



TQUK Level 1 Certificate in Design Engineer Construct! The Digital Built Environment (RQF)

Qualification Specification

Qualification Number: 603/1991/4

Training
Qualifications



Introduction

Welcome to TQUK

Training Qualifications UK (TQUK) is an Awarding Organisation recognised by the Office of Qualifications and Examinations Regulation (Ofqual) in England and CCEA Regulation in Northern Ireland.

TQUK offers qualifications which are regulated by Ofqual and, in some cases, by CCEA Regulation. All regulated TQUK qualifications sit on the Regulated Qualifications Framework (RQF) and are listed on the [Register of Regulated Qualifications](#).

Our qualifications are designed to support and encourage learners to develop their knowledge and skills. This development may result in progression into employment or career development in the workplace. Our qualifications also allow learners to progress onto further qualifications.

Please visit our [website](#) for news of our new and coming soon developments.

Centre Recognition

To offer any TQUK qualification a centre must be recognised by TQUK.

The TQUK centre recognition process requires a centre to have in place a number of policies and procedures to protect the learners undertaking a TQUK qualification and the integrity of TQUK's qualifications. These policies and procedures will also support a recognised centre's quality systems and help support the centre to meet the qualification approval criteria.

Recognised centres must seek approval for each qualification they wish to offer.

The approval process requires centres to demonstrate that they have sufficient resources, including; suitably qualified and occupationally competent staff to deliver, assess and quality assure the qualification, and access to appropriate support in the form of specialist resources.

Qualification approval must be confirmed prior to any assessment of learners taking place.

Qualification Specifications

Each qualification offered by TQUK is supported by a specification that includes all the information required by a centre to deliver a qualification. Information in the specification includes unit information, assessment and learning outcomes.

The aim of the qualification specification is to guide a centre through the process for delivering the qualification.

Please read it alongside the TQUK Centre Handbook.

Details of TQUK's procedures and policies can be found on our website www.tquk.org.

Qualification specifications can also be found on our website www.tquk.org.

If you have any further questions, please contact TQUK.

Use of TQUK Logo, Name and Qualifications

TQUK is a professional organisation and use of its name and logo is restricted. TQUK's name may only be used by recognised centres to promote TQUK qualifications. Recognised centres may use the logo for promotional materials such as on corporate/business letterheads, pages of a centre's website relating to TQUK qualifications, printed brochures, leaflets or exhibition stands.

When using TQUK's logo, there must be no changes or amendments made to it, in terms of colour, size, border or shading. The logo must only be used in a way that easily identifies it as TQUK's logo.

Any representation of TQUK's logo must be done so as a representation of the true logo.

It is the responsibility of the centre to monitor the use and marketing of TQUK's logos and qualifications on their own materials as well as on those of any re-sellers or third parties that they may use. TQUK should be made aware of relationships with re-sellers or third parties including any additional websites that the centre will use in addition to their own website. If this information is changed, TQUK should be notified. TQUK is required to monitor a centre's websites and materials to ensure that learners are not being misled.

If a centre is no longer a recognised TQUK centre, it must immediately discontinue the use of TQUK's logo, name and qualifications.

Introduction to the Qualification

The TQUK Level 1 Certificate in Design Engineer Construct! The Digital Built Environment (RQF) is regulated by Ofqual. This qualification has been accredited on the Scottish Credit and Qualifications Framework at SCQF Level 5.

The qualification was developed in association with Class Of Your Own® Limited (COYO).

COYO has licensed the Intellectual Property Rights in the Design Engineer Construct! Learning Programme to TQUK, on an exclusive basis, for incorporation into the TQUK DEC qualifications.

