Part of the Enginuity Group

Qualification Specification

EAL Level 3 NVQ Diploma in Installing Electrotechnical Systems and Equipment (Buildings, Structures and the Environment)

Qualification Number: 501/1605/8

Issue 2

www.eal.org.uk

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1.0 About EAL

For over fifty years, EAL has been the specialist awarding organisation for engineering, manufacturing, building services and related sectors. Developed to the highest technical standards, our qualifications reflect ever-changing industry and regulatory needs. We support the providers of our qualifications with an unparalleled level of service to ensure that learners are well prepared to take the next step in their journeys, whether study, an apprenticeship or work.

Through industry partnerships with EAL centres and training providers, decades of experience supporting our core sectors, and our role as part of the Enginuity Group, we have built unrivalled knowledge and understanding of employer skills needs. As a result, EAL's skills solutions, including apprenticeship End-Point Assessment, External Quality Assurance and qualifications are respected and chosen by employers to deliver real lifelong career benefits for all our learners. That's why in the last ten years, 1.2 million people across the UK have taken EAL qualifications.

1.1 Equal Opportunities and Diversity

EAL expects its centres to enable learners to have equal access to training and assessment for qualifications in line with equalities legislation. Further details can be located in the EAL Equal Opportunities and Diversity Policy.

1.2 Customer Experience and Feedback

Customer Experience is a fundamental part of EAL's commitment to you. EAL aims to ensure that all customers receive a high-quality efficient service. We are always interested in feedback and if you have any comments or feedback on our qualifications, products or services, please contact the Customer Experience team:

EAL Customer Experience
Tel: +44 (0)1923 652 400
Email: Customer.Experience@eal.org.uk

2.0 Introduction to the Qualification

What is this qualification?

This qualification is a National Vocational Qualification (NVQ). It involves the skills and knowledge needed to do the job, the ability to organise work, and the ability to identify and prevent problems.

NVQs are based on national occupational standards. The learner must meet these to be competent in a particular task. The achievement of NVQs will encourage an employee to value their contribution to the workplace, and it will develop their skills and potential. This qualification requires occupational evidence from the workplace.

To demonstrate occupational competence, learners must also complete the integrated Electrotechnical Occupational Competence Unit, which is assessed by the National Electrotechnical Training Ltd (NET) AM2.

Who is this qualification for?

- Those who wish to become a competent electrician.
- Those wishing to pursue a career in the electrotechnical/building services sector.

What does this qualification cover?

This qualification comprises of the skills and knowledge required to install electrotechnical systems and equipment in buildings, structures, and the environment.

The qualification is made up of knowledge units and performance units. The units cover a wide range of topics, including health and safety, environmental technology systems, overseeing and organising the work environment, planning, preparing and installing electrical systems and equipment, terminating and connecting conductors, cables and flexible cords, inspecting, testing, commissioning, and fault diagnosis and correction. Further details on the units for this qualification can be found in Section 3 of this document.

2.1 Support for this Qualification

This qualification:

- Is regulated at Level 3
- Is recognised by the Joint Industry Board (JIB) for grading
- Was developed in conjunction with industry and training providers
- Forms part of an industry-recognised apprenticeship framework (in the relevant nation).

2.2 Achievement of the Qualification

The qualification is awarded when all units for the qualification have been achieved. The Centre will then be able to apply for the learner's certificate. The learner will also receive a Certificate of Unit Credit, listing all the achieved units.

The overall grading for this qualification is Pass (or Fail) only.

If learners don't manage to complete the full qualification, a Certificate of Unit Credit can still be claimed for the units achieved. This will provide proof of their ability and enable them to complete the qualification at a later date.

Units can also be taken individually (standalone). This manual must be used in conjunction with the delivery and assessment of any individual units to ensure that assessment requirements and methodologies are consistently applied. Please see Section 6 for more detail on assessment.

2.3 Qualification Support Materials

The following materials are available for this qualification:

- Delivery Packs
- Learner Packs
- Assessor Packs
- Knowledge Assessment Documents
- Performance Unit Assessment Documents
- Amendment Document
- PowerPoint slides
- RPL/RPA Guidance.

All materials can be accessed by EAL-registered centres from the EAL website: www.eal.org.uk

Please note that delivery resources included with unit publications, such as PowerPoint slides and similar, may not meet current industry standards. Changes made to unit learning outcomes, assessment criteria, or coverage and depth might not be accompanied by an update to these delivery materials.

2.4 Progression Opportunities

The qualification relates to various electrotechnical qualifications including:

- EAL Level 3 Award in the Initial Verification and Certification of Electrical Installations
- EAL Level 3 Award in the Periodic Inspection, Testing and Certification of Electrical Installations
- EAL Level 3 Award in Electrical Installation Inspection, Testing, Certification, and Reporting
- EAL Level 3 Award in the In-Service Inspections and Testing of Electrical Equipment (PAT)
- EAL Level 3 Award in the Design, Installation and Commissioning of Electrical Energy Storage Systems
- EAL Level 3 Award in the Installation of Small Scale Solar Photovoltaic Systems
- EAL Level 3 Award in the Requirements for the Installation of Electric Vehicle Charging Points
- EAL Level 4 Award in the Design and Verification of Electrical Installations.

Learners may also be able to progress to other appropriate further or higher-level study.

Further information can be obtained from the EAL Website or alternatively contact:

EAL Customer Experience
Tel: +44 (0)1923 652 400
Email: Customer.Experience@eal.org.uk

2.5 Sustainability and Other EAL Qualifications

EAL has a range of qualifications that may be of interest including other products relating to sustainability.

Please see the EAL website for further details.

3.0 Qualification Structure

3.1 Rule of Combination

The learner will obtain this qualification once they have completed the 17 mandatory units. This diploma has **726** guided learning hours (GLH) and a total qualification time (TQT) of **1044** hours, which is the notional time required by the learner to complete the qualification.

The learner must complete the relevant knowledge units prior to the performance units.

The Electrotechnical Occupational Competence Unit is the final unit to be undertaken after completion of all the knowledge and performance units.

Mandatory Knowledge Units:

EAL Code	Unit Title	GLH	Ofqual Code
QELTK3-001	Understanding health and safety legislation, practices and procedures (installing and maintaining electrotechnical systems and equipment)	54	H/602/2523
QELTK3-002	Understanding environmental legislation, working practices and the principles of environmental technology systems	36	M/602/2525
QELTK3-003	Understanding the practices and procedures for overseeing and organising the work environment (electrical installation)	56	J/602/2532
QELTK3-004	Understanding the practices and procedures for the preparation and installation of wiring systems and electrotechnical equipment in buildings, structures and the environment	96	T/602/2560
QELTK3-004A	Understanding the principles of planning and selection for the installation of electrotechnical equipment and systems in buildings, structures and the environment	76	A/602/2561
QELTK3-005	Understanding the principles, practices and legislation for the termination and connection of conductors, cables and cords in electrical systems	86	J/602/2563
QELTK3-006	Understanding the principles, practices and legislation for the inspection, testing, commissioning and certification of electrotechnical systems and equipment in buildings, structures and the environment	78	D/602/2567

Continued

EAL Code	Unit Title	GLH	Ofqual Code
QELTK3-007	Understanding the principles, practices and legislation for diagnosing and correcting electrical faults in electrotechnical systems and equipment in buildings, structures and the environment	58	R/602/2579
QELTK3-008	Understanding the electrical principles associated with the design, building, installation and maintenance of electrical equipment and systems	106	A/602/2589

Mandatory Performance Units:

EAL Code	Unit Title	GLH	Ofqual Code
QELTP3-001	Applying health and safety legislation and working practices (installing and maintaining electrotechnical systems and equipment)	10	R/602/2596
QELTP3-002	Applying environmental legislation, working practices and the principles of environmental technology systems	10	H/602/2599
QELTP3-003	Overseeing and organising the work environment (electrical installation)	10	K/602/2605
QELTP3-004	Planning, preparing and installing wiring systems and associated equipment in buildings, structures and the environment	12	R/602/2792
QELTP3-005	Terminating and connecting conductors and cables in electrical systems	8	H/602/2828
QELTP3-006	Inspecting, testing, commissioning and certifying electrotechnical systems and equipment in buildings, structures and the environment	12	K/602/2703
QELTP3-007	Diagnosing and correcting electrical faults in electrical systems and equipment in buildings, structures and the environment	12	M/602/2704

Mandatory Occupational Competence Unit:

EAL Code	Unit Title	GLH	Ofqual Code
QEOC3-001	Electrotechnical Occupational Competence Unit (NET: AM2)	6	R/602/2503

4.0 Centre and Qualification Approval

Centres wishing to deliver the qualification will need to comply with this Qualification Specification and EAL's centre recognition criteria. Centres must also put in place the appropriate physical and human resources and administration systems to effectively run the qualification.

