



# QUALIFICATION SPECIFICATION

**ECITB Diploma in Engineering Construction Design and  
Draughting at SCQF Level 6**

**SQA Accreditation group award number: R831 04**

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# 1. Introduction

## Objective and overview

The Engineering Construction Industry Training Board (ECITB) is the employer-led skills, standards, and qualifications body for the development of the engineering construction workforce of Great Britain. An arms-length body of the UK Government, the ECITB reports directly to the Department for Education.

The ECITB Awarding Body for accredited engineering construction qualifications is part of the industry training board. Our qualifications certify knowledge and competence across craft and technical disciplines. They improve quality and standards for the industry, helping engineering construction companies to stay competitive.

This document is for use by Approved Centres and their assessment teams. It is also used by ECITB's External Quality Assurers. It may also be of interest to employers and training providers.

The ECITB Diploma in Installing Engineering Construction Design and Draughting at SCQF Level 6 is a work-based qualification based on the National Occupational Standards (NOS) for the Engineering Construction industry. The qualification comprises both knowledge and competence. NOS are developed by employers and professional bodies in conjunction with the ECITB Standard Setting Organisation and describe what employers mean by occupational competence within a particular job role.

The objectives of this qualification are to:

- Prepare candidates for employment in design and draughting in the engineering construction industry.
- Support candidates working in design and draughting in the engineering construction industry.
- Enable candidates to progress to higher levels, including opportunities to move to supervisory and managerial roles.

## Engineering design and draughting technicians

Engineering design and draughting technicians produce designs and drawings for structures, piping, electrical systems, control and instrumentation systems and mechanical components used in industrial and commercial construction. Typically, jobholders work in a wide range of industries of national importance including power generation, infrastructure (water, road, rail), petrochemical, oil and gas, steel, food and drink processing and manufacturing (aerospace, maritime, vehicle).

Jobholders are based at office locations within project design teams and occasionally work at on-site locations. They are required to understand on-site hazards and health and safety requirements and consider them in their designs.

Design and draughting plays an important part in driving forward innovation in engineering and it is important that jobholders continually learn and keep up to date with changes and innovations in materials, technology and software, and are able to think innovatively and communicate effectively.

The jobholder must: understand technical drawings and specifications and be able to create their own; identify factors likely to affect design decisions; consider health, safety and environmental implications when evaluating design options; produce CAD (computer aided design) models and engineering drawings and; communicate design information to internal and external parties. Engineering design and draughting technicians will begin by making minor amendments to existing drawings or designs and will be expected to take on increasingly complex tasks as their knowledge and experience increases. They will be required to develop design options as solutions to engineering problems, evaluate the

options and recommend the most effective solution as well as producing the drawing/model.

Engineering design and draughting technicians are overseen by an Engineering Design Manager. They are responsible for the quality of their own work, possibly that of others, and should be able to check and correct drawings, following procedures and completing essential documentation at all times. They work on various types of plant and systems depending on their company sector and typically specialise in one of the following: electrical, instrumentation and control, mechanical, piping or civil/structural.

### Entry requirements

There are no mandatory entry requirements for this qualification. The qualification is open to any candidate who the Approved Centre believes can reach the assessment requirements set out within this document. A candidate must have a sound grasp of the English language and mathematics to be able to follow instructions as well as complete the learning and assessment required for this qualification. The Approved Centre will work with prospective candidates and, where appropriate, employers, to determine a candidate's suitability for the qualification.

### Language

This qualification is available in English only. For candidates who use English as a second language, an Approved Centre must satisfy itself prior to registering a candidate that the candidate's level of English is sufficient to be able to access the learning and undertake the assessment at the appropriate level, and to be able to interact with others and work safely.

### Achievement

This qualification consists of seven mandatory units. A candidate must successfully meet the requirements in each of the units in order to attain the qualification. This document details the learning outcomes and assessment criteria that a candidate must meet in order to demonstrate the acquisition of the knowledge and skills to be awarded an ECITB Diploma in Design and Draughting at SCQF Level 6. Mandatory observation of the candidate by an Approved Centre assessor is required to achieve this qualification.

