

# End-point assessment plan for Utilities engineering technician apprenticeship standard

Apprenticeship standard number	Apprenticeship standard level	Integrated end-point assessment
ST0159	3	No

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## Introduction and overview

This document sets out the requirements for end-point assessment (EPA) for the Utilities engineering technician apprenticeship standard. It explains how EPA for this apprenticeship must operate.

Utilities engineering technician is a core and options apprenticeship standard. Apprentices must be trained and assessed against the core and one option, either:

- Electrical
- Mechanical
- Instrumentation Control and Automation

This document provides the EPA design requirements for end-point assessment organisations (EPAOs) for this apprenticeship standard. It will also be useful for apprentices undertaking this apprenticeship, their employers and training providers.

EPA must be conducted by an EPAO approved to deliver EPA for this apprenticeship standard. Each employer should select an approved EPAO from the Education & Skills Funding Agency's Register of end-point assessment organisations (RoEPAO).

Full-time apprentices will typically spend 48 months on-programme (before the gateway) working towards this occupational standard. All apprentices must spend a minimum of 12 months on-programme. All apprentices must spend a minimum of 20% of on-programme time undertaking off-the-job training.

Before starting EPA, an apprentice must meet the gateway requirements. For this apprenticeship they are:

- the employer must be content that the apprentice is working at or above the occupational standard
- apprentices must have compiled and submitted a portfolio of evidence to underpin the interview
- apprentices must have achieved English and Mathematics at Level 2<sup>1</sup>

The EPAO must confirm that all required gateway evidence has been provided and accepted as meeting the gateway requirements. The EPAO is responsible for confirming gateway eligibility. Once this has been confirmed, the EPA period starts.

This EPA should then be completed within an EPA period lasting typically for three months.

This EPA consists of three discrete assessment methods.

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<sup>1</sup> For those with an education, health and care plan or a legacy statement, the apprenticeship's English and Mathematics minimum requirement is Entry Level 3. British Sign Language (BSL) qualifications are an alternative to English qualifications for those who have BSL as their primary language.

It will be possible to achieve the following grades in each assessment method:

**Assessment method 1: Observation with questions**

- fail
- pass
- distinction

**Assessment method 2: Interview**

- fail
- pass
- distinction

**Assessment method 3: Multiple-choice test**

- fail
- pass

Performance in these assessment methods will determine the overall apprenticeship standard grade of:

- fail
- pass
- distinction

## EPA summary table

<b>On-programme</b> (typically 48 months)	<p>Training to develop the knowledge, skills and behaviours (KSBs) of the occupational standard.</p> <p>Training towards English and Mathematics Level 2, if required.</p> <p>Compiling a portfolio of evidence.</p>
<b>End-point assessment gateway</b>	<p>The employer must be content that the apprentice is working at or above the occupational standard.</p> <p>Apprentices must have achieved English and Mathematics Level 2.</p> <p>Apprentices must submit a portfolio of evidence to underpin the interview</p>
<b>End-point assessment</b> (typically three months)	<p><b>Assessment method 1: Observation with questions</b></p> <ul style="list-style-type: none"> <li>• fail</li> <li>• pass</li> <li>• distinction</li> </ul> <p><b>Assessment method 2: Interview</b></p> <ul style="list-style-type: none"> <li>• fail</li> <li>• pass</li> <li>• distinction</li> </ul> <p><b>Assessment method 3: Multiple-choice test</b></p> <ul style="list-style-type: none"> <li>• fail</li> <li>• pass</li> </ul> <p>Performance in these assessment methods will determine the overall apprenticeship standard grade of:</p> <ul style="list-style-type: none"> <li>• fail</li> <li>• pass</li> <li>• distinction</li> </ul>
<b>Professional recognition</b>	<p>Aligns with Engineering Technician (Eng.Tech) (or equivalent) professional registration.</p>

## Length of end-point assessment period

The EPA will be completed within an EPA period lasting typically three months, starting when the EPAO has confirmed that all gateway requirements have been met.

## Order of end-point assessment methods

The assessment methods can be delivered in any order.

The result of one assessment method does not need to be known before starting the next.

## EPA gateway

The apprentice should only enter the gateway once the employer is content that the apprentice is working at or above the occupational standard. In making this decision, the employer may take advice from the apprentice's training provider(s), but the decision must ultimately be made solely by the employer.

The EPAO determines when all other gateway requirements have been met, and the EPA period will only commence once the EPAO has confirmed this.

In addition to the employer's confirmation that the apprentice is working at or above the level in the occupational standard, the apprentice must have completed the following gateway requirements prior to beginning EPA:

- Achieved English and Mathematics at Level 2. For those with an education, health and care plan or a legacy statement, the apprenticeship's English and Mathematics minimum requirement is Entry Level 3. British Sign Language (BSL) qualifications are an alternative to English qualifications for those who have BSL as their primary language.

For observation with questions

- no specific requirements

For the interview the apprentice will be required to submit:

- portfolio of evidence

For multiple-choice test

- no specific requirements

**Portfolio of evidence requirements:**

- apprentices must compile a portfolio of evidence during the on-programme period of the apprenticeship
  - it must contain evidence related to the KSBs that will be assessed by the interview
  - the portfolio of evidence will typically contain eighteen discrete pieces of evidence
  - evidence must be mapped against the KSBs
  - evidence may be used to demonstrate more than one KSB; a qualitative as opposed to quantitative approach is suggested
  - evidence sources may include:
    - workplace documentation, for example workplace policies/procedures, records
    - witness statements
    - annotated photographs
    - video clips (cumulative duration 60 minutes). The clip must be succinct to provide the evidence described. The apprentice must be in view and identifiable. The clip must be timestamped to pinpoint the exact evidence to be considered.
- This is not a definitive list; other evidence sources are possible.
- it should not include any methods of self-assessment
  - any employer contributions should focus on direct observation of performance (for example witness statements) rather than opinions
  - the evidence provided must be valid and attributable to the apprentice; the portfolio of evidence must contain a statement from the employer and apprentice confirming this
  - the portfolio of evidence must be submitted to the EPAO at the gateway

The portfolio is not directly assessed. It underpins the interview and therefore should not be marked by the EPAO. EPAOs should review the portfolio in preparation for the interview but are not required to provide feedback after this review of the portfolio.

