

Building Services Engineering Craftsperson (Level 3) – End Point Assessment

Introduction

Building Services Engineering makes buildings work. It is a specialist branch of engineering within the construction sector. A craftsperson undertakes the installation, testing, pre-commissioning, commissioning and de-commissioning of large-scale engineering systems. These systems are used for heating workplaces such as those found in industrial and commercial buildings such as: office blocks, factories, schools and hospitals. These engineering systems operate by moving temperature controlled water around the inside of buildings, providing heating and cooling, and utilise fossil fuels and sustainable energy systems.

This assessment plan has been designed to inform those involved in delivery and assessment of the apprenticeship:

- **What** will be assessed
- **How** the apprentice will be assessed
- **Who** will carry out the assessment
- **Quality Assurance** arrangements to ensure that assessment of the craftsperson standard is reliable and consistent across different locations, employers, training and assessment organisations.

Summary of Assessment

The objective of the Building Services Engineering Craftsperson End Point Assessment is to provide a high quality, cost effective means of measuring the apprentice's competence in the final three months of their apprenticeship.

The assessment plan design is driven by the following principles:

- The apprentice demonstrating competence as far as practical through workplace performance
- The apprentice's ability to meet specified industry standards of competent performance
- The apprentice's ability to demonstrate the requisite knowledge and behaviours that support workplace performance
- Identification of the apprentice's potential for progression

The Craftsperson End Point Assessment will consist of three components:

- Knowledge Test
- Craftsperson Skills Test
- Professional Discussion supported by the apprentice's record of achievement

The following diagram provides a summary of the End Point Assessment process

On-programme

- Structured programme of learning and assessment
- Compilation of a Record of Achievement which forms the basis of the End Point Assessment Professional Discussion
- Level 3 Heating and Ventilating Craftsperson Qualification

Assessment Gateway

- Confirmation from Employer and Training Provider that the learner is ready to access the end point assessment
- Level 3 Heating and Ventilating Craftsperson Qualification achieved
- Level 2 English and Maths and Level 1 Information & Communication Technology achieved

End Point Assessment

Assessments must be accessed in the given order– the apprentice must pass each assessment component before moving onto the next one.

The Independent Assessment Organisation must be registered on the Register of Apprentice Assessment Organisations. It has overall responsibility for coordinating the End Point Assessment and for the final sign off of the apprenticeship as having been satisfactorily completed.

1. Knowledge Test

- Synoptic knowledge assessment, delivered as an onscreen multiple choice examination.
- Administered in an examination venue which is recognised by the Independent Assessment Organisation (IAO)
- Designed, maintained and marked by Independent Assessment Organisation

2. Craftsperson Skills Test

- Timed Synoptic practical assessment
- Administered in an assessment venue which is recognised by the Independent Assessment Organisation
- Marked and scored by Independent Assessor on behalf of the Independent Assessment Organisation

3. Professional Discussion

- A Record of Achievement will be made available to the interviewer prior to the Professional Discussion taking place
- Professional Discussion is conducted by an Independent Assessor on behalf of the Assessment Organisation
- The Independent Assessor will formulate questions around the evidence provided in the Record of Achievement and the relevant sections of the standard identified in Annex A, using the Independent Assessment Organisation brief
- The Independent Assessment Organisation, advised by the Independent Assessor makes the final decision on whether or not the apprentice has demonstrated the Knowledge, Behaviours and Skills of the standard

Assessment	Knowledge Test	Craftsperson Skills Test	Professional Discussion
Assessment Method	Onscreen multiple choice test centrally set and marked	Observation of practical task	Professional Discussion
Area assessed	Underpinning and applied knowledge	Application of knowledge, and behaviours	Knowledge, skills and behaviours applied in the workplace
Assessed by	Independent Assessment Organisation	Independent Assessor on behalf of the Independent Assessment Organisation	Independent Assessor on behalf of the Independent Assessment Organisation
Grading	Pass/ Merit/ Distinction/ Fail	Pass/ Merit/ Distinction/ Fail	Pass/ Merit/ Distinction/ Fail

