

Unit 21: Employer-Related Project in Construction and the Built Environment

NQF Level 3: BTEC National

Guided learning hours: 60

Unit abstract

This unit will enable learners who are employed, or are undertaking work-experience in the construction and built environment sectors, to complete a realistic project relevant to their workplace activities. The unit has been designed so that it can be used by learners from these different sectors to demonstrate their understanding of how a particular type of company organises, processes and manages projects and everyday business. The unit provides the learner with an opportunity to bring together the knowledge, learning and understanding from other areas in order to develop solutions for a project that has been negotiated and agreed with the learner and the learner's employer. The scale of the agreed project is intended to be achievable and yet challenging, and in keeping with the learner's level of learning and their position of responsibility within the work place. The project outcomes may also be designed to be of direct use to the employer.

The unit provides the learner with an opportunity to demonstrate an understanding of the processes and procedures that are required to bring a project from inception to completion. The learner will also be encouraged to consider the wider implications of modern technology on a company.

Learning outcomes

On completion of this unit a learner should:

- 1 Know how to identify and describe the organisational structure of a company with which they are associated
- 2 Be able to assess the implications of current industry thinking and the impact of modern technology on the company
- 3 Understand how a company plans, designs and constructs a single building from conception to completion
- 4 Understand the need for continual progress reviews throughout a project
- 5 Be able to prepare and present an appropriate project presentation.

Unit content

1 Know how to identify and describe the organisational structure of a company with which they are associated

Type of company: nature of the business, eg large public, private or group company, partnership, sole trader, designer, consultant, contractor; type of work typically undertaken by the company; marketplace activities and industry sectors in which they operate; construction, civil or building engineering services or turnkey projects; one-stop-shop, project or facility management company

Organisation: how the organisation is structured and functions, eg break down of management, technical, professional, supervisory, craft and operative roles, staff positions, roles and responsibilities held in the company, accountability of each person, importance and influence of organisational structure on a company

Operation: eg job role and responsibilities of each person, methods and lines of communication between different levels of the organisation, inter-departmental communication, company position within a group/partnership, association with other specialist service providers or sub-contractors

2 Be able to assess the implications of current industry thinking and the impact of modern technology on the company

Impact of recent major reports: consideration and evaluation of different ideas and opinions, eg Latham Report (1994) – trust as a key feature in developing constructive relationships, Egan Report (1998) – supply chain techniques applied to the construction industry, Movement for Innovation Report (1998) – introduction and testing of radical improvements in best practice through particular projects, National Audit Office Report of January 2001 – the selection of contractors on the basis of value for money rather than lowest cost and the establishment of better relationships between companies

Modern technologies: types of hardware and software technologies commonly available to the marketplace and their use to the construction industry, eg to assist with design, composition of drawings, electronic modelling, estimating and tendering, surveying of buildings; use of technology, eg scanners, printers, digital cameras, electronic measuring devices, software applications to aid with the design of building works, structural and civil engineering works and building services engineering calculations; specification of plant and equipment to ensure coordination between design and project planning programmes; use of the internet as a communication tool between companies

3 Understand how a company plans, designs and constructs a single building from conception to completion

Planning: sequence of events, eg meeting clients and other specialists, debriefing clients, land/building surveys, feasibility studies, timing of local authority planning applications and building regulation application, scheduling or programming of design and construction phase activities, forecasting of project management, labour, plant and materials, tendering and estimating requirements, social and environmental planning, use of RIBA Plan of Works, types and implications of contracts available/required for the project, funding of project

Design: sequence of events, eg appointment of competent design team, consideration of various different design phases in a project, achieving design approvals, strategic design briefing, conceptual designs, outline designs, detailed design phase, consideration of client's design requirements, potential use of building, methods of construction, traditional or modern, environmental issues, results of surveys, aesthetic considerations, structural considerations, building engineering services requirements and local availability of primary services, materials to be used for construction, design changes and implications in the construction phase, value engineering the design, consideration and implications of planning restrictions on design, coordination of all designs, consideration of the Construction, Design and Management Regulations 1998 (CDM), other relevant health, safety and welfare issues on the design, preparation and provision of all relevant project documentation, drawings, calculations and specifications