# End-point assessment methods

## End-point assessment method 1: Observation with questions

### Overview

This assessment method has one component.

An observation with questions involves an independent assessor observing and questioning an apprentice undertaking work as part of their normal duties, in the workplace. This allows for a demonstration of the KSBs through naturally occurring evidence. The observation must be of an apprentice completing their usual work and simulation is not permitted. Apprentices must be observed by the independent assessor completing work under normal working conditions. The independent assessor will ask questions in relation to underpinning knowledge or where an opportunity to observe an activity has not naturally occurred.

The rationale for this assessment method is:

- this is a practical role, best demonstrated through completing tasks in a real work setting
- observation makes use of employer resources and equipment, which will be familiar to the apprentice and thus allow them to perform at their best
- questioning allows for the testing of related underpinning knowledge
- tasks completed during the observation should contribute to workplace productivity and are valid
- it is a holistic assessment method

### Delivery

The observation with questions must take four hours.

The observation with questions may not be split, other than to allow comfort breaks as necessary or to allow the apprentice to move from one location to another as required.

Where breaks occur, they will not count towards the total assessment time.

EPAOs must manage invigilation of apprentices during breaks in order to maintain security of the assessment in line with their malpractice policy.

The independent assessor has the discretion to increase the time of the observation with questions by up to 10% to allow the apprentice to complete a task or respond to a question.

One independent assessor may observe only one apprentice at any one time, to ensure quality and rigour.

Apprentices must be provided with information on the format of the observation with questions, including the timescales they will be working to, before the start of the observation with questions. The time taken to give this information is exclusive of the assessment time.

The following activities must be observed during the observation:

- plan and prepare for work activities
- complete risk assessment and identify control measures
- communicate with a stakeholder/colleague for example, to outline work required/completed
- complete task documentation
- conduct planned, preventative or reactive specialist maintenance clean water/waste water equipment, covering:
  - two-three different types of maintenance tasks
  - two different types of equipment; equipment must have multiple parts/elements
  - use of at least three different tools and equipment, including ‘test equipment’
  - equipment isolation

The specialism is determined by the option taken by the apprentice: electrical, mechanical or instrumentation control & automation.

The observation should be conducted in the following way, to take account of the occupational context in which the apprentice operates:

Technicians will predominantly work in clean or waste water works, therefore it is sufficient for maintenance activity to be completed on clean water or waste water equipment.

The independent assessor must be unobtrusive whilst conducting the observation.

Questions must be asked to assess the level of competence against the grading descriptors. The independent assessor must ask a minimum of five questions, across the tasks.

As only naturally-occurring work is observed, those KSBs that the apprentice did not have the opportunity to demonstrate can be assessed via questioning, although these should be kept to a minimum.

Independent assessors must use their EPAOs’ question bank as a source for questioning and are expected to use their professional judgment to tailor those questions appropriately. Independent assessors are responsible for generating suitable follow-up questions in line with the EPAOs’ training and standardisation process.

They may ask follow-up questions where clarification is required. The questions can be asked by the independent assessor both during and after work completion. In order to remain as unobtrusive as possible, independent assessors should ask questions during natural stops between tasks and/or after completion of work rather than disrupting the apprentice’s flow.

The performance observed and responses to questions will be assessed holistically.

The time for questioning is included in the overall assessment time.

KSBs observed, and answers to questions, must be recorded by the independent assessor.

The independent assessor will make all grading decisions.



## Assessment location

The observation with questions will take place in:

- the apprentice's workplace

## Question and resource development

EPAOs will create and set open questions to assess related underpinning KSBs. They must develop 'question banks' of sufficient size to prevent predictability and review them regularly (and at least once a year) to ensure the questions they contain are fit for purpose. The questions relating to underpinning KSBs must be varied, yet allow assessment of the relevant KSBs.

EPAOs must ensure that apprentices have a different set of questions in the case of re-sits/re-takes.

EPAOs will produce the following material to support this assessment method:

- independent assessor training materials
- grading guidance
- question banks
- outline of the assessment method's requirements
- marking materials
- guidance document for employers and apprentices on the process / timescales for the interview as well as a description of the purpose
- guidance document for independent assessors on how to carry out the assessment

## End-point assessment method 2: Interview

### Overview

This assessment method has one component.

An interview consists of an independent assessor asking an apprentice a series of questions to assess their competence against the KSBs. The independent assessor leads this process to obtain information from the apprentice to enable a structured assessment decision-making process.

The rationale for this assessment method is:

- it allows for assessment of KSBs that do not occur on predictable or regular basis
- it allows for testing of responses where there are a range of potential answers that can't be tested through the multiple-choice test
- it is cost effective, as whilst seeking assurance of competence across a range of KSBs, it does not require the independent assessor to directly observe all of them thus reducing their time cost

### Delivery

The independent assessors will conduct and assess the interview.

The interview must last for 60 minutes. The independent assessor has the discretion to increase the time of the interview by up to 10% to allow the apprentice to complete their last answer.

The interview will have a minimum of nine questions. During this method, the independent assessor must combine questions from the EPAO's question bank and those generated by themselves.

