

PROJECT CONTROLS TECHNICIAN APPRENTICESHIP STANDARD

End-point assessment plan

Assessment plan: Project Controls Technician

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1. Summary of Assessment

This apprenticeship is for Project Controls Technicians. Typically job holders work in large project teams on complex projects in sectors such as construction, manufacturing, engineering, energy and infrastructure – where detailed progress /performance tracking, and an understanding of on-site hazards, health and safety requirements and compliance is critical. This hands-on role is crucial to ensuring the successful delivery of complex projects and a current shortage of skilled professionals provides the opportunity for a secure, fulfilling, long-term career.

Successful achievement of this Apprentice Standard enables the apprentice to take the next steps in their career as it demonstrates:

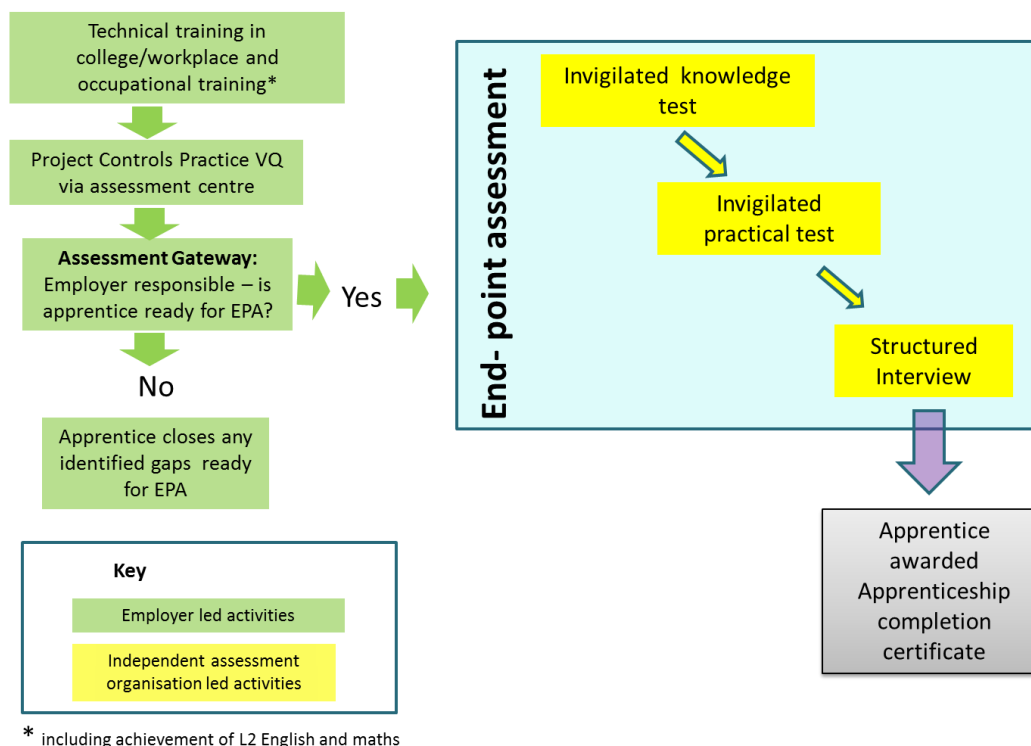
- that the apprentice is able to competently work as a project controls technician
- to the relevant professional organisation that they have the knowledge and skills suitable to be awarded EngTech Status (if they wish to apply for this and if they are a high performer with suitable engineering experience)
- to Universities (and similar level of institution) that a level of knowledge has been acquired which will enable the apprentice to access further education such as a foundation degree /degree (if they wish to do so).

The apprenticeship is expected to typically take 36 months to complete. It is recommended that the apprentice's progress is assessed throughout the apprenticeship to ensure the apprentice is progressing as required. A final gateway assessment will be undertaken by the Employer to assess that the apprentice has achieved the necessary level of technical project controls skills, knowledge and behaviours as well as related sector knowledge and is ready to be put forwards for the final End-point assessment (EPA).

There is a mandatory, synoptic EPA that typically takes place during 3 months before the expected end date of the apprenticeship. The aim of this is to comprehensively establish if the apprentice has achieved the technical skills, knowledge and behaviours listed in the Apprenticeship Standard (Annex 1). It comprises:

1. a theoretical, online, applied knowledge test using multiple choice questions
2. a written, practical test focused on assessing technical skills
3. a structured interview focused on assessing the apprentice's occupational behaviours and application of technical skills and knowledge.

