



# Building services engineering senior technician

## Key information

**Reference:** ST0041

**Version:** 1.3

**Level:** 4

**Typical duration to gateway:** 36 months

**Typical EPA period:** 4 months

**Maximum funding:** £13000

**Route:** Construction and the built environment

**Integration:** None

**Date updated:** 05/09/2024

**Approved for delivery:** 8 May 2018

**Lars code:** 275

**EQA provider:** Ofqual

**Example progression routes:**

Building services design engineer (degree),

Building services engineering site management (degree),

Building control surveyor (integrated degree),

Senior and head of facilities management (integrated degree),

Design and construction management (degree)

**Review:** this apprenticeship will be reviewed in accordance with our change request policy.

## End-point assessment plan

V1.3

### Introduction and overview

This document explains the requirements for end-point assessment (EPA) for the building services engineering senior technician apprenticeship. End-point assessment organisations (EPAOs) must follow this when designing and delivering the EPA.

Building services engineering senior technician apprentices, their employers and training providers should read this document.

A full-time building services engineering senior technician apprentice typically spends 36 months on-programme. The apprentice must spend at least 12 months on-programme and complete the required amount of off-the-job training in line with the apprenticeship funding rules.

The EPA should be completed within an EPA period lasting typically 4 months.

The apprentice must complete their training and meet the gateway requirements before starting their EPA. The EPA will assess occupational competence.

An approved EPAO must conduct the EPA for this apprenticeship. Employers must work with the training provider to select an approved EPAO from the apprenticeship providers and assessment register (APAR).

This EPA has 0 assessment methods.

The grades available for each assessment method are below.

The result from each assessment method is combined to decide the overall apprenticeship grade. The following grades are available for the apprenticeship:

- fail
- pass
- distinction

## EPA summary table

<p><b>On-programme - typically 36 months</b></p>	<p>The apprentice must:</p> <ul style="list-style-type: none"> <li>• complete training to develop the knowledge, skills and behaviours (KSBs) outlined in this apprenticeship's standard</li> <li>• complete training towards English and mathematics qualifications in line with the apprenticeship funding rules component except the integrated one of the following qualifications: Pearson L4 HNC in Building Services Engineering (RQF/2023) qualification number (QN) 610/0940/4 -OR- Pearson BTEC L4 HNC in Construction and the Built Environment (Building Services Engineering) qualification number (QN) 603/0465/0 -OR- a HNC or an equivalent qualification in building services engineering approved or accredited by the Engineering Council as meeting the educational requirements for an Engineering Technician and for progression towards IEng registration</li> <li>• complete training towards the qualification listed in the building services engineering senior technician apprenticeship standard</li> </ul> <p>The qualification required is:</p> <p>one of the following qualifications: Pearson L4 HNC in Building Services Engineering (RQF/2023) qualification number (QN) 610/0940/4 -OR- Pearson BTEC L4 HNC in Construction and the Built Environment (Building Services Engineering) qualification number (QN) 603/0465/0 -OR- a HNC or an equivalent qualification in building services engineering approved or accredited by the Engineering Council as meeting the educational requirements for an Engineering Technician and for progression towards IEng registration</p>
<p><b>End-point assessment gateway</b></p>	<p>The apprentice's employer must be content that the apprentice is occupationally competent.</p> <p>The apprentice must:</p> <ul style="list-style-type: none"> <li>• confirm they are ready to take the EPA</li> <li>• have achieved English and mathematics qualifications in line with the apprenticeship funding rules</li> </ul>
<p><b>End-point assessment - typically 4 months</b></p>	<p><b>The grades available for each assessment method are below</b></p> <p><b>Overall EPA and apprenticeship can be graded:</b></p> <ul style="list-style-type: none"> <li>• fail</li> <li>• pass</li> <li>• distinction</li> </ul>
<p><b>Professional recognition</b></p>	<p>This apprenticeship aligns with:</p> <ul style="list-style-type: none"> <li>• Engineering Council (EngTech) for level 4</li> </ul>

### Duration of end-point assessment period

The EPA will be taken within the EPA period. The EPA period begins when the EPAO confirms the gateway requirements are met and is typically 4 months.

The expectation is that the EPAO will confirm the gateway requirements are met and the EPA begins as quickly as possible.

