Title:	**Recognising the Age, Nature and Characteristics of Older and Traditional Buildings**
Level:	3
Credit value:	1
GLH	7
Unique Reference Number:	**D/650/4481**
Aim:	The aim of this unit is to provide learners with the knowledge to be able to identify the age, nature and characteristics of older and traditional buildings. This includes their age, construction, condition, thermal performance, hygrothermal performance, their heritage values and significance, and the implications of these for the introduction of energy efficiency measures.
Assessment	This unit is assessed through a multiple-choice assessment.

Learning outcomes *The learner will:*
1. Be able to establish the age of a building, to identify a building of traditional construction and to understand the implications for the introduction of energy efficiency measures.
Delivery content: The aim of this learning outcome is to provide the learners with the knowledge to identify older and traditional buildings and the implications this has for the introduction of energy efficiency measures. The learner must be able to: • identify **the ways of establishing the age of a building**. • explain **the implications of building age for the introduction of energy efficiency measures**.
2. Be able to identify the heritage values and significance of a building.
Delivery content: The aim of this learning outcome is to provide the learners with the knowledge to recognise the nature and characteristics of the building, its heritage values and significance. The learner must be able to: • understand **how to identify the heritage values**. • understand **how to identify the significance of a building**. • describe the **range of legislation and official guidance relating to built heritage**. • understand and explain the **whole building approach**.
3. Be able to explain how conservation principles are applied to older and traditional buildings.

Delivery content: The aim of this learning outcome is to provide the learners with the knowledge to understand and explain how conservation principles are applied to older and traditional buildings. The learner must be able to: • understand and explain **conservation principles**. • identify and apply appropriate **conservation principles to older and traditional buildings in relation to the introduction of energy efficiency measures**.
4. Be able to identify the construction of older and traditional buildings, their performance and the materials used.
Delivery content: The aim of this learning outcome is to provide the learners with the knowledge to identify the types of construction methods and the materials used in older and traditional buildings, and the implications these have on the introduction of energy efficiency measures. The learner must be able to: • identify the **types of construction of older and traditional buildings and the materials used**. • identify **local and regional variations of older and traditional buildings and materials**. • understand **how the performance of traditionally constructed buildings differs from modern construction**. • understand **the effects of geographical location, climate, aspect, orientation, and the differing exposure of individual elevations on the way older and traditional buildings perform**. • understand the implications these factors have on the introduction of energy efficiency measures.
5. Be able to identify the types of heating and ventilation systems in the building and the implications these have on the introduction of energy efficiency measures.
Delivery content: The aim of this learning outcome is to provide the learners with the knowledge to identify the types of heating and ventilation systems in the building and understand the implications these have on the introduction of energy efficiency measures. The learner must be able to: • identify the existing **types of heating in the building and the implications these have on the introduction of energy efficiency measures**. • identify the existing **ventilation systems in the building and the implications these have on the introduction of energy efficiency measures**. • understand **ways of measuring / establishing the level of air-tightness of an older or traditional building**.
6. Be able to explain the implications of common building defects for energy efficiency measures.

Delivery content: The aim of this learning outcome is to provide the learners with the knowledge to be able to identify common building defects and understand the implications these have on the introduction of energy efficiency measures. The learner must be able to: • understand how to identify **common building defects and their implications for energy efficiency measures with specific reference to moisture and structural movement**. • explain **how building materials degrade and deteriorate over time**. • explain **how alterations to the original construction affect the performance of the building**.
7. Be able to refer to a specialist or recommend further analysis or investigation when required
Delivery content: The aim of this learning outcome is to provide the learners with the knowledge to refer to a specialist or recommend further analysis or investigation when required. The learner must be able to: • **identify when there is insufficient knowledge or evidence present**; • understand and explain the **range of specialists that are available**; • understand and explain the **types of further analysis and investigation available**.

Scope of Training

The Scope of Training identifies areas that must be covered during the delivery of this unit. This is the minimum that is expected but tutors are expected to include other areas, knowledge of which will benefit their learners, based on location, types of work available and from the tutor's own professional experience.