At development this qualification was supported by:

Industry	Professional Bodies and Specialist Organisations	Further and Higher Educational Establishments
<p>The qualification is formally supported by industry leaders in the Built Environment sector who represent some of the UK's most respected companies. These include:</p>	<p>The qualification is formally supported by professional bodies and specialist organisations including:</p>	<p>This qualification is supported by the following universities:</p>
<ul style="list-style-type: none"> • Mott MacDonald • Topcon Positioning Systems • Laing O'Rourke • Willmott Dixon • Arup • BAM • Balfour Beatty • Bentley Systems 	<ul style="list-style-type: none"> • Royal Institution of Chartered Surveyors • Chartered Institute of Building • Chartered Institution of Civil Engineering Surveyors • UK BIM Alliance 	<ul style="list-style-type: none"> • Newcastle • Heriot-Watt (incl. Edinburgh, Dubai & Malaysia campus) • Dundee • London South Bank • Westminster • Salford • Northumbria

Qualification Purpose

Design Engineer Construct! Level 1 is an introductory programme for learners looking to explore professional practice in the digital Built Environment and provides excellent foundation learning for progression to Level 2.

The Design Engineer Construct!® Learning Programme (now commonly known as 'DEC') has gained a solid reputation as "the most innovative, challenging and relevant curriculum development in recent years", championed by respected leaders, and referenced in numerous national reports.

Learners design a small, community focused building - a highly sustainable and inclusive building that offers flexible use for diverse groups - with a brief to teach local communities about everyday environmentally friendly living.

Learners are empowered to take ownership of their own project and we recommend they are also given the opportunity to liaise with their 'client' – the local community itself - through the involvement of learners' families, teachers and governors.

Where possible, we recommend learners are given access to professional volunteers e.g. through the Class Of Your Own '[Adopt A School](#)' scheme and Professional Body outreach programmes.

The Level 1 qualification is an experiential learning programme – learners develop and deliver a fit for purpose, functional design, taking on the roles of key Built Environment professionals such as architects, engineers, surveyors and facilities managers.

A key objective is to develop the knowledge and skills required to define, develop and deliver a digital construction project from concept to handover, encouraging learners to focus on their impact on the end-user, the wider community and the environment, setting standards for resource efficiency, and committing to sustainable procurement.

Learners will understand the need for accurate technical information regarding the proposed site, and the constraints and challenges a site can present. Using building information modelling (BIM) methodologies and software, the project will be developed from concept stage to feasibility and planning, creating a digital model that incorporates main architectural, structural and services detail. Learners will explore the lifecycle of the building focusing on operation and management, maintenance and cost.

Aligning with the Sustainable Development Goals, the themes of social, environmental and economic sustainability run throughout Design Engineer Construct!® programmes, and learners discover how to minimise their own, and their community's, impact on the planet through role play and project based learning. They understand the value of inclusivity and diversity, designing for a world where everyone matters.

Entry Requirements

There are no specific entry requirements however learners should have a minimum of level one in literacy and numeracy or equivalent.

This qualification is suitable for learners aged 13 years and above.

Progression

This qualification provides opportunity to progress on to Design Engineer Construct!® Level 2 and access further education or employment in the Built Environment. It provides access to a wide range of career pathways, including Architecture and Architectural Technology, Geospatial and Property Surveying, Quantity Surveying and Cost Management, Information Management, Civil, Structural and Building Services Engineering and Construction Project Management.

The qualification complements other subject areas at Level 1, such as mathematics, physics, engineering, computer science, art, geography, environmental studies, business studies and design technologies to broaden the curriculum. With a range of transferable knowledge and skills, learners can also access wider industry opportunities, for example in the town planning, property and real estate, environmental and sustainability, creative and digital, financial, and legal sectors.

Learners wishing to access traditional trade and craft and advanced manufacturing destinations will have a more rounded approach to the Built Environment, understanding basic principles of building design processes.

Structure

Learners must successfully complete all four mandatory units to achieve the qualification.

Title	Unit ref.	Level	Guided learning hours	Credit value
Defining a sustainable construction project	F/615/8822	1	20	5
Roles in construction project teams	L/615/8824	1	60	9
Producing a technical design and sharing information	R/615/8825	1	20	5
Planning permission, costing and presenting a sustainable building project	D/615/8830	1	20	5

Guided Learning Hours

These hours are made up of all contact time, guidance or supervision of a learner by a teacher, supervisor, tutor, trainer or other appropriate provider of education or training. GLH for this qualification is 120 hours.

Directed study requirements

Learners are expected to study and complete aspects of their assessment portfolio in their own time. This additional time is expected to be approximately 120 hours over the cycle of the programme.