The purpose of the questions will be to cover the following topics:

- make components
- work allocation/supervision
- professionalism
- diversity and equality
- continued professional development
- ethical manner
- specialist duties
- specialist installation and commission of clean/waste water equipment; decommission
- specialist fault finding and repairs

The specialism is determined by the option taken by the apprentice: electrical, mechanical or instrumentation control & automation.

The interview will be conducted as follows:

EPAOs must make arrangements for the interview with the apprentice's employer.

Apprentices must be given at least two-weeks' notice of the date and time of the

interview.

Questions should be open. Additional follow up questions are allowed, to seek clarification and to make a judgement against the grading descriptors.

The independent assessor should adapt their questions to the apprentice's individual circumstances following a review of their portfolio of evidence. The independent assessor should have a minimum of five working days to review the portfolio of evidence.

Apprentices must have access to their portfolio of evidence during the interview.

Apprentices can refer to and illustrate their answers with evidence from their portfolio of evidence, however the portfolio evidence is not directly assessed.

Apprentices are expected to understand and use relevant occupational language that would be typical of a competent person in this occupation.

Evidence from the interview underpinned by portfolio of evidence must be assessed holistically using the grading criteria for this assessment method.

KSBs met and answers to questions, must be recorded by the independent assessor.

The independent assessor will make all grading decisions.

### **Assessment location**

The interview should take place in a quiet room, free from distractions and influence. Video conferencing can also be used to conduct the interview but the EPAO must have processes in place to verify the identity of the apprentice and ensure the apprentice is not being aided.

The interview can take place in any of the following:

- employer's premises
- a suitable venue selected by the EPAO, for example a training provider's premises

### **Question and resource development**

A 'question bank' must be developed by EPAOs. The 'question bank' must be of sufficient size to prevent predictability and the EPAO must review it regularly (at least once a year) to ensure that it, and its content, are fit for purpose. The questions relating to the underpinning KSBs, must be varied yet allow assessment of the relevant KSBs. Independent assessors must use the question bank as a source for questioning and are expected to use their professional judgment to tailor those questions appropriately. Independent assessors are responsible for generating suitable questions in line with the EPAO's training and standardisation process.

EPAOs must ensure that apprentices have a different set of questions in the case of re-sits/re-takes.

EPAOs will produce the following material to support this assessment method:

- question bank
- structured specification
- outline of the assessment method's requirements
- marking materials
- guidance document for employers and apprentices on the process / timescales for the interview as well as a description of the purpose
- guidance document for independent assessors on how to carry out the assessment

## End-point assessment method 3: Multiple-choice test

### Overview

This assessment method has one component.

A multiple-choice test is a controlled assessment which consists of a series of questions in which apprentices are asked to provide a response.

The rationale for this assessment method is:

- it allows for the efficient testing of knowledge where there is a right or wrong answer
- it does not require independent assessor time, reducing cost; the multiple-choice test can be administered, invigilated and marked by an independent person appointed by the EPAO. Alternatively, marking by computer is permissible where question type allows this.
- it allows for flexibility in terms of when, where and how it is taken
- it allows larger volumes of apprentices to be assessed at one time

### Delivery

#### Multiple-choice test format

The multiple-choice test can be:

- computer based
- paper based

It will consist of 40 questions.

These questions will consist of multiple-choice questions. The multiple-choice questions will have four options of which one will be correct. The questions must be varied, to avoid the multiple-choice test becoming too predictable, yet allow assessment of the relevant KSBs.

#### Multiple-choice test administration

Apprentices must have 60 minutes to complete the multiple-choice test.

The multiple-choice test is closed which means that the apprentice cannot refer to reference books or materials.

## Multiple-choice test assessment

Multiple-choice tests must be marked by independent assessors or markers employed by the EPAO following a marking guide produced by the EPAO. Alternatively, marking by computer is permissible where questions types allow this.

A correct response will be assigned one mark.

Any incorrect or missing answers must be assigned zero marks.

### Grading boundaries

The following grade boundaries apply to the multiple-choice test:

Grade	Minimum mark	Maximum mark
Fail	0	27
Pass	28	40

### Assessment location

Apprentices must take the multiple-choice test in a suitably controlled environment that is a quiet space, free from distractions and influence, in the presence of an invigilator. The invigilator may be any independent person appointed by the EPAO. The EPAO is required to have an invigilation policy that will set out how the multiple-choice test is to be carried out. This will include specifying the most appropriate ratio of apprentices to invigilators to best take into account the setting and security required in administering the multiple-choice test.

The EPAO is responsible for ensuring the security of any multiple-choice tests they administer to ensure the multiple-choice test remains valid and reliable (this includes any arrangements made using online tools). The EPAO is responsible for verifying the identity of the person taking the multiple-choice test. The EPAO must also verify the suitability of the venue for test-taking.

### Question and resource development

Questions must be written by EPAOs and must be relevant to the occupation and assess the knowledge and skill mapped to this assessment method. It is recommended that this be done in consultation with employers of this occupation. EPAOs should maintain the security and confidentiality of their questions when consulting employers. EPAOs must develop 'multiple-choice test specifications' and 'question banks' of sufficient size to prevent predictability and review them regularly (and at least once a year) to ensure they, and the questions they contain, are fit for purpose. The specifications, including questions relating to underpinning KSBs must be varied, yet allow assessment of the relevant KSBs.

EPAOs must ensure that apprentices have a different set of questions in the case of re-sits/re-takes.