Project Controls Technician apprenticeship overview



2. Assessment Overview

	Assessment method	Focus of assessment	Assessed by	Feedback
Final gateway review	Employer-led review and discussion	Skills Knowledge Behaviours Sector specific knowledge	Employer , achievement of Vocational Qualification in Project Controls Practice, and achievement of English and Maths Level 2 (if applicable)	Progress to End-point assessment (EPA) Resubmit

	Assessment method	Focus of assessment	Assessed by	Grading	Weighting
End-point assessment	Knowledge Assessment	Technical knowledge detailed in the Standard (Annex 1)	Assessment Organisation**	Fail Pass Merit Distinction	25%
	Practical test	Technical Skills detailed in the Standard Application of knowledge Application of behaviours	Assessment Organisation**	Fail Pass Merit Distinction	50%
	Structured interview	Skills Knowledge Behaviours	Assessment Organisation panel ** (optional employer representative)	Fail Pass Merit Distinction	25%

**Assessment Organisations (AOs) must meet the criteria set by the Skills Funding Agency's (SFA) for entry onto their Register of Approved Assessment Organisations (RoAAO) and the requirements set out in Annex 2
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2.1 On programme assessment (recommended approach)

The purpose of the on-programme assessment is to ensure that the apprentice is developing and progressing and provides a framework within which the apprentice is supported by the Employer for whom they work. It is recommended that each apprentice has regular reviews in accordance with each individual Employer's performance review scheme. It is recommended that the Employer ensures the apprentice's technical knowledge and skills are developing and reviews and records examples of the apprentice demonstrating the behaviours highlighted in the Standard. Good practice recommends quarterly reviews.

Achievement of the vocational qualification in Project Controls Practice is a mandatory pre-requisite for the apprentice taking the EPA. This includes development of a portfolio of work that the apprentice will also be able to use as a source of evidence for application for EngTech registration (plus suitable engineering related experience). For more details on evidence required for EngTech readiness refer to the relevant professional body and the Engineering Council website (see section 7.2. and <https://www.engc.org.uk/>).

In order for the apprentice to gain the level of specialist knowledge of technical, engineering and mathematical principles required by the Employer there is a mixture of external training, internal training and on-the-job learning, some leading to qualifications in relevant engineering and construction subjects that the apprentice may be required to study (Annex 3).

2.2 Assessment gateway

Once the apprentice has completed their technical and occupational training, achieved Level 2 English and maths and a vocational qualification (VQ) at level 3 in Project Controls Practice, then the Employer will undertake a Gateway Review. This is to ensure that the apprentice has made significant progress in terms of knowledge, skills and behavioural (KSB) development, is able to successfully demonstrate their ability to work as a Project Controls Technician and is therefore ready for this synoptic EPA.

The Employer has overall responsibility for this Assessment gateway review and may wish to seek feedback from training providers and VQ assessors. Successful achievement of the level 3 VQ in Project Controls Practice provides the Employer with evidence that the Apprentice has developed the knowledge and skills necessary to successfully pass the EPA. In order for the Employer to be confident that the Apprentice has gained the behaviours detailed in the Standard it is recommended that the Apprentice provides the Employer with a report that evidences when he or she has demonstrated these behaviours (especially team work).

Following the Employer Gateway review the apprentice will either progress to the EPA or be given feedback which will identify what additional progress needs to be made.

2.4 End-point assessment

2.4.1 What is being assessed?

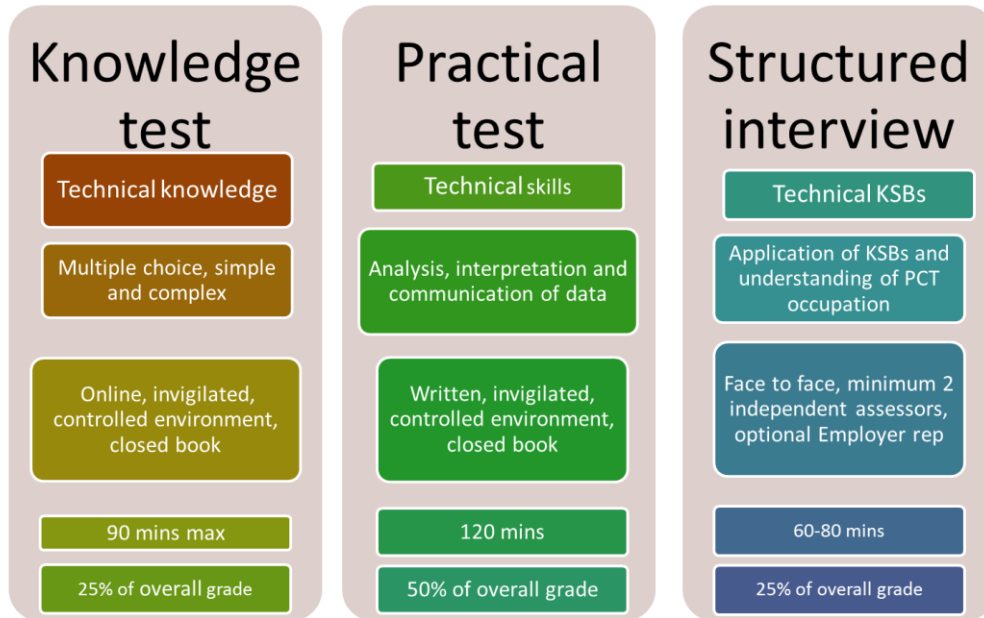
This synoptic EPA assesses the apprentice's ability to apply the knowledge, skills and behaviours learnt as detailed in the Standard (see Annex 1). All EPAs must be carried out by, and administered in accordance with an Assessment Organisation (AO, sections 4 and 5) from the Register of Approved Assessment Organisations (RoAAO). The AO is expected to develop the assessment tools, materials and marking guides for delivery of the EPA, these must be in line with the Standard and requirements set out in section 3.3 and section 5.

