

Understanding Traditional (pre-1919) and Historic Buildings for Construction and Built Environment Courses

TEACHING RESOURCE



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Who should use this teaching resource?



Princes Foundation Building Crafts Trainee Miriam Johnson gaining hands-on experience working with thatch. The programme involves working on a range of historic buildings using traditional materials and techniques. For more on the Building Crafts programme visit www.princes-foundation.org/education/building-craft-programme-heritage-skills-nvq-level-3.

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This teaching resource will help anyone who is or will be teaching an understanding of traditional (pre-1919) buildings as part of construction and built environment courses and qualifications.

It is designed for teachers, construction lecturers and assessors at schools, further education colleges and independent training providers.

It has been written as an introduction to traditional (pre-1919) and historic buildings and presents key terminology and approaches.

It will be useful for learners who will work on and plan to work on a range of existing buildings.

Further information and links to useful resources on careers in the heritage construction sector are provided in the **Find out more** section, as well as options for further study and training.

Mae'r ddogfen yma hefyd ar gael yn Gymraeg. This document is also available in Welsh.

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Cover photograph: Conservation works in 2018 to repair the chimneys at Castell Coch, a grade I listed building and scheduled monument in south Wales.
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Blaenavon Industrial Landscape, including the significant Blaenavon Ironworks and Big Pit, designated a World Heritage Site as an outstanding and remarkably complete example of a nineteenth-century industrial landscape. To visit this extraordinary site: www.visitblaenavon.co.uk/en/VisitBlaenavon/Visit-Blaenavon.aspx.

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Introduction –



Heritage Bursary Trainee Painter Decorator Lisa Ferguson applying decorative stenciling within a listed building. The placement involved working on a range of historic and traditional buildings and towards a Heritage NVQ Diploma Level 3.

©Traditional Building Skills Bursary Scheme

This teaching resource on traditional (pre-1919) buildings can be used to support learners on construction and the built environment courses.

It presents a key learning outcome in each chapter, explains important terminology and approaches, suggests learning activities and provides links to useful resources. The eight learning outcomes are relevant to a range of construction and built environment roles that may work directly on, or within the setting of traditional (pre-1919) buildings. This includes construction trades, site supervision and management, building services engineering, and design, surveying and planning professions.

It supports recent developments in the reforms to apprenticeships and further education and training:

- As an outcome of the Qualifications Wales Sector Review of Qualifications in Construction and the Built Environment, learners on government-funded construction courses at all levels, from GCSE through to apprenticeships, will develop an understanding of the differences between the tools, materials, processes, skills and knowledge used for traditional and modern buildings. A new foundation qualification will be introduced as part of the reforms and included in the first year of all further education construction programmes in Wales.
- In England, the Institute for Apprenticeships and Technical Education has developed occupational maps to shape the core content of the new T Levels and Trailblazer Apprenticeships. The description for a Core Building Tradesperson in the occupational map for construction, for

trades such as roofing, brickwork, plasterwork, and carpentry and joinery, includes the requirement for a 'knowledge of building methods and materials including heritage ones and knowledge of appropriate regulations'.

- In England, the 'principles of heritage and conservation, e.g. listed buildings, traditional buildings and maintenance of existing stock' is included in the core content of the new Construction T Level for Design, Surveying and Planning.
- The number and range of Trailblazer Apprenticeships available in England is increasing. Many of the employer groups developing the new apprenticeships have incorporated specific requirements relating to traditional and historic buildings. Examples include the Plasterer, Bricklayer, Stonemason and Chartered Town Planner apprenticeships.
- Knowledge of traditional (pre-1919) and historic buildings is embedded in the contents of the 14 to 19 UK Standards for Construction and the Built Environment Education. The specialist standard on heritage presents the same learning outcomes that are introduced in this guide.

Working on our built heritage can involve a wide range of activities including conservation, alteration, extension, refurbishment, repair and maintenance, installation of services and energy-efficiency retrofit. There are 6.5 million traditional (pre-1919) buildings in England, Scotland and Wales, which is approximately 20-30 per cent of all buildings in Great Britain. The number of traditional (pre-1919) buildings in Great Britain provides a significant source of work. Repair and maintenance alone (housing and non-housing) accounted for 35 per cent of the construction industry in Great Britain in 2016. This means that it is important for all learners to have a knowledge and understanding of how to plan and undertake work on traditional (pre-1919) buildings.

See the **Find out more** section for more on careers opportunities in this sector and for additional resources which can be used to help achieve the learning outcomes suggested in this guide.

1. Identify and describe the age, materials and construction methods of traditional (pre-1919) and historic buildings →

Traditionally constructed buildings make up part of our built heritage and include nearly all buildings constructed before 1919. They are generally of solid wall (i.e. not cavity wall) or solid timber-frame construction.

Our built heritage incorporates both traditional and historic buildings. Traditional buildings are usually defined as those constructed before 1919 using solid wall construction methods and materials, including wood and stone. Construction changed rapidly after this time as new materials and faster methods of construction were introduced. This was prompted largely by the national programme of social house building that was introduced to tackle the acute shortage of homes after the First World War. Nevertheless, traditional buildings remain an important and much loved part of the built environment. There are few towns and villages that do not have traditional buildings at their heart, helping to create our sense of identity, quality of life and economic prosperity, through tourism for example. Many traditional buildings are also historic buildings and protected through listing. Together, traditional and historic buildings are part of our historic

environment, which also includes ancient monuments, historic parks, gardens and landscapes, shipwrecks and battlefields, conservation areas and World Heritage Sites.

The architectural period or style of a building (exterior and interior), its visual appearance and its form of construction are the most important ways to determine its age. However, it is also important to remember that some buildings have more than one phase of construction. These phases reflect alterations to the original fabric, structure and services over a period of time. This means that a single building can include several different building styles and construction details. These changes may alter how the building performs in terms of its energy efficiency and ability to cope with moisture and extreme weather. It can also influence the type of repair and degree of maintenance that the building requires.



Terraced housing of traditional construction on Thorn Street, with features that have been adapted over time to reflect different styles, revealing the history of each building and contributing to the distinctive character of Earlston in Scotland.

© Historic Environment Scotland

Buildings through the ages



© Historic England Archive

Medieval

Thick stone rubble or heavy timber-framed buildings with daub-and-wattle panels. Stone and earth floors. Thatch or stone-tiled roofs. Buildings often 'vernacular' in character, that is, constructed in a local style using locally available materials.

Most houses had a simple rectangular plan. The hall or main living area was open to the roof, usually with two-storey accommodation at either end.



© Historic England Archive

Pre-Georgian

Stone and timber-frame still the most common building materials, but some use of brickwork.

Thatch and stone tile still common for roofs. Open halls still in use in the beginning of the period, but full upper storeys becoming common by its end.

Multi-paned and casement windows. Interiors often have wood panelling, decorative plasterwork and stone hearth surrounds. Decorative symbols of Tudor rose, thistle and fleurs-de-lys. More symmetrical architecture, often around an E- or H- shaped plan.



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Georgian: 1710s–1830s

Stonework, including high-quality ashlar, or render where good stone is not available. Brick also in widespread use. Lower pitched roofs and use of slate becoming increasingly common.

Windows vertical rather than horizontal, usually sash. Classical influence in form and detail, including elements such as classical columns in Corinthian, Ionic and Doric styles. Symmetry is very important in the elevations.

This example in Denbigh shows the remodelling of the front elevation of a sixteenth-century town house to conform to Georgian fashion. Rear elevations often remained unaltered, providing important clues to help dating.



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Victorian and Edwardian: 1830s–1910s

Local stone still dominant, but brick and terracotta also in widespread use. Slates of uniform size were the most common roofing material. Sash windows in general use.

Technological advances see the increasing use of innovative materials such as iron, larger panes of glass and later concrete.