On-programme assessment

- It is recommended that the apprentice receives basic health and safety induction prior to attending a work site. It is also recommended that Apprentices acquire a Trainee SKILL card in order to gain access to most construction sites
- All apprentices must achieve the following qualifications during the on-programme assessment:
 - Heating and Ventilating Craftsperson Qualification Level 3
 - English Level 2
 - Mathematics Level 2
 - Information and Communications Technology Level 1
- Craftsperson apprentices will initially follow the same foundation training programme as Building Services Engineering Installer apprentices. This provides the essential foundation training
- All apprentices must produce evidence within a Record of Achievement to demonstrate the knowledge, skills and behaviours identified in Annex A. The Record of Achievement will form the basis of the Professional Discussion

Assessment Gateway

- The assessment gateway allows the apprentice to access the End Point Assessment. This can only be accessed within the final three months of the apprenticeship
- End Point Assessment will be triggered by achievement of the on programme qualification
- The employer, in conjunction with the training provider, will decide if the learner has demonstrated the necessary knowledge, skills and behaviours during the on-programme learning so that they are ready to access the End Point Assessment

End Point Assessment

What

- The apprentice will be assessed on their ability to demonstrate the higher level skills, knowledge and behaviours detailed in the [Craftsperson Apprenticeship Standard](#) through three assessment opportunities. Annex A provides an overview of what an apprentice can expect to be covered in each assessment method

How and Who

- The assessment will be undertaken in the following sequence:
 - Knowledge Test
 - Craftsperson Skills Test
 - Professional Discussion
- The apprentice must achieve a minimum of a pass against the Knowledge and Skills tests, in this

sequence, before accessing the Professional Discussion. The apprentice must achieve a minimum of a pass against all components of the End Point Assessment to complete the apprenticeship successfully

Knowledge Test

Duration: 90 minute test (60 questions)

- Apprentices are required to have a detailed knowledge of:
 - the design principles, layout and operating principles of the following techniques:
 - installation
 - testing
 - pre-commissioning
 - commissioning
 - de-commissioning
 - how to work safely and sustainably
 - how to plan and prepare the work area
- The assessment will be synoptic of all areas identified in Annex A of this Assessment Plan to be tested by this assessment method
- The knowledge test will use multiple choice questions to assess underpinning and applied knowledge in these areas. The underpinning questions will cover the “how” and “why” elements of the content. Applied knowledge will use scenario type questions to assess the apprentice’s judgement and decision making
- The test will comprise of 20 underpinning knowledge questions and 40 applied knowledge questions
- This knowledge will be tested by the Independent Assessment Organisation, through centrally set and centrally marked multiple choice online examination. The examination venue must have been recognised by the Independent Assessment Organisation prior to the examination taking place. The examination venue must have access to appropriate resources to conduct the assessment such as appropriately trained invigilation staff. The assessment will be synoptic of all topics covered in the Apprenticeship standard
- Grading for this assessment will be as follows: Pass/ Merit/ Distinction/ Fail. If the apprentice has to re-sit this assessment they will only be able to achieve Pass/Fail grading
- Apprentices will be able to access merit and distinction grades by being able to reach a particular grade boundary which is determined below:

	Percentage Achieved (%)	Points allocated for overall apprenticeship grading
Pass	60 - 69	3
Merit	70 - 79	6
Distinction	80 and above	9

Craftsperson Skills Test

- This assessment will be used to confirm that the apprentice is able to plan, resource, organise and undertake a pipework test to the specified standards, within a stated timescale. It will measure elements of the standard identified in annex A
- The skills test will be undertaken in two parts, assessed by the Independent Assessor who is appointed by the Independent Assessment Organisation

Part 1: Preliminary activities

Duration: 3 hours

- Takes place under examination conditions at a venue which has to be approved by the Independent Assessment Organisation, this may be a training provider’s or employer’s facilities. This part of the test will be invigilated by an independent Invigilator approved by the assessment organisation.