EPAOs will produce the following material to support this assessment method:

- a question bank
- a test specification
- sample test and mark scheme
- live test and mark scheme
- analysis reports which show areas of weakness for completed multiple-choice tests and an invigilation policy

## Reasonable adjustments

The EPAO must have in place clear and fair arrangements for making reasonable adjustments to the assessment methods for the EPA for this apprenticeship standard. This should include how an apprentice qualifies for reasonable adjustment and what reasonable adjustments will be made. The adjustments must maintain the validity, reliability and integrity of the assessment methods outlined in this assessment plan.

## Overall EPA grading

All assessment methods are weighted equally in their contribution to the overall EPA grade.

Performance in the EPA will determine the apprenticeship grade of fail, pass, or distinction.

Independent assessors must individually grade the observation with questions and interview, according to the requirements set out in this plan. A person appointed by the EPAO must grade the multiple-choice test, according to the requirements set out in this plan.

EPAOs must combine the individual assessment method grades to determine the overall EPA grade.

Apprentices who fail one or more assessment method will be awarded an overall EPA 'fail'.

In order to gain an overall EPA 'pass', apprentices must achieve a pass in all the assessment methods.

In order to achieve an overall EPA 'distinction', apprentices must achieve a distinction in the observation with questions, a distinction in the interview and a pass in the multiple-choice test.

Grades from individual assessment methods should be combined in the following way to determine the grade of the EPA as a whole:

Assessment method 1 – Observation with questions	Assessment method 2 – Interview	Assessment method 3 – Multiple-choice test	Overall grading
Any grade	Any grade	Fail	Fail
Any grade	Fail	Any grade	Fail
Fail	Any grade	Any grade	Fail
Pass	Pass	Pass	Pass
Distinction	Pass	Pass	Pass
Pass	Distinction	Pass	Pass
Distinction	Distinction	Pass	Distinction

Any grade = fail, pass, or distinction

## Re-sits and re-takes

Apprentices who fail one or more assessment method will be offered the opportunity to take a re-sit or a re-take at the employer's discretion. The apprentice's employer will need to agree that either a re-sit or re-take is an appropriate course of action.

A re-sit does not require further learning, whereas a re-take does.

Apprentices should have a supportive action plan to prepare for a re-sit or a re-take.

An apprentice who fails one or more assessment methods, and therefore the EPA in the first instance, will be required to re-sit or re-take the failed assessment method(s) only.

The timescales for a re-sit/re-take is agreed between the employer and EPAO. A re-sit is typically taken within two months of the EPA outcome notification. The timescale for a re-take is dependent on how much re-training is required and is typically taken within four months of the EPA outcome notification.

All assessment methods must be taken within a six month period, otherwise the entire EPA will need to be re-sat/re-taken.

Re-sits and re-takes are not offered to apprentices wishing to move from pass to a higher grade.

Where any assessment method has to be re-sat or re-taken, the apprentice will be awarded a maximum EPA grade of pass, unless the EPAO determines there are exceptional circumstances requiring a re-sit or re-take.

## Roles and responsibilities

Role	Responsibility
Apprentice	<p>As a minimum, apprentices should:</p> <ul style="list-style-type: none"> <li>• participate in and complete on-programme training to meet the KSBs as outlined in the occupational standard for a minimum of 12 months</li> <li>• undertake 20% off-the-job training as arranged by the employer and EPAO</li> <li>• understand the purpose and importance of EPA</li> <li>• undertake the EPA including meeting all gateway requirements</li> </ul>
Employer	<p>As a minimum, employers should:</p> <ul style="list-style-type: none"> <li>• work with the training provider (where applicable) to support the apprentice in the workplace to provide the opportunities for the apprentice to develop the KSBs</li> <li>• arrange and support a minimum of 20% off-the-job training to be undertaken by the apprentice</li> <li>• decide when the apprentice is working at or above the occupational standard and so is ready for EPA</li> <li>• select the EPAO</li> <li>• ensure that all supporting evidence required at the gateway is submitted in accordance with this EPA plan</li> <li>• remain independent from the delivery of the EPA</li> <li>• confirm arrangements with the EPAO for the EPA (who, when, where) in a timely manner (including providing access to any employer specific documentations as required, for example company policies)</li> <li>• ensure that the EPA is scheduled with the EPAO for a date and time which allow appropriate opportunity for the KSBs to be met</li> <li>• ensure the apprentice is well prepared for the EPA</li> <li>• ensure the apprentice is given sufficient time away from regular duties to prepare for and</li> </ul>



	<p>complete all post-gateway elements of the EPA, and that any required supervision during this time (as stated within this EPA plan) is in place</p> <ul style="list-style-type: none"> <li>• where the apprentice is assessed in the workplace, ensure that the apprentice has access to the resources used on a daily basis</li> </ul>
EPAO	<p>As a minimum, EPAOs should:</p> <ul style="list-style-type: none"> <li>• make all necessary contractual arrangements, including agreeing the price of the EPA</li> <li>• understand the occupational standard</li> <li>• appoint administrators (and invigilators where required) to administer the EPA as appropriate</li> <li>• provide training for independent assessors in terms of good assessment practice, operating the assessment tools and grading</li> <li>• provide adequate information, advice and guidance documentation to enable apprentices, employers and training providers to prepare for the EPA</li> <li>• arrange for the EPA to take place, in consultation with the employer</li> <li>• conform to the requirements of this EPA plan and deliver its requirements in a timely manner</li> <li>• develop and provide appropriate assessment recording documentation to ensure a clear and auditable process is in place for providing assessment decisions and feedback to all relevant stakeholders</li> <li>• have no direct connection with the apprentice, their employer or training provider. In all instances including when the EPAO is the training provider (i.e. HEI) there must be no conflict of interest</li> <li>• have policies and procedures for internal quality assurance (IQA), and maintain records of regular and robust IQA activity and moderation for external quality assurance (EQA) purposes</li> <li>• conform to the requirements of the nominated external quality assurance provider (EQAP)</li> <li>• conform to the requirements of the Register of End-Point Assessment Organisations (RoEPAO)</li> </ul>

