Unit 19: Projects in Construction

Delivery guidance

This internally assessed unit is an opportunity for the learners to explore a live construction project that is either being built or has been completed. You may choose to give learners the project details, or to let them pick their own project.

Approaching the unit

You can approach the delivery of this unit in several ways. You may choose to deliver all the knowledge 'up front' and then allow the learners to work on their projects with tutorial support. Or you may follow the learning aims, delivering each in turn before allowing the learners to work on their final assessment. Whichever method you choose, delivery of the unit should be interactive and encourage open questioning of the features of a project.

Choice of a suitable construction project is key to the successful delivery of this unit. A good example would be a large, mixed-use scheme with ready access, and a complete online archive of plans and details from the planning stages. This could be a local sports stadium or retail development, along with community elements such as affordable housing, or community centres, for example, a new library. Alternatively, a new large residential estate with commercial facilities could be a good option for delivery. Although this type of scheme would be too large for the learners' assessment project, they would be able to visit and speak to the residents, designers and builders – all of which will support in-class learning activities.

Delivering the learning aims

Learning aim A

Learning aim A is primarily concerned with the design of a construction project. Learners will develop their knowledge in order to categorise the different types of projects, styles of construction and the influences on those styles. A walk around the local neighbourhood can give a good introduction to the various types of buildings for learners to identify. Alternatively, you could ask learners to source examples of projects of various types. You could again make use of the local area for the delivery of learning aim A2, where different design styles and considerations could be explored. This would be further enhanced if you have the opportunity to bring in a local architect to talk about design and design influences of local projects.

A good activity to show the developmental nature of styles could be getting the learners to produce a timeline for the local town or area around the centre, or to produce posters for different phases of history and the key influences and features of the design style. A local historic town, pictures and video are all useful visual resources that can show the architectural styles of different periods. Through the use of your appropriate questions, you can get the learners to identify, interpret, analyse and synthesise the features and the thinking that went into the building they are studying.

Learning aim B

Learners will develop skills to be able to analyse the methods of construction for an existing building, analyse the drawings and the actual structure and materials used. Because they will have covered this in a lot more detail elsewhere (such as *Unit 1: Construction Technology)* you can use this part of the unit as a refresher, incorporating quiz activities or the use of annotated sketches to identify the methods of construction and materials used. You may find that the learners are not as familiar with some of the modern commercial techniques used. However, a trip to an ongoing project or a case study of a live project will help you to give them the information they need.

Where possible, you are encouraged to consider how materials and construction styles are used in alternative contexts from their normal or established use. For example, the use of steel frames to build and extend houses – this form of technology is traditionally associated with commercial buildings. However, the fashion in design for large-scale picture windows and big open spaces has seen a shift towards their use in residential construction.

Learning aim C

Learning aim C considers the impact of a construction project and if you are using a completed project in your locality, the impacts should be easy to ascertain. A lot of the learning will come from the analysis of the project and you can use several examples of different projects of different sizes to show the different types and scales of impact.

If it is possible, make this topic area personal to the learners. For example, what impact did building 500 new houses have on them? Did it create more jobs, more noise, access to modern leisure facilities? Then ask them to consider the impact it may have had on their parents or grandparents. Stretch their reasoning to consider the impact of a new housing development on the future generations who live there: will there be sufficient provision for schools or open spaces? Where would the extra 2000 people get medical treatment, or buy groceries?

Assessment model

Learning aim	Key content areas	Recommended assessment approach
A Examine the design of a construction project	**A1** Types of construction project **A2** Design considerations of construction projects	Part one of a presented or written and illustrated portfolio, analysing and discussing a given construction project scenario that builds on and references other learning aims.
B Investigate methods and techniques used in a construction project	**B1** Methods and techniques for different construction projects **B2** Material selection for construction projects	Part two of a presented or written and illustrated portfolio, analysing and discussing a given construction project scenario that builds on and references other learning aims.
C Explore the impact of a construction project	**C1** Economic impacts of a construction project **C2** Societal impacts of a construction project **C3** Environmental impacts of a construction project	Part three of a presented or written and illustrated portfolio, analysing and discussing a given construction project scenario that builds on and references other learning aims.

