L3 - BIM - Unit 2 - Developing a Sustainable Construction Project

Overview

The candidate can prepare the design brief, including staff involved and designs, to prepare for a planning application. They will produce a detailed overview of the roles and responsibilities of those involved, including the client and devise a way to keep all parties informed. They will create a series of designs and plans to show the extend of the building including costs, energy use and other life-cycle issues of importance. They will prepare a planning feasibility stdy and explain the relevant legislation and regulations that will impact on different parts of the project, as well as how to manage these.

A work activity will typically be 'non-routine or unfamiliar' because the task or context is likely to require some preparation, clarification or research to separate the components and to identify what factors need to be considered. For example, time available, audience needs, accessibility of source, types of content, message and meaning, before an approach can be planned; and the techniques required will involve a number of steps and at times be non-routine or unfamiliar.

Example of context – candidates can investigate and prepare a feasibility planning study for their intended project.

Assessor's guide to interpreting the criteria

General Information

RQF general description for Level 3 qualifications

- Achievement at RQF level 3 (EQF Level 4) reflects the ability to identify and use relevant understanding, methods and skills to complete tasks and address problems that, while well defined, have a measure of complexity. It includes taking responsibility for initiating and completing tasks and procedures as well as exercising autonomy and judgment within limited parameters. It also reflects awareness of different perspectives or approaches within an area of study or work.
- Use factual, procedural and theoretical understanding to complete tasks and address problems that, while well defined, may be complex and non-routine.
- Identify, select and use appropriate skills, methods and procedures.
- Use appropriate investigation to inform actions.
- Review how effective methods and actions have been.
- Take responsibility for initiating and completing tasks and procedures, including, where relevant, responsibility for supervising or guiding others.
- Exercise autonomy and judgement within limited parameters information and ideas.

Requirements

- Standards must be confirmed by a trained Platinum Level Assessor or higher

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- 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 and files 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 judgment.

- 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 3 learner 60 hours GLH 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.

Expansion of the assessment criteria

1. Candidates will prepare a design brief and take steps to appoint an effective design team.

1.1 I can describe the role and responsibility of the client in a construction project

Candidates will describe the role and responsibility of the client in a construction project.

Evidence: will be provided directly from portfolios of evidence.

Additional information and guidance

The Client plays a major role in any construction project and has a wide range of responsibilities including ensuring that all appointees are competent and that suitable managers are appointed to oversee the project. He is also responsible for providing pre construction information, and ensuring that someone coordinates health and safety. Guidance can be found here [1].

1.2 I can prepare a design brief for a specific construction project and receive critical feedback for client sign off

Candidates will prepare a design brief and present to a critical audience.

Evidence: will be provided directly from student portfolios.

Additional information and guidance

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Learners will prepare an effective, jargon-free design brief which conveys a client's vision, their goals and their priorities and provides an accurate account of the project's deliverables. The brief should refer to a budget estimate and realistic timeline and should confirm the main point of contact and decision maker(s). Operational management must be a key part of the brief.

Learners will present to an audience which will act as client in the development. The candidate must present with conviction and confidence and make appropriate adjustments on receiving critical feedback.

1.3 I can formalise the appointment of an integrated Project Team contractual terms

Candidates will describe the formal appointment of an integrated Project Team.

Evidence: will be provided directly from student portfolios.

Additional information and guidance

Learners should describe the engagement of an efficient, multidisciplinary team focusing on their ability to work together in a collaborative design environment driven by the benefits of Building Information Modelling. In addition to standard contracts [2], candidates should highlight the BIM Protocol. [3] BIM Employer's Information Requirements (EIR) [4] and PAS1192:2 [5] specification.

Information regarding this can be found via the CDBB (Centre for Digital Built Britain) website [6].

1.4 I can produce an organogram outlining professionals and their roles at each phase of the project

Candidates will produce an organogram outlining professionals and their roles at each phase of the project.

Evidence: will be provided directly from student portfolios.

Additional information and guidance

Learners will outline key members of the Project Team with specific reference to the role of the Information Manager [7]. They will draft a Project Programme outlining tasks and deliverables at each stage. The Royal Institute of British Architecture has produced a Plan of Work [8] which offers clear guidance.