The contents of each unit within the qualification interrelate and the AB issues credit certificates for completion of stand-alone units, on request from the Approved Centre. The qualification contains the following units:

Unit Reference Number	SQA Accreditation unit number	Unit Title	Level	Credit
ECITBCO-S1	UT09 04	Contribute to effective working relationships in engineering construction	5	6
DD-01S	UT26 04	Meet requirements for health, safety, environmental sustainability, and ethics in engineering design practice	6	12
DD-02S	UT24 04	Interpret technical information to establish design requirements	6	12
DD-03S	UT22 04	Identify, analyse, and evaluate factors affecting technical design	7	9
DD-04S	UT11 04	Develop engineering construction concepts and design options to solve technical challenges	6	9

DD-05S	UT20 04	Evaluate engineering construction design options to determine the most appropriate solution	6	12
DD-06S	UT36 04	Produce, review and distribute the final design package and implement as-built modifications	7	40

### Credit and level

Credit is a value attached to each unit and each qualification, based on the amount of time it would take the average candidate to achieve and demonstrate the learning outcomes of a qualification. In practice, individual candidate requirements and individual delivery methods mean there will be variation in the actual time taken to complete a qualification. Credit are estimates, based on consultation with industry practitioners, supervisors, and assessors. One credit point is equivalent to 10 hours. Credit includes:

- Formal input, e.g. contact time with tutor, acquisition of knowledge/understanding. Off the job time.
- Additional activities, e.g. developing practice, reflection, research/study time. On the job time.
- Assessment, e.g. planning, completion of assessment tasks.

This qualification has 100 credit points.

The credit points allow candidates, learning providers and employers to compare the size of different qualifications.

In some instances, it may be possible to transfer SCQF credit points to and from other learning programmes This will enable a candidate to include evidence of prior knowledge and competence and to ensure they do not repeat learning previously undertaken.

Universities, colleges, SQA Accreditation and other awarding bodies decide how many of the credit points received from previous learning can be transferred into their programmes. In all cases of credit transfer, it would be the decision of the accepting learning provider as to how many credit points could be transferred. Please refer to the *ECITB Recognition of Prior Learning Policy and Procedures*.

Time limits on the process of credit accumulation or exemptions are set out for each unit within the qualification structure.

This qualification is at SCQF Level 6. The SCQF descriptor for Level 6 is:

<b>Characteristic 1: Knowledge and understanding</b>
Demonstrate and/or work with: An appreciation of the body of knowledge that constitutes a subject/discipline/sector. A range of knowledge, facts, theories, ideas, properties, materials, terminology, practices, and techniques about, and associated with, a subject/discipline/sector. Relating the subject/discipline/sector to a range of practical and/or commonplace applications.
<b>Characteristic 2: Practice: Applied knowledge, skills and understanding</b>
Apply knowledge, skills and understanding: In known, practical contexts. In using some of the basic, routine practices, techniques and/or materials associated with the subject/discipline/sector. In exercising these in routine contexts that may have non-routine elements. In planning how skills will be used to address set situations and/or problems and adapt these as necessary.
<b>Characteristic 3: Generic cognitive skills</b>
Obtain, organise, and use factual, theoretical and/or hypothetical information in problem solving. Make generalisations and predictions. Draw conclusions and suggest solutions.
<b>Characteristic 4: Communication, ICT, and numeracy skills</b>
Use a wide range of skills, for example: Produce and respond to detailed and relatively complex written and oral communication in both familiar and unfamiliar contexts. Select and use standard ICT applications to process, obtain and combine information. Use a wide range of numerical and graphical data in routine contexts which may have non-routine elements.
<b>Characteristic 5: Autonomy, accountability and working with others</b>
Take responsibility for carrying out a range of activities where the overall goal is clear, under non-directive supervision. Exercise some supervisory responsibility for the work of others and lead established teams in the implementation of routine work within a defined and supervised structure. Manage limited resources within defined and supervised areas of work. Take account of roles and responsibilities related to the tasks being carried out and take a significant role in the evaluation of work and the improvement of practices and processes.

### **Equity, diversity and inclusion**

We have designed this qualification and its assessments to enable fair access to all candidates as far as reasonably possible, while taking industry requirements into consideration, e.g. health and safety.

You may wish to refer to our *Equal Opportunities Policy* and the *Reasonable Adjustments and Special Considerations Policy and Procedure* that are published on the ECITB website.

If you would like to discuss arrangements for reasonable adjustments, please contact us at [qualifications@ecitb.org.uk](mailto:qualifications@ecitb.org.uk).

### **Progression**

Completing this qualification can lead to a range of further career options. Those who wish to stay in engineering construction can develop their skills further, or progress through supervision to senior positions such as Construction Manager. Individuals can progress through additional qualifications and apprenticeships or into supporting engineering functions such as technical leadership, procurement, quality assurance, project management or project controls.

