



RISE

Retrofit information,
support & expertise

Introduction to Historic Buildings

Supply chain advice pack

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www.riseretrofit.org.uk



Overview

One of England's greatest sources of carbon dioxide emissions is from heating and powering domestic buildings (see figure 1). This means that for the UK to meet its national net zero obligations, it must act to reduce the amount of energy people use to heat and power their homes. This often means taking steps to improve the fabric of the buildings people live in, which can be challenging if they are either historic or heritage buildings.

This advice pack introduces some basic information for supply chain organisations working in historic buildings for the first time. Historic buildings are not the same as heritage buildings; the former are defined by their age and construction, while the latter are defined by being protected for their heritage value. *For more information about heritage buildings, see our advice pack library ([Toolkits](#) | [Retrofit Information, Support and Expertise](#)).*

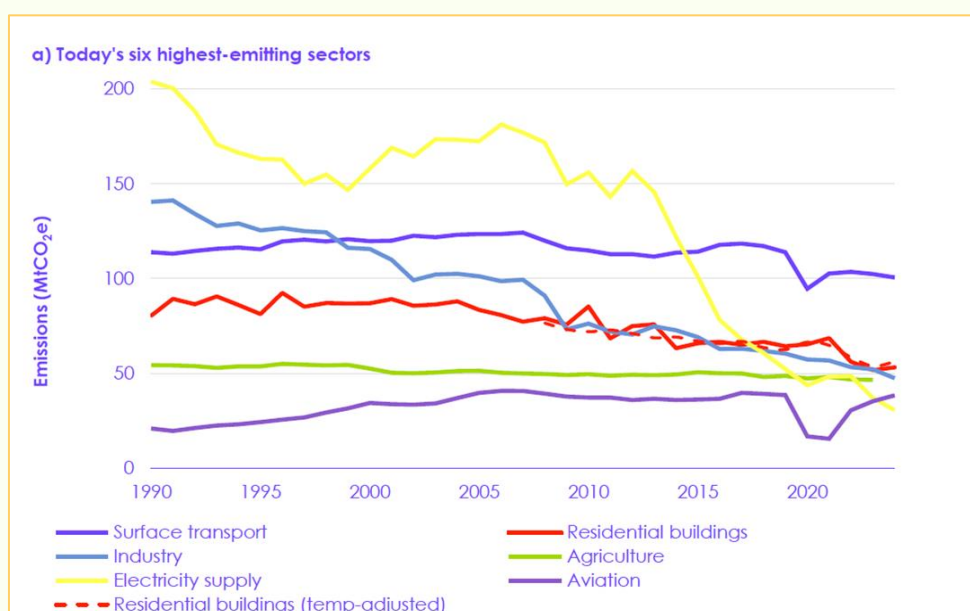


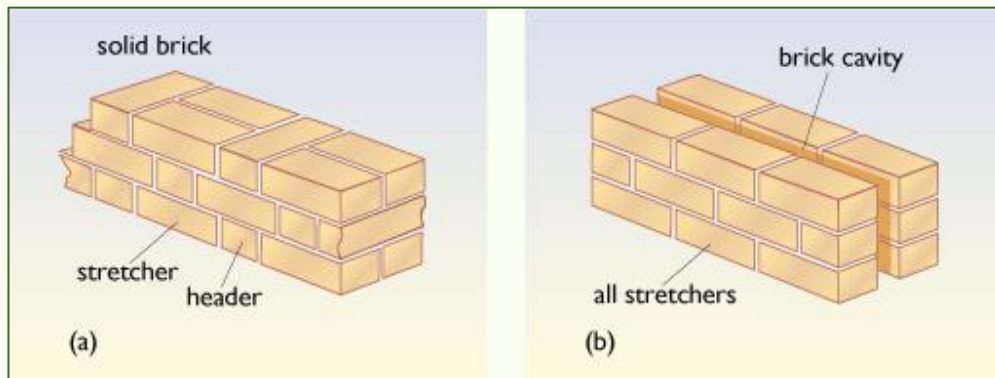
Figure 1 shows UK emissions by sector since 1990.