- The apprentice will be given a system brief which requires them to design a pipework fabrication and installation. At the end of the three hour period, the design will be sent to the Independent Assessor for marking. The marking process will include the Independent Assessor making any corrections or suggesting amendments where necessary to make the installation viable. Marking will reflect any corrections or amendments the Independent Assessor needs to make. The apprentice will then be provided with the marked design to install in part 2 of the test (Practical activities)
- Preliminary activities to be included:
 - Designing pipe installation from a brief including expansion
 - Producing an isometric sketch
 - Selecting materials, valves, brackets and fixings from a specification
 - Completion of risk assessment and method statement
 - Listing tools, equipment and materials

Part 2: Practical activities

Duration: 10 hours over 2 days

- The apprentice will install the design from Part 1 for this part of the test. The assessment will take place at a venue which has been approved by the Independent Assessment Organisation prior to the assessment taking place. This may be a training provider's or employer's facilities.
- It is expected that up to four apprentices will undertake the skills test at any one time. This requires apprentices to share larger tools and equipment, which enhances the opportunity to assess; planning, organising, safety, communication, and working with others
- The assessment will be invigilated; this can be administered by the training provider or employer provided they have an appropriately trained representative to carry out the role. Apprentices will be assessed by observation throughout the task by the Independent Assessor:
 - Installing pipework to a brief
 - Filling and testing the system
 - Commissioning the system
 - Communicating effectively
 - Working effectively and efficiently
 - Taking responsibility
 - Managing tasks
- The Independent Assessor will score both parts of the test to identify the grade achieved for this component
- They will then provide a report on test result and grading outcomes to the Independent Assessment Organisation, who will issue the result
- This component will be graded Pass/ Merit/ Distinction/ Fail. If an apprentice has to re-sit this component, the maximum grade they will achieve is a Pass/ Fail.

Skills Test Grading

- The Apprentices will be assessed against the criteria in the table below. They will need to meet all criteria at a minimum of a Pass in order to pass the assessment. Apprentices will be able to access merit and distinction grades reaching a particular number of points and reaching a grade boundary which is determined below.

Part 1: Preliminary activities				
Criteria	Marks Awarded			
	Fail	Pass	Merit	Distinction
Initial Design	0	1	2	3
Sketch	0	1	2	3
Identification of Materials Needed	0	1	2	3

Supporting Documentation (Risk Assessment, Method Statement)	0	1	2	3
Communicating Effectively	0	1	2	3
Part 2: Practical activities				
Criteria	Marks Awarded			
Time Taken	0	1	2	3
Efficient use of materials	0	1	2	3
Tolerance	0	1	4	6
Soundness Testing	0	1	4	6
Use of Bracketry	0	1	2	3
Use of Fittings and Components	0	1	2	3
Use of Tools	0	1	2	3
Working Safely	0	1	2	3
Working effectively and efficiently	0	1	2	3
Managing Tasks	0	1	2	3
Decommissioning	0	1	2	3
Grade Boundaries		16-27	28-37	38-54
Points allocated for overall apprenticeship grading		5	10	15
<ul style="list-style-type: none"> Merit builds on a demonstration of the Pass characteristics and distinction builds on both Pass and Merit. 				
Fail	Pass	Merit	Distinction	
<p>The apprentice has been unable to:</p> <ul style="list-style-type: none"> complete the task fully within the allocated time produce drawings of the fabrication they intend to install design a suitable system that meets the brief provided complete the installation, testing and draining of the pipework within the allocated time or to the expected standard use tools and pipework materials appropriately resulting in an unstable fabrication and damage to the working area and materials used 	<p>The apprentice has:</p> <ul style="list-style-type: none"> completed the task of planning and producing a fabrication of pipework that is tested and drained within the provided time frame produced a drawing which is labelled showing components selected suitable components for the fabrication that are to the brief that has been provided fixed the fabrication securely with suitable use of brackets produced a fabrication that passes a soundness test to industry standards produced a fabrication without damage to fittings 	<p>The apprentice must meet all Pass criteria and has:</p> <ul style="list-style-type: none"> completed the task without requesting further materials due to errors or miscalculations avoided damage to fittings and components, avoided tool marks and damage to building fabric and surfaces produced a fabrication with 70% of measurements within the defined tolerance (+/-2mm) plumb and level produced a drawing which is clearly labelled showing components in the correct position 	<p>The apprentice must meet all Pass and Merit criteria and has:</p> <ul style="list-style-type: none"> completed the task in at least 10% less than the time frame that is given completed the task without requesting further materials due to errors or miscalculations produced a fabrication with 80% of measurements within the defined tolerance (+/-2mm) plumb and level produced a fabrication which is water tight upon the first soundness test presented the work completed within the preliminary activities in a highly professional format 	

