Training Qualifications UK

Qualification Specification

TQUK Level 2 International Certificate in Design, Engineering, and Construction in the Digital Built Environment (RQF)

Qualification Number: 610/3227/X

V3

Contents

Go to contents Page >

Summary of changes

The following table provides a summary of the changes that have been made to the qualification specification since the publication of the previous version.

Version number	Summary of changes
V2	General updates have been added following the rebranding of the specification.
V3	Revisions made to the Internal Assessment – Portfolio of Evidence section to provide clarity of the points-based grading model Some typographical changes have been made throughout the specification.

Go to contents Page >

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 that 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.

Go to contents Page >

Qualification Specifications

Each qualification TQUK offers 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 of delivering the qualification.

Please read it alongside the TQUK Centre Handbook. Details of TQUK's procedures and policies can be found on our website.

Qualification specifications can also be found on our website. If you have any further questions, please contact TQUK.

Centres must ensure they are using the most recent version of the qualification specification for planning and delivery purposes.

Reproduction of this document

Centres may reproduce the qualification specification for internal use only but are not permitted to make any changes or manipulate the content in any form.

Centres must ensure they use the most up-to-date pdf version of the specification.

Use of TQUK Logo, Name and Qualifications

TQUK is a professional organisation and the 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 a true representation.

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 they may use. TQUK must be made aware of centre relationships with re-sellers of TQUK Qualifications. TQUK must also be made aware of any additional websites where the centre intends to use TQUK's name and/or logo. If this information is changed, TQUK should be notified immediately. TQUK is required to monitor a centre's websites and materials to ensure that learners are not being misled.

If a centre ceases to be/surrenders recognition as a TQUK centre, it must immediately discontinue the use of TQUK's logo, name and qualifications from all websites and documents.

Go to contents Page >

The Qualification

The TQUK Level 2 International Certificate in Design, Engineering, and Construction in the Digital Built Environment (RQF) is regulated by Ofqual.

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! The Digital Built Environment Learning Programme to TQUK, on an exclusive basis, for incorporation into the TQUK DEC qualifications.

The DEC learning programme has been designed to be highly adaptable and can be localised to meet the building regulations and standards specific to each country where it is delivered. This adaptability ensures the curriculum remains relevant, practical, and wholly inclusive.

Qualification Purpose

The Level 2 International Certificate in Design, Engineering, and Construction in the Digital Built Environment (RQF) is an intermediate qualification for learners looking to increase their knowledge of professional practice in the built environment and provides an excellent opportunity to advance knowledge gained at level 1 and extend knowledge and practice required to progress to level 3.

The Design, Engineer, and Construct!® programme (DEC) has gained a solid reputation as being “the most innovative, challenging and relevant curriculum development in recent years”, championed by respected leaders, and referenced in numerous, national reports.

The programme prepares learners for a meaningful career that can positively impact society given the focus on sustainability and innovation in the construction industry. Learners will gain holistic knowledge and skills in:

- STEM and digital engineering
- Project-based learning
- Sustainable development goals
- Net zero and modern construction methods
- Collaborative working
- Problem solving.

Learners will design, develop, deliver, and evaluate a fit-for-purpose, functional building that can be based on their interpretation of a ‘real’ project brief. Their building design should be highly sustainable and inclusive to be used by the local community and enable learners to demonstrate knowledge and the use of a range of industry processes and digital skills.

The building types learners might consider include:

- community health centre
- nursery/childcare facility
- community sports centre
- music and events venue.

Visits to live construction sites in a safe and secure environment can be facilitated by a local company through Class of Your Own's "Adopt a School" programme. Alternatively, learners can use a local site they can **safely** visit or an area of their existing school grounds as the 'building site' location of their building, enabling ease of access to a safe, outdoor space in which they can explore key topics such as spatial requirements, orientation and access.

Learners are empowered to take ownership of their project, focusing on a justifiable need for a community. We recommend they are also given the opportunity to liaise with their 'client' – the local community itself – through the involvement of learners' families, assessors, and governors.

Where possible, we recommend learners are given access to professional volunteers such as through the Class Of Your Own 'Adopt A School' scheme. Contact support@classofyourown.com for further information.

Entry Requirements

This qualification is accessible to learners in secondary schools, university technical colleges, further education colleges, international schools, and other educational institutions.

There are no specific entry requirements, however, learners should have a minimum of level 1 literacy and numeracy skills. This qualification is suitable for learners aged 14 years and above.

Centres should ensure that any learner registered on a TQUK qualification undertakes an initial assessment to ensure they have the ability to complete the course in full. The outcomes of the process inform:

- early judgements about the learner
- focus and level of learning
- skills and needs that will be developed and supported.

A review of a learner's prior achievements, well-managed interviews, and diagnostic tests are all suitable forms of initial assessment.

Aligning with the sustainable development goals, the themes of social, environmental and economic sustainability run throughout the DEC 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.

Progression

This qualification provides an opportunity to progress to level 3 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 2, such as mathematics, physics, engineering, computer science, art, geography, 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, 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

The qualification comprises 4 mandatory units. Learners must achieve a pass grade in each unit to achieve the qualification. In the event of a learner failing one unit, they will **not be awarded** the qualification.

Mandatory units

Title	Unit ref.	Level	Guided learning hours	Credit value
Defining a sustainable construction project	J/650/8390	2	40	7
Developing a sustainable construction project	K/650/8391	2	30	6
Delivering a sustainable construction project	L/650/8392	2	30	6
Evaluate a sustainable construction project	M/650/8393	2	20	5

Guided Learning Hours

These hours are made up of all contact time, guidance, or supervision of a learner by a lecturer, 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 qualification.

Go to contents Page >

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.

The Total Qualification Time for this qualification is 240 hours.

Resources

The recognised centre is required to have one or more delivery sites that offer facilities to support the programme of learning and assessment. These must comply with health and safety regulations and have in place appropriate access arrangements. All training and/or assessment sites must include the following facilities:

- A practical space to be used for learning and assessment activities. This should offer multimedia facilities such as data projector and laptop, flipchart and pens.
- Architectural model-making facilities (card, foam board).
- A high specification* IT suite and IT hardware
- Industry standard CAD and BIM software.

The use of industry standard software is a critical element of the qualification and prepares learners for working life in a modern, digital industry. Hardware and software specifications and training are available from Class Of Your Own. For further information, contact support@classofyourown.com.

Assessment

It is essential that all learners are assessed in English unless the qualification specification specifically states that another language may be accepted. This ruling also applies to all learner evidence presented for external quality assurance purposes.

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

All learning outcomes that 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, workbooks, or other portfolio evidence.

Where learning outcomes require the demonstration of practical skills and confirmation of workplace competence (usually learning outcomes beginning with ‘be able to’), the portfolio evidence must include observation of learner performance in real work situations.

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 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 particular assessment criteria
- **Useful Websites** are resources that could be used by centres for the delivery of the qualification and by learners to support them with the completion of the unit.

For a learner to achieve the qualification, they must attain a minimum pass mark for each unit.

All portfolios should be submitted as a single PDF file. If learners have completed work in a visual format, teachers should keep a record and add this into the learner's portfolios once they have been completed and before submitting to TQUK. All physical work should be scanned and added into the learner portfolio before submission.