Construct: sequence of events, eg handing over approved designs from design teams to construction teams, understanding and working within set budgets to achieve company profit margins, site set-up procedures and requirements under current legislation, on-site welfare facilities, procurement and delivery of all services and materials, management and supervision of all trades, use of in-house labour and sub-contractors, coordination of the various construction activities, testing, commissioning and handover of completed building, provision of required warranties and certification documents, scheduling of stage payments, monitoring design changes and variations to contract

4 Understand the need for continual progress reviews throughout a project

Creation of project file: determine key project information required for file, eg project title, address, location, nature of project, work involved, names of key personnel, client, specialists, design and construct teams; project programme; project meeting; communications; design work; calculations; financial costing and specifications; evolution of organised file format; schedule dates for completion of project phases

Maintenance of the project file: implement updating of all design and cost information on regular and as required basis; supersede old drawings and information with new; update project programmes for the design and construction phases, insert all communications about the project, schedule meetings

Meetings: present updated project file and information for discussion on progress of the project; regular assessment of progress and agreement of targets; identify problem areas and agree remedies; record meetings and actions

5 Be able to prepare and present an appropriate project presentation

Media formats: different methods of presenting completed project information, eg paper and electronic formats, software packages, photography, modelling, video and data projection aids

Presentation: assessment and consideration of audience for presentation; venue and documentation required; environment for presentation and equipment and resources that may be required

Presentation skills: understanding of the learning outcomes for the unit; identification and communication of achievement of learning outcomes; need for clarity and concision; planning, preparation and practice for presentation

Grading grid

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all of the learning outcomes for the unit. The criteria for a pass grade describe the level of achievement required to pass this unit.

| Grading criteria | | |
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| To achieve a pass grade the evidence must show that the learner is able to: | To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to: | To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to: |
| P1 identify and describe the sector of operations and marketplace activities carried out by a given company in the construction or built environment industry | M1 analyse the various ways in which personnel in the company may communicate with each other, their clients and other organisations in order to progress their activities | |
| P2 describe the structure and organisation of a given company in the construction or built environment industry | M2 compare and contrast new concepts, ideas and technologies in terms of their benefits to a company | D1 justify the importance attached to organisations keeping abreast of modern day thinking and technology and evaluate the potential consequences of their failing so to do |
| P3 assess and describe the impact that newly thought-out concepts, ideas and opinions can have on a company | | |
| P4 give typical examples of the use of modern technology in construction companies today | M3 discuss the benefits of good planning and design procedures when executing a project | D2 evaluate the outcome of a given project against the original brief and/or specification. |

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| Grading criteria | | |
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| To achieve a pass grade the evidence must show that the learner is able to: | To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to: | To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to: |
| <p>P5 explain the planning, design and construction processes and procedures a company undertakes in a typical project</p> <p>P6 create and maintain a project file that allows for the reporting of activities and progress of a project</p> <p>P7 prepare a presentation for a project and deliver this to a selected audience.</p> | <p>M4 make effective use of the maintained project file in progress reviews to demonstrate the regular planning and organisation of a project</p> <p>M5 incorporate the use of a wide variety of electronic and other media formats in a prepared presentation.</p> | |

Essential guidance for tutors

Delivery

Tutors delivering this unit have opportunities to use a wide range of techniques. Lectures, discussions, seminar presentations, site visits, supervised practicals, research using the internet and/or library resources and the use of personal and/or industrial experience are all suitable. Delivery should stimulate, motivate, educate and enthuse learners. Visiting expert speakers could add to the relevance of the subject.

This unit provides flexibility for learners, employers and tutors. A project can be selected that not only suits the learner, and the role that they play in the construction and built environment sector, but which will also benefit the employer by prescribing project outcomes that may be of use to the company.

