Gold - Unit 2 - Developing a Sustainable Construction Project

Relevant LINKS

BACK TO BIM UNITS **[1]**

Overview

This is the ability to understand and define a construction project with particular emphasis on what is required to make it sustainable over a reasonable period of time. Some understanding and appreciation of the impact on the wider community will also need to be in evidence. The main issues will need to be presented clearly to all stake-holders, and where appropriate, solutions to issues will need to be found before progressing.
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the software tools and functions will be predetermined or commonly used; and
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Main areas covered will include, but not be limited by:

- the ability to research materials and functions
- the understanding and application of local and national guidelines
- ability to present information and attend relevant meetings to support the process

Example of context: Proposing a local construction project, such as an eco friendly classroom for a primary school.

Activities supporting the assessment of this award

Assessor's guide to interpreting the criteria

General Information

QCF general description for Level 2 qualifications

- Achievement at QCF Level 2 (EQF Level 3) reflects the ability to select and use relevant knowledge, ideas, skills and procedures to complete well-defined tasks and address straightforward problems. It includes taking responsibility for completing tasks and procedures and exercising autonomy and judgement subject to overall direction or guidance.
- Use understanding of facts, procedures and ideas to complete well-defined tasks and address straightforward problems. Interpret relevant information and ideas. Be aware of the types of

information that are relevant to the area of study or work.
- Complete well-defined, generally routine tasks and address straightforward problems. Select and use relevant skills and procedures. Identify, gather and use relevant information to inform actions. Identify how effective actions have been.
- Take responsibility for completing tasks and procedures subject to direction or guidance as needed.

Requirements

- Standards must be confirmed by a trained Gold Level Assessor or higher
- Assessors must at a minimum record assessment judgements as entries in the on-line mark book on the INGOTs.org certification site.
- Routine evidence of work used for judging assessment outcomes in the candidates' records of their day to day work will be available from their e-portfolios and on-line work. Assessors should ensure that relevant web pages are available to their Account Manager on request by supply of the URL.
- When the candidate provides evidence of matching all the criteria to the specification subject to the guidance below, the assessor can request the award using the link on the certification site. The Account Manager will request a random sample of evidence from candidates' work that verifies the assessor's judgement.
- When the Account Manager is satisfied that the evidence is sufficient to safely make an award, the candidate's success will be confirmed and the unit certificate will be printable from the web site.
- This unit should take an average level 2 learner 40 hours of work to complete.

Assessment Method

Assessors can score each of the criteria N, L, S or H. N indicates no evidence. L indicates some capability but some help still required. S indicates that the candidate can match the criterion to its required specification. H indicates performance that goes beyond the expected in at least some aspects. Candidates are required to achieve at least a S on all the criteria to achieve the full award. Once the candidate has satisfied all the criteria by demonstrating practical competence in realistic contexts they achieve the unit certificate.

Expansion of the assessment criteria

1. The candidate will be able to develop feasible proposals from needs analysis.

1.1 I can prepare concept diagrams to describe and communicate ideas

Candidates will understand the need to clearly describe their ideas in a short presentation that can very quickly convey the whole project.
Evidence: Visual presentation containing a series of annotated diagrams and drawings in portfolios.

Additional information and guidance
Candidates will use analytical skills in order to evaluate their work and distil the project into a series of “key moves” described by diagrams. It is imperative that these diagrams communicate the essence of the project and at this stage, do not refer to unnecessary detail. The process should be simple, methodical and the approach should be that the client knows nothing about the project.

Candidates should also be aware that this presentation is an opportunity to impress. Remember, it is your client’s money that you are spending!

Have conviction in your ideas and inspire them.

1. What is your USP (unique selling point) / BIG idea that underpins this project?
2. Why should your client invest in YOU and YOUR VISION?
3. What makes YOUR ideas innovative and ground-breaking?

1.2 I can present the quality of the proposal to a client

Candidates will demonstrate that their proposal is of high quality in all respects.

Evidence: Verbal and visual presentation / use of communication skills documented and/or stored in portfolios.

Additional information and guidance
Candidates should establish ways to measure quality and against agreed standards (which may be derived from the students' own). The Commission for Architecture and the Built Environment (CABE) [2] offers general guidance.

- Meeting the brief - Will the accommodation proposed meet the functional needs of the brief?
- Users - Is it likely that the building's users – of all kinds – will be satisfied with the design?
- Operations - Is the design likely to enhance the efficiency of the operations to be contained in the building?
- Orientation - Can a stranger or visitor find the entrance and then find their way around the building? Is orientation clear enough not to need signs or maps?
- Coherence - Are the plans, sections, elevations and details all of a piece, visibly related to each other and to underlying design ideas?
- Design process - Does the design demonstrate that thinking about the requirements of the buildings structure and construction and environmental services has been an integral part of the design process? Is there evidence that the different design disciplines are working as a team?
- Flexibility - Will the building be easy to adapt or extend when the requirements of the building's users change? Are the floor plates suitable for other uses in the future?
- Whole-life costs - Does the design take into account whole-life costs?
- Over time - What will the project look like in different conditions: in sun and rain; at night; over the seasons? Will it age gracefully?
- Setting - Can one imagine the building becoming a cherished part of its setting?

