Gold - Unit 1 - Defining 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.
Word processing tools and techniques will described as ‘basic’ because:

the software tools and functions will be predetermined or commonly used; and
the techniques needed for text entry, manipulation and outputting will be straightforward or routine

Word processing tools and techniques will described as ‘basic’ because:

the software tools and functions will be predetermined or commonly used; and
the techniques needed for text entry, manipulation and outputting will be straightforward or routine.Word processing tools and techniques will described as ‘basic’ because:
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 understand a client's needs

1.1 I can identify the contextual needs of a client

Candidates should be able to identify the location, building type and end users.
Evidence: from assessor observations, video/recorded discussion in the context of a client meeting and written evidence in portfolios.

Additional information and guidance
Candidates should be encouraged to role play the architect/client relationship and define the project parameters. A member of the local community can provide a more realistic response to a mock interview/meeting. Learners should prepare a checklist of items to be discussed with the client. Level 2 learners should demonstrate some degree of independence and autonomy.

1.2 I can record project requirements and client expectations

Candidates should be able to provide a written summary outlining the project brief, reaffirming the role of the architect and what he or she will contribute.

Evidence: from check lists, written report and covering letter to the client in portfolios.

Additional information and guidance
Candidates will summarise their meeting with the client, outlining the skills and services he will provide, the high level goals of the project, and setting the scene for the design. Learners should demonstrate and open, collaborative process with their client, remembering that the relationship is a two way process and therefore requiring a written response to proceed. There should therefore be a formal invitation to the client to agree that items on the checklist are accurately represented in the report and nothing has been missed.

1.3 I can understand the requirement to establish a budget in relation to the agreed client's needs.

Candidates should be able to evidence research into construction project costs specific to their client's building type.

Evidence: from assessor observation and written documentation in portfolios.

Additional information and guidance
Learners will demonstrate research skills using the internet and other methods, e.g. contact with local professionals, sending questionnaire to design and construction organisations. Learners should demonstrate how they have attempted mathematically to establish what a building might cost.

2. The candidate will be able to formulate a project brief

2.1 I can outline the functional requirements of the project

Candidates should be able to present a schedule of accommodation which includes size of rooms/spaces, areas, adjacencies, circulation etc.
Evidence: From written and graphical reports in portfolios.

Additional information and guidance
Candidates should be able to define the spatial requirements of their building and determine 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), the relationship of one space to another, functionality and use of each room, but must demonstrate good and bad examples of this.

2.2 I can establish quality objectives for the project

Candidates should be able to present a vision for their project in terms of design, durability, elegance, efficiency and how the building will improve people's lives. They should define what the building will do, how it will perform, the problems it will solve and how the wider community will benefit.
Evidence: From an illustrated report in portfolios.

Additional information and guidance
Learners will present a precedent study evaluating similar buildings using set criteria. A vision document will contain images, drawings, sketches, ideas and written aspirations.

2.3 I can set the sustainability aspirations of the project

Candidates should be able to present a vision for their building in terms of social, environmental and economic principles.
Evidence: From an illustrated report in portfolios.

Additional information and guidance
Candidates will present a strategy that will make their building sustainable.

3. The candidate will understand the constraints on the project

3.1 I can identify constraints associated with the site location and present solutions

Candidates will identify any potential issues or questions relating to the site chosen ensuring they address the potential environmental and community concerns.
Evidence: Report and check list, annotated diagrams in portfolios e.g. site survey drawing.

Additional information and guidance
Candidates should identify potential issues to help them through the planning process, and also engage with the local community. Early identification of problems leads to better quality planning, and better public engagement. They might consider marking issues on a site plan, particularly as a graphical representation might be easier for the community to comprehend. They can present an additional ‘site analysis’ study comprising a series of annotated diagrams that investigate and record the key characteristics of the site. Candidates should understand the need for a professionally measured site survey in order to establish the exact size of the chosen site, the exact location of site boundaries and physical constraints and plot any changes in level that will impact on their proposals.