## 2. Qualification units and scope of assessment

### 2.1 Unit features

This qualification consists of seven mandatory units. Candidates must attain all the learning outcomes in each unit to gain a Pass in the qualification. Candidates attain a learning outcome by meeting each of the assessment criteria linked to the learning outcome at the appropriate standard. The units in this specification show the assessment criteria that a candidate must meet to attain the learning outcomes.

The qualification grade available is Pass.

Each unit has the following sections:

#### **ECITB unit number**

The unique unit code that identifies the unit on ECITB's system.

#### **SQA Accreditation unit number**

The unique unit code that the regulator (SQA Accreditation) uses to identify the unit.

#### **Unit title**

The name of the unit, which reflects the content of the unit.

#### **SCQF level**

These levels measure the degree of challenge posed by the qualification compared to other qualifications. The levels are determined by using the SCQF and EQF level descriptors.

#### **Credit value**

The credit value represents the learning time being defined as the time taken by candidates at the level of the unit, on average, to complete the learning outcomes of the unit to the standard determined by the assessment criteria.

#### **Unit aim**

A summary of what the unit enables the candidate to do.

#### **Learning outcomes**

What a candidate will know, understand and/or be able to do upon attainment of the unit. Each learning outcome starts with the letters LO.

#### **Assessment criteria**

The requirements a candidate is expected to meet to demonstrate the attainment of the related learning outcome. Each assessment criterion starts with the letter K if it relates to knowledge or understanding and with the letter S if it relates to skills. Each assessment criterion starts with a command verb which instructs the candidate in what to do.

#### **Assessment**

This section outlines how the unit will be assessed.

#### **Standards**

The National Occupational Standard(s) that the unit is mapped to.

### 2.2 Underpinning knowledge and skills

Unit ECITBCO-S1 details the factual, procedural and theoretical knowledge that the candidate must acquire and also demonstrate on plant, equipment and systems of their selected discipline:

- Relationships: importance of understanding of work relationship problems.
- Lines of communication, reporting lines and levels of responsibility in the workplace.
- The importance of ethical working and the sustainable use of resources including: codes of conduct, minimising the impact of work on the environment.
- The importance of questioning and demonstrating initiative in day- to- day problem solving.
- Procedures and related documentation and responsibility for reporting and following procedures.



### 2.3 Design and draughting specific knowledge and skills

Units DD-01S to DD-06S are discipline specific and the candidate must demonstrate their application of knowledge and skills on structures, plant and equipment.

The candidate is required to effectively demonstrate the theoretical, factual and procedural knowledge and practical skills of the following units that comprise the qualification in accordance with the stated assessment criteria and scope of assessment provided in this document:

ECITBCO-S1	Contribute to effective working relationships in engineering construction
DD-01S	Meet requirements for health, safety, environmental sustainability, and ethics in engineering design practice
DD-02S	Interpret technical information to establish design requirements
DD-03S	Identify, analyse, and evaluate factors affecting technical design
DD-04S	Develop engineering construction concepts and design options to solve technical challenges
DD-05S	Evaluate engineering construction design options to determine the most appropriate solution
DD-06S	Produce, review and distribute the final design package and implement as-built modifications

### 2.3 Further information

For further information either visit the ECITB website or contact the ECITB Awarding Body:

Office F15, Kings House Business Centre, Home Park Estate  
Station Road, Kings Langley, WD4 8LZ  
Email: [Qualifications@ecitb.org.uk](mailto:Qualifications@ecitb.org.uk)  
Website: [www.ecitb.org.uk](http://www.ecitb.org.uk)

## 2.4 Units

<b>ECITB unit:</b>	<b>ECITBCO-S1 Contribute to effective working relationships in engineering construction</b>
<b>SQA Accreditation unit code:</b> UT09 04	
<b>SCQF level:</b> 5 <b>Credit value:</b> 6	
<p><b>Unit purpose and aim:</b> This unit has been designed to assess learner competence in being able to:</p> <ol style="list-style-type: none"> <li>1. Establish and maintain productive working relationships</li> <li>2. Deal with disagreements in an amicable and constructive way so that good relationships are maintained</li> <li>3. Keep others informed about work plans or activities which affect them</li> <li>4. Seek assistance from others in a polite and courteous way without causing undue disruption to normal work activities</li> <li>5. Respond in a timely and positive way when others ask for help or information</li> </ol>	
<p><b>Details of the relationship between the unit and relevant National Occupational Standards or other professional standards or curricula (if appropriate)</b></p> <p>Derived from ECITB/ECS 11.04 (CO 1)</p>	