Centre Devised Assessment (CDA) Guidance

Centre-devised assessments play a vital role in the evaluation of a learner's progress as they are based on the qualification's learning objectives. They provide learners with the opportunity to evidence the knowledge, understanding, and skills gained while studying the qualification and support teaching staff in monitoring the learner's progress.

As this qualification is internally assessed, TQUK allows centres to produce their own assessments. When designing them, assessors must give consideration to the depth and breadth of knowledge allowed by each task.

TQUK has produced centre guidance on our suggested approaches to designing appropriate assessment tasks, and these may be accessed from our website www.tquk.org. This includes templates to support the design of internal assessments and a checklist to ensure that the assessments are valid and fit for purpose.

To ensure the validity and fairness of our qualifications, centre-devised assessments form part of our quality assurance processes. More information about this and how to prepare for external quality assurance reviews can be found on our website.

Internal Assessment – Portfolio Marking

The learner's portfolio of evidence is marked holistically using a points-based system. An overall grade is awarded on successful completion of the 4 mandatory units. **Individual unit grades are not awarded.**

Each assessment criterion (AC) must be assigned a point value between 1 and 4 to reflect the level of achievement demonstrated by the learner. Centres should refer to the guidance provided in the assessment matrices towards the end of this specification (pages 29-38) to support this activity.

A point value of zero should be assigned where the evidence presented by the learner does not meet the minimum required standards within the assessment matrix.

To calculate learner achievement for a Learning Outcome (LO), the total point value for the ACs within the LO should be averaged using the following formula:

Formula	Example
$\text{LO1 total} = \frac{\text{AC1.1} + \text{AC1.2} + \text{AC1.3} + \text{AC1.4}}{\text{total number of ACs}}$	$(\text{LO1}) \quad \text{Points total of } 2.25 = \frac{2+3+3+1}{4}$

The points awarded for the LOs within a unit are then added together to calculate the unit point value.

Each unit has a minimum point value to confirm achievement. The minimum points required for each unit are as follows:

- Unit 1: 4 points
- Unit 2: 3 points
- Unit 3: 2 points
- Unit 4: 2 points.

If a learner does not meet the minimum required points for any unit, they should be marked with a fail result.

Calculating the overall grade

The points achieved for each of the 4 mandatory units must be added together to calculate the overall total for the portfolio component of the qualification. The overall total will be compared against the grade boundary table provided below to determine the final portfolio grade.

Learners must meet the minimum required points for each unit to be eligible for the award of an overall grade.

Portfolio Marking Scale					
Combined unit score	0-10	11-21	22-32	33-38	39-44
Portfolio Grade	Fail	C	B	A	A*

Centres may wish to use the TQUK 'DEC Learner Attainment with Mark Logger' spreadsheet, available for download via our Verve Management Suite. This has been designed to support centres with logging and calculating learner grades.

Centres should arrange for their completed Learner Attainment Records (LARs) to be sent to TQUK's Quality Team (quality@tquk.org) by the submission date confirmed in our Key Dates communication.

Centres must ensure that portfolios are submitted to TQUK as a single PDF file. If learners have any paper-based evidence within their portfolio, centres must ensure that a scanned copy is taken and included with the digital portfolio before submitting it to TQUK.

Go to contents Page >

Re-assessment Requirements

Internally assessed portfolio

Portfolio reassessment requires learners to submit new evidence for the units. New evidence must be presented in line with specified awarding windows. Learners who submit a portfolio with new evidence will always be part of the cohort sample.

Centres will be required to pay an additional reassessment fee per learner. Details of the re-assessment fees can be found in our resit and resubmission fees document located at www.tquk.org/design-engineer-construct/.

Course Delivery

Pre-Course Information

All learners should be given appropriate pre-course information regarding any TQUK qualifications. The information should explain 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 of the level of the learner's current knowledge and/or skills and any additional specific support requirement the learner may need.

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.

Teaching resources

All teaching materials and additional resources used to support the delivery of this qualification must be age-appropriate. Centres must ensure when developing or sourcing delivery materials that careful consideration is given to the safeguarding and wellbeing of their learners in line with the centre's policies and procedures.

Learner Registration

Once approved to offer a qualification, centres must follow TQUK's procedures for registering learners. Learner registration is at the discretion of the centre and in line with equality legislation and health and safety requirements.

Centres must register learners before any assessment can take place.

Go to contents Page >

Tutor, Assessor, and Internal Quality Assurer Requirements

All members of staff involved with the qualification (assessing or IQA) will 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 remain up to date with work practices and developments associated with the qualifications they assess, or quality assure.

Tutor

Tutor or trainers who deliver a TQUK qualification must possess a teaching qualification appropriate for the level of qualification they deliver. This can include:

- Further and Adult Education Teacher's Certificate
- Cert Ed/PGCE/BEd/MEd
- PTLLS/CTLLS/DTLLS
- Level 3 Award/Level 4 Certificate/Level 5 Diploma in Education and Training.

Assessor

Staff who assess a TQUK qualification must possess an assessing qualification appropriate for the level of qualification they are delivering or be working towards a relevant qualification and have their assessment decisions countersigned by a qualified assessor. 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.

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

Internal Quality Assurer

Centre staff who undertake the role of an Internal Quality Assurer (IQA) for TQUK qualifications must possess or be working towards a relevant qualification and have their quality assurance decisions countersigned by a qualified internal quality assurer. 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.

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.

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 activities and remote reviews.

Useful Websites

- Office of Qualifications and Examinations Regulation

For further details regarding approval and funding eligibility please refer to the following websites:

- Education & Skills Funding Agency for public funding information for 14+ learners in England
- Learning Aim Reference Service (LARS)
- Insight
- Regulated Qualifications Framework (RQF) in England (and includes vocational qualifications in Northern Ireland)
- Scottish Credit and Qualifications Framework (SCQF)

You may also find the following websites useful:

- Design, Engineer, Construct
- Class Of Your Own
- Chartered Institute of Building : https://www.ciob.org/
- Construction Industry Council : https://www.cic.org.uk/
- Institution of Civil Engineers : https://www.ice.org.uk/
- Architects Registration Board : https://arb.org.uk/
- Royal Institute of British Architects : https://www.architecture.com/
- Chartered Institute of Architectural Technologists : https://architecturaltechnology.com/
- https://upa-bua-arch.be/en/profession/international-organisations-of-architects
- Architects Regional Council Asia : https://www.arcasia.org/
- USA : https://www.ncarb.org/about/related-organizations

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. For further information, contact support@classofyourown.com.

