

EAL Level 3 Awards in Environmental Technology Systems

ISSUE: 5

This qualification manual relates to the following awards:

- EAL Level 3 Award in Understanding the Fundamental Principles and Requirements of Environmental Technology Systems (QCF). Qualification number: 600/0665/1
- EAL Level 3 Award in the Installation of Small Scale Solar Photovoltaic Systems (QCF). Qualification number: 600/5175/9
- EAL Level 3 Award in the Installation and Maintenance of Small Scale Solar Photovoltaic Systems (QCF). Qualification number: 600/5252/1
- EAL Level 3 Award in the Installation of Solar Thermal Hot Water Systems (QCF). Qualification number: 600/5248/X
- EAL Level 3 Award in the Installation and Maintenance of Solar Thermal Hot Water Systems (QCF). Qualification number: 600/5251/X
- EAL Level 3 Award in the Installation of Heat Pump Systems (Non-refrigerant Circuits) (QCF). Qualification number: 600/5249/1
- EAL Level 3 Award in the Installation and Maintenance of Heat Pump Systems (Non-refrigerant Circuits) (QCF). Qualification number: 600/5253/3
- EAL Level 3 Award in the Installation of Water Harvesting and Re-use Systems (QCF). Qualification number: 600/5247/8
- EAL Level 3 Award in the Installation and Maintenance of Water Harvesting and Re-use Systems (QCF). Qualification number: 600/5250/8

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1.0 About EAL

Since 1964, **EAL (Excellence, Achievement & Learning Limited)** has been awarding superior vocational qualifications and apprenticeship components for engineering, building services and related sectors.

Developed to the highest technical standard, our qualifications are regularly updated to reflect regulatory and technical changes. We support the providers of our qualifications with an unparalleled level of service to ensure that learners are well prepared for the roles they plan to take on.

EAL recognise the value of skills in the work environment as one of the 5 key drivers of productivity; essential for economic growth and bringing a number of wider social benefits. Through its programme of continuous improvement EAL strives to meet the demand from employers for high performing, high quality products.

For further information please contact EAL Customer Services +44(0)1923 652400 or visit www.eal.org.uk.

2.0 Introduction to the Qualification

What are these qualifications?

These qualifications in environmental technology have been developed to enable the building services engineering sector to play its role in meeting the carbon reduction targets set by Government.

Lowering energy consumption, reducing emissions and conserving water cannot be achieved unless the sector designs, installs and maintains renewable and environmental technologies, and provides the best advice to customers.

This suite of qualifications has been developed from QCF units that reflect the national occupational standards to enable a highly skilled workforce in the building services engineering sector. The achievement of the awards in this suite will encourage an employee to value their contribution to the workplace, and it will develop their skills and potential. The performance units within the awards in this suite may be assessed through practical activities in the work place or as appropriate; in simulated conditions.

Who are these qualifications for?

- Those who wish to learn about micro-renewable energy and water conservation technologies,
- Those who wish to become a competent in the installation *or* installation and maintenance of environmental technologies,
- Those who to further their career building services sector.

What do these qualifications cover?

The qualifications cover a wide range of environmental technologies including: installation of small scale solar photovoltaic systems, installation and maintenance of small scale solar photovoltaic systems, installation of solar thermal hot water systems, installation and maintenance of solar thermal hot water systems, installation of heat pumps systems (non-refrigerant circuits), installation and maintenance of heat pumps systems (non-refrigerant circuits), installation of water harvesting and recycling system and the installation and maintenance of water harvesting and recycling system. The qualifications are made up of knowledge units and performance units. The units are listed in [Section 3](#) of this manual.

2.1 Accreditation & Industry Support for this Qualification

This qualification:

- Is a QCF qualification and is accredited by Ofqual at level three.
- Was developed in conjunction with industry and training providers.

2.2 Achievement of the Qualification & ‘Stand Alone Units’

The qualification is awarded when all the necessary units have been achieved. The centre will then be able to apply for the learner’s Award. The learner will also receive a Certificate of Unit Credit, listing all the units they have achieved.

However if they don’t manage to complete the full qualification learners can still claim a Certificate of Unit Credit for the units achieved therefore, they still have proof of their ability and could complete the qualification at a later date.

The learner must complete the relevant knowledge units prior to the performance units. [See section 3](#) for further details.

2.3 Relation to Other Qualifications

These qualifications relates to the following:

- EAL Qualifications in Key Skills, Functional Skills and Essential Skills Wales,
- EAL Qualifications in 17th Edition, requirements for electrical installations BS7671,
- EAL Diploma in Inspecting and Testing Electrotechnical Systems and Equipment,
- EAL Certificate in In-Service Inspection and Testing of Electrical Equipment (PAT),
- EAL Qualifications in access to building services engineering,
- EAL Qualifications in building services engineering including: domestic heating, heating and ventilation, plumbing and heating and install and commission air conditioning and heat pump systems.