<ul style="list-style-type: none"> • ensure that 60% of measurements are within tolerance • demonstrate safe working practices and does not use the appropriate PPE throughout the task 	<p>and components and without tool marks present</p> <ul style="list-style-type: none"> • produced a fabrication with 60% of measurements within the defined tolerance (+/-2mm) plumb and level • worked safely in accordance with health and safety procedures • maintained a safe and clear working environment for the duration of the task 	<p>relative to the fabrication they intend to install with minimal feedback or recommendations</p>	<p>(technically accurate, grammatically correct, clear and logical structure)</p> <ul style="list-style-type: none"> • produced a drawing which is clearly labelled showing components in the correct position relative to the fabrication they intend to install without any feedback or recommendations
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Professional Discussion

Duration: 1 Hour

- The Professional Discussion will be conducted by the Independent Assessor who is appointed by the Independent Assessment Organisation. It will explore how the apprentice applied the knowledge, skills and behaviours in the workplace, using evidence from the apprentice's Record of Achievement as the basis. It will allow the apprentice to demonstrate they understand what they have done, how they approached it, what problems they faced and how they dealt with them and in particular how they communicated and applied their initiative
- The Professional Discussion will be conducted by the Independent Assessor at a mutually convenient venue. It may be conducted remotely using an internet video link by agreement with the Independent Assessor and the Apprentice

Record of Achievement

- The Record of Achievement presents a wide range of evidence allowing the apprentice to demonstrate they are able to meet the standard consistently from sources as follows:
 - witness testimony work activity descriptions and records (minimum of three)
 - self-assessments (minimum three)
 - employer reports (minimum of two)
- The completed record of achievement must be supplied to the Independent Assessor prior to the Professional Discussion
- The Record of Achievement must not include any evidence previously assessed within the on programme part of the apprenticeship
- The evidence provided must cover the items identified in Annex A
- The Assessment Organisation will provide guidance on Record of Achievement content and structure
- The Independent Assessor will confirm the currency, validity and coverage of the evidence presented in the apprentice's Record of Achievement and use it to formulate their questions exploring how the apprentice applied the skills, knowledge and behaviours of the Apprenticeship standard, as identified in Annex A, including the following:
 - Problem solving
 - Teamwork
 - Communication and working with others
 - Personal development

- Promoting business image
 - Management of site personnel/task allocation
 - Task management
 - Working independently and taking responsibility
 - Time management and attendance
- The Independent Assessment Organisation will provide Independent Assessors with a Professional Discussion brief to ensure standardisation. This brief will outline the headline topic areas which should lead the questions they are asking the apprentice, and how to ensure the apprentice is able to evidence knowledge, skills and behaviours identified in Annex A

Grading

- This assessment will be graded Pass/ Merit/ Distinction/ Fail. If an apprentice has to re-sit this component, the maximum grade they will achieve is a Pass/ Fail.

Professional Discussion Grading Characteristics

- Apprentices will need to demonstrate the following characteristics in order to meet the stated grades. Merit builds on demonstration of the Pass characteristics and distinction builds on both Pass and Merit.