The delivery strategy should, therefore, include clear and continual reinforcement of all the learning outcomes by the tutor and the provision of support. It should outline technical guidance by the employer and self-directed learning by learners. The learning outcomes must inform a progressive and structured approach for the project and lead to achievement of the project outcomes. These outcomes should be followed by the tutor and learner to facilitate project development and structured assessment.

The initial focus of the unit delivery will be the agreement of appropriate project outcomes by the tutor, the learner and the employer. The size, scale and form of the project must be suitable for the number of guided learning hours allowed for the unit. It is essential that as much detail as possible concerning the actual project outcomes are discussed at this stage and collectively agreed in writing by all parties. The selected project should also allow scope for knowledge and information from other relevant units being studied concurrently to be incorporated.

The tutor should make sure that learners understands the constraints of the learning outcomes and provide guidance on the type of work that the learner needs to produce for their project in order to achieve all the pass level criteria as a minimum. This advice and guidance can be incorporated in regular timetabled sessions in the initial stage of the project.

The tutor, learners and their workplace supervisor should meet, discuss and monitor progress on the project at regular monthly tutorials. The tutor should encourage learners to create a schedule of agreed meetings and to set agendas to support project planning and self-learning. The tutor should arrange for some tutorials to be carried out in the workplace so learners can demonstrate the relevance of their project to the organisation. Learners can also explain how the processes and procedures used to progress their work meet the required learning outcomes.

Once the project has been agreed there will be no formal requirement for further technical input by the tutor. However, the tutor should be prepared to provide general advice and guidance on the project, as and when requested, and should confirm that learners is being adequately supported by their employer or organisation in providing suitable resources to meet the demands of the project. Appropriate resources should also be made available to learners at the study centre.

There is an assumption that learners will have the appropriate levels of mathematical, literacy and IT skills to undertake this unit and that each can be applied to the completion of the particular project.

Group activities are permissible, but tutors will need to ensure that individual learners are provided with equal experiential and assessment opportunities.

Health, safety and welfare issues are paramount and should be strictly reinforced through close supervision of all workshops and activity areas, and risk assessments must be undertaken prior to practical activities. Centres are advised to read the *Delivery approach* section on page 24, and *Annexe G: Provision and Use of Work Equipment Regulations 1998 (PUWER)*.

Assessment

Evidence for this unit may be gathered from a variety of sources, including well-planned investigative assignments, case studies or reports of practical assignments.

There are many suitable forms of assessment that could be employed, and tutors are encouraged to consider and adopt these where appropriate. Some examples of possible assessment approaches are suggested below. However, these are not intended to be prescriptive or restrictive, and are provided as an illustration of the alternative forms of assessment evidence that would be acceptable. General guidance on the design of suitable assignments is available on page 19 of this specification.

Some criteria can be assessed directly by the tutor during practical activities. If this approach is used suitable evidence would be observation records or witness statements. Guidance on the use of these is provided on the Edexcel website.

It is important that the tutor fully understands the unit content and refers to it throughout the assessment process as the type of evidence that is to be presented is clearly stated under each learner outcome. The assessor should formulate an appropriate assessment tool(s) for cross-mapping of the evidence to the unit content. This is to ensure that the evidence presented by the learner complies with the relevant learning outcomes. The assessment process should be well managed, standardised and agreed across the different courses of study to which the unit may contribute. This is to ensure that every learner is given the same opportunity when their evidence is being assessed.

The assessor should ensure that the evidence that the learner presents is their own work, although some guidance will almost certainly have been provided by the assessor and the employer. Representatives of the employer or organisation should be encouraged to attend the learner's tutorial sessions held at the work place. This will help substantiate the evidence presented by the learner and provide guidance for the learner if the project forms part of a larger company undertaking.

Assessment should be co-ordinated with regular progress reviews and the tutorials that support the learner's development of the project. Learners should also be encouraged to continually self-assess their progress for clear, structured production of evidence at project reviews and be able to indicate what evidence it is that they are presenting for assessment against the relevant grading criteria.