Please refer to Section 5 for the requirements of centre staff involved in the delivery of the qualification.

For existing EAL centres to put the qualification on your centre remit:
To add the qualification to your centre qualification remit, create and complete a qualification approval application form in Smarter Touch and submit to EAL.

For non EAL centres to gain centre approval to run the qualification:
Please contact the EAL Customer Experience Team:

EAL Customer Experience
Tel: +44 (0)1923 652 400
Email: Customer.Experience@eal.org.uk

5.0 Profiles and Requirements

5.1 Staff Responsible for Registering and Certification of Learners

Centres are required to appoint a suitable member of staff who can take responsibility for registering learners onto qualifications, submitting entries for assessments to EAL, and taking receipt of external assessment procedures (if appropriate). They may also be responsible for applying to EAL for learner certificates. The role may be undertaken by the same person who undertakes quality assurance.

5.2 Teaching Staff

Teachers/instructors must have the necessary knowledge and understanding of the occupation covered by this qualification in addition to the assessment criteria and learning outcomes they are delivering. They must also understand the structure and content of the qualification.

Teaching staff will also:

- Have 2 years' experience in teaching/training,
  or
- Be working towards an appropriate teaching/training qualification
  or
- Hold an appropriate teaching/training qualification
  - Suitable qualifications include Cert Ed, PCET or Learning and Development trainer units. This must be to a minimum of Level 3 standard.

Teacher CPD

Teachers/Instructors should be able to demonstrate evidence of being up to date with the electrical industry. This can be evidenced for example by either accessing trade publications, undertaking updates to wiring regulations or other courses of learning, attending networking events relevant to this qualification and/or attending industry events.

5.3 Learners

There are no formal academic entry requirements for the qualification; however, Centres should ensure that the learner has the potential to achieve the qualification.

Learners must have the minimum levels of literacy and numeracy to complete the learning outcomes and assessments.

Centres should make learners with particular requirements aware of the content of the qualification and they should be given every opportunity to successfully complete the qualification. EAL will consider any reasonable suggestions for, and from, those with disabilities that would help them to achieve the learning outcomes without compromising the standards required.

Age Restrictions

Learners must be at least 16 years old.

5.4 Assessors

The centre must provide EAL with the names of any teachers, trainers or other individuals who will undertake internal assessment (referred to as assessors), so that these can be approved prior to them carrying out an assessment role. They must satisfy all awarding organisation requirements.

Assessors must have:

- A minimum of 2 years' occupational experience within the area they are assessing
- Knowledge and understanding of the assessment criteria they are assessing
- Knowledge and understanding of the qualification structure, content and assessment components
- An understanding of the assessment process.

Assessors will also:

- Be occupationally competent electricians
    - This can be evidenced by the assessor holding a relevant electrotechnical NVQ L3* and/or having registration with the JIB as 'Approved Electrician' status or EngTech status via the IET.
    - *Assessors who qualified before NVQs were developed should provide evidence of how they are occupationally competent (such as through a CV together with any relevant references).

and

- Be working towards an appropriate assessment qualification
    - 'Candidate assessors' who are working towards their assessor qualifications must be countersigned by a qualified assessor.
    - Candidate assessors must have a clear action plan for achieving the assessor qualification.
    - Assessor approval will be withdrawn if a relevant qualification has not been attained within 18 months.

or

- Hold an appropriate assessment qualification
    - This must be to a minimum of Level 3 standard, such as the L3 CAVA.

Assessors who hold earlier qualifications, such as D32, D33 or TQFE/TQSE, must also have evidence of Continuing Professional Development (CPD) to demonstrate compliance with the current assessor standards.

In some instances, the teaching staff will also take on the role of internal assessors. In such cases, the staff member must be able to demonstrate that they satisfy the requirements of both teaching staff and assessor criteria.

Assessor CPD

Assessors must be able to demonstrate evidence of being up to date with the electrical industry. The occupational competence of assessors must be updated on a regular basis and be periodically confirmed with CPD via the Assessment Centre. Evidence of CPD will be sought by the External Quality Assurer for all approved Assessors at the centre.

It is the responsibility of each assessor to identify and make use of opportunities for CPD, such as industry conferences, access to trade journals, and Professional Body/Trade Association events, at least on an annual basis to enhance and upgrade their professional development and technical knowledge. It is imperative that records are kept of all such CPD

opportunities/occasions and that they provide evidence of cascading such technical knowledge and industry intelligence to all relevant colleagues.

5.5 Markers: Technical Competence

Where centre-based assessments are marked by a person who does not come into the assessor category, the marker must have auditable technical competence in the subject. For example, for a science-based assessment, the person may have auditable competency in that subject area but not necessarily in electrotechnical installation or maintenance. Examples of electrotechnical (occupational) competency are detailed under the requirements for assessors.

5.6 Internal Quality Assurers

The centre must provide EAL with the names of any teachers, trainers or other individuals who will undertake internal quality assurance, so that these can be approved prior to them carrying out this role.

The focus of internal quality assurance for this qualification is:

- The quality assurance of assessment procedures, including standardisation of assessment practice across different assessors within the centre
- Internal standardisation of marking and moderation of learner marks awarded for the units within the qualification.

Internal quality assurance staff must:

- Be familiar with the occupation(s) covered by this qualification
- Have knowledge and understanding of the qualification structure and content
- Understand the assessment process and the role of quality assurance.

Internal quality assurance staff must also:

- Be working towards an appropriate verification qualification
  or
- Hold an appropriate qualification, such as the ‘Level 4 Award in the Internal Quality Assurance of Assessment Processes and Practice’, or the ‘Level 4 Certificate in Leading the Internal Quality Assurance of Assessment Processes and Practice’.

Quality assurance staff who hold earlier qualifications (D34 or V1) should have CPD evidence to the most current standards.

Quality assurance staff are also required to have a minimum of occupational experience evidenced by having a building services engineering related qualification or proven sector competence and/or experience, plus access to relevant ‘occupational expertise’, which will enable them to conduct their quality assurance role appropriately. This evidence and access to ‘occupational expertise’ is quality assured by EAL.

CPD of internal quality assurance staff

The occupational experience of internal quality assurance staff must be updated on a regular basis and be periodically confirmed with CPD via the Assessment Centre. This will be quality assured by EAL.

It is the responsibility of each internal quality assurance staff member to identify and make use of opportunities for CPD, such as industry conferences, access to trade journals, and Professional Body/Trade Association events, at least on an annual basis to enhance and upgrade their professional development and technical knowledge. It is imperative that records are kept of all such CPD opportunities/occasions and that they provide evidence of cascading such technical knowledge and industry intelligence to all relevant colleagues.

5.7 Expert Witnesses

Where “Expert Witnesses” are used in the assessment process identified above, they must be sector-competent individuals who can attest to the learner’s performance in the workplace.

It is not necessary for expert witnesses to hold an assessor qualification, as a qualified assessor must assess the performance evidence provided by an expert witness. Evidence from expert witnesses must meet the tests of validity, reliability, authenticity, and sufficiency.