Mandatory Units

Title:		Defining a sustainable construction project	
Unit reference number:		J/650/8390	
Level:		2	
Credit value:		7	
Guided learning hours:		40	
Learning outcomes The learner will:		Assessment criteria The learner can:	
1.	Understand a client's needs to formulate a design brief and client requirements.	1.1	Identify the contextual needs of a client to create design brief.
		1.2	Record client's requirements and expectations.
		1.3	Calculate benchmark costs in relation to the agreed client's needs.
2.	Be able to formulate project requirements.	2.1	Outline the functional/spatial requirements of the project.
		2.2	Set the sustainability aspirations of the project
		2.3	Establish quality objectives for the project.
3.	Understand constraints on the project.	3.1	Identify constraints associated with the site location and present solutions.
		3.2	Investigate planning protocol.
		3.3	Explain the principles of legislation relevant to the project.
		3.4	Generate ideas, carry out a feasibility study, and present the results.
		3.5	Make modifications and developments, and a judgement on project viability based on evidence.
		3.6	Explain how the building design helps minimise energy use.
4.	Be able to draft a project plan.	4.1	Create a draft project plan and timeline.
		4.2	Match job roles and responsibilities to the construction professionals required for the project
		4.3	Create an organogram for the project.
		4.4	Estimate the lifespan of the completed project.
		4.5	Outline facilities management requirements and calculate facilities management costs.
		4.6	Take account of environmental considerations in planning and delivering the project.

Assessment guidance:

All assessment criteria will be expected to be evidenced in the learner's portfolio. Learners should include a bibliography, citing where they found information and images while researching.

1.1: Learners should aim to create a short design brief for their project that outlines what their project is, why it is necessary, who the end users are, the project's location and other key information. The learners should explore the local climate, surrounding buildings and precedents. Learners should also identify the stakeholders in their project.
Evidence: Written evidence, including a short design brief.

1.2: Learners will produce an Architect Agreement defining the function of the building, how the building will be used, the type of end user, the location, budget, rooms/spaces, materials, and style of the building.
Evidence: Written evidence, including an Architect's Agreement.

1.3: Learners should demonstrate how they have estimated what their building might cost through looking at the cost of other similar existing buildings. Learners will demonstrate research skills, using the internet and other methods such as contact with local professionals.

Evidence: Written evidence, including benchmark costing figures.

2.1: Learners should be able to define the spatial requirements of their building and the rooms, and determine, for example, what rooms/spaces/equipment is needed to perform certain functions. They can use buildings known to them to help determine size (by measuring existing spaces accurately using specific tools or researching appropriate sizes). The relationship of one space to another, circulation, functionality and use of each room is important. They must demonstrate good and bad examples.

Evidence: Written evidence including identification of rooms. Bubble diagrams for basic building layout ideas based on space. Schedule of accommodation.

2.2: Learners will research and generate a strategy that will make their building sustainable.

Evidence: Written evidence, with supporting images.

2.3: Learners will present a precedent study evaluating similar buildings using set criteria, including design, function, durability, elegance, efficiency, and how the building benefits the community. Learners will then create a vision document that will contain images, drawings, sketches, ideas and written aspirations for their own project.

Evidence: Written evidence, with supporting images, such as sketches.

3.1: A site analysis should be produced using maps and photographs to help produce a report that highlights existing buildings and the surrounding area, surface level changes, boundaries, geographical features, site access, site orientation and site climate. Learners should identify potential site constraints/issues, identifying solutions to help them through the planning process, and also engage with the local community.

Evidence: Written evidence, with supporting images, such as sketches.

3.2: Learners will investigate the process of gaining planning permission, national and local development frameworks, planning policies and legislations, planning restrictions and constraints, community consultation linked to their local area. Learners should then create a 'planning statement' that outlines their building

project and how their proposal conforms to the planning policy. The planning process can be quite lengthy. In the UK, as an example, the 'National Planning Policy Framework', is an important part of the government's reforms to make the planning system less complex easier to understand.

*Note: planning policies and legislation could include: Tree Preservation Orders (TPO), Areas of Outstanding Natural Beauty (AONB), Sites of Special Scientific Interest (SSSI), Wildlife and Countryside Act, and Conservation Areas, Green Belts and Listed Buildings. Learners can make links to policies from their local areas in their portfolios but should be aware of the UK policies and legislation.

Evidence: Written evidence.

3.3: There is a difference between a planning application being approved, and building construction being approved and given the go-ahead, with the health and safety of the end users in mind. Learners should investigate and link to their project, relevant legislation that needs to be followed when seeking approval from building control. Learners can also investigate guidelines/standards.

Learners can make links to legislation for their local areas in their portfolios, but should be aware of UK policies and legislation that could include Health and Safety at Work Act (HASAWA), Building Research Establishment Environmental Assessment Methods (BREEAM).

Evidence: Written evidence.

3.4: Learners should generate some initial design ideas and conduct a feasibility study on them. Learners should consider that a feasibility study is the opportunity to test all aspects of their early proposals and the first chance to review and refine their emerging ideas. It is also an opportunity to present their work to date (both visually and verbally) to their clients, demonstrating good practice for future project stages. A successful feasibility study will clearly demonstrate how the project is feasible in ALL respects and should cover function, quality, policy, budget, programme, team and the way forward.

Evidence: Written evidence might include sketches, CAD (Computer Aided Design) models, photographs of 3D physical models.

3.5: Learners should act on the analysis of their ideas and feedback from their initial feasibility study. Learners should be encouraged to work together, with their peers and professionals, in order to discuss and establish the merits of their projects. They should seek feedback on their proposal from a variety of different people. They should then identify the viability of their project from this feedback and identify any further changes that may need to be made to bring the project to viability.

Evidence: Written evidence could include, sketches, CAD drawings, photographs of 3D physical models.

3.6: Learners will research, investigate and create a set of criteria that ensures their project is energy efficient in terms of embodied energy and energy demand from the outset. They can present an 'environmental and sustainability strategy' comprising a series of criteria annotated with diagrams and images that demonstrate an understanding of different green/ renewable technologies and passive measures that could potentially be incorporated into their building.

Evidence: Written evidence, with supporting images and diagrams.

4.1: The learner should determine and communicate the client's mission and vision for the building, and also the short, medium and long term strategic plan. Priorities, goals and objectives for future use should be established in terms of scope, schedule and cost. A space analysis should be carried out. There may be a need to increase facilities or the number of people who use the building in the future and this will impact the design. Learners should create a Gantt chart outlining the main stages of the project.

Evidence: Written evidence, space analysis and Gantt chart.

4.2: Learners will outline the professionals involved in the building project, and communicate each of their roles, responsibilities, and points of contact. The learner should explain why each team member has a pivotal part to play in the successful development and delivery of the building project.

Evidence: Written evidence.

4.3: Learners will create a detailed organogram that clearly shows the construction professionals involved throughout the whole project, establishing clear lines of communication/how they relate to one another.

Evidence: Organogram.

4.4: The lifespan needs to be based on standard methods including maintenance schedules and adaptations for the interior, exterior, structure, and the purpose of the building. Spaces should be functional, accessible and durable, but may also need to be flexible. Learners should analyse the lifespan of similar existing buildings to their own.

Evidence: Written evidence with supporting images.

4.5: Learners should outline what facilities management is, including the main roles and requirements of facilities managers and their teams, and the costs. Forecasting should include the most significant cost areas related to operational requirements. These will depend on the particular project, but they are likely to include energy costs, buildings maintenance and health and safety checks.

Evidence: Written evidence.