The EPA utilises the following assessment tools: knowledge test; practical exercise; and structured interview. A candidate must pass all components in the correct sequence of this synoptic EPA in order to achieve the Apprenticeship. If the apprentice fails a component then he/she should undertake further training before retaking. The number of retakes allowed should be agreed between the Employer and the AO, a maximum number of 2 retakes is recommended. The online applied knowledge test must be passed first before the apprentice progresses because this is fundamental to the apprentice being able to competently work as a project controls technician. The components are in this order because it is important that the Interview panel

are able to assess the apprentice's overall performance and discuss any KSBs the apprentice may have failed to demonstrate in other components of the EPA.

Successful achievement of the EPA will lead to final certification of the apprenticeship and demonstrate that the apprentice is able to competently undertake the occupation of Project Controls Technician.

End-point assessment



2.4.2 Knowledge test

This provides each apprentice with an opportunity to demonstrate the knowledge and understanding required. The apprentice takes an online knowledge test in a controlled and invigilated environment. This could be at the Employer's premises. The invigilator must meet the requirements of the AO chosen by the Employer (Annex 2) and could be someone from the Employer. It is a closed book test with no supporting documents allowed. The apprentice must pass this element of the EPA in order to move onto the practical test. It is expected that the test is taken and marked by an online system.

The online knowledge test assesses the apprentice's ability to apply his or her knowledge and should include both simple multiple choice (approx. 45 minutes and 50 questions) and complex multiple choice based on project scenarios (recommend 1 scenario with 10 complex multiple-choice questions and 45 minutes). This test should include questions on the application of the following knowledge:

- fundamentals of project controls
- interpretation of technical information for project controls
- estimating practice terms and key techniques
- planning and scheduling terms and key techniques
- cost engineering terms and key techniques
- work breakdown and coding structures – creation, interpretation and flexibility
- tracking data and progress reporting
- analysis techniques – earned value analysis, critical path analysis and risk analysis
- typical company management systems, policies and procedures (the principles of, as appropriate) including:
 - organisational and project structures
 - quality management systems and related procedures
 - change control procedures
 - data management and security
 - configuration management

- version control
- confidentiality of data
- risk analysis and management
- commercial matters: how they impact project controls, the basics of contract, contract terms and supply chain management
- the principles of project controls related software and IT systems related to the identification of inaccuracies or discrepancies in data and methods of data validation and verification
 - limitations of software
 - data flows and paths
 - sources of data

Some elements of technical knowledge are not covered by the knowledge test and these will be assessed as part of the structured interview:

- importance of safety (also assessed in the practical test)
- sector specific knowledge e.g. construction and engineering based
- Employer specific procedures, processes and systems.

2.4.3 Practical test

It is critical that the apprentice is able to demonstrate that they can apply their technical skills; technical knowledge and related behaviours with minimal supervision and the Employer must have confidence in the apprentice's ability to undertake technical data analysis, pay attention to detail and identify potential issues and to communicate this information appropriately. This test will take place in a controlled, invigilated environment. This could be at the Employer's premises. The invigilator must meet the requirements of the AO chosen by the Employer (Annex 2) and could be someone from the Employer. It will be a written, paper-based test with no supporting documentation allowed. It will take no more than 120 mins. This practical test:

- must be designed to test the apprentice's ability to take raw data, review it, analyse it, interpret it, identify issues and assumptions, and communicate it appropriately
- must be based on real-world scenarios
- is seen for the first time on the day of the actual test
- will include a workbook with tables, some of which are partly pre-populated
- this test focuses on the following technical skills and behaviours detailed in the Apprentice Standard (Annex 1) (it will also test the application of the apprentice's project controls knowledge):
 - develop work breakdown and coding structures
 - manage data
 - estimate
 - schedule and plan
 - cost engineer and control
 - monitor progress/performance and analyse data
 - forecast
 - problem solve
 - effective communication – via effective presentation of the data within this test
 - risk management
 - project closeout – lessons learned
 - an element of
 - safety considerations
 - ethical and duty of care considerations
 - behaviours
 - attention to detail, with an enquiring mind
 - applies and upholds principles of social responsibility, environmental sustainability, equality and diversity.

2.4.4 Structured interview

The structured interview takes place after successful completion of the knowledge test and practical test. It could take place at the Employer's premises, as long as the interview room meets the requirements of the AO.

This means that the interview can be used to discuss and question the apprentice on any specific areas that he or she may have failed to demonstrate through the earlier assessments.

