Step 2

How Important is it to Maintain Your Building?

2.1 Maintenance and repairs

- Older building should not be made airtight as much as a new ones. This is because older buildings need to 'breathe' to balance out moisture levels. For this reason, impermeable materials should be avoided. See Section 2.2 below for more information about how building of traditional construction absorb and expel moisture. Maintaining your building helps to ensure that it keeps moisture moving through the structure in the right way, helping it to be more energy efficient.
- All buildings need regular maintenance and repair, but with older buildings there is potential for problems to become serious over time if this hasn't been kept up. Resolving causes of leaks and draughts and promptly preventing new ones developing, along with other routine maintenance, will make your building work efficiently and help protect its heritage value and your health. You can use our Historic Building Health Check form at Section 2.3 to review your building's current condition and identify any problems that may need to be resolved
- Keeping a building maintenance regime can help to ensure you cover all the tasks that will help to keep your historic building working efficiently. See our list of maintenance tasks at Section 2.4.
- Make repairs to the building (cracks, broken windows, leaky pipes, etc.) using appropriate "heritage-friendly" materials and making sure, where replacements are needed, they are 'like-for-like' as much as possible to maintain the building's character. Seek a conservation specialist's advice if in doubt.

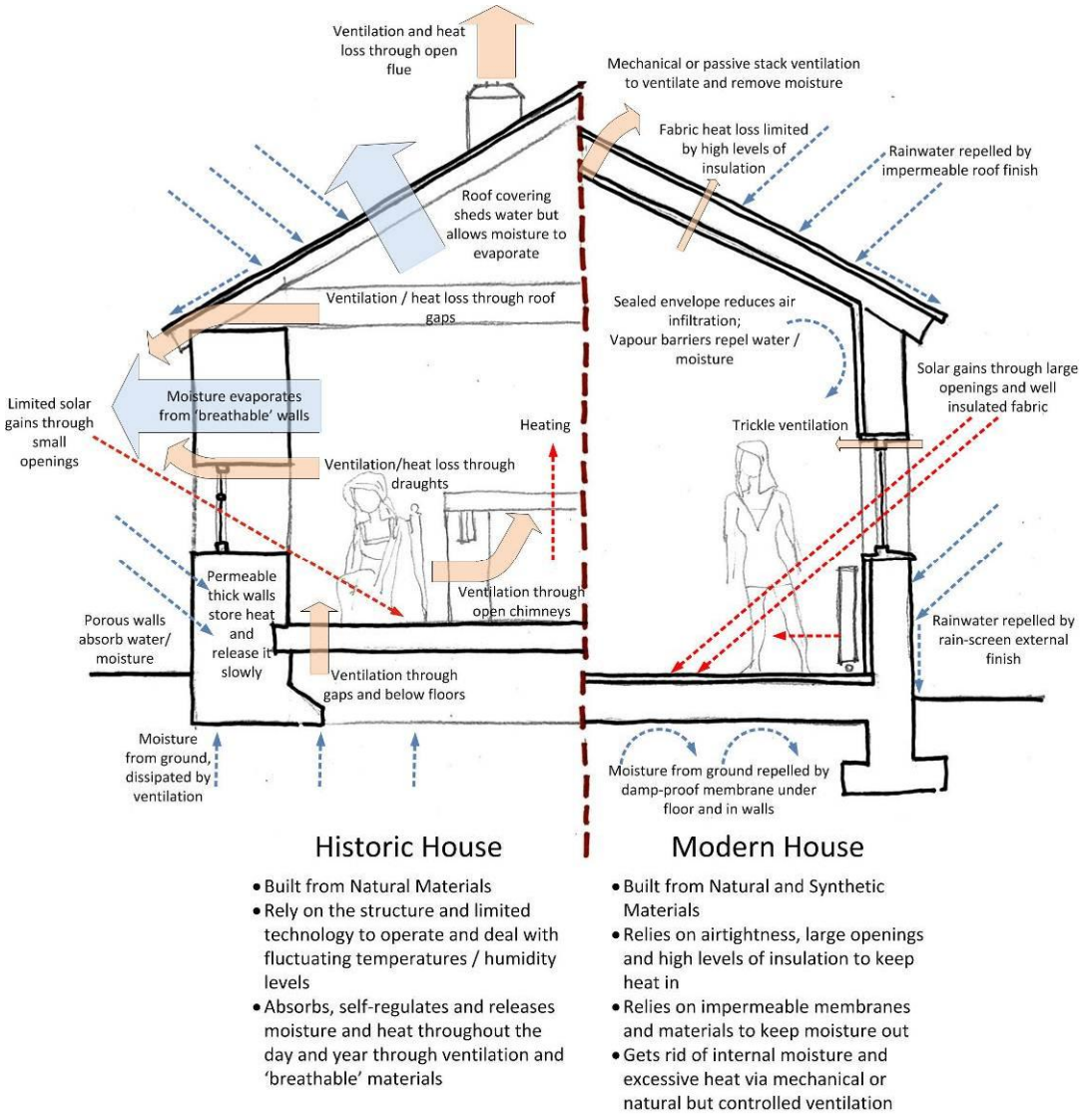
Find out more:

