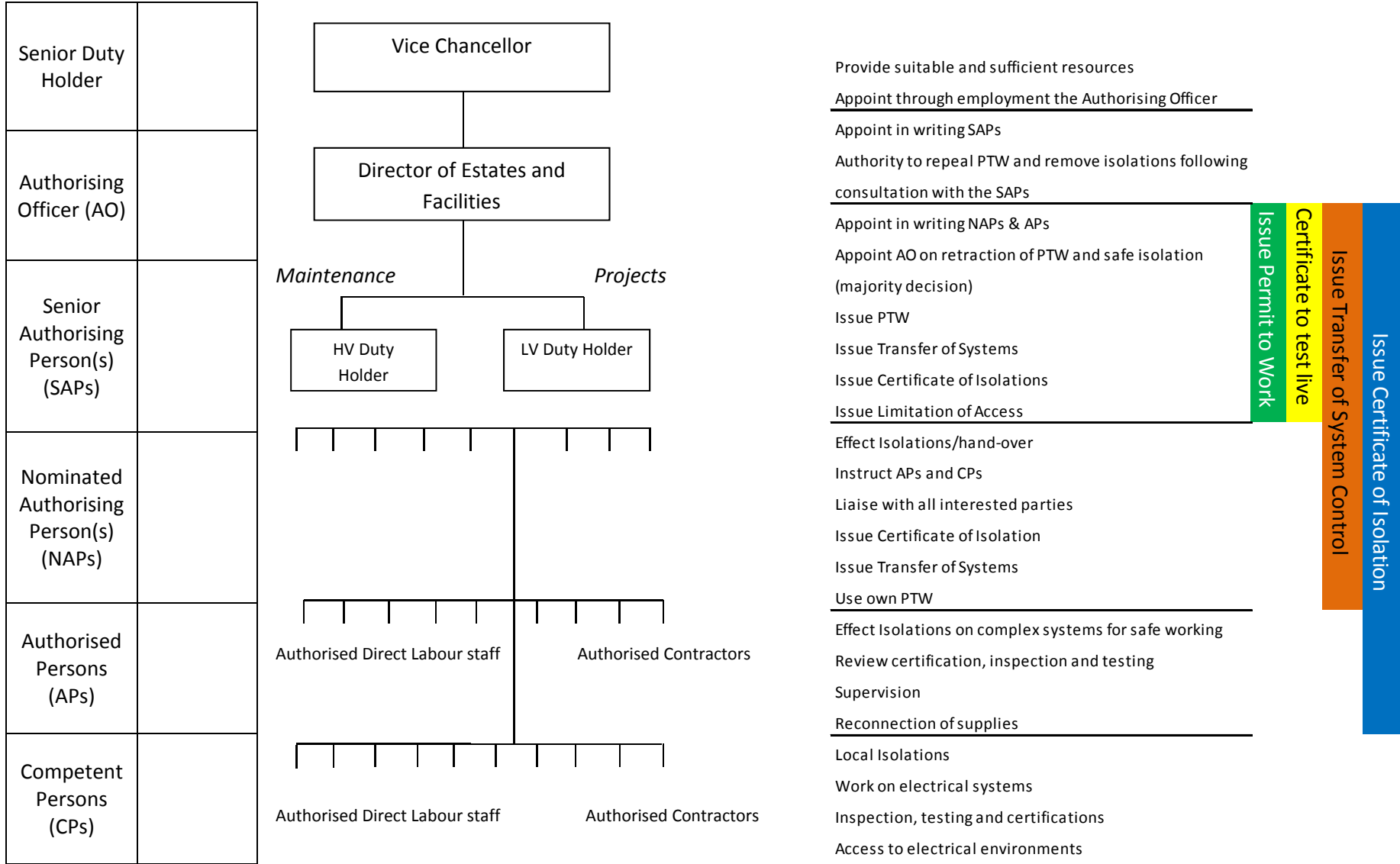
3.15 Excavations and Groundworks

Where excavation, ground-works, piling, structure erection and similar activities are to be carried out, The University of Reading Permit to dig procedure shall be applied.

3.16 Electrical Inspection and Testing

Initial and Periodic Inspection and Testing in accordance with BS 7671 is undertaken continuously throughout the whole of the University Estate. Where a contractor is employed to carry out this task a Transfer of System Control shall be issued to the Contractor for the duration of the inspection and testing period.

