

Supplementary Planning Guidance

**Appropriate Repair, Maintenance and
Energy Efficiency in Traditional
Buildings:**

Guidance for Sustainability



Canolfan Tywi Centre

This supplementary planning guidance (SPG) has been introduced to ensure Carmarthenshire's built heritage is appropriately conserved and sustained for future generations. It is relevant to all historic buildings in the County, not just those that have statutory protection - ie not just listed buildings or those in conservation areas.

It sets out why traditional 'breathable' plasters, renders and insulating materials should be used in historic buildings, and will guide decision-making when works of conversion, adaptation, renovation or repair are proposed as part of a planning application, in advice given by the Council and to work the Council carries out on its own building stock.

For more information contact
tywicentre.org.uk



Aim of the SPG?

This policy explains why the 'breathability' of traditional building fabric is necessary and why 'breathable' materials must be used in the plastering, rendering and insulating of traditional buildings.

It explains:

How historic or traditional buildings, the majority of which are more than 100 years old, are typically constructed from solid stone or brick without a cavity, and how they function.

Why historic buildings differ from modern 20th century cavity wall construction.

How Vapour Permeable or 'breathable' materials are 'vapour-open' allowing moisture to freely enter and exit from the fabric of the building.

The problems that occur when non-breathable materials are used – including rotting timber, heat loss and mould growth.

The benefits of using traditional breathable materials to occupants, owners and the broader Welsh housing estate.

Why using traditional breathable materials it is vital to the sustainability of the existing domestic housing stock.



Policy Context

The Council assess proposals and applications on historic buildings, whether formally designated or not, against a group of existing policies which promote the sustainability of historic buildings. These include:

- Placemaking and Sustainable Places (SP12).
- Conversion and Re-Use of Rural Buildings for Residential Use (RD2).
- Protection and Enhancement of the Built and Historic Environment (SP15).
- Listed Buildings and Conservation Areas (BHE1)
- Climate Change (SP16)

In line with existing built heritage policy, this SPG specifically assists in the interpretation and implementation of the following:

1. Wellbeing of Future Generations (Wales) Act 2015
2. Managing Change to Listed Buildings in Wales
3. The Local Development Plan (2018-2033. Strategic

Objectives:

- SO5 To safeguard and enhance the built and historic environment and promote the appropriate reuse of redundant buildings.
- SO7 To make a significant contribution towards tackling the cause and adapting to the effect of Climate Change, including promoting renewable energy and the efficient use and safeguarding of resources.

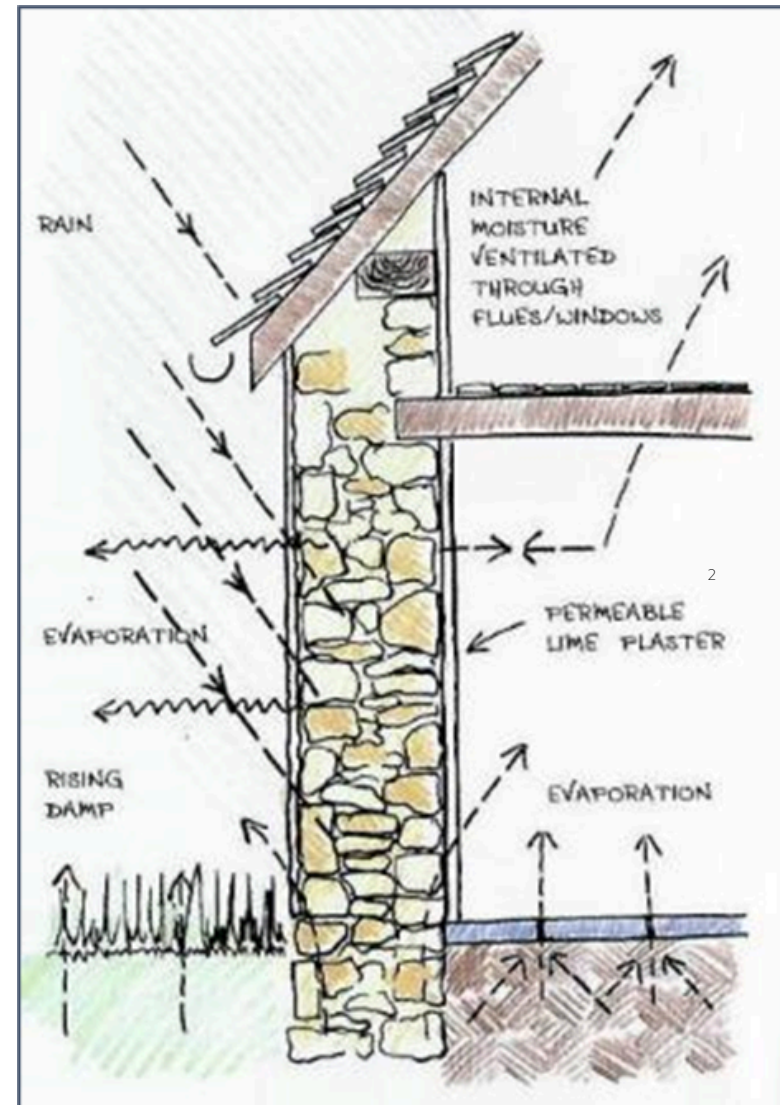
Traditional / Historic Building Construction