Details on these can be obtained from the EAL Website or alternatively contact:

- EAL Customer Services
Tel: +44 (0)1923 652400
Email: customercare@eal.org.uk

2.4 Qualification Support Materials

The following materials are available for this qualification with no additional charge to centres:

- **Performance Units:**
These are nationally recognised units. These documents allow both the learner and the assessor to record the progress through the qualification. They contain the performance to be assessed, and the evidence required from the learner to demonstrate their competence. Completed exemplars are provided in the EAL Guide to Assessment (ABG/101).
- **Knowledge Units:**
Also nationally recognised, these contain the learning outcomes and assessment criteria.
- **Delivery Advice Documents:**
The delivery advice is tailored specifically for each knowledge unit. The delivery advice is guidance and can be used to support and inform the in-centre schemes of work and learning plans.
- **PowerPoint Slides:**
Each knowledge unit has a tailored set of referenced slides which can be used in presentations, handouts, or formative assessments.
- **Learner Book:**
This book explains to the learner how they will be assessed in the performance units, and also gives ideas for evidence. It can be given to the learner during induction to ensure they understand the assessment requirements.
- **Performance Assessment Plan and Evidence Record (X200):**
This allows effective and holistic assessment planning and cross tracking of the learner portfolio to the performance units. Completed exemplars are provided in the EAL Guide to Assessment (ABG/101) (see below).

EAL have also provided for centres:

- EAL Guide to Assessment (ABG/101)
- EAL Guide to Internal Verification (ABG/102)
- EAL Centre Operations Manuals - This sets out the requirements for EAL Centres, contains all necessary documentation and also contains helpful teaching and delivery advice.
- Promotional Materials.

All these materials can be accessed from the EAL Website www.eal.org.uk.

3.0 Rule of Combination (Qualification Structure) & Unit Delivery Order

The qualification will be obtained by the learner once they have completed the necessary units that make up the rule of combination.

EAL Level 3 Award in Understanding the Fundamental Principles and Requirements of Environmental Technology Systems (QCF)

Knowledge Unit: *Must be completed:*

EAL Code	Knowledge Unit Title	Level	Credit	GLH	Ofqual Code
QET3/001	<input type="checkbox"/> Understand the fundamental principles and requirements of environmental technology systems	3	2	15	K/602/3138

EAL Level 3 Award in the Installation of Small Scale Solar Photovoltaic Systems (QCF)

The units with this qualification are intended to be delivered in the following order:

- QET3/002SPV and QET3/003SPV.

Knowledge Units: *Must be completed:*

EAL Code	Knowledge Unit Title	Level	Credit	GLH	Ofqual Code
QET3/002SPV	<input type="checkbox"/> Know the requirements to install, commission and handover small scale solar photovoltaic systems	3	4	35	D/602/3086

Performance Unit: *Must be completed:*

EAL Code	Performance Unit Title	Level	Credit	GLH	Ofqual Code
QET3/003SPV	<input type="checkbox"/> Install, commission and handover small scale solar photovoltaic systems	3	2	15	K/602/3088

EAL Level 3 Award in the Installation and Maintenance of Small Scale Solar Photovoltaic Systems (QCF)

The units with this qualification are intended to be delivered in the following order:

- QET3/002SPV, QET3/003SPV, QET3/004SPV, QET3/005SPV
Or
- QET3/002SPV, QET3/004SPV, QET3/003SPV, QET3/005SPV.

Knowledge Units: *Must be completed:*

EAL Code	Knowledge Unit Title	Level	Credit	GLH	Ofqual Code
QET3/002SPV	<input type="checkbox"/> Know the requirements to install, commission and handover small scale solar photovoltaic systems	3	4	35	D/602/3086
QET3/004SPV	<input type="checkbox"/> Know the requirements to inspect, service and maintain small scale solar photovoltaic systems	3	2	15	M/602/3089

Performance Units: *Must be completed:*

EAL Code	Performance Unit Title	Level	Credit	GLH	Ofqual Code
QET3/003SPV	<input type="checkbox"/> Install, commission and handover small scale solar photovoltaic systems	3	2	15	K/602/3088
QET3/005SPV	<input type="checkbox"/> Inspect, service and maintain small scale solar photovoltaic systems	3	2	15	M/602/3092

EAL Level 3 Award in the Installation of Solar Thermal Hot Water Systems (QCF)

The units with this qualification are intended to be delivered in the following order:

- QET3/002ST, QET3/003ST.