- **See IHBC Guide: A Stitch in Time:**

  http://www.ihbc.org.uk/publications/stitch/stitch.html

- **See SPAB Guide to maintaining religious building 'Faith in Maintenance':**
  http://www.spabfim.org.uk/

2.2 Historic buildings are breathable buildings



Modern buildings are built with insulation, vapour barriers, double-glazed windows, ventilation and extractor fans. By contrast, older buildings are often built using naturally water vapour 'permeable' materials and techniques, which are also termed as 'breathable'. In other words: they were built using materials like stone, timber and lime that soak up moisture from rain, rising damp, cooking, washing and breathing and then let it evaporate gradually. The draughts of windows, fireplaces and roofs provide ventilation that also prevents a build up of moisture.

Older buildings therefore need to breathe. When considering modern energy-efficiency measures you will need to think how they affect moisture movement to avoid creating problems with damp that might be self-defeating. Alternatives to foil-faced insulation and PVC double-glazed windows may need to be considered to ensure that moisture is not trapped. This means that you need to consider natural, breathable materials and managing ventilation as you reduce draughts to keep your building and its occupants healthy.

The main risks to traditional buildings are:

- Moisture trapped within the building material – this can cause growth of mould, which is potentially hazardous to health, as well as causing the materials to rot
- Condensation within unheated areas.
- Rendering / pointing / repairing with incompatible materials – i.e. cement that is not water-permeable
- Condensation at a 'cold bridge' (at a point where an insulated and un-insulated area meet).
- Insufficient ventilation and heating needed to remove moisture.
- Irreversible change through inappropriate 'improvements'.

Old doesn't mean inefficient

A 'U-value' is the construction industry's standard measurement for expressing the rate of heat loss through a wall, roof or window, per square metre; the lower the U-value, the lower the heat loss.

A study by the Society for the Protection of Ancient Buildings (SPAB) showed that the U-values of solid walls were lower than previously thought and retain heat for longer. In other words, some traditional buildings can be reasonably thermally efficient. However, their thermal performance is rarely up to the standards required under current building regulations.

2.3 Prepare a building "health check" – How well is your building working, what needs repairing or could be enhanced?

Maintaining your building well will make it more energy efficient by reducing draughts and damp. Damp, in particular, can result in the 'cold-bridging' effect that transmits the warmth of your heating to the outside environment. Areas that are less well insulated can also cause this effect and may result in the build-up of condensation, making the problem worse and resulting in related problems like mould.

A building's "health check" can help you identify possible sources of draughts that you could take simple measures to reduce, and any areas where moisture is getting into the structure of your building or condensing on colder surfaces.

It is an opportunity to find out how your building uses energy, what might be more efficient and where the biggest potential savings from energy efficiency enhancements might be made.

Look at your building one bit at a time. Start with the walls, roofs and floors, these are normally the largest elements in a building, then move on to the openings of windows, doors, chimneys and rainwater goods on the outside, before going inside to look at fixtures and fittings, like fireplaces, the finish of internal walls and your heating and lighting systems and controls.