### EPA gateway

The apprentice's employer must be content that the apprentice is occupationally competent. That is, they are deemed to be working at or above the level set out in the apprenticeship standard and ready to undertake the EPA. The employer may take advice from the apprentice's training provider, but the employer must make the decision. The apprentice will then enter the gateway.

The apprentice must meet the gateway requirements before starting their EPA.

They must:

- confirm they are ready to take the EPA
- have achieved English and mathematics qualifications in line with the apprenticeship funding rules
- have passed one of the following qualifications: Pearson L4 HNC in Building Services Engineering (RQF/2023) qualification number (QN) 610/0940/4 -OR- Pearson BTEC L4 HNC in Construction and the Built Environment (Building Services Engineering) qualification number (QN) 603/0465/0 -OR- a HNC or an equivalent qualification in building services engineering approved or accredited by the Engineering Council as meeting the educational requirements for an Engineering Technician and for progression towards IEng registration

Gateway evidence must be submitted to the EPAO, along with any organisation specific policies and procedures requested by the EPAO.

### Order of 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.

### Overall EPA grading

The EPA methods contribute equally to the overall EPA grade.

Performance in the EPA will determine the apprenticeship grade of:

- fail
- pass
- distinction

Independent assessors must individually grade the: according to the requirements set out in this EPA 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.

Apprentices must achieve at least a pass in all the EPA methods to get an overall pass. In order to achieve an overall EPA 'distinction', apprentices must achieve a distinction in both assessment methods.

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

OVERALL GRADING
Fail
Fail
Pass
Pass
Pass
Distinction

### Re-sits and re-takes

Apprentices who fail one or more EPA method(s) can take a re-sit or a re-take at the employer's discretion. The apprentice's employer needs to agree that a re-sit or re-take is appropriate. A re-sit does not need further learning, whereas a re-take does.

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

The employer and EPAO agree the timescale for a re-sit or re-take. A re-sit is typically taken within 4 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 6 months of the EPA outcome notification.

Failed EPA methods must be re-sat or re-taken within a 6-month period from the EPA outcome notification, otherwise the entire EPA will need to be re-sat or re-taken in full.

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

An apprentice will get a maximum EPA grade of pass for a re-sit or re-take, unless the EPAO determines there are exceptional circumstances.

### Roles and responsibilities

ROLES	RESPONSIBILITIES
Apprentice	<p>As a minimum, the apprentice should:</p> <ul style="list-style-type: none"> <li>• complete on-programme training to meet the KSBs as outlined in the apprenticeship standard for a minimum of 12 months</li> <li>• complete the required amount of off-the-job training specified by the apprenticeship funding rules and as arranged by the employer and training provider</li> <li>• understand the purpose and importance of EPA</li> <li>• prepare for and undertake the EPA including meeting all gateway requirements</li> </ul>
Employer	<p>As a minimum, the apprentice's employer must:</p> <ul style="list-style-type: none"> <li>• select the training provider</li> <li>• work with the training provider to select the EPAO</li> <li>• work with the training provider, where applicable, to support the apprentice in the workplace and to provide the opportunities for the apprentice to develop the KSBs</li> <li>• arrange and support off-the-job training to be undertaken by the apprentice</li> <li>• decide when the apprentice is working at or above the apprenticeship standard and is ready for EPA</li> <li>• ensure the apprentice is prepared for the EPA</li> <li>• ensure that all supporting evidence required at the gateway is submitted in line with this EPA plan</li> <li>• confirm arrangements with the EPAO for the EPA in a timely manner, including who, when, where</li> <li>• provide the EPAO with access to any employer-specific documentation as required for example, company policies</li> <li>• ensure that the EPA is scheduled with the EPAO for a date and time which allows appropriate opportunity for the apprentice to meet the KSBs</li> <li>• ensure the apprentice is given sufficient time away from regular duties to prepare for, and complete the EPA</li> <li>• ensure that any required supervision during the EPA period, as stated within this EPA plan, is in place</li> <li>• ensure the apprentice has access to the resources used to fulfil their role and carry out the EPA for workplace based assessments</li> <li>• remain independent from the delivery of the EPA</li> <li>• pass the certificate to the apprentice upon receipt</li> </ul>
EPAO	<p>As a minimum, the EPAO must:</p> <ul style="list-style-type: none"> <li>• conform to the requirements of this EPA plan and deliver its requirements in a timely manner</li> <li>• conform to the requirements of the apprenticeship provider and assessment register</li> <li>• conform to the requirements of the external quality assurance provider (EQAP)</li> <li>• understand the apprenticeship including the occupational standard and EPA plan</li> <li>• make all necessary contractual arrangements including agreeing the price 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>• maintain and apply a policy for the declaration and management of conflict of interests and independence. This must ensure, as a minimum, there is no personal benefit or detriment for those delivering the EPA or from the result of an assessment. It must cover: <ul style="list-style-type: none"> <li>• apprentices</li> <li>• employers</li> <li>• independent assessors</li> <li>• any other roles involved in delivery or grading of the EPA</li> </ul> </li> <li>• have quality assurance systems and procedures that ensure fair, reliable and consistent assessment and maintain records of internal quality assurance (IQA) activity for external quality assurance (EQA) purposes</li> <li>• appoint independent, competent, and suitably qualified assessors in line with the requirements of this EPA plan</li> <li>• appoint administrators, invigilators and any other roles where required to facilitate the EPA</li> <li>• deliver induction, initial and on-going training for all their independent assessors and any other roles involved in the delivery or grading of the EPA as specified within this EPA plan. This should include how to record the rationale and evidence for grading decisions where required</li> </ul>