Knowledge Units: *Must be completed:*

EAL Code	Knowledge Unit Title	Level	Credit	GLH	Ofqual Code
QET3/002ST	<input type="checkbox"/> Know the requirements to install, commission and handover solar thermal hot water systems	3	4	35	F/602/3100

Performance Unit: *Must be completed:*

EAL Code	Performance Unit Title	Level	Credit	GLH	Ofqual Code
QET3/003ST	<input type="checkbox"/> Install, commission and handover 'active' solar thermal hot water systems	3	2	15	L/602/3102

EAL Level 3 Award in the Installation and Maintenance of Solar Thermal Hot Water Systems (QCF)

The units with this qualification are intended to be delivered in the following order:

- QET3/002ST, QET3/003ST, QET3/004ST, QET3/005ST
Or
- QET3/002ST, QET3/004ST, QET3/003ST, QET3/005ST.

Knowledge Units: *Must be completed:*

EAL Code	Knowledge Unit Title	Level	Credit	GLH	Ofqual Code
QET3/002ST	<input type="checkbox"/> Know the requirements to install, commission and handover solar thermal hot water systems	3	4	35	F/602/3100
QET3/004ST	<input type="checkbox"/> Know the requirements to inspect, service and maintain 'active' solar thermal hot water systems	3	2	15	Y/602/3104

Performance Units: *Must be completed:*

EAL Code	Performance Unit Title	Level	Credit	GLH	Ofqual Code
QET3/003ST	<input type="checkbox"/> Install, commission and handover 'active' solar thermal hot water systems	3	2	15	L/602/3102
QET3/005ST	<input type="checkbox"/> Inspect, service and maintain 'active' solar thermal hot water systems	3	2	15	K/602/3107

EAL Level 3 Award in the Installation of Heat Pump Systems (Non-refrigerant Circuits) (QCF)

The units with this qualification are intended to be delivered in the following order:

- QET3/002HP, QET3/003HP.

Knowledge Units: *Must be completed:*

EAL Code	Knowledge Unit Title	Level	Credit	GLH	Ofqual Code
QET3/002HP	<input type="checkbox"/> Know the requirements to install, commission and handover heat pump systems (non-refrigerant circuits)	3	4	35	Y/602/3054

Performance Unit: *Must be completed:*

EAL Code	Performance Unit Title	Level	Credit	GLH	Ofqual Code
QET3/003HP	<input type="checkbox"/> Install, commission and handover heat pumps (non-refrigerant circuits)	3	2	15	D/602/3072

EAL Level 3 Award in the Installation and Maintenance of Heat Pump Systems (Non-refrigerant Circuits) (QCF)

The units with this qualification are intended to be delivered in the following order:

- QET3/002HP, QET3/003HP, QET3/004HP, QET3/005HP
- Or*
- QET3/002HP, QET3/004HP, QET3/003HP, QET3/005HP.

Knowledge Units: *Must be completed:*

EAL Code	Knowledge Unit Title	Level	Credit	GLH	Ofqual Code
QET3/002HP	<input type="checkbox"/> Know the requirements to install, commission and handover heat pump systems (non-refrigerant circuits)	3	4	35	Y/602/3054
QET3/004HP	<input type="checkbox"/> Know the requirements to inspect, service and maintain heat pump system installations (non-refrigerant circuits)	3	2	15	F/602/3078

Performance Units: *Must be completed:*

EAL Code	Performance Unit Title	Level	Credit	GLH	Ofqual Code
QET3/003HP	<input type="checkbox"/> Install, commission and handover heat pumps (non-refrigerant circuits)	3	2	15	D/602/3072
QET3/005HP	<input type="checkbox"/> Inspect, service and maintain heat pump installations (non-refrigerant circuits)	3	2	15	L/602/3083

EAL Level 3 Award in the Installation of Water Harvesting and Re-use Systems (QCF)

The units with this qualification are intended to be delivered in the following order:

- QET3/002WHR, QET3/003WHR

Knowledge Units: *Must be completed:*

EAL Code	Knowledge Unit Title	Level	Credit	GLH	Ofqual Code
QET3/002 WHR	<input type="checkbox"/> Know the requirements to install, commission and handover rainwater harvesting and greywater reuse systems	3	4	35	T/602/3109

Performance Unit: *Must be completed:*

EAL Code	Performance Unit Title	Level	Credit	GLH	Ofqual Code
QET3/003 WHR	<input type="checkbox"/> Install, commission and handover rainwater harvesting and greywater reuse systems	3	2	15	K/602/3110

EAL Level 3 Award in the Installation and Maintenance of Water Harvesting and Re-use Systems (QCF)

The units with this qualification are intended to be delivered in the following order:

- QET3/002WHR, QET3/003WHR, QET3/004WHR, QET3/005WHR
- Or*
- QET3/002WHR, QET3/004WHR, QET3/003WHR, QET3/005WHR.