4.6: Learners will analyse the energy efficiency of their building using energy analysing software. They will check data using mathematical calculation and comparison with precedents. Learners could investigate energy source, ventilation, energy saving initiatives, water distribution, lighting types and sources, electrical distribution and the impact of glazing, high quality construction and insulation.

Evidence: Written evidence with supporting images.

Title:		Developing a sustainable construction project	
Unit reference number:		K/650/8391	
Level:		2	
Credit value:		6	
Guided learning hours:		30	
Learning outcomes The learner will:		Assessment criteria The learner can:	
1.	Be able to develop a feasible and technical proposal.	1.1	Prepare design concepts that communicate ideas.
		1.2	Present the quality of the proposal to a client.
		1.3	Communicate a technical design proposal to the project team.
		1.4	Identify procurement options related to key elements of the project.
2.	Be able to produce technical support collateral for a project.	2.1	Present and annotate the 3D representations of the building project.
		2.2	Utilise the 3D environment to test the design in virtual locations.
		2.3	Establish the lighting requirements for the project.
		2.4	Produce detailed, scaled drawings that can form the basis of a planning application.
		2.5	Describe the key features that form the basis of a planning application.
		2.6	Calculate the likely cost of the project.
3.	Be able to support development of a project concept.	3.1	Explain the importance of compatibility between existing infrastructure and the project proposals.
		3.2	Explain the environmental and climate change reduction strategies.
		3.3	Monitor the execution of the plan to ensure compliance with client requirements, taking appropriate action where necessary.
		3.4	Establish strategies for the proposed construction that support health and safety, occupancy, management, and operation.
		3.5	Identify energy efficiency strategies and how they will be achieved.
		3.6	Inform planning through collaborative working groups.

Assessment guidance:

All assessment criteria will be expected to be evidenced in the learner's portfolio. Learners should include a bibliography, citing where they found information and images while researching

1.1: Learners should communicate their idea, showing any further developments if necessary. Ideas should be fully annotated.

Evidence: Written evidence may include, sketches, CAD models, photographs of 3D physical models, images of precedents.

1.2: Learners should plan a presentation that addresses if the proposal meet the design brief, initial project success criteria, if all end users will be satisfied, sustainability, efficiency, and can individuals easily navigate the building. The presentation should also include sections explaining circulation, fire exit placement and window placement.

Evidence: Written evidence may include, sketches, CAD models, photographs of 3D physical models.

1.3: Learners should take their concept design proposal and work it up into technical proposal using BIM or similar to create a technical model. Information must be clear and concise so colleagues can undertake their required tasks. Services should be identified on the floor plan.

Evidence: Written evidence may include, BIM models, flowcharts, models.

1.4: Learners need to consider 'procurement' in terms of social, economic and environmental responsibility in order that the client does not just get "a building" but that they get the best possible building within the project constraints. Several targets should be described, the life cycle of products established and the social, economic and environmental impact off obtaining these materials.

Evidence: Written evidence.

2.1: Learners can choose their own preferred method to create and communicate their technical concept model. Emphasis must be on detailed thinking, annotating all the defining features.

Evidence: Written evidence may include, sketches, BIM models, CAD models, photographs of 3D models.

2.2: Using industry software, learners will specify an exact location for their building by address or latitude and longitude and perform energy/solar/wind analysis. They will consider situation, orientation, impact of adjacent buildings and agree the most suitable positioning for optimum solar gain and seasonal thermal performance in relation to the sun's path.

Evidence: Written evidence with supporting images.

2.3: Learners must consider and conduct an in-depth exploration of lighting for their building. Lighting must be thought of in terms of functional/general/task lighting, emergency/safety lighting, sustainable lighting and from a creative viewpoint in terms of how lighting can enhance the architecture and the sensory experience in the building. Learners should explore types of lighting and light bulbs and understand how these impact on the building's energy use and maintenance costs. Suitable lighting solutions should be suggested for their building.

Evidence: Written evidence with an annotated floor plan that illustrates the types and location of different lighting.

2.4: Learners should have a clear understanding of the types of documents that need to be submitted with a planning application, and what scale is suitable. Typically, planners require a location plan which defines where the project is situated relative to surrounding properties (usually issued at a scale of 1:1250 and 1:2500) and a site plan which shows the position of the project relative to its boundary (usually issued at a

scale of 1:200 or 1:500) and any trees on site. Learners should be aware of Tree Preservation Orders (TPOs). The (compass) north point and scale should always be shown clearly on the plan. Learners should prepare floor plans and elevations at a suitable scale (usually 1:50 or 1:100), and have an understanding of the relationship of the size of the building and the paper size a drawing is to be plotted on. Note: At a scale of 1:100, 10 mm on a plan = 1m in reality and 1:50 = 10mm = 0.5m. Drawings are usually submitted digitally as pdf formats.

Evidence: Series of scale drawings: Location/site plan, elevations, and floor plan, screenshots of learner work.

2.5: Learners should establish the type of planning permission they require as there are a number of types for example domestic/household, conversion, listed building. Planning applications should describe the project's size and location, how it will function, and its relationship with the immediate surroundings. It should also include information including drainage, vehicle and pedestrian access, materials to be used, design of the building and the direction it faces. It should also include the location of waste and recycling facilities (for example, where they would situate a bin). The project description should be clear and concise with sufficient detail.

Evidence: Written evidence with supporting images.

2.6: Using software tools, and costings information, learners can produce an estimated project costing based on a square metre cost or can calculate the total cost of the project by materials used using scheduling. Accuracy is dependent on the definition of design and engineering data. Learners should be encouraged to discuss the significance of complete data in producing reliable costing.

Evidence: Written evidence and report in portfolio. Schedules and costings should be placed into learner portfolios.

3.1: Learners should consider the existing infrastructure surrounding their building. Infrastructure is the basic physical systems of a country's or community's population, including roads, pavements, transport systems, utilities, water, sewage. New buildings should benefit the people who will use them in terms of appeal, health (such as air quality) and aesthetics, but to be explicitly functional and minimise the impact on the environment. A building can contribute to energy and water collection, and even food harvesting through green roofs and vertical farms. Accessible transport links and close proximity of public (green) spaces are fundamental to good urban design. Learners should identify existing infrastructure around their project site and suggest improvements that could be made to help contribute to the building's success.

Evidence: Written evidence with supporting images.

3.2: Learners should outline their strategies for energy efficiency, giving examples of how each one can be achieved, including technologies used and the impact it will have on the environment. They should determine how they will record, review and evaluate their recommendations. Learners should consider existing local environmental regulations and building codes, and whether there are existing or complimentary programmes which can support their aims.

Evidence: Written evidence.

3.3: Learners should reflect upon initial criteria to prepare a compliance list that will enable them to check the progress of the project in accordance with their client's brief (and that outlined in the Architect's Agreement, and project success criteria). This list should clearly support the future direction of the project adhering to agreed principles, standards, specifications and functionality. Regular meetings with the client are necessary to ensure compliance. Preparing a compliance list aims to highlight errors quickly and easily, thereby reducing costs and delays due to unforeseen changes as the project develops.

Evidence: Written evidence.