Patterned, encaustic floor tiles or etched glass were often used for entrance halls. Fireplaces were of ornate marble, slate or cast-iron inset with patterned tiles. Gothic Revival was influential with pointed arched door surrounds and windows, decorative use of contrasting materials, and irregular facades and plan forms.

The age of a building can be researched from many resources, including old maps, photographs and archives. If the building is listed, the list description is a good place to begin your research (see chapter 2). The building itself will hold evidence of its age in the materials used, design, methods of construction and architectural features.

Materials and construction methods

Floors

Solid floors were constructed from earth or concrete slab and were often finished with stone slabs or clay tiles. In areas where gypsum was in plentiful supply, plaster was also used.

Suspended timber floors usually rest on brick or stone piers. Grilles in the exterior walls just below the level of a suspended floor provide ventilation and ensure that the floor remains dry and free of rot and insect attack.

Up until the Victorian period floorboards were generally irregular, hand-cut wide planks of oak or elm. They became narrower and more uniform in size as production was mechanised and softwood was introduced.



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Doors and windows

Doors and windows are critical in maintaining the character of a building and can help identify the period in which it was built. They were generally made of oak until the mid-eighteenth century after which painted softwood became popular. Casement windows were also made of cast or wrought iron, bronze or steel, sometimes with lead strips to hold the glass panes together.

Small-paned timber box sash windows were popular from the Georgian period. The panes of glass increased in size during the Victorian period as new methods of glass manufacture were developed.



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Chimneys

Chimneys can be constructed of many different types of materials and can vary from basic stone structures to very tall and ornate brick ones. They usually have projecting brick or stone courses at the top to help shed water and keep the stack dry.

Chimney pots were particularly popular from the Victorian period onwards. They were made of clay and were mass produced using moulds to produce a wide variety of practical and decorative designs.



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Walls

Mass masonry walls were built of brick or stone with lime or clay mortar. In some areas earth walling known as 'cob' in England or 'clom' in Wales was common. Up until the Victorian period it was common to cover walls with lime render or limewash for added protection.

Heavy timber-framed buildings had infill panels made of lime and mud-based daub applied onto thin wooden slats or a lattice of woven sticks called wattle. Later, lime plaster was applied onto riven or sawn timber laths nailed to the timber framing. In some areas timber framing was clad with timber boards or clay tiles.

Roofs

The design of roofs has developed from heavy oak to thinner softwood timbers as new sources of material became available and construction techniques evolved. By the Victorian period, pre-cast-iron trusses and steel had begun to be used in roof structures.

Often, roof coverings in older buildings reflect the availability of local materials, including thatch, stone tiles, clay tiles and slate. They can also reflect local practices creating distinctive, but often subtle variations in detail.



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Suggested learning activities

Working as a group, explore the age, materials and construction of local buildings. Here is an example of a local heritage study for younger school children.
www.youtube.com/watch?v=4ejwNarbmWc

Study this timeline, which illustrates the history of domestic construction in the past 500 years. It includes key architectural styles, and highlights which construction materials were used and when.
www.geoffrey-hunt.com/about.php

Find out more about how to research a building's history through the Historic England website.
www.historicengland.org.uk/advice/your-home/your-homes-history/

Resources

England

The National Heritage List for England (NHLE) is the only official, up-to-date, register of all nationally protected historic buildings and sites in England.
www.historicengland.org.uk/listing/the-list

Pastscape is a quick and easy way to search over 420,000 records held in the National Record of the Historic Environment (NRHE).
www.pastscape.org.uk/

Heritage Gateway allows you to cross-search over 60 resources, offering local and national information relating to England's heritage.
www.heritagegateway.org.uk/gateway/default.aspx

Wales

Archwilio provides online public access to the historic environment records for each local authority area in Wales, and is maintained and enhanced with further information held by the Welsh archaeological trusts.
www.archwilio.org.uk

Cof Cymru is Cadw's online record of the national historic assets of Wales, which includes listed buildings, scheduled monuments, protected wrecks, World Heritage Sites and registered historic landscapes.

www.cadw.gov.wales/advice-support/cof-cymru/search-cadw-database

Coflein is the online catalogue for the National Monuments Record of Wales (NMRW), the national collection of information about the historic environment of Wales.

www.coflein.gov.uk/

Scotland

Heritage Portal allows you to search, browse and view decisions and designation records, download spatial datasets or use the map search.

www.historicenvironment.scot/advice-and-support/listing-scheduling-and-designations/listed-buildings/search-for-a-listed-building/

Canmore is the online catalogue of the National Record of the Historic Environment. It holds detailed information and archive images for more than 300,000 places in Scotland.

www.historicenvironment.scot/archives-and-research/archives-and-collections/canmore-database/

Pastmap allows you to find out more about the heritage in your local area.

www.pastmap.org.uk/

General

The Brooking National Collection of Architectural Detail charts the evolution of Britain's buildings' constructional elements, such as windows and staircases, over the last 500 years.

www.thebrooking.org.uk/

2. Understand and explain the legislation and official guidance relating to built heritage →

‘99 per cent of people in England live within a mile of a listed building or place.’
Historic England

Our built heritage is an irreplaceable resource. It is part of the wider historic environment which has been created as a result of the interaction between people and places through time. This includes all surviving physical remains of past human activity both above and below ground or under the sea, as well as deliberately planted or managed landscapes.

When changes are proposed that will affect the historic environment, the planning system sets out a clear framework of legislation and guidance for decision-making. This helps to ensure that all aspects of the historic environment, including historic buildings, scheduled monuments, archaeology, conservation areas and designed landscapes, etc., are conserved and, where appropriate, enhanced in a manner that is consistent with their significance (see chapter 3).

Listed buildings

The extensive damage caused by bombing during the Second World War prompted the government to introduce a system of protection for buildings based on their architectural quality. This involved creating a list of buildings, which is why legally protected buildings are called listed buildings.

Today, a listed building is a building or structure that is considered to be of special architectural or historic interest and included on a statutory list. The term ‘listed building’ is wide ranging and includes not only buildings such as houses, churches or barns, but also walls, milestones, bridges, telephone boxes and many

other types of structure. There is even a 5 tonne lump of coal at Tredegar amongst the 30,000 listed buildings in Wales. It is said to be the largest block of coal ever cut and is listed for its significance as a unique monument to the coal industry in south Wales and to the skill of the miners.

There are three main criteria used in deciding which buildings to list:

1. **Architectural interest:** this includes all buildings which are of importance for their architectural design, decoration and craftsmanship; also important examples of particular building types and techniques (for example, buildings displaying technological innovation) and significant plan forms.
2. **Historic interest:** this includes buildings that illustrate important aspects of the nation’s social, economic, cultural, or military history. This might also include close historical associations with people or events of importance to the nation.
3. **Group value:** especially where buildings show an architectural or historic unity or are fine examples of planning (for example, squares, terraces or model villages).

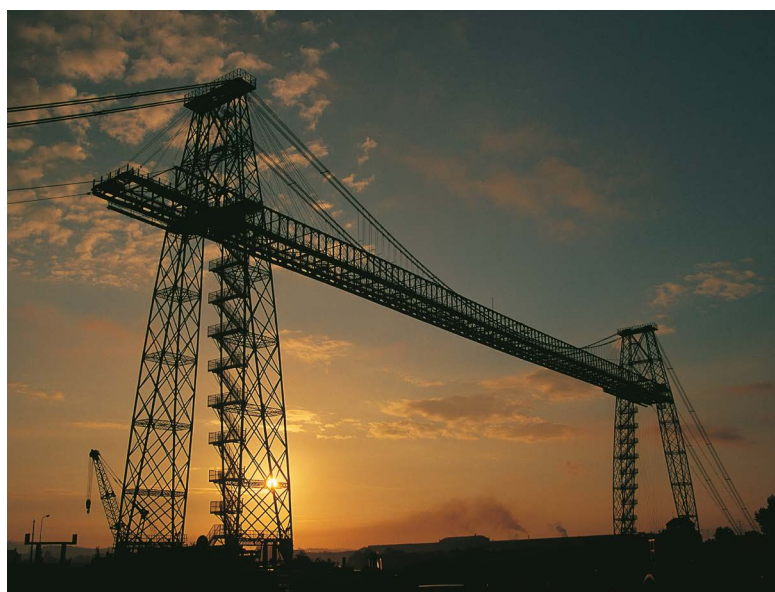
Age and rarity are also important. For example, all buildings built before 1700 which survive in anything like their original condition are listed, whereas buildings which are less than 30 years old are normally listed only if they are of exceptional quality and under threat.

