Stoke Climsland Retrofit Guide

Supplement

Retrofit Guidance for Heritage / Traditional Properties

Andrew Richards

Strategic Historic Environment Senior Officer (Built Environment), Cornwall Council

June 2024

Funded by UK Government

GOOD GROWTH
CORNWALL & ISLES OF SCILLY SHARED PROSPERITY FUND

CORNWALL COUNCIL
one and all • onen hag oll

LEVELLING UP

Retrofit Guidance for Heritage / Traditional Properties

This guidance was produced as part of the Stoke Climsland Carbon Zero Homes Project and is a summary of recommendations made in the heritage/traditional property surveys carried out to co-ordinate with the whole house plan and retrofit surveys, heat loss surveys and heating system assessments.

The Carbon Zero Homes Project and has been fully funded by the Community Levelling Up Programme (CLUP).

1.Heritage Value

Historic buildings all differ and are subject to varying levels of protection under the planning system. They vary in their construction, location, quality of services and the way they are used. Consequently there is no 'one size fits all' solution to upgrade their energy efficiency.

Retrofitting can often damage the authenticity, character and setting of a historic building. It is important to upgrade historic buildings sensitively and retain any detailing, externally and internally, that has historic merit. This will retain character.

Any alteration to a listed building will need listed building consent. A Heritage Statement highlighting the significance of remaining detailing and informing proposals in the listed building consent application is highly recommended.

Some alterations to non-listed historic buildings may need planning permission. Further advice is available here: Do I need planning permission or building control? - Cornwall Council

More detailed advice on what permissions are required for renewables, as well as links to conservation advice, can be found in Cornwall Council's Minimum Energy Efficiency Standards guidance for landlords with historic buildings: Minimum Energy Efficiency Standards Guidance HB (cornwall.gov.uk)

Further information on upgrading historic buildings without damaging their character is available in Cornwall Council's 'Improving Energy Efficiency in Cornish Historic Buildings' guide: Improving Energy Efficiency in Historic Cornish Buildings (cornwall.gov.uk) and Technical conservation advice and guidance - Cornwall Council

2. Heritage Issues

Roof

- Check for any loose slates and if there are any refix them as soon as possible to ensure that the roof is fully weathertight.
- Carefully clean off any vegetation to roofs, especially where roofs abut external walls.
- Check flashings exist at junctions with external walls and chimneys. Check any existing flashings are fully functioning.
- Check that chimneys are structurally secure and weathertight. Check whether any repointing is required to chimney stacks and that flashings and flaunching's are sufficient. 'Pepperpot' chimney cowls or similar will give protection against the weather but still allow the chimney stack to 'breathe'.

'Pepperpot' chimney cowl

Guttering and downpipes

- Repair or replace any defective or missing sections of gutters and downpipes. Assess whether gutters are of adequate size and the amount of downpipes are sufficient to discharge rainwater. Consider adding additional downpipes and adjusting gutter falls accordingly on long runs. Adding a gutter hopper to the top of some downpipes

could help rainwater discharge from roofs where a number of gutters converge at the same spot. Check how gutters and downpipes are working on a rainy day.

Rainwater from the roof is overshooting the gutters at Higher Pempwell Farmhouse which could be causing problems for the external walls at ground level.

Walls

- Properties built with solid walls work in different ways to cavity walls and need to breathe. When it rains moisture is absorbed a short distance into a solid wall's external surface but evaporates when the rain stops, helped by the drying effect of the sun and wind. Rising damp could be evaporated through the walls. Impermeable materials like cement render, concrete floor slabs and plastic membranes can trap moisture resulting in dampness, timber decay and a thermally inefficient wall. Repointing or rendering, where required, should be carried out in a permeable lime-based mortar or render which will allow the walls to breathe and dispense moisture, thus absorbing damp. A solid wall's thermal mass can also cool internal rooms in summer by absorbing external heat during the day and slowly releasing it during the night.

This photo of the gable wall of this house in Pempwell, Calllington shows a number of areas where moisture is penetrating into the stonework:

- *Loose stonework around the end of the gutter on the main roof needs structural assessment and repointing in a lime-based mortar.*
- *An inefficient arrangement of gutters and downpipes could be causing water ingress to lower stonework.*
- *The roof has loose slates that need refixing. Vegetation needs removing from the lower roof and flat stone ledges where water could be pooling.*

- *Flashings at the junction of lower roof and external wall and water run off at ground level both need checking.*

- Any repointing should be carried out in a lime-based mortar matching the colour and texture of the original pointing. On many rural historic buildings aggregate could be exposed by brushing mortar when 'green hard' with a churn brush. The areas of hard cement pointing and patching on the photo above could be stopping the solid external walls from breathing.