Assessment guidance

It is recommended that you have one assessment instrument that is split into three parts to match each learning aim. You are encouraged to allow the learners an opportunity to select their own project to study. Ideally, this would be a project they have access to and can visit. However, a visit is not essential – providing they can get sufficient information to allow them to access the higher grading criteria, then it would be acceptable. You should introduce the assessment instrument early in the delivery plan, and plan tutorials to discuss the learners' choices.

Part one of the portfolio submission will assess learning aim A. The learners are required to explain how the design of the project they have chosen meets both functional and aesthetic requirements. To do this, they will need to consider the project in its wider context, such as the local environment and the local vernacular style. To set this up to enable them to access all the grading criteria, you could pose a series of questions in the assessment instrument that will promote critical thinking. For the aesthetic consideration, the learners can present several images that show how the project works in the environment.

The second part of the portfolio submission will examine learning aim B. Within this section, the learners are required to analyse the methods of construction, assess their suitability and justify their use. In principle, you are asking the learners to describe what, how and why. This again lends itself to a series of images with supporting annotations and justification of the methods used.

Assessment for learning aim C will be captured in the final part of the portfolio submission work and will consider the impact of the project. Typically, learners will find this section is more difficult than the first two and you will need to consider in greater detail how you pose the questions. You may find the economic and environmental impacts tend to be easier concepts for the learners to grasp. Without creating excessive scaffolding for the learners in relation to the societal impacts, you could set up the assessment instrument with a series of carefully thought out and well placed questions that will prompt appropriate thinking towards the subject or area.

There is a maximum number of three summative assignments for this unit. The relationship of the learning aims and criteria is:

- Learning aim: A (A.P1, A.P2, A.M1, A.D1)
- Learning aim: B (B.P3, B.P4, B.M2, B.D2)
- Learning aim: C (C.P5, C.P6, C.P7, C.M3, C.D3).

Getting started

This gives you a starting place for one way of delivering the unit, based around the recommended assessment approach in the specification.

Unit 19: Projects in Construction

Introduction

The aim of this unit is to allow learners to investigate, explore and analyse the success of a construction project – from the initial design through to the wider impact on the global environment.

They will be encouraged to consider how the buildings around them came about – the styles, methods of construction and the resulting impact of the building. Wherever possible throughout the unit, you are encouraged to take the learners out of the classroom to interact with the environment around them.

Delivery of this unit will be enhanced by talks from professionals, such as architects, surveyors and builders. If you can find ones who have worked in your local area, allowing the learners to interact with the creators of the environment would be hugely beneficial. Throughout the study of this unit, there is also opportunity for the learners to interact with the communities who use the same buildings and environment as the learners. Learners will find that most people have an opinion – especially where architectural style is concerned.

Learning aim A – Examine the design of a construction project

Learning aim A1

- The terminology used in this learning aim should have already been encountered by the learners, so you may wish to treat this as a refresher. One initial exercise could be to give the learners several images, which they must order into appropriate categories.
- Alternatively, you could play a dominoes type game: each domino would be split to show both a category of construction project and a building type, and the learners would then need to match properties with the categories as the dominoes are played.
- To enhance learning, you could give extracts from the local development plan for your area if it exists, or ask learners to analyse the different categories of buildings in their location. You could further develop this activity by allowing the learners to visit the areas, identifying the different categories of buildings and evaluating their uses.

