Planning and Completing an Electrical Inspection and Testing Programme using EDIS

A document providing guidance on the steps required to plan and completing an electrical inspection and testing programme

Version: 15 April 2017

(EDIS is the Electrical Distribution Information System)

www.electricalcertificates.co.uk

About this document:

- This document has multi-purposes readers should select the chapter or section most relevant to the current task – attempting to read the document end to end is not recommended;
- The document aims to provide guidance for each stage of the electrical testing lifecycle. The key chapters listed below can be read at each point in the life cycle:
    - Planning the EI&T programme
    - Example EI&T specification
    - Contractor work instructions for using EDIS
    - Using EDIS to ensure alignment with Guidance Note 3
    - Managing Observations and recommendations
    - EDIS procedures

Table of Contents

Table of Tables

Table of Figures

1 PRE-REQUISITES

1. You should be registered on the EDIS system- www.electricalcertificates.co.uk
2. You should have reviewed the EDIS basic training videos - http://www.electricalcertificates.co.uk/video-basic-training
3. You must familiarize yourself with the latest BS7671; British Standard **BS 7671** "Requirements for Electrical Installations. IET Wiring Regulations BS 7671:2008 incorporating Amendment 3:2015
4. You must familiarise yourself with Guidance Note 3 Inspection and Testing for IET Wiring Regulations BS 7671:2008 incorporating Amendment 3:2015

This document assumes that you are familiar with the above documents and have registered on the EDIS system and have watched the basic training presentation.

2 STEPS FOR PLANNING AND COMPLETING AN ELECTRICAL TESTING PROJECT

Electrical Inspection and Testing Project Overview

Initial Survey	Initial Survey aims to establish the list of distribution boards
Risk Assessment	Risk Assessment aims to establish the scope of inspection and testing
Budgeting and Cost	Budgeting and Cost provides the financial requirement for achieving the scope
Planning	Planning provides the work packages required to address the scope
Inspection and testing	Inspection and testing of the electrical system and associated certificates
Obs'vatons &Rec's	Obs'vatons &Rec's that become the actions required to reduce the risk
Costing and assignment	Costing and assignment of the actions required for remediation
Remediation	Remediation of the non-compliances

Figure 1 Overview of the Electrical Inspection and Testing Project

2.1 The Initial Survey

2.1.1 Objective

The size and nature of the electrical infrastructure needs to be described. The aim is to do a survey, consisting of a "desk study "of the available electrical information and non-intrusive survey of the electrical infrastructure. The materials reviewed will include electrical documentation, schematics and distribution board schedules. This survey will be carried out prior to any EI&T work being tendered or started.

2.1.2 Surveying the electrical infrastructure

- The building should be divided into practical, manageable sections consisting of approximately 15 to 20 distribution board per section. A section may be a floor of the building or part of the floor. The boards in each section should be supplied from the same supply, same sub-main or bus bar. Dividing the building into manageable sections will ensure the testing team can effectively manage the data and certificates associated with the distribution board test results.
- Collect all electrical distribution information, including schematics, distribution board schedules and previous electrical certificates.
- If required update EDIS to ensure that a complete board list is available; the board list is essential for all the next steps and provides a key planning and work tracking units during the inspection and testing process.
- As a minimum the Board reference, number of ways, section, floor, location and asset number

for each board must be updated in the EDIS system. Where circuit details are unknown the circuit designation should be 'Verification required'.

2.1.3 Deliverable

The deliverables will include, as far as possible:

- Low voltage distribution schematics (EDIS document and drawing register)
- Distribution board schedules (EDIS Board list)
- Previous inspection schedules (EDIS certificates list)
- Last inspection and testing results (EDIS Manage compliance report)
- Confirmation that the previous certificate Observations and Recommendations from the previous Inspection and testing have been attended to (EDIS Actions Required report)

Table 1 - DELIVERABLES - Initial Survey Phase

The above information should be available on EDIS; if it is not it should be captured into the system.

2.2 Risk assessment

2.2.1 Objective

The information obtained during the survey stage will enable the engineering manager to do a risk assessment of the electrical infrastructure. The objective of the risk assessment is to establish the likelihood and severity of electrical faults, e.g. fire, shock or any other event which could put people or property at risk. The risk assessment will provide the basis for the testing strategy, including sampling, limitations, business interruption and other constraints practical constraints.

2.2.2 Carrying out the Risk Assessment

The information collected in the initial survey will be used to do a risk assessment.

The risk assessment and resulting testing strategy should take the following guidance and factors into account:

- The Guidance Note 3 inspection and testing, Refer: section 4.3 Inspection frequencies later in this document.
- The recommendation in the previous condition report, the previous report will provide guidance on the next test date based on the previous 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 risk assessment will vary from building to building and may be different for different areas of the

building. Using EDIS board list, the last/next test dates and the above factors the risk assessment will identify the boards and circuits that need to be inspected and tested to reduce the electrical risk.

The process is described here - http://www.electricalcertificates.co.uk/sites/default/files/edis_user_guide-_manage_compliance19july2015_1.pdf

The resulting list of boards and circuits will be updated and re-loaded into EDIS using the compliance planning Excel upload feature.

2.2.3 Deliverables

- The scope of the work, including the limitations and exclusions.
- Board and circuit last inspection, next inspection and planned inspection date schedule that was updated as part of the risk assessment. The list can be downloaded from the Manage Compliance menu option.

Table 2 - DELIVERABLES - Risk Assessment Phase

2.3 Inspection and testing cost and budgeting

The number of boards and circuits can be used as a basis for obtaining quotations from electrical inspection and testing contractors. Other factors including the sampling, limitations and timing will also influence the project budget. A specification is provided in **Section 6 APPENDIX: EXAMPLE OF AN ELECTRICAL INSPECTION AND TESTING SPECIFICATION**

2.3.1 Objective

Establish a cost and budget for carrying out the inspection and testing scope

2.3.2 Obtaining costs for the inspection and testing

Requests costs from suitably qualified electrical testers

2.3.3 Deliverables

- Agreed scope of the work
- Provide clear work instructions to the electrical inspection electricians, this should include a list of boards and circuits due for testing, the testing policy and any agreed limitations.
- Costs for carrying out the electrical inspection and testing
- Proof of electrical testers competency to carry out the work

Table 3 - DELIVERABLES - Inspection and testing cost and budgeting phase

2.4 Inspection and testing planning

2.4.1 Objective

Prepare an inspection and testing programme.

2.4.2 Planning the inspection and testing

During the planning phase the project manager, works with the occupants of the building and the

electrical tester to establish a practical schedule for delivering the scope of the work. At this stage, the Scope of work can be divided into Work Packages – where each work package can be packaged as an EDIS certificate.

Inspection and testing costs are often increased due to lack of access or instructions not to turn off power. Suitable arrangements informing the tenants of the purpose of the work should be made and should not be underestimated.

Using the list of boards and circuits which have been planned for testing, prepare a list of boards and circuits to be inspected and tested and the planned testing date and time.

Create the EDIS draft certificates for the programme, add the required planned boards into each certificate. Certificates should ideally consist of between 15-20 boards for each section being tested. A separate Condition Report should be completed for each supply. If required, a separate Condition Report can be provided for each 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.

2.4.3 Deliverables

- Communication plan and information used to inform the building tenants of the planned inspection and testing.
- List of boards and circuits to be inspected and tested and the planned testing date and time.
- Communicate and agree with the building tenants that the date, time and duration of testing is acceptable to them – if it is not the programme will need to be re-planned or re-scoped.
- Work packages (Draft Certificates) listing the boards due for inspection per section and their circuits that planned to be tested.
- A time schedule for the work package start and completion
- Ensure the contractors and testing team have received the training and work instructions to complete the work and deliver the completed certificates as required by the scope of work.
- Change management: Record and agreed changes to the scope and limitations of the work.