<b>Learning outcomes</b>	<b>Assessment criteria</b>
The candidate will:	The candidate can:
LO1 Understand lines of communication and responsibilities	K1.1 Explain the individual's responsibilities and the responsibilities of others within the work location
	K1.2 Describe the lines of communication that exist within the individual's working environment and explain the agreed procedure for passing information

<b>Learning outcomes</b>	<b>Assessment criteria</b>
The candidate will:	The candidate can:
LO2 Understand the importance of creating and maintaining working relationships	K2.1 Describe the individual's responsibilities for creating and maintaining working relationships and explain why it is important to do so
LO3 Understand problems affecting relationships	K3.1 Describe different problems that can affect relationships, and the actions that can be taken to deal with specific difficulties
LO4 Establish and maintain productive working relationships	S4.1 Develop working relationships with different people in the work environment such as: those for whom they are responsible, those to whom they are responsible, clients, colleagues, other tradespersons, suppliers, security/safety personnel
LO5 Deal with disagreements in an amicable and constructive way so that effective relationships are maintained	S5.1 Respond in a positive way when others ask for help or information
	S5.2 Treat everyone fairly and with respect and support the creation of a welcoming and inclusive environment for everyone
	S5.3 Maintain effective relationships by: <ul style="list-style-type: none"> <li>a. Resolving disagreements in a constructive and objective manner</li> <li>b. Escalating if needed</li> <li>c. Reporting, in accordance with procedures</li> </ul>
LO6 Seek assistance from others in a polite and courteous way without causing undue disruption to normal working activities	S6.1 Maintain effective relationships by seeking assistance from others in a polite and courteous manner
LO7 Respond in a timely and positive way when others ask for help or information	S7.1 Follow relevant work or professional codes of conduct, as appropriate for their role
	S7.2 Requests for help and information to identify exactly what is required
	S7.3 Resolve problems within the limits of their authority as they arise

<b>Assessment requirements or guidance specified by a sector regulatory body (if appropriate)</b>	<p>Assessment of this unit will be by occupationally competent assessors approved by an awarding body. They will gather sufficient evidence of competence from work-based activities on suitable engineering construction industry sites or realistic workplace environment. Such methods may include discussions about product evidence and questioning.</p> <p>Assessment criteria may be satisfied by observation, questioning, expert witness testimony, professional discussion or any other approved method.</p> <p>Further guidance on this ECITB unit can be found in the SQA Accreditation ECITB Assessment Strategy document.</p>
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<b>ECITB unit:</b>	<b>DD-01S Meet requirements for health, safety, environmental sustainability, and ethics in engineering design practice</b>
<b>SQA Accreditation unit code: UT26 04</b>	
<b>SCQF level: 6      Credit value:                      12</b>	
<p><b>Unit purpose and aim:</b></p> <p>This unit has been designed to assess learner competence in being able to meet requirements for health, safety, environmental sustainability, and ethics in engineering design practice.</p> <p>In the context of this unit, responsibility is limited to working within clearly defined formats, procedures, and conventions and using readily available and detailed information. In some cases, the learner may still be expected to refer to others for final authorisations, even though they remain responsible for identifying and implementing decisions.</p>	
<p><b>Details of the relationship between the unit and relevant National Occupational Standards or other professional standards or curricula (if appropriate)</b></p> <p>Derived from NOS ECIDD06 and Unit ECIDDS1</p>	

<b>Learning outcomes</b>	<b>Assessment criteria</b>
The candidate will:	The candidate can:
LO1 Understand the terminology, standards, principles, and practices for meeting requirements for health, safety, environmental sustainability, and ethics	K1.1 Explain the statutory and relevant requirements of the main health, safety, environmental, and sustainability legislation, regulations, standards, and quality procedures
	K1.2 Explain typical hazards and risks relevant to engineering designs in the engineering construction industry, including: <ul style="list-style-type: none"> <li>a. What a hazard is and common types of hazards</li> <li>b. The potential effects of hazards on persons, assets, and the environment, including sustainability impact</li> </ul>

