Unit 12: Building Surveying in Construction

Delivery guidance

This unit will give learners an opportunity to explore different building styles, methods of construction and defects associated with each, and conclude with them undertaking a building survey to produce a detailed building survey report and accurate scale plans.

Approaching the unit

Delivery of this unit should be both practical and theoretical, giving learners the opportunity to inspect properties, identify and analyse defects and synthesise their findings into a high-quality report. It will reinforce learning from several other units – e.g. *Unit 1: Construction Technology*; *Unit 2: Construction Design*; *Unit 3: Construction Science*; and *Unit 4: Safe Working Practice* – allowing learners to apply that theoretical learning to the practical discipline of building surveying.

You may use a range of delivery methods and teaching styles, with emphasis on practical hands-on interaction. Allowing learners access to properties with various defects can be challenging. You could consider campus or community buildings where access could be granted. The chosen property should include all the elements learners need to inspect.

Visiting speakers, such as practising building surveyors, would be advantageous, especially if they can demonstrate some of the more advanced technology to the learners.

This unit is mandatory for learners registered on the Diploma in Building Services as well as Extended Diploma in Building Services. This unit is optional for both the Subsidiary Diploma and Foundation Diploma in Construction and the Built Environment.

Delivering the learning aims

Learning aim A

Learning aim A covers the different styles of construction and the traditional and modern methods used in constructing buildings. Learners will be aware of the different types of residential property such as detached and semi-detached, though the styles of construction may be new to them. You should also make sure that learners are familiar with types of property in their own country.

This is a very visual subject area. Learners should be given lots of images to analyse and identify different features, materials and unique aspects of each style and construction method. Learning aim A could be taught in a way that takes learners through the evolution of construction styles, methods and materials. This topic area will enable the learners to reinforce learning from the other technical construction subject areas, such as those covered in *Unit 1: Construction Technology.*

Learning aim B

Learning aim B focuses on internal and external defects in buildings and how repair and remedial techniques could be used in various scenarios. The external defects are considered first, then the internal ones – as would be the approach in a survey. Delivery should utilise real-life examples – preferably an actual property to inspect, though

suitable project documents including good quality photographs could be used. Taking your own photographs may be of benefit, as it will allow you to capture the wider area around the defect as learners will need to consider the wider environment when inspecting a property – looking solely at a crack may not tell them why it is cracked.

To reinforce learning throughout delivery of learning aim B, you should reference the methods of construction, the possible defects associated with each method and the remedial methods employed to extend their typical life span. You could set learners research tasks to specifically investigate areas in greater detail or hold in-class quiz activities to check their understanding.

Learning aim C

The culmination of learning aim C is the production of a written report and scale plans of a building. If the learners have had access to a suitable property throughout the delivery, this can then become the subject of their final assessment. In an introductory session on the different types of survey, you could give learners real-life examples for comparison, analysis and class discussion.

Accuracy and tidiness are key skills to highlight when learners start to compile their own notes and drawings, along with the well-ordered collation of other supporting information such as photographs, plans and so on. In the practical inspections, you should also reinforce that a systematic approach is essential to the collection of accurate data and the production of a high-quality report.

Learners should be encouraged to take ownership and to act in an appropriate and professional manner at all times. Through well thought out delivery and regular formative feedback during the unit, learners will develop a range of higher order skills that they can transfer to other units, further study and into employment.

Summary of unit

Learning aim	Key content areas	Assessment approach
A Understand the impact of the methods used to construct existing buildings on current and future maintenance requirements	**A1** Different styles and types of residential property **A2** Traditional methods of construction **A3** Modern methods of construction	Illustrated report or presentation and information booklet on different types and styles of residential properties.
B Explore different defects and methods of repair for low-rise residential properties	**B1** Defects to the external envelope **B2** Internal defects **B3** Methods of repair and remediation	Building and measured survey of a low-rise residential property. Production of survey report detailing the condition, defects, remedial works, plans and elevation.
C Undertake a building survey of a low-rise residential property	**C1** Types of survey **C2** Undertaking a building survey **C3** Undertaking measured surveys **C4** Skills, knowledge and behaviours	

Assessment guidance

There is a maximum of two summative assignments. The first will cover learning aim A and the second addressing learning aims B and C.

Assignment 1 can be in any number of formats such as an illustrated report, presentation, info-graphic style poster, booklet or guide. The key here is to allow learners the opportunity to be creative while ensuring access to higher grades. Depending on the assessment approach you choose, there should be no real need for special resources. The learners will evaluate different styles of housing, methods of construction and requirements for current and future repair and remedial works.

For Assignment 2, learners must have access to a suitable building to undertake the building and measured survey. This could be challenging as the building will need to have sufficient defects to satisfy the requirements of the criteria for learning aim B, be safe enough for the learners to work in and not too large, as they will need to measure and draw it too. For practical activities related to measured surveys, it is acceptable for learners to work in pairs but they should produce their own survey notes and reports.

It is your responsibility to the ensure health and safety of all learners, including the provision of appropriate safety briefings and the use of appropriate safety equipment. The learners will carry out evaluations based on their surveys supported with drawings as well as repair and remedial work options for the identified defects.