We have provided the template below to help you record your observations.

Similarly to the Building Heritage Assessment Template in Step 1, the Historic Building Health Check will not give you definite answers about your building, but will rather prompt you to think about your building in details, and highlight areas that you may not be aware of that need attention.

PLEASE NOTE: YOU CAN DOWNLOAD A WORD FORMAT VERSION OF THE TEMPLATE BELOW FROM THE HEET WEBSITE.

Historic Building Health Check

THE 'ENVELOPE' – the outside of your building that keeps the warmth in and the weather out

2.3.1 Walls

What are they made of? Note: Some traditional materials are better for insulation than others. Cob walls, for instance, are noted as having U-values (the ability to transfer heat) that are as low as modern insulation materials, i.e. that they keep the building's temperature at comfortable levels in just the same way. *Some things to consider:* Is this the same material through the wall, or is the outside a skin of material covering a core of something else?	
Is there any evidence that the walls include a cavity? Note: Most domestic buildings constructed after 1919 include a cavity between two skins of brick, which can make a big difference to how well they insulate the building. They are also a great opportunity to improve insulation by filling them with an insulating material.	
Do they have a damp course? Note: Preventing rising damp can make a wall more thermally efficient, but there may be issues with adding a damp course to some walls of traditional forms of construction (seek professional guidance if in doubt).	
How thick is the wall? Note: Traditional solid walls act as heat reservoirs, but this effect depends on the depth of material used (the thicker the wall the better the thermal performance).	
Is there evidence of water penetration or damp? Note: Damp walls act as heat bridges, taking warmth out of your building and creating cold areas inside. Also, damp wall can facilitate the growth of mould, with ill consequences for the health of people inside the building, as well as posing a risk to the structure of the building,	

which could decay as a result of it. Damp can show up on the walls in a number of ways – including white salt-staining, darker patches, areas of crumbling masonry or areas where algae or plants have started to grow. Common causes are rising damp from the ground, which may be exacerbated by blocked or cracked drains, overflowing gutters or rainwater hoppers, or the effect of salts in the soot and tar in chimneys.	
Are there any gaps or cracks that could result in draughts or trap moisture?	
Any other consideration:	

2.3.2 Roof

What is the roof covered with?	
Is there any evidence of gaps or leaks that would reduce its efficiency? Evidence might include missing tiles, gaps under the eaves, or even plants growing. If it's safe, try getting into the roofspace, if you can see chinks of light through the roof, cold air will be getting in.	
Can you see any gaps or loose areas of lead flashing at the joins of the roof and chimneys or parapets?	
What sort of insulation is there in the roofspace?	
How deep is the insulation?	
Does air need to move around (ventilate) a cold roof, or can it be sealed?	
Any other consideration:	

2.3.3 Windows

What styles of windows does the building have?	
What materials are they made from?	
Do you know if they have already had any enhancements such as brush seals	

or secondary glazing to improve their efficiency?	
Do they fit well in their frames? Windows may have changed shape over time. If they have become loose in their frames they may be letting in cold air.	
Are the frames well fitted to the wall? Gaps around the frames can create draughts, letting cold air into your building.	
Is there any evidence that they need repair or maintenance? If they aren't regularly sanded, painted and repaired when broken, timber windows can rot and become draughty and let in moisture. Often the damage can be repaired by a specialist craftsman as it tends to only affect a specific part of the window.	
Is there any evidence of excessive condensation on the glass or frames? Pooling water on the window sill, or a build-up of mould suggests that cold draughts are meeting moist air at windows. This suggests there is a need to manage moisture and air flows which might include enhancing your windows.	
Any other consideration:	

2.3.4 Doors

What styles of doors does the building have?	
What materials are they made from?	
Do you know if they have already had any enhancements such as brush seals or draught lobbies?	
Do they fit well in their frames? Doors may have changed shape over time. If they have become loose in their frames they may be letting in cold air.	