Total Qualification Time

This is an estimate of the total length of time it is expected that a learner will typically take to achieve and demonstrate the level of attainment necessary for the award of the qualification i.e. to achieve all learning outcomes.

Total Qualification Time is comprised of GLH and an estimate of the number of hours a learner is likely to spend in preparation, study or any other learning including assessment which takes place as directed by, but not under the supervision of, a lecturer, supervisor or tutor. The credit value for a qualification, where given, is determined by TQT, as one credit corresponds to 10 hours of learning.

Total Qualification Time for this qualification is 240 hours.

Assessment

The qualification is assessed by internally set and marked assessments subject to external quality assurance.

All learning outcomes which assess knowledge and understanding (usually beginning with 'understand' or 'know how to') may be assessed through, for example, internally set and marked written assignments, tasks, records of oral or written questions, work books or other portfolio evidence.

All learning outcomes which require demonstration of practical skills and confirmation of workplace competence (usually learning outcomes beginning with 'be able to'). Portfolio evidence must include observation of learner performance in real work situations.

Materials for internal assessment must be submitted to TQUK for approval prior to use and must be mapped to the relevant unit, learning outcome and assessment criteria.

All learning outcomes and assessment criteria must be met to achieve a pass - there is no grading.

Each unit within the qualification may have their own assessment requirements, assessment guidance and range.

- **Assessment requirements** are conditions of assessment that must be met by learners when undertaking their assessments to achieve the unit or meet a particular assessment criteria.
- **Assessment guidance** are areas that could be covered by learners in their assessments to achieve the unit or particular assessment criteria, but are not mandatory.
- **Range** sets out the scope of what should be taught and may be assessed as part of a particular assessment criteria.

At Level 1 we recommend the use of FormIT for learners to support aspects of digital modelling. This software is cloud-based and much more suited to the home learning environment. Other industry standard design software can be used to support digital modelling. The use of industry standard software is a critical element of the programme and prepares learners for working life in a modern, digital industry.

Training is available through Class Of Your Own and advised to each Centre.

Support from TQUK

Recognised centres will be able to access support from TQUK whenever necessary. External Quality Assurance activities will be undertaken on a regular basis. TQUK also offers recognised centres the service of a Client Relationship Officer whose role is to support centres with any administration queries or qualification support.

Centres will also be able to access excellent support and resources from Class Of Your Own Limited. These include student workbooks, training programmes, support materials, resource banks, the 'DEC School' eLearning platform, teaching network support and facilitation of industry support both in class and virtually.

Course Delivery

Pre-Course Information

All learners should be given appropriate pre-course information regarding any TQUK qualifications. The information should explain about the qualification, the fee, the form of the assessment and any entry requirements or resources needed to undertake the qualification.

Initial Assessment

Centres should ensure that any learner registered on a TQUK qualification undertakes some form of initial assessment. The initial assessment should be used to inform a teacher/trainer on the level of the learner's current knowledge and/or skills.

Initial assessment can be undertaken by a teacher/trainer in any form suitable for the qualification to be undertaken by the learner/s. It is the centre's responsibility to make available forms of initial assessment that are valid, applicable and relevant to TQUK qualifications.

Learner Registration

Once approved to offer a qualification, the centre should register learners before any assessment can take place. Recognised centres must follow TQUK's procedures for registering learners. For short courses, TQUK offer the option of registering a course and booking a number of places. Learners are then added once the course has taken place, thus acknowledging situations where substitutions are made at short notice to meet business needs.

Assessor Requirements

TQUK recommend that teachers delivering and assessing the DEC suite of qualifications are qualified to degree level in a relevant subject and have experience of teaching a related subject area. Assessors who assess a TQUK qualification must possess an assessing qualification appropriate for the level of qualification they are delivering. This can include:

- Level 3 Award in Assessing Competence in the Work Environment
- Level 3 Award in Assessing Vocationally Related Achievement
- Level 3 Award in Understanding the Principles and Practices of Assessment
- Level 3 Certificate in Assessing Vocational Achievement
- A1 or D32/D33
- Appropriate teaching qualification

Specific requirements for assessors may be indicated in the assessment strategy/principles identified in individual unit specifications.



