Pearson BTEC Level 3 National Extended Diploma in Construction and the Built Environment

Unit 10: Building Surveying in Construction

Level 3 – 60 GLH

Unit type: Internal

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Please read this handbook in conjunction with departmental and unit pages on Microsoft Office Teams (including the Programme Handbook)

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1 INTRODUCTION

1.1 Purpose of the Unit Handbook

This unit handbook aims to provide learners with the skills needed to survey existing buildings, establish current condition and size, and enable detailed survey reports/plans that highlight defects and identify potential issues.

1.2 Introduction to the Unit

If something goes wrong with a building, how do you know what the problem is and how to fix it? A building surveyor carries out surveys on existing properties and advises the owners on how to repair, alter or extend the building to meet new needs. In this unit, you will learn how to carry out a buildings survey, identify defects and record findings in a format suitable for a range of end users. You will gain a good understanding of building defects, their causes and the remedies available. You will learn how to undertake a measured survey of an existing property to produce scale plans and elevations of the building. The skills in this unit are essential for employment as a building surveyor, and other related construction roles in a range of areas such as construction management, site supervision, quantity surveying and architecture. This unit will give you a good foundation for studying construction-related subjects at a higher level, including degree-level programmes.

1.3 Unit Content

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

Different methods of construction, styles and periods of architecture

A1 Different styles and types of residential property

The features and details of residential property types, periods and styles to inform maintenance requirements and remedial works.

• Types of property:

o detached, semi-detached, terraced, end-terraced, bungalow, flat, duplex, maisonette, cottage, mansion, manor house, ‘prefab’.

• Key periods and architectural styles of residential property:

o Tudor, Elizabethan, Georgian, Victorian

o pre-war (1900 to 1939), post-war (1945 to 1960)

o modern, postmodern, contemporary.

A2 Traditional methods of construction

Recognition and knowledge of construction technologies found in low-rise residential properties and how material evolution and advancement impact on construction to facilitate decisions related to maintenance required and remedial works.

• Foundations:

o strip foundations

o raft foundations

o spreader foundations/corbelled brickwork/masonry foundations

o timber piles.

• Walls:

o solid:

– stone, brick, block

o cavity:

– brick and block, brick and brick, stone and block/brick,

block/brick and metal cladding

o framed:

– cruck frame, box frame, post and beam, storey height panels.

• Roofs:

o pitched, mono-pitched, mansard, dormer

– traditional timber, timber truss, metal truss

– slate, stone, clay tiles, thatch, metal sheet

o flat:

– timber, metal deck, concrete

– lead, felt, asphalt.

• Floors:

o concrete/ground-bearing slab

o suspended timber (ground floor and upper floors).

• Internal walls:

o concrete block

o timber stud

o solid plaster and plaster and lath finishes.

• Doors and windows:

o timber, metal, single glazing, secondary glazing, leaded lights.

A3 Modern methods of construction

Recognition and knowledge of construction technologies found in low-rise residential properties and how material evolution and advancement impacts on construction to facilitate decisions related to maintenance required and remedial works.

• Foundations:

o strip

o trench fill

o raft

o short bored pile.

• Walls:

o solid

– thermal blocks, external insulation, internal insulation,

external finishes (render, cladding)

– rainscreen cladding

o cavity:

– brick and thermal block, block and block, insulated cavities,

internal insulation, internal finishes (plaster, dry lining),

external insulations, external finishes (render, cladding)

o framed:

– storey height panels, structured insulated panels (SIPs)

– timber frame construction, platform frames

o insulation.

• Roofs:

o pitched and mono-pitched:

– timber truss, metal truss, SIPs

– slate, stone, clay tiles, thatch, metal sheet, green roof,

polycarbonate, glass

o flat:

– timber, metal, concrete

– felt, single ply membrane, Green Roof Professional (GRP)

o insulation.

• Floors:

o concrete:

– ground-bearing slab, suspended concrete, insulation, screeds

o suspended timber:

– solid timber, engineered joists

o insulation.

• Internal walls:

o metal stud

o timber stud

o board and skim finishes.

• Doors and windows:

o timber, PVCu, thermally broken metal, composite frames, composite doors, double and triple glazing, thermal coatings and gases.