<b>Learning outcomes</b> The candidate will:	<b>Assessment criteria</b> The candidate can:
	<p style="text-align: center;">c. How to eliminate or mitigate the risks from common hazards within the context of their designs</p> <p>K1.3 Explain the principles of environmental sustainability, including good growth, net zero carbon, and low carbon transformation</p> <p>K1.4 Explain principles and strategies of engineering controls and how to apply these in design practice</p> <p>K1.5 Describe common challenges in sustainable design, and typical solutions, including retrofitting</p> <p>K1.6 Explain industry codes of professional ethics, principles of ethical design, and ethical practice</p> <p>K1.7 Explain the purpose of a risk control strategy and implementation, detailing: <ul style="list-style-type: none"> <li>a. The importance of managing risk</li> <li>b. Risk assessments</li> <li>c. Safe systems of work</li> <li>d. Design risk reviews</li> </ul> </p> <p>K1.8 Explain sustainability assessment methods, including lifecycle assessment</p> <p>K1.9 Explain typical formats for communicating risk and sustainability performance information to internal and external stakeholders</p> <p>K1.10 Explain their responsibilities with regard to the reporting lines and procedures in their working environment</p>
LO2 Meet relevant expectations and standards in health, safety, environmental sustainability, and	K2.1 Comply with health, safety, environmental, and sustainability legislation, regulations, standards, quality procedures, and industry codes of professional ethics in their design practice

<b>Learning outcomes</b> The candidate will:	<b>Assessment criteria</b> The candidate can:
ethics in their engineering design practice and output	K2.2 <b>Apply principles of environmental sustainability, ethical design, designing-in safety, and designing-out risk to designs, models, and drawings</b>
	K2.3 <b>Identify potential hazards and assess the level of risk and sustainability impact and performance involved in the output of their design solutions, or of existing designs, throughout the lifecycle of the designed item</b>
	K2.4 <b>Communicate design-related risk and sustainability performance information to relevant people</b>
	K2.5 Deal promptly and effectively with problems within their control and report those that have been and report those that cannot be solved

<b>Assessment requirements or guidance specified by a sector regulatory body (if appropriate)</b>	<p>Assessment of this unit will be by occupationally competent assessors approved by an awarding body. They will gather sufficient evidence of competence from work-based activities on suitable engineering construction industry sites or realistic workplace environment.</p> <p>Assessment criteria may be satisfied by observation, questioning, expert witness testimony, professional discussion or any other approved method.</p> <p><b>Mandatory workplace observation is required for Assessment Criteria S2.2, S2.3 &amp; S2.4</b></p> <p>Further guidance on this ECITB unit can be found in the SQA Accreditation ECITB Assessment Strategy document.</p>
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<b>ECITB unit:</b>	<b>DD-02S Interpret technical information to establish design requirements</b>
<b>SQA Accreditation unit code: UT24 04</b>	
<b>SCQF level: 6      Credit value:                      12</b>	
<p><b>Unit purpose and aim:</b></p> <p>This unit has been designed to assess learner competence in being able to interpret information from engineering models, drawings, and specifications in the engineering construction industry.</p> <p>In the context of this unit, responsibility is limited to working within clearly defined formats, procedures, and conventions and using readily available and detailed information.</p> <p>In some cases, the learner may still be expected to refer to others for final authorisations, even though they remain responsible for identifying and implementing decisions.</p>	
<p><b>Details of the relationship between the unit and relevant National Occupational Standards or other professional standards or curricula (if appropriate)</b></p> <p>Derived from NOS ECIDD09 and Unit ECIDDS2</p>	

<b>Learning outcomes</b>	<b>Assessment criteria</b>
The candidate will:	The candidate can:
LO1 Understand the terminology, techniques, and practices for interpreting information from engineering models, drawings, and specifications	K1.1 Explain the principles of design, in relation to relevant standards
	K1.2 Describe the stages of design, including functional specification
	K1.3 Explain typical information sources
	K1.4 Describe document control systems



<b>Learning outcomes</b> The candidate will:	<b>Assessment criteria</b> The candidate can:
	K1.5 Describe different types of engineering technical models, drawings, specifications, data sheets, and schedules K1.6 Describe conventions, symbols, and abbreviations relevant to their design requirements K1.7 Explain how to identify and interpret appropriate data from relevant models, drawings, and specifications K1.8 Explain how to ensure the content and accuracy relating to assumptions, underpinning information, and relevant standards are applied K1.9 Explain their responsibilities with regard to the reporting lines and procedures in their working environment
LO2 Interpret technical information from engineering models, drawings, and specifications	K2.1 <b>Identify, extract, and interpret information from technical models, drawings, and functional specifications</b> K2.2 <b>Review and validate obtained information against specification and ensure all essential information is present, current, and compliant</b> K2.3 <b>Ensure that design deliverables meet agreed specifications, to include:</b> <b>a. Technical requirements</b> <b>b. Requirements of internal and external customers</b> K2.4 Resolve or report any inaccuracies or discrepancies in models, drawings, and specifications.