Fail	Pass	Merit	Distinction
The apprentice is unable to provide sufficient documented evidence to meet the knowledge, skills and behaviours identified in Annex A	<p>The apprentice:</p> <ul style="list-style-type: none"> • provides documented evidence examples and explains them, demonstrating an accurate knowledge and ability to apply the skills and behaviours shown in Annex 1, to the range of systems and their installation requirements with particular emphasis on: <ul style="list-style-type: none"> - health and safety - compliance with company procedures - task management - promoting business image (personal presentation, punctuality, diligent and methodical approach to work aligned with company and industry values (i.e. working ethically)) • is able to answer questions accurately, but gives limited explanation or expansion when answering • is able to draw on limited examples of 	<p>The apprentice meets all the Pass characteristics. In addition the apprentice:</p> <ul style="list-style-type: none"> • provides documented evidence examples and explains them in sufficient detail to demonstrate a comprehensive knowledge and ability to apply skills and behaviours shown in Annex 1, with particular emphasis on: <ul style="list-style-type: none"> - communication and working with others - time management and attendance • is able to answer questions comprehensively and provide supporting explanations • is able to draw on a wide range of examples and experience to answer questions • consistently shows attention to detail 	<p>The apprentice meets all the merit characteristics. In addition the apprentice provides documented evidence examples and explains them in sufficient detail to demonstrate an exceptional knowledge and ability to apply skills and behaviours shown in Annex 1, with particular emphasis on:</p> <ul style="list-style-type: none"> - working independently and taking responsibility - Management of site personnel/task allocation - Problem solving <ul style="list-style-type: none"> • is able to provide expansive detailed answers to the questions • responses are considered and use an extensive range of examples and experiences from the workplace responses show in-depth understanding of the knowledge, skills and

	<p>their experience to answer questions</p> <ul style="list-style-type: none"> • understanding of knowledge, skills and behaviours detailed in Annex A is basic but accurate 		behaviours detailed in Annex A
Points allocated for overall apprenticeship grading	2	4	6

Delivery Requirements

Minimum requirements for Independent Assessors

- Independent Assessors must be occupationally competent and competent to assess. They must meet the following requirements:
 - occupational competence - people with at least five years post qualification experience within the industry should be able to demonstrate they have up to date, relevant, in-depth and broad experience through evidence of:
 - attainment of a heating and ventilating Craftsperson NVQ or SVQ level 3, Gold Engineering Services SKILLcard or equivalent demonstrable experience
 - performing recruitment, selection, supervision/management and performance review of Craftspersons
 - undertaking CPD each year, to confirm their technical knowledge and their understanding of how the listed behaviours apply within the Craftsperson occupation
 - competence to assess - must be working towards or have achieved a relevant recognised assessor qualification such as a Level 3 Certificate in Assessing Vocational Achievement and continue to practice to that standard. Assessors who hold earlier qualifications (D32 or D33 or A1 or TQFE/TQSE) should have CPD evidence to the most current standards.
- Independent Assessors will be recruited, trained, standardised and contracted by the Independent Assessment Organisation.

End Point – final judgement

- The Independent Assessment Organisation, advised by the Independent Assessor, makes the judgement on whether the apprentice has passed the End Point Assessment or not, this decision is based upon the Professional Discussion outcome and results from the knowledge test and skills test. The Independent Assessment Organisation will also provide the overall apprenticeship grading based on the apprentice's combined results from the Knowledge Test and Craftsperson Skills Test.
- The Independent Assessor will provide a report on the Professional Discussion and grading outcomes to the Independent Assessment Organisation who will issue the result to the apprentice, their employer and training provider.
- The Independent Assessment Organisation is responsible for allocating the overall apprenticeship grading and making the final decision on apprenticeship completion.