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

Consideration of the defects to the key elements of a building, focusing on those most commonly noted in the building survey.

B1 Defects to the external envelope

Recognition and knowledge of external building defects to facilitate decisions related to maintenance required and remedial works.

• Foundation defects:

o settlement:

– seasonal movement (frost, heave), mining, compression of substrata, landfill, trees

o sulphate attack

o overloading

o bad design/poor construction methods.

• Wall defects:

o bowing/bulging:

– poor construction detailing, wall tie failure, lack of lateral support, overloading, roof thrust, alterations and changes to original structure

o failure of arches, lintels, embedded timbers and structural elements

o expansion of embedded steel and iron fixings

o surface failure

– frost, efflorescence, cracking, sulphate attach, poor specification, bad workmanship/detailing, failed pointing, incorrect pointing mixes, material failure, water ingress.

• Chimney defects:

o tall and thin stacks with no support, failure of the internal structure, freeze thaw, sulphate attack, water ingress.

• Roof defects:

o structural failure:

– poor construction/detailing, lack of ties, lack of lateral restraint, change of covering, water ingress, alterations, rot/insect attack of timber, flashings (missing, sand : cement), no ventilation

o covering failure:

– poor construction, corrosion of mechanical fixings, delamination, efflorescence, pointing corrosion, thermal expansion, frost damage.

• Door and window defects:

o rotten timber, putty failure, fixing failure, failure of hinges and handles, rusting to steel and iron fixings, swelling and poor operation.

• Failure of decoration.

B2 Internal defects

Recognition and knowledge of internal building defects to facilitate decisions related to maintenance

required and remedial works.

• Ground floor:

o concrete:

– sulphate attack, membrane failure, damp ingress, poor detailing/construction,

settlement, heave, screed failure, excessive spans for pre-cast

o timber:

– poor construction and detailing, lack of ventilation, damp ingress, excessive spans, lack of support/strutting, insect attack, fungal attack, joist ends built in with no DPC.

• Upper floors and ceilings:

o floors:

– poor construction and detailing, lack of support to the joist ends, lack of support and strutting causing sagging, alterations and service holes/notches, overloading, insect and fungal attack, joist ends built in with no DPC, failure of mechanical fixings

o ceilings:

– poor construction and detailing, failure of fixings to plaster laths or boards causing debonding of surface finish, water leaks causing stains.

• Walls:

o masonry:

– overloading, alterations, poor detailing and construction, damp (rising and penetrating), lack of lateral support, lack of support below

o timber:

– overloading, alterations, poor detailing and construction, damp, lack of lateral support, lack of support below, lack of strutting, insect and fungal attack, service holes and notches.

• Stairs:

o overloading, insect and fungal attack, poor detailing and design, loose spindles and handrails, loose tread and risers.

• Decoration:

o damp staining, wallpaper peeling, paint finish imperfections.

B3 Methods of repair and remediation

Determining appropriate repairs from which options are selected.

• Repair:

o minimal intervention to affected area only

o repairs to the obvious damage but not necessarily the root cause (stitching cracks, sealing damp areas, redecoration to cover defects).

• Methods of repair for common defects:

o damp, cracking, insect and fungal infestation.

• Replace/renew:

o extensive repairing option to remove root cause and makes good to wider area

o underpinning

o taking down and rebuilding

o complete removal of damaged area, rebuilding with new materials,

e.g. structural timbers.

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

Understanding of different survey types, their use and application, and the actual process of undertaking a survey.

C1 Types of survey

Survey types, purpose, essential content and use.

• Building survey.

• RICS Level 1 Condition Report.

• RICS Level 2 HomeBuyer Report.

• RICS Level 3 Building Survey.

• Mortgage valuation.

• Schedule of Dilapidations (Landlord and Tenant).

• Schedule of Condition (Landlord and Tenant).

• Maintenance survey.

• Alteration survey.

• Stock condition survey.

• Mortgage drawdown.

• Access audits.

• Elemental survey.

• Insurance reinstatement survey.

• Defect analysis survey.

• Health and safety survey.

• Measured survey.