The interview is Chaired and led by an independent assessor from the AO, plus a minimum of two others (i.e. a panel of 3), of which at least one must be an independent assessor (see Annex 2), the other should either be from the AO or the Employer (this is optional), this representative must NOT be the Apprentice's line manager and has no influence on the assessment. The Chair determines the final decision on the scores awarded.

The structured interview will focus on assessing the Apprentice's application of knowledge, skills, behaviours and attitude (see Annex 1). The structured interview should take 60-80 mins and will work as follows:

- the apprentice can prepare in advance by reviewing the Apprenticeship Standard
- the apprentice should expect to discuss evidence of his/her work so the interview panel can ascertain the apprentice's role in completing work, how effectively he/she works with others, his/her attitude to change and how he/she deals with issues and challenges to overcome barriers in the workplace
- it will enable the apprentice to showcase how he/she combines technical skills, knowledge and behaviours in order to carry out his/her occupational role effectively
- it will assess the following KSBs as detailed in the Apprenticeship Standard (Annex 1):
 - technical information: evidence of when they have reviewed and interpreted technical information from different sources specific to the context in which they work
 - technical, engineering and mathematical principles: how the apprentice has applied them to support effective project controls within the context of their role
 - application of Employer organisation, management systems, policies and procedures
 - problem solving and analytical ability
 - project controls related software and IT systems and using computer based technology
 - input to project close-out
 - observe and apply professional ethics
 - apply safety in the context of the role and have knowledge of health, safety and environmental requirements and related company policies and procedures at all times
 - strong work ethic, takes personal responsibility for own work, meets deadlines, sets the right example for others and displays honesty and integrity
 - team player that shows sensitivity to others and works collaboratively demonstrating an openness to others' ideas and input
 - positive attitude, constructive thinking and able to adjust to change
 - attention to detail, with an enquiring mind, not afraid to ask questions, seek assistance or challenge
 - committed to advancing own learning and competence, showing a willingness to learn new skills
 - applies and upholds principles of social responsibility, environmental sustainability, equality and diversity.
- an evaluation sheet will be completed for the apprentice by each member of the interview panel
- on completion of the interview, the panel will review their scores and agree a final score for the structured interview
- where a score is borderline between fail, pass, merit or distinction, or where panel members have conflicting views, the Chair (from the AO) makes the final decision.

3. End-point: final judgement, grading and consistency

3.1 Final judgement

The AO moderates, validates and verifies the assessments and the grades awarded by different assessors to ensure that these are fair, consistent and comparable.

The decision on the overall grade awarded to the apprentice is made by the AO. On completion of the EPA the AO reviews the scores from each of the 4 components and awards a fail, pass, merit or distinction to the

apprentice. Employers will not be required to make any grading judgement. In the event of an appeal against the grade awarded, the Assessment Organisation will operate an appeals' procedure.

It is expected that the following types of organisations will be on the RoAAO: Professional bodies; Large employers; Training organisations and Awarding Bodies.