3.4: Learners should generate a Construction, Design and Management (CDM) plan. It must demonstrate that they have taken reasonable steps to ensure health and safety is of paramount importance throughout the life cycle of the building. The plan should reflect foreseeable key risks to the health and safety of those involved in or affected by construction, use, maintenance and demolition of the building, for example, working at height, vehicles, power, structure instability (especially concerning excavations, refurbishment of existing buildings), slips trips and falls and project specific hazards (such as fire). Attention must also be paid to ensuring the building is designed safely to avoid injuries during use. Learners can refer to the ERIC model (Eliminate, Reduce, Inform, and Control). Health hazards may include those incurred though lifting, exposure to excessive noise, vibration, hazardous materials, dust, vermin and other animal derived hazards, contaminated land.

Evidence: Written evidence, CDM/Health and Safety Plan.

3.5: Learners should produce a concise report which outlines the reasoning behind key design decisions relative to achieving optimum energy efficiency requirements including, but not limited to, the use of renewable energy, energy efficient materials, technologies, resources and systems, ways of minimising energy, use of natural resources, building design, low embodied energy, and the way their building promotes and sustains positive end user behaviour.

Evidence: Written evidence with supporting images.

3.6: Learners will outline methodology to ensure communication of all aspects of the project and processes to all team members, and to promote and facilitate effective collaboration throughout the construction project.

Evidence: Written evidence, schedule, flow diagram, or table.

Title:		Delivering a sustainable construction project	
Unit reference number:		L/650/8392	
Level:		2	
Credit value:		6	
Guided learning hours:		30	
Learning outcomes The learner will:		Assessment criteria The learner can:	
1.	Be able to deliver a project.	1.1	Identify potential problems to ensure mistakes are avoided.
		1.2	Identify potential problems and the action that was taken.
		1.3	Identify construction specialists and what they will be needed for.
		1.4	Monitor progress in consultation with peers.
		1.5	Ensure the project is developed on time and to budget.
2.	Be able to respond to technical issues.	2.1	Provide a 3D model to test the design.
		2.2	Validate the design against the brief using a technical investigation.
		2.3	Ensure that the project complies with building regulations as it progresses.
		2.4	Explain how the building works in practice.
		2.5	Review progress and reflect on decisions.
		2.6	Conduct a peer review and respond appropriately.

Assessment guidance:

All assessment criteria will be expected to be evidenced in the learner's portfolio. Learners should include a bibliography, citing where they found information and images while researching.

1.1: Learners should clearly demonstrate that they are looking for potential problems and communicating with a range of people to ensure that nothing is missed that would have a major adverse effect on the project delivery.

Evidence: Written evidence with supporting images/photographs.

1.2: Learners should identify any issues that could have a significant effect and which, if implemented badly or missed, will be difficult to put right. This is a form of risk assessment prioritising things early on that will be difficult to put right subsequently. Learners should identify problems that arose in their project and what actions were put in place.

Evidence: Written evidence with supporting images/photographs.

1.3: Learners should identify construction specialists they liaised with, and what they are needed for. This may require further guidance if learners have not studied the level 1 qualification.

Suggested website: www.designingbuildings.co.uk/wiki/Consultant_team_for_design_and_construction

Evidence: Written evidence with supporting images/photographs.

1.4: Learners should outline any feedback following consultation with peers and explain any modifications or improvements to the project's design. Conversely, if no changes are to be made to certain areas following feedback learners should justify this.

Evidence: Written evidence with supporting images/photographs.

1.5: Learners should produce a detailed description of how their project will be delivered on time and on budget, with an explanation of the different factors that could affect this. Has the project managed to stay within budgets outlined previously? Has the project managed to keep to the proposed timeline?

Evidence: Written evidence with supporting images/photographs.

2.1: Learners should test the model to experiment with variations to improve their design and document successful and unsuccessful changes.

Evidence: Written evidence with supporting images/photographs.

2.2: Learners should analyse their final project proposal against their initial project design brief and project success criteria.

Evidence: Written evidence.

2.3: Learners should consider building regulations and record any necessary actions and adjustments to their project as a result of building regulations checks. They should document the procedure they have adopted and report their decision that the project is compliant with the regulations.

Evidence: Written evidence with supporting images/photographs.

2.4: Learners should provide statements on if the building is: suitable for its intended use, built to last, adaptable, safe to construct and occupy, contributes to its context, and is aesthetically pleasing.

Evidence: Written evidence with supporting images/photographs.

2.5: Learners should complete a detailed summary exploring how the project has evolved, outlining key decisions and explains why they were made. Learners suggest 3 or more improvements based on technical issues and their solutions. Learners should outline and justify any major changes made so far and how the project has progressed over time.

Evidence: Written evidence with supporting images/photographs.

2.6: Learners should conduct a peer review of their project and respond appropriately. Taking criticism and giving it constructively are the main purpose of this criterion, and learners should focus on objectivity and improvement.

Evidence: Written evidence with supporting images/photographs.

Title:		Evaluating a sustainable construction project	
Unit reference number:		M/650/8393	
Level:		2	
Credit value:		5	
Guided learning hours:		20	
Learning outcomes The learner will:		Assessment criteria The learner can:	
1.	Be able to test the final design against original intentions.	1.1	Explain how the building works so a user knows how to optimise performance.
		1.2	Explain how well final outcomes meet original intentions.
		1.3	Evaluate feedback and use it as a basis for improvements in future projects.
		1.4	Analyse data and use it to inform the project evaluation.
		1.5	Use data to forecast the long-term performance of the building in terms of energy usage.
2.	Be able to transfer project evaluation to other contexts.	2.1	Identify issues in an existing local building.
		2.2	Make recommendations to improve existing buildings.
		2.3	Carry out a qualitative audit reporting on aesthetics and sensory experiences of users.
		2.4	Present the building project to a professional audience.

Assessment guidance:

All assessment criteria will be expected to be evidenced in the learner's portfolio. Learners should include a bibliography, citing where they found information and images while researching

1.1: Learners should evaluate the design of the building in terms of optimising performance in relation to user behaviour. They should include sustainability, energy efficiency, circulation, accessibility, function.

Evidence: Written evidence with supporting images/photographs.

1.2: Learners should be analytical in their approach to evaluate the strengths and weaknesses, compare and contrast aspects of their design in relation to original intentions. They should realise the importance of clarity at the planning stage so their final evaluation can be decisive and rational rather than vague and subjective.

Evidence: Written evidence.

1.3: Learners should receive and give feedback graciously and objectively. It is difficult to remove emotion from criticism and a good part of this criterion is to demonstrate emotional intelligence in the form of maintaining control and being constructive in order to foster improvement rather than destructive and precipitating withdrawal or resistance to change. Learners should record and evaluate the feedback given to them and use it as a basis to suggest improvements for future projects.

Evidence: Written evidence.

1.4: Learners should provide evidence of and analyse the data they have used to inform their project and evaluate its use. While there are always grounds for subjective elements in evaluation, there needs to be at

least some dimensions of backing evaluation judgements with clear evidence. Learners should realise that they will have to work to gather evidence for objective evaluation.

Evidence: Written evidence with supporting images/photographs.