	<ul style="list-style-type: none"> <li>• conduct standardisation with all their independent assessors before allowing them to deliver an EPA, when the EPA is updated, and at least once a year</li> <li>• conduct moderation across all of their independent assessors' decisions once EPAs have started according to a sampling plan, with associated risk rating of independent assessors</li> <li>• monitor the performance of all their independent assessors and provide additional training where necessary</li> <li>• develop and provide 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>• use language in the development and delivery of the EPA that is appropriate to the level of the apprenticeship</li> <li>• arrange for the EPA to take place in a timely manner, in consultation with the employer</li> <li>• provide information, advice, and guidance documentation to enable apprentices, employers and training providers to prepare for the EPA</li> <li>• confirm the gateway requirements have been met before they start the EPA for an apprentice</li> <li>• arrange a suitable venue for the EPA</li> <li>• maintain the security of the EPA including, but not limited to, verifying the identity of the apprentice, invigilation and security of materials</li> <li>• where the EPA plan permits assessment away from the workplace, ensure that the apprentice has access to the required resources and liaise with the employer to agree this if necessary</li> <li>• confirm the overall grade awarded</li> <li>• maintain and apply a policy for conducting appeals</li> </ul>
Independent assessor	<p>As a minimum, an independent assessor must:</p> <ul style="list-style-type: none"> <li>• be independent, with no conflict of interest with the apprentice, their employer or training provider, specifically, they must not receive a personal benefit or detriment from the result of the assessment</li> <li>• have, maintain and be able to evidence up-to-date knowledge and expertise of the occupation</li> <li>• have the competence to assess the EPA and meet the requirements of the IQA section of this EPA plan</li> <li>• understand the apprenticeship's occupational standard and EPA plan</li> <li>• attend induction and standardisation events before they conduct an EPA for the first time, when the EPA is updated, and at least once a year</li> <li>• use language in the delivery of the EPA that is appropriate to the level of the apprenticeship</li> <li>• work with other personnel, where used, in the preparation and delivery of assessment methods</li> <li>• conduct the EPA to assess the apprentice against the KSBs and in line with the EPA plan</li> <li>• make final grading decisions in line with this EPA plan</li> <li>• record and report assessment outcome decisions</li> <li>• comply with the IQA requirements of the EPAO</li> <li>• comply with external quality assurance (EQA) requirements</li> </ul>
Training provider	<p>As a minimum, the training provider must:</p> <ul style="list-style-type: none"> <li>• conform to the requirements of the apprenticeship provider and assessment register</li> <li>• ensure procedures are in place to mitigate against any conflict of interest</li> <li>• work with the employer and support the apprentice during the off-the-job training to provide the opportunities to develop the KSBs as outlined in the occupational standard</li> <li>• deliver training to the apprentice as outlined in their apprenticeship agreement</li> <li>• monitor the apprentice's progress during any training provider led on-programme learning</li> <li>• ensure the apprentice is prepared for the EPA</li> <li>• work with the employer to select the EPAO</li> <li>• advise the employer, upon request, on the apprentice's readiness for EPA</li> <li>• ensure that all supporting evidence required at the gateway is submitted in line with this EPA plan</li> <li>• remain independent from the delivery of the EPA</li> </ul>

### Reasonable adjustments

The EPAO must have reasonable adjustments arrangements for the EPA.