Internal Quality Assurer Requirements

Centre staff who undertake the role of an Internal Quality Assurer (IQA) for TQUK qualifications must possess or be working towards a relevant qualification. This could include:

- Level 4 Award in the Internal Quality Assurance of Assessment Processes and Practice
- Level 4 Certificate in Leading the Internal Quality Assurance of Assessment Processes and Practice
- V1 Conduct internal quality assurance of the assessment process
- D34 Internally verify the assessment process
- Appropriate teaching qualification

It is best practice that those who quality assure qualifications also hold one of the assessing qualifications outlined above. IQAs must follow the principles set out in Learning and Development NOS 11 - Internally monitor and maintain the quality of assessment.

All staff members involved with the qualification (assessing or IQA) will also need to be '*occupationally competent in the subject area being delivered*'. This could be evidenced by a combination of:

- A higher level qualification in the same subject area as the qualification approval request.
- Experience of the delivery/assessment/IQA of the qualification/s requested.
- Work experience in the subject area of the qualifications.

Staff members will also be expected to have a working knowledge of the requirements of the qualification and a thorough knowledge and understanding of the role of tutors/assessors and internal quality assurance. They are also expected to undertake continuous professional development (CPD) to ensure they are up to date with work practices and developments in the qualifications they are involved with.

The recognised centre is required to have in place an internal Quality Assurance strategy which is directly related to the internal moderation of the portfolios and includes strategic objectives which require:

- A selected sample of learner evidence and assessor feedback from 25% of registered learners or a minimum of five learners across the rank order is internally standardised from 100% of the programmes authorised.
- All assessors and all activities within the portfolios are standardised across all active assessment sites, over a twelve-month period
- Standardisation meetings are conducted annually and are focussed on the assessment and internal verification. Ideally, this would progress from unit to unit across years.

External Quality Assurance

External Quality assurance will be undertaken by TQUK to ensure that centres are satisfying TQUK quality assurance compliance with the requirements associated with their TQUK recognised centre status and formal written agreement. This will consist of physical visits and remote reviews.

Useful Websites

[Office of Qualifications and Examinations Regulation](#)

[Register of Regulated Qualifications](#)

For further details regarding approval, please refer to the following websites:

[Regulated Qualifications Framework \(RQF\) in England \(and includes vocational qualifications in Northern Ireland\)](#)

[Scottish Credit and Qualifications Framework \(SCQF\)](#)

[Education and Skills Funding Agency \(ESFA\) and Learning Aim Reference Service \(LARS\)](#)

[Insight](#)

For more information on Design Engineer Construct! and Class Of Your Own, please visit:

[Design Engineer Construct!](#)

[Class Of Your Own](#)

A full list of useful links is available through Class Of Your Own's teaching resources and 'DEC School' eLearning platform. All Centres will be invited to use 'DEC School' as their central resource for learning and teaching support.

Title:		Defining a sustainable construction project	
Unit reference number:		F/615/8822	
Level:		1	
Credit value:		5	
Guided learning hours:		20	
Learning outcomes The learner will:		Assessment criteria The learner can:	
1.	Understand issues related to sustainability in construction projects.	1.1	Define sustainability in a range of contexts.
		1.2	Identify ways in which sustainability affects the local community.
		1.3	Identify the range and depth of knowledge in the local community related to sustainability.
		1.4	Outline current sustainability issues in the local community.
		1.5	Identify ways of improving sustainability in the local community.
2.	Understand local community issues related to a construction project.	2.1	Produce a report to present the demographic information of the local community.
		2.2	Outline how the community can be engaged in the design and planning of a building project in their role as 'client'.
		2.3	Describe how community members with a range of personal or physical challenges will be considered during the design of the project.
		2.4	Outline how the project impacts the local community and how their views will be taken into account.
		2.5	Explain how a formal meeting should be structured, conducted and recorded.
Assessment Guidance:			
1.1 Learners could define sustainability in a range of different contexts including: <ul style="list-style-type: none"> • Global Sustainability e.g. Brundtland Report, Sustainable Development Goals • National Sustainability • Local Sustainability 			

- Personal Sustainability e.g. how do I contribute to sustainable living?