Knowledge Units: *Must be completed:*

EAL Code	Knowledge Unit Title	Level	Credit	GLH	Ofqual Code
QET3/002 WHR	<input type="checkbox"/> Know the requirements to install, commission and handover rainwater harvesting and greywater reuse systems	3	4	35	T/602/3109
QET3/004 WHR	<input type="checkbox"/> Know the requirements to inspect, service and maintain rainwater harvesting and greywater reuse systems	3	2	15	M/602/3111

Performance Units: *Must be completed:*

EAL Code	Performance Unit Title	Level	Credit	GLH	Ofqual Code
QET3/003 WHR	<input type="checkbox"/> Install, commission and handover rainwater harvesting and greywater reuse systems	3	2	15	K/602/3110
QET3/005 WHR	<input type="checkbox"/> Inspect, service and maintain rainwater harvesting and greywater reuse systems	3	2	15	A/602/3130

4.0 Centre & Qualification Approval

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

For *existing* EAL Centres to put the qualification on your centre remit:

- The approval form can be downloaded from the centre area of the EAL Website or alternatively obtained from the EAL Centre Operations Manual. Please contact you EV, or EAL Customer Services (see below) if you need any assistance.

For *non* EAL Centres to gain centre approval to run the qualification:

- Please contact the EAL Customer Services Department who will be delighted to hear from you:
Tel: +44 (0)1923 652400
Fax: +44 (0)1923 652401
Email: customercare@eal.org.uk

5.0 Profiles & Requirements

The personnel involved in these qualifications must meet the requirements in this section for the applicable Awards delivered.

5.1 Assessors

Assessor must:

- Have a relevant assessor qualification (A1 and A2 or TDLB D32 and D33 and evidence of CPD to A1/A2 standards).
- Or**
- Alternative recorded evidence, endorsed by SummitSkills to confirm assessor competence to A1 standards.

Assessor must also have evidence of competence in the applicable environmental technologies systems design, installation, testing, commissioning, inspection, service, and maintenance for the units being assessed. Evidence may be in the form of a qualification or certificate issued by a recognised awarding/certification organisation or other recorded evidence to confirm technical competence that covers the knowledge and practical skill outcomes contained within the qualification units being assessed.

The occupational competence of assessors must be updated on a regular basis and will be periodically reconfirmed by EAL as part of the quality assurance arrangements.

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 SSC 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.

5.2 Internal Verifiers

Internal verifiers must:

- Have a relevant internal verifier qualification (V1 or TDLB D34 and evidence of CPD to V1 standards)
- Or**
- Alternative recorded evidence, endorsed by SummitSkills to confirm internal verifier competence to A1 standards.

Internal verifiers must also have a building services engineering occupational experience evidenced by having a building services engineering sector related qualification at N/SVQ Level 3 or proven sector competence/experience plus access to relevant “occupational expertise” to enable them to conduct their role as internal verifier appropriately.

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The occupational competence of internal verifiers must be updated on a regular basis and will be periodically reconfirmed by EAL. Where internal verifiers have proven sector competence/experience plus access to relevant “occupational expertise” this arrangement will also be quality assured by EAL. It is the responsibility of each IV to identify and make use of opportunities for CPD, such as industry conferences, access to trade journals, and sector skills council 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 or occasions.

5.3 Learners

The entry requirements for learners are detailed here for each of the awards in this suite:

EAL Level 3 Award in Understanding the Fundamental Principles and Requirements of Environmental Technology Systems (QCF)

Learner entry requirements:

There are no specific learner prerequisite entry requirement to access this qualification; however, it is recommended that delivery centres have processes in place to confirm that learners have the potential and where applicable, relevant support to achieve the learning outcomes.

EAL Level 3 Awards in Small Scale Solar Photovoltaic systems (QCF): (Installation; and; installation and Maintenance):

Learner entry requirements:

N/SVQ 3 in Electrical Installation (Buildings and Structures) or equivalent earlier certification that provides evidence of competence. In addition, if not included in the above, current certification of 7671 Requirements for Electrical Installations.

Note: Stand alone vocationally related qualifications (technical certificates) are not acceptable as an alternative to the NVQ awards listed above.

EAL Level 3 Awards in Solar Thermal Hot Water Systems(QCF): (Installation; and; installation and Maintenance):

Learner entry requirements:

- N/SVQ Level 2/3 in Plumbing or equivalent earlier certification that provides evidence of competence; or,
- N/SVQ Level 2/3 in Heating and Ventilating (Domestic Installation) or equivalent earlier certification that provides evidence of competence; or,
- N/SVQ Level 2/3 in Heating and Ventilating (Industrial and Commercial Installation) or equivalent earlier certification that provides evidence of competence; or,
- N/SVQ Level 2/3 in Oil-Fired Technical Services or equivalent earlier certification that provides evidence of competence; or,
- N/SVQ Level 2/3 in Gas Installation and Maintenance or equivalent earlier certification that provides evidence of competence.