Explore the range of listed buildings and structures



The Spinning Mill at Shrewsbury Flax Mill Maltings. The world's first iron-framed building, paving the way for the modern skyscrapers that now burst through the skylines of our major commercial centres. This makes it one of the most important buildings of the industrial revolution. Find out more here www.historicengland.org.uk/get-involved/visit/shrewsbury-flax-mill

© Historic England



Newport transporter bridge, listed grade I, is the finest and largest transporter bridge in Great Britain and the only one in the UK built by the internationally famous inventor and engineer, Ferdinand Arnodin. It is one of only a handful of surviving transporter bridges in the world.

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Grade I listed Audley End House, situated in a designated historic landscape designed by Capability Brown. The seventeenth-century building was adapted and refurbished in the eighteenth and nineteenth centuries and is recognised for its exceptional architectural and historic interest. Visit this Jacobean mansion. www.english-heritage.org.uk/visit/places/audley-end-house-and-gardens/

© Historic England



A grade II listed mid-nineteenth-century quarry worker's cottage in Nant Peris. The traditional slate roof and solid masonry walls with lime render, constructed from locally sourced materials, reflects the vernacular style of north-west Wales.

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Listed buildings are graded in slightly different ways across Great Britain — grades I, II* and II in England and Wales, and A, B and C in Scotland. However, in each case the whole building or structure is listed, both its interior and exterior. Boundary walls and other structures within the 'curtilage' or area surrounding the listed building may also be included. There is no such thing as a listed facade or a listed interior, and even modern elements of a building added at later times are included. It should also be assumed that fixtures and fittings, such as statues or fireplaces, are protected. If in doubt, advice should be sought from the local planning authority's built heritage Conservation Officer.

Listed building consent

Listed building consent must be obtained from the local planning authority before starting any works to alter, extend or demolish a listed building in a way that affects its character as a building of special architectural or historic interest. Common works requiring listed building consent might include replacement of windows or doors, knocking down internal walls or changing roof coverings.

It is good practice to talk to the local planning authority's built heritage Conservation Officer at the beginning of any project. Carrying out unauthorised works to a listed building is a criminal offence and owners and their professional advisors and contractors may be prosecuted. A local planning authority can insist that all unauthorised work is reversed.

Other consents

Other types of planning or heritage consent may be needed before work is undertaken; the most common are:

Planning permission: This is needed for works that fall within the definition of development, such as the construction of new buildings and the alteration or extension of existing ones. Maintenance and repairs that would not materially affect the external appearance of a building do not normally require planning permission.

When deciding whether to grant planning permission a local planning authority will consider the impact of the proposal on the historic environment. This may be a designated heritage asset such as a listed building, scheduled monument, conservation area, World Heritage Site or registered historic park or garden, or its setting.

'Permitted development rights' allow certain building works, such as the construction of small-scale extensions, to be carried out without having to apply for planning permission, subject to conditions and limitations. The local planning authority will be able to provide advice.

Scheduled monument consent: The monuments included on the schedule are of national importance and cover a diverse range of archaeological sites from earthworks that are thousands of years old to nineteenth-century industrial buildings and Second World War military installations. Scheduled monument consent is needed for any works that would have the effect of demolishing, destroying, damaging, removing, repairing, altering, adding to, flooding, or covering up a scheduled monument. Scheduled monument consent takes precedence if the monument is listed as well as scheduled.

Applications are considered by the relevant home nation heritage body — Historic England, Cadw and Historic Environment Scotland. These organisations are also able to offer pre-application advice.

Conservation area consent: Conservation areas are areas of special architectural or historic interest whose character and appearance deserve to be protected. They range from historic town and village centres to stretches of canal. Conservation area consent is needed for the total or substantial demolition of an unlisted building within a conservation area, although there are some exemptions. Applications are determined by the local planning authority, which is also a good source of advice.

Conservation area consent has been merged with planning permission in England.

Ecclesiastical exemption: Some religious groups or denominations are exempt from the need to apply for listed building consent for places of worship. These groups have their own advisory and decision-making bodies which provide the same standard of protection as the secular system operated by local planning authorities.



Pentre Ifan burial chamber in Pembrokeshire was one of the three monuments in Wales to be protected as a scheduled ancient monument through the first historic environment legislation in 1882.

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Suggested learning activities

Select the guidance below for your country to learn more about the listing process and what consents you might need when making changes to a building, such as adding an extension or making changes to the windows.

A Guide for Owners of Listed Buildings, Historic England, 2016

www.historicengland.org.uk/images-books/publications/guide-for-owners-of-listed-buildings/

Managing Change to Listed Buildings in Wales, Cadw, 2017

www.cadw.gov.wales/advice-support/historic-assets/listed-buildings/managing-change-to-listed-buildings

Listed Building Consent Process, Historic Environment Scotland

www.historicenvironment.scot/advice-and-support/applying-for-consents/listed-building-consent-and-conservation-area-consent/listed-building-consent-process/

Get involved by listing your local war memorial in England by using these teachers' resources.

www.historicengland.org.uk/whats-new/news/school-children-help-list-bristol-war-memorial
www.youtube.com/watch?v=4ejwNarbmWc

Become a contributor by Enriching the List, share

your knowledge and pictures of listed places with Historic England to help record important facts, and even unlock the secrets of some places.

www.historicengland.org.uk/listing/enrich-the-list/

Resources

More information about the range of legislation and official guidance:

Historic England

www.historicengland.org.uk/advice/planning/consents/lbc/

Cadw

www.cadw.gov.wales/advice-support/placemaking

Historic Environment Scotland

www.historicenvironment.scot/advice-and-support/listing-scheduling-and-designations/

Department for Communities

www.communities-ni.gov.uk/articles/buildings-advice-and-maintenance

3. Understand and describe the heritage values and significance of traditional (pre-1919) and historic buildings and how they contribute to sustainable development –

‘Sustainable development is about improving the way that we can achieve our economic, social, environmental and cultural well-being.’

Welsh Government

Heritage values

The significance of a traditional or historic building comes from four different heritage values. A building may possess one or more of these values and in different amounts. To help us understand what is important about the building, we have to assess its heritage values and the strength of them in comparison to other buildings. The heritage values are:

1. **Evidential value:** This comes from those parts of a building that provide evidence about its construction and subsequent use and alteration. These elements may be easy to see or they may be hidden below ground or beneath later finishes. They reveal when and how the building was constructed and how it has changed over time. Additional evidence may be gained from archives or museum collections. Written reports or surveys of the building, old maps and photographs can be particularly helpful.
2. **Historical value:** A building might illustrate a particular aspect of past life or be associated with a notable family, person, event or movement. It illustrates broader historical themes, such as the way society was organised, developments in agriculture and industry, or the influence of political and religious movements.

3. **Aesthetic value:** This relates to the appearance and form of the building and its relationship with its surroundings or setting. It may be the result of conscious design and style or use of local building traditions. The method of construction, materials, finish and detail, as well as the quality of craftsmanship can be important considerations. It can also include the setting and views to and from the building, which may have changed over time.
4. **Communal value:** This comes from the meaning that a building has for people. This includes social and economic value, as well as commemorative, spiritual or symbolic value.