C2 Undertaking a building survey

Surveying a building and recording findings to produce a building survey report.

• Pre-survey protocol:

o confirmation of instruction, access arrangements, health and safety considerations.

• Property inspection requirements:

o inspection of the building's main elements (walls, roof, floors, doors and windows)

o recording inspection findings – element condition, defects

o photographic record requirements, e.g. of the property, defects

o measurement of defects, e.g. levels of damp, width of cracks, distance of deflection or movement.

• Survey report requirements and completion: general description of the property, details of condition and specific defects, photographic record of condition and defects.

C3 Undertaking measured surveys

Measured survey requirements to produce survey drawings.

• Pre-survey protocol:

o confirmation of instruction, access arrangements, health and safety considerations.

• Property inspection requirements:

o sketching the layout of floor plans and elevations

o measurements and recording requirements to produce floor plans and elevations.

• Survey drawings:

o production of scale plans

o production of elevations.

C4 Skills, knowledge and behaviours

Demonstrate behaviour and its impact on outcomes, to include professionalism, etiquette, working to deadlines, accountability and individual responsibility.

• Evaluating outcomes to help inform high-quality, justified recommendations and decisions.

• Media and communication skills, including:

o the ability to convey intended meaning, e.g. written (design documentation, recording documentation, reports, visual aids for presentation use), verbal communication requirements (one to one and group, informal and formal situations)

o use of tone and language for verbal and written communications to convey intended meaning and make a positive and constructive impact on audience, e.g. positive and

engaging tone, technical/vocational language suitable for intended audience.

2 TEACHING AND LEARNING METHODS

Delivery will be through lectures, group workshops and tutorials. It is expected that learners undertake problem solving, further reading and research to support the guidance provided during taught sessions. Reading materials will be provided via the virtual learning environment (VLE) to support teaching but learners are encouraged to familiarise themselves with college library and online databases. Prior to each assessment, there will be series of formative feedback tutorial sessions/revision. These sessions will provide the opportunity for learners to receive constructive feedback on work/tasks prior to assessment.

3. LECTURE PROGRAMME

Week	Date	Lecture Duration (Hours)	Learning Aim	Session Aim
1	WC 02/09/2024	1.5	N/A	- **Induction**
2	WC 09/09/2024	1.5	LA A	- Unit introduction - Types of property
3	WC 16/09/2024	1.5	LA A	- Key periods and architectural styles of residential property
4	WC 23/09/2024	1.5	LA A	- Traditional methods of construction: foundations
5	WC 30/09/2024	1.5	LA A	- Traditional methods of construction: walls and roofs
6	WC 07/10/2024	1.5	LA A	- Traditional methods of construction: floors, internal walls, doors and windows
7	WC 14/10/2024	1.5	LA A	- Modern methods of construction: foundations, walls
8	WC 21/10/2024	1.5	LA A	- Modern methods of construction: roofs, floors
	WC 28/10/2024			- **STUDY REVIEW WEEK**
9	WC 04/11/2024	1.5	LA A	- Modern methods of construction: internal walls, doors, and windows
10	WC 11/11/2024	1.5	LA A	- **Issue Assignment 1**
11	WC 18/11/2024	1.5	LA A	- **Student Support/Independent Study**
12	WC 25/11/2024	1.5	LA A	- **Student Support/Independent Study**

13	WC 02/12/2024	1.5	LA A	- **Student Support/Independent Study**
14	WC 09/12/2024	1.5	LA A	- **Submit Assignment 1**
15	WC 16/12/2024	1.5	LA B	- Defects to the external envelope: foundation, walls, chimney
HOLIDAY	WC 23/12/2024			
HOLIDAY	WC 30/12/2024			
16	WC 06/01/2025	1.5	LA B	- Defects to the external envelope: roof, door, and window - **Give feedback: Assignment 1**
17	WC 13/01/2025	1.5	LA B	- Internal defects: ground floor, upper floors and ceilings
18	WC 20/01/2025	1.5	LA B	- Internal defects: walls, stairs, decoration
19	WC 27/01/2025	1.5	LA B	- Methods of repair and remediation
20	WC 03/02/2025	1.5	LA B	- **LA B Revision**
21	WC 10/02/2025	1.5	LA BC	- Types of survey
22	WC 17/02/2025	1.5	LA C	- Undertaking a building survey (1)
	WC 24/02/2025			- **STUDY REVIEW WEEK**
23	WC 03/03/2025	1.5	LA C	- Undertaking a building survey (2)
24	WC 10/03/2025	1.5	LA C	- Undertaking measured surveys (1)
25	WC 17/03/2025	1.5	LA C	- Undertaking measured surveys (2)
26	WC 24/03/2025	1.5	LA C	- **Issue Assignment 2**