In addition, if not included in the above current certification in relation to:

- Water Regulations/Water Byelaws (WRAS or equivalent)
- Unvented Domestic Hot Water Storage Systems
- Energy Efficiency for Domestic Heating (C&G 6084 or equivalent)

Note: Stand alone vocationally related qualifications (technical certificates) are not acceptable as an alternative to the NVQ awards listed above.

EAL Level 3 Awards in Heat Pumps Systems (Non-refrigerant Circuits) (QCF): (Installation; and; installation and Maintenance):

Learner entry requirements:

- N/SVQ Level 2/3 in Plumbing or equivalent earlier certification that provides evidence of competence; or
- N/SVQ Level 2/3 in Heating and Ventilating (Domestic Installation) or equivalent earlier certification that provides evidence of competence; or
- N/SVQ Level 2/3 in Heating and Ventilating (Industrial and Commercial Installation) or equivalent earlier certification that provides evidence of competence; or
- N/SVQ Level 2/3 in Oil-Fired Technical Services or equivalent earlier certification that provides evidence of competence; or
- N/SVQ Level 2/3 in Gas Installation and Maintenance or equivalent earlier certification that provides evidence of competence.

In addition, if not included in the above current certification in relation to:

- Water Regulations/Water Byelaws (WRAS or equivalent)
- Energy Efficiency for Domestic Heating (C&G 6084 or equivalent)

Note: Stand alone vocationally related qualifications (technical certificates) are not acceptable as an alternative to the NVQ awards listed above.

EAL Level 3 Awards in Water Harvesting and Recycling Systems(QCF): (Installation; and; installation and Maintenance):

Learner entry requirements:

- N/SVQ Level 2/3 in Plumbing or equivalent earlier certification that provides evidence of competence; or
- N/SVQ Level 2/3 in Heating and Ventilating (Domestic Installation) or equivalent earlier certification that provides evidence of competence; or
- N/SVQ Level 2/3 in Heating and Ventilating (Industrial and Commercial Installation) or equivalent earlier certification that provides evidence of competence; or
- N/SVQ Level 2/3 in Oil-Fired Technical Services or equivalent earlier certification that provides evidence of competence; or
- N/SVQ Level 2/3 in Gas Installation and Maintenance or equivalent earlier certification that provides evidence of competence.

In addition, if not included in the above current certification in relation to:

- Water Regulations/Water Byelaws (WRAS or equivalent).

Note: Stand alone vocationally related qualifications (technical certificates) are not acceptable as an alternative to the NVQ awards listed above.

5.4 Expert Witnesses

Where “Expert Witnesses” are used in the assessment process 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.

5.5 Teaching Staff

This relates to staff that are teaching/training only; assessor requirements are given in 5.1.

Teaching staff must:

- Have 2 years experience in teaching/training.
or
- Are working towards an appropriate teaching/training qualification (e.g. Cert Ed or Learning & Development trainer units).
or
- Hold an appropriate teaching/training qualification (e.g. Cert Ed or Learning & Development trainer units).

Must also have:

- Knowledge and understanding of the occupation covered by this qualification.
- Knowledge and understanding of the structure and content of this qualification.

5.6 Personnel Conducting the External Assessment

This relates to staff that are conducting and controlling exam sessions only; assessor requirements are given in 5.1.

These personnel must:

- Have experience in conducting and controlling exam sessions or be supervised, conducting this function, by an individual experienced in conducting and controlling exam sessions.
- Have knowledge, understanding and compliance to EAL examination procedures (see the EAL Centre Operations Manual).

5.7 Physical Resources

Safe working is a key issue 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.

The required resources will be clearly detailed within the performance units if simulation/replication is to take place. See [Section 6.3](#) for details about simulation

6.0 Assessment

For general guidance on assessment refer to the EAL Guide to Assessment (ABG/101) and for internal verification refer to the EAL Guide to Internal Verification (ABG/102).

The assessments of the units within the qualifications of this suite involve the following aspects:

- Knowledge Units: External (EAL marked) on-screen exams
- Performance Units: Locally assessed, either through practical activities in the workplace or as appropriate; in simulated conditions.

Learners must pass all the assessments to achieve the qualification. The learner **must** complete the relevant knowledge units prior to the performance units. See [Section 3](#) of this manual for the delivery order of the units.

EAL will monitor and externally verify the internal and external assessments conducted at the centre. The EAL Centre Operations Manual must be followed along with this section.

The following sub-sections will give an overview of the internal and external assessments.

6.1 External (EAL Marked) Assessment for Knowledge Units

These are separate on-screen examinations, for each **knowledge unit** which assess the unit's learning outcomes and assessment criteria. The learner will be assessed using various question types.

Setting specifications for the on-screen exams will be available from the EAL web-site.