To identify the heritage values of a building, we must first understand its history, construction and character. Questions to consider:

- who values the place and why?
- how do the values (such as usefulness, importance, how the building serves a purpose or creates an effect) relate to the building fabric?
- what is the relative importance of these different values to the community?
- do associated objects, such as paintings or furniture, contribute to these values?
- what does the setting and context (for example, the garden, street or wider landscape) add to the place?
- how does the place compare with others sharing similar values?



Harmondsworth Great Barn is an exceptional grade I listed agricultural building that dates back to the fifteenth century. The barn is an outstanding example of medieval carpentry and contains one of the most intact interiors of its era and is therefore recognised for its significant evidential and aesthetic value. Rescued by English Heritage it is now open to visitors. www.english-heritage.org.uk/visit/places/harmondsworth-barn/

© Historic England



In 2017, following repairs using traditional materials such as lime mortars, Mount Batten Tower in Plymouth was brought back into use after falling into disrepair and being placed on the Heritage at Risk register. The building is now accessible to members of the public and used for events and educational visits, delivering wider social and economic benefits.

© Historic England

This assessment process will help to establish the relative importance of the different values, the qualities of the building that people value and how they might be vulnerable to harm or loss. The results, particularly for buildings that are listed, scheduled or in a conservation area, should then be captured in a written statement of significance. This will help establish priorities for reconciling or balancing potentially conflicting interests and inform decisions about change.

Sustainable development and management

Conservation is an active process of maintenance and managing change. In the case of buildings, the risks of neglect and decay are usually best addressed by keeping the buildings in a use that is compatible with their conservation. Keeping such buildings in use and valued is likely to require sympathetic changes to be made from time to time. Understanding the heritage values and significance of traditional and historic buildings is the first step towards their sustainable management or development.

There are strong arguments for retaining traditional buildings, not least because their replacement has significant energy, carbon and financial cost implications. The durable materials used in many traditional buildings can also reduce the frequency of refurbishment, requiring less energy and carbon in the long term.

Effective conservation also delivers wider social, economic and environmental benefits. The repair, maintenance, reuse and adaptation of redundant buildings, for example, can revitalise and enhance town centres, bringing social and environmental benefits to the community, as well as economic growth and job creation through increased trade and tourism. However, change must be managed carefully to ensure that the significance of traditional and historic buildings, and their special qualities, are protected and enhanced so that they can be enjoyed and understood by present and future generations.



Forge Row in Cwmavon, listed grade II* as one of the finest surviving terraces of industrial houses in a south Wales valley. The terrace was built in the early nineteenth century for ironworkers at nearby Varteg Forge. Originally a terrace of 12, the cottages were doubled up when the row was repaired in 1987–88. This shows how carefully managed change can conserve character whilst making the cottages suitable for modern day living.

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Suggested learning activities

Try the e-learning module on understanding heritage value.

www.ehhelm.articulate-online.com/p/2877919194/DocumentViewRouter.ashx?Cust=28779&DocumentID=c78b6870-1f3c-43c9-a5b1-c5c605372118&Popped=True&v=4&InitialPage=story.html

Use Cadw's best-practice guidance, Heritage Impact Assessment in Wales, to draft a statement of significance for a building of your choice such as your home, school or college

www.cadw.gov.wales/advice-support/placemaking/heritage-impact-assessment

Resources

These publications explain how to assess the significance and heritage values of historic buildings and historic areas:

Conservation Principles for the Sustainable Management of the Historic Environment in Wales, Cadw, Welsh Assembly Government, 2011

www.cadw.gov.wales/advice-support/conservation-principles

Conservation Principles, Policies and Guidance, Historic England, 2008

www.historicengland.org.uk/images-books/publications/conservation-principles-sustainable-management-historic-environment/

Conservation principles for the properties in the care of Scottish Ministers, Historic Environment Scotland, 2015

www.historicenvironment.scot/media/2554/hes-internal-conservation-principles.pdf

4. Explore, analyse and evaluate how the principles of conservation are applied in practice, including using traditional skills, materials and methods, minimum intervention, like-for-like repairs and practices –

‘Conservation is the process of managing change to any significant place in its setting, in ways that will best sustain its heritage values, whilst recognising opportunities to reveal or reinforce those values for present and future generations.’

Historic England

Conservation management plans

For complex or important historic buildings it is good practice to produce a conservation management plan or conservation plan. This is a tool that will help those responsible for the building or site to make decisions about its future use, development and care. The objective of the plan is to:

- identify what is important about the building and why, using the statement of significance discussed in chapter 3
- set out the principles of conservation and policies that will be used to conserve or manage those aspects of the building which contribute to its significance.

The conservation policies set out in the plan might state, for example, that damage caused by the installation of new services should be kept to a minimum. One practical action to help achieve this might be to reuse existing cable routes rather than cutting new routes through structural timbers or decorative plasterwork.

The conservation management plan will be useful for the day-to-day management of the building as it can help to prioritise work and financial resources where they are most needed. It will also help to guide the development of any proposals for change, such as alterations or a change of use.

Putting the principles of conservation into practice

Before making any changes to a traditional or historic building it is important to think about the following questions:

- what are you trying to achieve and why?
- what are the heritage values and significance of the building?
- what changes or alterations are proposed or necessary?

Other factors to consider include the following:

- **Authenticity**
Characteristics that most truthfully reflect and embody the cultural heritage values of a place.
- **Integrity**
Wholeness, honesty.
- **Like-for-like repair**
Repair using original, identical or matching materials.
- **Minimum intervention**
The most appropriate works are those that entail minimum change to materials and character.
- **Restoration**
To return a place to a known earlier state on the basis of compelling evidence, without conjecture.



Range of traditional materials used in the careful selection and preparation of lime mortars to carry out conservation repairs. Various types and combinations of sands are tested to produce different mortar samples. These are compared with the properties of the original lime mortar to ensure a like-for-like repair is carried out and the 'breathable' performance of the building maintained.

© Historic England

- **Retreatability**

Using materials and techniques that do not produce permanent negative consequences that could restrict future works.

- **Reversibility**

Capable of being undone without any significant damage or harm to the original fabric.

It is also important to think about:

- what impact will the proposals have on the evidential, historical, aesthetic and communal values of the building?
- are there other risks, such as increased maintenance and management liabilities or compromised performance through use of incompatible materials?
- why have you chosen this particular option rather than others? For example, could a proposed extension be repositioned to be less disruptive to the original design, or could a feature be repaired rather than being replaced?



A minimum intervention conservation repair at Harmondsworth Barn where new timber has been used to replace only the rotten timber and leave as much of the original historic fabric in place, and hence not reducing the building's evidential value. The repair also demonstrates integrity as an honest repair as it can be distinguished from the original fabric, so contributing to the history of the building.

© Historic England

Heritage impact statements

This analysis, also known as a heritage impact assessment, will help you to develop your proposals and identify the approach that will bring the greatest benefit and cause the least harm to the building. For alterations requiring listed building consent, scheduled monument consent or conservation area consent, the results of this analysis should be recorded in a heritage impact statement to help explain and justify the proposals.

Suggested learning activities

Learn more about the tools that are used in planning conservation works, including conservation management plans.

www.historicengland.org.uk/advice/technical-advice/parks-gardens-and-landscapes/maintenance-repair-and-conservation-management-plans-for-historic-parks-and-gardens/

Explore how conservation principles are applied in practice using case studies from Historic Environment Scotland.

www.historicenvironment.scot/archives-and-research/publications/?q=case+study%20

Using the statement of significance that you prepared in chapter 3 and the Cadw best-practice guidance *Heritage Impact Assessment in Wales*, draft a heritage impact statement for a proposed plan of building works to your selected building.

www.cadw.gov.wales/advice-support/placemaking/heritage-impact-assessment

Resources

Conservation Plans: A Guide to the Preparation of Conservation Plans, Historic Environment Scotland, 2000

www.historicenvironment.scot/media/2786/conservation-plans.pdf

Conservation Planning Guidance, National Lottery, Heritage Fund

www.heritagefund.org.uk/publications/conservation-planning-guidance

5. Understand and describe the difference in performance characteristics between traditional and modern materials and construction methods –

‘Traditional buildings perform differently in some respects from modern buildings, both in their existing state and when subjected to retrofit measures.’