Appendix 1 Hierarchy of Control and Authorisation



Appendix 2

University of Reading Authorisation to test live process

The objective of this Authorisation to Work is to ensure a safe system of work is adopted for internal electrical work. Reference to specific safe working procedures i.e. isolation, testing live etc. will be necessary. The Authorisation will highlight the area of work required, a brief description of the work, the hazards involved.

Location Identification

Locations that are deemed to be of medium to high risk, established by risk assessment, will be notified on the permit. The areas will include isolated locations within the site as well as specific electrical plant and equipment. The issuer of the Permit will enter YES or NO in the relevant box.

Description of work to be carried out

A brief description of the work to be done is required in order that the hazard identification section C and necessary precautions section D of the Authorisation can be accurately completed, including equipment/system to be isolated and locked off e.g. the Distribution board reference and sub-circuit number.

Hazard Identification

Recognised hazards involving electrical work will be nominated on the Authorisation and the person issuing the Authorisation and receiver of the Authorisation will agree which hazards apply to the work described above. Once the hazards are agreed the issuer of the permit will enter YES or NO in the relevant box. Environmental hazards etc. should be entered within the 'Other' section.

Necessary Precautions

The necessary precautions required in order to ensure the work is carried out safely will have been established by risk assessment and documented on the Authorisation to Work. At the point where the specific hazards have been agreed it will be necessary for the issuer of the Authorisation and the receiver of the Authorisation to agree the safety precautions that will be required, once established the issuer of the authorisation will tick the relevant box.

Person Issuing Authorisation

The Authorisation to work shall only be issued by an AUTHORISED PERSON. That person's position is to be entered, and date of issue must be entered and apply his/her signature in the box provided.

Time of issue

The time of issue and expected time of completion for the work must be agreed between the issuer and receiver and entered in the relevant boxes of the Authorisation to Work.

Extension

In the event that the recipient of the Authorisation to Work believes that the work cannot be completed during the times entered in section he must contact the issuer before the nominated time elapses. An extension of the Authorisation should be agreed, and entered in the relevant boxes of the Authorisation to Work.

Person Accepting the Authorisation

The competent person shall check and ask for any additions / alterations to be made prior to signing the declaration in acceptance of the Authorisation.

Work Completion Status

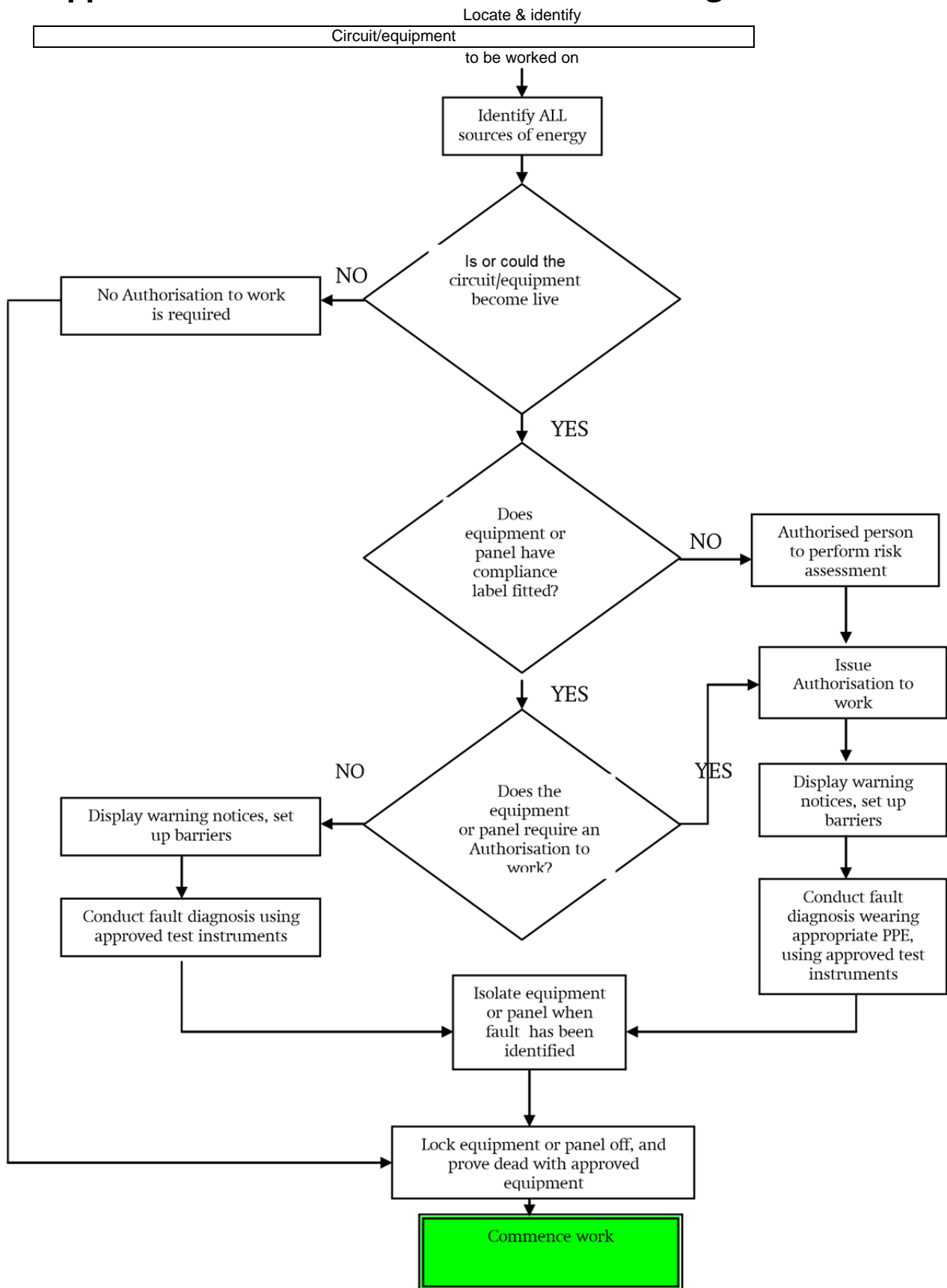
When the recipient of the Authorisation to Work has completed the work task, and is certain that the plant, machinery or equipment has been left in a safe condition he must place a tick in the **YES** box in section I, and complete the signature box of this section. If the work is not complete then he must place a tick in **NO** and move to section J of the Authorisation.