Traditional buildings are buildings of solid walled (non-cavity) construction built of stone or brick, the majority of which were built before 1919. Across Wales around 500,000 homes are buildings of this type, making up about 1/3 of Wales's housing stock.

Homes of this form of construction traditionally rely on the thickness of the wall to keep inhabitants warm and dry, rather than any waterproofing render or paints.

Typical features of a solid wall constructed building include:

- Shallow foundations
- Stone buildings often having mud or shale infill between the outer and inner wall faces
- Timber embedded in the walls eg, window lintels and floor joists
- Originally built with a breathable lime mortar
- Often rendered, plastered and limewashed with a breathable lime



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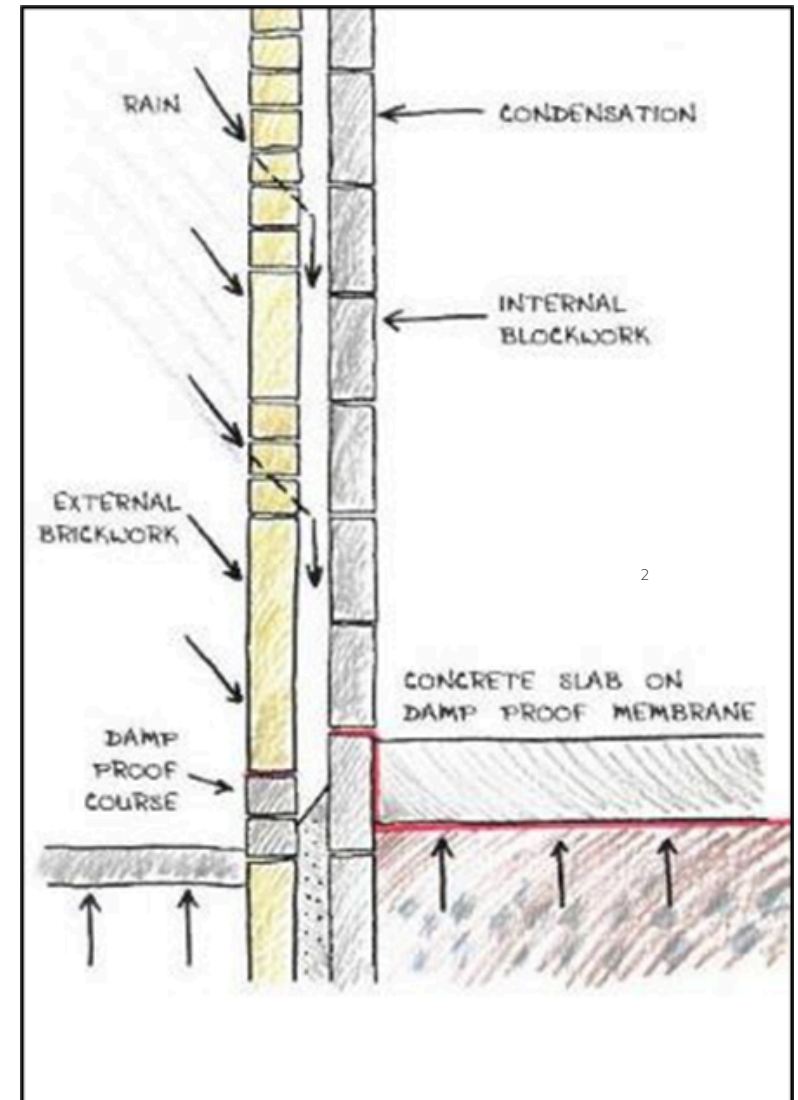
Modern 20th Century Construction

Traditional Construction is compared to buildings whose external walls are made up of two 'leaves' with a cavity between them: Cavity wall construction. These 'leaves' can be brick, block or timber, but the common feature is that they have a gap between the 'leaves'.