Sustainable Traditional Buildings Alliance

Traditional materials and construction methods

Most traditional buildings are made of permeable materials that do not incorporate barriers to external moisture. This creates a ‘breathable’ form of construction. As a result, the permeable fabric tends to absorb moisture which is then released by internal and external evaporation.

When traditional buildings are working as they were designed to and sufficient ventilation is provided, the evaporation will keep dampness levels in the building fabric below the levels at which decay can start to develop. Lime and/or earth-based mortars, renders, plasters and limewash are particularly important for this as they act as buffers for environmental moisture, absorbing it from the air when humidity is high (after a shower or cooking, for example) and releasing it when the air is dry. They also have a wicking effect, drawing moisture and soluble salts away from more vulnerable building materials, including wood.

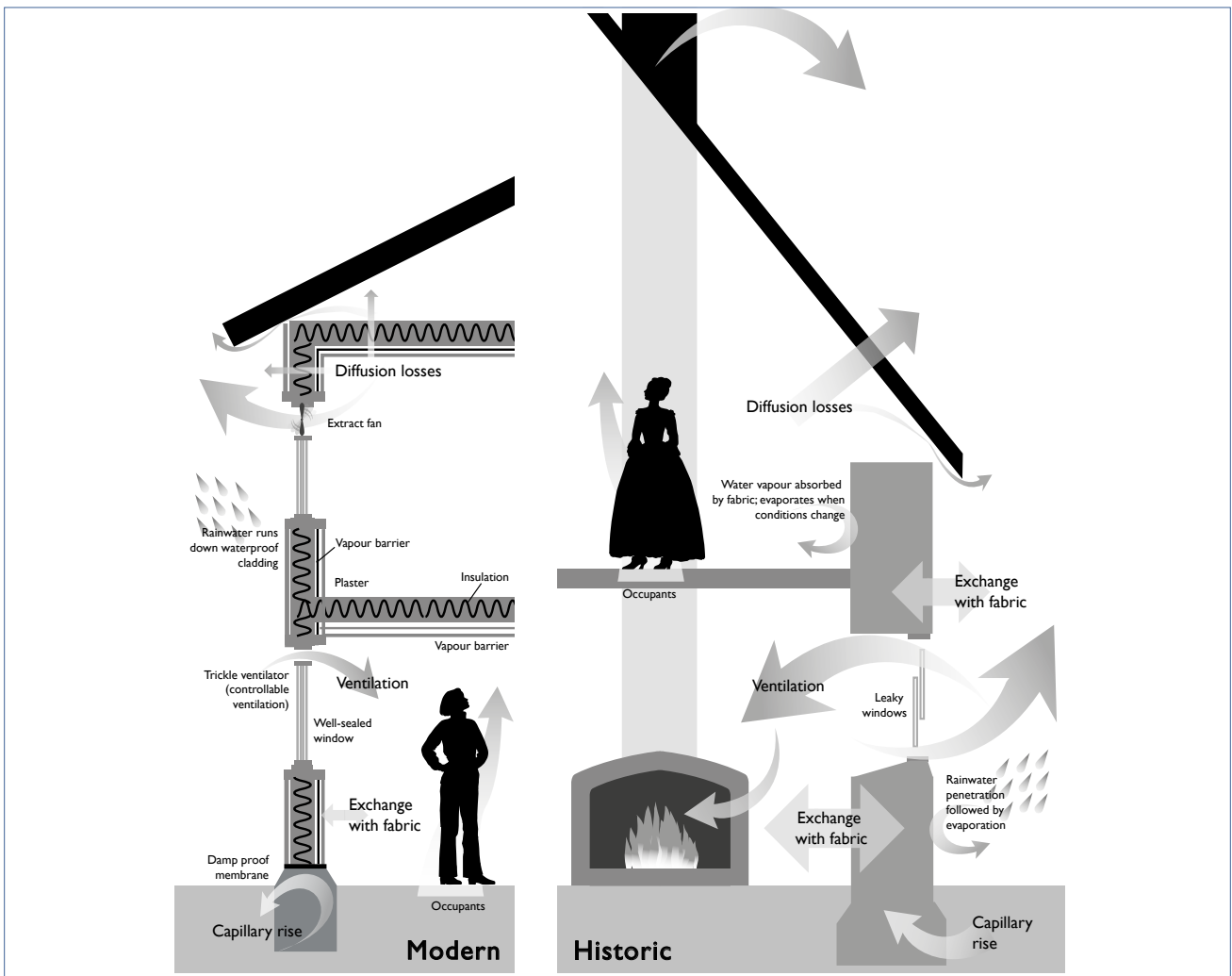
The use of lime as a binder in mortars was gradually replaced by Ordinary Portland Cement (OPC) from the mid-nineteenth century. However, lime has many advantages, even in new construction:

- It is flexible and can tolerate movement well, unlike cement, which is hard and brittle. Cement is prone to forming hairline cracks which allow moisture to get in. By contrast, lime mortars are ‘self-healing’ and small cracks will repair themselves in time.

- Lime mortars are soft and will not wear away the edges of the stone or brick that they are binding together.
- It is an easy material to use.
- It produces an attractive finish, particularly limewash, with its soft appearance and subtle variations in colour.
- The manufacturing process that burns natural limestone, chalk or sea shells to produce quicklime produces less carbon dioxide than cement. Carbon dioxide is also reabsorbed over time as the lime mortar carbonates.
- Walls bound together by lime mortar can be dismantled easily and the bricks or stones cleaned up and reused. The old mortar can be crushed and used in new mortar mixes, thereby eliminating waste.

Modern materials and construction methods

Modern buildings are constructed using impermeable materials and incorporate barriers to external moisture, such as cavities, rain-screens, damp-proof courses, vapour barriers and membranes. Modern construction also often relies on mechanical extraction to remove water vapour formed by the activities of occupants.



The key to understanding the differences between a modern, impermeable building and a traditional 'breathable' building is in the materials, movement of air and movement of moisture.

© Historic England

Taking the right approach

As traditional buildings need to 'breathe', the use of vapour barriers and other impermeable materials commonly found in modern buildings must be avoided when undertaking repairs or making alterations. These materials can trap and hold moisture, hasten decay and reduce the temperature of walls, thereby encouraging condensation and mould growth. The use of modern, impermeable

materials, if essential, needs to be based upon an informed analysis of the likely risks to the building fabric. This 'whole building approach' is described in chapter 8 below.

It is also essential that buildings are well maintained, otherwise improvements made in energy efficiency, for example, will be cancelled out by the problems associated with water ingress and/or excessive draughts.

Suggested learning activities

Study the INFORM guides published by Historic Environment Scotland to learn more about traditional building materials.

www.enginehed.scot/publications/?curPage=1&publication_type=36

Resources

SPAB Briefings, Society for the Protection of Ancient Buildings

www.spab.org.uk/advice/spab-briefings

SPAB answers some commonly asked questions about building materials and construction methods

www.spab.org.uk/advice/search-our-knowledgebase?keywords=&category_type=139

6. Identify and describe the causes of common defects in traditional (pre-1919) and historic buildings, and the range of investigative and recording techniques used to understand a building's condition →

'In order to be effective, any maintenance or repair work needs to address the underlying causes of the problem and not just treat the symptoms.'

Historic England

The main causes of decay in traditional buildings are moisture, structural movement and use of the wrong materials and techniques, such as cement. This last point is explained in chapter 5 above.

Moisture

Moisture and its effects are perhaps the single biggest cause of decay in traditional materials. It can lead to problems with damp, mould growth, and attack by woodworm and fungi. Nevertheless, damp issues are often wrongly diagnosed and treated.