If the work is not completed and it is necessary to leave the system in a de-energised condition, the Authorisation issuer must place a tick in the **YES** box to state that it will remain out of service. The Authorisation will then be signed off for the issued period in the signature box of this section.

Clearance


Cancellation of the Authorisation shall be carried out by the Authorised Person only upon satisfactory completion of the work, or equipment left in a de-energised out of service condition.

Appendix 2.2 Authorisation to Work – flow diagram




Appendix 2.3 Authorisation to Test Live - document


Appendix 3.3 Authorisation to Test Live – Document

Issue No.			
 The University of Reading FACILITIES MANAGEMENT DIRECTORATE AUTHORISATION TO TEST LIVE			
1. ISSUE			
I hereby declare that the person named below is authorised to work on the following equipment and / or system(s) with exposed conductors which are energised for the purpose of obtaining a test result			
Building No.	Location	Equipment	Asset No
person to carry out the works :			
accompanying person:			
employed by:			
the work is necessary for the following reasons:			
and will remain under that person's control until this document has been signed and returned accordingly. This document will expire on _____ (day and date) at _____ (24 hour clock), to which an additional AUTHORISATION TO TEST LIVE document will need to be obtained, if works are to continue beyond the expiry date.			
<i>Senior Authorising Person</i>			
<i>Name (Print)</i>		<i>Signature</i>	
Time		Date	
2. RECEIPT			
I accept this document as a DUTY HOLDER ,scheduled in Section 1 above. I accept responsibility for the setting up and enforcement of safe working procedures and the control of danger associated with the works detailed within Section 1 above and shall ensure that the works carried out by competent persons having the necessary skills and experience and who have been made familiar with the 'University of Reading Low Voltage Code of Practice'.			
I understand the person issuing this document has made no provision to render the installation / equipment safe and that all electrical dangers remain present. It is my responsibility to effect safe isolation before exposing any live part and on subsequent replacement of barriers and covers and to implement company policy, which shall as a minimum be equal to those of the University of Reading.			
<i>Name (Print)</i>		<i>Signature</i>	
Position		Date	
Time		☎ No.	
3. CLEARANCE			
I declare that the work for which this Authorisation to Test Live document was issued is now suspended / complete/ has superseded, and that all persons involved with the project have been withdrawn and will carry out no further work, and that all tools and equipment are clear. I also declare that the transferred part of the electrical system / equipment has been inspected, tested and certified and is safe to energise			
<i>Name (Print)</i>		<i>Signature</i>	
Time		Date	
4. CANCELLATION			
I certify that this document is hereby cancelled			
<i>Senior Authorising Person</i> / <i>Nominated Authorising Person</i>			
<i>Name (Print)</i>		<i>Signature</i>	
Time		Date	
TO BE CLEARLY DISPLAYED AT POINT OF SYSTEM CONTROL			
Distribution : White - Remains in book Pink – To Maintenance within the working day Card – Issued to Contractor			