6.2 Assessment of Performance Units

The environment, in which the evidence and the quantity of evidence for **Performance Units** must be assessed, is detailed in each EAL Performance Unit.

Evidence that is sourced from the real working environment for **Performance Units** must be naturally occurring 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 primary source of evidence).
- Candidate's reflective account of performance.
- Work plans and work based products e.g. diagrams, drawings, specifications, customer testimony, authorised and authenticated photographs/images and audiovisual records of work completed.
- Evidence from prior achievements that demonstrably match the requirements of the Performance Unit.
- Witness testimony ([See Section 5](#)).

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.

Competence must be demonstrated **consistently over a period of time**. However Summit Skills the sector skills council, does not wish to stipulate what that period of time might be 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.

Simulation and Simulated Conditions (Performance Units)

The unit may be assessed through practical activities in the work place or as appropriate; in simulated conditions. Where simulated conditions are used, particular attention is drawn to the requirement for 'real working conditions' and a real working environment'.

Simulation and simulated conditions is defined as an environment in which simulated activities take place involving the replication of a real working environment. The criteria for which must be to supply fit-for-purpose tools, equipment, full-size components, realistic deadlines and other commercial requirements.

Continued

A real working environment is defined as an environment in which real work activities take place under real working conditions in keeping with real commercial situations.

The performance units are designed to allow the assessment centre the opportunity to assess the candidate in either the workplace or in simulated conditions. Where simulated conditions are used a practical assignment is detailed within the performance unit.

6.3 Quality Control of Assessment

General

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, the EAL External Verifier (EV) ensures that the Centre is suitably equipped and prepared to deliver the new qualification.
- Monitoring: Throughout the ongoing delivery of the qualification EAL, through EV monitoring and other mechanisms will maintain the quality and consistency of the assessment of the qualification.

Approval

In granting approval, EAL, normally through its External Verifiers (EVs) will ensure that the prospective Centre:

- meets any procedural requirements specified by the Awarding Organisation,
- 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 QA for the qualifications.

EAL may decide to visit the Centre to view the evidence provided. The Awarding Organisation must have a clear rationale for the method(s) deployed.

Monitoring

EAL, through EV monitoring and other mechanisms will ensure:

- that a strategy is developed and deployed for the ongoing monitoring of the Centre. This strategy is based on an active risk assessment of the Centre. In particular the strategy will identify the learner, assessor and IV sampling strategy to be deployed and the rationale behind this,
- that the Centre's internal quality assurance processes are effective in learner assessment,
- that sanctions are applied to a Centre where necessary and that corrective actions are taken by the Centre and monitored by the EV,
- that reviews of EAL's external auditing arrangements are undertaken.

7.0 About the Qualification Units

This qualification is made up of the following types of units:

- Knowledge Units: A unit that gives the learner the opportunity to demonstrate their knowledge and understanding of identified topics and subject areas.
- Performance Units: A unit that gives the learner the opportunity to demonstrate they have the practical skills that are in keeping with the relevant National Occupational Standards for identified activities.

Both the knowledge and performance units contain the following information:

- Qualification and unit title
- QCF Level
- [Credit value](#)
- [Guided learning hours \(GLH\)](#)
- Unit aims
- Unit and assessment information
- How the unit reflects the National Occupation Standards
- Learning outcomes
- Assessment criteria

The knowledge units contain the learning outcomes and knowledge assessment criteria. Please refer to [Section 6](#) for assessment of these units. The learner **must** complete the relevant knowledge units prior to the performance units (refer to [Section 3](#)).

The performance units are designed to record the progress of the learner through the qualification. This document can be completed by the learner or the assessor. The performance units contain the evidence required from the learner for completion of the unit. Worked examples of the EAL documentation will be provided in the EAL Guide to Assessment (ABG/101). *(New issue from early 2011)*. The EAL external verifier is on-hand to guide you with referencing.

7.1 Learner's Portfolio Building and Referencing

Worked examples of the EAL documentation will be provided in the EAL Guide to Assessment (ABG/101). *(New issue from early 2011)*.

Appendix 1: Centre Setting Specifications for Examinations

Unit Setting Specifications for Exams

Unit ET 001 Know the fundamental working principles, installation options and regulatory requirements for micro-renewable energy and water conservation technologies Test Specification	
Number of questions: 25 Closed Book Each test will cover the knowledge learning outcomes of the unit as follows:	
Knowledge learning outcome:	Approximate coverage:
1.0 Know the fundamental working principles of micro-renewable energy and water conservation technologies	36%
2.0 Know the fundamental requirements of building location/building features for the potential to install micro-renewable energy and water conservation systems to exist	36%
3.0 Know the fundamental regulatory requirements relating to micro-renewable energy and water conservation technologies	20%
4.0 Know the typical advantages and disadvantages associated with micro-renewable energy and water conservation technologies	8%

