

Level 3 Award in the Periodic Inspection, Testing and Certification of Electrical Installations (2395-01)

April 2016 version 2.3



Qualification at a glance

Subject area	Electrical
City & Guilds number	2395
Age group approved	18+
Assessment	Online multiple choice test, written test and assignment.
Fast track	Automatic approval takes place in certain circumstances.
Support materials	Centre handbook Assessment pack
Registration and certification	Consult the Walled Garden/Online Catalogue for last dates

Title and level	City & Guilds number	Accreditation number
Level 3 Award in the Periodic Inspection, Testing and Certification of Electrical Installations	2395-01	600/4693/4

Version and date	Change detail	Section
2.0 Feb 2012	Amendment to assessment information	Assessment
	Amend Unit information Units 301/2/3	Units
2.1 Aug 2012	Addition of common assessment criteria for 2394 and 2395 e-volve test	Test specifications
2.2 Feb 2014	Age restriction changed to 18+	Qualification at a glance Age restriction section
2.3 April 2016	Updated information on 502 assessment	Pg.8 & Pg.9



Contents

1	Introduction	4
	Structure	5
2	Centre requirements	6
	Approval	6
	Resource requirements	6
	Candidate entry requirements	7
3	Delivering the qualification	8
	Initial assessment and induction	8
	Support materials	8
4	Assessment	9
	Test specifications	10
	Recognition of prior learning (RPL)	11
5	Units	12
Unit 301/2/3	Principles, practices and legislation for the periodic inspection, testing and condition reporting of electrical installations	13
Appendix 1	Sources of general information	22



1 Introduction

This document tells you what you need to do to deliver the qualification:

Area	Description
Who is the qualification for?	It is aimed at practising electricians who have not carried out inspection and testing since qualifying or who require some update of training before going onto other City & Guilds qualifications. The qualification is also suitable for those with limited experience of periodic inspection of electrical installations, such as those entering the industry from other engineering disciplines or who have been working in allied trades.
What does the qualification cover?	The qualification prepares candidates for the periodic inspection of electrical installation work.
Who did we develop the qualification with?	The qualification is endorsed by SummitSkills, the Sector Skills Council for the building services engineering sector.
What opportunities for progression are there?	It allows candidates to progress into employment or to the following City & Guilds qualifications: <ul style="list-style-type: none">• Level 3 Award in Initial Verification and Certification of Electrical Installations• Level 4 Award in the Design and Verification of Electrical Installations• ILM management and leadership qualifications

Structure

To achieve the **Level 3 Award in the Periodic Inspection, Testing and Certification of Electrical Installations**, learners must achieve **5** credits from the mandatory unit.

Unit accreditation number	City & Guilds unit	Unit title	Credit value
Mandatory			
	301	Principles, practices and legislation for the periodic inspection, testing and condition reporting of electrical installations (online)	
T/503/7873	302	Principles, practices and legislation for the periodic inspection, testing and condition reporting of electrical installations (written)	5
	303	Principles, practices and legislation for the periodic inspection, testing and condition reporting of electrical installations (assignment)	



2 Centre requirements

Approval

If your Centre is approved to offer the qualification Level 2 Certificate in Fundamental Inspection, Testing and initial Verification (2392-08) you will receive automatic approval to offer the new Level 3 Award in the Periodic Inspection, Testing and Certification of Electrical Installations (2395-01).

To offer this qualification, new centres will need to gain both centre and qualification approval. Please refer to the *Centre Manual - Supporting Customer Excellence* for further information.

Centre staff should familiarise themselves with the structure, content and assessment requirements of the qualification before designing a course programme.

Resource requirements

Physical resources and site agreements

Centres must provide access to sufficient equipment in the centre or workplace to ensure candidates have the opportunity to cover all of the practical activities.

The Assignment guide gives details on the specifications of any practical rig which must be built.

Centre staffing

Staff delivering this qualification must be able to demonstrate that they meet the following occupational expertise requirements. They should:

- be technically competent in the area for which they are delivering training and/or should have experience of providing training.
- have recent relevant experience in the specific area they will be assessing

Centre staff may undertake more than one role, eg tutor and assessor or internal verifier, but cannot internally verify their own assessments.

Assessors and internal verifiers

Assessor/Verifier (A/V) units are valued as qualifications for centre staff, but they are not currently a requirement for the qualifications.

Continuing professional development (CPD)

Centres must support their staff to ensure that they have current knowledge of the occupational area, that delivery, mentoring, training, assessment and verification is in line with best practice, and that it takes account of any national or legislative developments.

Candidate entry requirements

Candidates should not already be entered for a qualification of the same type, content and level as that of a qualification they already hold.