The four principal sources of moisture that can affect traditional buildings are:

1. **Rain:** Most traditional buildings are capable of resisting rain effectively if they are kept in good condition. But water can get into the building fabric through cracked or missing roof tiles, broken panes of glass, failed lead flashings, etc. It is important to retain traditional features, such as storm porches and projecting string courses as they help to shed water away from the building. In very exposed locations slate hanging was sometimes used to give additional protection from driving rain.
2. **Rising and penetrating damp:** Problems tend to occur where external ground levels are higher than the level of the internal floor structure or damp-proof course. This means that the damp-proof course, if there is one, is bridged and can no longer work effectively. Timber-suspended ground floors remain constantly damp and can begin to rot. Damaged mortar joints or render, or use of impermeable modern materials, such as concrete floors or damp-proof membranes, can also encourage rising or penetrating damp.
3. **Internal moisture vapour:** Activities including breathing, washing and cooking generate a lot of moisture in the air. This moisture condenses on contact with cold surfaces, such as windows and walls. If the building is well-maintained and there is enough ventilation the condensation will evaporate quickly. If not, condensation can encourage the growth of mould.
4. **Damaged drainage systems:** Water from damaged or blocked drains, gullies, gutters and downpipes can create serious damp problems if not tackled early.

Structural movement

Structural movement is a potential defect. Most old buildings move to some degree during their life, but this movement may not be a problem. Cracks do not necessarily need to be a cause for concern. Most traditional buildings can tolerate a degree of movement without any serious problems. Movement can be seasonal, dictated by temperature changes. It could also be historic — that is, there is evidence of past movement, but there is no further movement now. However, if the movement is ongoing or it threatens the use or safety of the building, advice should be sought from a structural engineer with experience of traditional buildings.

Investigative and recording techniques

The amount and type of information captured during a survey can vary from building to building depending on the nature of the building and the reason why the survey is being undertaken. This may be to understand or monitor defects, analyse and communicate significance, inform the design process, record the building before changes are made, help ensure the accurate reinstatement of construction details or to assist future management and maintenance of the building.

It can be as simple as a basic visual record of what is found or a comprehensive analytical record that draws on a range of resources and investigative techniques. However, the starting point of any survey involves looking closely at the building and the area around it to see what clues can be found. For example, is there staining or moss growth behind a downpipe that might suggest a leak?

Increasingly, drones are being used to help survey and record as they are able to get close to otherwise inaccessible parts of the building, such as chimneys and roofs. Some investigative techniques are listed below.

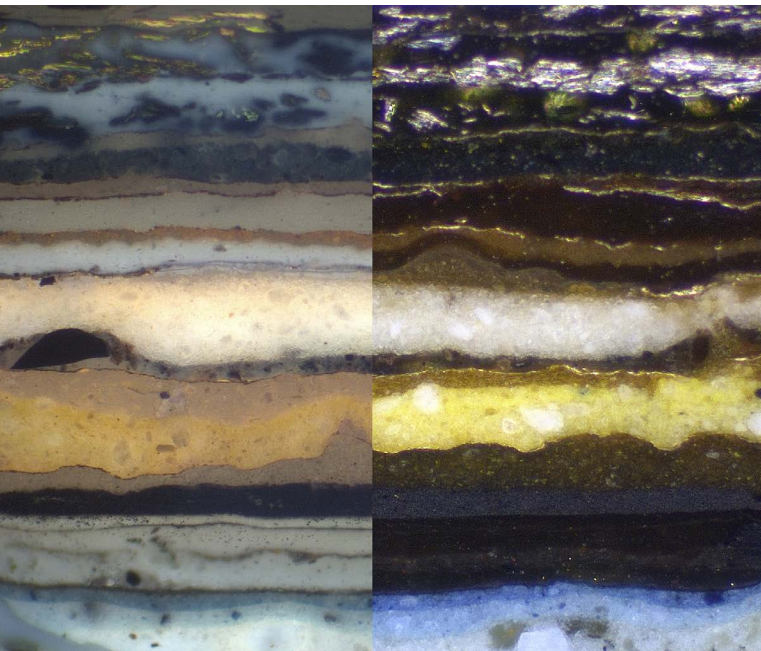
- **Archaeological investigation:** This intrusive method of investigation is sometimes used to reveal buried features in or around the building. Excavation of a floor, for example, may reveal the footings of earlier walls that have been removed.
- **Dendrochronology:** Also known as tree-ring dating, this technique involves removing a small cross-section of wood from timbers. The pattern of growth rings in the sample is then compared with those of trees of a known age to give the date at which the timber was felled.



The roof at Hendre near Llanrwst was carefully recorded while it was being stripped. This helped ensure that the construction details were understood and accurately replicated when the house was re-slatted.

© Terry Hughes, Stone Roofing Association

- **Keyhole investigation:** This is a non-destructive method that allows the condition of hidden timbers and other features to be investigated. Borescopes, for example, consist of a thin tube with an eyepiece at one end and a lens at the other. The tube is carefully pushed into crevices to examine the material beneath.
- **Opening up:** This is a more destructive technique as it involves the removal of small areas of the building material. It can be useful where there is an underlying problem, the cause of which is not apparent from the surface.
- **Paint analysis:** This involves microscopic examination of paint layers and other finishes. It is used to reveal past colour schemes and identify the materials used.



A photomicrograph from a paint sample, analysed as part of a historic finishes investigation and used to identify the composition of a painted surface and the various layers of finishes used over time. This type of detailed investigation can reveal the phases of refurbishment that have taken place throughout the building's history, and inform decisions on repair and conservation projects.

© Lincoln Conservation

- **Monitoring:** Monitoring a building over a period of time will help to establish if a problem is getting worse and, if so, how quickly. 'Tell-tales' for example can be used to measure the width of cracks over time. These commonly consist of two overlapping pieces of plastic, one fixed on either side of the crack. One piece has a cross-hair and the other a calibration scale, allowing any movement between the two to be measured.
- **Remote sensing:** A variety of remote sensing techniques are available that allow you to 'look through' the surface material. Examples include ultrasound, radar and thermography. Care is needed when using moisture metres as the results can be unpredictable and difficult to interpret.

The results of these investigations should be recorded. This may include a written description and analysis of any problems found and/or measured survey drawings, sketches and photos. Building Information Models (BIM) can be a useful way of recording traditional and historic buildings.



Historic England Archaeological Investigators surveying Clifford Castle in Herefordshire using an electronic total station theodolite (TST) to measure, map and record the historic site.

© Historic England, Steven Baker; image reference DP218241

Suggested learning activities

Working in a group, undertake a condition survey
www.historicengland.org.uk/services-skills/education/teaching-activities/doing-a-condition-survey-with-your-class-guidance-for-teachers

Resources

Maintaining your Home: Short guide 9, Historic Environment Scotland, 2014
www.historicenvironment.scot/archives-and-research/publications/publication/?publicationId=9b3ca2e8-afcc-42ba-92c3-a59100fde12b

Understanding Decay in an Older Home, Historic England
www.historicengland.org.uk/advice/your-home/looking-after-your-home/repair/decay/

Information on the SPAB website on common building defects

www.spab.org.uk/advice/search-our-knowledgebase?keywords=&category_type=73

More information about the techniques used to investigate and record buildings, including 3D laser scanning and developing a Historic Building Information Model (HBIM)

www.historicengland.org.uk/advice/technical-advice/recording-heritage/

Understanding Historic Buildings: A Guide to Good Recording Practice, Historic England, 2016

www.historicengland.org.uk/images-books/publications/understanding-historic-buildings/

7. Understand the range of maintenance and repair operations, and explain the importance of these for maintaining traditional buildings ⇐

‘Maintenance is the continuous care of a historic building and is the most common and important activity in their conservation and preservation.’

BS 7913:2013 Guide to the Conservation of Historic Buildings

Any maintenance or repair work needs to address the underlying causes of the problem and not just treat the symptoms. There are a range of surveys that professionals can deliver, including building surveys and structural surveys.