The gap is present to prevent moisture travelling from the outer 'leaf' to the inside of the building and it is this physical barrier which keeps the inhabitants of the building dry.

Typical features of a cavity wall constructed building include:

- Deep Foundations – in accordance with Building Regulations
- Damp proof course to ensure that any water running down the cavity exits the building rather than pooling at the bottom of the cavity
- Originally built with rigid, non-breathable mortars, such as cement.

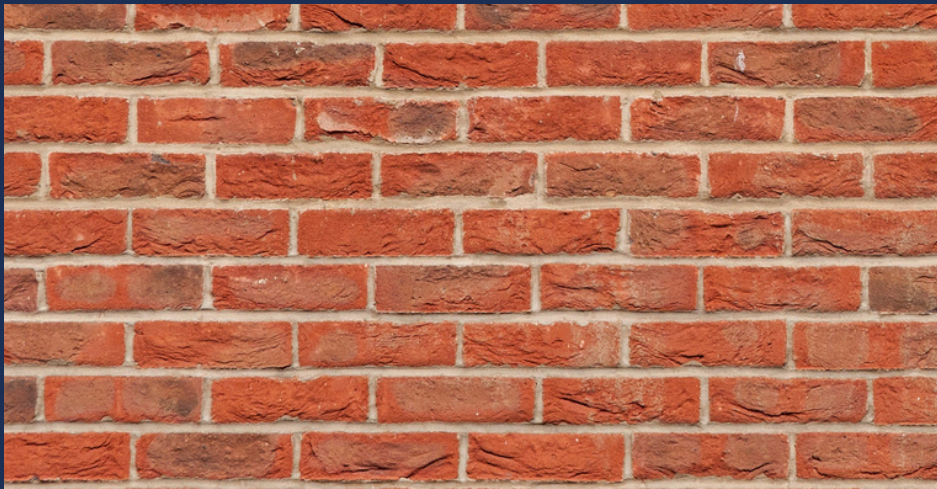


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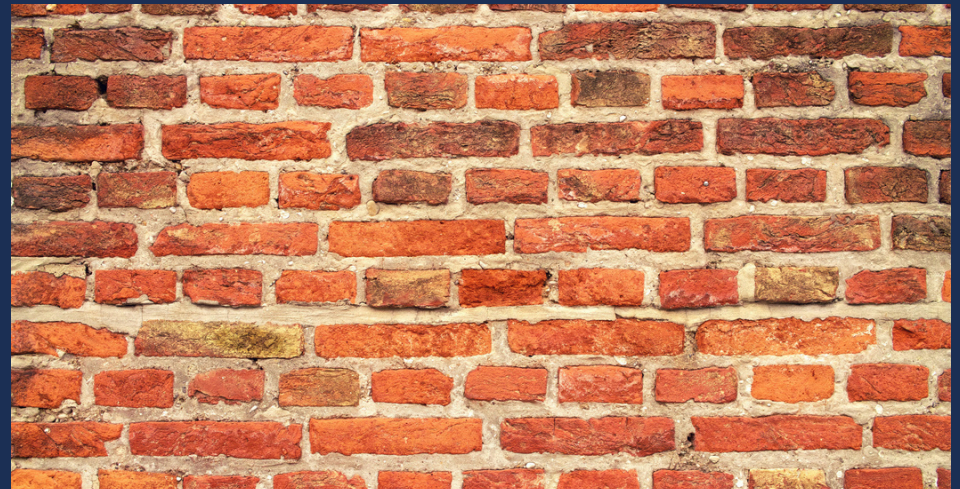
How to determine if a brick wall is solid or has a cavity

There are two easy ways to check if you have cavity walls. Either look at the 'bond' or pattern of the brickwork or check the thickness of the wall.

The thickness of a wall can be measured at a door or window. A solid wall is likely to be 23cm (9") thick plus internal plastering and external rendering (if any) and a cavity wall 30cm (11.5") plus plastering and rendering (if any).



A cavity wall has all the bricks laid end-to-end, usually with only the long face of the brick or 'stretcher' showing. A second wall makes up the inside 'leaf' and the two walls are tied together with wall ties.



A solid brick wall has both the long face of the brick and the short face or 'header' showing in a regular pattern. The 'header' runs directly through the solid wall so the same pattern is reflected on the other side of the wall.

Traditional breathable materials should be used to render, plaster and insulate all traditional buildings of solid walled construction to ensure that any moisture that enters the solid walls of the building can freely exit.