Learning aim A2

- The aim of learning aim A2 is to prepare the learners to be able to identify, interpret, analyse and justify why a particular building or project is designed the way it is. When looking at the design considerations of projects, you'll have the opportunity to invite a guest speaker – ideally a local architect – to describe the processes and design considerations they go through to produce a finished design.
- Learner-led, interactive sessions (based around Socratic questioning of techniques) could be employed here. In a session like this, your role is as the facilitator, and you should try to guide the learner without telling them what they need to know. For example, initiate a discussion with a simple question such as 'Why does building A look different to building B, which again is different to building C?'. You can then direct the learners to look at different influences on design, different periods of architecture, legislative control, fashion and trends.
  A walk through a town centre would give you a number of examples.

Learning aim B – Investigate methods and techniques used in a construction project

Learning aim B1

- Learning aim B1 is again reinforcement of prior learning from other units within the course, particularly *Unit 1: Construction Technology and Unit 2: Construction Design*. The learners should be familiar with the different forms of construction, methods and techniques used in the construction of the areas mentioned within the content. Test through an in-class test or quiz, where the learners devise their own questions and answers and you act as the quiz master. Alternatively, conduct a learning walk around the local area, asking learners to identify and describe the different methods and techniques seen.
- Learners should now be able to demonstrate that they can analyse the suitability of the method of construction for the end use and location. To encourage their critical analysis and thinking, regular questioning of learners as to why buildings are designed in a certain way, what the alternatives might be, and what could be improved, will develop the essentials skills that will be required for the final assessment.

Learning aim B2

- Moving on to material selection for construction projects, once you have tested learner understanding of the broader subject area, you can then start to test their interpretive and analytical skills. Use regular questioning of why the materials selected are fit for purpose. This will prompt the learners to start to analyse the materials and the suitability for the use they have been put to.
- As part of your delivery of this topic area, you can show how inappropriate material selection fails in use or creates additional problems elsewhere. For example, the use of hard cement mortar when pointing soft stonework, or excessive wear and tear of decorative finishes in public areas.
- The learners need to understand that different building uses will require different material selection, and when they analyse their building for the assessment they should take this into consideration. Learning can be tested through the use of partially completed learning mats; ask learners to complete the missing information on the mat. Give them a building type, location and use, and ask them to select appropriate materials, justifying their answers. This could be a small group task with a group plenary.

Learning aim C – Explore the impact of a construction project

- Learning aim C is quite often the most difficult part of the unit for the learners to understand, so when delivering this part of the unit, you should try to make it as practical and relatable as possible and use a lot of local examples the learners will be familiar with. Selecting a suitably sized scheme, such as a large retail or housing development in your area, will make delivery easier for you and for the learners to relate to. Allowing the learners to interact with the environment around them and to speak to local people who use the environment will help them to understand some of the broader conceptual areas.

Learning aim C1

- Find a suitable scheme where an area of previously rundown land has been regenerated. Ideally, this will be somewhere local, but if you cannot find anything local to you, then you could consider using the regeneration of East London for the 2012 Olympic games. This

was an area that was rundown, lacked significant investment in recent years and had several empty and dilapidated properties.

- In a tutor presentation, show learners how the area was before the development and how it looks today. You can discuss the economic impact in terms of the intermediate financial benefits during construction and the long-term benefits through the ongoing regeneration and use. Using the Olympic project, you can demonstrate examples of development that has continued, resulting in a thriving area with a broad range of property types and uses. You could contrast the success seen in London with previous Olympic projects, such as Athens 2004, highlighting that economic impacts should be sustainable and give long-term benefits to the community they serve. Learners can then follow this up by identifying similar issues on a project they have independently researched, and produce a one-page infographic on the subject. Check these for accuracy and then share them with the rest of the class.