Learners should be assessed on their ability to carry out and present the project in line with standards expected within the construction and built environment sector. This should take into account the level of learning and work experience of the learner and their use of numeracy, literacy and ICT skills in terms of the use of relevant modern technology such as software packages for project planning, designing and performing calculations, AutoCad and word-processing.

The grading criteria for pass, merit and distinction levels determine, clearly but broadly, what the learner must do in order to meet each one. However, the criteria encourage flexibility of assessment and allow the assessor to use their judgement. It is expected that the merit grade will build on work already performed at the relevant pass level and distinction grade to build further on achievements at merit level.

To achieve a pass grade learners must meet the seven pass criteria listed in the grading grid.

For P1 to P5, learners must work with their employer or organisation to determine exactly how that organisation is structured, operates and communicates as an individual company, partnership or group of companies; but also to consider them within the wider context of the construction and built environment sector. They will be expected to use their literacy skills to demonstrate their understanding of the organisation's operations and should support this with specific examples such as organisational charts. Learners should present evidence of research carried out on given construction industry reports and findings.

Learners must demonstrate the ability to describe whether the ideas and opinions of industry and the reports and findings have affected, or could affect, the operational processes and procedures of the organisation and in what particular way they may do so. The same criteria should be applied to the impact of modern technology on individual staff and the ability of a company to perform successfully.

Learners should use literacy and numeracy skills, not only to form their own opinions, but also to assess those of their colleagues or managers. They must be able to provide factual evidence or documented examples of how the organisation could change in the light of evidence from report findings or modern technologies.

For P6 and P7, learners must demonstrate their organisational planning and presentation skills. The project file should be formulated and maintained in a professional manner typical of that expected at work. The file will typically include all the required project information, clearly identified by a logical filing system and updated in a timely way. The file will support the final overall presentation of the project and provide further clarification and details of the processes of managing a project from concept stage to completion. Use of simple yet clear, up to date media formats to present the project should be demonstrated by learners, together with the ability to adapt the format to suit pre-selected audiences. These could be in a paper format including the use of text, diagrams, photos or web page screenshots etc.

To achieve a merit grade learners must meet all of the pass grade criteria and the five merit grade criteria.

For M1 to M3, learners must use the information gathered in P1 to P5 to carry out further research on the advantages and disadvantages of industry-wide ideas, opinions and new technologies, not only as they affect their own organisation, but also in terms of the organisations that operate in the same marketplace. Comparisons should be drawn and clearly demonstrated by the learner, with written research evidence presented to back-up observations.

For M4 and M5, learners must demonstrate their ability to sustain a programme of planned operations in a selected project by achieving set targets at progress review meetings. The targets can be set either by the learner, to demonstrate self-learning skills, or by their tutor and/or workplace supervisor. There should be clear evidence of self-assessment procedures being carried out in order to inform regular, planned project reviews. Learners should be able to demonstrate competent use of electronic forms of media presentation, such as PowerPoint and desktop publishing.

To achieve a distinction grade learners must meet all of the pass and merit grade criteria and the two distinction grade criteria.

For D1 and D2, learners must use their analytical skills and judgement to consider all the work produced, the research carried out and the findings gathered in P1 to P5 and M1 to M3, to explain why organisations must keep at the forefront of technology and continually embrace new industry ideas and opinions. Learners should be able to present their explanations in a mature and professional manner reflecting the views of their organisation. Having completed the required project the learner should be able to evaluate whether it meets the original brief and/or specification and analyse the success, or lack of success. This analysis should refer to how and why the project was structured, planned and actioned and whether this was in keeping with standard organisational practices. It should highlight where improvements either have been made, or could have been made to existing processes and procedures.

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit may have links to the Edexcel Level 3 Technical and Professional NVQs for Construction and the Built Environment. Updated information on this, and a summary mapping of the unit to the CIC Occupational Standards, is available from Edexcel. See *Annexe D: National Occupational Standards/mapping with NVQs*.

The unit provides opportunities to gain Level 3 key skills in communication, information and communication technology, improving own learning and performance, problem solving and working with others. Opportunities for satisfying requirements for Wider Curriculum Mapping are summarised in *Annexe F: Wider curriculum mapping*.