1.5: Learners should forecast the future long-term performance of their building in terms of energy usage, throughout the year, in different weather conditions. Learners could provide a study of possible variations in energy costs in the long-term depending on how the building is used and the environmental conditions outside, suggesting improvements where necessary.

Evidence: Written evidence.

2.1: Learners should identify, record, and explain a range of design issues in an existing local building. Learners could consider issues in terms of health and safety, inclusivity, aesthetics, sensory experience, and sustainability.

Evidence: Written evidence with supporting images/photographs.

2.2: Learners should make recommendations to improve the problems they identified in the existing building, and if there are any cost implications in terms of the running costs or capital costs. They should appreciate that there is always going to be a tension between cost and benefit and that issues related to health and safety are going to get the highest priority. Some solutions will have running cost implications such as installing air conditioning or carpeting an area. Some capital cost implications will make for example, replacing a flat roof with a pitched roof prohibitively expensive. The best solutions are ones that have a significant impact but do not cost anything or perhaps even save money such as better energy efficiency.

Evidence: Written evidence with supporting images/photographs.

2.3: Learners should draw up a questionnaire for users of the building, based on an inspection of the building, with factors related to aesthetics and sensory impact. They should be provided with guidance to ensure that their questionnaire is free from bias and targeted on getting valid and targeted responses from the users.

Evidence: Written evidence with supporting images and graphs.

2.4: Learners should plan and deliver a concise presentation of their project to a knowledgeable audience. Learners should answer questions when asked, and include evidence of their presentation, delivery of their presentation and the Q&A in their portfolios. Assessors should bring out the basic principles for this type of presentation so that learners appreciate that the learning can be transferred to other contexts.

Evidence: Written evidence with supporting images/photographs.

Go to contents Page >

Mathematics for Design, Engineering, and Construction in the Digital Built Environment

At Level 2, learners will be expected to have an understanding of the following mathematics concepts:

- Addition
- Subtraction
- Multiplication
- Division
- Rounding
- Fractions and simplifying fractions
- Percentages and increases/decreases by percentage
- Ratios and working to scale
- Perimeters and circumferences
- Area of shapes – Squares, rectangles (Area = width * length), triangles (Area = ½*b*h), circles (ΠR^2)
- Area of rooms through subtraction and/or addition
- Pythagoras – $c^2 = a^2 + b^2$

Additionally, learners will be expected to demonstrate the following mathematics knowledge and skills within the portfolio component:

- Learners will be expected to have an understanding of basic arithmetic skills to support the calculation of various costs including:
    - Addition, subtraction, multiplication, division, estimation, rounding and percentage calculations of various budget costs reported in £ and £/m2 (or local currency).

- Learners will be able to apply their mathematics knowledge to understand lighting and energy requirements and use this to compare efficiency including:
    - Use of calculations to compare and contrast different options for lighting and energy requirements based on cost, room size
    - Use of the following formulas with to calculate lighting requirements:
        - Lumens = lux x area
        - Bulbs required = lumens required / lumens of light bulb.

- Learners will have an understanding how volume and area of various building components are calculated or in situations concerning the functional requirement of a building and relative room sizes:
    - Common building elements include floors, walls and roofs.
    - Elements may take the shape of triangles, squares, circles, rectangles and trapeziums
    - Calculation of various room sizes

- Calculation of volume of common building elements such as:
  - Cube/rectangle = length * width * height
  - Triangle = 0.5 * b * h * length
  - Cylinders = $\pi r^2 * h$

Standard units

Learners may be required to convert units within the same measurement type. **When providing answers to exam questions, learners should state units.**

Measurement	Standard Unit	Conversions
Money	Pound, £ (or local currency)	N/A
Length	Metre, m	Millimetre (mm) and Kilometre (KM)
Mass	Kilogram, kg	Gram (g)
Temperature	Celsius, (°C)	Kelvin, K
Power	Watts, W	Kilowatts, K
Force	Newton, N	Kilonewton (kN)
Light	Lumens, Lux	
Sound	Decibels, db	

Go to contents Page >

Assessment Matrices

Unit 1: Defining a sustainable construction project.			
Learning outcome 1: Understand a client's needs to formulate a design brief and client requirements			
Points	0	1-2	3-4
1.1: Identify the contextual needs of a client to create a design brief.	No evidence submitted or fails to meet minimum requirement.	Location, building type and end users identified.	Short design brief for their project that outlines the project's location, local climate, explores surrounding buildings and precedents. Learners should also identify the stakeholders in their project
1.2: Record client requirements and expectations	No evidence submitted or fails to meet minimum requirement.	Architect's agreement attempted. Good agreement that covers most of the considerations outlined at bands 3-4.	Detailed architect's agreement that defines location, function, use, end-users, space, budget, materials, and style
1.3: Calculate benchmark costs in relation to the agreed client's needs.	No evidence submitted or fails to meet minimum requirement.	Provides explanation of what benchmark costs are.	Explanation of what a benchmark cost is. Benchmark costs researched and a relevant value identified in £/m^2 or local equivalent currency
Learning outcome 2: Be able to formulate a project brief			
Points	0	1-2	3-4
2.1: Outline the functional/ spatial requirements of the project.	No evidence submitted or fails to meet minimum requirement.	Spaces and rooms are listed with some relevant areas defined.	Schedule of accommodations presented including information on size of rooms, spaces, areas, adjacencies, circulation.
2.2: Set the sustainability aspirations of the project	No evidence submitted or fails to meet minimum requirement.	Vision for the building defined in terms of social, environmental, and economic principles	Vision for the building explained in terms of social, environmental, and economic principles with examples of how this could be achieved
2.3: Establish quality objectives for the project	No evidence submitted or fails to meet minimum requirement.	A simple vision that presents what the building could look like and the positive impacts it will provide to the community	Detailed vision that illustrates and explains the design, durability, elegance, efficiency and how the building will benefit the community.
Learning outcome 3: Understand constraints on the project			
Points	0	1-2	3-4

3.1: Identify constraints associated with the site location and present solutions.	No evidence submitted or fails to meet minimum requirement.	Site map and photographs with key features labelled; orientation, access, surrounding buildings, sun path, prevailing wind.	Detailed site map with key features labelled, orientation, access, surrounding buildings, sun path, prevailing wind. Constraints of the site are identified and solutions proposed.
3.2: Investigate planning protocol.	No evidence submitted or fails to meet minimum requirement.	Relevant aspects of national and local planning policy are identified.	Relevant aspects of national and local planning policy are identified and then an explanation of how their building will support these policies.
3.3: Explain the principles of legislation relevant to the project.	No evidence submitted or fails to meet minimum requirement.	At least 5 pieces of legislation have been described and the relevance to their project identified in terms of what needs to be considered.	All relevant legislation has been explained in terms of the considerations required for their project.
3.4 Generate ideas, carry out a feasibility study, and present the results.	No evidence submitted or fails to meet minimum requirement.	Simple feasibility study that describes the need for their building in terms of, function, quality, policy, budget, programme.	A detailed feasibility study explaining how the project is feasible in ALL respects and should cover function, quality, policy, budget, programme, team, and the way forward.
3.5: Make a modifications and developments and a judgement on project viability based on evidence.	No evidence submitted or fails to meet minimum requirement.	Feedback obtained from multiple sources and presented in the portfolio. Statement on the viability of the project.	Feedback obtained from multiple sources and presented in the portfolio. Statement on the viability of the project. Identified any changes they make to the building based on this feedback and stated why this is an improvement.
3.6: Explain how the building design helps minimise energy use.	No evidence submitted or fails to meet minimum requirement.	Simple environmental and sustainability strategy produced, comprising a series of criteria annotated with diagrams and images that demonstrate an understanding of different green/ renewable technologies and passive measures that could potentially be incorporated into their building	Detailed environmental and sustainability strategy produced, comprising a series of criteria annotated with diagrams and images that demonstrate an understanding of different green/ renewable technologies and passive measures that could potentially be incorporated into their building.
Learning outcome 4: Be able to draft a project plan			
Points	0	1-2	3-4
4.1: Create a draft project plan.	No evidence submitted or fails to meet minimum requirement.	Simple project plan that outlines the vision of the building, what the building aims to be and a short, medium and long term strategic plan. A simple Gantt chart that includes the main stages of the project.	Detailed project plan that outlines the vision of the building, what the building aims to be and a short, medium and long term strategic plan.