Expert witnesses will need to demonstrate:

- They have relevant current knowledge of industry working practices and techniques
- That they have no conflict of interest in the outcome of their evidence.

5.8 Staff Invigilating Onscreen Examinations

Members of staff with responsibility for invigilating onscreen examinations must know, understand and comply with the ‘Procedures for Conducting the Exam Component within EAL Qualifications’ (EAF1), which is published by EAL.

These members of staff must also:

- Have experience in conducting and controlling exam sessions
  or
- Be supervised by an individual experienced in conducting and controlling exam sessions.

Note: A teacher/tutor who has prepared the learners for the subject of the exam must not be the sole supervisor at any time during an exam for that subject(s).

5.9 Physical Resources

Safe working is a key consideration and all practical activities conducted within the centre must be subject to up-to-date risk assessments. All learners must be properly supervised and wear the correct personal protective equipment. Arrangements for first aid and emergency action in case of accident must be in place and signposted accordingly.

For the practical assessments, the required resources are detailed within the associated documentation (available from EAL website).

6.0 Assessment

6.1 Introduction

The learner must pass **ALL** assessments to achieve the qualification.

The assessment of this qualification involves the following aspects:

Knowledge Units

EAL Code	Unit Title	On-screen Exam	Centre-marked Assessment
QELTK3-001	Understanding health and safety legislation, practices and procedures (installing and maintaining electrotechnical systems and equipment)	35 question MC exam Closed book	N/A
QELTK3-002	Understanding environmental legislation, working practices and the principles of environmental technology systems	20 question MC exam Closed book	N/A
QELTK3-003	Understanding the practices and procedures for overseeing and organising the work environment (electrical installation)	45 question MC exam Closed book	N/A
QELTK3-004	Understanding the practices and procedures for the preparation and installation of wiring systems and electrotechnical equipment in buildings, structures and the environment	40 question MC exam Closed book	N/A
QELTK3-004A	Understanding the principles of planning and selection for the installation of electrotechnical equipment and systems in buildings, structures and the environment	30 question MC exam Open book	N/A
QELTK3-005	Understanding the principles, practices and legislation for the termination and connection of conductors, cables and cords in electrical systems	25 question MC exam Closed book	Practicals: 05A, 05B and 05C
QELTK3-006	Understanding the principles, practices and legislation for the inspection, testing, commissioning and certification of electrotechnical systems and equipment in buildings, structures and the environment	40 question MC exam Closed book	Practical 06

EAL Code	Unit Title	On-screen Exam	Centre-marked Assessment
QELTK3-007	Understanding the principles, practices and legislation for diagnosing and correcting electrical faults in electrotechnical systems and equipment in buildings, structures and the environment	45 question MC exam Closed book	Practical 07
QELTK3-008	Understanding the electrical principles associated with the design, building, installation and maintenance of electrical equipment and systems	45 question MC exam Closed book	Practical 08A (Transformers) Controlled Knowledge Assignment ELTK08B Open book

Performance Units

- Locally assessed. (EAL will carry out verification and continuous monitoring via EQA visits to quality assure these)

IMPORTANT NOTE: The learner must complete the relevant knowledge units prior to the associated performance units.

Electrotechnical Occupational Competence Unit

- Assessed by the AM2 at a NET centre. (NET carry out verification and continuous monitoring via EQA visits to quality assure this assessment)

IMPORTANT NOTE: The learner must complete the relevant knowledge units and performance units prior to undertaking the Electrotechnical Occupational Competence Unit.

General

Learners must achieve **ALL** components for the overall qualification to be awarded. If learners are unsuccessful in one or more of the assessment components, then the overall result for the qualification will be 'referred' and a certificate will not be awarded.

Units may also be taken individually and a Certificate of Unit Credit can be claimed for the units achieved by the learner.

IMPORTANT NOTE: **ALL** components of a unit must be completed before claiming that unit on EAL's systems. The assessment components for each unit can be seen in the table above.

All assessments are graded Pass (or Refer) only.

The qualification is graded Pass or Fail only.

The following table indicates the knowledge unit assessment components that are included in the qualification, and for each component:

- Who is responsible for setting and marking the component
- How the component is quality assured

Assessment component	Set by	Marked by	Method of quality assurance	
			Internal	External
On-screen exam[1]	EAL	EAL	Exam invigilation	Verification and continuous monitoring via EQA visits
Centre-marked assessment[2]	EAL	Centre	On-going standardisation within the Centre (Including moderation)	Verification and continuous monitoring via EQA visits

[1] Refer to Section 6.2 External Assessment (On-screen Exam).
[2] Refer to Section 6.3 Centre Marked Assessment.

Specific Guidance - Permitted reference materials

IET Wiring Regulations and other permitted publications for use in open book assessments can contain bookmarks, page tags, highlighting, short notes referencing other parts of the document, and, where appropriate, corrigenda or amendments published by the IET or BSI.

Publications for use in assessments cannot contain sample questions, answers, diagrams, formulae, detailed notation, or any content that could be advantageous to the learner, not part of the original document. Centres should ensure a learner's reference materials cannot advantage them in any way. 'Clean' copies should be made available when suitability is unclear.

The relevant assessment packs and Appendix 3 Centre Exam Specifications indicate the permitted reference materials.

6.2 External Assessment (On-Screen Exam)

Key Points

- The external examinations are available on demand
- See Appendix 3 Centre Exam Specifications for details on time, number of questions and learning outcome coverage for each examination.

The exams must be undertaken by the learner under controlled conditions as specified by EAL. Refer to 'EAF1 – EAL Policy – Instructions for Conducting Examinations within EAL Qualifications' and related guidance in EAL Smarter Touch.

Resitting external assessment (on-screen exam)

Learners who fail to achieve a pass will be permitted to resit the exam after feedback and appropriate tuition have taken place. Resits for externally set and marked exams will be subject to the current published charges.

IMPORTANT NOTE: Centres must notify their EQA before booking any exam sitting past a learner's fifth attempt within any unit.

6.3 Centre Marked Assessment

General information regarding conducting controlled internal assessment can be found in the document 'EAL Guidance for Controlled Internal Assessment marked by the Centre' with specific guidance referenced from or contained within this qualification specification.

Internal assessment includes practical and/or knowledge assessments. These assessments are set by EAL and marked by members of the delivery team at the Centre (see profiles of Assessors and Markers in Section 5). All assessment decisions are then subject to internal standardisation and external quality assurance.

Centres should maintain an assessment and feedback record for each learner, which details the evidence evaluated and the feedback given to the learner. This should include all documents and feedback for every assessment attempt. These records must be made available to the EQA upon request.

Centres are responsible for ensuring that centre marked assessments are suitably controlled to ensure that assessment decisions are valid and reliable, and that work submitted for assessment by learners is prepared and produced by them independently, without assistance from others, and free of plagiarism. Centres must impose necessary restrictions on learners to ensure this.

Further guidance on assessment is provided within the knowledge assessment documents, further support documents are also available on Smarter Touch.

Specific Guidance - Controlled internal assessment marked by the Centre

Assessor pack

The Assessor Packs contain relevant information for Centre staff to use as reference/guidance. These documents must not be shared with learners as they may contain confidential information for Centre staff only.

Learner pack

The Learner Packs relate to the individual practical and knowledge assessments. They contain instruction, feedback forms and marking checklists for each assessment. Learners will require access to each document when they are ready to be assessed. Assessors should issue the relevant Learner Pack to the Learner. These documents must be controlled by the assessor and provided to the learner as and when required but not retained by the learner. All assessment documentation must be retained by the Assessor and/or Internal Quality Assurer within the controlled environment, unless where otherwise specified. Centres must ensure that the assessment criteria information is only made available to a learner during the active part of the assessment.

Learners must be appropriately supervised when undertaking the practical and knowledge assessments. The level of supervision must be sufficient to safeguard the learners' health and safety, and ensure the evidence generated is attributable to the Learner.