Source: Carbon Change Committee 2025

What are historic buildings?

Historic buildings are generally defined as those built before 1919, which is when cavity wall construction became widely adopted. Although there are exceptions to this classification, with some early cavity walls dating from the 1800s and later solid walled buildings, most pre-1919 buildings are characterised by:

- Solid walls (figure 2).
- Suspended timber floors (figure 3).
- Single-glazed timber windows and doors (figure 4).
- Solid plaster to internal walls and ceilings (figures 5 and 6).
- Timber roof structure with slate or tile coverings (figure 7).
- Structural chimneys (figure 8).



Figures 2 shows solid wall construction (a) compared to cavity wall construction (b).

Note that 'header' bricks laid perpendicular to the wall line provide structural stability in a solid wall. This is why the short edge of a 'header' is always visible in a solid wall. Source: open.edu



Figure 3 shows a suspended timber floor without floorboards. These were developed to avoid damp problems associated with laying floorboards directly on solid ground. Source: Ecological Building Systems



Figure 4 shows a former fire station in Tower Hamlets, which was converted into housing in 1997. All the windows and doors would have originally been timber with single glazing. Source: Historic England.



Figure 6 shows the reverse of a lathe and plaster wall, which from the front appears smooth. Source: Historic England



Figure 7 shows a solid plaster ceiling with simple cornice, also made in solid plaster. Source: plasterceilingroses.com



Figure 8 shows a pre-1919 building being reroofed with Westmorland slates. Source: nealroofing.com



Figure 9 shows a tiled hipped roof around a structural chimney. Source: Historic England

‘Hard to treat’

There are about 5.9 million pre-1919 buildings in England, which is 20% of the whole building stock ([Historic England 2024](#)). This means that many historic buildings are homes that need to be made more energy efficient. However, they are sometimes considered ‘hard to treat’ or ‘difficult to decarbonise’. This is usually for one or both of two key reasons:

- **Heritage value:** Elements of the building are significant for their heritage value that they cannot be upgraded to the energy efficiency standards necessary
- **Vapour permeable performance:** The methods and materials of construction mean the building handles moisture differently to modern buildings. This difference in performance means it can be incompatible with many of the modern materials and methods commonly used in retrofit

Buildings with heritage value

Heritage buildings are often protected via the planning system. It can be challenging to make changes like installing energy efficiency measures because the measures themselves may cause harm to the heritage value. However, there are a growing number of case studies where energy efficiency measures have been approved on heritage buildings. Detail on some of these is available in the RISE supply chain advice pack on Heritage Buildings.

There are some instances where pre-1919 buildings are not formally recognised for their heritage value but are considered by the local authority to make a positive contribution to the local area. In these instances, the local planning authority can interpret external wall insulation as a change in appearance:

The materials used in any exterior work (other than materials used in the construction of a conservatory) must be of a similar appearance to those used in the construction of the exterior of the existing dwellinghouse

The General Permitted Development Order 2015

In 2023, Manchester City Council required that households sought planning permission to add external wall insulation (EWI) to the side elevation of their home. Built of solid brick around the turn of the 20th century, the building was characteristic of the area (figure 10). However, in approving the colourful EWI, the local authority stated that ‘the resulting impact is not considered so significant as to warrant refusal on the grounds of visual impact (figure 11).



Figure 10 (left) shows a typical street scene in Manchester that the property is in figure 11 (right) is located in. The blue EWI required planning permission before being installed. Source: Carbon Coop

Buildings with alternative performance characteristics

Although most pre-1919 buildings are not protected for their heritage value, the materials and methods of their build means that they perform differently to modern buildings (figure 12). Their inherent vapour permeability, which allows moisture to enter and then evaporate from the fabric, means that they are particularly high risk of the unintended consequences like damp and mould. These

occur when moisture enters the fabric and gets trapped behind the impermeable materials used in the retrofit of modern buildings.