	<ul style="list-style-type: none"> <li>• deliver induction training for independent assessors, and for invigilators and markers where used</li> <li>• undertake standardisation activity on this apprenticeship standard for all independent assessors before they conduct an EPA for the first time, if the EPA is updated and periodically as appropriate (a minimum of annually)</li> <li>• manage invigilation of apprentices in order to maintain security of the assessment in line with their malpractice policy</li> <li>• verify the identity of the apprentice being assessed</li> <li>• use language in the development and delivery of the EPA that is appropriate to the level of the occupational standard</li> <li>• request certification via the Apprenticeship Service upon successful achievement of the EPA</li> <li>• develop and produce assessment materials including specifications and marking materials (for example mark schemes, practice materials, training material)</li> <li>• appoint suitably qualified and competent independent assessors</li> <li>• provide details of the independent assessor's name and contact details to the employer</li> <li>• have and apply appropriately an EPA appeals process</li> </ul>
Independent assessor	<p>As a minimum, an independent assessor should:</p> <ul style="list-style-type: none"> <li>• have the competence to assess the apprentice at this level and hold any required qualifications and experience in line with the requirements of the independent assessor as detailed in the IQA section of this EPA plan</li> <li>• understand the occupational standard and the requirements of this EPA</li> <li>• have, maintain and be able to evidence up to date knowledge and expertise of the subject matter</li> <li>• deliver the end-point assessment in-line with the EPA plan</li> <li>• comply with the IQA requirements of the EPAO</li> </ul>

	<ul style="list-style-type: none"> <li>• have no direct connection or conflict of interest with the apprentice, their employer or training provider; in all instances including when the EPAO is the training provider (i.e. HEI)</li> <li>• attend induction training</li> <li>• attend standardisation events when they begin working for the EPAO, before they conduct an EPA for the first time and a minimum of annually on this apprenticeship standard</li> <li>• assess each assessment method, as determined by the EPA plan, and without extending the EPA unnecessarily</li> <li>• assess against the KSBs assigned to each assessment method, as shown in the mapping of assessment methods and as determined by the EPAO, and without extending the EPA unnecessarily</li> <li>• make all grading decisions</li> <li>• record and report all assessment outcome decisions, for each apprentice, following instructions and using assessment recording documentation provided by the EPAO in a timely manner</li> <li>• use language in the development and delivery of the EPA that is appropriate to the level of the occupational standard</li> </ul>
Training provider	<p>As a minimum, the training provider should:</p> <ul style="list-style-type: none"> <li>• work with the employer and support the apprentice during the off-the-job training to provide the opportunities to develop the knowledge, skills and behaviours as listed in the occupational standard</li> <li>• conduct training covering any knowledge, skill or behaviour requirement agreed as part of the Commitment Statement (often known as the Individual Learning Plan).</li> <li>• monitor the apprentice's progress during any training provider led on-programme learning</li> <li>• advise the employer, upon request, on the apprentice's readiness for EPA</li> <li>• remain independent from delivery of the EPA. Where the training provider is the EPA (i.e. a</li> </ul>

	HEI) there must be procedures in place to mitigate against any conflict of interest
Marker	<p>As a minimum, the marker should:</p> <ul style="list-style-type: none"> <li>• attend induction training</li> <li>• have no direct connection or conflict of interest with the apprentice, their employer or training provider in all instances including when the EPAO is the training provider (i.e. HEI)</li> <li>• mark multiple-choice test answers accurately according to the EPAO's mark scheme and procedures</li> </ul>
Invigilators	<p>As a minimum, invigilators should:</p> <ul style="list-style-type: none"> <li>• attend induction training as directed by the EPAO</li> <li>• have no direct connection or conflict of interest with the apprentice, their employer or training provider; in all instances, including when the EPAO is the training provider (i.e. HEI)</li> <li>• invigilate and supervise apprentices during tests and in breaks during assessment methods to prevent malpractice in accordance with the EPAO's invigilation procedures</li> </ul>

## Internal Quality Assurance (IQA)

Internal quality assurance refers to the strategies, policies and procedures that EPA organisations must have in place to ensure valid, consistent and reliable end-point assessment decisions. EPAOs for this EPA must adhere to all requirements within the Roles and Responsibilities section and:

- have effective and rigorous quality assurance systems and procedures that ensure fair, reliable and consistent assessment across employers, places, times and independent assessors
- appoint independent assessors who have recent relevant experience of the occupation/sector gained in the last five years or significant experience of the occupation/sector with evidence of continued professional development
- appoint independent assessors who are competent to deliver the end-point assessment and who meet the following minimum requirements:
  - experience of working in a technician role in clean water or waste water industry
  - operated at the same level as the occupational standard - Level 3 as a minimum
- operate induction training for independent assessors, markers and invigilators
- provide training for independent assessors in terms of good assessment practice, operating the assessment tools and grading
- where appropriate:
  - provide ongoing training for markers
  - provide ongoing training for invigilators
- undertake standardisation activity on this apprenticeship standard for all independent assessors:
  - before they conduct an EPA for the first time
  - if the EPA is updated
  - periodically as appropriate (a minimum of annually)
- conduct effective moderation of assessment decisions and grades
- conduct appeals where required, according to the EPAO's appeals procedure, reviewing and making final decisions on assessment decisions and grades

## Affordability

Affordability of the EPA will be aided by using at least some of the following practices:

- using employers' facilities and resources for the observation with questioning
- observed activity will contribute to workplace operations
- using an employer's venue for the interview underpinned by portfolio of evidence and multiple-choice test
- using video conferencing for the interview underpinned by portfolio of evidence
- the possibility of scheduling multiple assessment methods on the same day

## Professional body recognition

This apprenticeship standard is designed to prepare successful apprentices to meet the requirements for registration as Engineering Technician (Eng.Tech) (or equivalent) professional registration.