There are no formal entry requirements for candidates undertaking this qualification. However, centres must ensure that candidates have the potential and opportunity to successfully gain the qualification. It would be expected that candidates have a basic knowledge and understanding of electrical science and principles and experience of electrical installation work either within the electrical contracting industry or an allied trade.

Age restrictions

City & Guilds cannot accept any registrations for candidates under 18 as this qualification is not approved for under 18s.



3 Delivering the qualification

Initial assessment and induction

An initial assessment of each candidate should be made before the start of their programme to identify:

- if the candidate has any specific training needs
- support and guidance they may need when working towards their qualification
- the appropriate type and level of qualification.

We recommend that centres provide an induction programme so the candidate fully understands the requirements of the qualification, their responsibilities as a candidate, and the responsibilities of the centre. This information can be recorded on a learning contract.

Support materials

The following resources are available for this qualification:

Description	How to access
Short answer sample tests	www.cityandguilds.com
Assignment guide for centres	www.cityandguilds.com
SmartScreen	www.smartscreen.co.uk



4 Assessment

Candidates must:

- successfully complete one online multiple choice test
- successfully complete one written test **or** one on-demand, on-line short answer test.
- successfully complete one assignment

City & Guilds has written the following assessments to use with this qualification:

Unit	Title	Assessment method	Where to obtain assessment materials
301	Principles, practices and legislation for the periodic inspection of electrical installations (Online multiple choice)	City & Guilds e-evolve multiple choice test *(This test is the same test as 2394-301 – learners need only achieve the test once)	Examinations provided on e-evolve.
302/ 502	Principles, practices and legislation for the periodic inspection of electrical installations (Written test)	City & Guilds written test It is set and marked by City & Guilds. Or City & Guilds e-evolve short answer questions	The Written test is dated entry.
303	Principles, practices and legislation for the periodic inspection of electrical installations (Assignment)	Assignment It is set by City & Guilds, delivered and marked by the tutor/assessor, and will be externally verified by City & Guilds to make sure it is properly carried out.	The Assignment is available from the City & Guilds website.

Test specifications

The way the knowledge is covered by each test is laid out in the table below:

Test 1: Unit 301 (Online multiple choice)

Duration: 1 hour 20 mins

Unit	Outcome	Number of questions	%
301	1 Understand the requirements for completing the safe isolation of electrical circuits and installations	7	18
	2 Understand the requirements for inspecting, testing and recording the condition of electrical installations	2	5
	5 Understands the requirements for the safe testing of electrical installations which have been placed in service	9	22
	6 Understand the requirements for testing circuits which have been placed in service and may require isolation	7	18
	7 Understand the requirements for testing energised installations	13	32
	8 Understand and interpret test results	2	5
Total		40	100

Common Assessment criteria for 2394 and 2395 e-volve test

2394 Ref.	2395 Ref.
1.1	1.1
1.2	1.2
1.3	1.3
1.4	1.4
2.3.1	2.3
4.1	5.1
4.2	5.2
4.3	5.3
5.1	6.1
5.3	6.3
5.5	6.5
5.6	6.6
6.2	7.1
6.3	7.2
6.4	7.3
6.5	7.4

2394 Ref.	2395 Ref.
6.6	7.5
6.7	7.6
6.8	7.7
6.10	7.9
6.11	7.13
4.4	8.1

Recognition of prior learning (RPL)

Recognition of prior learning means using a person's previous experience or qualifications which have already been achieved to contribute to a new qualification.

RPL is allowed and is also sector specific.



5 Units

Availability of units

The following units can also be obtained from The Register of Regulated Qualifications: <http://register.ofqual.gov.uk/Unit>

Structure of units

These units each have the following:

- City & Guilds reference number
- unit accreditation number (UAN)
- title
- level
- credit value
- guided learning hours
- unit aim
- relationship to NOS, other qualifications and frameworks
- endorsement by a sector or other appropriate body
- information on assessment
- learning outcomes which are comprised of a number of assessment criteria

Unit 301/2/3 Principles, practices and legislation for the periodic inspection, testing and condition reporting of electrical installations

UAN:	T/503/7873
Level:	3
Credit value:	5
GLH:	37
Relationship to NOS:	Learners achieving the outcomes of this unit will have demonstrated that they are competent in accordance with the National Occupational Standards (NOS) for the Electrotechnical Industry ELT24, 25 and 26.
Endorsement by a sector or regulatory body:	This unit is endorsed by SummitSkills.
Aim:	This unit is designed to enable learners to understand principles, practices and legislation for periodic inspection, testing and condition reporting of electrical installations in accordance with statutory and non-statutory regulations and requirements. Its content is the knowledge needed by a learner to underpin the application of skills for the periodic inspection, testing and condition reporting of electrical installations.