<b>Learning outcomes</b> The candidate will:	<b>Assessment criteria</b> The candidate can:
LO3 Manage problems within their control	K3.1 Deal promptly and effectively with problems within their control and report those that have been and report those that cannot be solved

<b>Assessment requirements or guidance specified by a sector regulatory body (if appropriate)</b>	<p>Assessment of this unit will be by occupationally competent assessors approved by an awarding body. They will gather sufficient evidence of competence from work-based activities on suitable engineering construction industry sites or realistic workplace environment.</p> <p>Assessment criteria may be satisfied by observation, questioning, expert witness testimony, professional discussion or any other approved method.</p> <p><b>Mandatory workplace observation is required for Assessment Criteria S2.1, S2.2 &amp; S2.3</b></p> <p>Further guidance on this ECITB unit can be found in the SQA Accreditation ECITB Assessment Strategy document.</p>
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<b>ECITB unit:</b>	<b>DD-03S Identify, analyse, and evaluate factors affecting technical design</b>
<b>SQA Accreditation unit code: UT22 04</b>	
<b>SCQF level: 7      Credit value:                      9</b>	
<p><b>Unit purpose and aim:</b></p> <p>This unit has been designed to assess learner competence in being able to identify, analyse and evaluate factors that impact on technical design in the engineering construction industry.</p>	
<p><b>Details of the relationship between the unit and relevant National Occupational Standards or other professional standards or curricula (if appropriate)</b></p> <p>Derived from NOS ECIDD01 and Unit ECIDDS3</p>	

<b>Learning outcomes</b>	<b>Assessment criteria</b>
The candidate will:	The candidate can:
LO1 Understand the terminology, techniques, and practices to identify, analyse, and evaluate factors that impact on engineering design	K1.1 Explain the principles of design
	K1.2 Explain relevant analysis methods and techniques
	K1.3 Explain the typical factors with the potential to affect engineering design
	K1.4 Explain the methods and formats for communicating technical design information and how to use these to present to the design team and other relevant stakeholders
	K1.5 Describe their responsibilities with regard to the reporting lines and procedures in their working environment

<b>Learning outcomes</b> The candidate will:	<b>Assessment criteria</b> The candidate can:
LO2 Identify, analyse, and evaluate factors affecting technical design	K2.1 <b>Use appropriate analysis methods to identify factors with the potential to affect design</b>
	K2.2 <b>Analyse and evaluate factors with the potential to affect design</b>
	K2.3 <b>Rank factors with the potential to affect technical design, including:</b> <ol style="list-style-type: none"> <li>a. <b>Specific weighted requirements</b></li> <li>b. <b>The design's feasibility</b></li> <li>c. <b>The item's function</b></li> </ol>

<b>Learning outcomes</b> The candidate will:	<b>Assessment criteria</b> The candidate can:
LO3 Produce, record, and communicate recommendations about factors affecting technical design	K3.1 <b>Produce, record, and communicate detailed recommendations to the relevant people, including the design team</b>
LO4 Manage problems within their control	S4.1 Deal promptly and effectively with problems within their control and report those that have been and report those that cannot be solved

<b>Assessment requirements or guidance specified by a sector regulatory body (if appropriate)</b>	<p>Assessment of this unit will be by occupationally competent assessors approved by an awarding body. They will gather sufficient evidence of competence from work-based activities on suitable engineering construction industry sites or realistic workplace environment.</p> <p>Assessment criteria may be satisfied by observation, questioning, expert witness testimony, professional discussion or any other approved method.</p> <p><b>Mandatory workplace observation is required for Assessment Criteria S2.1, S2.2, S2.3 &amp; S3.1</b></p> <p>Further guidance on this ECITB unit can be found in the SQA Accreditation ECITB Assessment Strategy document.</p>
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<b>ECITB unit:</b>	<b>DD-04S Develop engineering construction concepts and design options to solve technical challenges</b>
<b>SQA Accreditation unit code: UT11 04</b>	
<b>SCQF level: 6      Credit value:                      9</b>	
<b>Unit purpose and aim:</b> This unit has been designed to assess learner competence in being able to develop engineering concepts and design options to solve technical challenges in the engineering construction industry.	
<b>Details of the relationship between the unit and relevant National Occupational Standards or other professional standards or curricula (if appropriate)</b> Derived from NOS ECIDD05 and Unit ECIDDS5	