The experience gained and responsibility held by the apprentice on completion of the apprenticeship standard will either wholly or partially satisfy the requirements for registration with the professional body. For more details on the requirements and application process, please contact the professional body directly.

# Mapping of knowledge, skills and behaviours (KSBs)

## Assessment method 1: Observation with questions

<b>Knowledge</b>
K2. Maintenance practices, processes and procedures covering a range of waste and water systems, plant and equipment.
K5. Planned, reactive, and predictive maintenance processes, practices and procedures.
<b>Skills</b>
S2. Follow and comply with industry health and safety and environmental working practices and regulations.
S4. Carry out maintenance activities on a range of waste and water systems, plant and equipment.
S6. Carry out and follow planned, reactive and predictive plant and equipment maintenance procedures.
S7i. Communicate with and provide information and guidance to colleagues in line with personal role and responsibilities.
S8. Handover and confirm completion of engineering activities.
S9ii. Work to technical specifications and supporting documentation.
S10. Adhere to safe working practices and procedures and carry out risk assessments.
S11. Carry out safe isolation of equipment, using permit and lock-off systems as required.
S13i. Maintain equipment and components as required.
<b>Behaviours</b>
B1. Display a self-disciplined, self-motivated approach whilst recognising personal limitations and seeking advice from fact holders and specialists when required.
B2. Accept responsibility for work of self or others.

B4i. Work effectively and safely when undertaking tasks to approved standards and safe working practices when working alone.
B5. Undertake and complete work in a way that contributes to sustainable development.
B6. Be risk aware and minimise risks to life, property and the environment when undertaking work activities.
B7i. Be quality focused.
B8. Identify, organise and use resources effectively to complete tasks, with consideration for cost, quality, safety, security and environmental impact.
<b>Option A. Electrical</b>
E4. Use electrical theories and principles to use test equipment for voltage, current and earth resistance testing to maintain the integrity of the electrical system.
E9. Carry out electrical procedures on industrial low voltage systems (up to 1000V AC) operating switchgear, fuses, motor control centres, transformers, manual & automatically controlled drives and motors.
<b>Option B. Mechanical</b>
M2i. Inspect and monitor mechanical systems, and maintain mechanical equipment and components.
M8i. Test and service mechanical equipment as part of planned preventative maintenance and/or reactive maintenance programmes.
<b>Option C. Instrumentation Control and Automation</b>
I2i. Maintain instrumentation and control equipment and circuits.
I4i. Use Instrumentation and Control Systems knowledge and skills to maintain instruments, controllers, probes, attachments, cabling, meters and display units.
I7. Test, calibrate and validate fixed and portable analogue and digital instrumentation using approved procedures and standards.
I8i. Maintain and calibrate field instrumentation, communication devices and associated equipment used in system and process control, such as Programmable Logic Controllers (PLC) and Supervisory Control & Data Acquisition (SCADA) systems.



I11. Carry out isolation procedures to ensure process or system stability and personnel safety when carrying out operations.

## Assessment method 2: Interview

<b>Knowledge</b>
K4. Principles and processes that underpin the location, diagnosis and rectification of faults.
<b>Skills</b>
S1. Apply technical knowledge to carry out inspections, condition monitoring and reporting.
S3. Locate, diagnose and rectify faults on plant and equipment.
S5. Use workshop machinery and equipment to create, repair and modify component and apparatus.
S7ii. Communicate with and provide information and guidance to contractors, suppliers in line with personal role and responsibilities.
S12. Drive vehicles equipped with tools and materials to job sites.
S13ii. Install, replace and commission equipment and components as required.
S14. As required, undertake standby duties to provide 24 hour cover to remedy fault situations requiring diagnostic testing procedures.
<b>Behaviours</b>
B3. Deliver a polite, courteous professional service to customers and members of the public.
B4ii. Work effectively and safely when undertaking tasks to approved standards and safe working practices as part of a team or with appropriate supervision.
B7ii. Be professional in work and in personal standards.
B9. Accept, allocate and supervise technical and other tasks.

B10. Be aware of the needs and concerns of others, especially where related to diversity and equality.
B11. Carry out and record CPD necessary to maintain and enhance competence.
B12. Exercise responsibilities in an ethical manner.
<b>Option A. Electrical</b>
E1. Inspect and monitor electrical systems, and inspect, monitor, maintain and repair electrical equipment.
E2. Test electrical equipment and systems and assist in installing electrical systems and equipment.
E3. Access a range of sites to install, maintain, test, repair and dismantle electrical equipment.
E5. Consult design specifications to analyse and calculate electrical system parameters and rectification procedures.
E6. Interpret electrical drawings to install, position or re-locate electrical equipment and cabling.
E7. Test, service and repair electrical equipment as part of planned preventative maintenance and/or reactive maintenance programmes.
E8. Install and connect electrical cables, switchgear, circuit breakers, motors, transformers and other associated equipment.
E10. Carry out basic fault diagnostics on Programmable Logic Controllers (PLC) and Supervisory Control & Data Acquisition (SCADA) systems.
<b>Option B. Mechanical</b>
M1. Apply mechanical theories and principles in order to carry out diagnostic fault finding procedures.
M2ii. Inspect and monitor mechanical systems, and inspect, monitor, dismantle and repair mechanical equipment and components.
M3. Test mechanical equipment and systems and assist in installing mechanical systems and equipment.

