Double-glazing and heritage buildings

Windows can be a major source of heat loss. However, the designation of the village of Barningham as a Conservation Area along with the relatively high number of Listed Buildings can presents difficulties in gaining improvement.

❖ Some physics

- Windows can be a major source of heat loss. Heat is lost in two ways – by conduction and through draughts.
- Heat loss through conduction is measured by 'U-values', which is the amount or energy lost through a material for each degree difference in temperature.
    - A typical pane of single glazing has a U-value of 5.4W/m^{2}K. This means that on a day when the outside temperature is 5°C and the room is 18°C, a 1m^2 window will lose 70W of heat, around enough energy to power three or four low energy light bulbs.
    - By contrast, Part L of the Building Regulations generally requires new windows to achieve a U-value of 1.6W/m^{2}K.
- In addition to losses through conduction, poor draught-proofing can mean older windows lose even more heat. If anything, allowing draughts through poorly fitting windows can lose even more heat than conduction losses.

❖ Planning and heritage

- The village of Barningham is almost entirely within the boundaries of a Conservation Area and there are around 45 Grade II and Grade II* listed structures in total within the village, including 25 houses. The protective planning restrictions make energy efficiency improvements to windows more complicated.
- Replacing windows in the Conservation Area may require planning permission. If the property is a Listed Building, you will also need to apply for Listed Building Consent. Both of these can be done online – see: https://www.durham.gov.uk/article/8293/Submit-an-application

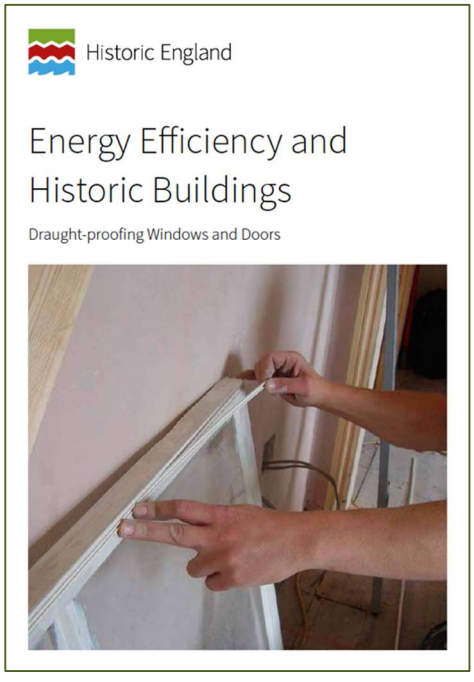
The Rural Community Energy Fund

This Project is supported by the BEIS funded Rural Community Energy Fund which is managed by the North East Yorkshire and Humber Energy Hub and administered by Tees Valley Combined Authority

- Durham County Council planning officers have advised owners wishing to gain planning consent for window alterations to first make an informal enquiry. This is due to the number of Listed Buildings in Barningham and the alteration of Permitted Development Rights on individual properties arising from previous developments.
- You are likely to require consent to replace or make any alterations to windows, whereas like-for-like repairs do not usually require any consent.
- While sympathetically designed double-glazing can be permitted in Conservation Areas, Listed Buildings can present particular issues for energy efficient glazing.
    - Modern double-glazed units typically have an air gap of 22mm, which is often too wide to fit into traditional window glazing bars.
    - In addition, modern glass appears 'flat' with a different look to traditional glass, and can alter the appearance of buildings.
- For these reasons, fitting double-glazing into Listed Buildings can be problematical but there are other measures you can take.

❖ Repair and draught-proofing

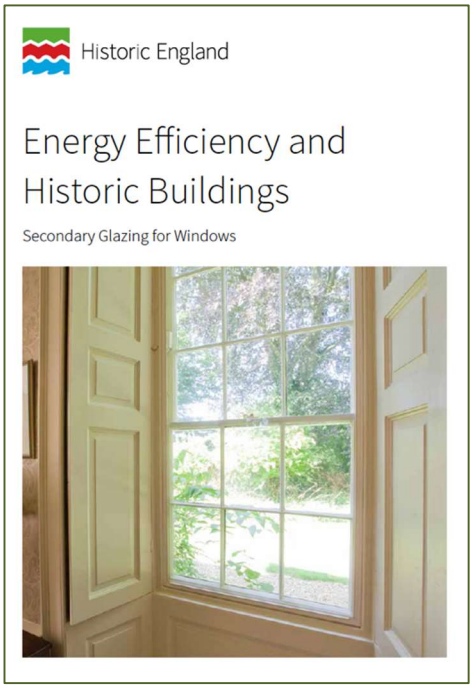
- English Heritage promotes the idea of repairing and draughtproofing traditional windows as a first step - see: https://historicengland.org.uk/images-books/publications/traditional-windows-care-repair-upgrading/heag039-traditional-windows-revfeb17/
- Historic windows of interest should be retained wherever possible using careful matching repair.
    - Their complete replacement should be a last resort and is rarely necessary.
    - If repair is beyond the skills of a good joiner or metal worker, an accurate copy should be made.
- By carefully repairing sashes and casements, ensuring they fit properly and including draught stripping where possible, many of the heat loss problems can be addressed without double-glazing.



- The precise approach to draught proofing will depend on the window design.
    - Typically, hinged windows require compression seals, where a flexible sealer strip is squeezed between the fixed and movable frames on closure.
    - Sash windows require wiper seals. These are usually brush type seals which cover the gaps while allowing the sashes to slide along the frame.
- An important consideration in older buildings is ensuring adequate ventilation.
    - Modern homes are built to a standard of reduced air infiltration to reduce heat loss. This is normally measured in terms of 'air changes per hour', with 0.4ac/hour the target standard.
    - English Heritage recommends 0.8ac/hour in older houses, particularly solid wall properties where walls should ideally 'breathe' to regulate moisture levels.
    - It is also important to maintain good ventilation for rooms with stoves, fires or older boilers (more recent boilers will have a 'balanced flue' where the flue brings combustion air in as well as ejecting combustion exhaust gases).
- Using old fashioned shutters and curtains at night can provide exactly the same benefits as double glazing.

❖ Secondary glazing

- If windows need to be replaced in a Listed Building, the preference is usually for a like-for-like replacement but there is usually the possibility of adding secondary glazing. This is not a new solution – while not common, 'double hung' sash windows, where there are two independent sash windows, date back to the nineteenth century.
- Any secondary glazing needs to be designed specifically for the property so that it fits with the style of the existing windows.
- For listed buildings, it's likely that heritage window specialists will be needed to design acceptable replacements and secondary glazing additions.



- Secondary glazing can be fixed but usually access for cleaning or ventilation is required.
- Secondary glazing can be fitted in sliding units, hinged, or as lift out units, where the secondary glazing units are taken out over the summer and stored elsewhere. The choice will depend on the type of windows concerned and the preferences of the property owners.
- More detailed guidance can be found in this publication from Historic England: https://historicengland.org.uk/images-books/publications/eehb-secondary-glazing-windows/

  The Historic England North East office can be contacted for further advice on email at: northeast@HistoricEngland.org.uk

Version1.1
09/04/2021