Getting started

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

Unit 12: Building Surveying in Construction

Introduction

The aim of this unit is to give learners the knowledge and skills to undertake a building and measured survey – to produce detailed high-quality survey reports with the minimum of help and assistance from you.

As a practical unit, every opportunity should be taken to get the learners out of the classroom, inspecting the different elements of a building and identifying defects. You could make use of campus buildings or other properties close by.

Through such activities, you should witness independent, critically thinking learners who can identify a building element, analyse methods of construction, assess different defects and produce recommendations for suitable and appropriate methods of repairing and remediation.

Learning aim A - Understand the impact of the methods used to construct existing buildings on current and future maintenance requirements

Learning aim A1

- Delivery of this section can be undertaken by way of a history of residential development. A tutor-led discussion could initially outline how residential property has evolved over time encouraging learners to consider issues such as changes in society, the desire for more space or the need for more housing, for example.
- A presentation from you with images could progress to reviewing typical examples of particular styles seen in residential properties. Learners then capture the key information in a learning mat (creative learning diagram) (or structured handout) with space to produce some sketches of the key features and capture the different methods and materials employed to create the houses.
- Learning can be reinforced with a walk through your nearest town or village. Learners can identify the different types and styles they see, picking out the key features and materials used. Giving them details of why housing evolved will allow them to make evaluative decisions on the environment in which they live. There is an opportunity to link topic A1 to both A2 and A3 here (traditional and modern methods when considering the evolution of housing styles) so learners can see some modern developments. Wherever possible, encourage them to link learning in the classroom to the built environment around them. If the local area is not suitable, you should utilise images of towns and cities across the country to find suitable examples. It is important learners are familiar with styles of building they are likely to encounter in their own country. The aim here is to enable the learners to identify the types and styles of properties in preparation for their final survey inspection and report.

Learning aims A2 and A3

- These could be taught together; however, it might be sensible to teach A3 first, as this will reinforce learning from other modules such as *Unit 1: Construction Technology*, where the topics are covered in more detail. You could gauge prior learning with a simple in class test or Q&A-style session before giving each area due consideration by way of a refresher.
- As well as referring to several images, where appropriate get the learners to draw their own sketches of the different elements (foundations, walls, roofs, floors, doors and windows) and methods of construction for each. A good class activity is to invite learners

to come up and draw on the board – learners will find large-scale accurate drawing a challenge, but this type of activity is great for reinforcing learning. During the exercise, you may wish to recap on how material development and construction methods have changed over the years.

- When focusing on traditional construction methods, again you can use images and sketching activities in your delivery. In a tutor-led discussion, ask learners to consider why buildings were constructed in a particular way and task learners to work in small groups to research a given method and present back to the class.
- There are several online video resources covering the refurbishment of old buildings, highlighting the methods of construction and skills used. If you do utilise any of these, you should make sure they are suitable for your local and national areas. Create suitable resources (such as learning mats or structured question sheets) to ensure learners are actively watching. A well-placed Q&A activity is a good way to recap at the start of the next session.
- A fun way to conclude this learning aim, and check on learners' progress, would be a quiz activity. Split the class into small groups and task each 'team' to write 10 questions and answers relevant to the topic area that will be presented by you to the other teams.

Learning aim B – Explore different defects and methods of repair for low-rise residential properties

Learning aims B1, B2 and B3

- Consider an integrated approach to the delivery of this learning aim. For example, if you are presenting a session on structural failure of foundations, it would be logical to consider the various methods of repair and remediation. Learning could start with theoretical classroom-based delivery to impart the initial knowledge content before moving on to practical surveying activities.
- Incorporating a brief refresher of learning aim A, as you progress, will allow you to develop the discussion – from the specific methods of construction for the different elements and how the elements are built, to the consideration of different defects, how they occur and the resulting consequences. This development of knowledge will carry through to the analysis of the mechanisms of failure and ultimately the processes of repair and remediation.
- Classroom delivery should be very visual and there are options for a variety of activities such as providing learners with an image of a defect they then annotate; alternatively, in some instances – such as looking at structural failures – you could give learners a description of a defect and ask them to draw it.
- Once you have delivered the classroom content, you can then translate this into actual surveying practice. Take learners for a tour of the campus buildings asking them to identify the defects you have previously been discussing in class. This will reinforce the learning, develop high-level critical thinking skills and be developmental towards the final assessment.
- **(B2)** You may wish to cover the internal defects of buildings following the methods suggested earlier or approach them element by element. If breaking down into the different elements, you could give learners an outline of the issues and defects along with appropriate resources and reference points for research activities. Working in small groups, learners could undertake the appropriate research and produce a presentation or an information booklet for the class. Asking the learners to teach a subject area is a very successful mechanism for learning; however, you will need to ensure that other subject areas the learners did *not* research are fully understood. This can be done through in-class quizzes and tests, or by asking learners to undertake surveys and produce short reports on

the defects analysing the causes and methods of repair. It is important that learners cover ground floors, upper floors and ceilings, walls, stairs and decoration.