- Any external render or paint should be lime based to allow solid walls to continue to breathe. Limewash or a good quality mineral paint are suitable external finishes. A breathable finish to internal walls is also recommended.

Windows and doors

- Any original windows and doors should be regularly maintained and repaired, when required. It is important that windows can be easily and regularly opened to allow ventilation to internal rooms. Repainting should be carried out when required in a high quality paint with a long lifespan to reduce maintenance periods.

- Check any flat external window cills that could allow water to pool and seep through window frames and external walls.

The cill at this house near Downgate is lipped at one end and could be potentially trapping water.

Ventilation

- Controlled ventilation is important to reduce damp and mould internally. It is especially important where radon is a potential issue such as in buildings located in or near former mining areas.

- On sash windows it is possible to install window stops to the bottom of opening sashes slightly above meeting rails and create discreet trickle ventilation under top cases of sash windows. This will give secure and controlled ventilation through the top of the opening top sash. See section 3.7 (pages 19 and 20) of Cornwall Council's: Improving Energy Efficiency in Historic Cornish Buildings (cornwall.gov.uk) guide.

- Consider adding restrictors to casement and/or rooflights to give more controlled ventilation.

- Check any trickle vents on windows are working correctly. Consider adding trickle vents to any double glazed windows where none exist.

- Make sure all windows can be easily opened. Regularly opening them and leaving internal doors open, when possible, in the summer, will increase air circulation to internal rooms and reduce damp. Doors to bathrooms should be kept closed. It might be possible to provide additional ventilation to internal rooms under some fireplaces on chimneys.

- Any existing grills through external walls could be checked to make sure air is providing ventilation internally. Mechanical ventilation from all kitchens and bathrooms could be checked to ensure that they are working sufficiently.

The air brick at this farmhouse near Stoke Climsland is partially covered by the external surfacing which could be restricting air floor under timber floors.

External areas

- Check surface water is adequately discharging away from the building to ensure no water is pooling and seeping into external walls. Adding drainage channels or gullies or adjusting surfacing to fall away from the building could be solutions if any surface water was pooling. A French drain may also be worth considering if there are any issues with surface water running towards the external walls of the house.


External areas at these houses near Luckett have vegetation close to external walls that should be regularly cleared to protect external walls. A French drain might be worth considering for the example on the right if surface water run off to the house from the garden became an issue.

3. Retrofitting Opportunities

Prior to any retrofitting it is important to ensure that any required repairs to historic buildings are carried out quickly and that the building's historic fabric is regularly maintained. This is to ensure that the building is structurally secure and weathertight to get the maximum benefit from proposed retrofitting measures. It is important to analyse the building prior to any work as all buildings differ. Southwestern elevations are likely to require more protection from prevailing winds. A number of historic houses around Stoke Climsland have slate hung weather screens on south westerly facing elevations to give additional protection to external walls. North facing elevations are likely to be colder and in need of additional thermal improvements. South facing elevations are likely to be warmer and might need less upgrading. Damp problems are more likely where internal floor levels are below external floor levels.

Insulation

- Check that insulation to roof spaces and any sloping ceilings is sufficient and if not add additional insulation. Add insulation to loft hatches which are often left uninsulated.

- Floor insulation can be effective at reducing heat loss. Insulation can be installed between timbers on suspended timber floors. Care is needed when lifting any floor boards to prevent any damage. Avoid blocking any airbricks or vents under timber floors and maintain cross ventilation. In some cases it may be possible to add insulation to intermediate floors. Where timbers are exposed reduce the thickness of any insulation to still reveal the edges of the timber beams. This helps retain character.

In some cases on later extensions or additions such as these examples at a farmhouse near Luckett, insulation could be added between exposed timbers on ceilings and roofs. It is important to still leave the bottom of any exposed timbers protruding to retain character.

- Internal insulation is preferable on historic buildings and can be sometimes sensitively installed to the internal face of external walls where no historic detailing remains. Natural breathable insulation will improve thermal performance while still allowing solid walls to breathe.

It might be possible to replace the dry lining either side of the fireplace on this wall at a house in Pempwell, Callington in natural breathable insulation as no original historic detailing to the wall remains.

- It might be possible to insulate behind any window seats that are not original. This would allow the condition of the inner face of the external wall behind to be inspected. Natural breathable insulation could be installed which would improve thermal efficiency of the walls while still allowing external walls to breathe.

This window seat at this house in Pempwell, Callington is a later addition. It may be possible to install natural breathable insulation behind it.

- In some cases internal insulation could be sensitively added to some later additions such as the walls, below, of this single skin brick porch at Trelane, Luckett.