Requirements	
1. Be able to establish the age of a building to identify a building of traditional construction and to understand the implications for the introduction of energy efficiency measures.	
The ways of establishing the age of a building	Recognise the architectural styles and characteristics of buildings from the following periods: • Medieval; • Pre-Georgian; • Georgian; • Victorian; • Edwardian. Identify other sources of information available to help establish the age of a building, including from: • Owner / occupier; • building plans and documents; • historic maps; • historic environment records/ listed building records; • Conservation Area Character Appraisals.

The implications of building age for the introduction of energy efficiency measures	Explain the relevance of building age for the introduction of energy efficiency measures with particular reference to: • the age bands used to calculate U-values for Reduced Data Standard Assessment Procedure (RdSAP); • the difference in performance characteristics between traditional and modern materials and construction methods.
2. Be able to identify the heritage values and significance of a building.	
How to identify the heritage values	Understand and describe the following heritage values: • evidential; • historic; • aesthetic; • communal.
How to identify the significance of a building	Explain how heritage values are used to assess and describe the significance of a building. Understand why and how statements of significance and heritage impact statements are prepared and used.
Range of legislation and official guidance relating to built heritage	Describe the range of legislation and official guidance relating to built heritage, including: • listed buildings; • scheduled monuments; • conservation areas and Tree Preservation Orders (TPOs); • Article 4 Directions; • ecclesiastical exemption; • local listing.
Whole building approach	Describe the factors to consider when taking a whole building approach to the installation of energy efficiency measures, including: • people – e.g. occupant / owner needs, behaviours and well-being (i.e. healthy environments, good indoor air quality, thermal comfort, etc.), financial and human resources; • local context – e.g. building location, orientation, elevation and exposure to sun, wind and rain, access, adjoining properties, planning and site constraints; • exposure to natural hazards (existing and future) – e.g. flood risk, radon; • building use and occupancy patterns; • building fabric – e.g. materials and construction, alterations and extensions, embodied carbon; • building condition, hygrothermal performance and risk of overheating; • heritage values and significance; • building services – e.g. methods of heating, cooling and ventilation, user understanding of controls; • existing energy efficiency measures and climate change adaptations;

	• local options for heat / energy supply – e.g. urban vs. rural (i.e. off-grid), low carbon; • wider context – e.g. environmental, cultural, community and economic issues. Describe the benefits of taking a whole building approach to the installation of energy efficiency measures, including ensuring that interventions are: • building specific – no 'one size fits all' approach; • suitable and proportionate; • timely; • well-integrated and properly coordinated; • effective; • sustainable; • uncertainties are highlighted and resolved; • risks of unintended consequences are managed.
3. Be able to explain how conservation principles are applied to older and traditional buildings.	
Conservation principles	Understand and explain the principles of conservation, including: • authenticity; • integrity; • like-for-like repair; • minimum intervention; • restoration; • re-treatability; • reversibility; • maintenance and repair.
Appropriate conservation principles to older and traditional buildings in relation to the introduction of energy efficiency measures	Explain how the principles of conservation are applied to older and traditional buildings in relation to the introduction of energy efficiency measures.
4. Be able to identify the construction of older and traditional buildings, their performance and the materials used.	
Types of construction of older and traditional buildings and the materials used	Identify the types of construction of older and traditional buildings and the materials used and how they differ from modern construction and materials with specific reference to: • roofs; • walls; • floors • windows and doors; • chimneys and fireplaces.
Local and regional variations of older and traditional buildings and materials	Identify vernacular buildings and give examples of local regional materials.