Sector specific guidance can also be found relating to particular building types:. For example: education [3].

1.3 I can communicate the concept design to the project team

Candidates will effectively communicate the design to team members.
Evidence: Briefing documents in portfolios.

Additional information and guidance
An architect requires the client's approval (known as 'sign off') to progress beyond concept stage to delivering a more detailed set of proposals. It is important that the client's comments are appropriately acknowledged and that any changes or issues are addressed. before moving on to the next stage.

The concept design can then be worked up into coherent proposal that provides a basis for team briefing. Information must be clear and concise so colleagues can undertaking their required tasks. Candidates should pay particular importance to briefing the structural engineer as it is critical that they fully understand the design intent at this early stage. It is their job to ensure your building will stand up so any misunderstanding could result in significant problems later in the project.

1.4 I can identify procurement options related to key elements of the project

Candidates will understand the alternatives for procurement related to key elements of the project
Evidence: Portfolios.

Additional information and guidance
Candidates need to consider Procurement in terms of social, economic and environmental responsibility in order that the client doesn't just get "a building" but that they get the best possible building within the project constraints. Targets and actions for the entire project (including the whole life of the building) should be clearly communicated between the client, the project team, the contractor and the supply chain. Strong leadership here is critical when sustainability is to be the overarching theme. The UK government's Sustainable Procurement National Action Plan provides greater guidance, and includes initiatives to:

1. reduce waste, carbon emissions, energy and water consumption
2. protect biodiversity
3. stop the buying of timber from unsustainable sources
4. support fair and sustainable economic growth
5. deliver social benefits through procurement

Another excellent resource regarding industry and sustainable procurement can be found here [4].

2. The candidate will produce technical support collateral for a project.

2.1 I can prepare 3D representations of outline information

Candidates will create a 3D model using industry software.
Evidence: Building Model, portfolio evidence.

Additional information and guidance
Candidates can choose their own preferred method to create a concept model. Emphasis must be on detailed thinking, creating a "kit of parts" where each component has a clear purpose and provenance.

2.2 I can utilise the 3D environment to test the design in virtual locations

Candidates will use industry software to test their design in virtual locations.
Evidence: Report and portfolio evidence.

Additional information and guidance
Using industry software, Candidates 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.Candidates will use industry software to test their design in virtual locations.

2.3 I can use quantitative methods to establish the energy requirements, and a lighting strategy.

Candidates will assess energy efficiency potential and suggest an appropriate lighting strategy based on measurements and quantities.

Evidence: Report and portfolio evidence.

Additional information and guidance
Lighting must be thought of in terms of functional/task lighting, necessity/emergency/safety lighting and from a creative viewpoint in terms of how lighting can enhance the architecture. Candidates should consider alternatives to the obvious lighting hanging from the ceiling, and also ascertain the most efficient light bulb for their particular lighting system calculating potential energy savings and costs in bulbs. Candidates should explore types of lighting and understand how this impacts on the building energy use and maintenance costs. How is brightness measured and how does it relate to perception?

This [5] is a useful background on lighting and how we perceive it.

2.4 I can prepare detailed, scaled drawings that can form the basis of a planning application.

Candidates will prepare appropriate drawings for a planning application.
Evidence: portfolio evidence.

Additional information and guidance
Candidates should have a clear understanding of the types of document that needs 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 tress on site. Candidates should be aware of Tree Protection Orders (TPO). The (compass) north point and scale should always be shown clearly on the plan. Candidates 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. A Design and Access Statement may also be required.
For more information see here [6] and also here [7]:

2.5 I can describe the project in writing to form the basis of a planning application.

Candidates will use appropriate language to describe the project to form the basis of a planning application.
Evidence: Example documents in portfolios.

Additional information and guidance
Candidates should establish the type of planning permission they require as there are a number of types for example domestic/household, conversion, listed building,

Guidance can be found here [8]:

The project description should be clear and concise with sufficient detail. 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 (e.g. where you will situate a bin). A non-residential application will require more details. Planning applications are generally submitted online, and candidates are encouraged to obtain example applications. Further information can be found here [9].

2.6 I can produce a financial model of the budget that aggregates the

elemental costs of the project

Candidates will produce a baseline costing of the project in the form of a model that can be used to aggregate components and experiment with different component costs.
Evidence: Report in portfolios.

Additional information and guidance
Using software tools, Candidates 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. Candidates should be encouraged to discuss the significance of complete data in producing reliable costings.

3. The candidate will support development of a project concept.

3.1 I can explain the importance of compatibility between existing infrastructure and the project proposals

Candidates will identify existing infrastructure and outline how their project is compatible with it.
Evidence: Report in portfolios.

