

ESTATE MANAGEMENT - MAINTENANCE SECTION

Fixed Electrical Installations: Periodic Inspection and Testing

version 1

Title

Maintenance Code of Practice for Periodic Inspection and Testing of Electrical Installations.

Purpose & Scope

The purpose of this Maintenance Policy is to set out specific guidelines to enable University of Cambridge Estate Management to be assured that the electrical safety of fixed electrical installations are inspected at appropriate frequencies, and maintenance standards, to minimise the risk of fire, injury and / or death.

Technical Standard

All works to be carried out in strict accordance with:-

- BS.7671 2008 including all current amendments.
- The Health and Safety at Work Act 1974.
- The Electricity at Work Regulations 1989.
- The Building Regulations Approved Document P: Fixed Installations in Dwellings.

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1. Purpose and Scope of the Maintenance Policy

The purpose of this Maintenance Policy is to set out specific guidelines to enable University of Cambridge Estate Management to be assured that the electrical safety of fixed electrical installations are inspected, and maintained, at appropriate frequencies to minimise risk of fire, injury and /or death..

All fixed electrical installations within the University of Cambridge Estate Management are subject to regular inspection and testing except the categories of installations listed in Section 6.

The scope and requirement for categorisation, testing regime and frequency are defined in Section 8.

2. Fixed Electrical Installations

The fixed electrical installation is the assembly of associated electrical equipment supplied from a common point of origin to fulfil a specific purpose and having certain co-ordinated characteristics.

3. Duties and Responsibilities

a) University of Cambridge Estate Management Employees

To ensure compliance with the Electricity at Work Regulations 1989, the Senior Maintenance Manager assumes the role of Duty Holder, and is responsible for actions and requirements defined by this Maintenance Policy . The Duty Holder may delegate some of the duties to others deemed skilled to aid operational requirements. This will be communicated in written form. Appropriate notice and the likely impact of the testing regime will be agreed with the relevant Head of Department or nominated deputy who will filter this information through to appropriate staff prior to the commencement of any testing.

b) Occupying Departments

To undertake fixed installation inspection and testing, it is necessary to de-energise the electrical supply to the property. All tenants properties where Electrical Inspection and Testing is to be carried out, shall be written to informing them that the electrical installation will require de-energising Accordingly, the tenant shall ensure:

Any requirement to save IT software is identified and actioned prior to the commencement of any electrical operations.

Any contingency arrangements arising from the absence of electrical supplies are facilitated.

Appropriate access and relocation/removal of any obstacles will be undertaken.

All freezers/ fridges contain a minimum amount of perishable food stuffs.

4. Authorised Inspectors and Testers

Only skilled persons as defined by BS 7671 2008 (Requirements for Electrical Installations) including all current amendments will be authorised to carry out Inspection and Testing. They must hold following qualifications:-

- City & Guilds 2382 – Requirements for Electrical Installations – 17th Edition

And

- City & Guilds 2391 - Inspection, Testing and Certification of Electrical Installations

Or

- City & Guilds 2395 - Periodic Inspection and Testing

A person shall be deemed skilled to carry out the appropriate Inspection and Testing only if she/he has sufficient knowledge and experience of the test equipment, the installation being tested and testing procedures.

The Duty Holder must be assured of the technical competence of any Contractor undertaken test and inspection works, prior to appointment. All contractors shall be incorporated with a recognised Electrical Industry registration scheme such as those operated by the NICEIC or ECA. Any contractor must be on the Estate Management Approved Contractors List, prior to undertaking any works.

All persons, University staff and contractors shall be subject to monitoring to ensure appropriate standards are met and maintained.

5. Responsibilities of those carrying out testing

It is the responsibility of those undertaking Inspection and Testing:

- To ensure no danger occurs to any person or livestock.
- To ensure no damage occurs to property.
- To compare the inspection and testing results with the design criteria
- To take a view on the condition of the installation and advise on remedial works
- In the event of a dangerous situation, to make an immediate recommendation to University of Cambridge Estate Management.

The Duty Holder will define the level of skill required by Inspectors and Testers.

6. Repairs and Rectification

Except for undertaking unforeseen emergency repairs whilst carrying out the Inspection and Testing works, no repairs or rectification works shall be carried out by persons or contractor undertaking the testing works. This is to ensure that the testing is carried out completely impartially and to avoid any conflict of interest.

Emergency repairs are defined as those which will have an immediate effect on life safety and will put the business of the University at unacceptable risk shall not commence without first obtaining the correct authority from an appointed member of University of Cambridge Estate Managements staff.

7. Exceptions to the Requirements

Certain electrical installation on the University Estate will not be tested in accordance with this policy. They generally comprise of specialist system that require specialist testing and the works will be carried under separate contract.

Such systems include:-

- All high voltage electrical distribution installations operating at a voltage greater than 1000V ac.
- All extra low voltage system (below 50V a.c. or 120V d.c (ripple free) are exempt from this policy. The following schedule shows typical installation of this type (not exhaustive).
 - o Lift shaft Wiring and Controls
 - o Building Management Systems
 - o Fire Alarm Installation
 - o Central battery operated Emergency Lighting Systems
 - o Telephone and data systems.
 - o Intruder alarm, access control and closed circuit television systems
- All portable appliances, with the exception of stage lighting equipment.
- Lightning protection systems

8. New Installations

All new installations shall be provided with an Electrical Installation Certificate complete with a Schedule of Inspections and Test Results. The documents shall be suitably completed and in full compliance with BS 7671 : (2008) Requirements for Electrical Installations., Guidance Note 1 (Selection and Erection) and all current amendments.

9. Frequency of Inspection and Testing

The frequency of periodic inspection and testing must be determined, taking into account:

- the type of installation
- its use and operation
- the frequency and quality of maintenance
- any external influences to which it is subjected.