M4. Basic Fabrication and welding of structures and components.
M5. Use mechanical knowledge and skills to install, maintain and dismantle a wide range of complex plant, machinery and components.
M6. Consult design specifications to analyse and calculate mechanical system parameters and rectification procedures.
M7. Interpret plans and drawings to install, position or re-locate mechanical equipment and components.
M8ii. Repair mechanical equipment as part of planned preventative maintenance and/or reactive maintenance programmes.
M9. Install and maintain mechanical components including motors, pumps and gearboxes, maintaining and replacing lubricants.
M10. Inspect and maintain condition monitoring equipment.
<b>Option C. Instrumentation Control and Automation</b>
I1. Apply theories and principles of electronics to use equipment to carry out diagnostic fault finding procedures.
I2ii. Repair and overhaul instrumentation and control equipment.
I3. Test and Calibrate Instrumentation and control equipment and circuits, and assist in installing instrumentation and control equipment.
I4ii. Use instrumentation and Control Systems knowledge and skills to install, and dismantle instruments, controllers, probes, attachments, cabling, meters and display units.
I5. Carry out telemetry outstation and internal system configuration.
I6. Identify and resolve data quality and calibration issues.
I8ii. Repair and configure field instrumentation, communication devices and associated equipment used in system and process control, such as Programmable Logic Controllers (PLC) and Supervisory Control & Data Acquisition (SCADA) systems.
I9. Use standards and specifications to improve the information gathered by telemetry data.

I10. Inspect and maintain security equipment, telecommunication devices and alarm systems.

I12. Provide support to day-to-day users of instrumentation and control systems.

I13. Complete data cleansing to ensure consistent and valid data is available for business and regulation purposes.

### Assessment method 3: Multiple-choice test

#### Knowledge

K1. Relevant industry health and safety standards and regulations, and environmental and regulatory requirements.

K3. Relevant level of theory and principles that underpin the design and function of electro-mechanical and instrumentation systems and equipment.

#### Skills

S9i. Read, understand and interpret computer data and displays.

## Grading descriptors

### End-point assessment method 1: Observation with questions

Theme KSBs	Pass Apprentices must demonstrate all the pass descriptors	Distinction Apprentices must demonstrate all the pass descriptors and the following distinction descriptors relating to the core and their chosen option
<b>Core - Health, safety and environment</b> <b>S2 S10</b> <b>B4i B5 B6 B8</b>	<p>Completes risk assessment to identify risks and hazards in the workplace and applies suitable control measures to minimise risks to life, property and the environment</p> <p>Conducts work in line with health and safety and environment practices, procedures and regulations</p> <p>Monitors and maintains safe working conditions and practices</p> <p>Conducts work in a way that contributes to sustainable development for example, considers use of resources, recycles waste materials, disposes of waste material following safe practice</p>	
<b>Core - Communication</b> <b>S7i S8</b>	<p>Communicates with colleagues as required by the task; communication style is appropriate to the audience</p> <p>Provides technically correct information and guidance</p> <p>Handovers and confirms completion of engineering activities to the appropriate person</p> <p>Uses industry terminology accurately and appropriately</p> <p>Completes task documentation in full, accurately and legibly</p>	<p>Takes responsibility to explain the added benefits of the task completion and checks understanding with contractor, supplier or colleague answering any outstanding queries accurately.</p>

<p><b>Core - Maintenance task</b></p> <p><b>K2 K5</b></p> <p><b>S4 S6 S9ii S11 S13i</b></p> <p><b>B1 B2 B4i B7i B8</b></p>	<p>Identifies and organises required resource from information provided, including tools, equipment, materials for tasks. Considers the implications of cost, quality and security when making their choices</p> <p>Conducts maintenance tasks to specification and in-line with company processes, practices and procedures.</p> <p>Carries out safe isolation of equipment using permit and lock-off systems as required</p> <p>Asks for specialist advice when required</p>	<p>Justifies choice and use of resources, based on balancing the impact of cost, quality, safety, security and environment impact</p> <p>Considers options and chooses the most efficient and effective approach for example, plans tasks, multi-tasks, reducing the need for self-correction after the task has commenced.</p> <p>Analyses and explains the potential consequences of not undertaking the maintenance</p> <p>Identifies and explains the potential issues that could arise during the work and how they mitigate against them</p>
<p><b>Electrical option – maintenance</b></p> <p><b>E4 E9</b></p>	<p>Uses electrical theories, principles and procedures to use test equipment as part of a planned preventative and/or reactive maintenance programme</p> <p>Carries out electrical procedures on industrial low voltage systems (up to 1000V AC; operates switchgear, fuses, motor control centres, transformers, manual &amp; automatically controlled drives and motors to ensure they are electrically safe.</p>	
<p><b>Mechanical option – maintenance</b></p> <p><b>M8i M2i</b></p>	<p>Tests and services mechanical equipment as part of a planned preventative and/or reactive maintenance programme</p>	
<p><b>ICA option – maintenance</b></p> <p><b>I2i I4i I7 I8i I11</b></p>	<p>Tests, maintains, calibrates and validates fixed and portable analogue and digital instrumentation as part of a planned preventative and/or reactive maintenance programme</p>	

	Carries out isolation procedures to ensure process or system stability and personnel safety when carrying out operations	
Fail – Apprentices will fail where they do not demonstrate all the pass descriptors		

## End-point assessment method 2: Interview

Theme KSBs	Pass Apprentices must demonstrate all the pass descriptors	Distinction Apprentices must demonstrate all the pass descriptors and the following distinction descriptors relating to their chosen option
<b>Core – Health &amp; safety B4ii</b>	Describes how they have monitored and maintained safe working conditions and practices when working as part of a team or when supervised.  Explains the implications of non-compliance with relevant health and safety standards, regulations and practice	
<b>Core – Make components S5</b>	Describes how they have used workshop machinery and equipment to create, repair and modify component and apparatus appropriately	
<b>Core – Communicate S7ii</b>	Describes how they communicate with contractors and suppliers and provide information and guidance in line with personal role and responsibilities	
<b>Core - Work allocation/supervision B4ii B9</b>	Describes how they have managed tasks, including delegation and supervision  Describes how their contributions to a team project made a difference, whilst working to approved standards and safe working practices.	