<b>Learning outcomes</b>	<b>Assessment criteria</b>
The candidate will:	The candidate can:
LO1 Understand the terminology, techniques, and practices to develop, record, and communicate engineering concepts and design options	K1.1 Explain the principles of conceptual engineering and design challenges
	K1.2 Explain current design thinking and approaches to innovation
	K1.3 Explain design techniques and methodologies for developing and analysing design options
	K1.4 Explain the principles of cross-team operation, and requirements of collaborative working in a design engineering environment
	K1.5 Explain the principles of sustainable design, including designing for circularity
	K1.6 Describe cost and change control methods and techniques

<b>Learning outcomes</b> The candidate will:	<b>Assessment criteria</b> The candidate can:
	K1.7 Describe customer requirements and their typical complexities K1.8 Explain methods of risk identification, risk analysis, risk evaluation, and recording risk information K1.9 Explain how to record design options and communicate them to the relevant people in appropriate formats K1.10 Describe their responsibilities with regard to the reporting lines and procedures in their working environment
LO2 Develop engineering concepts and design options to solve technical challenges	K2.1 <b>Explore a range of design concepts to meet the requirements of a technical challenge</b> K2.2 <b>Research and apply current design thinking and approaches to innovation appropriate to the technical challenge requirements</b> K2.3 <b>Use a range of techniques to develop engineering concepts and design options</b> K2.4 <b>Consult and collaborate with relevant people in design development, including cross-team operation</b> K2.5 <b>Produce design options that meet customer requirements</b> K2.6 <b>Confirm the technical feasibility and potential costs of each design option at each stage of the project</b>



<b>Learning outcomes</b>	<b>Assessment criteria</b>
The candidate will:	The candidate can:
LO3 Record and communicate design options	K3.1 <b>Record and communicate design options to relevant people using appropriate formats and methods</b>
LO4 Manage problems within their control	S4.1 Deal promptly and effectively with problems within their control and report those that have been and report those that cannot be solved

<b>Assessment requirements or guidance specified by a sector regulatory body (if appropriate)</b>	<p>Assessment of this unit will be by occupationally competent assessors approved by an awarding body. They will gather sufficient evidence of competence from work-based activities on suitable engineering construction industry sites or realistic workplace environment.</p> <p>Assessment criteria may be satisfied by observation, questioning, expert witness testimony, professional discussion or any other approved method.</p> <p><b>Mandatory workplace observation is required for Assessment Criteria S2.1, S2.2, S2.3, S2.4, S2.5, S2.6 &amp; S3.1.</b></p> <p>Further guidance on this ECITB unit can be found in the SQA Accreditation ECITB Assessment Strategy document.</p>
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<b>ECITB unit:</b>	<b>DD-05S Evaluate engineering construction design options to determine the most appropriate solution</b>
<b>SQA Accreditation unit code: UT20 04</b>	
<b>SCQF level: 6      Credit value:                      12</b>	
<b>Unit purpose and aim:</b>	
This unit has been designed to assess learner competence in being able to evaluate engineering design options in the engineering construction industry to determine the most appropriate solution.	
<b>Details of the relationship between the unit and relevant National Occupational Standards or other professional standards or curricula (if appropriate)</b>	
Derived from NOS ECIDD07 and Unit ECIDDS6	

<b>Learning outcomes</b>	<b>Assessment criteria</b>
The candidate will:	The candidate can:
LO1 Understand the terminology, techniques, and practices to evaluate design options and communicate related information	K1.1 Explain the principles of design
	K1.2 Describe criteria used to assess and rank design options
	K1.3 Describe design techniques and methodologies for evaluating design options
	K1.4 Explain how to assess the suitability of options and the relationship with design execution
	K1.5 Describe methods of communicating and presenting design options and recommendations to relevant parties

<b>Learning outcomes</b>	<b>Assessment criteria</b>
The candidate will:	The candidate can:
	K1.6 Explain their responsibilities with regard to the reporting lines and procedures in their working environment
LO2 Evaluate engineering design options to determine the most appropriate solution	K2.1 <b>Identify design criteria requirements</b>
	K2.2 Resolve problems identified relating to design requirements and agree solutions
	K2.3 <b>Evaluate design options and rank them in order of appropriateness, including:</b> a. <b>Cost comparisons</b> b. <b>Timescale comparisons</b>
	K2.4 <b>Confirm that the design solution selected is achievable</b>
LO3 Make and communicate recommendations about design options	K3.1 <b>Produce, record, and present detailed recommendations to relevant parties</b>
LO4 Manage problems within their control	S4.1 Deal promptly and effectively with problems within their control and report those that have been and report those that cannot be solved