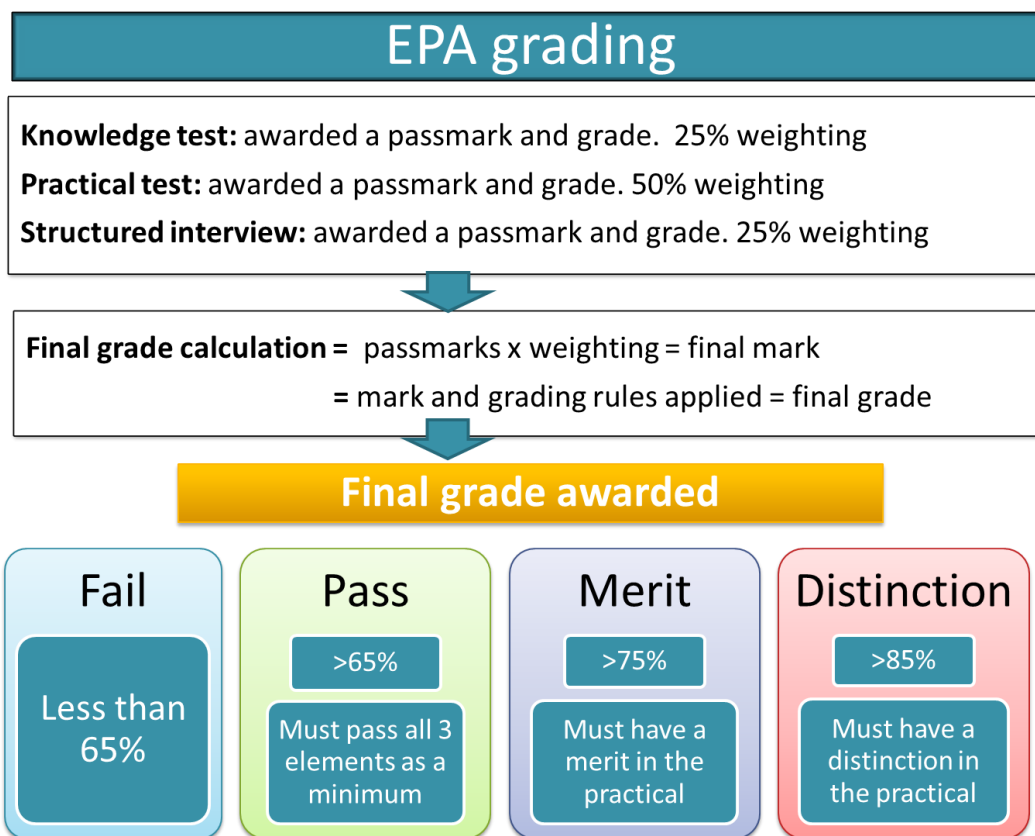
3.2 Grading of EPA

AOs are required to develop an appropriate assessment model to support consistent, valid and reliable assessment decisions. The marking criteria and exemplars for assessing fail, pass, merit or distinction are a key part of this and will be developed by AOs working in partnership with Employers. Each element of the EPA is individually marked and awarded a grade in accordance with the marks gained. The marking scheme should reflect the following:

Descriptor	Mark	Grade
The apprentice has failed to demonstrate the expected level of KSBs.	Less than 65%	Fail
Demonstrates the ability to consistently apply skills, knowledge and behaviours as a Project Controls Technician in the workplace at the core level set out in the apprenticeship standard. Particularly in the quality of work and data analysis and interpretation. Commitment and understanding of all theoretical work is to industry standard. Requires minimum supervision with practical tasks.	65% -74%	Pass
Demonstrates the ability to consistently apply skills, knowledge and behaviours as a Project Controls Technician in the workplace to a high standard. Demonstrates a very good level of accuracy in data interpretation, generally selects the appropriate analysis techniques, demonstrates a good knowledge of project controls disciplines with an understanding of how this impacts across project progress. Demonstrates a good quality of work, generally able to problem solving with good communication and reporting skills. Often works unsupervised on practical tasks which are completed to a good standard.	75% - 84%	Merit
Demonstrates outstanding ability to consistently apply skills, knowledge and behaviours in the workplace to an exceptional standard as a Project Controls Technician. Demonstrates excellent levels of accuracy in data interpretation, consistently selects appropriate techniques to analyse data, demonstrates breadth and depth of knowledge across all project controls disciplines and an excellent grasp of how these impact on project progress in order to problem solve. Excellent quality of work demonstrating excellent communication skills, team working, succinct and accurate reporting and applying initiative. Works unsupervised on own practical tasks and finds time to help and assist others. Shows potential for progression into higher level technical roles.	85% and above	Distinction

To obtain the final grade the mark awarded to each element is multiplied by the weighting to create a final mark mathematically. Then grading rules are applied, as detailed in the diagram below to award a final fail, pass, merit or distinction.

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3.3 Consistency

To ensure consistency between different AOs, they are expected to work with Employers to develop the EPA tools that assess the KSBs included in the Apprentice Standard in a way that:

- is specified in the standard
- meets the occupational needs as detailed in the National Occupational Standards for Project Controls, estimating, planning and cost engineering (against which the Standard has been reviewed).**

** there are National Occupational Standards (NOS) that detail the practical ability and knowledge required of a Project Controls Technician. These are owned by the Crown, are independent and have been developed by Employers for Employers.

Assessment Organisations must ensure that all assessment methods are designed to produce assessment outcomes that are consistent and reliable, allowing fair and proper comparison between apprentices employed in different types and sizes of organisation. In order to ensure consistency in assessment and marking the AOs must: develop and use marking guidance and templates for each element of the EPA; train their independent assessors in using these marking templates; ensure the independent assessors are using the marking templates and schemes in accordance with the guidelines set and in a consistent manner.

Components of EPA	Ensuring consistency in marking
Knowledge test	These will be mostly binary yes/no correct answers which it is expected the online test system will mark. A marking guide should be created for the more complex multiple-choice questions, if necessary but, if possible, these should also have correct answers with automatic marking applied.
Practical test	A marking guide should be created, outlining what is expected and setting parameters for how many marks to give for what.
Structured interview	An evaluation sheet should be provided that sets out questions to ask and each member of the interview panel should annotate a copy of this to indicate what skills and behaviours have been evidenced. This must include guidance on what evidence is needed in relation to marks awarded to the apprentice. The evaluation sheets should be compared and discussed by the members of the

interview panel to award a final mark for the interview.
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4. Independence

The EPA will be undertaken by independent assessors who are employed by AOs that have been approved on RoAAO. All Employers large and small will have access to the organisations on the RoAAO and those on the RoAAO must offer EPA that small companies are able to access.

Organisations that can provide the EPA will meet the requirements set out in Annex 2, and the independent assessors that they use will have no relationship with the apprentice i.e. they will not have been involved in their training, assessment or job role at any previous point in the apprenticeship. They will be impartial.