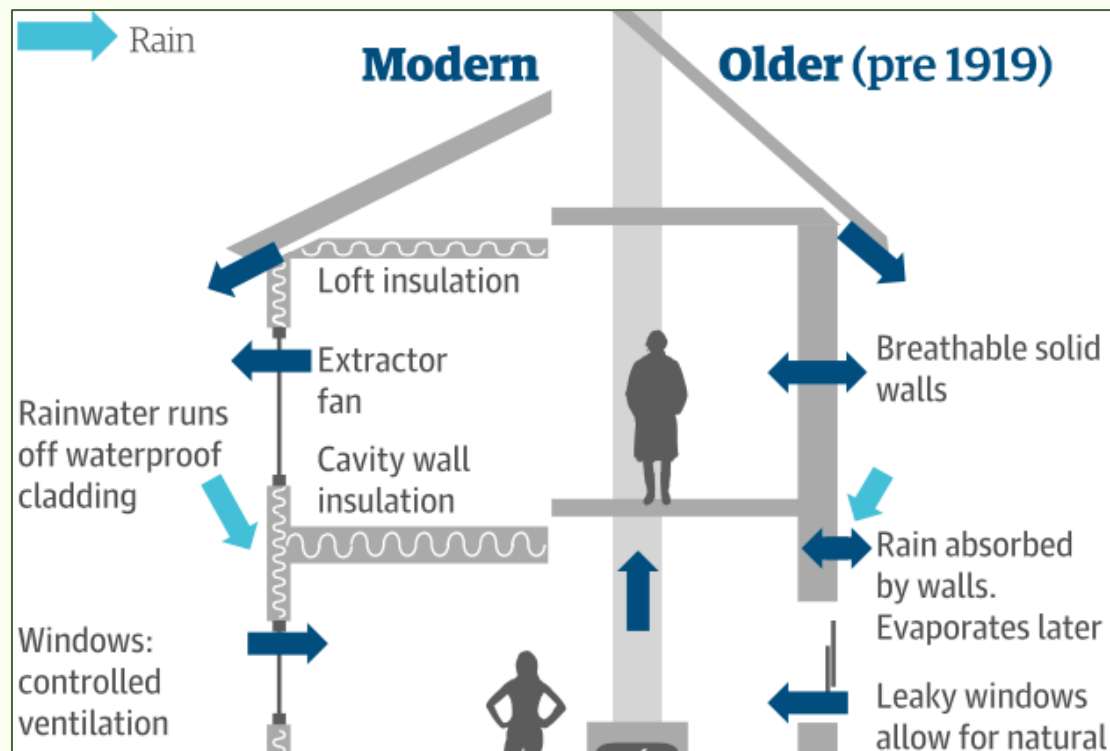


Figure 12 explains how the performance characteristics of modern and pre-1919 buildings differ (bright blue arrows indicate rainwater; dark blue arrows indicate moisture movement). Source: Living Space Architects.

It is possible to install energy efficiency measures on pre-1919, vapour permeable buildings. This is true whether they are recognised for their heritage value or not, if the measures are installed very carefully. Some of the considerations to be aware of are detailed in table 1 below.