Are the frames well fitted to the wall? Gaps around the frames can create draughts, letting cold air into your building.	
Is there any evidence that they need repair or maintenance? If they aren't regularly sanded and painted, timber doors can rot and become draughty and let in moisture. Often the damage can be repaired by a specialist craftsman as it tends to only affect a specific part of the door. Cracked window panes can also let in a surprising amount of cold air.	
Is there any evidence of excessive condensation around the door way? A build-up of mould around the doorway suggests that cold draughts are meeting moist air. This suggests there is a need to manage moisture and air flows which might include enhancing your door or improving ventilation elsewhere.	
Any other consideration:	

2.3.5 Rainwater Goods and Drains

Buildings are designed with the need to remove rainwater from their structure and surroundings. Where this stops happening, the walls and roof can become damp, reducing their energy efficiency.

When were the gutters and hoppers last cleaned of moss or fallen leaves?	
Is there any evidence that the gutters and downpipes aren't working properly? Staining on the walls, including growths of algae can show where gutters are overflowing or cracked pipes are leaking. Plants growing in gutters or rainwater hoppers are a sign that a serious blockage has developed. Parapets can also trap fallen leaves and should be cleared each year.	
Are there any wet or boggy areas around the building that might indicate whether drains are blocked or cracked?	
Any other consideration:	

2.3.6 Chimneys

Are the chimneys being used?	
If they aren't used, have they been capped to prevent water getting in?	
Any other consideration:	

2.3.7 Ventilation

Does air move freely around the outside of your building, or are there areas where vegetation or buildings restrict air movement creating a damp atmosphere? Poor air circulation can prevent a building from drying out adequately and may affect both internal and external conditions. These areas often feel cool and damp, whilst moss, algae and even fungi can become established on hard surfaces.	
Any other consideration:	

THE INSIDE – Your living / working environment and the means by which you heat, light and ventilate it.

2.3.8 Walls

What sort of coverings are there on the interior walls? For example, are walls plastered or covered by timber panelling?	
Are there any areas of mould or is staining condensation developing on cold surfaces?	
Are there any areas of loose plaster or damp patches low down on walls that might suggest moisture is coming up from the ground?	
Any other consideration:	

2.3.9 Floors

Do they conduct heat out of the building? For instance, through gaps and cracks?	
Are there gaps and cracks that cause excessive draughts?	
Any other consideration:	

2.3.10 Windows

Are they making the most of natural light? Are your windows in good working order and clean? North-facing windows will provide plenty of diffused natural light without the heat gains, while west and south facing ones may need sheltering as they may cause glare and over-heating.	
Any other consideration:	

2.3.12 Doors between rooms

Do they fit their frames well? Where doors have gaps around them they can let draughts circulate around the building, potentially reducing the efficiency of your heating and spreading moisture from areas like bathrooms and kitchens.	
Do you normally close them or leave them open?	
Any other consideration:	

2.3.13 Heating

What sorts of heating does your building have?

< + efficiency - >		
	Electrical storage heaters	
	Electric panel/bar/fan heaters	
	Coal fires	
	Gas fires	
	Pumped warm air system	
	Central heating radiators with a central boiler	
	Underfloor heating	
	Wood open fires	
	Woodburning/solid fuel stoves	
	Ground source heat pump	
	Air source heat pump	

If your building has one or more heating boilers what sort of fuel does it use?

< - carbon + >		
	Solid fuel (coal/anthracite)	
	Oil	
	Gas	
	Biomass (woodchip/pellets)	

Which forms of control does your heating have?

< + efficiency - >		
	“I turn it on when I’m cold”	
	Thermostat control on electric panel heaters	
	Timer control on the boiler	
	Central thermostat	
	Dial (thermostatic) valves on each radiator	
	Programmed heating control system with separately managed ’zones’	

Are hot water/heating pipes lagged or otherwise insulated?	

2.3.14 Lighting

What types of bulbs/lamps are installed? (from least to highest energy efficiency)

< + efficiency - >	Traditional Tungsten filament/ Incandescent (standard non energy saving)	
	Halogen bulbs or spotlights	
	Fluorescent strip lights	
	Compact Fluorescent Lamp (CFL) or energy saving bulbs	
	Light Emitting Diodes (LEDs)	

How is this controlled?