Assessment decisions

Assessors are responsible for making assessment decisions in accordance with the assessment criteria detailed in the relevant specification and guidance documents. Assessor comments should also provide evidence indicating why assessment decisions have been awarded. This will facilitate the standardisation of assessment decisions within the Centre and enable the moderator to check that assessment decisions are in line with the

assessment criteria. Comments for further learner development should be included with feedback.

Centre assessors should allocate a mark for the assessment for each learner using the Assessment Checklist provided. No other sources of information should be used to make judgements about the quality and sufficiency of the evidence.

All materials should be retained securely and confidentially by the Centre, in accordance with EAL policy.

Retaking centre marked assessments

Learners are permitted to retake the centre marked assessments post feedback and after any appropriate training/learning has taken place.

Standardisation of internal assessments

Members of the internal quality assurance team at the centre have an important role to play in ensuring that internal assessment is standardised. In particular, they should work with assessors to ensure that the correct procedures are being followed at all times, and to ensure that assessment decisions taken by different assessors are consistent, fair and reliable.

Key activities will include:

- Meeting with assessors (individually and collectively) throughout the course to discuss quality assurance, standardisation matters and provide support/guidance where needed
- Observing assessors and giving them feedback to help improve their assessment technique
- Sampling learner evidence across different learner cohorts to ensure that appropriate standards have been met
- Arranging cross-marking of learner work to compare results and agree benchmarks.

Moderation of centre marked assessments

Moderation is required to ensure that assessment staff are making accurate, consistent judgements against learning outcomes and assessment judgements made for any learner are accurate, fair and comparable with those made for all other learners.

Internal moderation should be conducted by all centres that undertake assessment and marking of assessments on behalf of EAL. The moderation process may sit as a feature of the Centre's internal quality assurance process. Internal quality assurers must ensure this requirement is followed for centre marked assessments.

As part of Centre engagements, a review of internal moderation records and external moderation of assessments may take place. Your assigned AO moderator may be different from your assigned Centre EQA depending on the qualifications and units you deliver.

Further detail, including internal moderation staff requirements, can be found in 'EAL Centre Requirements for Moderation of Centre Marked Assessments' available on Smarter Touch.

Specific Guidance - Practical assessment resources

Practical assessment rigs (as described in the relevant assessment documents) must only be used for formal, recorded assessments. They must not be used for any training/teaching prior to assessment. All assessment rigs should be kept secure, with no learner access, between assessments.

6.4 Assessment of Performance

Competence must be demonstrated consistently over a period of time. However, there is no stipulated period of time this should occur over as this is a decision for the assessor. Based on their own professional judgement, assessors must be capable of identifying when competence has been demonstrated by the learner.

Evidence that is sourced from the real working environment for Performance Units must be naturally occurring, assessed on a minimum of two occasions, and can be generated by:

- Direct observation of performance in the workplace by a qualified assessor and/or testimony from an expert witness subject to the activity being assessed. This will be the preferred source of evidence
  or
- Candidate's reflective account of performance and work plans / work-based products, e.g., risk assessment documentation, method statements, diagrams, drawings, specifications, customer testimony, authorised and authenticated photographs/images, and audio-visual records of work completed together with candidate questioning
  or
- Evidence from prior achievements that demonstrably match the requirements of the Performance Unit
  or
- Witness testimony only.

Meeting the assessment requirements of Performance Units will need initial discussions and assessment planning between the learner and assessor, as an essential activity to identify opportunities to assess real working environment evidence, gaps that need to be filled or opportunities to recognise the prior achievement of the learner.

Learners must be adequately supervised in the workplace in accordance with relevant legislation. This is particularly important when working toward the performance units when working at heights, inspecting, testing, and diagnosing faults.

IMPORTANT NOTE: Please find specific performance assessment evidence requirements for each performance unit in the associated unit document.

The learner must complete the relevant knowledge units prior to the performance units.

IMPORTANT NOTE: For the following two units:

- QELTP3-002: Applying environmental legislation, working practices and the principles of environmental technology systems
- QELTP3-003: Overseeing and organising the work environment (electrical installation).

Learning outcomes can be assessed through professional discussion with the learner in the workplace (please refer to each unit to see where it is specified).

Simulation and simulated conditions - Where simulation is permissible:

Simulation can occur in rare circumstances where the opportunities to collect naturally occurring evidence are limited or absent, and the learner lacks evidence for completion of the unit. However, this scenario is anticipated to be rare in relation to the qualifications and the units to which this strategy applies, given the inherent flexibility of the evidence-gathering process. Where simulation does take place it must be in a realistic working environment. A

Real Working Environment is an environment in which real work activities take place under real working conditions in keeping with real commercial situations.

6.5 Assessment of Electrotechnical Occupational Competence

The Electrotechnical Occupational Competence Unit (QEOC3-001) is assessed by the NET AM2. It is part of the assessment process and requirements for this qualification. It is an independently administered holistic assessment which is used to confirm occupational competence has been achieved. It is a means of assessing safety and technically critical aspects of units within this qualification, including:

- Safe isolation
- Termination and connection
- Risk assessments and safe working practices
- Inspection, testing and commissioning
- Diagnosing and correcting faults.

These safety-critical aspects are activities with the potential to harm/damage personnel/property if carried out incorrectly.

Learners must **NOT** be put forward for the AM2 before the learner is deemed ready to be assessed as competent and have sufficient technical expertise, knowledge, skill and maturity to meet the expectations of employers in terms of 'Occupational Competence'. The Electrotechnical Occupational Competence Unit is the final unit to be undertaken in this Level 3 Diploma.

In order to undertake this stage of the qualification's assessment procedure/requirements, evidence of a learner's involvement, relevant experience, and progressive development of occupational competence must be available before the assessment is undertaken.

The assessment consists of a series of timed tasks in specially equipped booths containing typical electrical wiring systems and a short online component. The assessment is taken over 14 hours in total. The tasks cover areas including installation, inspection and testing, and fault finding. The work must comply with the current IET Wiring Regulations and be carried out in accordance with health and safety best practice.

The AM2 assessment can only be taken at a licensed NET assessment centre. An assessment place should be booked directly with the preferred AM2 Assessment Centre. For details of the Assessment of Occupational Competence, including the candidate pre-assessment checklist visit: www.netservices.org.uk

Learning outcomes and assessment criteria for the Electrotechnical Occupational Competence Unit can be found in Appendix 2.

7.0 Quality Control of Assessments

There are two major points where EAL interacts with the Centre in relation to the external quality control of assessment for a qualification and these are:

- Approval - when a Centre take on new qualifications, EAL, normally through an external verifier ensures that the Centre is suitably equipped and prepared to deliver the new qualification.
- Monitoring - throughout the ongoing delivery of the qualification EAL, through external verification monitoring and other mechanisms must maintain and the quality and consistency of assessment of the qualification.

Approval

In granting approval, EAL, normally through its external verifiers, must ensure that the prospective Centre:

- Meets any procedural requirements specified by EAL
- Has sufficient and appropriate physical and staff resources
- Meets relevant health and safety and/or equality and access requirements
- Has a robust plan for the delivery, assessment and quality assurance for the qualification/units.

EAL may decide to visit a Centre to view evidence or may undertake this via other means and there must be a clear rationale for the method(s) deployed.

Monitoring

EAL, through external monitoring and other mechanisms will ensure that a strategy is developed and deployed for the ongoing EAL monitoring of the Centre.

This strategy must be based on an active risk assessment of the Centre. In particular, the strategy must identify the apprentice, assessor, and internal verifier sampling strategy to be deployed and the rationale behind this:

- That the Centre's internal quality assurance processes are effective in assessment.
- That sanctions are applied to a Centre where necessary and that corrective actions are taken by the Centre and monitored by the EAL external quality assurer (EQA).
- That reviews of EAL's external auditing arrangements are undertaken.