Building element	Typical energy efficiency measure	Building performance considerations
Walls	Cavity wall insulation (CWI)	Not possible. Only one solid mass of wall (as figure 2 above) means the gap between the two leaves of a cavity wall is not present to fill with CWI.
	External wall insulation (EWI)	Often discouraged because it changes the appearance of buildings. Can be installed when detailed appropriately and in compliance with PAS2035 (as figure 11 above). Some finishes replicate the appearance of the existing building, but these can be prohibitively expensive (figure 13).
	Internal wall insulation (IWI)	Usually installed to conserve the external appearance of the building (figure 14). Disruption and cost of making good can be prohibitive.
Floors	Underfloor insulation	Can be installed in the void between floor joists and the ground (as figure 3 above). Care needed to ensure existing timbers are well-ventilated (see figure 15 for an example). Removal floorboards can be seen as very disruptive.
Windows and doors	Triple and double glazing	Can be installed with minimal impact on performance but sometimes discouraged due to impact on appearance. Window reveals may be too shallow for thicker window frames to be installed. The installation of new windows and doors should always address any draughts (figure 16).
	Secondary glazing	Where high performance windows cannot be installed, either practically (as above) or for heritage reasons, secondary glazing should be fitted. Again, this work should address draughts (figure 17).
Internal plaster	Retain or reinstate solid plaster	Solid plaster performs better thermally than modern substitutes. Advantageous to repair or reinstate it. Filling gaps behind skirting, so plaster extends from ceiling to floorboards, also thermally beneficial. When installing IWI in heritage buildings, reinstatement of decorative plaster can be expensive.
Roofs	Roof insulation	As in modern buildings, cold and warm roofs can be insulated (figure 18). As with underfloor voids, care needed to ventilate the roof appropriately.
Chimneys	Chimney balloons	Well-ventilated chimneys were at the core of how a vapour-open building performed. When blocking up a chimney, care needed to ventilate the building appropriately elsewhere as set out in PAS2035.



Figure 13 shows art brick EWI used in a conservation area. Source: Broxtowe Council

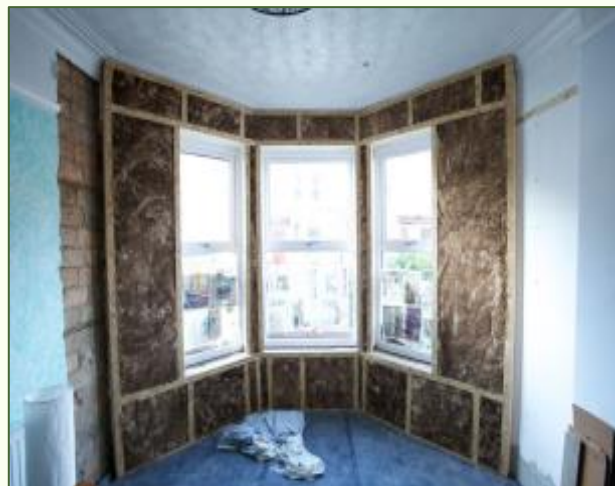


Figure 14 shows IWI being installed in a bay window. Source: Carbon Coop

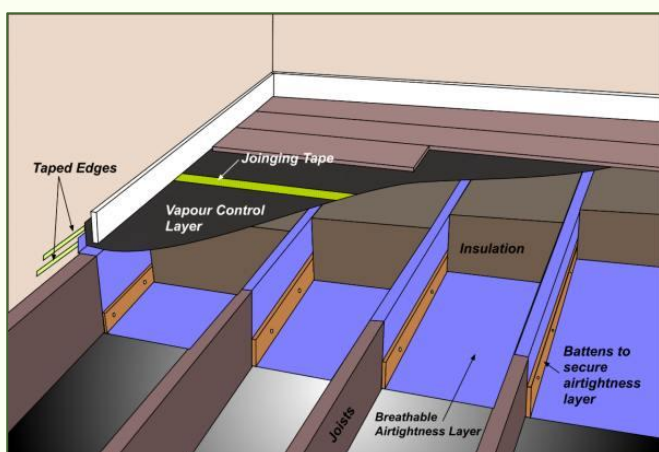


Figure 15 shows a breathable membrane being installed around joists before underfloor insulation is added. Source: eco-home-essentials.co.uk



Figure 16 shows airtightness tape between insulation boards in the roof of a historic building. Source: 21degrees.com



Figure 17 shows a nylon brush being inserted into a sash window as draught proofing. Source: Historic England.