Candidates will consider issues such as

- Orientation, aspect, exposure - why is it so important to know which direction your site faces? how might this be fundamental to the future energy use of your building?
- topography, geography and geology - how might we use maps to help us understand the location we have chosen. What existing utilities impact the design? How might the rock formations or ground conditions below your site potentially have a bearing on your design? Who will provide this information for us?
- prevailing wind and microclimate - does this site or do the immediate surroundings have particular weather patterns that make this location more or less suitable for your building? Is it prone to regular or repeated episodes of extreme weather? How might this inform your design?
- surrounding buildings and local context / vernacular - is there a specific style of architecture or use of materials that defines this place or site that we need to respond to or respect? What about existing building levels/height restrictions?
- transport and infrastructure - is your site well connected to the local community, amenities and services or do they need to be improved? Why is it so important to consider ALL modes of transport?
- accessibility - are there physical site characteristics that may result in access limitations for certain users? Do they have a bearing on where we might access the building from or locate entrances?

Good site analysis is more than what you see or get from just taking photographs. Learners will apply a critical eye if they are to really understand the site and significance of keys features. Team working and sharing of resources should be encouraged. Physical model making using layers of card to represent contours could help understanding of topography.

3.2 I can test initial ideas against planning protocol

Candidates will understand how their proposal responds to planning policy and where potential conflicts may exist that may impact on the project brief.
Evidence: evidence in portfolios.written

(function(i,s,o,g,r,a,m){i['GoogleAnalyticsObject']=r;i[r]=i[r]||function(){ (i[r].q=i[r].q||[]).push(arguments)},i[r].l=1*new Date();a=s.createElement(o), m=s.getElementsByTagName(o)[0];a.async=1;a.src=g;m.parentNode.insertBefore(a,m) })(window,document,'script','//www.google-analytics.com/analytics.js','ga'); ga('create', 'UA-46896377-2', 'auto'); ga('send', 'pageview');

Additional information and guidance
Candidates will create a 'planning statement' study outlining how their proposal will conform to and respond to particular areas of policy. The planning process can be quite lengthy, however the 'National Planning Policy Framework', which sets out the government's planning policies for England, is an important part of the government's reforms to make the planning system less complex easier to understand. It vastly reduced the number of policy pages about planning. The Framework sets out planning policies for England and how they are expected to be applied. It provides guidance for local planning authorities and decision-takers, both in drawing up plans and making decisions about planning applications [2].

It is important that candidates understand the need to involve the wider community in the process and the introduction of the 'Localism Act' and the new 'Neighbourhood Planning' framework empowers communities to have their say regarding development in their neighbourhoods. A guide to the Act and the powers of communities can be found here [3].

If a construction project is classed as a 'major development' it is crucial that the community is involved at an early stage. There may be more evidence required, in particular an environmental impact assessment, a transport study which outlines the impact the site entry and exit will have on existing roads and traffic volumes, and a design & access statement, which outlines the suitability of the design for the particular site, and how users will access it.

Large scale developments often include a commitment from the developer to provide community services such as providing a park for local children. This is called a Section 106 agreements and is a powerful, legally binding agreement between a local council and developer to improve the local area.

Major developments can include:

- Housing developments of more than 10 dwellings
- Housing development on a site of 0.5 hectares or more
- Any other development with a floor area of 1000 m 2
- Any other development on a site of 1 hectare or more
- Waste development or mineral working

Planning applications must also be decided in accordance with the Local Development Framework (LDF), and information regarding this can be found at here [4].

Candidates should consider location specific policy - is the site situated in a green belt, or conservation area? It may be close to listed buildings (or indeed is the proposed project a refurbishment of a listed building?) or be situated in a Site of Special Scientific Interest (SSSI) which gives legal protection to local wildlife and specific geological formations.

3.3 I can explain the principles of legislation relevant to the project

Candidates will understand that planning legislation must be adhered to and all projects are bound by its principles.
Evidence: written evidence in portfolios.

Additional information and guidance
The Planning process is wide ranging and can be extensive. Candidates can find significant information via the government planning website [5], and key points are noted below.

There is a difference between a planning application being approved, and a building being constructed with the health and safety of the end users in mind. Building Regulations approval sets out design standards that focus on issues of health, safety, energy efficiency and disability access. It may also be necessary to notify the Health and Safety Executive (HSE) and may have other duties as well under the Construction (Design and Management) Regulations 2007 (CDM 2007) [6].