End Point - Grading

- **The apprentice must pass all of the End Point Assessment components in the prescribed order; knowledge test, craftsperson's skills test and Professional Discussion, before the apprenticeship can be achieved.**
- The grade will be awarded by the Independent Assessment Organisation using the points-based

system shown below on the condition that the apprentice has passed the Professional Discussion assessment

- The system allocates points which reflects which methods are considered to be most important. The Skills Test allocated most points, followed by the Knowledge Test and then the Professional Discussion
- The apprenticeship grade is established by aggregating the points achieved for each assessment method and matching it to the apprenticeship grade the total falls within

	Pass	Merit	Distinction
Knowledge Test	3	6	9
Skills Test	5	10	15
Professional Discussion	2	4	6

Apprenticeship grade	Pass	Merit	Distinction
Points Achieved	10-17	18-24	25-30

- The overall apprenticeship grades descriptions are given below:

Pass

- Demonstrates the ability to consistently apply skills, knowledge and behaviours as a craftsperson in the workplace to the industry standard particularly in the quality of work and problem solving areas; commitment and understanding of all theoretical work has been to industry standard requires minimum supervision with practical tasks

Merit

- Demonstrates the ability to consistently apply skills, knowledge and behaviours as a craftsperson in the workplace to a high standard, particularly in the quality of work, problem solving, communicating and reporting areas; shows potential for progression into a supervisory role; often works unsupervised on practical tasks which are completed to a good standard

Distinction

- Demonstrates outstanding ability to consistently apply skills, knowledge and behaviours in the workplace to an exceptional standard as a craftsperson, particularly in the quality of work, work planning and foresight, problem solving, communicating, reporting and applying initiative; shows innovation and is receptive to new concepts and ideas; not only works unsupervised on own practical tasks but finds time to help and assist others; shows potential for progression into supervisory, technical or managerial roles

Re-sits

- The maximum grade (and hence point allocation) for any component re-sit is a Pass. For this reason it is important that apprentices are not entered for the end assessment until the employer and training provider feel the apprentice is ready for the End Point Assessment

Independence

- Independence is provided to the Craftsperson apprenticeship by:
 - the multiple choice knowledge test being centrally set, maintained and marked by the Independent Assessment Organisation
 - the End Point Assessment being co-ordinated by the Independent Assessment Organisation
 - the Independent Assessment Organisation being responsible for the overall decision on apprenticeship completion
 - the End Point Assessment Professional Discussion being led by an Independent Assessor
 - the Independent Assessment Organisation being responsible for the grading of the apprenticeship

End Point Assessment – summary of roles and responsibilities

Assessor	Role
Apprentice's Employer	<ul style="list-style-type: none"> • Contributes to the assessment gateway by observing and authenticating the workplace evidence to substantiate that it is authentic and meets industry standards • Decides on the timing of and makes arrangements for the on programme and End Point Assessment, with the support of the training provider as required • Ensures the apprentice has the necessary documentation for End Point Assessment • Works with the training provider to agree remedial action required by the apprentice before re-sitting any unsuccessful component/s
Training Provider	<ul style="list-style-type: none"> • Delivers and assesses on-programme qualification and assessment. • Provides and manages assessors who are occupationally competent and qualified to assess • Manages the generation of workplace evidence working with the employer to plan and continuously monitor the apprentice's progress, address any gaps in learning or experience and to ensure the record of achievement is completed to a high standard for End Point Assessment • Supports the employer in deciding the timing of and arranging the End Point Assessment • Prepares the apprentice for end point assessment with training on the process • Supports the employer in agreeing remedial action required by the apprentice before re-sitting any unsuccessful component/s
Independent Assessors	<ul style="list-style-type: none"> • Bring an independent view as they have not been previously involved with the apprentice • Administer and mark the knowledge assessment • Conduct and assess the Professional Discussion • Inform the Independent Assessment Organisation of the overall grades and grade for each assessment method the apprentice has achieved in the End Point Assessment • Undertake observation, marking and scoring of the craftsperson skills test • Assess against marking criteria which will establish either a pass, merit or distinction grade against each component • Participates in at least two standardisation events per year which will be arranged by the assessment Organisation
Independent Assessment Organisation	<ul style="list-style-type: none"> • Makes final decision on apprentice's competence and grading of apprenticeship • Approves and maintains a network of venues that are approved to deliver the knowledge and skills test • Provides independent assessment of knowledge by centrally setting, maintaining and marking online multiple choice examinations • Provides and manages independent assessors to observe, mark and score craftsperson skills test and professional discussion • Provides and manages Independent Assessors to lead and conduct the Professional Discussion • Provides documentation, training and support for independent assessors to ensure rigour and consistency • Contributes to maintenance and implementation of the Building Services Engineering Craftsperson Assessment Plans
Quality Assurance – internal	
<ul style="list-style-type: none"> • Quality assurance of End Point Assessment is provided by the Independent Assessment Organisation who will: <ul style="list-style-type: none"> - Apply the criteria to become an approved assessment centre by using definitions provided in the assessment strategy of the staff, resources, processes and procedures required to undertake the knowledge and skills test invigilation 	