Learning outcome
The learner will: 1. understand the requirements for completing the safe isolation of electrical circuits and installations
Assessment criteria
The learner can: 1.1 state the requirements of the Electricity at Work Regulations for the safe inspection of electrical systems and equipment 1.2 specify the appropriate procedure for completing safe isolation 1.3 state the reasons for carrying out safe isolation 1.4 state the implications of carrying out safe isolation 1.5 state the implications of not carrying out safe isolation 1.6 identify the Health and Safety requirements which apply when inspecting, testing and commissioning electrical installations and circuits

Learning outcome
The learner will: 2. understand the requirements for inspecting, testing and recording the condition of electrical installations
Assessment criteria
The learner can: 2.1 state the purpose of periodic inspection of electrical installations 2.2 state the requirements of the periodic inspection 2.3 identify the relevant documents associated with the inspection and testing and condition reporting of an electrical installation 2.4 specify the information that is required by the inspector to conduct the periodic inspection of an electrical installation

Learning outcome
The learner will: 3. understand the requirements for completing the periodic inspection of electrical installations
Assessment criteria
The learner can: 3.1 select appropriate items to be checked during the inspection process 3.2 identify the human senses which can be used during the inspection process 3.3 state how the senses can be used during the inspection process 3.4 specify the requirements for the inspection of electrical installations in service

Learning outcome
The learner will: 4. understand the differences between periodic inspection and initial verification
Assessment criteria
The learner can: 4.1 state the reasons for requiring a periodic inspection as identified in IET Guidance Note 3 4.2 state the need to determine the Extent and Limitations of a periodic inspection with the client and interested third parties before work begin 4.3 explain the application of sampling when carrying out periodic inspection and testing to include: <ul style="list-style-type: none"> • Factors which determine the extent of sampling • Situations where sampling may not be appropriate 4.4 identify the need to record agreements with the client and third parties on the condition report 4.5 explain the reasons why testing may be undertaken in a different order to that identified in BS 7671 for initial verification 4.6 identify the considerations which need to be made during a periodic inspection to ensure the safety of the persons and

livestock on the premises
4.7 state the purpose of the observations and classification codes in regards to: <ul style="list-style-type: none"> • the observations to be recorded • appropriate recommendations to be made
4.8 state the action to be taken if a dangerous situation is identified during the periodic inspection as identified in BS 7671 and IET Guidance Note 3
4.9 explain the action required by the inspector when the Extent and Limitations agreed may not be achieved on site
4.10 explain the difference between defects and noncompliances
4.11 explain why fault finding and remedial work does not form part of the periodic inspection process

Learning outcome
The learner will: 5. understand the requirements for the safe testing of electrical installations which have been placed in service
Assessment criteria
The learner can: 5.1 state the tests to be carried out during the periodic inspection of an electrical installation in accordance with the BS 7671 and IET Guidance Note 3 5.2 identify the appropriate instrument for each test to be carried out in terms of: <ul style="list-style-type: none"> • checks to confirm the instrument is fit for purpose • identifying the right scale/settings of the instrument appropriate to the test to be carried out 5.3 specify the requirements for the safe use of instruments to be used for testing and commissioning, to include: <ul style="list-style-type: none"> • checks required to prove that test instruments and leads are safe and functioning correctly • the need for instruments to be regularly checked and calibrated

Learning outcome
The learner will: 6. understand the requirements for testing before circuits are energised
Assessment criteria
The learner can: 6.1 state why it is necessary to verify the continuity, to include: <ul style="list-style-type: none"> • protective bonding conductors • circuit protective conductors • ring final circuit conductors 6.2 state the methods for verifying the continuity, to include: <ul style="list-style-type: none"> • protective conductors • ring final circuit conductors 6.3 explain the factors that effect conductor resistance values.

6.4	specify the procedures for completing insulation resistance testing
6.5	state the effects on insulation resistance values that the following can have: <ul style="list-style-type: none"> • cables connected in parallel • variations in cable length
6.6	explain why it is necessary to verify polarity
6.7	state the procedures for verifying polarity