Learning aim C2

- The learners' own critical analysis of the societal impacts of a construction project is key to learning, but some knowledge input will be required from you. You may choose to base your delivery around a large-scale project, such as the Olympics, as you can give various examples of fit-for-purpose properties.
- An activity you could undertake with the learners is to get them to identify what a large development will need to give to satisfy the needs of the local population. This could be a theoretical exercise and focus on a rundown area of your town, or you could select a real-life project with available access to the before and after information. Learners should be encouraged to rationalise why things such as improved services, buildings and open spaces are a good idea.
- The learners ultimately should be able to describe the societal benefits from a redevelopment scheme, both short and long term – for example, high-rise developments that replace the city slums, which are later demolished to make way for a different style of housing. The learners should also consider the negative aspects of a redevelopment project and the impact on the local environment, particularly during construction. If you have a local construction site you can visit, get learners to walk around the local environment to ascertain what impact it is having. Issues such as noise, dust and increased traffic could all be perceived as being negative.
- Develop the discussion with the learners to consider if there are any negative impacts on completion of the scheme. For example, a larger housing development may be viewed positively by many, but will ultimately create an increase in traffic for the existing residents in the area. After your initial input to consider the positive and negative impacts of a development, you could set up a debate, dividing learners into groups speaking for and against a proposed development (you could act as the impartial arbiter). This session can be set up like a planning committee meeting, with the various bodies being allowed a maximum of three minutes to speak for or against the proposals.

Learning aim C3

- Learners should understand that there are both positive and negative impacts from a construction project on the environment, and they should be able to identify what they are for any given project. Images or videos of construction sites will allow them

to identify the issues that may have a negative environmental impact. Similarly, images and videos of rundown areas that have been redeveloped will demonstrate the positive impact on the local environment. If it is feasible, take the learners to a regeneration scheme that will highlight and reinforce these benefits. The debating activity above could also be used here to reinforce several of the key topic areas.

- Working in pairs, you could task learners with planning the use of large areas of land, incorporating a mix of uses in response to needs of the area. Learners could then present their proposals to the class, providing a one-sided handout to copy for the rest of the class. This activity is a good way to generate discussion about the positive impact on the environment that suitable design and development can have. At the closing of the session, learners could be balloted on their favourite proposal.
- Wider environmental considerations can sometimes be difficult for learners to grasp, so you may need to stress the impact a construction project can have in terms of consumption of resources, energy production and use, and the importance of considering sustainable construction methods. Online videos and TV programmes, such as Grand Designs, will have several good examples of sustainable methods of building. Using these resources along with a series of prepared questions as part of your delivery will actively engage learners when watching. At the end of the teaching input for this section, the learners should be able to make well-informed, reasoned, balanced and justified statements about the issues covered.

Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

The knowledge and skills required for this unit will complement, enhance and reinforce learning from several other units within the qualification. These include:

- Unit 1: Construction Technology
- Unit 2: Construction Design
- Unit 11: Management of a Construction Project.

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC International Level 3 Qualifications in Construction and the Built Environment. Check the Pearson website (http://qualifications.pearson.com/endorsed-resources) for more information as titles achieve endorsement.

Textbooks

Chudley, R and Greeno, R – *Building Construction Handbook*, 11th edition (Routledge, 2016) ISBN 9781138907096 – a comprehensive guide to methods and types of construction.

Emmit, S and Gorse, C – *Barry's Introduction to Construction of Buildings*, 3rd edition (Wiley-Blackwell, 2014) ISBN 9781118255421 – a good starting point for some of the wider considerations of the unit.

Journals

Architects Journal (EMAP Publishing Limited) – the journal for architects and design professionals. It is a good resource for details on design ideas and the thinking behind schemes.

Building Magazine (UBM) – a construction industry journal that covers construction, design and the wider environmental issues.

Websites

Go to the Channel 4 website and search 'Grand Designs' for the popular Channel 4 programme website that contains links to the various episodes and related articles.

Go to the Channel 4 website and search 'Restoration Man' for the popular Channel 4 programme website.

Pearson is not responsible for the content of any external internet sites. It is essential for tutors to preview each website before using it in class so as to ensure that the URL is still accurate, relevant and appropriate. We suggest that tutors bookmark useful websites and consider enabling learners to access them through the school/college intranet.