Table 4 - DELIVERABLES - Inspection and testing planning phase

2.5 Inspection and testing

2.5.1 Objective

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

2.5.2 Contractor work instructions

Refe: Section 3 CONTRACTOR WORK INSTRUCTIONS AND RESPONSIBILITIES FOR USING EDIS

2.5.3 Deliverables

- Assignment of the draft certificates to the contractor
- Contractors to agree an approach for capturing the test results, e.g. hand written test results, entered into excel or directly entered into the browser and entering the data into the EDIS system. ***The approach should include an agreement on the retention of the original record of the measurements and observations recorded by the tester.***
- Completed and certified (signed original) Condition Report to be completed **within two weeks of completing the final test in the work package.**
- The list of Observations and Recommendations (These will automatically appear in the Actions Required list)

Table 5 - DELIVERABLES - Inspection and Testing phase

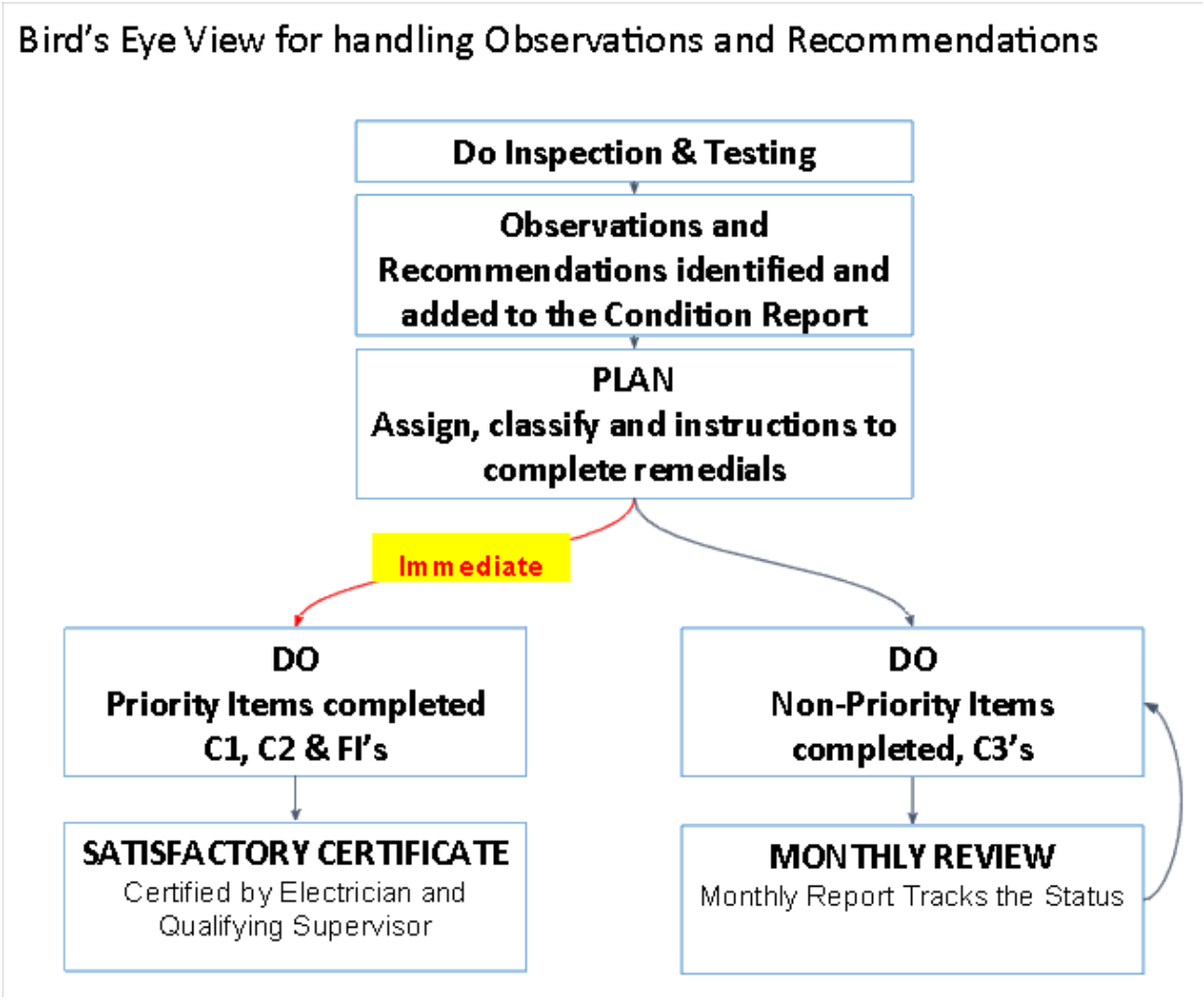
2.6 Managing, editing and closing the remedial actions

2.6.1 Objective

Electrical inspection condition report includes a section on Observations and Recommendations. These Observations and Recommendations will have been recorded during the inspection and testing process and need to be reviewed, managed and actioned. EDIS facilitates this process via the Actions Required feature. If the Condition Report is unsatisfactory remedial actions will need to be carried out before a satisfactory certificate can be issued.

An unsatisfactory Condition Report will contain Code 1 and Code 2 Observations and Recommendations. Code 1 items should have been addressed when found, C2's and FI's need to be completed before a satisfactory certificate can be issued. C3's and other items can be scheduled for remediation at a later stage.

The aim of this stage of the inspection and testing process is to categorise, allocate, track and record the remedial actions so that a suitable record is kept for each of the Observation has received due consideration.



2.6.2 Actions

The overall actions required are shown in the figure below:

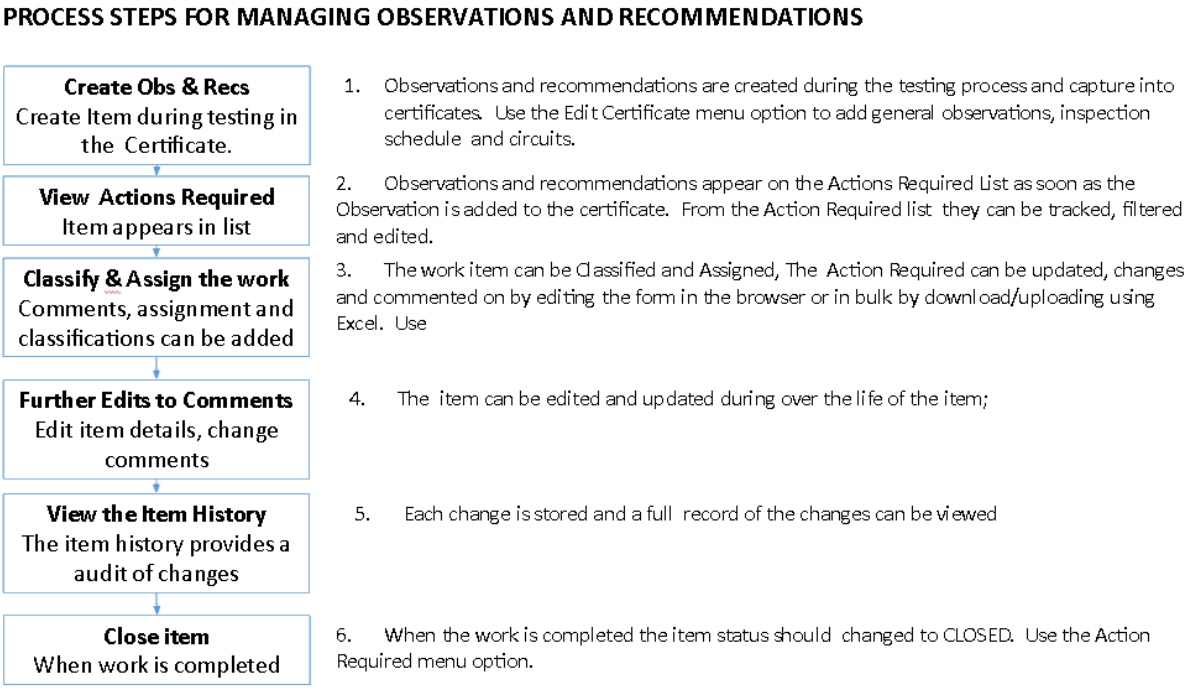


Figure 2- Process for managing the Actions Required resulting from the Observations and Recommendations

The steps below describe how the Observations and Recommendations, that appear in the Actions Required list can be reviewed, assigned, grouped and managed to completion:

1. Group the observations based on pre-defined list of groups
2. Assign the action to an EDIS user
3. Change the action from “Action required” to “Work in progress”
4. Add a comment to the item
5. On Completion of the work the Action required must be updated
6. Finally, any additional comments can be made and the status be changed to CLOSED
7. The history of the changes can also be viewed at any time