Appendix 3 Transfer of System Control Document

<i>Issue No.</i>			<h2 style="margin: 0;">The University of Reading</h2> <p style="margin: 0;">FACILITIES MANAGEMENT DIRECTORATE</p> <h3 style="margin: 0;">LOW VOLTAGE TRANSFER OF SYSTEM CONTROL</h3>	
1. ISSUE				
I hereby declare that the control of the following part(s) of the University Electrical System.....				
<u>Building No.</u>	<u>Location</u>	<u>Equipment</u>	<u>Asset No</u>	
has been transferred to :				
employed by:				
for the following reasons:				
and will remain under that person's control until this document has been signed and returned accordingly. This document will expire on _____ (day and date) at _____ (24 hour clock), to which an additional Transfer of System Control document will need to be obtained, if works are to continue beyond the expiry date.				
<i>Senior Authorising Person / Nominated Authorising Person</i>				
<i>Name (Print)</i>		<i>Signature</i>		
Time		Date		
2. RECEIPT				
I accept this document as a DUTY HOLDER for the electrical dangers on the system / equipment scheduled in Section 1 above. I accept responsibility for the setting up and enforcement of safe working procedures and the control of danger associated with the works detailed within Section 1 above and shall ensure that the works carried out by competent persons having the necessary skills and experience and who have been made familiar with the 'University of Reading Low Voltage Code of Practice'.				
I understand the person issuing this document has made no provision to render the installation / equipment safe and that all electrical dangers remain present. It is my responsibility to effect safe isolation and implement company policy, which shall as a minimum be equal to those of the University of Reading.				
<i>Name (Print)</i>		<i>Signature</i>		
Position		Date		
Time		Mobile ☎ No.		
3. CLEARANCE				
I declare that the work for which this Transfer of System Control document was issued is now suspended / complete/ has superseded, and that all persons involved with the project have been withdrawn and will carry out no further work, and that all tools and equipment are clear. I also declare that the transferred part of the electrical system / equipment has been inspected, tested and certified and is safe to energise				
<i>Name (Print)</i>		<i>Signature</i>		
Time		Date		
4. CANCELLATION				
I certify that this Certificate is hereby cancelled				
<i>Senior Authorising Person / Nominated Authorising Person</i>				
<i>Name (Print)</i>		<i>Signature</i>		
Time		Date		
TO BE CLEARLY DISPLAYED AT POINT OF SYSTEM CONTROL				
Distribution :	White - Remains in book	Pink – To Maintenance within the working day	Card – Issued to Contractor	

Appendix 4 Certificate of Isolation Document

Issue No.	
 The University of Reading FACILITIES MANAGEMENT DIRECTORATE LOW VOLTAGE CERTIFICATE OF ISOLATION	
1. ISSUE	
To:	University / Company Name :
Land ☎ No.	Mobile ☎ No.
<p style="color: red; font-weight: bold;">This is to certify that the equipment below has been switched out and isolated. No attempt shall be made to remove the safety devices until the Certificate has been cancelled.</p>	
Site:	Building No:
Equipment:	Asset No:
Points of isolation:	
Remarks:	
Advise: Building Manager <input type="checkbox"/> End User <input type="checkbox"/> I.T. Services <input type="checkbox"/> Security <input type="checkbox"/> Other <input type="checkbox"/>	
<i>Senior Authorising Person / Nominated Authorising Person / Authorised Person</i>	
Name (Print)	Signature
Time	Date
2. RECEIPT	
I acknowledge the receipt of this certificate of isolation	
Name (Print)	Signature
Time	Date
<p style="font-size: small;">In accepting this certificate I understand that whilst isolation has been carried out, the SUPPLY HAS NOT BEEN PROVEN DEAD and no attempt has been made to prevent unintentional back-feeds or the connection of temporary supplies. Furthermore, I understand that my employers code of practice for safe working, including where appropriate the issue of a Permit to Work will apply and shall be followed, this being to a standard at least equal to the policies and procedures laid down by the University of Reading.</p>	
3. CLEARANCE	
<p style="color: red; font-weight: bold;">I declare that all men under my charge have been withdrawn and warned that it is no longer safe to work on the apparatus which is isolated as detailed above, and that all equipment, tools and temporary earth connections are clear; prepared for re-energisation by the Authorised Person.</p>	
Name (Print)	Signature
Time	Date
4. CANCELLATION	
I certify that this Certificate is hereby cancelled	
<i>Senior Authorised Person / Nominated Authorised Person / Authorised Person</i>	
Name (Print)	Signature
Time	Date
TO BE CLEARLY DISPLAYED AT POINT OF ISOLATION	
Distribution : White - Remains in book Pink - To Maintenance within the working day Card - Issued to Contractor	