Unit Setting Specifications for Exams

Unit ET 02 PV**Know the requirements to install, commission and handover solar photovoltaic systems**

Test Specification

Number of questions: 45

Closed Book

Each test will cover the underpinning knowledge and understanding relevant to the unit as follows:

Learning Outcome:	Approximate coverage:
1.0 Know the health and safety risks and safe systems of work associated with solar photovoltaic system installation work	4%
2.0 Know the requirements of the relevant regulations/ standards relating to practical installation, testing and commissioning activities for solar photovoltaic system installation work	5%
3.0 Know the fundamental differences between a.c and d.c circuits within solar photovoltaic systems	4%
4.0 Know the purpose of solar photovoltaic system components	7%
5.0 Know the types, silicon characteristics and typical conversion efficiencies of solar photovoltaic modules	11%
6.0 Know the fundamental design principles used to determine solar photovoltaic system module array size and position requirements	11%
7.0 Know the preparatory work required for solar photovoltaic system installation work	4%
8.0 Know the layouts and the requirements for installing solar photovoltaic module arrays	25%
9.0 Know solar photovoltaic system d.c and a.c circuit installation layouts within the scope of the relevant Engineering recommendation for grid tied systems	4%
10.0 Know solar photovoltaic system protection techniques and components	5%
11.0 Know the requirements to test and commission solar photovoltaic systems	16%
12.0 Know the requirements to handover solar photovoltaic systems	4%

Unit Setting Specifications for Exams

Unit ET 04 PV Know the requirements to inspect, service and maintain solar photovoltaic systems	
Test Specification	
Number of questions: 20	
Closed Book	
Each test will cover the underpinning knowledge and understanding relevant to the unit as follows:	
Learning Outcome:	Approximate coverage:
1.0 Know the requirements for the routine inspection, service and maintenance of solar photovoltaic system installations	40%
2.0 Know how to diagnose faults in solar photovoltaic system installations	35%
3.0 Know how to rectify faults in solar photovoltaic systems	25%

Unit Setting Specifications for Exams

Unit ET 02 ST Know the requirements to install, commission and handover solar thermal hot water systems	
Test Specification	
Number of questions: 50	
Closed Book	
Each test will cover the knowledge learning outcomes of the unit as follows:	
Learning Outcome:	Approximate coverage:
1.0 Know the health and safety risks and safe systems of work associated with solar thermal hot water system installation work	4%
2.0 Know the requirements of relevant regulations/standards relating to practical installation, testing and commissioning activities for solar thermal hot water system installation work	4%
3.0 Know the types and layouts of solar thermal hot water system	6%
4.0 Know the purpose of components used within solar thermal hot water system installations	4%
5.0 Know the types and key operating principles of solar collectors	8%
6.0 Know the information requirements to enable system component selection and sizing	4%
7.0 Know the fundamental techniques used to select, size and position components for solar thermal hot water systems	18%
8.0 Know how the performance of solar hot water systems is measured	2%
9.0 Know the preparatory work required for solar thermal hot water system installation work	6%
10.0 Know the requirements for connecting solar thermal hot water system collector circuits to combination boiler domestic hot water circuits	4%
11.0 Know the requirements for installing solar collector arrays	10%
12.0 Know the requirements for installing for solar thermal hot water system pipework	10%
13.0 Know the requirements to test and commission solar thermal hot water system installations	16%
14.0 Know the requirements to handover solar thermal hot water systems	4%

Unit Setting Specifications for Exams

Unit ET 04 ST Know the requirements to inspect, service and maintain active solar thermal hot water systems	
Test Specification	
Number of questions: 20	
Closed Book	
Each test will cover the knowledge learning outcomes of the unit as follows:	
Learning Outcome:	Approximate coverage:
1.0 Know the requirements for the routine service and maintenance of 'active' solar thermal hot water systems	45%
2.0 Know how to diagnose faults in active solar thermal hot water system installations	30%
2.0 Know how to rectify faults in 'active' solar thermal hot water systems	25%

Unit Setting Specifications for Exams

Unit ET 02 HP Know the requirements to install, commission and hand over heat pump systems (non-refrigerant circuits) Test Specification	
Number of questions: 50 Closed Book Each test will cover the knowledge learning outcomes of the unit as follows:	
Knowledge learning outcome:	Approximate coverage:
1.0 Know the health and safety risks and safe systems of work associated with heat pump system installation work (non-refrigerant circuits)	4%
2.0 Know the requirements of relevant regulations/standards relating to practical installation, testing and commissioning activities for heat pump installation work	6%
3.0 Know the purpose and operational characteristics of heat pump unit and heat pump system components	4%
4.0 Know the different types of heat pump units and system arrangements for hydraulic emitter circuits	12%
5.0 Know the fundamental principles of heat pump selection and system design that are common to both air and ground source heat pumps	16%
6.0 Know the fundamental design principles for ground source 'closed loop' heat pump collector circuit design, component sizing and installation	18%
7.0 Know the layouts of 'open loop' water filled heat pump collector circuits	2%
8.0 Know the fundamental design considerations and principles that are specific to air source heat pumps	6%
9.0 Know the preparatory work required for heat pump installation work	6%
1.0 Know the requirements to install and test heat pump systems (non-refrigerant circuits)	10%
11.0 Understand the requirements to commission heat pump system installations (non-refrigerant circuits)	8%
12.0 Understand the requirements to handover heat pump system installations	8%