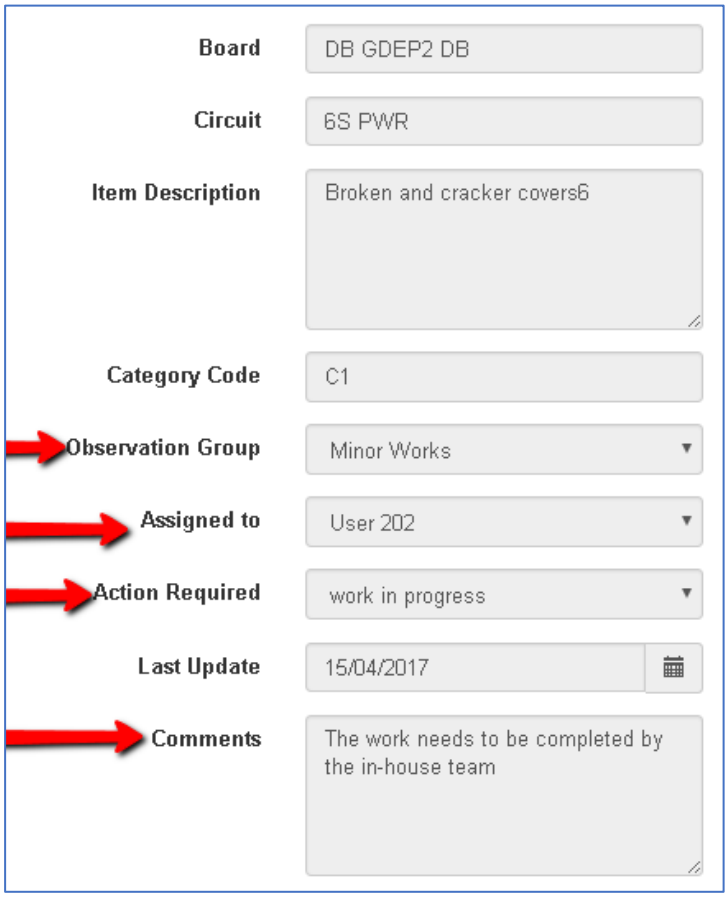


Figure 3 - Editing the action required group, assigned user and comments

The document in the link below provides further detailed steps for the management of observations.

http://www.electricalcertificates.co.uk/sites/default/files/managing_observations_and_recommendations_and_associated_action_required.pdf

2.6.3 Deliverables

- Complete the required remedial actions: Each Observation should be reviewed and closed; the final list of Actions Required should indicate that all Actions Required have a status = CLOSED.

Table 6 - DELIVERABLES Manage and close the remedial actions

NOTE: The Action Required history records all changes for each of the Action Required items; to view the history, select the History option in the dropdown box associated with the Action Required .

Action Required History

Item No	Cert No	Date	Code	Obs. Group	Action	Comments	Assigned To	Edit Date	User	Organization
42	100403	17/04/2017	C1	Minor Works	resolved	Work completed	User 202	17/04/2017 09:30 AM	User 202	org 202-upload from API
42	100403	17/04/2017	C1	Minor Works	work in progress	To be delivered by the internal maintenance team.	User 202	17/04/2017 09:29 AM	User 202	org 202-upload from API

Figure 4 - Action Required History

3 CONTRACTOR WORK INSTRUCTIONS AND RESPONSIBILITIES FOR USING EDIS

The instructions below should be carefully carried out when updating data in the EDIS system:

3.1 SUMMARY OF THE BASIC STEPS TO USING EDIS

This section provides a summary of how EDIS needs to be used. Registration and use of the system is free for designers, contractors and electricians to use.

3.1.1 Register on EDIS

1. Go to www.electricalcertificates.co.ukhttp://www.electricalcertificates.co.uk/
2. Complete the registration
3. Validate the email by clicking on the link in the email that EDIS sends after you have registered
4. Login
5. Request estate visibility for the estate
6. Request Building access

3.1.2 Create and enter data into EDIS electrical certificates

1. Inspector and Tester: Select the Create certificate menu option
2. Inspector and Tester: Create, select the qualifying supervisor, designers, constructor that need to certify the certificate
3. Inspector and Tester: Enter the results of the testing and inspection

3.1.3 Certify certificates as completed

Certificates in EDIS use a two-stage validation for the electronic sign off process:

1. Complete certificate: The final step after completing the capture of the test data is to review and complete the certificate, this is done by clicking the 'certify complete box' on step 5 of the certificate, then saving the certificate. Emails will be sent to the users that need to certify the certificate
2. The testing electrician must certify the certificate by clicking the link in the email they receive.
3. The qualifying supervisor, must click on the link in the email, sign into EDIS and verify the certification.
4. The EDIS system will generate the final signed original PDF. The date and time of the email and the sign-off process are recorded on the certificate and included in the PDF.

Further information and assistance:

- www.electricalcertificates.co.ukhttp://www.electricalcertificates.co.uk/
- support@electricalcertificates.co.ukmailto:support@electricalcertificates.co.uk

3.2 Registration and use

Registration is free for contractors. Users self-register and request access to estate and buildings:

1. Each tester, electrical designer and qualifying supervisor will register on the EDIS system and

provide organization details and an email associated with the organization

2. Each EDIS user should familiarise themselves with the system; training will be provided if required, contact support@electricalcertificates.co.uk, user manuals are available and EDIS support will respond to questions via email. If required a telephone conversation or meeting can be arranged to address any issues which cannot be resolved remotely

3.3 Boards and circuits data

1. The EDIS board list provides a list of the current boards in a building, completing a new installation, minor works or condition report automatically updates the EDIS board list. Changes to the board and circuit data is tracked via an audit log and can be viewed for each board and circuit.

3.4 Distribution Board schedules

3.4.1 Distribution Board Schedules: Board Data

1. The Contractor is responsible for creating and updating new boards on the system. Specific care should be taken to ensure that:
    a. Complete and correct data is entered for new and existing boards is captured
    b. The board reference is unique and follows the format used in the rest of the building
    c. The board section (e.g. east wing), floor (e.g. G) and location (e.g. space reference or room number) should be complete and correct
    d. The contractor is responsible for marking boards as obsolete if it is decommissioned
    e. The contractor is responsible for identifying where the board is fed from and selecting or entering this data into the board schedule

3.4.2 Distribution Board Schedules: Circuit Data

1. The Contractor is responsible for creating new circuits and completing the data associated with new and existing circuits that they work on. Care should be taken to ensure:
    a. The circuit data is complete
    b. The circuit last test and next test dates are correct
    c. A suitable description for each circuit should be provided or the description should be SPARE if the circuit is not connected to any other equipment

3.5 EDIS Certificates

3.5.1 New installation certificates, minor works certificates and condition reports

Any electrical work requires an electrical certificate:

1. The contractor will complete a minor works certificate after completing any minor electrical works, e.g., extending an existing circuit
2. The certificates created must be EDIS certificates, the non-EDIS feature is only used for historical certificates where the certificate was completed before the adoption of the EDIS

system

3. The contractor will complete a new installation certificate if a new board is installed or the circuit characteristics are changed or added
4. The contractor will complete a condition report when reporting on the condition of an existing electrical installation
5. When completing a certificate, the contractor will ensure the data in the certificate is correct, including the supply details, the board details and the circuits
6. For circuits not tested the full distribution board schedule including circuit details need to be included in the New Installation Certificates and Condition Reports; this data is required for future use and testing.
7. All circuits tested will have a value or LIM in the measured Zs field
8. If values are not applicable N/A should be placed in the field
9. If no measurement was made the field can be left blank
10. Circuit designations which are spare should state "SPARE"
11. Circuit designations which cannot be verified should state NOT Verified and no value should be included in the measure Zs value
12. When completing a certificates care should be take not to test circuits that are not planned for testing or where the next test date is in the future. Circuits which have a next test date in the future should only be tested after confirmation with the responsible person.
13. Certificates should be certified, certification is an electronic process. After completing the certificate the contractor, qualifying supervisor and designers should certify the certificate via email.
14. Certificates are completed when a PDF, with the status 'Signed Original' is in the EDIS certificate list
15. Certificates in status Draft or Awaiting Approval are not deemed complete
16. Certificates should be completed within 2 weeks after the testing on that certificate has been completed; certificates should not be left incomplete.