How the performance of traditionally constructed buildings differs from modern construction	Explain how the performance of traditionally constructed buildings differs from modern construction, particularly in relation to: • thermal mass; • moisture transport mechanisms: diffusion, convection, capillary suction and gravity, and how these affect hygrothermal performance; • relevant material properties such as hygroscopicity and vapour permeability; • ability of materials to buffer moisture and temperature; • condensation and dew-point; • vapour pressure; • absolute and relative humidity; • ventilation and air movement.
The effects of geographical location; climate; aspect; orientation, and the differing exposure of individual elevations on the way older and traditional buildings perform	Describe how the following factors affect the way older and traditional buildings perform: • geographical location; • climate; • aspect; • orientation; • differing exposure of individual elevations.
The implications these factors have on the introduction of energy efficiency measures	Describe the consequences of using incompatible and poorly detailed energy efficiency measures on traditionally constructed buildings with particular reference to: • thermal mass; • thermal bridging; • moisture movement; • ventilation and air movement; • indoor air quality (IAQ) and indoor environmental quality (IEQ); • overheating; • heritage value and significance.
5. Be able to identify the types of heating and ventilation systems in the building and the implications these have on the introduction of energy efficiency measures.	
Types of heating in the building and the implications these have on the introduction of energy efficiency measures	Describe the different types of water and space heating system, including: • gas heating systems; • oil systems; • micro-renewable systems; • electric systems; • solid fuel; • hybrid systems (heat pumps and gas boilers); • combined heat and power (CHP); • district heating systems. Explain the implications these have on the introduction of energy efficiency measures.
Ventilation systems in the building and the	Describe the different types of controlled ventilation, including: • background, e.g. trickle vents;

implications these have on the introduction of energy efficiency measures	• centralised and decentralised mechanical extract ventilation (MEV) and mechanical ventilation with heat recovery (MVHR); • passive stack ventilation; • permanent opening, e.g. ventilation grilles; • purge; • positive input ventilation. Describe the sources of uncontrolled air infiltration. Explain the implications of controlled ventilation and uncontrolled air infiltration on the introduction of energy efficiency measures.
Ways of measuring / establishing the level of air-tightness of an older or traditional building	Understand ways of measuring / establishing the level of air-tightness of an older or traditional building, including: • smoke tests; • blower door testing; • infrared thermography.
6. Be able to explain the implications of common building defects for energy efficiency measures.	
Common building defects and their implications for energy efficiency measures with specific reference to moisture and structural movement	Identify common building issues and defects and their causes with specific reference to: • moisture e.g. driving rain, rising and penetrating damp, internal moisture vapour, inadequate or damaged drainage systems; • ventilation; • structural movement; • condition of exterior building fabric; • defects with existing energy efficiency measures; • cavity wall issues, e.g. early cavity walls, blocked cavity, wall-tie failure; • asbestos; • radon. Describe the implications of common building issues and defects for the installation of energy efficiency measures.
How building materials degrade and deteriorate over time	Explain how building materials degrade and deteriorate over time with particular reference to: • inherent material defects; • physical processes, e.g. shrinkage, expansion, erosion; • chemical processes, e.g. corrosion, salt crystallisation; • fungal attack and insect infestation; • excess loading.
How alterations to the original construction affect the thermal performance of the building	Explain how alterations to the original construction affect the performance of the building with particular reference to: • thermal performance (e.g. thermal conductivity, specific heat capacity, thermal bridges); • hygrothermal performance; • overheating and thermal comfort.

7. Be able to refer to a specialist or recommend further analysis or investigation when required	
Identify when there is insufficient knowledge or evidence present	Identify when there is insufficient knowledge or evidence present to make recommendations on the introduction of energy efficiency measures to older and traditional buildings.
Range of specialists that are available	Describe the range of specialists that may be needed when considering the introduction of energy efficiency measures to older and traditional buildings, including: • fire consultant; • heritage consultant; • local authority planning or built heritage conservation officer; • building surveyor; • structural engineer; • independent damp and timber consultant; • building services consultant; • conservator; • archaeologist; • ecologist.
Types of further analysis and investigation available	Explain the types of further analysis and investigation available, including: • fire assessment; • assessment of significance and heritage impact assessment; • building condition survey; • keyhole investigation; • opening up; • testing, monitoring and remote sensing, including air-tightness testing, infrared thermography and in situ U-value monitoring; • moisture risk assessment; • building services assessment; • archaeological investigation; • ecological assessment.