Unit Setting Specifications for Exams

Unit ET 04 HP Know the requirements to inspect, service and maintain heat pump system installations (non-refrigerant circuits) Test Specification	
Number of questions: 20 Closed Book Each test will cover the knowledge learning outcomes of the unit as follows:	
Learning Outcome:	Approximate coverage:
1.0 Know the requirements for the non-refrigerant circuit routine service and maintenance of heat pump system installations	55%
2.0 Know how to diagnose faults in heat pump system installations	25%
3.0 Know how to rectify non-refrigerant circuit faults in heat pump system installations	20%

Unit Setting Specifications for Exams

Unit ET 02 WHR Know the requirements to install, commission and handover rainwater harvesting and greywater reuse systems	
Test Specification Number of questions: 50 Closed Book Each test will cover the knowledge learning outcomes of the unit as follows:	
Learning Outcome:	Approximate coverage:
1.0 Know the health and safety risks and safe systems of work associated with rainwater harvesting and greywater reuse system installation work	4%
2.0 Know the requirements of relevant regulations/standards relating to practical installation, testing and commissioning activities for solar thermal hot water system installation work	10%
3.0 Know the types and layouts of rainwater harvesting and greywater reuse system used for single premises installations	8%
4.0 Know the purpose of components used within rainwater harvesting and greywater reuse systems	6%
5.0 Know the information requirements to enable rainwater harvesting and greywater reuse system component selection and sizing	6%
6.0 Know the fundamental techniques used to select, size and position components for rainwater harvesting and greywater reuse systems	22%
7.0 Know options and requirements for the treatment of water in biological, physical, biomechanical and hybrid rainwater harvesting/greywater recycling systems	8%
8.0 Know the preparatory work required for rainwater harvesting and greywater recycling system installation work	6%
9.0 Know the requirements for installing rainwater harvesting and greywater reuse storage tanks	4%
10.0 Know the requirements for installing for rainwater harvesting and greywater recycling system pipework	6%
11.0 Know the requirements to test and commission rainwater harvesting and greywater re-use system installations	16%
12.0 Know the requirements to handover rainwater harvesting and greywater recycling systems	4%

Unit Setting Specifications for Exams

Unit ET 04 WHR Know the requirements to inspect, service and maintain rainwater harvesting and greywater reuse systems	
Test Specification Number of questions: 20 Closed Book	
Each test will cover the underpinning knowledge and understanding relevant to the unit as follows:	
Learning Outcome:	Approximate coverage:
1.0 Know the requirements for the routine service and maintenance of rainwater harvesting and reuse systems	55%
2.0 Know how to diagnose faults in rainwater harvesting and greywater reuse systems	25%
3.0 Know how to rectify faults in rainwater harvesting and greywater reuse systems	20%

Appendix 2: Learner Registration & 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 on line at the EAL Website www.eal.org.uk. For paper based registration and certification use forms CRF1, and CRF1A. These are located in the centre operations manual.

To Register the Learner on the Chosen Qualification/Pathway Code:

Qualification Title	Code
EAL Level 3 Award in Understanding the Fundamental Principles and Requirements of Environmental Technology Systems (QCF).	600/0665/1
EAL Level 3 Award in the Installation of Small Scale Solar Photovoltaic Systems (QCF).	600/5175/9
EAL Level 3 Award in the Installation and Maintenance of Small Scale Solar Photovoltaic Systems (QCF).	600/5252/1
EAL Level 3 Award in the Installation of Solar Thermal Hot Water Systems (QCF).	600/5248/X
EAL Level 3 Award in the Installation and Maintenance of Solar Thermal Hot Water Systems (QCF).	600/5251/X
EAL Level 3 Award in the Installation of Heat Pump Systems (Non-refrigerant Circuits) (QCF).	600/5249/1
EAL Level 3 Award in the Installation and Maintenance of Heat Pump Systems (Non-refrigerant Circuits) (QCF).	600/5253/3
EAL Level 3 Award in the Installation of Water Harvesting and Re-use Systems (QCF).	600/5247/8
EAL Level 3 Award in the Installation and Maintenance of Water Harvesting and Re-use Systems (QCF).	600/5250/8

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