



Planning an Electrical Inspection and Testing Programme using EDIS

A guidance document on the steps to planning and
completing an electrical inspection and testing
programme

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www.electricalcertificates.co.uk

(EDIS is the Electrical Distribution Information System)

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After reading this document you should be able to:

- Follow the steps required to plan an electrical inspection and testing programme
- Modify the example specification to suit the needs of your programme

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1 Pre-requisites

1. You should be registered on the EDIS system; www.electricalcertificates.co.uk
2. You must familiarize yourself with the latest BS7671; [British Standard BS 7671](#) "Requirements for Electrical Installations. IET Wiring Regulations.", informally called **The "Regs"** (wiring regulations), is the national standard in the United Kingdom for electrical installation and the safety of [electrical wiring](#) in domestic, commercial, industrial, and other buildings. In general, BS 7671 applies to circuits supplied at nominal voltages up to and including 1000 volts AC or 1500 volts DC. The standard therefore covers the 230 volt 50 Hz AC mains supply used in the UK for houses, offices, and commerce¹.
(Refer: EDIS User Guides – www.electricalcertificates.co.uk)

2 Steps for Planning and Instructing electrical testing (Condition Report) project in a building

2.1 Survey

2.1.1 Objective

The size and nature of the electrical infrastructure needs to be described. The outcome is a set of documentation, schematics and schedules.

2.1.2 Deliverable

- Low voltage distribution schematics
- Distribution board schedules
- Previous inspection schedules
- Last inspection and testing results
- Confirm the list of Observations and Recommendations from the previous Inspection and testing has been attended to.

2.2 Risk assessment

2.2.1 Objective

The likelihood and probability of electrical fire, shock or any other event which could put people or property at risk needs to be assessed.

2.3 Assessing the risk

Before specifying the items to be inspected and tested a desk based risk assessment should be carried out. The risk assessment should take the following factors into account:

- The BS7671 and related regulations, provide generic guidance for the inspection and test requirements, e.g. 100% every 5 years
- The recommendation in the previous condition report, the previous report will

¹ https://en.wikipedia.org/wiki/BS_7671

- provide guidance on the next test date based on the inspector's judgement
- the age of the infrastructure, older buildings required more thorough inspection and testing than newer buildings
- the usage of the circuits, sockets and supplies, e.g. power sockets used by the public required more thorough inspection and test than a power socket that is seldom used
- The last inspection and test date, in general, the items with the oldest last inspection and test date should be inspected and tested first.

The electrical inspection and testing specification will thus vary from building to building and may be different for different areas of the building. Notwithstanding the above - a simple clear and risk based instruction needs to be provided to the electricians doing the testing. An example is provided below; this can be adjusted to suit the conditions in a building.

2.3.1 Deliverables

- List which boards or areas have not been inspected in the previous 5 years (a schedule of boards listing the last inspection date)
- List which circuits have not been tested in the previous 5 years
- List which circuits are due for testing.
- Identify boards and circuit which have never been inspected and tested.
- Identify boards and circuits that are due for testing.

2.4 Inspection and testing plan

2.4.1 Objective

Prepare an inspection and testing programme.

2.4.2 Deliverables

- Communication plan and material to inform the building tenants of the planned inspection and testing
- Prepare a list of items to be inspected and tested, by area by date/time
- Agreement with the building tenants on the date, time and duration of testing.
- The list of boards due for inspection/section
- The circuits that need to be tested/board
- Provide work instructions to electricians,

2.5 Inspection and testing

2.5.1 Objective

Adhering to the agreed electrical inspection and testing plan developed in the previous steps, carry out the inspection and testing.

2.5.2 Deliverables

- Work instructions to the electrical inspection electricians, this should include a list of boards and circuits due for testing, the testing policy.
- Completed and signed Condition Report: A separate Condition Report should be

completed for each supply. If required, the Condition Report can be further broken down into building sections. If the extent or limitations of the inspection is different for different areas in the building is different, separate Condition Reports may be required.

2.6 Carry out any remedial actions

2.6.1 Objective

If the Condition Report is non-satisfactory, remedial actions need to be carried out. An unsatisfactory Condition Report will contain Code 1 and Code 2 Observations and recommendations. Code 1 items should have been addressed when found, Code 2 items should be remediated as soon as possible, with a Satisfactory report being issued after the remediation work has been completed.

2.6.2 Deliverable

- Complete the required remedial actions
- Update the Condition Report to “Satisfactory”

3 Electrical inspection and testing specification example

NOTE: The specification below is meant to be provided as an example and should be modified with taking the electrical installation into account.