Appendix 1: Unit Summaries

App. 1a: Knowledge Unit Summaries

Unit QELTK3-001: Understanding health and safety legislation, practices and procedures (installing and maintaining electrotechnical systems and equipment)

This knowledge unit enables learners to understand the health and safety legislation, practices and procedures associated when installing and maintaining electrotechnical systems and equipment. Its content is the knowledge needed by a learner to underpin the application of health and safety legislation, practices and procedures.

IMPORTANT NOTE: Given the safety-critical nature of this topic, it is a requirement that learners will have their knowledge consolidated by the use of "Practical Support Learning" activities in simulated conditions.

Learning Outcomes

1. Understand how relevant health and safety legislation applies in the workplace.
2. Understand the procedures for dealing with health and safety in the work environment.
3. Understand the procedures for establishing a safe working environment.
4. Understand the requirements for identifying and dealing with hazards in the work environment.

Assessment

This unit will be assessed by one on-screen exam.

Unit QELTK3-002: Understanding environmental legislation, working practices and the principles of environmental technology systems

This knowledge unit enables learners to understand environmental legislation, working practices and the principles of environmental technology systems. Its content is the knowledge needed by a learner to underpin the application of skills and working practices appropriate to relevant legislation and systems.

Learning Outcomes

1. Understand the environmental legislation, working practices and principles which are relevant to work activities.
2. Understand how work methods and procedures can reduce material wastage and impact on the environment.
3. Understand how and where environmental technology systems can be applied.

Assessment

This unit will be assessed by one on-screen exam.

Unit QELTK3-003: Understanding the practices and procedures for overseeing and organising the work environment (electrical installation)

This knowledge unit enables learners to understand practices and procedures for overseeing and organising the work environment for the installation of electrotechnical systems and equipment. Its content is the knowledge needed by a learner to underpin the application of skills for overseeing and organising the work environment.

Learning Outcomes

1. Understand the types of technical and functional information that is available for the installation of electrotechnical systems and equipment.
2. Understand the procedures for supplying technical and functional information to relevant people.
3. Understand the requirements for overseeing health and safety in the work environment.
4. Understand the requirements for liaising with others when organising and overseeing work activities.
5. Understand the requirements for organising and overseeing work programmes.
6. Understand the requirements for organising the provision and storage of resources that are required for work activities.

Assessment

This unit will be assessed by one on-screen exam.

Unit QELTK3-004: Understanding the practices and procedures for the preparation and installation of wiring systems and electrotechnical equipment in buildings, structures and the environment

This knowledge unit enables learners to understand and interpret the practices and procedures for the preparation and installation of wiring systems and electrotechnical equipment in buildings, structures and the environment. Its content is the knowledge needed by a learner to underpin the application of skills of preparing and installing electrotechnical systems and equipment.

IMPORTANT NOTE: Given the safety-critical nature of this topic, it is a requirement that learners will have their knowledge consolidated by the use of “Practical Support Learning” activities in simulated conditions.

Learning Outcomes

1. Understand the procedures, practices and statutory and non-statutory regulatory requirements for preparing work sites for the installation of wiring systems and associated equipment.
2. Understand the procedures for checking the work location prior to the commencement of work activities.
3. Understand the practices, procedures and regulatory requirements for completing the safe isolation of electrical circuits and complete electrical installations.
4. Understand the types, applications and limitations of wiring systems and associated equipment.
5. Understand the procedures for selecting and using tools, equipment and fixings for the installation of wiring systems, associated equipment and enclosures.
6. Understand the practices and procedures for installing wiring systems, associated equipment and enclosures.
7. Know the regulatory requirements which apply to the installation of wiring systems, associated equipment and enclosures.

Assessment

This unit will be assessed by one on-screen exam.

Unit QELTK3-004A: Understanding the principles of planning and selection for the installation of electrotechnical equipment and systems in buildings, structures and the environment

This knowledge unit enables learners to understand the principles associated with planning the installation of electrotechnical equipment and systems in buildings, structures and the environment and the selection of material, components and equipment. Its content is the knowledge needed by a learner to underpin the application of skills in the planning and selection of materials and equipment for completing an electrical installation in accordance with a specification.

Learning Outcomes

1. Understand the characteristics and applications of consumer supply systems.
2. Understand the principles of internal and external earthing arrangements for electrical installations for buildings, structures and the environment.
3. Understand the principles for selecting cables and circuit protection devices.
4. Understand the principles and procedures for selecting wiring systems, equipment and enclosures.

Assessment

This unit will be assessed by one on-screen exam.

Unit QELTK3-005: Understanding the principles, practices and legislation for the termination and connection of conductors, cables and cords in electrical systems

This knowledge unit enables learners to understand and interpret the principles, practices and legislation associated with the termination and connection of conductors, cables and cords in electrotechnical systems. Its content is the knowledge needed by a learner to underpin the application of skills for terminating and connecting conductors, cables and cords in electrotechnical systems in accordance with statutory and non-statutory regulations/requirements.

Learning Outcomes

1. Understand the principles, regulatory requirements and procedures for completing the safe isolation of electrical circuits and complete electrical installations.
2. Understand the regulatory requirements and procedures for terminating and connecting conductors, cables and flexible cords in electrical wiring systems and equipment.
3. Understand the procedures and applications of different methods of terminating and connecting conductors, cables, and flexible cords in electrical wiring systems and equipment.

Assessment

This unit will be assessed by one on-screen exam and three centre-marked practical assessment tasks.

Unit QELTK3-006: Understanding the principles, practices and legislation for the inspection, testing, commissioning and certification of electrotechnical systems and equipment in buildings, structures and the environment

This knowledge unit enables learners to understand principles, practices and legislation for the inspection, testing, commissioning and certification of electrotechnical systems and equipment in buildings, structures and the environment 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 inspection, testing, commissioning and certification of electrotechnical systems and equipment in buildings, structures and the environment.

IMPORTANT NOTE: Given the safety-critical nature of this topic, it is a requirement that learners will have their knowledge consolidated by the use of “Practical Support Learning” activities in simulated conditions.

Learning Outcomes

1. Understand the principles, regulatory requirements and procedures for completing the safe isolation of an electrical circuit and complete electrical installations in preparation for inspection, testing and commissioning.
2. Understand the principles and regulatory requirements for inspecting, testing and commissioning electrical systems, equipment and components.
3. Understand the regulatory requirements and procedures for completing the inspection of electrical installations.
4. Understand the regulatory requirements and procedures for the safe testing and commissioning of electrical installations.
5. Understand the procedures and requirements for the completion of electrical installation certificates and related documentation.

Assessment

This unit will be assessed by one on-screen exam and a centre-marked practical assessment.

Unit QELTK3-007: Understanding the principles, practices and legislation for diagnosing and correcting electrical faults in electrotechnical systems and equipment in buildings, structures and the environment

This knowledge unit aims to provide learners with the knowledge and understanding of the principles, practices and legislation associated with diagnosing and correcting electrical faults in electrotechnical systems and equipment in buildings, structures and the environment 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 used for fault diagnosis and correction in electrotechnical systems and equipment in buildings, structures and the environment.

IMPORTANT NOTE: Given the safety-critical nature of this topic, it is a requirement that learners will have their knowledge consolidated by the use of “Practical Support Learning” activities in simulated conditions.

Learning Outcomes

1. Understand the principles, regulatory requirements and procedures for completing the safe isolation of electrical circuits and complete electrical installations.
2. Understand how to complete the reporting and recording of electrical fault diagnosis and correction work.
3. Understand how to complete the preparatory work prior to fault diagnosis and correction work.
4. Understand the procedures and techniques for diagnosing electrical faults.
5. Understand the procedures and techniques for correcting electrical faults.

Assessment

This unit will be assessed by one on-screen exam and a centre-marked practical assessment.

Unit QELTK3-008: Understanding the electrical principles associated with the design, building, installation and maintenance of electrical equipment and systems

This knowledge unit enables learners to understand the relationship between electrical scientific principles and the competencies required of a qualified electrical operative. Its content is the knowledge needed by a learner to underpin the application of skills in the installation and maintenance of electrotechnical systems and equipment.