Additional information and guidance
Infrastructure is the basic physical systems of a country's or community's population, including roads, transport systems, utilities, water, sewage, etc. New buildings should benefit the people who will use them in terms of appeal, health (e.g. 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. Consideration should be given as to whether the building or structure can be re-purposed after it’s proposed ‘useful’ life.

3.2 I can explain the environmental and climate change reduction strategies

Candidates will be able to demonstrate the green credentials of their proposal.
Evidence: Illustrated environmental strategy report

Additional information and guidance
Candidates should outline their objectives and expectations, and clearly iterating how their low carbon measures are sensitive to the environment and cost effective. They should determine how they will record, review and evaluate their recommendations.
Candidates should consider existing local environmental regulations and building codes, and whether there are existing or complimentary programmes which can support their aims. Candidates should be able to prioritise environmental proposals based on the location of their chosen building (for example if the building is by a river, particular attention might be paid to waste management and potential pollutants). The report should focus on all areas of environmental impact including waste, water, energy, transport, supply chain, etc. It may also include a strategy for the community and how they will encourage a cooperative approach to encourage good environmental practice and positive attitudes.

3.3 I can monitor the execution of the plan to ensure compliance with client requirements taking appropriate action where necessary

Candidates will undertake and record scheduled project compliance checks
Evidence: Compliance checklist, record and recommendations.

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Additional information and guidance
Regular meetings with the client are necessary to ensure compliance. Candidates should prepare a 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). This list should clearly support the future direction of the project adhering to agreed principles, standards, specifications and functionality. Preparing a compliance list aims to highlight errors quickly and easily, thereby reducing costs and delays due to unforeseen changes as the project develops.

3.4 I can establish strategies for the proposed construction that support health and safety, occupancy, management and operation

Candidates will formulate a plan to eliminate hazards and minimise risk to health and safety.
Evidence: Construction (Design and Management) (CDM) Plan and designers' risk assessments.

Additional information and guidance
Candidates must demonstrate that they have taken reasonable steps to ensure health and safety is of paramount importance throughout the life cycle of the building, and that a collaborative coordinated approach with others involved in the building can only support the management and control of risk. Preparation of a 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, e.g. working at height, vehicles, power, structure instability (especially concerning excavations, refurbishment of existing buildings, etc), slips trips and falls and project specific hazards (fire etc). Candidates can refer to the ERIC model (Eliminate, Reduce, Inform, Control). Health hazards may include those incurred through lifting, exposure to excessive noise, vibration, hazardous materials, dust, vermin and other animal derived hazards, contaminated land, etc.

Candidates should refer to:

Construction (Design and Management) Regulations 2015 (CDM 2015)
Construction (Design and Management) Regulations 2007 (CDM 2007)
Health and Safety at Work Act 1974

3.5 I can relate building design specification to energy efficiency

Candidates will describe the energy efficient characteristics of their building designs
Evidence: Overview report

Additional information and guidance
Candidates 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 energy efficient materials, technologies, resources and systems, use of natural resources, and the way their building promotes and sustains positive end user behaviour.

3.6 I can inform planning through collaborative working groups

Candidates will produce an action plan to implement effective collaboration throughout a construction project
Evidence: Concise report

Additional information and guidance
Candidates will outline their methodology to ensure communication of the project plan and processes to all team members, and to promote and facilitate effective collaboration throughout the construction project.

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Moderation/verification

The assessor should keep a record of assessment judgements made for each candidate guided by the above guidance. Criteria should be interpreted in the context of the general descriptors of QCF Level 2 qualifications. They should make notes of any significant issues for any candidate and be in a position to advise candidates on suitable routes for progression. They must be prepared to enter into dialogue with their Account Manager and provide their assessment records to the Account Manager through the on-line mark book. They should be prepared to provide evidence as a basis for their judgements through reference to candidate e-portfolios.
Before authorising certification, the Account Manager must be satisfied that the assessor's judgements are sound. In the event of missing evidence, the assessor will be requested to gather appropriate information before the award can be made.

Links
[1] https://theingots.org/community/BIM_qualification_info_units
[2] http://www.designcouncil.org.uk/our-work/CABE/Pulicatbions-resources/What-makes-a-good-project/
[3] http://www.education.gov.uk/schools/adminandfinance/schoolscapital/buildingsanddesign/baseline?page=2
[4] http://www.ciria.org/service/Web_Site/AM/ContentManagerNet/ContentDisplay.aspx?Section=Web_Site&ContentID=19278
[5] http://www.cns.nyu.edu/~david/courses/perception/lecturenotes/brightness-contrast/brightness-contrast.html
[6] http://www.planningportal.gov.uk/
[7] https://www.gov.uk/government/publications/planning-applications-information-requirements-and-validation
[8] http://www.planningportal.gov.uk/planning/applications/howtoapply/permissiontypes
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