This should include:

- how an apprentice qualifies for reasonable adjustment
- what reasonable adjustments may be made

Adjustments must maintain the validity, reliability and integrity of the EPA as outlined in this EPA plan.

### Internal quality assurance

Internal quality assurance refers to how EPAOs ensure valid, consistent and reliable EPA decisions. EPAOs must adhere to the requirements within the roles and responsibilities section and:

- have effective and rigorous quality assurance systems and procedures that ensure fair, reliable and consistent EPA regardless of employer, place, time or independent assessor
- appoint independent assessors who are competent to deliver the EPA and who:
  - have recent relevant experience of the occupation or sector to at least occupational level 4 gained in the last 2 years or significant experience of the occupation or sector
  - hold, or are working towards, an assessor qualification
  - have professional body membership with:

The Engineering Council, and registered with a relevant professional engineering institution (PEI)

- meet the following minimum requirements:
  - be professionally active and maintain their cpd record annually
  - complete an epao induction to demonstrate working knowledge of the apprenticeship standard and assessment methodology
- operate induction training for anyone involved in the delivery and/or assessment of the EPA
- provide training for independent assessors in good assessment practice, operating the assessment tools and making grading decisions
- provide ongoing training for markers and invigilators
- provide standardisation activity for 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 EPA decisions and grades
- conduct appeals where required, according to the EPAO's appeals procedure, reviewing and making final decisions on EPA decisions and grades
- have no direct connection with the apprentice, their employer or training provider. In all instances, including when the EPAO is the training provider (for example a higher education institution)

### Value for money

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

- utilising digital remote platforms to conduct applicable assessment methods
- using the employer's premises
- conducting assessment methods on the same day

### Professional recognition

This apprenticeship standard is designed to prepare successful apprentices to meet the requirements for registration as a:

Engineering Council (EngTech) for level 4

### KSB mapping table

KNOWLEDGE	ASSESSMENT METHODS
<b>K1</b> Engineering principles, underpinned by relevant scientific, theoretical and technical knowledge and understanding to solve well-defined building services engineering problems.	No mapped assessment methods
<b>K2</b> Building services engineering techniques, procedures and methods used for building services engineering systems, to either measure and test, design, install, commission, maintain or operate.	No mapped assessment methods
<b>K3</b> Advanced mathematical, statistical and analytical problem-solving tools.	No mapped assessment methods
<b>K4</b> Properties of, and selection criteria for materials, components or parts used in building services solutions.	No mapped assessment methods
<b>K5</b> Techniques and methods to collect data and technical information for analysis and evaluation.	No mapped assessment methods
<b>K6</b> Design principles and control processes used in the building services engineering consultancy, construction or manufacturing process, and the common constraints faced.	No mapped assessment methods
<b>K7</b> Technical drawings, designs, and models, using analytical and computer-based software packages.	No mapped assessment methods
<b>K8</b> Uses and limitations of computational and digital models, including Building Information Modelling (BIM).	No mapped assessment methods
<b>K9</b> Industry policies, standards, regulations and legislation, and codes of practice, including Building Safety legislation or BSI Flex 8670.	No mapped assessment methods
<b>K10</b> Statutory health, safety and welfare policies, procedures, and regulations including Construction (Design and Management) (CDM).	No mapped assessment methods
<b>K11</b> Risk assessment and mitigation processes, and their importance in the building services environment.	No mapped assessment methods
<b>K12</b> Principles of sustainable development and their impact on the lifecycle of building services engineering solutions, including United Nations Sustainable Development Goals (UNSDG), net-zero carbon emissions, environmental policies and legislations, and the climate change act.	No mapped assessment methods
<b>K13</b> Project management techniques, including quality and information management and assurance systems and continuous improvement processes.	No mapped assessment methods
<b>K14</b> Methods for planning and resourcing building services engineering tasks, and the impact on cost, quality, safety, security, and environment.	No mapped assessment methods
<b>K15</b> Methods of communication and when to use them, using appropriate engineering terminology and conventions.	No mapped assessment methods
<b>K16</b> Roles and responsibilities within the organisation, team dynamics and their own boundaries of authority.	No mapped assessment methods