Appendix 5 Permit to Work Document

Issue No.		 The University of Reading FACILITIES MANAGEMENT DIRECTORATE LOW VOLTAGE PERMIT TO WORK	
1. ISSUED - ON BEHALF OF THE UNIVERSITY OF READING			
To:		University / Company Name	
Land ☎ No.		Mobile ☎ No.	
<p style="color: red; font-size: small;">You are hereby authorised to enter into the undernoted low voltage area or equipment for the purpose herein specified and subject to the terms and conditions specified below, and in accordance with your contract with the University of Reading and/or its representatives.</p>			
a) LOCATION & DESCRIPTION OF EQUIPMENT :		ASSET No:	
		BUILDING No.	
b) PERIOD OF VALIDITY		from	to
c) WORK TO BE CARRIED OUT:			
d) POINTS OF ISOLATION : Are applied @			
▪			
▪			
▪			
e) SAFETY PRECAUTIONS ALREADY TAKEN BY THE UNIVERSITY OF READING			
▪			
▪			
▪			
f) SAFETY PRECAUTIONS TO BE TAKEN BY CONTRACTOR			
▪ Enclosure to be locked whenever operatives are not at work inside			
▪ Work to be carried out under continuous supervision of Personal Representative			
▪ At least one competent operative to be present at all times whilst work is in progress			
▪ No switching is to be carried out without authority (<i>other than isolation in case of accident involving danger to life</i>)			
▪			
ALL EQUIPMENT OTHER THAN LISTED ABOVE IS TO BE REGARDED AS LIVE			
Name (Print)		Senior Authorising Person	
Time		Date	
2. RECEIPT			
I certify that I understand and will comply with all the requirements of this <i>permit to work</i>			
Name (Print)		Position	
Time		Date	
3. CLEARANCE			
I certify that I have completed the works as detailed under (c), withdrawn all tools and equipment and have warned all operatives that no further work may be carried out until a further <i>permit to work</i> is issued.			
Name (Print)		Position	
Time		Date	
4. CANCELLED - ON BEHALF OF THE UNIVERSITY OF READING			
I certify that this <i>Permit</i> is hereby cancelled			
Name (Print)		Senior Authorising Person	
Time		Date	
TO BE CLEARLY DISPLAYED AT POINT OF ISSUE			
Distribution : White - Remains in book Pink - To Maintenance within the working day Card - Issued to Contractor			

Appendix 6 Limitation of Access Document

Issue No.

**FACILITIES MANAGEMENT DIRECTORATE
LIMITATION OF ACCESS LOW VOLTAGE AREAS**

1. ISSUE			
To:		University / Company Name	
Land No.		Mobile No.	
Permission is given to carry out the work described below:			
Location:		Access to:	
Work to be done:			
SAFETY PRECAUTIONS APPLICABLE			
a) Plant and Apparatus			
b) Environment			
c) Access/General			
d) Duration	Start	Finish	Key Number
Name (<i>Print</i>)		Signature	
Time		Date	
2. RECEIPT			
I accept responsibility for carrying out the work in accordance with this Limitation of Access and no other work will be done by me or the persons under my charge at the above location.			
Name (<i>Print</i>)		Position	
Time		Date	
3. CLEARANCE			
All persons under my charge have been withdrawn and warned that it is no longer permitted to carry out the work specified on this Limitation of Access. The work site has been left free from hazards and in a clean and tidy state.			
Name (<i>Print</i>)		Position	
Time		Date	
4. CANCELLATION			
This Limitation of Access is cancelled.			
Senior Authorising Person		/ Nominated Authorising Person	
/ Authorised Person			
Name (<i>Print</i>)		Senior Authorising Person	
Time		Date	
TO BE CLEARLY DISPLAYED AT POINT OF ISOLATION			
Distribution:	White - Remains in book	Pink - To Maintenance within the working day	Card - Issued to Contractor