- **(B3)** Analysis of methods of repair and remediation should be considered throughout delivery of this learning aim. To ensure learners know the different levels of intervention, and when each is applied, you could give them a copy of a survey report that highlights a variety of defects. From this, you can ask them to produce a schedule of appropriate repairs. The key here is the word 'appropriate'. Taking down a building and rebuilding is not a proportionate response to a few minor defects!

Learning aim C – Undertake a building survey of a low-rise residential property

Learning aim C1

- Learners will need to understand the difference between the survey types. You could obtain copies of the different types listed in the unit and ask the learners to analyse them. You may wish to direct their thinking for the detailed analysis of the reports by providing them with a table containing appropriate headings. Learners can then work through the different report types and differentiate between the levels of detail in each one. To test learning, you can ask learners to describe the differences between two (or more) different reports in a group plenary session.

Learning aims C2 and C3

- Follow this by carrying out surveys. The surveys they are required to undertake are all visual and not intrusive in any way. Before you take learners out of the classroom for the first time, you must do a full health and safety briefing.
- Early on in this learning aim, you could use survey of a building you have access to. Your sessions can be based around how you undertook the inspection and the information you gathered. If you include field notes, the learners will learn how to collect data and how it is used in the survey report.
- It might be useful for the first few surveys to give learners a structured handout that will encourage them to focus on key aspects of the inspection. As the unit develops, you will be able to reduce the level of input you have in the actual planning and data-gathering elements.
- A good activity to help with data collection is to have learners exchanging their field notes to produce the report. You should ensure learners are working in different parts of the building before allowing them to exchange such notes. You should emphasise the need to produce neat, accurate and detailed field notes, as this will be vital when it comes to the final assessment.
- Once the learners have captured the data from site, they will need to start producing written survey reports. You could give learners different template formats (as used in the industry locally) for them to input the relevant data, supporting images and descriptions. There are several template examples available online; alternatively, your local surveying firm may be willing to supply one.

Learning aim C4

- Learners should note the importance of appropriate and professional written communication in this unit, with particular emphasis placed on the use of language, giving clear, reasoned and justified recommendations. You could demonstrate some good and bad examples of language and communication here.
- A key skill for all construction personnel is the ability to interpret and produce drawings. Throughout the unit, you should develop the learners' sketching skills when out on site so that they are confident to produce sketches of all aspects of a property. Link this to *Unit 7: Graphical Detailing* where possible.

- Learners will also need to produce formal drawings to scale, as they will need to undertake a measured survey and produce scale plans of a property for the assessment. The act of measuring and recording data should be done as practical tasks outside the classroom. A good activity is to ask learners each to measure and draw a small section of the campus building. To test accuracy, you can then join up the drawings and, hopefully, they will all sit neatly alongside each other for a larger-scale floor plan. Again, exchanging field notes is a good way to develop learners' skills when producing scale drawings from measured surveys.
- Demonstrations run by you would be beneficial on some of the technical challenges of surveying – e.g. how to locate isolated parts of the property (such as columns), how to triangulate the data, how to measure elevations, cross-sections and the thickness of upper floors. Learners could then carry out these measurements and exchange data with other learners as necessary.
- You may need to teach learners how to set up a drawing page initially. Letting them work at their own pace to produce scale drawings afterwards is the best way. You should give support and advice as they work.
- At all stages of your delivery, you should reinforce the need for professionalism and independent learning. Encourage learners to work in groups, sharing information and demonstrating levels of professionalism you would expect to see in a young professional within the industry.

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

- Unit 1: Construction Technology
- Unit 2: Construction Design
- Unit 3: Construction Science
- Unit 4: Safe Working Practice
- Unit 7: Graphical Detailing
- Unit 10: Surveying in Construction

Resources

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

Textbooks

Glover P, *Building Surveys*, Routledge, 2013, ISBN 9780415635844 – a very good guide to the process of undertaking and writing up a survey

Hollis M, *Surveying Buildings*, RICS Books, 2005, ISBN 9781842191927 – comprehensive guide to building surveys and defects

Marshall D, Worthing D, Heath R and Dann N*, Understanding Housing Defects*, Estates Gazette, 2013, ISBN 9780080971124 – an excellent resource that details the common defects found in residential construction; detailed illustrations and clear descriptions

Journal

Building Surveying Journal (RICS Journals) – this is the journal for building surveyors and has a lot of useful articles on defects and dealing with them

Videos

Common building defects – client seminar – July 2014' – seminar on building defects in multi-unit developments

RICS Condition Report' – producing an RICS Condition Report

Some defects found during building surveys in Bradley Stoke BS32' – domestic defects on modern properties

The Property Show – house survey – undertaking a residential survey; a guide to the process and things to consider

Websites

40D Grand Designs – Channel 4 programme website that contains links to the various episodes and related articles; videos are also available on YouTube

40D Restoration Man – Channel 4 programme website that contains links to the various episodes and related articles; videos are also available on YouTube

Royal Institution of Chartered Surveyors – gives links to several very useful resources and sources of information relevant to the unit

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.