5. EPA: summary of roles and responsibilities

Organisation	Role
Employer	<ul style="list-style-type: none"> • Supports the Apprentice throughout the apprenticeship, sets expectations, provides on-programme training, feedback, coaching and mentoring to ensure the apprentice develops the technical KSBs needed to achieve the EPA • Develops training programme for the apprentice(s) • Tenders for and appoints the training provider • Tenders for and selects an AO from the RoAAO • Supports the apprentice to apply for Professional Body status (and EngTech), as appropriate) • Can provide controlled environments and /or invigilators for components of the EPA, as long as these meet the needs of the AO
Awarding Body	<ul style="list-style-type: none"> • Assesses the apprentice's progress in the development and application of work-based competence as an integral part of the VQ process • Confirms that the mandatory Project Controls Practice VQ has been achieved. • Work with Employers to ensure the mandatory qualification continues to meet their needs (at appropriate review interval)
Other i.e. Employer-led support body	<ul style="list-style-type: none"> • Supports Employer (s) to identify, appoint and mentor apprentices • Supports Employer in identifying and negotiating with training providers • Works with Employer to develop and review training products and services • Supports Employer in assessing the apprentice(s) especially at the Gateway • Works with Employer(s) to ensure the AO's EPA assessment tools meet the Employers' and Apprentice Standard requirements
Training provider(s)	<ul style="list-style-type: none"> • Provides on-programme training in project controls, safety and sector knowledge and skills • Develops training programmes that meet and deliver the KSB requirements set by the Employer and the Apprentice Standard • Reviews the apprentice's technical KSB development and provides feedback to the apprentice and Employer throughout the training, as appropriate
Independent Assessment organisation	<ul style="list-style-type: none"> • End point assessment tools and materials: <ul style="list-style-type: none"> ○ develops the tools and materials to deliver the EPA ○ has expertise in developing training, tests and assessments ○ works with employers to approve the assessment materials and grading model ○ develops marking guides to ensure consistency in marking different apprentices by different assessors ○ runs assessment training and refresher workshops to ensure consistent application of the marking and grading structure by the independent assessors ○ has in place a process to review and quality check the application of the marking and grading structure by the independent assessors used

	<ul style="list-style-type: none"> • Capability and governance: <ul style="list-style-type: none"> ○ has current technical and sector knowledge and understanding and have credibility with employers ○ has robust governance, including leadership and management arrangements ○ develop and manage a complaints and appeals procedure ○ attends assessment organisation meetings and meets requirements as set out by the External quality organisation • Delivery of the EPA <ul style="list-style-type: none"> ○ provides access to an assessment infrastructure with an appropriate geographical coverage ○ provides the location and equipment necessary for each element of the assessment (location and equipment may be provided by the Employer) ○ ensures the location and access to equipment for each element of the EPA meets the requirements set out in this plan ○ provide pre-notification of EPA dates (exact details to be agreed with the Employer when contracted) ○ is able to verify the candidates' identities ○ ensure the tests take place in a controlled environment without distractions ○ invigilates, manages, delivers, marks and reports on all components of the EPA ○ awards the final grade to the apprentice (notifies the apprentice and the Employer) ○ keeps a record of the apprentice, Employer, grade and date of award ○ has an appeals procedure.
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6. Quality assurance

6.1 Internal quality assurance

Quality assurance of the EPA will be undertaken through the AO meeting the following requirements:

1. the capability to identify, quality assure and use independent assessors that meet the requirements detailed in Annex 2
2. has an internal quality management system and quality control procedures
3. develops and provides a marking and grading structure and related guidance which enables standardisation and consistency in marking for all components of the EPA and the attainment of a pass, merit and distinction
4. provides training for independent assessors on the EPA, applying the grading and how to report and communicate the final grading decisions
5. holds regular standardisation events for independent assessors to ensure consistent application of the marking and grading assessment guidance
6. ensures AO staff and assessors are trained in assessment and moderation processes and undertake regular continuing professional development
7. commits to resource annual standardisation meetings including, but not limited to, collaboration with other AOs and sector experts.

6.2 External quality assurance

The Institute for Apprenticeships will carry out external quality assurance for this standard.