Maintenance

Maintenance is ‘routine work necessary to keep the fabric (and services) of a place in good order’. The main objective is to limit deterioration. Inspections carried out at regular intervals, coupled with prompt action to pre-empt or remedy problems, are the basis of effective maintenance. Although it is often seen as mundane, maintenance forms a cornerstone of building conservation.

There are three key steps to plan effective maintenance:

1. Draw up a **maintenance plan and checklist** to help identify any issues that will need attention.
2. Use the checklist when carrying out inspections, which can be:
 - **Periodic/cyclical:** These take place at planned intervals — monthly, annually or even every four to five years depending on the nature of the building.
 - **Occasional/reactive:** These are carried out following severe weather or unforeseen events and need to concentrate on those parts of a building where water could get in easily, such as parapet gutters.

3. Keep a **log book** to record when each maintenance check is done and what was found. It can also be used to record what repairs (if any) need doing, when they were done, and by whom.



Clearing the drain as part of the regular maintenance of a traditional building. A blocked drain or gutter can prevent water from draining away, instead it can find an alternative route through the building fabric to the interior of the building resulting in damp.

© Crown copyright (2019) Cadw, Welsh Government

Repair

Repair can be defined as 'work beyond the scope of maintenance, to remedy defects caused by decay, damage or use. This might include minor adaptation to improve drainage, for example, but will not involve alteration or restoration.' Repair is normally carried out to sustain the significance of the building or place.

Benefits of maintenance and repair

- It is cost-effective. Small problems can soon escalate and even risk permanently damaging a building if they are not tackled when they are first spotted. Ignoring them can prove costly at a later date and will often require more expensive repairs.
- It helps protect the value of the building.
- It helps to ensure the health and safety of building users and the general public.
- It is important for sustainability as keeping the building in use is the best way to safeguard its future.
- It is good for energy efficiency as damp building elements are less thermally efficient than dry ones.

Maintenance and repair, where necessary, should always be carried out **before** any energy-efficiency upgrade works are undertaken. The addition of



Princes Foundation Heritage Carpenter Joiner Trainees Tom Mott and Sam Rowland-Simms carrying out repairs to the timber roof structure on Shrewsbury Flax Mill Maltings. The timber structure will be covered with traditional Welsh slates so the building will be watertight and can be put back into use, and so helping to safeguard its future. www.historicengland.org.uk/get-involved/visit/shrewsbury-flax-mill

© Historic England Archive, Steven Baker

insulation to a poorly maintained and damp building could make these problems worse and fail to improve the energy efficiency.

Suggested learning activities

Use the typical maintenance checklist to draw up a plan for a local building.

www.historicengland.org.uk/advice/your-home/looking-after-your-home/maintenance/maintenance-checklist/

Find out more about installing, replacing or upgrading building services, such as gas or heating pipes and electrical wiring, without causing any permanent damage to the historic fabric.

www.historicengland.org.uk/advice/your-home/making-changes-your-property/types-of-work/installing-services/

Resources

Maintaining Your Home: Short guide 9, Historic Environment Scotland, 2014

Provides more on the range of maintenance and repair operations.

www.historicenvironment.scot/archives-and-research/publications/publication/?publicationId=9b3ca2e8-afcc-42ba-92c3-a59100fde12b

For more detail on the range of maintenance operations see the SPAB and Historic Environment Scotland websites.

www.spab.org.uk/advice/search-our-knowledgebase?keywords=&category_type=154
www.spab.org.uk/advice/rainwater-fittings
www.engineshed.scot/building-advice/

Find out more about repairs operations such as:

Structural movement

www.historicengland.org.uk/advice/your-home/looking-after-your-home/repair/structural-movement/

Traditional windows

www.historicengland.org.uk/images-books/publications/traditional-windows-care-repair-upgrading/

Repointing brick and stone walls

www.historicengland.org.uk/images-books/publications/repointing-brick-and-stone-walls/

Repairing roofs

www.historicengland.org.uk/advice/your-home/looking-after-your-home/repair/roofs/

8. Describe and evaluate the benefits, options and risks of energy-efficiency and retrofit measures, and of climate change adaptations –

‘Traditional buildings often perform better in terms of heat loss through fabric than as stated in standard models and assessment methods. This means that the likely paybacks from some retrofit measures, such as solid wall insulation, may be less than assumed.’

Sustainable Traditional Buildings Alliance

Background

For the past two centuries gas and electricity have been cheaper and more easily exploited than ever before. One of the most worrying consequences is a rapidly changing climate due to rising levels of greenhouse gases, such as carbon dioxide (CO₂), in the atmosphere.

In 2010, 45 per cent of CO₂ emissions generated in the UK came from energy used for day-to-day building operations and powering electrical equipment in buildings. The UK Government is legally committed to an 80 per cent reduction in greenhouse gas emissions by 2050. The building stock is inevitably coming under the spotlight as it is the largest single user of energy and of many other resources.

Energy efficiency and retrofit

The three biggest influences on a building’s energy use in operation are:

1. **Building fabric:** Older houses are often thought to be cold and draughty, but they can vary greatly in their energy efficiency depending on how they are constructed and maintained. There is growing evidence that many perform better than assumed and some outperform modern houses. Nevertheless, action can and should be taken to reduce energy use and carbon emissions from traditional buildings where possible.

2. **Building services and equipment:** Of the total energy consumed by the average UK dwelling in 2010, 6 per cent was used for heating, 21 per cent for hot water, 14 per cent for electrical appliances, 3 per cent for lighting and 3 per cent for cooking. Almost 50 per cent of carbon emissions were associated with heating.

3. **People:** Factors to consider include how the occupants maintain their buildings, the heating and lighting levels they require, the equipment, such as computers and washing machines they use, and how they use the spaces.

All these factors are highly interdependent. Critically, the efficiency of a building will also depend on how well it is maintained.

A key benefit of upgrading the thermal efficiency of traditional buildings is that most improvements can be carried out at relatively low cost. They can significantly enhance the comfort and health of building users, creating warmer homes with improved air quality, as well as providing savings on fuel bills and helping to meet greenhouse gas emission reduction targets. Improving energy and carbon performance may also give a welcome opportunity to protect and enhance a traditional building and ensure that it remains viable into the future. Repairing and draught-proofing windows and doors, for example, is an easy and cost-effective action that will pay for itself quickly through the reduction in fuel bills.

Useful sources of advice on upgrading the thermal performance of individual building elements, such as windows, walls and floors, are listed in the resources section below. However, there are also risks that need to be considered.



The thermal efficiency of a traditional or historic building can be improved without loss of the original windows which form such an integral part of their character. Simple draft proofing or installing secondary glazing reduces heat loss. This non-intrusive approach retains the original windows and does not damage the original fabric of the historic building.

© Historic England

Risks Altering the thermal performance of older buildings is not without risks. For example, use of inappropriate energy-efficiency and retrofit measures can:

- introduce thermal bridges (cold bridges)
- reduce ventilation below the level required to keep a building dry
- encourage condensation
- reduce indoor air quality

- affect the movement of moisture through the building fabric, which can encourage decay
- encourage overheating
- harm the significance of traditional buildings by damaging, removing or covering up important features.

Research has shown that these risks can result in buildings consuming considerably more energy after retrofit measures have been installed than predicted.

The most significant risk is that of creating condensation either on the surface of a building component (such as a window or wall) or between layers of the building fabric. This is referred to as interstitial condensation. Condensation can give rise to health problems for occupants as it can lead to mould growth. It can also damage the building fabric through decay.

Avoiding the risk of condensation can be complex as a wide range of variables come into play. For older buildings though there is no one size fits all solution; each building needs to be considered and an optimum solution devised.



Research shows that traditional buildings can often perform better in practice than widely used theoretical and computer modelling results, so it is important to understand the building. Thermal imaging cameras can show variations in surface temperature and can highlight thermal defects such as cold bridges.