Learning outcome	
The learner will:	
7.	understand the requirements for testing energised installations
Assessment criteria	
The learner can:	
7.1	state the methods of measuring earth electrode resistance to include: <ul style="list-style-type: none"> • installations forming part of a TT system • generators and transformers
7.2	describe common earth fault loop paths
7.3	state the methods for verifying protection by automatic disconnection of supply
7.4	identify the requirements for the measurement of prospective fault current
7.5	specify the methods for determining prospective fault current
7.6	verify the suitability of protective devices for prospective faults currents
7.7	specify the methods for testing the operation of residual current devices
7.8	state the reasons for verifying phase sequence
7.9	state the methods used to verify phase sequence
7.10	describe the methods used to verify voltage drop
7.11	state the cause of voltage drop in an electrical installation
7.12	determine voltage drop
7.13	state the need for functional testing
7.14	identify items which require functional testing
7.15	state the appropriate procedures for dealing with clients during the periodic inspection process

Learning outcome	
The learner will:	
8.	understand and interpret test results
Assessment criteria	
The learner can:	
8.1	explain why it is necessary to confirm whether test results comply with standard values
8.2	analyse test results to determine action to be taken

Learning outcome

The learner will:

9. understand the requirements for the completion of electrical installation condition reports and associated documentation

Assessment criteria

The learner can:

- 9.1 explain the purpose of an electrical installation condition report
- 9.2 state the **information** that must be contained within an electrical installation condition report
- 9.3 explain the requirements for the recording and retention of completed electrical installation condition reports, in accordance with BS 7671
- 9.4 identify appropriate methods for providing information to a client following completion of the electrical installation condition report

Learning outcome

The learner will:

10. be able to confirm safety of system and equipment prior to completion of inspection and testing

Assessment criteria

The learner can:

- 10.1 carry out safe isolation procedures in accordance with regulatory requirements
- 10.2 comply with the health and safety requirements of themselves and others within the work location during the periodic process
- 10.3 check the safety of electrical systems prior to the commencement of inspection and testing

Learning outcome

The learner will:

11. be able to carry out inspection of electrical installations

Assessment criteria

The learner can:

- 11.1 identify a safe system of work appropriate to the work activity
- 11.2 carry out an periodic inspection of an electrical installation in accordance with the requirements of BS 7671 and IET Guidance Note 3
- 11.3 complete a Condition Report Inspection Schedule in accordance with BS 7671 and IET Guidance Note 3

Learning outcome
The learner will: 12. be able to test electrical installations in service
Assessment criteria
The learner can: 12.1 select the test instruments and their accessories for tests to include: <ul style="list-style-type: none"> • continuity • insulation resistance • polarity • earth electrode resistance • earth fault loop impedance • prospective fault current • RCD operation • phase sequence • functional testing 12.2 carry out tests in accordance with BS 7671 and Guidance notes 3 to include: <ul style="list-style-type: none"> • continuity including <ul style="list-style-type: none"> ○ main protective bonding conductors ○ circuit protective conductors ○ Ring Final Circuits • insulation resistance • polarity • external earth fault loop impedance (Z_e) • system earth fault loop impedance (Z_s) • prospective fault current • RCD operation including additional protection • phase sequence • functional testing • additional protection • verification of voltage drop 12.3 compare test results with standard requirements and previous test results

Learning outcome
The learner will: 13. produce a condition report with recorded observations and classifications
Assessment criteria
The learner can: 13.1 use information to determine defects and non-compliances to include: <ul style="list-style-type: none"> • dwellings • other premises 13.2 complete Electrical Installation Condition Report and associated

documents

13.3 handover of the condition report to the client with appropriate information and guidance regarding actions to be taken

Range

requirements

In terms of:

- those carrying out the work
- those using the premises during the inspection

completing safe isolation

Carrying out safe working practices:

- Identification of circuit(s) to be isolated
- Identifying suitable points of isolation
- Selecting correct test and proving instruments in accordance with relevant industry guidance and standards
- Suitable testing methods
- Selecting locking devices for securing isolation
- Warning notices
- Appropriate sequence for isolating circuits

carrying out safe isolation

In relation to:

- The inspector
- Other personnel
- Customers/clients
- Public
- Building systems (presence or removal of supply)

Health and Safety requirements

- Working in accordance with risk assessments / permits to work / method statements
- Safe use of tools and equipment
- Safe and correct use of measuring instruments
- Provision and use of PPE
- Reporting of unsafe situations

documents

- Electricity at Work Regulations 1989
- BS 7671
- IET Guidance Note 3

requirements for the inspection

- Earthing conductors
- Circuit protective conductors
- Protective bonding conductors:
 - main bonding conductors