1.5 I can devise an effective communication strategy to promote collaboration between all parties

Candidates will produce an effective internal and external communication strategy

Evidence: will be provided directly from student portfolios.

Additional information and guidance

Learners will explain what they will need to communicate and how they will use BIM to support the communication process, through collaboration, integration and improving awareness, understanding and decision-making through a 3D model. They must ensure the project is on target at each stage to meet the client's aims and objectives including quality and budget. Candidates may also consider the use of social media to assist stakeholders in keeping up to date with the project. How might a team use Twitter, Facebook and website Links and RSS feeds for people to subscribe to?

2. Candidates will use building information modelling techniques for concept design.

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2.1 I can create preliminary concept designs based on design brief

Candidates will create a concept design based on the agreed design brief.

Evidence: will be provided directly from portfolios of evidence and internal testing.

Additional information and guidance

Learners will produce a number of concept design options extracting key information from the design brief. They will understand the benefits of conceptual modelling as a critical stage of building design such as enabling the communication of ideas and supporting early stage analysis for building life cycle sustainability and cost.

2.2 I can assess concept designs for space requirements, circulation and accessibility

Candidates will assess concept designs for space requirements, circulation and accessibility.

Evidence: will be provided directly from student portfolios and internal testing.

Additional information and guidance

Learners will determine how their concept design maximises efficient and effective space use for those who will use it and how it facilitates the safe, convenient movement of people, both able bodied and disabled. They should define spatial requirements for a range of occupant activities and equipment and consider how the positioning of elements such as corridors, lifts, escalators, and staircases contribute to the optimisation of the flow of people through a building. They should be encouraged to explore the size of rooms and areas with specific purpose and it is useful to visit a building with a similar purpose to establish what works and what doesn't, interviewing existing end users where possible. Candidates should consider building operations and maintenance activities and the potential need for flexibility to accommodate changes in future use and technologies. They should understand the project’s relationship with, and effective use, of the landscape in which it sits. Furthermore they should pay specific attention to statutory regulations concerning size, function, access etc.

2.3 I can assess concept design to produce preliminary cost and lifecycle cost prediction

Candidates will assess concept design to produce preliminary cost and life cycle cost prediction.

Evidence: will be provided directly from student portfolios and internal testing.

Additional information and guidance

Learners will produce high level estimates based on number of occupants and area or volume on a standard £/m^2 and £/m^3 basis according to the type of project they have designed. Whilst this is a function that can be quickly carried out using industry software, candidates should understand the methodology behind calculation, the risks involved in estimation, and the impact of lifecycle costing on sustainability.

2.4 I can perform energy analysis relative to form, orientation, weather, surfaces and glazing

Candidates will perform energy analysis relative to form, orientation, weather, surfaces and glazing.

Evidence: will be provided directly from student portfolios.

Additional information and guidance

Learners will produce a high level analysis of overall energy use. They will provide a solar study taking into account the shading effects of surrounding buildings where applicable and

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recommending ways to maximize solar gain. They will explore the effects of making changes to form and orientation to maximise energy efficiency and make comparisons. Whilst this is a function that can be quickly carried out using industry software, candidates should understand the methodology behind calculation, the risks involved in estimation, and the impact of analysis on sustainability.

2.5 I can present information for whole project lifecycle and provide validation for chosen model

Candidates will present a final concept model and provide whole project life cycle validation.

Evidence: will be provided directly from student portfolios.

Additional information and guidance

Learners will present an effective, efficient concept model which is most aligned to the project design brief, life cycle objectives and vision.

3. Candidates will prepare information and resources needed to support a planning application.

3.1 I can explain the planning process for a specific construction project

Candidates will identify the sources of information which will provide a basis for a construction project.

Evidence: will be provided directly from portfolios of evidence.

Additional information and guidance

The 'National Planning Policy Framework [9]' 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 . See here [10].

It is important that candidates understand the need to involve the wider community in the process and the introduction of the 'Localism Act' [11] and the new 'Neighbourhood Planning [12]' framework empowers communities to have their say regarding development in their neighbourhoods.

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 [13] agreement 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

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A planning authority will facilitate community consultation by notifying neighbouring properties about an application, and in some cases they planning applications will also be advertised in the local press and a site notice.