Sustainability and the local community should always be the main focus in the development of a construction project and there are a number of Acts and national guidelines to follow.

Natures and Wildlife:

- A Tree Preservation Order (TPO) is used to protect important trees and planning authorities can impose a very large fine for anyone who cuts down or destroys a tree without permission to do so
- The Wildlife and Countryside Act 1981 protects animals, plants and habitats with special protection for particular species e.g. bats, great crested newt - see here [7].

Environmental Policies:

BREEAM (Building Research Establishment Environmental Assessment Method and the Code for Sustainable Homes sets the standard for best practice in sustainable building design, construction and operation. The measures used represent a broad range of categories and criteria and include aspects related to energy and water use, the internal environment (health and well-being), pollution, transport, materials, waste, ecology and management processes. Much of this criteria is covered at Level 1. More information about BREAMM can be found at the site [8]. There are also a number of local Waste Management policies which should be adhered to.

Also consider:

The Disabled Persons Act 1981 and Disability Discrimination Act 1995 ensures that the needs of disabled persons are provided for in any development schemes

The Equality Act 2010 ensures that local planning policies need to take into account the particular needs of women, young people and children, older people, ethnic minorities, children and disabled people.

The Party Wall Act 1996 prevents and resolves disputes in relation to party walls (walls of adjoining dwellings e.g. semi detached houses and terraces), boundary walls and excavations near neighbouring buildings.

Right to Light - a private, legally enforceable easement or right to a minimum level of natural illumination through a ‘defined aperture’, usually a window opening.

3.4 I can carry out a feasibility study and present the results

Candidates will understand the need to prove their proposals are believable, based on high quality research and fully meet the client’s brief.
Evidence: Written report and check list, annotated diagrams.

Additional information and guidance
Candidates should consider that a feasibility study is an 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, good practice for the project stages further ahead! A successful feasibility will clearly demonstrate how the project is feasible in ALL respects and should cover the following areas:

- Function - how do the proposals meet the end-user requirements identified in the project brief?
- Quality - how do the proposals meet the design aspirations identified in the project brief? Students can use precedent images, sketches and models to describe their ideas.

- Policy - how do the proposals broadly fit the relevant policies that have been identified?
- Budget - how do the proposals broadly fit the budget that has been identified?
- Programme - has an outline programme been formulated that we know to be achievable?
- Team - Are the right people with the right skills available and on-board to help us make progress?
- The Way Forward - what needs to happen next and what challenges must be overcome to enable the project to succeed?

3.5 I can make a judgement on project viability based on evidence.

Candidates will be able to apply objective thinking to assess the merits of a particular proposal against agreed criteria.
Evidence: Student designed compliance matrix.

Additional information and guidance
Candidates should be encouraged to work together in order to discuss and establish the merits of each project. The ability to develop a constructive commentary on the viability of others work whilst presenting a reasoned justification of their own are both equally valuable skills.

3.6 I can explain how the building design helps minimise energy use.

Candidates can explain how their design minimises energy use.
Evidence: Student designed criteria matrix.

Additional information and guidance
Candidates will create a set of criteria that will enable every element of their project to be interrogated through a systematic approach in order to understand how the whole building and process must be challenged 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 technologies and passive measures that
could potentially be incorporated into their building.

Whilst much information can be found through Internet research, a number of research establishments can be contacted including the UK Green Building Council [9] and Candidates should be encouraged to contact local experts via professional establishments, for example the Chartered Institute of Building Services Engineers [10] who have regional officers and a ‘young engineers’ programme, and local universities who often have specialist departments in the field of sustainable design and energy efficiency - indeed it is to be encouraged that candidates have access to such institutions.

Guidance is often found via candidates’ earlier research into precedent projects. Downloadable pdf format information is often extensive and thorough. However, there is nothing quite like a visit to an existing sustainable building or conference to inspire and motivate. For examples, see here [11] or Green Build Expo [12].

4. The candidate will be able to draft a plan.

4.1 I can create a draft project plan.

Candidates will create a draft plan including timescale, deliverables, roles and responsibilities.
Evidence: Gantt chart, project plan in portfolios.