SCHEDULE OF TEST RESULTS FOR THE INSTALLATION

TO BE COMPLETED ONLY IF THE DISTRIBUTION BOARD IS NOT CONNECTED DIRECTLY TO THE ORIGIN OF THE INSTALLATION										TEST INSTRUMENTS (SERIAL NUMBERS) USED		
Z _e at DB	0	Ω	Operating times of associated RCD		At I _{Δn}	ms	Earth fault loop impedance	2073041	RCD 2073044			
I _{pr} at DB	0	kA	(if any)		At 5I _{Δn}	ms	Insulation resistance	2073042	Other N/A			
Distribution board designation:	42644 DB						Continuity	2073043	Other N/A			
Correct Supply Polarity Confirmed:	-	Phase Sequence Confirmed:	-	Details of circuits and/or installed equipment vulnerable to damage when testing:					Next test date:	11/11/2021		

Circuit number and phase	Circuit impedances (Ω)						Insulation resistance Record lower or lowest value		Polarity (V)	Z _e (Ω)	RCD			Remarks
	Ring final Continuity [measured end to end] (Ω)			Continuity [at least one column to be completed] (Ω)			Live/Line (MΩ)	Live/Earth (MΩ)			at I _{Δn} (ms)	at 5I _{Δn} (if applicable) (ms)	Test Button Operation (V)	
	I ₁ (Line)	I _n (Neutral)	I ₂ (cpc)	R ₁ +R ₂	R ₂									
1 L1	-	-	-	-	-	>299	>299	-	3.9	-	-	-		
2 L1	-	-	-	-	-	>299	>299	-	4.4	-	-	-		
3 L1	-	-	-	-	-	>299	>299	-	-	-	-	-		

3.1 Distribution boards and final circuits

- 1) Visually inspect ALL the boards and circuits due for inspection and record any observations and recommendations.
- 2) Final circuit testing
 - a) Sample testing (suitable for low risk circuits).
 - i) Test a representative sample of all final circuits. The number of circuits in the representative sample size depends on the nature of the circuits. If all circuits are similar and have similar loads, then a target sample size of 20% can be used. If the circuits are dissimilar and server different locations a 100% test should be considered. If an error or fault is found during testing the full board needs to be tested, i.e. 100% of the circuits.
 - ii) The sample should be tested for:

- (1) Continuity,
 - (2) Insulation resistance,
 - (3) Polarity and
 - (4) Direct measurements of earth fault loop impedance to determine Z_s
 - (5) For RCD tests see below.
- b) Full testing (suitable for circuits deemed as not being low risk). Approximately 100%, there will be limitations due to risk, access, time and cost constraints.
- i) 100% power circuits will be tested for insulation resistance.
 - ii) 100% final ring circuits tested for insulation resistance will have their conductors tested for continuity where practicable.
- c) 100% of circuits that supply a “downstream” distribution board unit should be tested, sometimes referred to as Sub-Mains. These tests will provide the distribution boards’ Earth Loop Impedance and Prospective Short Circuit Current test readings.

3.2 Lighting

- a) A light fitting within each lighting circuit should be tested for insulation resistance, Earth Loop Impedance test at the furthest point in the circuit wherever possible will receive a thorough internal inspection.
- b) 100% of lighting circuits tested for insulation resistance will be given an Earth Loop Impedance test at the furthest point in the circuit wherever possible.
- c) An additional sample of 5% of all light fittings will be given an Earth Loop Impedance test.
- d) 100% of lighting power sockets will receive a thorough external inspection.
- e) 100% of lighting power socket outlets will be tested for Earth Loop Impedance and polarity.

3.3 Fixed Appliances (e.g. Heaters, hand dryers, not operated by control panels)

- a) 100% of fixed appliances will receive a thorough external inspection, whilst 10% will be internally inspected
- b) 100% of fixed appliances will be tested for Earth Loop Impedance.
- c) 10% of fixed appliances will be internally inspected.

3.4 Fixed Appliances (Operated by control panels)

- a) 100% of control panels will receive a thorough internal inspection wherever possible.
- b) Earth loop impedance tests will be performed at each control panel and at each appliance fed from the panel wherever possible.
- c) A 10% sample of electrical terminations inside control panels will be checked for tightness.

3.5 RCDs (Residual Current Devices)

- a) 100% of RCDs will be tested for tripping time at half rated, full rated and five times rated tripping current, across positive and negative cycles.

3.6 Main Switchgear & Circuits

100% of all circuits (sub mains) from main switchgear to local distribution or dedicated plant will be inspected and tested for the following;

- b) Insulation Resistance
- c) Main switchgear will be internally inspected.
- d) Cable sizes will be checked for current carrying capacity.
- e) Circuit protective devices will be checked for discrimination
- f) Earth loop impedance & prospective short circuit current will be measured as close to the origin of the supply as possible.

3.7 Thermographic testing and reporting

A thermographic test is not a substitute for the electrical testing, it can provide a mitigation in case control panels, plant or switchgear is inaccessible. Where electrical testing cannot be carried out a limitation may be agreed with the person requesting the testing. If requested appliances, control panels and switchgear that cannot be tested can be risk assessed using a thermographic scan to identify high resistance connections and hot spots.

3.8 Limitations & Exclusions

Testing and Inspection shall be undertaken where it is reasonable and practical to do so, where it is not practicable due to cost, risk or time and the inspector judges that further investigation is required, an observation should be included with a Code FI (Further Investigation) and an explanation.

3.9 Exclusions:

- Security, fire and door entry systems.
- Data and Telecommunication Systems
- Lift Installations
- HV Power Systems i.e. more than 1000 Volts AC