3.6 Observations and recommendations classification codes

The results of the inspection that precedes the testing of an electrical unit should be recorded along with a code that summarises the nature of the observation. The codes and notes relating to the use of the codes are shown below:

CODE (Description), *(refer 1 below)*	**Notes and Use of the Code**
Code C1 (Danger present. Risk of injury. Immediate remedial action required)	Danger exists and the persons using the installation are at immediate risk. Immediate action is required and the person that has requested the report should be immediately informed verbally and in writing, a detailed risk assessment

	should be provided of the problem. If possible, immediately, dangerous situations should be made safe or rectified before further work or inspections are carried out. The duty holder should take action to address the issue immediately. Code C1 examples: accessible live conductors due to damage, poorly modified enclosures or removed maintenance panels. It should be noted that incorrect polarity would also attract a code C1 as it may allow conductive parts, not normally expected to be live, to become live *(refer 3 below)*. Any observation given a code C1 classification should result in the overall condition of the installation being reported as unsatisfactory.
Code C2 (Potentially dangerous-urgent remedial action required)	The person ordering the report should be advised that remedial action should be taken to avoid the risk of a future incident. The phrase "potentially dangerous", is designed to point towards a risk of injury from contact with live parts after a sequence of events. A sequence of events could mean that an individual would need to move, open or gain access to live parts through a day to day task that would not be expected to give access to live parts, for example: If an isolator in a locked cupboard had a damaged casing, leaving exposed live parts that could not be accessed without the use of access equipment, such as a specialist tool or key this would be considered a code C2 (*refer 3 below*) Any observation given a code C2 classification should result in the overall condition of the installation being reported as unsatisfactory.
Code C3 (Improvement recommended)	There is no immediate risk or danger, an improvement will enhance the safety of the installation. The code C3 implies that the installation is not necessarily dangerous but it may not comply with the current version of the regulations or for example, may have damaged fittings that do not have exposed live parts. A code C3, in itself, should not warrant an overall unsatisfactory report *refer 3*

	below).
Code FI (Further investigation required)	Further investigation is required if there is a reasonable expectation that there is a dangerous or potentially dangerous situation. Note 9 of the notes for the person producing the report has been revised with regard to where the inspection has revealed an apparent deficiency that could not be fully identified due to the extent or limitations of the inspection. The note points out that if a further investigation may reveal that the deficiency warrants the award of classification code C1 (Danger present) or C2 (Potentially dangerous), a recommendation of further investigation required (Code FI) should be recorded at Section K (Observations). It should be appreciated, however, that an FI classification should not be recorded if the investigation could only be expected to lead, at worst, to the award of C3 classification (Improvement recommended) in relation to the observation.
Code FIO (For information only)	THE FIO, For information only code is provided as a convenience for the testers in case they want to make a note or statement that will assist the client at some future date.
Code NCFF (Non-conformance found and fixed)	If a Code C1 (Danger present. Risk of injury. Immediate remedial action required) is found, it should be attended to immediately. If it is attended, the NCFF code provides an indication that the item has been made safe.
Code N/V (Not Verified)	If the inspection of some equipment cannot be done, and no **Further Investigation** is required, then a N/V code is appropriate**. FI is only required if a dangerous situation is reasonably expected**, if not, then a Not Verified code is warranted. The N/V code is usually only used where there is a defined schedule of items to be inspected, i.e. where there is a pre-defined set of questions in the Inspection Schedule.
Code LIM (Limitation)	If the condition report section D. Extent of the installation and limitations of the inspection and testing, excludes an inspection or test, then the LIM code can be applied.

	The LIM code also indicates a limited inspection or test where the section D does expect a test or inspection to take place. The reason for the LIM should be clearly stated in the observation and recommendation text.
Code N/A -Not Applicable.	In a pre-defined Schedule of Inspections, if an inspection item is not applicable, the N/A code should be used.

Table 7 – Classification codes for observations and recommendations

Sources:

1- BS 7671:2008, 17th Edition, incorporating Amendment 3:2015, Notes on the Model Forms

2-Electrical Safety First, Best practice guide 4 (Issue 4)

3- IET Wiring Matters | Winter 11 2011_41_winter_wiring_matters_Observation_codes.pdf

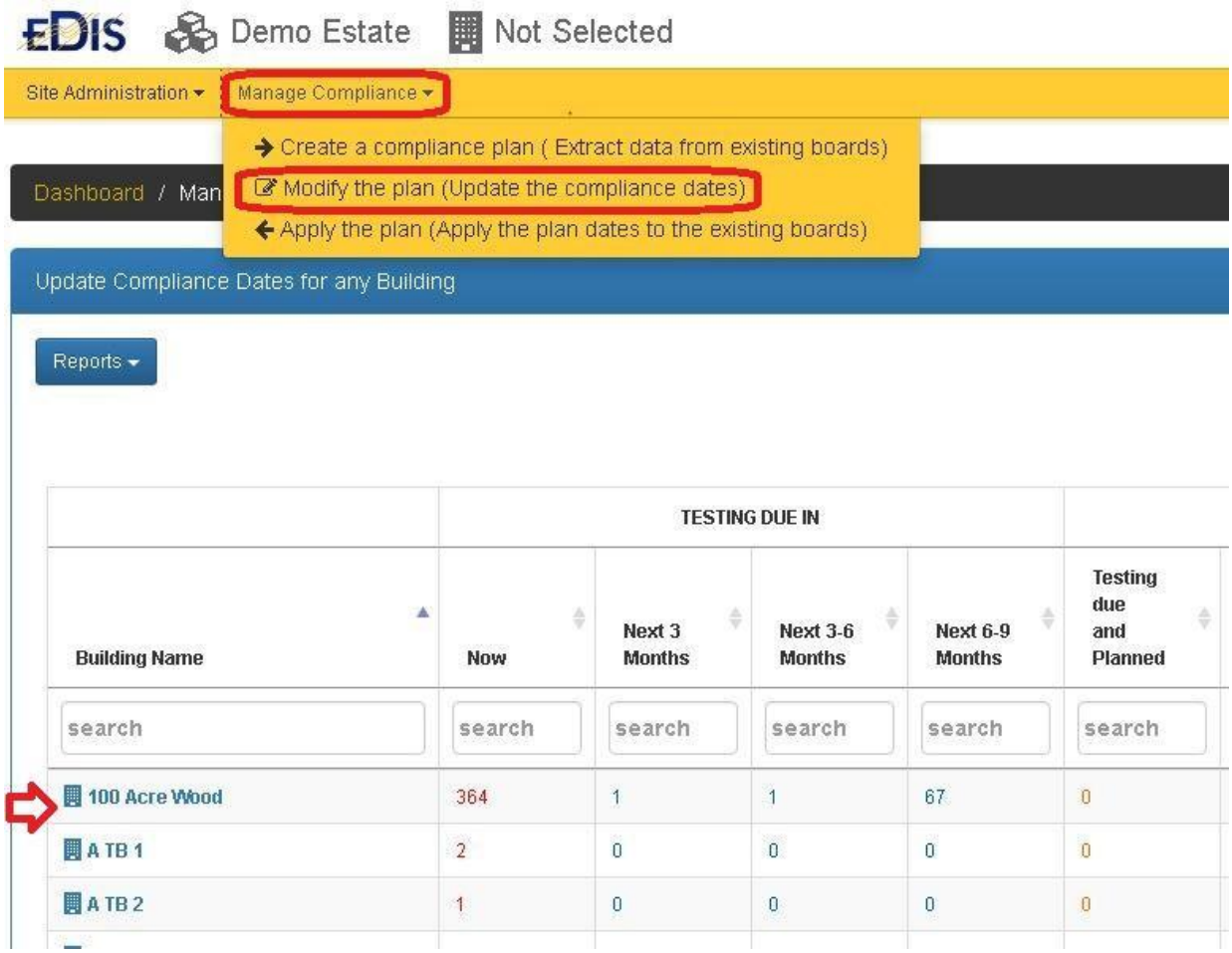
3.7 EDIS PROCEDURES

EDIS procedures provide short descriptions of each of the key processes used during the electrical inspection and testing phase.

3.7.1 EDIS PROCEDURE 1 – Selecting circuits for testing in EDIS

The easiest way to determine which circuits need to be tested and which circuits were previously tested is to download a building compliance report. This report needs to be requested from the EDIS Building Administrator. It provides a list of the last test/next test dates and provides a quick way to identify circuits that need to be tested.

If you do have building administration rights for the estate, you can download the report: From the main menu select Manage compliance, select create then select the building – the figure below provides the guidance.