<ul style="list-style-type: none"> - provide and manage a network of Independent Assessors to undertake marking and scoring of the end point Craftsperson Skills Test - provide and manage a network of Independent Assessors to undertake the Professional Discussion - develop, manage and maintain online multiple choice examinations to test synoptic knowledge and basic health and safety assessment of Craftsperson apprentices • The Independent Assessment Organisation's independent verifiers will visit centres on at least one occasion per year to review the assessments made by training provider assessors. During these visits they will: <ul style="list-style-type: none"> - review operation of the multiple choice knowledge examinations - review operation of the Skills Tests • Multiple choice examinations will be formulated, reviewed and moderated by the Independent Assessment Organisation to meet a common assessment specification
Quality Assurance - external
<ul style="list-style-type: none"> • External quality assurance of the end point assessment for this apprenticeship standard will be managed by the Institute for Apprenticeships
Implementation
<p>Affordability:</p> <ul style="list-style-type: none"> • The percentage proportion of End Point Assessment against the overall cost of the apprenticeship is 16.4% • Costings for the end point assessment were arrived at by summarising the main end point assessment components and obtaining estimated costs for delivery from three aspirant providers. The process also took into consideration cost effectiveness in delivery of the assessment methods. • It is expected that assessment providers will run skills test sessions with up to four apprentices undertaking the skills test at any one time. This strikes the balance between cost effectiveness in the use of assessment personnel, space and equipment, while ensuring apprentices are effectively monitored and assessed. The professional discussion may be conducted remotely using an internet video link by agreement with the Independent Assessor and the Apprentice. This is intended to allow assessors to conduct professional discussions more efficiently in different geographical locations. • On demand multiple choice knowledge tests provide an effective and appropriate means of testing the apprentices knowledge and an efficient method of marking and grading the results.
<p>Consistency:</p> <ul style="list-style-type: none"> • Independent Assessment Organisations will provide documentation, training and support for independent assessors to ensure rigour and consistency • The Independent Assessors will attend at least two meetings per year, arranged and managed by the Independent Assessment Organisations. The purpose of these meetings will be: <ul style="list-style-type: none"> - to improve consistency and rigour in the approach and execution of their quality assurance responsibilities - to ensure that where any technical or assessment variation (or scope for variation) is identified, a standard interpretation is established and applied. • Independent Assessors will be provided with marking schemes for the craftsperson skills test. • The Independent Assessment Organisation will provide Independent Assessors with guidance on: <ul style="list-style-type: none"> - How to conduct the End Point Assessment Professional Discussion - Standardisation of approach and marking - Marking schemes - Schedules to record the outcomes
<p>Volumes:</p> <ul style="list-style-type: none"> • Based on previous apprenticeship patterns it is expected that there will be between 250 and 500 Craftsperson apprentices' enrolled each year <p>Capacity:</p> <ul style="list-style-type: none"> • There is currently a network of 15 providers delivering craftsperson apprenticeships throughout England for employers to choose from • These training providers are experienced in the delivery of training, administering assessments such as on-screen examinations and assessing portfolios within this occupation.