1.2

Learners could explore ways in which their local community is affected by issues of sustainability. They can investigate:

- how local systems operate, and research the environmental, economic and social health benefits of creating a more sustainable future.
- the ways electricity, water, sewage treatment, refuse collection and other council services are provided, and how sustainable these services are
- human behaviour in their community with regard to recycling, litter, wellbeing, tolerance, inclusion and social cohesion.

1.3

Learners could devise a questionnaire and encourage their community to participate in their research to ensure that a wide range of data is collected. Research can focus on:

- how people feel about sustainability
- whether they are adopting measures to be more sustainable
- whether they value a more sustainable lifestyle

Learners could evaluate strengths and weaknesses in social, economic and environmental behaviour and conditions in the community.

2.1

Learners could report of the following demographic information:

- Population
- Age
- Gender
- Ethnicity

Learners can use government national statistics websites or find other census information from local council/authority websites and offices to support their report.

2.2

Learners could devise an appropriate method to engage their local community in contributing towards a vision for a truly inclusive community project. Learners' family members, teaching staff and other relevant individuals may be invited to contribute at this stage to emulate community members. Learners may devise a social media strategy e.g. how they might use social media to reach the wider community.

2.5

Learners could cover the following items when explaining formal meetings.

- Governing roles and responsibilities.
- Meeting minutes
- Importance of accurate record-keeping and advising stakeholders
- Establish the aim of the group and prepare a group plan.
- Set an agenda and agree a method of publicising the minutes to the community.



Title:		Roles in construction project teams	
Unit reference number:		L/615/8824	
Level:		1	
Credit value:		9	
Guided learning hours:		60	
Learning outcomes The learner will:		Assessment criteria The learner can:	
1.	Understand the importance of teams in construction projects.	1.1	Identify the role of teamwork in a successful construction project.
		1.2	Identify the roles and responsibilities of the key members in a construction team.
		1.3	Identify how each team member contributes to the sustainability of a construction project.
2.	Understand the role of the Architect.	2.1	Outline the role of an Architect.
		2.2	Explain how the Architect works with a client on a building project.
		2.3	Identify the key elements and structure of a design brief.
		2.4	Summarise how to use architectural precedents to inform research.
		2.5	Explain the importance of a clear design brief in supporting effective communication with the client.
3.	Understand the role of the Building Services Engineer.	3.1	Outline the role of the Building Services Engineer.
		3.2	Identify services associated with a familiar building.
		3.3	Describe how the behaviour of end-users to impact on the efficiency of a building.
		3.4	Identify the symbols that represent building services on a plan (drawing).
		3.5	Describe how end-users impact the sustainable design of a building.
4.		4.1	Outline the role of the Landscape Architect.

	Understand the role of the Landscape Architect.	4.2	Describe how natural and manmade features impact the layout of a landscape design.
		4.3	Explain how the path of the sun affects the positioning of natural and manmade garden design features.
		4.4	Describe how to use a water level to measure changes in height.
		4.5	Explain how an outdoor learning environment complements a sustainable building project.
		4.6	Produce a detailed landscape plan.
5.	Understand the role of the Site Engineer.	5.1	Outline the role of a Site Engineer.
		5.2	Use specific mathematical solutions to solve site engineering problems.
		5.3	Describe considerations that need to be taken into account when orientating a building.
6.	Understand the role of the Facilities Manager.	6.1	Outline the role of a Facilities Manager in the context of a familiar building.
		6.2	Describe positive and negative aspects relating to sustainability in a familiar building.
		6.3	Explain how the behaviour of people within a building affects the success of adoption and subsequent sustainability.
		6.4	Relate sustainability research on a familiar building to the development of a building project.
		6.5	Outline resource efficiency guidelines to support the facilities management roles.

Assessment Requirements:

5.2

Learners must understand how Pythagoras Theorem ($a^2 + b^2 = c^2$) is used in construction to 'set out' a building. Using two known dimensions for the width and length of a square/rectangular building, they can calculate the hypotenuse of the associated right-angled triangle and use the theorem to ensure their building is perfectly 'square' (i.e. has 90° corners).

Assessment Guidance:

2.4

Learners could research local, national and global examples of existing eco structures to understand the work of other architects and inform their own design.

3.2

Learners could produce a floor plan of their home and identify existing services.