After selecting the building the last text next test dates are displayed – an example is shown below:

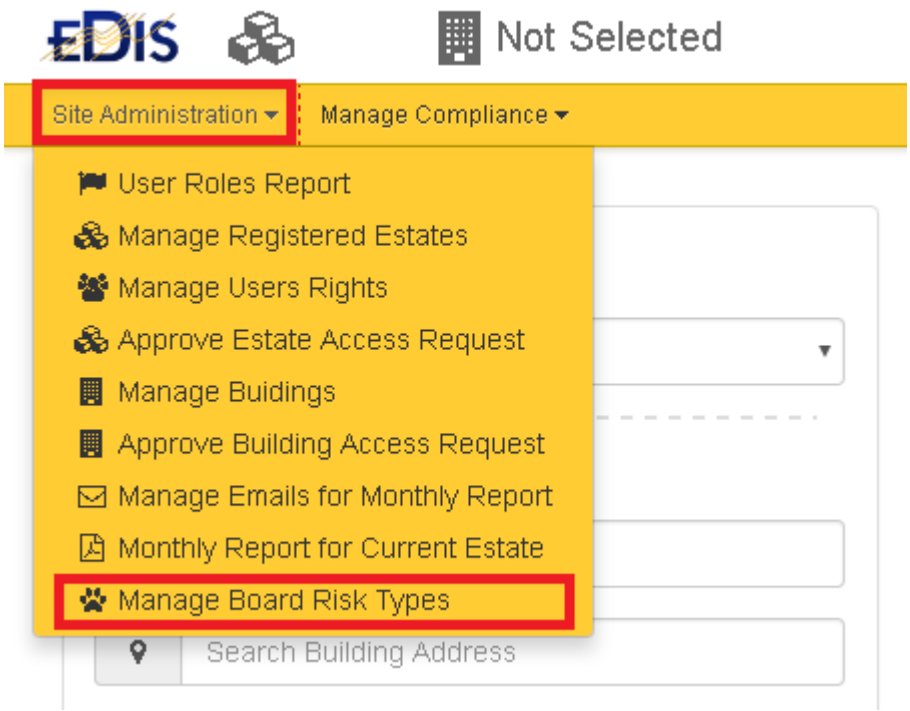
Browse							Last Test Date		Next Test Date		Planned Test Date	
Board Ref	Ref Type	Phase	Section	Floor	Circuit	Description	Board	Circuit	Board	Circuit	Board	Circuit
100	DB	3	sect	F			26/07/2015		30/08/2015		14/09/2020	
					1-L1	101 DB, North Wing/1flo/		14/09/2015		14/09/2020		14/09/20
					1-L2	102 DB, North Wing/2nd/		26/07/2015		30/08/2015		
					1-L3	103 DB, South Wing/3rd/		26/07/2015		30/08/2015		
					2-L1	power 104 DB, //;						
					2-L2	power						
					2-L3	power						
101	DB	1	North Win	1flo								
102	DB	1	North Win	2nd			25/02/2016		21/05/2017		21/05/2017	
102-B	DB	1	basement	B			10/04/2016		10/04/2021		10/04/2021	
103	DB	1	South Win	3rd								

All the reports can be downloaded in Excel.

3.7.2 EDIS PROCEDURE 2-Setting the Default Inspection Frequencies in EDIS

The default date is 5 years OR is set by selecting a Board Type. The number of years to the next test date can be controlled by defining the **Board Risk Type.** The board risk types are setup **via** the Site Administration / Manage Board Risk Types menu option. The period associated with the board risk type is then used to determine the next test date. So, if high-risk boards are set to have a 3 year period to the next test, then the next test date will be calculated as follows: “Most recent test date + 3 years”.

The screenshots below show the steps to setting the Board Risk Type.



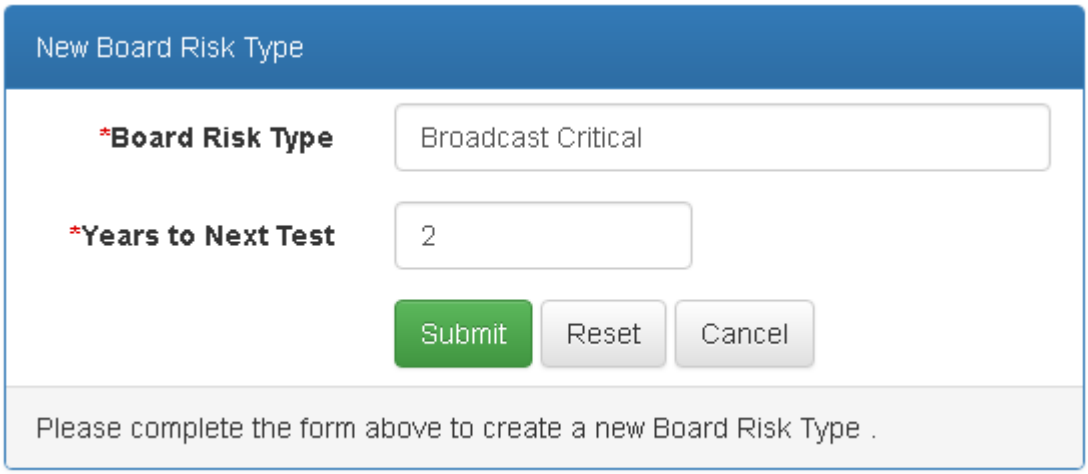
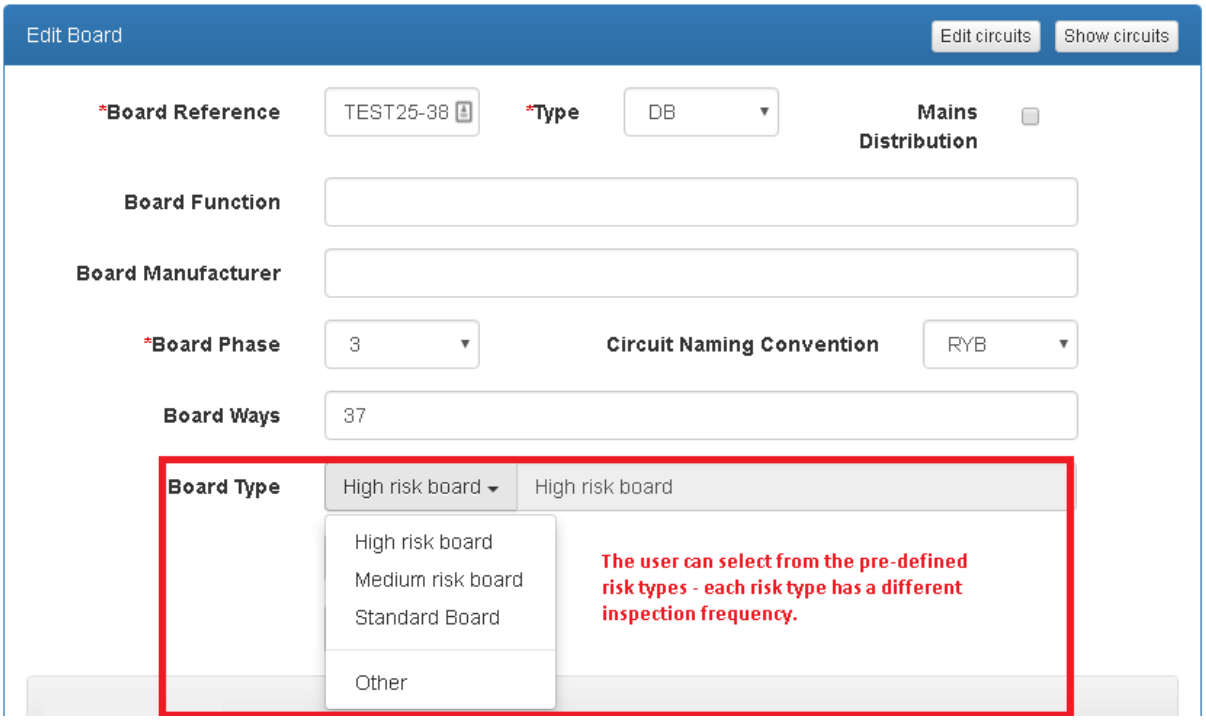


Figure: Selecting the Board Risk Type menu option and updating the Board Risk Types

The board risk type can then be selected when editing a board. It is then stored in the Board Type field.