IMPORTANT NOTE: Given the safety-critical nature of this topic, it is a requirement that learners will have their knowledge consolidated by the use of “Practical Support Learning” activities in simulated conditions.

Learning Outcomes

1. Understand mathematical principles which are appropriate to electrical installation, maintenance and design work.
2. Understand standard units of measurement used in electrical installation, maintenance and design work.
3. Understand basic mechanics and the relationship between force, work, energy and power.
4. Understand the relationship between resistance, resistivity, voltage, current and power.
5. Understand the fundamental principles which underpin the relationship between magnetism and electricity.
6. Understand electrical supply and distribution systems.
7. Understand how different electrical properties can affect electrical circuits, systems and equipment.
8. Understand the operating principles and applications of DC machines and AC motors.
9. Understand the operating principles of different electrical components.
10. Understand the principles and applications of electrical lighting systems.
11. Understand the principles and applications of electrical heating.
12. Understand the types, applications and limitations of electronic components in electrotechnical systems and equipment.

Assessment

This unit will be assessed by one on-screen exam, a centre-marked practical assessment, and a centre-marked controlled knowledge assignment.

App. 1b: Performance Unit Summaries

Unit QELTP3-001: Applying health and safety legislation and working practices (installing and maintaining electrotechnical systems and equipment)

Prior to undertaking this unit, a learner must provide auditable evidence that they have the relevant knowledge and understanding as detailed in the unit QELTK3-001: Understanding health and safety legislation, practices and procedures (installing and maintaining electrotechnical systems and equipment).

This unit is designed to enable learners to develop the skills and apply the relevant knowledge associated with health and safety legislation, practices and procedures when installing and maintaining electrotechnical systems and equipment.

Learning Outcomes

1. Apply relevant health and safety legislation in the workplace.
2. Assess the work environment for hazards and identify remedial actions in accordance with health and safety legislation.
3. Apply methods and procedures to ensure work on site is in accordance with health and safety legislation.
4. Apply procedures to deal with and report health and safety in accordance with health and safety legislation.

Unit QELTP3-002: Applying environmental legislation, working practices and the principles of environmental technology systems

Prior to undertaking this unit, a learner must provide auditable evidence that they have the relevant knowledge and understanding as detailed in the units:

- QELTK3-002: Understanding environmental legislation, working practices and the principles of environmental technology systems
  AND
- QELTK3-008: Understanding the electrical principles associated with the design, building, installation and maintenance of electrical equipment and systems.

This unit is designed to enable the learner to develop the skills required and apply the associated knowledge, in order for them to apply environmental legislation, and working practices and interpret the principles of environmental technology systems in accordance with approved industry practices, statutory and non-statutory regulations, including:

- The Electricity at Work Regulations
- BS 7671
- Health & Safety at Work Act
- The Building Regulations.

The purpose of the unit is to enable the candidate to provide knowledge of environmental aspects up on activities and potential renewable environmental technology possibilities. The scope would be relevant to the worksite at which the assessment of providing knowledge takes place.

Learning Outcomes

1. Apply environmental legislation, working practices and principles for electrotechnical services.
2. Apply work methods and procedures to reduce material wastage and the impact of work activities on the work environment.
3. Supply information on environmental technology systems in the work location.

Unit QELTP3-003: Overseeing and organising the work environment (electrical installation)

Prior to undertaking this unit, a learner must provide auditable evidence that they have the relevant knowledge and understanding as detailed in the unit QELTK3-003: Understanding the practices and procedures for overseeing and organising the work environment (electrical installation).

This unit is designed to enable the learner to develop the skills required and apply the associated knowledge in order for them to demonstrate they can implement practices and procedures for overseeing and organising the work environment for the installation of electrotechnical systems and equipment.

Learning Outcomes

1. Provide relevant people with technical and functional information for work on electrical systems and equipment.
2. Oversee Health and Safety during work on electrical systems and equipment.
3. Coordinate liaison with other relevant persons during work activities.
4. Organise and oversee work activities and operations.
5. Organise a programme for working on electrical systems and equipment.
6. Organise the resource requirements for work on electrical systems and equipment.

Unit QELTP3-004: Planning, preparing and installing wiring systems and associated equipment in buildings, structures and the environment

Prior to undertaking this unit, a learner must provide auditable evidence that they have the relevant knowledge and understanding as detailed in the units:

- QELTK3-004: Understanding the practices and procedures for the preparation and installation of wiring systems and electrotechnical equipment in buildings, structures and the environment
  AND
- QELTK3-004A: Understanding the principles of planning and selection for the installation of electrotechnical equipment and systems in buildings, structures and the environment
  AND
- QELTK3-008: Understanding the electrical principles associated with the design, building, installation and maintenance of electrical equipment and systems.

This unit is designed to enable the learner to develop the skills required, and apply the associated knowledge, in order for them to demonstrate the competence required to plan, prepare and install wiring systems and associated equipment in buildings, structures and the environment in accordance with approved industry practices, statutory and non-statutory regulations, including:

- The Electricity at Work Regulations
- BS 7671
- Health & Safety at Work Act
- The Building Regulations.

Learning Outcomes

1. Prepare the working environment for the installation of wiring systems, enclosures and associated equipment.
2. Correctly interpret appropriate information for the installation of wiring systems, enclosures and associated equipment.
3. Confirm that planned work is in accordance with the installation specification.
4. Confirm the electrical supply is in accordance with the installation specification.
5. Measure and mark out the fixing and fitting locations for wiring systems, wiring enclosures and equipment in accordance with current relevant statutory and non statutory regulations.
6. Fit and fix wiring systems, wiring enclosures and associated equipment safely in accordance with the installation specification.
7. Confirm any variations to the installation specification or planned programme of work.

Unit QELTP3-005: Terminating and connecting conductors and cables in electrical systems

Prior to undertaking this unit, a learner must provide auditable evidence that they have the relevant knowledge and understanding as detailed in the unit QELTK3-005: Understanding the principles, practices and legislation for the termination and connection of conductors, cables and cords in electrical systems.

This unit is designed to enable the learner to develop the skills required and apply the associated knowledge so that they are able to demonstrate the competence required to terminate and connect conductors and cables in electrical systems in accordance with approved industry practices, statutory and non-statutory regulations, including:

- The Electricity at Work Regulations
- BS 7671
- Health & Safety at Work Act
- The Building Regulations.

Learning Outcomes

1. Confirm safety of system prior to completion of any termination and connection in accordance with statutory and non-statutory regulations.
2. Terminate and connect conductors in electrical wiring systems and equipment.
3. Confirm that terminations and connections are safe and free from defects in accordance with statutory and non-statutory regulations.

Unit QELTP3-006: Inspecting, testing, commissioning and certifying electrotechnical systems and equipment in buildings, structures and the environment

Prior to undertaking this unit, a learner must provide auditable evidence that they have the relevant knowledge and understanding as detailed in the units:

- QELTK3-006: Understanding the principles, practices and legislation for the inspection, testing, commissioning and certification of electrotechnical systems and equipment in buildings, structures and the environment
  AND
- QELTK3-008: Understanding the electrical principles associated with the design, building, installation and maintenance of electrical equipment and systems.

This unit is designed to enable the learner to develop the skills required and apply the associated knowledge in order that they are able to demonstrate the competence required to inspect, test, commission and certify electrotechnical systems and equipment in accordance with approved industry practices, statutory and non-statutory regulations, including:

- The Electricity at Work Regulations
- BS 7671
- Health & Safety at Work Act
- The Building Regulations.

Learning Outcomes

1. Confirm safety of the system and equipment prior to completion of inspection, testing and commissioning in accordance with statutory and non-statutory regulations.
2. Inspect electrotechnical systems and equipment.
3. Test electrotechnical systems and equipment.
4. Commission electrotechnical systems and equipment.