Title:		Producing a technical design and sharing information	
Unit reference number:		R/615/8825	
Level:		1	
Credit value:		5	
Guided learning hours:		20	
Learning outcomes The learner will:		Assessment criteria The learner can:	
1.	Be able to follow BIM principles using appropriate technologies to produce realistic buildings.	1.1	Identify reasons why BIM is an essential process for development of a construction project.
		1.2	Produce a 3D model including simple architectural and aesthetic elements using digital software .
		1.3	Demonstrate how to input, organise, and combine information in a 3D environment using digital software .
		1.4	Produce 2D floor plans, elevations, sections, and renders/visualisations.
		1.5	Produce fully annotated drawings on a title sheet using digital software .
2.	Be able to share information effectively.	2.1	Explain the value of professional collaboration and information sharing in a building project.
		2.2	Demonstrate the use of tools and techniques to present a building project in a 3D environment.
		2.3	Explain the impact of natural and artificial light on a building project.
		2.4	Explain how information about the building would be communicated to the client and project team using BIM-enabled CAD technology and methods.
Assessment Requirements: 1.5: Learners must create their own fully annotated drawing sheet complete with floor plans, elevations and sections at an appropriate scale. 2.1:			

Learners must discuss the merits of collaborative working and sharing ideas and information. Learners must recognise that BIM plays a key role in reducing construction resource consumption and promoting sustainability.

Assessment Guidance:

Digital Software

At Level 1 we recommend the use of FormIT for learners to support aspects of digital modelling. This software is cloud-based and much more suited to the home learning environment. Other industry standard design software can be used to support digital modelling.

1.3

When using digital software to input, organise and combine information, learners could include spaces/rooms, walls, doors, windows, floors, ceilings, roofs, furniture and other features. Where software allows, they should choose (or annotate) materials as specified in their project brief. Areas should be calculated using standardised units (m²) and rooms named. The external site can be modelled to include topography.

2.3:

Learners could compare and evaluate the use of natural and artificial lighting in their design and justify their choice of the most energy efficient solution.

Title:		Planning permission, costing and presenting a sustainable building project	
Unit reference number:		D/615/8830	
Level:		1	
Credit value:		5	
Guided learning hours:		20	
Learning outcomes The learner will:		Assessment criteria The learner can:	
1.	Understand issues associated with planning legislation and controls.	1.1	Describe the importance of planning and planning protocols.
		1.2	Identify planning requirements related to the design construction of the project.
		1.3	Identify common problems that arise in planning applications.
		1.4	Produce a structured argument that supports a planning application in a particular scenario.
		1.5	Outline appropriate measures to conclude a successful planning application.
2.	Understand issues associated with procurement for a construction project.	2.1	Identify the effects of local and global procurement on local and global communities.
		2.2	Identify properties of sustainable building materials.
		2.3	Identify sustainable goods and services from local sources.
		2.4	Explain the term 'bill of quantities' and how it is used in a construction project.
3.	Be able to make effective presentations.	3.1	Present the final building project using digital technology.
		3.2	Identify strengths and weaknesses in the presentation through critical feedback.
Assessment Guidance:			
1.2:			

Learners could investigate potential planning restrictions on their construction project and outline all measures in place to ensure a positive result.

1.4:

Information that could support a planning application includes:

- Transport impact assessment
- Green travel plans
- Flood risk assessment
- Ecological assessment
- Tree report
- Site survey
- Environmental statements
- Information following public consultation
- Legal agreements

1.5:

Learners could consider the typical information required when submitting a planning application to the local authority. Further information can be found at <https://www.gov.uk/planning-permission-england-wales/after-you-apply>

2.1:

Learners could explore the sourcing of everyday purchases by investigating items on a shopping receipt (e.g. the local supermarket) and determine where the goods are coming from (the source), how they are manufactured/grown, by whom, and how they get to them. This exercise can then be related to the procurement of the construction materials chosen for their project.

Learners can make use of carbon footprint calculators and associated resources available online.

3.1:

Learners presentation could:

- Be supported with Digital Media e.g. Videos, Photos
- Prioritise key information and highlight key stages of their project
- Make appropriate use of time to deliver clear and concise points

This presentation can be completed face-to-face or online using various video software.



Training Qualifications

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