<b>K17</b> Relationships between key organisations in the building services engineering sector (for example organisations, customers, partners and suppliers).	No mapped assessment methods
<b>K18</b> Equality, diversity and inclusion, its importance and impact on building services engineering solutions.	No mapped assessment methods
<b>K19</b> Ethical principles as applied to building services engineering including the need for security of data and information.	No mapped assessment methods
<b>K20</b> Methods to maintain professional competence and technical knowledge including initial professional development (IPD) and continuing professional development (CPD).	No mapped assessment methods



SKILL	ASSESSMENT METHODS
<b>S1</b> Apply engineering principles, using relevant scientific, theoretical and technical know-how to solve well-defined building services engineering problems.	No mapped assessment methods
<b>S2</b> Apply building services engineering techniques, procedures and methods, and review the results, when measuring and testing, designing, installing, commissioning, maintaining or operating building services engineering systems.	No mapped assessment methods
<b>S3</b> Employ a range of advanced mathematical, statistical and data interpretation tools, using analytical and computational methods to interpret and solve well-defined building services engineering problems.	No mapped assessment methods
<b>S4</b> Interpret and compare performance information to choose compliant materials, components or parts.	No mapped assessment methods
<b>S5</b> Select and use technical literature and other sources of information and data to address well-defined building services engineering problems.	No mapped assessment methods
<b>S6</b> Produce and interpret building services engineering technical drawings, designs, and models, using analytical and computer-based software packages, recognising the limitations of the software used.	No mapped assessment methods
<b>S7</b> Produce building services engineering technical solutions in accordance with relevant industry standards, procedures, codes of practice, regulations, and legislation.	No mapped assessment methods
<b>S8</b> Comply with, and encourage others to demonstrate, statutory health, safety and welfare policies, procedures and regulation.	No mapped assessment methods
<b>S9</b> Complete risk assessments to identify, evaluate and mitigate risks.	No mapped assessment methods
<b>S10</b> Apply principles of sustainable development, and assess the impact of these in their work.	No mapped assessment methods
<b>S11</b> Employ project management techniques, measuring and recording progress against building services engineering project plans.	No mapped assessment methods
<b>S12</b> Assess and report on quality using appropriate management and assurance systems and continuous improvement processes.	No mapped assessment methods
<b>S13</b> Identify and use resources, equipment and technology to meet project requirements, including specifications, budget and timescales.	No mapped assessment methods
<b>S14</b> Monitor and manage individual performance, and supervise others, recognising the need to comply with appropriate codes of practice and equality, diversity & inclusion (EDI) requirements.	No mapped assessment methods
<b>S15</b> Communicate using appropriate methods for the audience, using appropriate engineering terminology and conventions.	No mapped assessment methods
<b>S16</b> Apply ethical principles to building services engineering projects, including the secure use of data and information.	No mapped assessment methods

<b>S17</b> Plan, undertake and review their own professional competence, updating and reviewing their CPD to improve performance.	No mapped assessment methods
<b>BEHAVIOUR</b>	<b>ASSESSMENT METHODS</b>
<b>B1</b> Works to health, safety and welfare requirements, industry standards, statutory regulation and legislation, policies, and codes of practice, and ensuring others do likewise.	No mapped assessment methods
<b>B2</b> Makes independent decisions when delivering building services engineering projects, whilst knowing their own limitations and when to ask for help or to escalate.	No mapped assessment methods
<b>B3</b> Works individually and as part of a team, being aware of their actions and the impact they may have on others, and demonstrating awareness of diversity and inclusion issues so as to meet the requirement of fairness at work.	No mapped assessment methods
<b>B4</b> Solves problems with attention to detail, accuracy, and diligence, and seeks to continually improve.	No mapped assessment methods
<b>B5</b> Maintains professional and ethical working relationships with internal, external, and other stakeholders.	No mapped assessment methods
<b>B6</b> Takes responsibility for their own professional development, seeking opportunities to enhance their knowledge, skills, and experience, and support others when requested.	No mapped assessment methods

## Mapping of KSBs to grade themes

### Version log

Version	Change detail	Earliest start date	Latest start date	Latest end date
1.3	Occupational standard and end-point assessment plan revised. Update to mandated qualifications and reinstate component 2 information	05/09/2024	Not set	Not set
1.2	Occupational standard and end-point assessment plan revised.	03/04/2024	04/09/2024	Not set
1.1	Standard, funding band and end-point assessment plan revised	01/07/2022	02/04/2024	Not set
1.0	Approved for delivery	08/05/2018	30/06/2022	Not set

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