<b>Core - Professionalism</b> <b>B3 B7ii</b>	Describes how they have delivered a polite, courteous and professional service to customers and members of the public	
<b>Core - Diversity and equality</b> <b>B10</b>	Describes how they have taken account of the needs and concerns of others in relation to diversity and equality	
<b>Core - Continued professional development</b> <b>B11</b>	Describes the CPD activities they have completed and explains how it enhanced their competence	
<b>Core – Ethical manner</b> <b>B12</b>	Describes how they exercise responsibilities in an ethical manner	
<b>Electrical option - Duties</b> <b>S1 S12 S14</b> <b>E1 E3 E7</b>	<p>Describes how they have applied technical knowledge in their electrical duties: inspecting, condition monitoring and reporting; and testing servicing/maintaining and repairing electrical equipment</p> <p>Describes the different contexts/settings in which they have installed, maintained and tested electrical equipment</p> <p>If appropriate to the apprentice's workplace, describes their role in driving vehicles equipped with tools and materials to job sites</p> <p>If appropriate to the apprentice's workplace, describes how they provide 24 hour cover to remedy fault situations requiring diagnostic testing procedures</p>	
<b>Electrical option - Electrical installation and commission of clean/waste water equipment</b> <b>S13ii</b>	Explains how they have installed or replaced and commissioned equipment and components (electrical cables, switchgear, circuit breakers, motors, transformers and other associated equipment), including	Identifies and explains the potential issues that could arise during the work and how they mitigate against them



E2 E6 E8	interpretation of electrical drawings and testing	
<b>Electrical option</b> <b>Electrical fault finding and repair</b> <b>K4</b> <b>S3</b> <b>E5 E10</b>	<p>Describes how they have located, diagnosed and rectified faults on Programmable Logic Controllers (PLC) and Supervisory Control &amp; Data Acquisition (SCADA) systems or similar</p> <p>Explains how they consulted design specifications to analyse and calculate electrical system parameters and rectification procedures</p>	Describes different fault-finding methods they have used, justifying their choices
<b>Mechanical option – Duties</b> <b>S1 S12 S14</b> <b>M2ii M5 M8ii M9</b> <b>M10</b>	<p>Describes how they have applied technical knowledge in their mechanical duties: inspecting, condition monitoring and reporting, testing, installing, dismantling, repairing mechanical equipment and components</p> <p>Describes different types of complex plant, machinery and components they have worked on including motors, pumps and gearboxes</p> <p>If appropriate to the apprentice's workplace, describes their role in driving vehicles equipped with tools and materials to job sites</p> <p>If appropriate to the apprentice's workplace, describes how they provide 24 hour cover to remedy fault situations requiring diagnostic testing procedures</p>	
<b>Mechanical option – Mechanical installation and commission of clean/waste water equipment</b> <b>S13ii</b>	<p>Explains how they have installed/repositioned, replaced, and commissioned equipment and components, including interpretation of plans and testing</p> <p>Describes use of fabrication and welding appropriate to the task</p>	Identifies and explains the potential issues that could arise during the work and how they mitigate against them

<b>M3 M4 M7</b>		
<b>Mechanical option - Mechanical fault finding and repair</b>  <b>K4</b> <b>S3</b> <b>M1 M6</b>	Describes how they have located, diagnosed and rectified faults  Explains how they consulted design specifications to analyse and calculate mechanical system parameters and rectification procedures	Describes different fault-finding methods they have used, justifying their choices
<b>ICA option – Duties</b> <b>S1 S12 S14</b> <b>I5 I6 I9 I10 I12 I13</b>	Describes how they have applied technical knowledge in their ICA duties: inspecting, condition monitoring and reporting, testing telemetry outstation and internal system configuration, inspecting and maintaining security equipment, telecommunication devices and alarm systems, supporting day-to-day users of instrumentation and control systems  If appropriate to the apprentice's workplace, describes their role in driving vehicles equipped with tools and materials to job sites  If appropriate to the apprentice's workplace, describes how they provide 24 hour cover to remedy fault situations requiring diagnostic testing procedures  Explains how they identify and resolve data quality and calibration issues, use standards and specifications to improve information gathered by telemetry data and complete data cleansing to ensure consistent and valid data is available for business and regulation purposes	
<b>ICA option – ICA installation and commission of</b>	Explains how they have installed, tested, replaced, calibrated and dismantled ICT equipment and	Identifies and explains the potential issues that could

<b>clean/waste water equipment</b> <b>S13ii</b> <b>I3 I4ii</b>	components (controllers, probes, attachments, cabling, meters and display units)	arise during the work and how they mitigate against them
<b>ICA option - ICA fault finding and repair</b> <b>K4</b> <b>S3</b> <b>I1 I2ii I8ii</b>	Describes how they have located, diagnosed and rectified faults Describes how they have repaired instrumentation and control equipment and configured and calibrated field instrumentation, communication devices and associated equipment used in system and process control, such as Programmable Logic Controllers (PLC) and Supervisory Control & Data Acquisition (SCADA) systems	Describes different fault-finding methods they have used, justifying their choices
<b>Fail – Apprentices will fail where they do not demonstrate all the pass descriptors</b>		