What are breathable materials.

Vapour Permeable or 'breathable' materials are those that are 'vapour-open' allowing moisture to freely enter and exit from the fabric of the building.

These materials include lime mortars and plasters as well as many natural insulation materials such as corklime, hemplime, sheepswool and woodfibre boards.

Non-breathable and inappropriate materials include cement-based mortars and renders; gypsum plasters; and foil-backed or extruded polystyrene insulation.

The consequences of using non-breathable materials on a traditional building.

Most traditional buildings have shallow foundations and tend to move slightly though the year as the ground gets wet and dry, and hot and cold. If a building is covered in a rigid mortar such as cement or gypsum plaster, this movement causes the renders to crack and moisture inevitably enters the wall. Once water is in a wall it is very difficult for it to escape.

You can see evidence of this following rainfall on a cement rendered building with moisture trying to find its way out of the cracks.



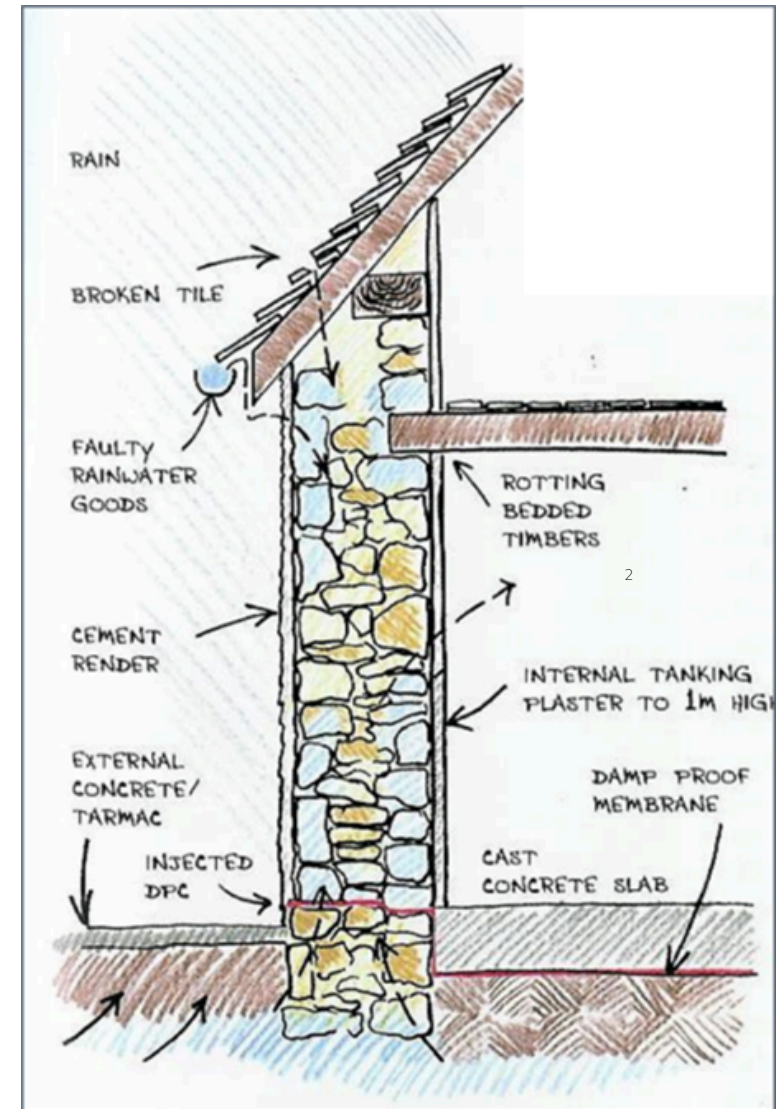
Rotting Timber. Once water gets into a wall, it tends to get trapped there. It is easier for water to enter through a small crack than exit through it. If water is held in a wall by a non-breathable render and plaster, any timbers embedded in that wall are extremely likely to rot.

Heat Loss. If water is trapped in a solid wall in the mortar between the stone or the brick, the thermal capacity of the wall drops - which results in that wall conducting heat more effectively and heat loss occurs more quickly. It is therefore more expensive to heat a damp solid walled building.

Mould Growth. If the external walls of a building are damp and cold, any heat and moisture generated inside by inhabitants (eg, by cooking, or showering) is likely to condense on the cold walls and attract mould growth.