27	WC 31/03/2025	1.5	LA B & C	- **Student Support/Independent Study**
28	WC 07/04/2025	1.5	LA B & C	- **Student Support/Independent Study**
HOLIDAY	WC 14/04/2025			
HOLIDAY	WC 21/04/2025			
29	WC 28/04/2025	1.5	LA B & C	- **Student Support/Independent Study**
30	WC 05/05/2025	1.5	LA B & C	- **Submit Assignment 2**
31	WC 12/05/2025	1.5	LA B & C	- **Give feedback: Assignment 2**
32	WC 19/05/2025	1.5	LA B & C	- **Give feedback: Assignment 2**
	WC 26/05/2025			- **STUDY REVIEW WEEK**
33	WC 02/06/2025	1.5	LA A - C	- **Student support for resubmissions**
34	WC 09/06/2025	1.5	LA A - C	- **Student support for resubmissions**

4. ASSESSMENT SCHEDULE

4.1 Detailed Description of Assessment Scheme

The unit will comprise of two summative assessments.
Summative assessment one 10.1 will cover learning aim A.
Summative assessment two 10.2 will cover learning aims B & C.

NB: There will be ample opportunities for assessment resubmissions. Resubmission dates will be communicated in due course.

4.2 Learning Aim and Assessment Criteria

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

Pass	Merit	Distinction
A.P1 Describe the different styles and types of residential housing. A.P2 Describe the different methods of traditional and modern construction used for residential housing and their impact on current and future repair and remedial work.	A.M1 Discuss the different residential housing styles and types and how their construction methods are applied and their impact on the current and future requirements for repair and remedial work.	A.D1 Evaluate the different residential housing styles and types and how their construction methods are applied and their impact on the current and future requirements for repair and remedial work.

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

Pass	Merit	Distinction
B.P3 Describe a range of external and internal defects commonly occurring in residential properties. B.P4 Explain different methods of repair and remediation to a range of internal and external defects of a residential property.	B.M2 Discuss appropriate repair and remedial measures for a range of external and internal defects for a residential property.	BC.D2 Evaluate the repair and remedial work options for the defects identified in the building survey.

Learning aim C: Undertake a building survey of a low-rise residential property		BC.D3 Demonstrate individual responsibility, creativity and self-management when preparing for and undertaking the building survey and producing the survey report and drawings.
C.P5 Perform a building survey, detailing the condition and defects with required remedial works for a residential property. C.P6 Record the findings of the survey in a survey report. C.P7 Perform a measured survey on a residential property. C.P8 Produce accurate scale plans and elevations for a residential property to standard conventions.	C.M3 Produce a comprehensive and detailed building survey, detailing the condition, defects and remedial works required, with plans and elevations for a residential property.	

4.3 Marking Standards

The controlled assessments will be marked in accordance with the Pearson standards. It will also meet requirements set by the Regulated Qualifications Framework (RQF). Learners are expected to make reasonable attempts towards problem solving. A coherent, well-balanced and organised approach to tasks with clear notations and evidence will be rewarded.

5. LEARNING RESOURCES

The library offers services and resources needed for this unit. The following resources have been provided to assist your studies in this Unit:

- Access to specialist databases.
- Class notes and lecture slides.
- Library electronic services.
- Links to online journal articles.
- Open-access computers and printers.
- Reprographic services.
- Staff expertise and advice.
- Librarian and team of learning support staff.

Pearson BTEC National Construction Student Book. Authors: Simon Topliss, Mike Hurst, Simon Cummings. Sohrab Donyavi

If you have any queries about how to access any of these learning resources, please ask the Unit Leader.