7. Implementation

Affordability	<ul style="list-style-type: none"> • The group of Employers has considered costs and the most appropriate form of assessment in great detail. A key driver for our assessment model has been to ensure our approach is consistent and directly linked to our Standard. Our assessment process is robust, and will ensure the best use of management time. The costs and practicality of assessments have been important considerations in the development of this approach, as at this stage we do not anticipate high numbers. This has resulted in an approach which will be easy to manage and affordable by all firms regardless of their size, the specific number of apprenticeships or their geographical location. • It is possible to keep costs low by: a) an Employer providing the controlled and/or invigilated environments for components of the EPA and b) apprentices taking more than one component in one day. • It is anticipated that the EPA will be about 10-20 % of the overall apprenticeship cost.
Professional body recognition	<ul style="list-style-type: none"> • This Apprenticeship Standard and Assessment plan has been reviewed by the Association of Cost Engineers (ACostE), as the main professional body. On completion of the Apprenticeship the apprentice will be able to apply for graduate membership of the ACostE. • The Standard has also been reviewed against the UK Spec set by the Engineering Council to ensure it meets their requirements. High performing apprentices who have gained engineering work-related experience can choose to apply for EngTech status via a professional body (e.g. ACostE) • Following completion of the apprenticeship, and with further training, individuals may choose to specialise in specific sectors or related roles which could lead to membership of professional bodies such as: Royal Institution of Chartered Surveyors (RICS); Institute of Chartered Engineering Surveyors (ICES); Chartered Institute of Building (CIOB); and Association for Project Management (APM). • The Apprentice should verify the requirements of the specific professional body that he/she is considering applying to as these are subject to change.
Volumes	<ul style="list-style-type: none"> • Anticipated volumes for 2017/18 starts are: 50+ • This is subject to positive economic conditions and the go-ahead for major UK projects in infrastructure, energy and construction.

Annex 1 Apprenticeship Standard: Project Controls Technician

1. Occupation(s)

A Project Controls Technician controls, monitors and systematically analyses progress and performance data on engineering, manufacturing, construction and infrastructure projects. They require strong analytical skills and a practical approach to interpret technical information. They use specific, complex software tools to undertake a wide range of project controls tasks, including: identifying the right data for scrutinising progress; setting baseline targets; tracking progress and performance; forecasting trends; identifying, modelling and anticipating deviations from baseline; assessing the impact of design/construction changes; and using insight to recommend early preventative and remedial actions.

Project Controls includes the technical disciplines of estimating, planning, scheduling and cost engineering for which this apprenticeship gives a comprehensive grounding leading to roles such as project controller, estimator, planner, scheduler and cost engineer. Typically job holders work in large project teams on complex projects in sectors such as construction, manufacturing, engineering, energy and infrastructure – where detailed progress /performance tracking, and an understanding of on-site hazards, health and safety requirements and compliance is critical. This hands-on role is crucial to ensuring the successful delivery of complex projects and a shortage of skilled professionals provides opportunities for a secure, fulfilling long-term career.

2. **Progression:** With additional training the Project Controls Technician could also progress to more specialist roles in areas such as project controls, planning, scheduling, estimating, cost control, risk and quality and ultimately a role as project controls manager or director.
3. **Suggested Entry Requirements:** Set by individual employers, entry requirements will typically include a minimum of 5 GCSE grades A* - C (or equivalent qualifications) including mathematics; English (Language).
4. **Technical knowledge** - the Project Controls Technician requires an understanding of:
 - **Project controls:** the project life-cycle, breakdown structures, the relationship between time and cost, quality and risk, how project controls is critical to successful project delivery
 - **Technical information:** how to review and interpret technical information from different sources e.g. engineering drawings, manufacturing plans or construction plans to develop the scope for control
 - **Estimating practice:** classes of estimate, how to interpret technical requirements and specifications to develop the estimate, techniques for estimate development such as parametric, analogous, bottom-up.
 - **Planning and scheduling practice:** difference between planning and scheduling, key terms and processes used to produce control schedules, how to interpret the technical requirements to produce a workable control schedule including development of logic networks, dependencies, critical paths, resource management, levelling and smoothing and impact of uncertainty and risk
 - **Cost engineering practice:** key terms and processes related to preparing control budgets, cash flow, cost control and cost engineering relationships
 - **Work breakdown and coding structures:** their purpose, how to create, use and interpret them to enable accurate control and the need for flexibility
 - **Tracking data and progress reporting:** collection, validation and monitoring of data against plan, reviewing accuracy of reporting, how to tailor the presentation of data for understanding and buy-in
 - **Analysis techniques:** how to identify trends and variances using techniques such as earned value analysis, forecasting, critical path analysis and risk analysis
 - **Technical, engineering and mathematical principles:** what these are and how to apply them to support effective project controls within the context of the role
 - **Importance of safety:** relevant engineering, construction and infrastructure specific knowledge including related national and industrial health, safety and environmental standards and legislation
 - **Employer organisation, management systems, and procedures:** related governance including quality, change control, data management and security, configuration management, version control, risk analysis and management, and document control
 - **Commercial matters:** how they impact on the role, the basics of contract and supply chain management
 - **Project controls related software and IT systems:** attributes, limitations and systems used, in-house and proprietary applications used for: planning and scheduling, cost and risk analysis, estimating and progress and performance monitoring.