4.2: Match job roles and responsibilities to the construction professionals required for the project.	No evidence submitted or fails to meet minimum requirement.	Simple resource plan that allocates specific tasks to members of the team and establishes clear lines of communication and key points of contact.	Detailed resource plan that allocates specific tasks to members of the team and establishes clear lines of communication and key points of contact.
4.3: Create an Organogram for the project.	No evidence submitted or fails to meet minimum requirement.	Simple explanation of what each role entails and how they relate to each other, along with how they are pivotal to the project.	Detailed explanation of what each role entails and how they relate to each other, along with how they are pivotal to the project.
4.4: Estimate the lifespan of the completed project.	No evidence submitted or fails to meet minimum requirement.	Simple research into the lifespan of a building and applying knowledge found to project to produce a lifespan estimate	Detailed research into the lifespan of a building and applying knowledge found to project to produce a lifespan estimate.
4.5: Outline facilities requirements and calculate the facilities management costs.	No evidence submitted or fails to meet minimum requirement.	Simple forecast produced of costs related to operational requirements including energy costs, building maintenance and health and safety checks.	Detailed forecast produced of costs related to operational requirements including energy costs, building maintenance and health and safety checks.
4.6: Take account of environmental considerations in planning and delivering the project.	No evidence submitted or fails to meet minimum requirement.	Energy model used to test the energy efficiency of the building with at least 2 suggestions for improvement identified.	Energy model used to test the energy efficiency of the building with more than 2 suggestions for improvement explained.

Unit 2: Developing a sustainable construction project.			
Learning outcome 1: Be able to develop a feasible and technical proposal			
Points	0	1-2	3-4
1.1: Prepare design concepts that communicate ideas.	No evidence submitted or fails to meet minimum requirement.	Simple 3D representation of project with description. Multiple 3D images representing product with a description for each.	Multiple formats used (such as sketches, paintings, collages, 3D computer models, photographs and images of precedents) to communicate the learner's ideas in a clear manner.
1.2: Present the quality of the proposal to a client.	No evidence submitted or fails to meet minimum requirement.	Clear and well-presented presentation that addresses if the project will meet their design brief, all end users will be satisfied.	Clear and well-presented presentation that addresses if the project will meet their design brief, all end users will be satisfied, will the design contribute to the efficiency of the building, and can individuals easily navigate the building. The presentation should also include sections explaining circulation, fire exit placement and window placement.
1.3: Communicate a technical design proposal to the project team.	No evidence submitted or fails to meet minimum requirement.	Concept technical design worked into a simple proposal. Services identified on the floor plan.	Concept technical design worked into a coherent proposal. Services identified on the floor plan.
1.4: Identify procurement options related to key elements of the project.	No evidence submitted or fails to meet minimum requirement.	Multiple targets set out, life cycle of most of the products established with a simple review of the social, economic and environmental impact of obtaining these materials.	Multiple targets set out, life cycle of most of the products established with a detailed review of the social, economic and environmental impact of obtaining these materials.
Learning outcome 2: Be able to produce technical support collateral for a project			
Points	0	1-2	3-4
2.1: Present and annotate the 3D representations of the building project.	No evidence submitted or fails to meet minimum requirement.	Simple 3D concept. Identifies features.	Detailed 3D concept clearly labelled. Explains some of the defining features.
2.2: Utilise the 3D environment to test the design in virtual locations.	No evidence submitted or fails to meet minimum requirement.	Exact location for their building identified by address or latitude and longitude. Simple energy/solar/wind analysis. Consider situation, orientation, impact of adjacent buildings and agree the most suitable positioning for optimum solar gain and seasonal thermal performance in relation to the sun's path.	Exact location for their building identified by address or latitude and longitude. Detailed energy/solar/wind analysis. Consider situation, orientation, impact of adjacent buildings and agree the most suitable positioning for optimum solar gain and seasonal thermal performance in relation to the sun's path.

2.3: Establish the lighting requirements for the project	No evidence submitted or fails to meet minimum requirement.	Simple exploration of lighting. Descriptions of the different types of lights. Delves into the most sustainable type of bulb with regards to energy use and maintenance costs. Suitable lighting solution suggested for building.	In-depth exploration of lighting. Explanation of the different types of lights. Delves into the most sustainable type of bulb with regards to energy use and maintenance costs. Suitable lighting solution suggested for building. Annotated floor plan that illustrates the different lighting levels needed and the most appropriate alternative
2.4: Produce detailed, scaled drawings that can form the basis of a planning application.	No evidence submitted or fails to meet minimum requirement.	Series of simple scale drawings: Locations, site plan, elevations and floor plan.	Series of detailed scale drawings: Locations, site plan, elevations and floor plan.
2.5: Describe the key features that form the basis of a planning application.	No evidence submitted or fails to meet minimum requirement.	Key features of a planning application described.	Key features of a planning application and a design and access statement described.
2.6: Calculate the likely cost of the project.	No evidence submitted or fails to meet minimum requirement.	Detailed report on the costs associated with the building. Reported in appropriate units.	Detailed report on the costs associated with the building. Reported in appropriate units. Details of costings for individual materials.
Learning outcome 3: Be able to support development of a project concept			
Points	0	1-2	3-4
3.1: Explain the importance of compatibility between existing infrastructure and the project proposals.	No evidence submitted or fails to meet minimum requirement.	Identification of existing infrastructure around their project site and simple improvements suggested that could be made to help contribute to the building's success.	Identification of existing infrastructure around their project site and detailed improvements suggested that could be made to help contribute to the building's success.
3.2: Explain the environmental and climate change reduction strategies.	No evidence submitted or fails to meet minimum requirement.	Simple strategy proposed to combat climate change and environmental impact. Local environmental regulations reported on.	Detailed strategy proposed to combat climate change and environmental impact. Local environmental regulations reported on.
3.3: Monitor the execution of the plan to ensure	No evidence submitted or fails to meet minimum requirement.	Simple compliance list that is used to support the future of the project, so it keeps with the agreed principles, standards, specifications and functionality.	Detailed compliance list that is used to support the future of the project, so it keeps with the agreed principles, standards, specifications and functionality.