Unit QELTP3-007: Diagnosing and correcting electrical faults in electrical systems and equipment in buildings, structures and the environment

Prior to undertaking this unit, a learner must provide auditable evidence that they have the relevant knowledge and understanding as detailed in the units:

- QELTK3-007: Understanding the principles, practices and legislation for diagnosing and correcting electrical faults in electrotechnical systems and equipment in buildings, structures and the environment
  AND
- QELTK3-008: Understanding the electrical principles associated with the design, building, installation and maintenance of electrical equipment and systems.

This unit is designed to enable the learner to develop the skills required and apply the associated knowledge in order that they are able to demonstrate the competence required to diagnose and correct electrical faults in electrical systems and equipment in buildings, structures and the environment in accordance with approved industry practices, statutory and non-statutory regulations, including:

- The Electricity at Work Regulations
- BS 7671
- Health & Safety at Work Act
- The Building Regulations.

Learning Outcomes

1. Confirm safety of the system and equipment prior to diagnosing and correcting electrical faults in accordance with statutory and non-statutory regulations.
2. Carry out procedures to identify faults on electrical systems and equipment.
3. Correct faults on electrical systems and equipment.

Appendix 2: Electrotechnical Occupational Competence Unit

The Electrotechnical Occupational Competence Unit is the final unit to be undertaken in this Level 3 Diploma. This unit is designed to enable learners to demonstrate 'Electrotechnical Occupational Competence' in accordance with approved industry practices and the current statutory and non-statutory regulations. 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 ELT1,2, 4, 7, 8, 9, 23 to 28. Refer to Section 6.5 for guidance on how this unit is assessed.

This unit's outcomes and assessment criteria underpin the electrotechnical industry's competence requirements for qualified operatives in installation or maintenance roles.

Learning outcome The learner will be able to…	**Assessment criteria** The learner can...
1. Interpret specifications, drawings and diagrams	Interpret specifications and technical data for the installation of: 1.1 Protective Earthing Systems 1.2 A ring final circuit 1.3 A general lighting circuit 1.4 A control system for a three-phase motor 1.5 A central heating/sustainable energy system 1.6 A safety service circuit 1.7 A data cabling system 1.8 A three-phase socket-outlet
2. Undertake risk assessments	2.1 Review safe working practices 2.2 Undertake a risk assessment 2.3 Complete risk assessment documentation in accordance with organisational procedures
3. Carry out the safe isolation of electrical circuits and complete electrical installations	3.1 Locate correct means of isolation 3.2 Follow correct procedures for the isolation of electrical circuit(s) and complete electrical installations 3.3 Isolate circuit (s) in correct sequence 3.4 Select correct test and measuring instruments 3.5 Correctly test for the presence of an electrical supply
4. Plan and prepare to install, terminate and connect wiring systems	In accordance with an installation specification select the correct cables, accessories, equipment, components and protective devices for the installation of: 4.1 Protective Earthing Systems 4.2 A ring final circuit 4.3 A general lighting circuit 4.4 The control of a three-phase motor 4.5 A central heating/sustainable energy system 4.6 A safety service circuit 4.7 A data cabling system 4.8 A three-phase socket-outlet

Learning outcome The learner will be able to…	Assessment criteria The learner can...
5. Complete the installation, termination and connection of wiring systems in accordance with industry requirements	In accordance with an installation specification, install, terminate and connect cables, accessories, equipment, components and protective devices for the installation of: 5.1 Protective Earthing Systems 5.2 A ring final circuit 5.3 A general lighting circuit 5.4 The control of a three-phase motor 5.5 A central heating/sustainable energy system 5.6 A safety service circuit 5.7 A data cabling system 5.8 A three-phase socket-outlet
6. Complete the visual inspection, initial verification and certification of an electrical installation	6.1 Comply with correct procedures 6.2 Record relevant findings on correct documentation
7. Complete the testing and certification of an electrical installation in accordance with industry requirements	7.1 Select and use the correct measuring instruments 7.2 Confirm instruments function accurately 7.3 Measure the continuity of protective conductors 7.4 Measure the continuity of ring final circuit conductors 7.5 Measure the insulation resistance of the installation and its circuits 7.6 Confirm the polarity of the installation's electrical outlets and components 7.7 Determine the installation's earth fault-loop impedance 7.8 Determine the installation's prospective fault current 7.9 Carry out functional tests on the installation's equipment and components 7.10 Complete the correct documentation in accordance with statutory and non-statutory regulations
8. Diagnose, and recommend how to rectify, electrical faults in an electrical installation in accordance with industry requirements	8.1 Undertake an assessment of risk accordingly 8.2 Carry out safe isolation in the correct sequence as appropriate to fault diagnosis procedures 8.3 Select and use correctly, fit-for-purpose tools, equipment and instruments 8.4 Carry out relevant checks and preparations 8.5 Locate faults from given information 8.6 State how the identified faults can be rectified

Appendix 3: Centre Exam Specifications

Unit QELTK3-001: Understanding health and safety legislation, practices and procedures (installing and maintaining electrotechnical systems and equipment)

Assessment Type: On-Screen MCQ Exam, Closed Book
Number of Questions: 35
Time Allowed: 70 Minutes

The pass mark is normally expected to be around 60%.

Candidates may use a non-programmable calculator.

The examination will cover the knowledge learning outcomes of the unit as follows:

Learning Outcome	Number of Questions
1. Understand how relevant health and safety legislation applies in the workplace.	5 *(15%)*
2. Understand the procedures for dealing with health and safety in the work environment.	8 *(23%)*
3. Understand the procedures for establishing a safe working environment.	10 *(28%)*
4. Understand the requirements for identifying and dealing with hazards in the work environment	12 *(34%)*
Total:	**35**

Unit QELTK3-002: Understanding environmental legislation, working practices and the principles of environmental technology systems

Assessment Type: On-Screen MCQ Exam, Closed Book
Number of Questions: 25
Time Allowed: 40 Minutes

The pass mark is normally expected to be around 60%.

Candidates may use a non-programmable calculator.

The examination will cover the knowledge learning outcomes of the unit as follows:

Learning Outcome	Number of Questions
1. Understand the environmental legislation, working practices and principles which are relevant to work activities.	9 *(36%)*
2. Understand how work methods and procedures can reduce material wastage and impact on the environment.	4 *(16%)*
3. Understand how and where environmental technology systems can be applied.	12 *(48%)*
Total:	**25**

Unit QELTK3-003: Understanding the practices and procedures for overseeing and organising the work environment (electrical installation)

Assessment Type: On-Screen MCQ Exam, Closed Book
Number of Questions: 45
Time Allowed: 90 Minutes

The pass mark is normally expected to be around 60%.

Candidates may use a non-programmable calculator.

The examination will cover the knowledge learning outcomes of the unit as follows:

Learning Outcome	Number of Questions
1. Understand the types of technical and functional information that is available for the installation of electrotechnical systems and equipment.	10 *(22%)*
2. Understand the procedures for supplying technical and functional information to relevant people.	8 *(18%)*
3. Understand the requirements for overseeing health and safety in the work environment.	3 *(7%)*
4. Understand the requirements for liaising with others when organising and overseeing work activities.	9 *(20%)*
5. Understand the requirements for organising and overseeing work programmes.	9 *(20%)*
6. Understand the requirements for organising the provision and storage of resources that are required for work activities.	6 *(13%)*
Total:	**45**

Unit QELTK3-004: Understanding the practices and procedures for the preparation and installation of wiring systems and electrotechnical equipment in buildings, structures and the environment

Assessment Type: On-Screen MCQ Exam, Closed Book
Number of Questions: 40
Time Allowed: 80 Minutes

The pass mark is normally expected to be around 60%.

Candidates may use a non-programmable calculator.