<p><b>Assessment requirements or guidance specified by a sector regulatory body (if appropriate)</b></p>	<p>Assessment of this unit will be by occupationally competent assessors approved by an awarding body. They will gather sufficient evidence of competence from work-based activities on suitable engineering construction industry sites or realistic workplace environment.</p> <p>Assessment criteria may be satisfied by observation, questioning, expert witness testimony, professional discussion or any other approved method.</p> <p><b>Mandatory workplace observation is required for Assessment Criteria S2.1, S2.3, S2.4, &amp; S3.1</b> which may take the form of an expert witness testimony supported by photographic and/or video evidence.</p> <p>Further guidance on this ECITB unit can be found in the SQA Accreditation ECITB Assessment Strategy document.</p>
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<b>ECITB unit:</b>	<b>DD-06S Produce, review, and distribute the final design package and implement as-built modifications</b>
<b>SQA Accreditation unit code: UT36 04</b>	
<b>SCQF level: 7      Credit value:                      40</b>	
<p><b>Unit purpose and aim:</b></p> <p>This unit has been designed to assess learner competence in being able to produce, review, and distribute the final design package, including producing detailed drawings to specified draughting conventions in the engineering construction industry, reviewing designs, producing, and distributing the final package with all requirements and completing as-built modifications.</p> <p>In the context of this unit, responsibility is limited to working within clearly defined formats, procedures, and conventions and using readily available and detailed information.</p> <p>In some cases, the learner may still be expected to refer to others for final authorisations, even though they remain responsible for identifying and implementing decisions.</p>	
<p><b>Details of the relationship between the unit and relevant National Occupational Standards or other professional standards or curricula (if appropriate)</b></p> <p>Derived from NOS ECIDD03 and Unit ECIDDS7</p>	

<b>Learning outcomes</b>	<b>Assessment criteria</b>
The candidate will:	The candidate can:
LO1 Understand the terminology, techniques, and practices to produce, review, and distribute the final design package	K1.1 Explain requirements of detailed design models and drawings
	K1.2 Describe the types of technical information required for the final design package
	K1.3 Explain the typical peer and inter-disciplinary review processes, including coordination monitoring and review

<b>Learning outcomes</b> The candidate will:	<b>Assessment criteria</b> The candidate can:
	K1.4 Explain the required quality procedures K1.5 Explain post-release review, including technical queries on the completed design package K1.6 Describe the typical requirements for lifetime records K1.7 Explain the principles and techniques for producing as-built modifications and requirements of as-built documents K1.8 Explain their responsibilities with regard to the reporting lines and procedures in their working environment
LO2 Produce detailed models and drawings to specified draughting conventions and to meet requirements	K2.1 <b>Produce detailed design models and drawings to meet requirements</b>

<b>Learning outcomes</b> The candidate will:	<b>Assessment criteria</b> The candidate can:
LO3 Manage designs through the design review process	K3.1 Submit the design package for peer and inter-disciplinary review
	K3.2 <b>Evaluate review feedback on designs against agreed requirements and respond to feedback</b>
	K3.3 <b>Update models and drawings in line with review feedback, including revisions and modifications in line with organisational procedures</b>
LO4 Prepare and distribute the final design package	S4.1 <b>Collate and review the required technical information and detailed models or drawings</b>
	S4.2 <b>Ensure the design package is complete and valid</b>
	S4.3 <b>Ensure all design package documents are recorded, distributed, and filed in accordance. with company and customer policies and procedures</b>
LO5 Implement as-built modifications to designs	S5.1 <b>Implement changes to designs which occur at the fabrication or build stage</b>
	S5.2 <b>Produce as-built documents, plans, models, and drawings</b>
LO6 Manage problems within their control	S6.1 Deal promptly and effectively with problems within their control and report those that have been and report those that cannot be solved

<b>Assessment requirements or guidance specified by a sector regulatory body (if appropriate)</b>	<p>Assessment of this unit will be by occupationally competent assessors approved by an awarding body.</p> <p>They will gather sufficient evidence of competence from work-based activities on suitable engineering construction industry sites or realistic workplace environment.</p> <p>Assessment criteria may be satisfied by observation, questioning, expert witness testimony, professional discussion or any other approved method.</p>
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	<p><b>Mandatory workplace observation is required for Assessment Criteria S2.1, S3.2, S3.3, S4.1, S4.2, S4.3, S5.1, &amp; S5.2</b></p>
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Further guidance on this ECITB unit can be found in the SQA Accreditation ECITB Assessment Strategy document.