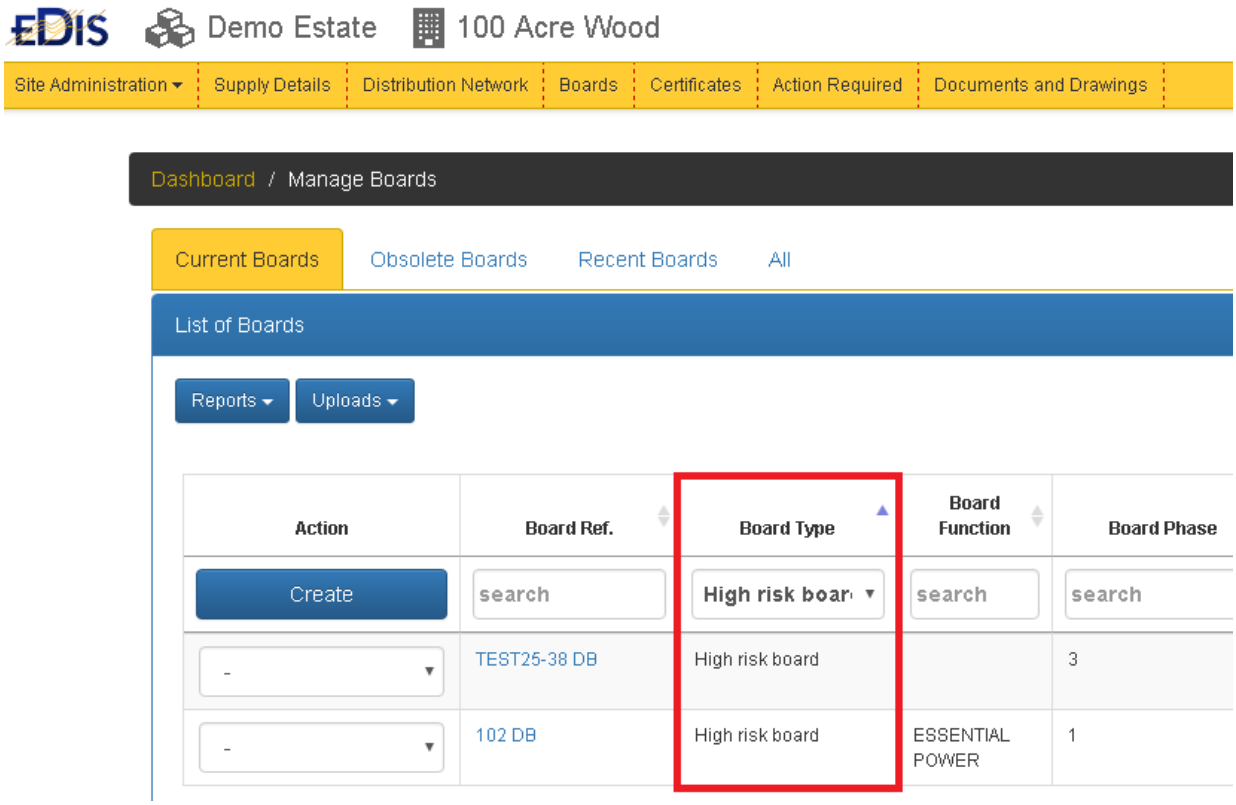


Figure: Board Type field is the Boards list and edited via the edit boards forms

3.7.3 EDIS PROCEDURE 3 - Recording the Risk Assessment in EDIS

The RISK ASSESSMENT associated with the electrical infrastructure can be documented and attached to the EDIS certificate. Entering free text into the Additional Comments form, accessed while editing the certificate, will result in the Risk Assessment being included at the end of the PDF of the certificate.

Enter EDIS additional comments field, accessed by editing the certificate

Job Ref: Hackney
EDIS Number: 106794

ADDITIONAL COMMENTS

RISK ASSESSMENT

In addition to the limitations in Section d the following risk assessment has been prepared in support of this EICR:

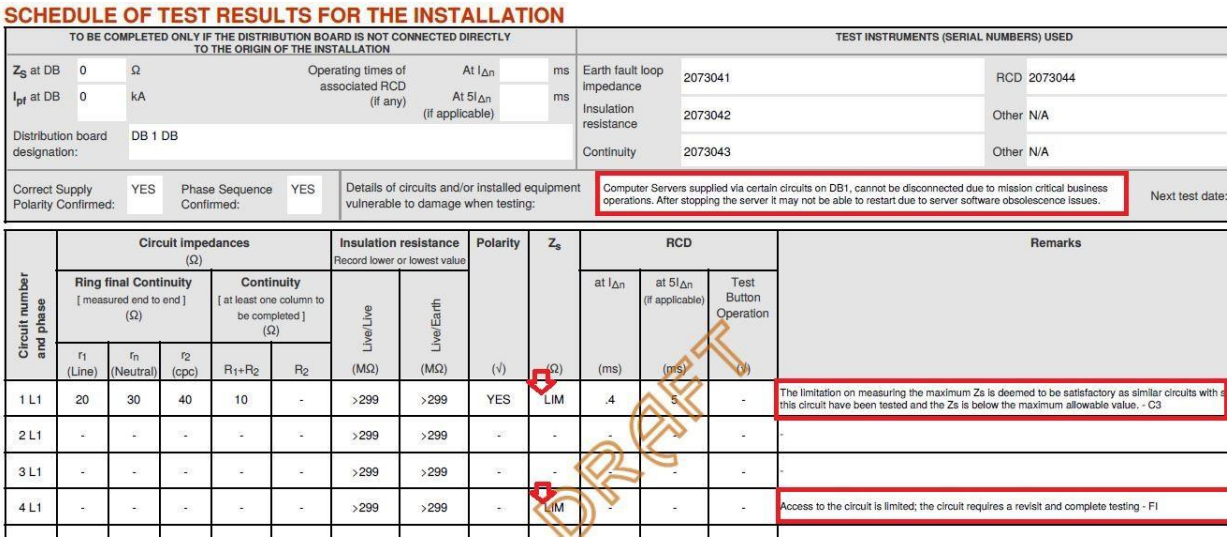
- **23 floor distribution boards have not been tested, these boards were installed three months ago and as such they have been inspected, refer certificate 123456, and the risk of non-compliance with BS7671 is judged to be low.**
- **Final distribution circuits have been sample tested. For each board a 25% sample of the circuits were tested. The sample is judged to representative of the circuits in the board and a successful test results can be reasonably assumed to be the same as circuits not tested.**
- **Where the value of the earth loop impedance could not be measured, a value of LIM has been entered into the field and an Observation Code of C3 (Improvement recommended) has been associated with the circuit along with a comment stating the reason for the limitation. Where the limitation is judged to be a danger, due to other considerations and Observation Code FI (Further investigation) has been assigned. The FI code indicates that the assessed risk of not doing the tests is high and work needs to be undertaken in order to measure the earth loop impedance.**

EDIS Certificate PDF, includes the text from the Additional Comments field.

3.7.4 EDIS PROCEDURE 4 - Recording limitations and deviations for tests

When testing a board and a circuit there are two text fields that can be used to record comments on the cost, difficulty, practicality of carrying out the test.

1. For each board, there is a general comment area “Details of circuits and/or installed equipment vulnerable to damage when testing.”
2. For each circuit, there is a ‘remarks’ text area, Observations and recommendations associated with a specific circuit should be captured in this field.
3. If the observation or recommendations, do not relate to a specific circuit, a General Observation can be captured. Care should be taken to include the distribution board reference or some other location reference. A photograph can also be taken and uploaded into EDIS.



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_s at DB	0	Ω	Operating times of associated RCD (if any)	At $I_{\Delta n}$	ms	Earth fault loop impedance	2073041	RCD	2073044
I_{pf} at DB	0	kA		At $5I_{\Delta n}$ (if applicable)	ms	Insulation resistance	2073042	Other	N/A
Distribution board designation:	DB 1 DB					Continuity	2073043	Other	N/A

Correct Supply Polarity Confirmed: YES — Phase Sequence Confirmed: YES

Details of circuits and/or installed equipment vulnerable to damage when testing: Computer Servers supplied via certain circuits on DB1, cannot be disconnected due to mission critical business operations. After stopping the server it may not be able to restart due to server software obsolescence issues.