© Dr Chris Whitman, Cardiff University

Climate change adaption and mitigation

Flooding is perhaps one of the most obvious risks for traditional buildings as a result of climate change. Many older homes are in areas where there is a significant chance of river or coastal flooding. Even more are at risk from surface water, groundwater or sewer flooding.

Steps can be taken to improve the resistance and resilience of traditional buildings to withstand flooding, such as the installation of flood barriers on doors and windows. However, when flooding does occur, buildings can be damaged by unsuitable drying out methods and repair works, which can sometimes result in historic materials and fittings being thrown away needlessly.

Climate change can also bring long-term risks that are more easily overlooked, such as the gradual erosion of masonry as a result of increased rainfall and winds. Good maintenance is essential to keep on top of problems as they develop. It is also important to retain original traditional weathering details, such as overhanging eaves and projecting lintels as they help to protect the building. These features should always be retained and repaired, or reinstated if they are missing.

The introduction of micro-generation equipment, including solar panels, can harm the appearance of a traditional building or historic area, but with care in the choice, siting and design of equipment, this need not be the case. Sources of advice on this topic are included below.

Whole building approach

For historic buildings a balance needs to be achieved between improving energy efficiency and avoiding damage both to the significance of the building and its fabric. Taking a whole building approach can achieve significant improvements in most cases.

Factors which should be considered are:

- existing building structure and condition
- selection of materials suited to the permeable nature of traditional buildings
- use of correct detailing
- care in the installation of services
- heritage values and significance of the building
- technical risks

- relevant planning permission and legislation, and official guidance relating to built heritage
- national building regulations including any exemptions and special considerations for older and traditional buildings.

The whole building approach is outlined in *Planning Responsible Retrofit of Traditional Buildings* from the Sustainable Traditional Buildings Alliance as integrating fabric, services (such as heating and ventilation) and human behaviour with the context of the building. This follows a joined-up and balanced approach based on assessment, design, installation, user advice and on-going maintenance.



The whole house approach to improving the energy efficiency of a traditional building. The performance of the building envelope was improved by using simple retrofit measures, such as installing appropriate insulation and carrying out conservation timber repairs that respected the building's history and significance, original materials, construction methods and detailing.

© Historic England

Suggested learning activities

Use the Guidance Wheel and Knowledge Centre on the Sustainable Traditional Buildings Alliance (STBA) website to customise and select measures for a traditional building of your choice.

www.responsible-retrofit.org/wheel/

Resources

Planning Responsible Retrofit of Traditional Buildings, Sustainable Traditional Buildings Alliance (STBA), 2015

www.stbauk.org/stba-guidance-research-papers

Historic England has produced a series of publications offering practical advice on how to save energy in older homes

www.historicengland.org.uk/advice/your-home/saving-energy/guidance/

Find out about installing, replacing or upgrading building services, such as gas or heating pipes and electrical wiring without causing any permanent damage to the historic fabric

www.historicengland.org.uk/advice/your-home/making-changes-your-property/types-of-work/installing-services/

Design Guides, National Trust

www.nationaltrust.org.uk/features/building-design-guides

Energy Efficiency and Historic Buildings: Application of Part L of the Building Regulations to Historic and Traditionally Constructed Buildings, Historic England, 2017

www.historicengland.org.uk/images-books/publications/energy-efficiency-historic-buildings-ptl/

Learn more about how to implement specific energy-efficiency measures, from Historic England's technical guidance

www.historicengland.org.uk/advice/technical-advice/energy-efficiency-and-historic-buildings/

Short Guide 1: Fabric Improvements for Energy Efficiency in Traditional Buildings, Historic Environment Scotland, 2013

www.engineshed.scot/publications/publication/?publicationId=179c1909-3679-4486-9583-a59100fa98c1

Short Guide 11: Climate Change Adaptation of Traditional Buildings, Historic Environment Scotland, 2017

www.historicenvironment.scot/archives-and-research/publications/publication/?publicationId=a0138f5b-c173-4e09-818f-a7ac00ad04fb

Flooding and Historic Buildings, Historic England, 2015

www.historicengland.org.uk/advice/your-home/flooding-and-older-homes/

Renewable Energy and your Historic Building, Cadw, Welsh Assembly Government, 2010

www.cadw.gov.wales/advice-support/historic-assets/listed-buildings/best-practice-guidance#section-renewable-energy-and-your-historic-building

Several publications about different types of renewable energy equipment have been produced by Historic England

www.historicengland.org.uk/advice/planning/infrastructure/renewable-energy/microgeneration/

What is whole house retrofit? Sustainable Traditional Buildings Alliance (STBA), 2016

www.sdfoundation.org.uk/downloads/What-is-Whole-House-Retrofit-Dec2016.pdf

Find out more ↪

For more on careers opportunities in this sector, see the following webpages and videos:

GO CONTRUCT, Construction Industry Training Board (CITB)

www.goconstruct.org/learn-about-construction/find-the-role-for-you/career-explorer/heritage-consultant/

Creative and Cultural Skills

www.ccskills.org.uk/careers/advice/job-profiles/heritage/?gclid=EAlalQobChMlyOzfIfH62AIVr7ftCh3d8wduEAAYASAAEgIJJO_D_BwE

Twyi Centre

www.youtube.com/watch?v=vDwKnySwwrU

Society for the Protection of Ancient Buildings (SPAB)

www.spab.org.uk/learning/careers-advice

Prince's Foundation

www.princes-foundation.org/education/building-craft-programme-heritage-skills-nvq-level-3

Traditional Building Skills Bursaries

www.historicengland.org.uk/services-skills/training-skills/work-based-training/traditional-building-bursaries/

There are a number of excellent resources which can be used to help achieve the learning outcomes suggested in this guide, including:

Conservation Basics, Historic England, 2013.

Conservation Basics reviews the history and evolution of building conservation in England, explaining the philosophical and legal frameworks that exist today. It covers the processes involved in caring for historic buildings, and gives advice on the practical application of current legislation and guidance. Topics covered include conservation planning, surveying and recording, assessment, and planning programmes of maintenance and repair (including specification and procurement).

www.historicengland.org.uk/images-books/publications/conservation-basics-conservation/

Conservation Principles for the Sustainable Management of the Historic Environment in Wales, Cadw, Welsh Assembly Government, 2011

Conservation Principles explains Cadw's conservation principles and how to apply them in a range of situations from routine management and maintenance to new work and alteration. It also explains how to assess the significance and heritage values of a historic building or site to inform decisions about its future.

www.cadw.gov.wales/advice-support/conservation-principles

Conservation Principles, Policies and Guidance, Historic England, 2008

The primary aim of *Conservation Principles, Policies and Guidance* is to support the quality of decision-making, with the ultimate objective of creating a management regime for all aspects of the historic environment that is clear and transparent in its purpose and sustainable in its application.

www.historicengland.org.uk/images-books/publications/conservation-principles-sustainable-management-historic-environment/

BS 7913:2013 Guide to the Conservation of Historic Buildings

This British Standard describes best practice in the management and treatment of historic buildings through all stages from initial assessment through to the completion of work.

www.shop.bsigroup.com/ProductDetail/?pid=00000000030248522

INFORM guides, Historic Environment Scotland

The INFORM guides provide an excellent introduction to a range of traditional building materials and techniques.

www.engineshed.scot/publications/?curPage=1&publication_type=36

More detailed technical guides and case studies published by Historic Environment Scotland can be found here

www.historicenvironment.scot/archives-and-research/publications/

The SPAB Approach to the Conservation and Care of Old Buildings, Society for the Protection of Ancient Buildings (SPAB),

The SPAB Approach aims to promote the value and good sense of caring for the fabric of old buildings. The SPAB takes a long-term view, urging that in our own actions we consider the legacy we will leave to future generations.

www.spab.org.uk/campaigning/spab-approach

Understanding Conservation, COTAC

Understanding Conservation is an online educational resource for all involved in, or interested in, conservation of the historic environment. It will be particularly useful for more advanced learners.

www.understandingconservation.org/

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