- They give varying levels of supports dependent on the needs of the employer
- They are also able to operate in a flexible way to meet the needs of larger businesses who normally have well developed training, mentoring and monitoring processes in place, but can also meet the needs of smaller businesses where more direct support is required to help structure work experience, provide mentoring and monitoring the apprentice's progress

Annex

- Annex A shows which method/s of assessment are used to cover each element of the Apprenticeship Standard

Annex A**Assessment Methods – Standard Coverage**

This chart provides an overview of what an apprentice can expect to be covered in each assessment method

Key to assessment method identification within tables:

- IEA** Independent End Assessment activity – identifies which assessment method will be used for that section of the standard
- T** Assessment will be through the on demand Knowledge Test
- S** Assessment will be through the Skills Test
- PD** Assessment will be through the Professional Discussion

Some sections of the standard are assessed by more than one method

Knowledge and Understanding		IEA		
		T	S	PD
Working Safely	Understand relevant safety legislation and safe working practices applying to themselves and others in building services engineering working environments	✓		
Working Sustainably	Understand scientific principles underpinning building services engineering industrial and commercial systems including measurement, force and pressure, heat and power, materials and electricity	✓		
	Understand environmental protection measures within building services engineering for effective use of material resources, minimising wastage, the legislation surrounding the effective use of energy, gas and water resources.	✓		
Planning and Preparing	Understand how to utilise resources effectively within building services engineering including the roles and responsibilities of relevant people, how to oversee work; how to produce risk assessments and method statements and how to plan work programmes for self and small teams installing industrial and commercial systems	✓		✓
	Understand the preparation requirements for work areas in new and existing building services engineering sites	✓		✓
Installing Pipework	Understand pipework fabrication and jointing techniques for industrial and commercial systems, including prefabricated and/or modularised components and distribution systems	✓		✓
	Understand the preparation, procedures, process, standards and codes of practice required to undertake welding of industrial and commercial systems pipework	✓		✓
Installing Systems	Understand the design principles, layout, and operating principles, installation, testing, pre-commissioning, commissioning and decommissioning techniques for new and existing industrial and commercial cold water systems, hot water systems, heating systems, chilled water systems, compressed air systems and steam systems	✓		✓
	Understand the principles and requirements of industrial and commercial gas, oil and solid fuel systems and mechanical sustainable energy systems	✓		✓

Skills		IEA		
		T	S	PD
Working Safely	Apply relevant safety legislation, codes of practice and safe working practices to self and others in building services engineering working environments		✓	✓
Planning, Preparing and Working Sustainably	Plan, organise and undertake the installation of industrial and commercial systems in ways which use resources effectively to complete work, with consideration for cost, quality, safety, security and environmental impact, within relevant legislative requirements, codes of practice and industry recognised practices		✓	✓
	Prepare work areas in new and existing sites to undertake building services engineering industrial and commercial systems installation		✓	✓
Installing Pipework	Apply pipework fabrication and jointing techniques for industrial and commercial systems, including prefabricated and/or modularised components and distribution systems and natural gas distribution pipework		✓	✓
Installing Systems	Apply installation, testing, pre-commissioning, commissioning and decommissioning techniques for industrial and commercial; cold water systems; hot water systems, heating systems, chilled water systems		✓	✓
Behaviours		IEA		
		T	S	PD
Communicating Effectively	Use oral, written and electronic methods to communicate technical and other information effectively with work colleagues, other tradespeople, clients representatives, supervisors, and other members of the building services engineering and wider construction team		✓	✓
Working Effectively and Efficiently	Work reliably and effectively without supervision, to the appropriate codes of practice and be aware of the needs and concerns of others, especially where related to diversity and equality.		✓	✓
	Solve problems within their own scope of responsibility, by applying technical and behavioural skills and knowledge to define the problem, identify, evaluate and select alternatives and implement solutions		✓	✓
Taking Responsibility	Accept responsibility for the work of self and others under their control			✓
Managing Tasks	Accept allocate and supervise technical and other tasks		✓	✓
Working with Others	Work effectively with colleagues, the public, other tradespeople, clients representatives, supervisors, and other members of the building services engineering and wider construction team		✓	✓
	Support the learning and development of others through activities such as mentoring, and sharing professional expertise and knowledge		✓	✓
Continuing Personal Development	Maintain and enhance competence in own area	✓		✓
Working Ethically	Exercise responsibilities in an ethical manner	✓	✓	✓