Table T1 indicates a suggested frequency of Periodic Inspection and Testing of Electrical Installations and conditions of use, but is subject to an appropriate risk assessment and dependent on the environment and use.

Table T1 - Recommended Frequencies of Inspection of Electrical Installations

Type of Installation	Routine Check	Maximum Period Between Inspections and Testing as Necessary
Domestic accommodation	-	Change of occupancy/10 years
Residential Accommodation	1 year	Change of occupancy/10 years
Commercial	1 year	Change of occupancy/5 years
Offices	1 year	5 – 10 years
Hospitals	1 year	5 years
Laboratories	1 year	5 -10 years
Educational Establishments	1 year	5 -10 years
Leisure Complexes	1 year	3 years
Places of Public Entertainment	1 year	3 years
Restaurants and Hotels	1 year	5 years
Theatres	1 year	5 -10 years
Highway Power Supplies	1 year	5 -10 years
Agricultural and Horticultural	1 year	3 years
Construction Site Installations	3 months	3 months

All buildings shall be subject to a full Periodic Inspection and Test at the prescribed frequency. Partial testing of circuits or installations is not generally permitted. However, should detailed records, test results and drawings be available, the Duty Holder may relax the requirements subject to Risk Assessment.

The frequency should be increased if the history indicates signs of progressive deterioration.

The maximum interval between a full periodic inspection and test shall not exceed 10 years.

10. Tests to be Undertaken

Tests to be carried out on each Periodic Inspection and Test are detailed on Table T2.

TABLE T 2 :- Testing to be carried out where practicable on existing installations.

TEST	
Protective Conductors Continuity	Between the earth terminal of distribution boards to the following exposed conductive parts. • Socket Outlet earth connections • Accessible exposed conductive parts of current using equipment and accessories
Bonding Conductors Continuity	• All main bonding conductors. • All necessary supplementary bonding conductors.
Ring Circuit Continuity	Where there are proper records of previous tests, this test may not be necessary. This test should be carried out where inspection/documentation indicate that there may have been changes made to the final ring circuit.
Insulation Resistance	If tests are to be made • Between live conductors, with phases and neutral connected together, and earth at all final distribution boards. • At main and sub main distribution panels, with final circuit distribution boards isolated from the mains.
Polarity	At the following positions • Origin of the installation • Distribution boards • Accessible Socket Outlets. • Extremity of Radial Circuit.
Earth Electrode Resistance	Test each earth rod or group of rods separately, with the test links removed, and with the installation isolated from the supply source.
Earth Fault Loop Impedance	At the following positions • Origin of the installation. • Distribution boards. • Accessible Socket Outlets. • Extremity of Radial Circuits.
Functional Tests RCD's, Circuit Breakers, Isolators and All Switching Devices	Tests as required by Regulation 713-13-01, followed by the operation of the functional test button. Manual tests to prove that the devices disconnect the supply.
Thermal Image Survey	All distribution boards and significant switch gear

11. Labelling

The provision of Marking and Labelling shall be provided in full accordance with BS 7671 2008 Requirements for Electrical Installations and Guidance Note 3 (Inspection and Testing). Including all current amendments.

12. Records

Records shall be provided in full accordance with BS 7671 2008 Requirements for Electrical Installations and Guidance Note 3 (Inspection and Testing) Including all amendments Additionally record drawings shall be suitably provided /annotated to illustrate the electrical layout and circuit configuration of the installation following the completion of the Inspection and Testing regime and any necessary rectification works. Original Inspection certificates must be provided to University of Cambridge Estate Management.

13. Approved Test Equipment

Test equipment shall comply with the requirements of BS 7671 2008 Requirements for Electrical Installations and Guidance Note 3 (Inspection and Testing). Including all amendments.

14. Risk Assessments

Prior to commencement of any works activities, University of Cambridge Estate Management employees or appointed contractors shall undertake a suitable and sufficient risk assessment for the work involved

15. Programme of Works

The Duty Holder or other appointed University of Cambridge Estate Management employee will agree an appropriate programme of works, and issue instructions for this to be carried out..

16. Further Information

Further information or advice on the requirements of this maintenance policy is available from University of Cambridge Estate Managements, Maintenance Section.

17. Definitions

- **Duty Holder**
The person nominated by University of Cambridge Estate Management who has responsibility for implementation, monitoring of standards and quality in respect of Inspection and Testing. Additionally they have responsibility for the health and safety and other legal requirements relating to the electrical work undertaken.
- **ECA**
Electrical Contractors Association.
- **Electrical Contractors**
An external procured competent resource appointed to undertake prescribed electrical operations on behalf of University of Cambridge Estate Management..
- **University of Cambridge Estate Management Electricians**
A group of persons employed by University of Cambridge Estate Management to undertake prescribed electrical operations.
- **Extra Low Voltage**
Normally not exceeding 50V a.c. or 120V d.c. (Ripplefree)
- **Low Voltage**
Exceeding extra low voltage, but not exceeding 1000V a.c. or 1500V d.c.
- **High Voltage**
Normally exceeds 1000V a.c.
- **NICEIC**
National Inspection Council for Electrical Installation Contracting.
- **Skilled Person**
A person with technical knowledge or sufficient experience to enable Him / her to avoid dangers which electricity may create.

18. Related Documents

Health and Safety at Work etc. Act 1974,

The Management of Health and Safety at Work Regulations 1999,

Electricity at Work Regulations 1989,

BS 7671: 2008 - Requirements for electrical installations,

IEE Guidance Note 3 (Inspection and Testing),

University of Cambridge Estate Management;-Health and Safety Policy

University of Cambridge Estate Management -Approved Contractors Code of Practice for Work/
Code of conduct.