The examination will cover the knowledge learning outcomes of the unit as follows:

Learning Outcome	Number of Questions
1. Understand the procedures, practices and statutory and non statutory regulatory requirements for preparing work sites for the installation of wiring systems and associated equipment.	5 *(12.5%)*
2. Understand the procedures for checking the work location prior to the commencement of work activities.	6 *(15%)*
3. Understand the practices, procedures and regulatory requirements for completing the safe isolation of electrical circuits and complete electrical installations.	5 *(12.5%)*
4. Understand the types, applications and limitations of wiring systems and associated equipment.	11 *(27.5%)*
5. Understand the procedures for selecting and using, tools, equipment and fixings for the installation of wiring systems, associated equipment and enclosures.	5 *(12.5%)*
6. Understand the practices and procedures for installing wiring systems, associated equipment and enclosures.	3 *(7.5%)*
7. Know the regulatory requirements which apply to the installation of wiring systems, associated equipment and enclosures.	5 *(12.5%)*
Total:	**40**

Unit QELTK3-004A: Understanding the principles of planning and selection for the installation of electrotechnical equipment and systems in buildings, structures and the environment

Assessment Type: On-Screen MCQ Exam, Open Book
Number of Questions: 30
Time Allowed: 60 Minutes

The pass mark is normally expected to be around 60%.

Open book, the following publications are permitted:

- BS 7671:2018(2022) Amendment 2 and BS 7671:2018 (2024) Amendment 3
- IET On-Site Guide
- Unite the Union Book 'Electrician's Guide to Good Electrical Practice'.

Amendment 3 is a loose-leaf addendum to BS 7671:2018 (2022) (the brown cover book). *It is available for free download on the IET website.*

Candidates may also use a non-programmable calculator.

The examination will cover the knowledge learning outcomes of the units as follows:

Learning Outcome	**Number of Questions**
1. Understand the characteristics and applications of consumer supply systems.	4 *(20%)*
2. Understand the principles of internal and external earthing arrangements for electrical installations for buildings, structures and the environment.	8 *(27%)*
3. Understand the principles for selecting cables and circuit protection devices.	12 *(40%)*
4. Understand the principles and procedures for selecting wiring systems, equipment and enclosures.	4 *(13%)*
Total:	**30**

Unit QELTK3-005: Understanding the principles, practices and legislation for the termination and connection of conductors, cables and cords in electrical systems

Assessment Type: On-Screen MCQ Exam, Closed Book
Number of Questions: 25
Time Allowed: 50 Minutes

The pass mark is normally expected to be around 60%.

Candidates may use a non-programmable calculator.

The examination will cover the knowledge learning outcomes of the unit as follows:

Learning Outcome	Number of Questions
1. Understand the principles, regulatory requirements and procedures for completing the safe isolation of electrical circuits and complete electrical installations.	2 *(8%)*
2. Understand the regulatory requirements and procedures for terminating and connecting conductors, cables and flexible cords in electrical wiring systems and equipment.	13 *(52%)*
2. Understand the procedures and applications of different methods of terminating and connecting conductors, cables, and flexible cords in electrical wiring systems and equipment Understand the principles for selecting cables and circuit protection device.	10 *(40%)*
Total:	**25**

Note:

- To achieve the unit, the learner must also pass the centre-marked practical assessments.

Unit QELTK3-006: Understanding the principles, practices and legislation for the inspection, testing, commissioning and certification of electrotechnical systems and equipment in buildings, structures and the environment

Assessment Type: On-Screen MCQ Exam, Closed Book
Number of Questions: 40
Time Allowed: 80 Minutes

The pass mark is normally expected to be around 60%.

Candidates may use a non-programmable calculator.

The examination will cover the knowledge learning outcomes of the unit as follows:

Learning Outcome	Number of Questions
1. Understand the principles, regulatory requirements and procedures for completing the safe isolation of an electrical circuit and complete electrical installations in preparation for inspection, testing and commissioning.	6 *(15%)*
2. Understand the principles and regulatory requirements for inspecting, testing and commissioning electrical systems, equipment and components.	3 *(7%)*
3. Understand the regulatory requirements and procedures for completing the inspection of electrical installations.	5 *(13%)*
4. Understand the regulatory requirements and procedures for the safe testing and commissioning of electrical installations.	22 *(55%)*
5. Understand the procedures and requirements for the completion of electrical installation certificates and related documentation.	4 *(10%)*
Total:	**40**

Notes:

- To achieve the unit, the learner must also pass the centre-marked practical assessment.
- The practical assessment covers elements of outcomes 1-4.

Unit QELTK3-007: Understanding the principles, practices and legislation for diagnosing and correcting electrical faults in electrotechnical systems and equipment in buildings, structures and the environment

Assessment Type: On-Screen MCQ Exam, Closed Book
Number of Questions: 45
Time Allowed: 90 Minutes

The pass mark is normally expected to be around 60%.

Candidates may use a non-programmable calculator.

The examination will cover the knowledge learning outcomes of the unit as follows:

Learning Outcome	Number of Questions
1. Understand the principles, regulatory requirements and procedures for completing the safe isolation of electrical circuits and complete electrical installations.	3 *(10%)*
2. Understand how to complete the reporting and recording of electrical fault diagnosis and correction work.	3 *(10%)*
3. Understand how to complete the preparatory work prior to fault diagnosis and correction work.	11 *(37%)*
4. Understand the procedures and techniques for diagnosing electrical faults.	10 *(33%)*
5. Understand the procedures and techniques for correcting electrical faults.	3 *(10%)*
Total:	**30**

Notes:

- To achieve the unit, the learner must also pass the centre-marked practical assessment.
- The practical assessment covers elements of outcomes 1 and 4.

Unit QELTK3-008: Understanding the electrical principles associated with the design, building, installation and maintenance of electrical equipment and systems

Assessment Type: On-Screen MCQ Exam, Closed Book
Number of Questions: 45
Time Allowed: 90 Minutes

The pass mark is normally expected to be around 60%.

Candidates may use a non-programmable calculator.

The examination will cover the knowledge learning outcomes of the unit as follows:

Learning Outcome	Number of Questions
1. Understand mathematical principles which are appropriate to electrical installation, maintenance and design work.	N/A
2. Understand standard units of measurement used in electrical installation, maintenance and design work.	3 *(7%)*
3. Understand basic mechanics and the relationship between force, work, energy and power.	4 *(9%)*
4. Understand the relationship between resistance, resistivity, voltage, current and power.	7 *(15%)*
5. Understand the fundamental principles which underpin the relationship between magnetism and electricity.	3 *(7%)*
6. Understand electrical supply and distribution systems	9 *(20%)*
7. Understand how different electrical properties can affect electrical circuits, systems and equipment.	N/A
8. Understand the operating principles and applications of DC machines and AC motors.	5 *(11%)*
9. Understand the operating principles of different electrical components.	4 *(9%)*
10. Understand the principles and applications of electrical lighting systems.	5 *(11%)*
11. Understand the principles and applications of electrical heating.	2 *(4%)*
12. Understand the types, applications and limitations of electronic components in electrotechnical systems and equipment.	3 *(7%)*
Total:	**40**

Notes:

- To achieve the unit, the learner must pass QELTK3-008 on-screen exam, QELTK3-008A the centre-marked practical assessment covering transformers, and QELTK3-008B the centre-marked, controlled knowledge assignment.
- The QELTK3-008A practical assessment covers elements of outcome 6.
- The QELTK3-008B assignment covers outcomes 1 and 7, and elements of outcomes 2, 10, 11 and 12.

Appendix 4: Learner Registration and Certification

Learners must be registered with EAL on a code which relates to the qualification. This must be completed prior to assessment. Both learner registration and certification can be completed online at the EAL Website www.eal.org.uk. For paper-based registration and certification use the appropriate forms, located on the EAL Website. Please refer to the Registration and Certification User Guide for guidance on registration and certification.

To register the learner on the chosen qualification/pathway code:

Qualification Title	Code
EAL Level 3 NVQ Diploma in Installing Electrotechnical Systems and Equipment (Buildings, Structures and the Environment)	501/1605/8

For further information, please contact EAL Customer Experience:

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