- Cold bridging often exists on window reveals. Plaster on these reveals could be removed and replaced with insulating plaster which would improve thermal performance but still allow walls to breathe.

The deep reveals of the window of this house in Pempwell could be replaced in an insulating plaster which will improve thermal performance but still allow the walls to breathe.

Windows

Any original windows should be retained, repaired and regularly maintained. There are a number of options to upgrade windows in historic buildings (see also section 5 of Cornwall Council's Improving Energy Efficiency in Historic Cornish Buildings (cornwall.gov.uk) guide):

- **Draughtproofing**
  Draughts through windows can be reduced by fixing appropriate gap fillers and weatherised rubber tubes or pile brushes. Draughtproofing reduces heating requirements, reduces any rattling and makes windows easier to open, allowing them to be used more frequently for ventilation. See Section 5.2.3 of Improving Energy Efficiency in Historic Cornish Buildings (cornwall.gov.uk) guide.

- **Thermal blinds and curtains**
  Modern insulated or heavy lined curtains or reflective and/or insulated blinds are a simple and cheap way to improve thermal performance of windows. Thermal curtains can also be installed behind external doors to increase thermal performance.

- **Secondary glazing**
  Sensitively installed secondary glazing can often be fixed behind an original window. Secondary glazing with glass panels fixed on magnetic strips (so they can be easily removed for cleaning) usually works best. Secondary glazing on sash windows should slide the same way as the opening sections of the original window. Condensation can be reduced by draughtproofing either the original window or the secondary glazing (not both) and regularly opening the window and secondary glazing at the same time. On casement windows it may be possible to install secondary glazing slightly back from the corner of the internal window reveal rather than fixing directly to the window frame. This could give thermal and acoustic benefits. Secondary glazing fixed to the opening sections of a casement window or horizontally opening sections may also be worth considering. On all installed secondary glazing it is important that both the original window and secondary glazing can easily be opened to allow controlled internal ventilation. Section 5.2.4 of the Improving Energy Efficiency in Historic Cornish Buildings (cornwall.gov.uk) guide gives more details.

DIY secondary glazing fixed on magnetic strips installed on windows in a house in Pempwell, Callington. The secondary glazing is left in place over Winter and removed in Summer. It does not affect the character of the window visually but care is needed to maintain adequate ventilation to reduce damp and mould in internal rooms.

- **Internal timber shutters**
  Internal timber shutters were historically used to retain heat and improve security and privacy. They can improve thermal efficiency while adding character to internal rooms. Existing internal timber shutters could be overhauled and made to work where they exist. New timber shutters could be made and installed where missing.

Remaining Internal timber shutters at this farmhouse near Bray Shop could be retained as an energy saving measure and replicated in other rooms to add character.

Traditional timber internal window shutters and window seat at Trelane, Luckett can improve energy peformance and security while retaining original character.

- **Double glazing**
  Replacement double glazing to traditional buildings, where permissible, should be in timber with glazing bars and detailing as near to the original windows as possible. 'Stuck on' glazing bars should be avoided. Slim double glazing is available which can look less bulky. Double glazing looks more authentic on larger paned windows but can often look a bit clumsy on small paned windows. Spacing bars between glass can be colour coded to match the colour of the windows. Installing windows further back within the recess of the window openings is more authentic through increased depth. Trickle vents are important to give controlled ventilation to internal rooms. It may be possible to add trickle vents to existing double glazed windows.. Any windows installed more recently in an historic building without historic merit could present opportunities for better quality and more efficient replacements.


Double glazing in these examples at a farmhouse near Venterdon have been installed within original windows and frames.


Double glazed replica windows at this farmhouse near Luckett on the left have glazing bars much thicker than the slim glazing bars of the remaining original windows in the same house on the right.

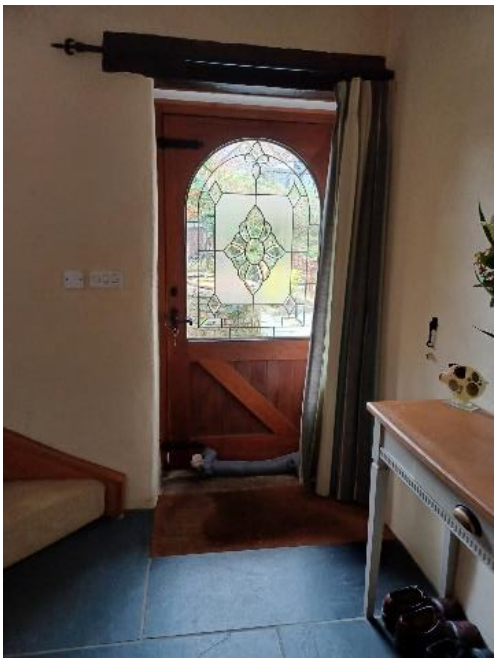
Any replacement double glazed windows on this house at Venterdon may look more authentic fixed further back into window reveals.