Water trapped above DPC. Solutions to try to prevent water entering solid walls are often misplaced. Injected Damp Proof Courses (DPC's) cannot be successfully installed due to the voids in the walls and the porosity of many historic mortars, bricks and stone. It is virtually impossible to form a continuous impermeable layer at the foot of a historic wall to prevent moisture from rising up a wall from the ground, and therefore the result of attempts to inject a DPC lead to a layer punctuated with gaps, which tends to have the opposite of the intended effect by trapping water above the DPC in the wall.

Tanking exacerbates the problem. Tanking an internal wall surface adds a further impermeable layer to a historic wall and serves to trap moisture in a wall, much the same way as a cement render, exacerbating the issues of heat loss, rotting timbers, condensation and mould growth.



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Sustainability and Traditional Buildings.

Wales's domestic housing stock is made up of around 500,000 traditional buildings. It is not economically viable, environmentally efficient or healthy for occupants to allow these buildings to become damp and fall into disrepair.

To replace the amount of energy embodied in these buildings both from a Carbon and an Economic perspective would be prohibitive and historic buildings are an irreplaceable part of our Welsh culture and heritage.

In order to improve the energy efficiency of traditional buildings it is therefore important that they are repaired and maintained using appropriate breathable materials.



Saving Energy: Where to start?

Owners of historic buildings often find their buildings perform much more efficiently in terms of heat and air loss when moisture can evaporate correctly.

In considering energy efficiency, the first action should therefore be to ensure the walls and embedded timbers are dry by ensuring the renders and plasters are breathable. The addition of any energy saving measures should only be considered once the walls are dry, and then, only breathable insulation materials should be used.

Planning applications or proposed works to upgrade the energy efficiency of historic buildings should first demonstrate that the walls are dry, that moisture is evaporating correctly, and the building is performing correctly, before any new breathable insulation materials are introduced.

Maintenance Matters

Undertaking regular maintenance and timely repairs will prevent simple problems from developing into more serious, costly issues. Common problems and damp walls often relate to inappropriate repairs using cement; leaking, blocked or missing gutters and down pipes; leaking or blocked chimneys; and vegetation growing on buildings.

There are many good reasons for undertaking regular building maintenance. It can help:

- Keep building walls dry and so reduce heating costs
- Retain a building's maximum value, particularly when original architectural features are still present.
- Save money through repair, rather than replacement, of features, such as windows.
- Prevent more serious problems, such as dry rot, and avoid the cost and disruption of major repairs.
- Maintain the appearance of your building and contribute to a sense of pride in your community.
- Promote sustainability by protecting your building for future generations to use and enjoy.

Other ways to improve Energy Efficiency

As well as keeping a building well maintained and dry, other relatively low risk measures to improve energy efficiency in a traditional building could include loft insulation using breathable insulation, and secondary glazing or draft proofing windows.

In applying Internal and External Wall Insulation to Traditional Buildings there is a real danger of trapping moisture in the walls. Seeking advice of the Built Heritage Team when considering this form of wall insulation is highly recommended.



Conclusion

The sustainability of Wales's built heritage relies on its economic and environmental viability. If a building is performing poorly in its role of keeping inhabitants warm, dry and healthy it will fall into disrepair and ultimately disuse.

In Wales, and particularly where such a large proportion of Wales's housing stock is of traditional construction, the most important contribution that can be made to its sustainability is to ensure the walls of traditional buildings are kept dry using breathable materials compatible with their construction type: such as lime mortars and renders. This ensures any moisture that enters the solid walls of the building can freely exit and the building performs efficiently. Any works being considered to upgrade energy efficiency should first demonstrate that the historic building is 'breathing' correctly, and then ensure only traditional breathable insulation materials are used, to guard against problems such as rotting timber, heat loss and mould growth in the future.

Further sources of information

Tywi Centre information and courses:
www.tywicentre.org.uk

Building Regulations 2010 Approved Document Part L,
Volume 1, 0.8-0.15

Cadw - How to Improve Energy Efficiency in Historic
Buildings in Wales: www.cadw.gov.wales/advice-support

Society for the Protection of Ancient Buildings Guidance:
www.spab.org.uk/advice

This SPG will be taken into consideration and guide decision-making when works of conversion, adaptation, renovation or repair are proposed and promoted by Carmarthenshire County Council to any buildings of traditional construction in the county, in order to help meet its Zero Carbon commitments.

This Supplementary Planning Guidance was produced by the Built Heritage Team at Carmarthenshire County Council.

www.carmarthenshire.gov.wales/home/council-services/planning/listed-buildings-and-conservation-areas/

www.tywicentre.org.uk

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