Next test date:

Circuit number and phase	Circuit impedances (Ω) Ring final Continuity [measured end to end] (Ω) r_1 (Line)	r_n (Neutral)	r_2 (cpc)	Continuity [at least one column to be completed] (Ω) R_1+R_2	R_2	Insulation resistance Record lower or lowest value Live/Live (MΩ)	Live/Earth (MΩ)	Polarity (√)	Z_s (Ω)	RCD at $I_{\Delta n}$ (ms)	at $5I_{\Delta n}$ (if applicable) (ms)	Test Button Operation (√)	Remarks
1 L1	20	30	40	10	-	>299	>299	YES	LIM	.4	5	-	The limitation on measuring the maximum Zs is deemed to be satisfactory as similar circuits with a this circuit have been tested and the Zs is below the maximum allowable value. - C3
2 L1	-	-	-	-	-	>299	>299	-	-	-	-	-	-
3 L1	-	-	-	-	-	>299	>299	-	-	-	-	-	-
4 L1	-	-	-	-	-	>299	>299	-	LIM	-	-	-	Access to the circuit is limited; the circuit requires a revisit and complete testing - FI

DRAFT

The inclusion of the 'LIM' in the Zs value results in two updates in EDIS:

1. The last/next test date for the circuit is updated.
2. The list of Actions Required (Observations and Recommendations) is is updated

3.7.5 EDIS PROCEDURE 5 - Certifying certificates and the resulting update of the distribution board details

When a certificate is ready to sign-off the electrician needs to select one of the 4 options listed in the table below. **The most commonly used options are 1 and 3, it should be noted that the last/next test date value will only ever be updated if the Zs >0, i.e. a Zs measure must be taken. The same rule applies to EICR, New Installation and MW certificates.**

Care should be taken when completing the certificate that the correct option is selected in order to ensure the distribution board and circuit details are correctly updated, **refer 3.7.5 EDIS PROCEDURE 5 - Certifying certificates and the resulting update of the distribution** board details

` Change applied on completing the certificate Based on the option selected			
Option	**Changes to circuit details applied in Boards and Circuits Schedule**	**Changes to Last test / Next test dates**	**Notes**
1	**If Zs>0**	**If Zs>0**	**The default case**

	If Zs=LIM		
2	none	If ZS>0 or LIM	
3	**Regardless of Zs**	**If ZS>0**	**This allows circuit details to be updated regardless of Zs value, however the last test/next test date is not updated of Zs<=0**
4	In every case	In every case	**This allows all circuit details to be updated regardless of Zs value**

On signing off the certificate the electrician should select one of the options on the page 5. The screenshot for the options is shown below:

CASE 1 - (Default) Test data retained; Changes to circuit details only if Zs>0 or Zs=lim; Last test/Next test date updated if Zs>0

If Zs in tested circuit >0 the data in the certificate schedules will replace the data in the final board schedule. Last test/Next test date for the circuit will only be updated if Zs>0; if the Zs=blank no changes will be applied in the final board schedule; if Zs=Lim the last test next test date will not be updated.

Use if you want the circuit details to be the same as the final circuit details except where Zs =0 or Zs=blank; e.g. if Zs is blank, and the circuit description is "Not Tested", the circuit description will not appear on the final schedule, that is, the final schedule will retain the original circuit description because Zs=blank.

CASE 2 - Test data retained; No change to circuit details; Only last test/Next test date updated if Zs>0 or Zs =lim

No changes in the tested circuit details will be applied to the final board schedule. Test data will be retained and if Zs>0 or Zs=lim the last test / next test date in the final schedule will be updated.

Use if you do not want to update any circuit details. (Note: the last test date will be updated if the Zs>0 or Zs=lim no other changes will be updated in the final schedule)

CASE 3 - Test data retained; Changes to circuits details regardless of Zs value; Last test/Next test date updated if Zs>0 or Zs=lim

The data in the certificate schedules will replace the data in the final board schedule; if the Zs=0 or blank the last test next test date will not be updated because the circuit has not been tested.

Use if you want all circuit details in the certificate to appear in the final schedule.

CASE 4 - Test data retained; Changes to circuit details regardless of Zs value; Last test/Next test date updated regardless of Zs value

All data in the certificate schedules will replace the all data in the final board schedule.

Use if you want the test schedule to be exactly the same as the final schedule and you want the last test/next test dates on the circuit to be updated for all circuits.

4 GUIDANCE NOTE 3: Inspection frequencies, sampling and classification of observations and recommendations

Guidance Note 3: *Inspection & Testing (17th Edition, BS7671: 2008 incorporating amendments 3: 2015)* provides information for carrying out inspection and testing on electrical installations. EDIS aligns with these requirements and the content below aims to provide guidance on how EDIS can be used, specifically:

- *Table 3.2 - Recommended initial frequencies of electrical inspection*
- *Table 3.3 Range of samples for inspection*
- *Table 3.5 Classification of danger and non-compliance* (observations and recommendations classification codes)

4.1 EDIS Prerequisites

This guide provides instructions primarily for electricians, testers and qualifying supervisors on how to use EDIS in a way that enables compliance with Guidance Note 3. The required EDIS system rights and permissions are mostly for electrician and qualifying supervisor, some EDIS compliance management features require building administration rights. If you require building administration rights you should request them, instruction to do so can be found in section 4 of the user permissions guide.

4.2 GN3 - Purpose of periodic inspection and testing

3.1 Purpose of periodic inspection and testing

621.2 The purpose of periodic inspection and testing is to provide an engineering view on whether or not the installation is in a satisfactory condition where it can continue to be used safely.

A detailed visual examination of the installation is required, together with appropriate tests. The tests are mainly to confirm that the disconnection times stated in Chapter 41 are met.

The periodic inspection and testing is carried out, so far as is reasonably practicable, for:

(a) the safety of persons and livestock against the effects of electric shock and burns
(b) protection against damage to property by fire and heat arising from an installation defect
(c) confirmation that the installation is not damaged or deteriorated so as to impair safety
(d) the identification of installation defects and departures from the requirements of the Regulations that may give rise to danger.

The primary aim of periodic electrical inspection and testing is to confirm that the so far as is reasonably practicable[1], whether the installation is in a satisfactory condition for continued service. *'so far as is reasonably practicable'* is used regulation, it allows for a balance to be struck between, on one hand, the level of risk reduction considered acceptable and on the other hand, the cost, time and effort of reducing the risk to such an acceptable level.

[1] *'so far as is reasonably practicable'* is defined in the case Edwards v National Coal Board, https://en.wikipedia.org/wiki/Edwards_v_National_Coal_Board

4.3 Inspection frequencies

Table 3.2 - Recommended initial frequencies of electrical inspection provides a guide to the initial time interval between initial installation and the next inspection date. For a new installation, the initial inspection frequency guidelines in Table 3.2 can be followed. The challenge faced by compliance manager is in deciding the frequency for subsequent frequencies. The guide states *'In short, the inspector, being a skilled person, should apply engineering judgement when deciding on intervals and may use Table 3.2 as a starting point for the decision*'.

The frequencies in EDIS are recorded in the last test and next test dates for each circuit. These dates are set when a Minor Works, New Installation or Condition Report is completed. EDIS *suggests a default date which can be overridden by the inspector*.

The section **3.7.2 EDIS PROCEDURE 2-Setting the Default Inspection Frequencies in EDIS,** describes the steps to setting default frequencies for the next inspection.