5. Technical skills - the Project Controls Technician is able to:

- **Develop work breakdown and coding structures** to meet the scope laid out in the projects' technical information and specification, ensuring that the controls will monitor project progress and performance accurately
- **Manage data:** source, retrieve, check, edit, format, record and analyse data – using it to create relevant time, cost and resource reports
- **Estimate:** develop cost estimates for defined scopes of work, create appropriate benchmarks, analyse quotes from sub-contractors and suppliers, and input to tenders and the early stages of projects
- **Schedule and plan:** break down the scope into activities to create a logical linked control schedule to input to the development of outline and integrated plans and baseline schedules; identify critical milestones; gather accurate progress data for controlling the schedule; and monitor progress
- **Cost engineer and control:** prepare control budgets, carry out cost control activities, gather and interpret cost data, monitor progress on a regular basis, interpret trends and forecasts; keep in line with contractual requirements, maintain baselines; ensure accurate reporting and control
- **Monitor progress/performance and analyse data:** associated with milestones, schedules, progress, manpower, resource and costs; undertake earned value analysis, create progress reports and identify variances from plan and likely consequences if no corrective action is taken
- **Use computer based technology:** model potential trends and resource use etc. using the right software package for the right task
- **Problem solve:** recommend early corrective actions to reduce variances, identify issues and risks, present and maintain related action plans and contingencies
- **Effectively communicate:** with good interpersonal skills and share the right information with the right people in an appropriate format to enable effective project control
- **Input to project closeout:** generate key benchmarks and outturns including lessons learnt
- **Observe and apply professional ethics,** and maintain a duty of care
- **Apply safety in the context of the role:** comply with relevant national and international health, safety and environmental requirements
- **Work in accordance with company management systems, policies and procedures:** especially those relating to quality, data security, risk, change and document management.

6. Behaviours

- Strong work ethic, takes personal responsibility for own work, meets deadlines, sets the right example for others and displays honesty and integrity
- Team player that shows sensitivity to others and works collaboratively demonstrating an openness to others' ideas and input
- Positive attitude, constructive thinking and able to adjust to change
- Attention to detail, with an enquiring mind, not afraid to ask questions, seek assistance or challenge
- Committed to advancing own learning and competence, showing a willingness to learn new skills
- Applies and upholds principles of social responsibility, environmental sustainability, equality and diversity.

7. Duration: The duration of this apprenticeship is typically 36-42 months.

8. Qualifications: Prior to taking the EPA candidates must achieve level 2 English and maths and must attain a Level 3 Diploma in project control practice.

9. Level and Professional registration: This is a level 3 apprenticeship. On completion the apprentice will be eligible to apply for membership of the Association of Cost Engineers (ACostE) as a Graduate Member and will also be eligible to apply for registration as an Engineering Technician (EngTech), subject to having suitable engineering experience and undergoing a professional review process.

With further training following on from the apprenticeship, individuals may choose to specialise in specific sectors or related roles which could lead to membership of other related professional bodies.

10. Review date: This apprentice standard will be reviewed in 3 years.

Annex 2 Requirements for Independent Assessment Organisation and their Independent Assessors

Independent Assessment Organisations (AOs) must be on the Register of Approved Assessment Organisations register. The AO must maintain a register of independent assessors for the EPA and commit to ensuring that the independent assessors are competent to deliver the role they provide in the EPA. The assessors must receive training to ensure they assess the apprentices against the requirements of the Apprentice Standard in a consistent manner.

The following recommendations are made as a basis for the selection of those suitable to be invigilators for the knowledge test and practical test:

- be independent from the Apprentice they are assessing i.e. not their trainer or line manager
- have integrity

The following recommendations are made as a basis for the selection of suitable independent assessors for the structured interview:

- be independent from the Apprentice they are assessing , the Employer company and not their trainer or line manager
- have integrity
- have relevant experience in teaching/training/assessing /interviewing
- have good interpersonal skills
- have effective communication skills
- have a thorough practical knowledge of what constitutes effective performance and good working practices in the occupational context
- are technically knowledgeable in project controls, ideally with an appropriate technical qualification, relevant Vocational Qualification or industry accepted equivalent discipline qualification or equivalent technical experience
- ideally have relevant professional body membership.

Annex 3 Recommended on-programme qualifications

Below is a table that includes qualifications that an Employer may choose to use. It should be noted that there are other qualifications and that other suitable qualifications may be developed and made available in the next few years.

	Qualification name
Technical knowledge	BTEC Level 3 Diploma in Operations & Maintenance Engineering
Technical knowledge	BTEC Level 3 Diploma in Construction and the Built Environment
Technical knowledge	BTEC Level 3 Diploma in Engineering
Technical knowledge	ECITB Certificate in Project Controls

If the Employer decides the apprentice(s) is to study a qualification it may be possible to work with a training provider to tailor the qualification to meet any specific sector and/or other needs. The decision on qualifications used should be based upon such factors as:

- the apprentice's prior learning
- the anticipated role of the apprentice within the company
- associated activities the employer requires the apprentice to undertake during the on-the-job learning
- the career aspirations of the apprentice
- an assessment of the academic qualifications achieved by the apprentice prior to undertaking the apprenticeship to determine if the apprentice will have the ability to achieve a more academically demanding technical knowledge qualification
- the preferred learning style of the apprentice
- custom and practice within the Sector, including any legislative requirements.