Essential resources

As the selected projects for this unit may be wide and varied, it is expected that centres of study will be able to provide only fundamental underpinning knowledge for project management in the form of hard copies to suit the various sector skills. There should be access to online facilities for research.

Each learner should seek appropriate and reasonable resources from the employer to help them develop their project and achieve the project outcomes.

Indicative reading for learners

Journal

Construction News, BSE Journal, HVCA News, Civil Engineer

Websites

www.cbi.org.uk

www.dti.org.uk

Key skills

Achievement of key skills is not a requirement of this qualification but it is encouraged. Suggestions of opportunities for the generation of Level 3 key skill evidence are given here. Tutors should check that learners have produced all the evidence required by part B of the key skills specifications when assessing this evidence. Learners may need to develop additional evidence elsewhere to fully meet the requirements of the key skills specifications.

| Communication Level 3 | |
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| When learners are: | They should be able to develop the following key skills evidence: |
| <ul style="list-style-type: none"> reporting on their project at regular progress review meetings presenting a project to an audience verbally which is backed up by information contained within paper and electronic media formats. | <p>C3.1a Take part in a group discussion.</p> <p>C3.1b Give a talk of at least eight minutes using an image or other support material.</p> <p>C3.2 Read and synthesise information from at least two documents about the same subject. Each document must be a minimum of 1000 words long.</p> <p>C3.3 Write two different types of documents each one giving different information about complex subjects. One document must be at least 1000 words long.</p> |

| Information and communication technology Level 3 | |
|---|--|
| When learners are: | They should be able to develop the following key skills evidence: |
| <ul style="list-style-type: none"> • researching new technologies commonly used in the construction industry, particularly looking for further new innovations • using project planning software to identify project procurement, timings and developing project activities into a full project plan • presenting a project to an audience verbally which is backed up by information contained within paper and electronic media formats. | <p>ICT3.1 Search for information using different sources, and multiple search criteria in at least one case.</p> <p>ICT3.2 Enter and develop the information and derive new information.</p> <p>ICT3.3 Present combined information such as text with image, text with number, image with number.</p> |
| Improving own learning and performance Level 3 | |
| When learners are: | They should be able to develop the following key skills evidence: |
| <ul style="list-style-type: none"> • developing and maintaining the project file and scheduling planned review meetings • assessing their own progress and setting targets for each stage or phase of a project and agreeing timescales and standards to be achieved • producing the updated project file for regular discussions at progress meetings. | <p>LP3.1 Help set targets using information from appropriate people and plan how these will be met.</p> <p>LP3.2 Take responsibility for your learning, using your plan to help meet targets and improve your performance.</p> <p>LP3.3 Review progress and establish evidence of your achievements.</p> |

| Problem solving Level 3 | |
|--|---|
| When learners are: | They should be able to develop the following key skills evidence: |
| <ul style="list-style-type: none"> • considering a design brief for a project and assessing suitable and viable options for an acceptable solution • carrying out particular design solutions or calculations which may be restricted by legislation or regulations and optimising the results in relation to financial implications • considering the budgets for a project and seeing if selected solution is feasible and practical. | <p>PS3.1 Identify a problem and identify different ways of tackling it.</p> <p>PS3.2 Plan and implement at least one way of solving the problem.</p> <p>PS3.3 Check if the problem has been solved and review your approach to problem solving.</p> |
| Working with others Level 3 | |
| When learners are: | They should be able to develop the following key skills evidence: |
| <ul style="list-style-type: none"> • agreeing the project scope of work with employer and tutor • undertaking tasks within the workplace to progress a project and requiring the guidance and assistance of colleagues • meeting with workplace mentors, colleagues and tutors to establish/ensure future success of a project. | <p>WO3.1 Plan work with others.</p> <p>WO3.2 Work to develop co-operation and check progress towards your agreed objectives.</p> <p>WO3.3 Review work with others and agree ways of improving collaborative work in future.</p> |