Windows in this former agricultural building at Deer Park Farm are modern single glazed replacements and doors are domestic in style. It could be possible to replace

these with more efficient windows and doors that relate more to the former use, openings and character of the building.

Doors

- Any large gaps around doors could be sealed to reduce draughts. Thermal curtains behind external doors will increase thermal performance.



Replacing existing curtains behind these doors in houses at Venterdon (right) and Downgate (right) with thermal curtains would enhance thermal performance further.

Renewables

- On historic buildings solar thermal and solar pv (photovoltaic) panels are preferred on less visible elevations not seen from the public highway. PV slates are more expensive but can look better on or near roofs of historic buildings. Care is needed to ensure that the panels do not damage historic roof fabric. Ideally any panel should face south on open areas not obscured by shading from other roofs or surrounding trees. They should be able to be regularly cleaned. Sensitive arrays should be installed respecting the size and proportions of the roof pitch. Rear and inner valley roofs are sometimes options for panels as are extensions and outbuildings. Panels can also be ground mounted and faced in stone or timber at edges, as a feature, in a similar way to those installed at the National Trust café at Trengwainton Gardens, Penzance.

Ground mounted solar panels at the National Trust café at Trengwainton Gardens, Penzance.

Solar panels do not always need to be installed on the main roof of buildings. Opportunities exist here to install panels on the roofs of separate rear outbuildings and garages at a farmhouse near Luckett (left) and Stoke Climsland Post Office (right)

- The feasibility of having a heat pump could be investigated. Appropriate professional advice should be sought, particularly with respect to whether or not additional wall insulation may be required. A well designed, installed, and operated heating system with a heat pump can be a very effective and efficient solution for older buildings with solid walls even without additional wall insulation. An air source heat pump would require a suitable well-ventilated space for the external unit, plus space for internal equipment. The principle of installation on historic buildings is fine as long as sensitive locations can be found for units and fan coil units etc. Ground source heat pumps are configured differently and would be more expensive and disruptive to install. Some heat pumps can provide cooling in the summer as well as heating in the winter. Air-to-air heat pumps are also available and are a cheaper alternative.

- Multiple renewable technologies can interact to good effect for historic buildings, and this could also be investigated. For example, the combination of a heat pump and solar PV with battery storage, together with time-of-use tariffs can have a significant impact on energy efficiency.

4. Useful Links

Cornwall Council

- Heritage Matters Only Pre-application Service: Fees and Charges Document Planning, Building Control and Land Charges (cornwall.gov.uk) (pg 14)Please send queries to hep@cornwall.gov.uk
  Technical advice on energy efficiency and renewable energy in historic buildings: Historic Environment and Planning - Cornwall Council and Technical conservation advice and guidance - Cornwall Council
- Improving Energy Efficiency in Cornish Historic Buildings: Improving Energy Efficiency in Historic Cornish Buildings (cornwall.gov.uk)
- The Climate Emergency Development Plan Document: Climate Emergency Development Plan Document (DPD) - Cornwall Council
- Guidance on residential solar installations: https://www.cornwall.gov.uk/media/w4ejvesn/residential-solar-best-practice-guidance.pdf
- Minimum Energy Efficiency Standards: Minimum Energy Efficiency Standards - Cornwall Council
- Cornwall Council Strategic Historic Environment: Strategic Historic Environment Service - Cornwall Council
- Historic Environment Record: Cornwall and Isles of Scilly Historic Environment Record - Cornwall Council

Other organisations

- Historic England: Historic England - Championing England's heritage | Historic England
- Institute of Historic Building Conservation: Welcome to the Institute of Historic Building Conservation (IHBC)
- Society for the Protection of Ancient Buildings: Home | spab.org.uk

Professional organisations

- Building Conservation accredited Architects: The Register of Architects Accredited in Building Conservation (AABC) | AABC (aabc-register.co.uk)
- Building Conservation accredited Surveyors: Building Conservation Accreditation (rics.org)
- Conservation accredited structural engineers: rgn-6-conservation-accreditation-register-for-engineers.pdf (ice.org.uk)

5. Acknowledgements

Thank you to the households who took part in the Property Diagnostics Campaign of the Carbon Zero Homes Project which has provided valuable material for this guidance, and specifically to those households who have provided their consent for the photos contained with this guidance to be included.