▼ **Table 3.2** Recommended initial frequencies of inspection of electrical installations

Type of installation	Routine check see section 3.5	Maximum period between inspections and testing (note 8)	Notes
General installation			
Domestic accommodation - general	—	Change of occupancy/10 years	
Domestic accommodation - rented houses and flats	1 year	Change of occupancy/5 years	1, 2, 10
Residential accommodation (Houses of Multiple Occupation) - halls of residence, nurses accommodation, etc.	1 year	Change of occupancy/5 years	1, 2, 10, 11
Commercial	1 year	Change of occupancy/5 years	1, 2, 3, 4
Educational establishments	6 months	5 years	1, 2, 6
Industrial	1 year	3 years	1, 2
Offices	1 year	5 years	1, 2
Shops	1 year	5 years	1, 2
Laboratories	1 year	5 years	1, 2
Hospitals and medical clinics			
Hospitals and medical clinics - general areas	1 year	5 years	1, 2
Hospitals and medical clinics - medical locations	6 months	1 year	9
Buildings open to the public			
Cinemas	1 year	1-3 years	2, 6
Church installations	1 year	5 years	2
Leisure complexes (excluding swimming pools)	1 year	3 years	1, 2, 6
Places of public entertainment	1 year	3 years	1, 2, 6
Restaurants and hotels	1 year	5 years	1, 2, 6
Theatres	1 year	3 years	2, 6, 7
Public houses	1 year	5 years	1, 2, 6
Village halls/community centres	1 year	5 years	1, 2
Special and specific installations (for medical locations see above)			
Agricultural and horticultural	1 year	3 years	1, 2
Caravans	1 year	3 years	7
Caravan parks	6 months	1 year	1, 2, 6
Highway power supplies	as convenient	6-8 years	
Marinas	4 months	1 year	1, 2
Fish farms	4 months	1 year	1, 2
Swimming pools	4 months	1 year	1, 2, 6
Emergency lighting	daily/monthly	3 years	2, 3, 4
Fire alarms	daily/weekly	1 year	2, 4, 5
Launderettes	monthly	1 year	1, 2, 6
Petrol filling stations	1 year	1 year	1, 2, 6
Construction site installations	3 months	3 months	1, 2

TABLE 3.2 - GUIDANCE NOTE 2

4.3.1 Selecting samples

For electrical inspection and testing in buildings where distribution boards and circuits have the same manufactured and installed specification testing a sample of the total can provide statistically based confidence that the electrical installation meets the required electrical safety standard. To do this a sampling strategy needs to be developed. Guidance note Table 3.3 Range of samples for inspection provides advice on selecting the test sample:

- Main switchgear (external)- 100%
- Main switchgear (internal sections and cable connections) – 100% where practicable, not less than 10%
- Main switch gear (internal), inspection of circuit breaker connections and control sections -- ideally 100% not less than 10%.
- Final circuit distribution boards – Ideally 100%, not less than 25%
- Final circuit accessories – Between 10% and 100%
- Earthing and protective bonding conductors – 100%

The guidance in Table 3.3 can be broadly summarised as :

ITEM	Ideal Sample size	Lowest sample size	Typical checks
Inspection of Main switchgear (external)	100%	100%	Visual inspection for signs of overheating, aging or damage
Inspection of Main switchgear (internal)	100%	>10%, (100% where practicable)	A visual inspection for signs of overheating, aging or damage, Check tightness of cable connections.
Sub-Mains distribution boards	100%	>10%, (100% where	The mains distribution boards, i.e a board supplying another board can classed as part of the main

		practicable)	switchgear and treated in the same way
Final distribution boards	100%	>25%	These are the boards that supply the final, or terminating, point of the system, refer note 4 below
Final circuit accessories	100%	>10%	These are sockets, lights or supply to electrical devices, refer note 3 and 4 below

Table 3.3 in the Guidance note provide further advice.

Note 3, from Guidance Note 3, Table 3.3: Sample sizes for sockets, which are more easily accessible to end users, should be higher than for lighting which are less accessible.

Note 4, from Guidance Note 3, Table 3.3: Do not 'sample samples', if a 10% sample is applied to a sub-main distribution board, then further sampling should not be applied to the final circuit distribution board on these circuits. If a submain has 10 circuits and 1 circuit is inspected and tested, then all the circuits associated with the distribution board supplied by this 1 circuit should be tested. It would be inappropriate to test 1 submain circuit and sample % of the final distribution circuits.

An example of a testing specification is provided is in - *EDIS Planning and Inspection and Testing Programme.doc* available at www.electricalcertificates .co.uk

4.3.2 Selecting boards and circuits to test

Guidance note 3, 78, states, "if a repeat periodic inspection is undertaken using a sampling system, then a different sample, again representative of the installation, must be chosen. Therefore, previous periodic inspection and test records should be consulted prior to commencement of a sample inspection and test.' **EDIS Practice – EP1 Selecting circuits for testing** provides instructions on how task can be easily achieved.

4.3.3 Classifying observations and recommendations

Table 3.5 Classification of danger and non-compliance provides guidance classifying the inspection and testing observations and recommendations classification codes. EDIS provides a number of mechanisms to report any non-compliances:

1. Where there is a deviation from the guidance note or regulation, the details of the deviation needs to be recorded and retained in the condition report risk assessment**, refer section EDIS PROCEDURE 3 - Recording the Risk Assessment** in EDIS**.**

2. Where the value of the earth loop impedance cannot not be measured, a value of LIM should have been entered into the field and an Observation Code of C3 (Improvement recommended) should be associated with the circuit along with a comment stating the reason for the limitation**, refer Section 3.7.4 EDIS PROCEDURE 4 - Recording limitations and deviations** for tests**.**

3. Where the limitation is judged to be a danger, due to other considerations an Observation Code FI (Further investigation) should be assigned. The FI code indicates that the assessed risk of not doing the tests is high and further work needs to be undertaken in order to measure the earth loop impedance to assess the risk, **refer Section 3.7.4 EDIS PROCEDURE 4 - Recording limitations and deviations** for tests**.**

5 APPENDIX: EDIS RESERVED WORDS

- SPARE, this is reserved for a circuit description where the circuit is not used. Other terms, BLANK, NOT USED or no description should not be used to indicate a SPARE circuit.
- LIM has a special meaning when used as the measured Zs value during testing. If the measured Zs value is > 0 or LIM, the circuit is deemed as having been tested. If the Zs value is empty or 0, the circuit is deemed not tested. EDIS uses the Zs value to determine whether the last/next test date for the circuit should be updated - a value in the measured Zs field will result in the Last/Next test date for a circuit being updated when the certificate is completed.

6 APPENDIX: EXAMPLE OF AN ELECTRICAL INSPECTION AND TESTING SPECIFICATION

NOTE: *The specification below is meant to be provided as an example and must be modified by taking the specific electrical installation into account.*

6.1 Specification for capturing the data associated with schedule of tests

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

Z_S at DB	0.08	Ω	Operating times of associated RCD (if any)	At $I_{\Delta n}$	ms	Earth fault loop impedance	04-002	RCD	95-675
I_{pf} at DB	5.24	kA		At $5I_{\Delta n}$ (if applicable)	ms	Insulation resistance	01-022	Other	12-001
Distribution board designation:	MCC 711 DB					Continuity	01-022	Other	N/A

Correct Supply Polarity Confirmed:	YES	Phase Sequence Confirmed:	YES	Details of circuits and/or installed equipment vulnerable to damage when testing:	-	Next test date: 13/06/2021

Circuit number and phase	Circuit impedances (Ω)					Insulation resistance (Record lower or lowest value)		Polarity	Z_s	RCD			Remarks
	Ring final Continuity [measured end to end] (Ω)			Continuity [at least one column to be completed] (Ω)		Live/Live	Live/Earth			at $I_{\Delta n}$	at $5I_{\Delta n}$ (if applicable)	Test Button Operation	
	r_1 (Line)	r_n (Neutral)	r_2 (cpc)	R_1+R_2	R_2	(MΩ)	(MΩ)	(√)	(Ω)	(ms)	(ms)	(√)	
1 R	1.07	1.02	0.51	0.39	-	-	>299	YES	0.5	-		-	ARMOURED GLAND TO EARTH BAR REQUIRES CORRECT EARTHING - C3
1 Y	-	-	-	-	-	>299	>299	-	Lim	-		-	Correct Earthing of Gland to Earth Bar Required - C3
1 B	-	-	-	-	-	>299	>299	-	Lim	-		-	Correct Earthing of Gland to Earth Bar Required - C2
2 R	-	-	-	-	-	>299	>299	-	-	-	-	-	-
2 Y	1.22	1.15	0.5	0.4	-	-	>299	YES	0.48	-	-	-	ARMOURED GLAND TO EARTH BAR REQUIRES CORRECT EARTHING - C2
2 B	-	-	-	-	-	>299	>299	-	-	-	-	-	-

DRAFT

Figure 5 - Schedule of test results

The test results for each board and circuit need to be captured into the Schedule of Test results format associated with the board.

Observations and recommendations associated with the circuit should be included with the circuit test results.

General Observations relating to the board or other aspects of the installation should be captured in the general observation section.

If the Schedule of Inspections for buildings less than 100A is used, the findings should be included in the related schedule.

All the data must be loaded into EDIS and used to generate the EDIS PDF electrical certificate.

6.2 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 Zs
   (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 (Zdb) and Prospective Short Circuit Current test readings.

6.3 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 and wherever possible do an 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.

6.4 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.

6.5 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.

6.6 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.

6.7 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.

6.8 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.

6.9 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.

6.10 Exclusions:

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