<ul style="list-style-type: none">• supplementary bonding conductors• Isolation and switching• Type and rating of overcurrent protective devices• Terminations of cables and conductors• Containment systems (steel and plastic)• Cables and conductors (not enclosed)• Support systems <p>reasons</p> <ul style="list-style-type: none">• Legislation requirement• Change of ownership• Insurance• Licensing• Mortgage• Change in use• Increase in load• Environmental impact (such as fire or flood) <p>interested third parties</p> <ul style="list-style-type: none">• Client• Insurers• Licensing officers• Mortgage lenders• Local authorities etc. <p>factors that effect conductor resistance</p> <ul style="list-style-type: none">• Conductors connected in parallel• Variations in conductor length• Variations in conductor cross sectional area <p>completing insulation resistance testing</p> <ul style="list-style-type: none">• Precautions to be taken before conducting insulation resistance tests• Particular requirements for testing where voltage sensitive devices are installed.• Particular requirements for testing where there are surge protection devices installed.• Methods of testing insulation resistance• The required test voltages and minimum insulation resistance values for circuits operating at given voltages• Identifying typical voltage sensitive devices <p>common earth fault loop paths</p> <ul style="list-style-type: none">• TT• TN-S• TN-C-S <p>methods for verifying protection</p>
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- The measurement of the external earth fault loop impedance (Z_e) and the system earth fault loop impedance (Z_s)
- Establishing Z_e by enquiry
- Calculation of the value of Z_s from given information
- The use of measured values to establish Z_s
- Comparing measured Z_s values with the maximum tabulated figures as specified in BS 7671 including the application of the adjustments in guidance note 3.

methods for testing the operation of residual current devices

- Fault protection
- Additional protection

information in a condition report

Serious defects, minor defects, non compliance



Appendix 1 Sources of general information

The following documents contain essential information for centres delivering City & Guilds qualifications. They should be referred to in conjunction with this handbook. To download the documents and to find other useful documents, go to the **Centres and Training Providers homepage** on **www.cityandguilds.com**.

Centre Manual - Supporting Customer Excellence contains detailed information about the processes which must be followed and requirements which must be met for a centre to achieve 'approved centre' status, or to offer a particular qualification, as well as updates and good practice exemplars for City & Guilds assessment and policy issues. Specifically, the document includes sections on:

- The centre and qualification approval process
- Assessment, internal quality assurance and examination roles at the centre
- Registration and certification of candidates
- Non-compliance
- Complaints and appeals
- Equal opportunities
- Data protection
- Management systems
- Maintaining records
- Assessment
- Internal quality assurance
- External quality assurance.

Our Quality Assurance Requirements encompasses all of the relevant requirements of key regulatory documents such as:

- Regulatory Arrangements for the Qualifications and Credit Framework (2008)
- SQA Awarding Body Criteria (2007)
- NVQ Code of Practice (2006)

and sets out the criteria that centres should adhere to pre and post centre and qualification approval.

Access to Assessment & Qualifications provides full details of the arrangements that may be made to facilitate access to assessments and qualifications for candidates who are eligible for adjustments in assessment.

The **centre homepage** section of the City & Guilds website also contains useful information such on such things as:

- **Walled Garden:** how to register and certificate candidates on line
- **Events:** dates and information on the latest Centre events
- **Online assessment:** how to register for e-assessments.

Useful contacts

UK learners General qualification information	T: +44 (0)844 543 0033 E: learnersupport@cityandguilds.com
International learners General qualification information	T: +44 (0)844 543 0033 F: +44 (0)20 7294 2413 E: intcg@cityandguilds.com
Centres Exam entries, Certificates, Registrations/enrolment, Invoices, Missing or late exam materials, Nominal roll reports, Results	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 E: centresupport@cityandguilds.com
Single subject qualifications Exam entries, Results, Certification, Missing or late exam materials, Incorrect exam papers, Forms request (BB, results entry), Exam date and time change	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 F: +44 (0)20 7294 2404 (BB forms) E: singlesubjects@cityandguilds.com
International awards Results, Entries, Enrolments, Invoices, Missing or late exam materials, Nominal roll reports	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 E: intops@cityandguilds.com
Walled Garden Re-issue of password or username, Technical problems, Entries, Results, e-assessment, Navigation, User/menu option, Problems	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 E: walledgarden@cityandguilds.com
Employer Employer solutions, Mapping, Accreditation, Development Skills, Consultancy	T: +44 (0)121 503 8993 E: business@cityandguilds.com
Publications Logbooks, Centre documents, Forms, Free literature	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413

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City & Guilds Group

The City & Guilds Group operates from three major hubs: London (servicing Europe, the Caribbean and Americas), Johannesburg (servicing Africa), and Singapore (servicing Asia, Australia and New Zealand). The Group also includes the Institute of Leadership & Management (management and leadership qualifications), City & Guilds Land Based Services (land-based qualifications), the Centre for Skills Development (CSD works to improve the policy and practice of vocational education and training worldwide) and Learning Assistant (an online e-portfolio).

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