3.2 I can make use of current legislation and guidance

Candidates will identify the sources of information which will provide a basis for a planning application.

Evidence: will be provided directly from student portfolios and internal testing.

Additional information and guidance

Learners will align significant legislation to their specific project. Guidance can be found via the government planning website [14] and a number of key points are noted below. Candidates should be aware of a number of Acts and codes of practice from Level 2 including Tree Preservation Orders (TPOs) and the Wildlife and Countryside Act 1981. 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.

Planning applications must also be decided in accordance with the Local Development Framework (LDF), and information regarding this can be
found at here [15].

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. There are also a number of local Waste Management policies which should be adhered to.

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 [16]). Candidates will use BIM to model Health and Safety requirements. BREEAM 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 in BIM at Level 1 and 2. More information about BREAMM can be found here [17].

3.3 I can prepare a planning feasibility study for a specific construction project

Candidates will prepare a planning feasibility study for a specific construction project.

Evidence: will be provided directly from student portfolios.

Additional information and guidance

Learners will create a feasibility study outlining how their proposal will conform and respond to particular areas of policy and legislation.

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3.4 I can describe what is meant by the term ‘undesirable precedent’ in planning decisions and provide an example of such

Candidates will identify and describe the impact of ‘undesirable precedent’.

Evidence: will be provided directly from student portfolios.

Additional information and guidance

Learners will explain the term ‘undesirable precedent’ in the context of building design and impact on planning law/codes of practice. A large number of case studies can be found on the internet and candidates should provide an appropriate example aligned to their own project.

3.5 I can formulate justification and present evidence for the approval of a specific project

Candidates will formulate justification and present evidence for the approval of a specific project.

Evidence: will be provided directly from student portfolios.

Additional information and guidance

Learners will include significant facts and provide appropriate evidence (e.g. site plans and design drawings (elevations, floor plans, sections). Planning authorities will focus on material considerations when deciding a planning which include:

- Overlooking/loss of privacy
- Loss of light or overshadowing
- Parking
- Highway safety
- Traffic
- Noise
- Effect on listed building and conservation area
- Layout and density of building
- Design, appearance and materials
- Government policy
- Disabled persons' access
- Proposals in the Development Plan
- Previous planning decisions (including appeal decisions)
- Nature conservation

Further information is available on the UK website [14]

Moderation/verification

The assessor should keep a record of assessment judgements made for each candidate and make notes of any significant issues for any candidate. They must be prepared to enter into dialog 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 and through signed witness statements associated with the criteria matching marks in the on-line markbook. Before authorizing certification, the Account Manager must be satisfied that the assessors judgements are sound.

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Source URL: https://theingots.org/community/decl3u2x

Links
[1] http://webarchive.nationalarchives.gov.uk/20110118161138/http://www.cabe.org.uk/buildings/client-role/description
[2] https://www.jctltd.co.uk/category/contract-families
[3] https://www.designingbuildings.co.uk/wiki/CIC_BIM_Protocol
[4] https://www.designingbuildings.co.uk/wiki/Employer's_information_requirements_EIR
[5] https://theingots.org/community/sites/default/files/uploads/user4107/BSI_PAS_1192_2_2013.pdf
[6] https://www.cdbb.cam.ac.uk/BIMLevels
[7] https://theingots.org/community/sites/default/files/uploads/user4107/outline-scope-of-services-for-the-role-of-information-managment.pdf
[8] https://www.architecture.com/knowledge-and-resources/resources-landing-page/riba-plan-of-work
[9] https://www.gov.uk/government/publications/national-planning-policy-framework--2
[10] https://www.gov.uk/guidance/local-plans#nppf
[11]
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/5959/1896534.pdf
[12] https://www.gov.uk/guidance/neighbourhood-planning--2
[13] https://www.ashfords.co.uk/news-and-events/general/section-106-agreements-a-short-guide
[14] https://www.planningportal.co.uk
[15] https://www.gov.uk/guidance/local-plans
[16] http://www.hse.gov.uk/construction/cdm/2015/index.htm
[17] https://www.designingbuildings.co.uk/wiki/BREEAM

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