compliance with client requirements, taking appropriate action where necessary.			
3.4: Establish strategies for the proposed construction that support health and safety, occupancy, management and operation.	No evidence submitted or fails to meet minimum requirement.	Simple health and safety plan produced detailing potential concerns, along with actions that could be taken at all stages of a building's lifecycle.	Detailed health and safety plan produced detailing potential concerns, along with actions that could be taken at all stages of a building's lifecycle.
3.5: Identify energy efficiency strategies and how they will be achieved.	No evidence submitted or fails to meet minimum requirement.	At least 3 different energy efficiency strategies described.	Four or more strategies for energy efficiency explained in terms of how they will be achieved, the technology used and the impact they will have.
3.6: Inform planning through collaborative working groups.	No evidence submitted or fails to meet minimum requirement.	Simple communication action plan outlining what needs to be communicated, who will communicated this, who will receive this, how frequent communications are to be and the appropriate delivery method.	Detailed communication action plan outlining what needs to be communicated, who will communicated this, who will receive this, how frequent communications are to be and the appropriate delivery method.

Unit 3: Delivering a sustainable construction project			
Learning outcome 1: Be able to deliver a project			
Points	0	1-2	3-4
1.1: Identify potential problems to ensure mistakes are avoided.	No evidence submitted or fails to meet minimum requirement.	Identification of potential problems that may arise. Statement on why this would be a problem.	Identified and explained potential problems that may arise and if left unchecked what problems they could cause. They have identified who they may need to communicate with to resolve these problems.
1.2: Identify potential problems and the action that was taken.	No evidence submitted or fails to meet minimum requirement.	Simple risk assessment of design. Describe a problem that they identified in their design and what action was taken.	Detailed risk assessment of design. Describe 2 or more problems they identified in their design, what action they took and how this will impact on the design.
1.3: Identify construction specialists and what they will be needed for.	No evidence submitted or fails to meet minimum requirement.	Specialists identified such as architect, cost consultant, services engineer, structural engineer. Simple explanation on what they will be needed for.	Specialists identified such as architect, cost consultant, services engineer, structural engineer. Detailed explanation on what they will be needed for.
1.4: Monitor progress in consultation with peers.	No evidence submitted or fails to meet minimum requirement.	Consulted with peers and feedback given. Simple report given.	Consulted with peers and feedback given. Moderation and improvements to the project design reported.
1.5: Ensure the project is developed on time and to budget.	No evidence submitted or fails to meet minimum requirement.	A description of how their project will be delivered on time and on budget. At least one possible issue identified.	A detailed description of how their project will be delivered on time and on budget. An explanation of the different factors that could affect this.
Learning outcome 2: Be able to respond to technical issues			
Points	0	1-2	3-4
2.1: Provide a 3D model to test the design.	No evidence submitted or fails to meet minimum requirement.	Multiple models tested with findings explained. Outline successful and unsuccessful changes.	Multiple models tested with findings explained. Outline successful and unsuccessful changes and how they impacted design.
2.2: Validate the design against the brief using a technical investigation.	No evidence submitted or fails to meet minimum requirement.	Simple systematic approach and successful technical investigation of project.	Detailed systematic approach and successful technical investigation of project.
2.3: Ensure that the project	No evidence submitted or fails to meet	Multiple regulations taken into account, considerations for each	Multiple regulations taken into account, a minimum of 3

complies with building regulations as it progresses.	minimum requirement.	regulation and actions reported if needed.	considerations for each regulation and actions reported if needed.
2.4: Explain how the building works in practice.	No evidence submitted or fails to meet minimum requirement.	Simple description of how the building is suitable for intended use, built to last, adaptability, safe to construct and occupy, contributes to its context and is aesthetically pleasing.	Detailed description of how the building is suitable for intended use, built to last, adaptability, safe to construct and occupy, contributes to its context and is aesthetically pleasing.
2.5: Review progress and reflect on decisions.	No evidence submitted or fails to meet minimum requirement.	Simple summary exploring how the project has evolved, outlines key decisions and explains why they were made. Learners suggest 3 or more improvements based on technical issues and their solutions.	Detailed summary exploring how the project has evolved, outlines key decisions and explains why they were made. Learners suggest 3 or more improvements based on technical issues and their solutions.
2.6: Conduct a peer review and respond appropriately.	No evidence submitted or fails to meet minimum requirement.	Evidence of peer review and feedback.	Evidence of peer review, feedback and improvements/modifications made in response.

Unit 4: Evaluating a sustainable construction project			
Learning outcome 1: Be able to test the final design against original intentions			
Points	0	1-2	3-4
1.1: Explain how the building works so a user knows how to optimise performance.	No evidence submitted or fails to meet minimum requirement.	Simple evaluation of the practical aspects of a building related to the end user's behaviour.	Detailed evaluation of the practical aspects of a building related to the end user's behaviour.
1.2: Explain how well final outcomes meet original intentions.	No evidence submitted or fails to meet minimum requirement.	Outline original criteria. A simple statement on the strengths and weaknesses of the final design and identifies whether the original intentions were met.	Outline original criteria. Detailed strengths and weaknesses of the final design and identifies whether the original intentions were met.
1.3: Evaluate feedback and use it as a basis for improvements in future projects.	No evidence submitted or fails to meet minimum requirement.	Briefly summarises feedback and discusses how learner might approach a future project with this in mind.	Detailed summary of feedback and discusses how the learner might approach a future project with this in mind.
1.4: Analyse data and use it as evidence to inform evaluation.	No evidence submitted or fails to meet minimum requirement.	Evidence of data being used to inform decisions in the project.	Evidence of data being used to inform decisions in the project and improve the design.
1.5: Use data to forecast the long term performance of the building in terms of energy usage.	No evidence submitted or fails to meet minimum requirement.	A simple forecast on the future performance of the building, outlining potential energy costs based on building use and environmental conditions.	Detailed forecast on the future performance of the building, outlining potential energy costs based on building use and environmental conditions.
Learning outcome 2: Be able to transfer project evaluation to other contexts.			
Points	0	1-2	3-4
2.1: Identify issues in an existing building.	No evidence submitted or fails to meet minimum requirement.	Identification of a local building. Multiple building issues stated in relation to the end user and sustainability.	Identification of a local building. Multiple building issues detailed in relation to the end user and sustainability.
2.2: Make recommend-ations to improve	No evidence submitted or fails to meet minimum requirement.	List of recommendations. Details how they will improve the building.	Recommendations detailing why they will help. Outlines both financial and environmental impact of these.

existing buildings.			
2.3: Carry out a qualitative audit reporting on aesthetics and sensory experiences of users.	No evidence submitted or fails to meet minimum requirement.	Statement on experiences of users.	Explains how results was acquired and explains what results show.
2.4: Present the building project to a professional audience.	No evidence submitted or fails to meet minimum requirement.	A presentation with concern to the building project has been produce and presented.	Excellent presentation. Concise and hits key points. Answers questions when asked.