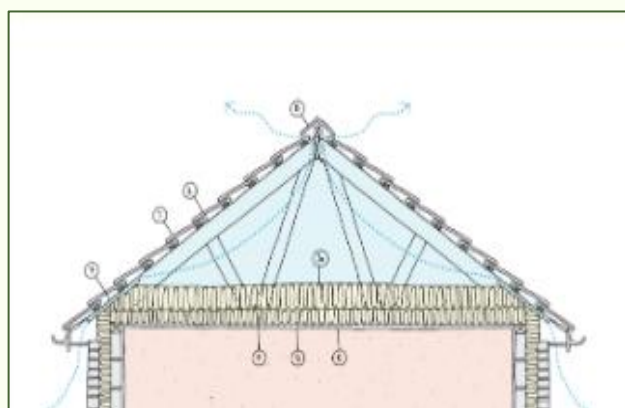


Figure 18 shows insulation installed in a cold roof. Source: designsindetail.com

Overarching considerations

There are also some broader considerations to be aware of when improving the energy efficiency of older buildings:

- **PAS2035:** Provides a framework for managing the risks associated with installing energy efficiency measures to existing dwellings. It is usually a requirement for government funded schemes, such as Warm Homes. Even if compliance with PAS2035 is not required, some of the guidance on particularly challenging areas or sourcing qualified professionals may be useful. It has some guidance on retrofitting heritage and historic homes.
- **Building condition:** Effective retrofit works begin with making sure the existing fabric is in good condition. This might involve repairing roofs and rainwater goods to allow walls and other building elements to dry out. It may also involve resolving structural issues, repairing cracks in masonry, and repointing.
- **Airtightness and ventilation:** Historically the draughts in buildings helped the building's vapour permeable materials dry out, preventing damp and mould. In modern energy efficient construction, 'draughts are controlled through airtightness works and central ventilation. For historic buildings, any works to control a building's vapour permeability, and increase its airtightness and insulation levels must be balanced by controlled ventilation.
- **Thermal mass of existing building elements:** As with solid plaster, some building elements in historic buildings have a higher thermal mass than their modern counterparts. This is not always accounted for fully in RdSAP methodologies but should be considered in efforts to make historic buildings more energy efficient.
- **Embodied carbon:** Utilising and improving the existing built environment is inherently sustainable because of the carbon embodied in its fabric. Natural materials, which often suit the buildings' vapour permeability, also tend to have lower embodied carbon levels than modern counterparts (STBA 2025). This means that continuing a historic building's use by improving its energy efficiency while protecting its performance characteristics can often be seen as a sustainable approach.

Links to PAS

BSI PAS 2035: 2023 has clauses relating to working with historic dwellings including:

- *A.1.2 details the qualifications required for retrofit assessors.*
- *7.3.2 details historic considerations required at the retrofit assessment stage.*
- *7.3.4 If the dwelling to be assessed is of traditional construction, an assessment of significance shall also be carried out in accordance with BS 7913. and the significance assessment template in 7.3.4 b. These outlines retrofit coordinator's discretion should be used to seek specialist historic skills where required.*

RISE resources

Disclaimer: some content referred to may be about PAS 2035:2019.



Podcast: All RISE podcasts are available [here](#).



Podcast: "Historic England Advice Notes (HEANs)" available [here](#).



Masterclass: All RISE masterclasses are available [here](#).



Masterclass: "Heritage retrofit examples with Edward Hart Consultancy" available [here](#).



Advice pack: All RISE advice packs available [here](#).



Advice packs: RISE Heritage Planning advice pack available [here](#).

This pack aims to share insights, good practices, and lessons learned from the sector. It is intended for informational purposes only and does not constitute as recommendations or endorsements of specific suppliers, products, or services or as legal advice. Please always check the latest regulations.



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