Additional information and guidance

(function(i,s,o,g,r,a,m){i['GoogleAnalyticsObject']=r;i[r]=i[r]||function(){ (i[r].q=i[r].q||[]).push(arguments)},i[r].l=1*new Date();a=s.createElement(o), m=s.getElementsByTagName(o)[0];a.async=1;a.src=g;m.parentNode.insertBefore(a,m) })(window,document,'script','//www.google-analytics.com/analytics.js','ga'); ga('create', 'UA-46896377-2', 'auto'); ga('send', 'pageview');

The candidate should determine 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 years to come, and this will obviously impact the design. Spaces should be functional, accessible and durable, but may also need to be flexible - easily changed depending on the nature of the activity taking place. The space may need to be inspiring and allow interaction between different user groups. Certainly the space should be efficient and environmentally friendly.

Data obtained by candidates earlier in the syllabus will be useful to outline local community needs, demographics, preferences and concerns regarding the building design. The client may have a steering committee or a number of committees dependent on the size of the project, each with its own responsibility. There may also be an appointed project manager who will be responsible for the coordination and day to day running of the project. Meeting dates should be scheduled and a general project timeline established. The client and/or committee will be responsible for articulating the vision for the building and this meeting is perhaps the most important.

A number of deliverables should be established and candidates should identify the activities needed and time required to produce them. They will develop a Gantt chart which puts all tasks and estimates in a calendar and outlines each stage of the project, how much time each stage is expected to take, and when each stage is scheduled to begin and end.

Once the goals, objectives and tasks and responsibilities have been defined, the building plan can be drafted and evaluated.

4.2 I can match project planning to the human resources of the team

Candidates will understand the need for a team undertaking a large and complex project to have carefully considered project plan that targets specific expertise.
Evidence: documentation in portfolios.

Additional information and guidance
Candidates will create a resource plan that allocates specific tasks to members of the team and establishes clear lines of communication and key points of contact.

4.3 I can create an Organogram for the project

Candidates can create a human resource plan defining inter-relationships and responsibilities.
Evidence: Organogram diagram in portfolios.

Additional information and guidance
Candidates will create an annotated diagram that clearly explains the scope of each role and how they relate to one another. Think of cogs in a well oiled machine; the candidate should explain why each team member has a pivotal part to play in the successful development and delivery of the building project.

4.4 I can forecast the lifespan of the completed project

Candidates should make a forecast of the project lifespan based on evidence.
Evidence: Portfolios of evidence.

Additional information and guidance
The lifespan needs to be based on standard methods including maintenance schedules and the purpose of the building.

4.5 I can forecast facilities management costs

Candidates should forecast facilities management costs demonstrating an understanding of the most important underlying factors.
Evidence: from portfolios.

Additional information and guidance
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 fuel costs, buildings maintenance and health and safety checks.

4.6 I can take account of environmental considerations in planning

Candidates need to demonstrate an understanding environmental factors when planning their project.
Evidence: portfolios of evidence, internal testing.

Additional information and guidance
Candidates will use energy analysis and cost software to evaluate their designs for energy efficiency, carbon footprint and lighting. They will check data using mathematical calculation and comparison with precedents. Candidates will investigate ventilation, energy source, water distribution, lighting sources, electrical distribution and the impact of glazing and insulation.

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.planningportal.gov.uk/planning/planningsystem/localplans#nppf
[3] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/5959/1896534.pdf
[4] http://www.planningportal.gov.uk/planning/planningsystem/localplans
[5] http://www.planningportal.gov.uk/
[6] http://www.planningportal.gov.uk/PpWeb/jsp/redirect.jsp?url=http%3A//www.hse.gov.uk/construction/cdm/buildingcontrol.htm
[7] http://www.naturalengland.org.uk/ourwork/regulation/wildlife/species/europeanprotectedspecies.aspx#eps
[8] http://www.breeam.org/about.jsp?id =66
[9] http://www. ukgbc.org/
[10] http://www.cibse.org

[11] http://www.theguardian.com/environment/2007/nov/22/ethicalliving.renewableenergy
[12] http://www.greenbuildexpo.co.uk/