Appendix 7 Certificate of Appointment

UNIVERSITY LOGO

Serial Number

012345

Certificate of Appointment

Section 1 ISSUE	I hereby appoint the person named in section 1.1 to the position indicated in section 1.6 in accordance with the University of Reading Code of Practice.	
	1.1 Name:	1.6 Level of Authorisation:
	1.2 Job Title:	
	1.3 Employer:	1.7 Specific Details of Appointment:
	1.4 Contact Number:	
	1.5 Date of Commencement:	1.8 Date of Expiry:
	1.9 Signed:	1.11 Position:
	1.10 Print:	1.12 Date:
		Acting for and on behalf of the University of Reading
Section 2 ACCEPTANCE	2.1 I hereby accept appointment in the position indicated in section 1.6 and understand the implications of such appointment. I shall duly and diligently discharge my duties as indicated in section 1.7 to the best of my ability; having due regard to the health, safety and welfare of others and myself. _____ (initial)	
	2.2 I have read, understood and retained a copy of the Code of Practice for Safe Working On or Near Low Voltage Electrical Systems issued by the University of Reading. _____ (initial)	
	2.3 I have an understanding of the principles and requirements of the Electricity at Work Regulations 1989 and recognise my responsibilities as a delegate of the university with regards to the Health and Safety at Work (etc) Act 1974; The Management of Health and Safety at Work Regulations 1999 and all subordinate regulations and approved codes of Practice _____ (initial)	
	2.4 Signed:	2.7 Position:
	2.5 Print:	2.8 Date:
	2.6 Acting for and on behalf of:	
Section 3 CANCELLATION	3.1 This appointment is hereby cancelled and the person named in section 1.1 has been instructed to carry out no further works on electrical systems until a new Certificate of Appointment has been issued.	
	3.2 The reasons for cancellation are:	
	3.3 Signed:	3.5 Position:
	3.4 Print:	3.6 Date:
	Acting for and on behalf of the University of Reading	

Appendix 8 :- Legislation

Regulation 13 of the Electricity at Work Regulations 1989 states the following:-

“Adequate precautions shall be taken to prevent electrical equipment, which has been made dead in order to prevent danger while work is carried out to or near that equipment, from becoming electrically charged during that work if danger may thereby arise”.

Regulation 14 of the Electricity at Work Regulations 1989 states the following:-

“No person shall be engaged in any work activity on or so near any live conductor (other than one suitably covered with insulating material so as to prevent danger) that danger may arise unless:-

- **it is unreasonable in all the circumstances for it to be dead, and**
- **it is reasonable in all the circumstances for him to be at work on or near it while it is live; and**
- **Suitable precautions (including where necessary the provision of suitable protective equipment) are taken to prevent injury”.**

The Health and Safety at Work etc Act 1974 legislates conditions to ensure safe working which may be summarised as follows:-

- **It is the duty of every employee while at work to take reasonable care for the health and safety of himself and other persons who may be affected by his acts or omissions at work, and, as regards any duty imposed on his employer, to co-operate with him to enable that duty to be complied with.**
- **It is the duty of every employer to ensure the safety at work of all employees by providing systems of work that are safe; providing information, instruction, training and supervision; maintaining safe conditions and providing safe means of access and egress and providing and maintaining a safe working environment.**
- **It is the duty of the employer to ensure that persons in his employment are not exposed to risk to their safety and it is the duty of a self-employed person to ensure that he and other persons are not exposed to risks to their safety.**
- **It is the duty of any person who erects or installs any article for use at work to ensure that nothing about the way in which it is erected or installed makes it unsafe.**
- **It is the duty of any person who supplies any substance for use at work to ensure that the substance is safe, to carry out any testing and examination necessary and to take steps necessary to secure that there will be available adequate information about tests carried out and conditions necessary to ensure that it will be safe when properly used.**