Individual switches	
Timers	
Daylight/light level sensors	
Movement sensors	

2.3.15 Ventilation

Do the 'wet rooms' (e.g. kitchens, bathrooms and W.C.s) have extractor fans ventilating them to the outside of the building?	
Have these been cleaned and are they in good working order? Extractor fans can become clogged or less efficient if they are not cleared of dust and/or grease regularly.	
Do you close the doors to these rooms when doing things that are likely to increase humidity? It may seem obvious, but leaving the bathroom door open after having a shower reduces how effective your extractor fan is at removing moisture and allows moisture out into the rest of your building. This will exacerbate any condensation problems you may have.	
How long ago were they installed? Over time, motors will become less efficient.	
Any other consideration:	

2.3.16 How do you use your building?

What time of the day are you in your building or is you building most in use?	
Do you use your building more or less at weekends?	
Do you keep your building at a standard temperature or do you vary the temperature for different times or occasions?	
Any other consideration:	

2.4 Basic maintenance and repair tasks for building health and energy efficiency

The envelope

Building element	Energy efficiency maintenance tasks
2.4.1 Walls	Note the position of any existing cracks, bulges or other such defects. Take photographs so you have a record to check for changes. Take advice from a conservation specialist about whether repair or monitoring is required. Report significant changes in any cracks to your conservation specialist. Take professional advice if there is evidence of 'spalling' of masonry or brickwork and make repairs using matching materials to the original as well as addressing the causes, where they can be identified. Take professional advice if the mortar of masonry or brickwork appears defective and repair on a like for like basis if necessary (Please note that if your building is listed you will need listed building consent if pointing is to be renewed over a large area). Ensure the integrity of paint finishes is maintained by renewing external paintwork every few years. Be careful to use a paint that allows moisture to pass through Consider removing ivy and other climbing plants if there is an indication they are causing damage.
2.4.2 Roof	Have slipped slates and tiles replaced with matching materials, you may need to use a temporary repair until this is done. Clear away snow from parapets and valley gutters in the winter. Consider fitting heating tapes with a frost thermostat in inaccessible gutters, hoppers and downpipes to prevent snowfall or ice causing blockages and floods. Ensure electrical wiring in roof spaces is checked regularly by a qualified electrician. Clear debris from roof valleys and parapet gutters at least twice a year. Clear debris and droppings left by birds or mammals in roofspaces to prevent conditions that will encourage insect infestation, fungi or restrict ventilation. Bird-proof roofs and other high areas, including windows and

	louvres. Does the roof insulation restrict ventilation? Clear a path to allow airflow using tiles or pipe to keep this open.
2.4.3 Windows	Repaint windows every few years to protect the woodwork from moisture penetration. Ensure windows open easily to encourage their use for ventilation. This might include lubricating window ironmongery, checking hinges and catches are in good condition and well fixed, or overhauling sash-cords, weights and pulleys. Clear dirt from condensation drainage channels. Replace cracked or broken panes of glass and repair cracked, crumbling or 'gappy' putty. Replace old brush seals where these have become deformed or otherwise ineffective. Ensure windows are regularly cleaned to ensure efficiency for lighting.
2.4.4 Doors	Lubricate door ironmongery and check they open easily to encourage their use in summer to ventilate the building. Seal redundant key holes to prevent draughts. Ensure paint finishes are maintained by repainting every few years. Test efficiency of spring or brush-seals to letter boxes and, if necessary, replace to prevent draughts. Replace any deformed or ineffective brush or 'fin' seals to prevent draughts.
2.4.5 Rainwater Goods and Drains	Clear away leaves, silt and debris from gutters, hoppers, downpipes and gulleys regularly (at least twice a year). Consider fitting bird/leaf guards. Use rods to clean blockages from drains and empty any silt traps regularly. Check the mortar of ground gutters and repoint if necessary or replace any broken or frost damaged bricks.

2.4.6 Chimneys	Have chimneys swept once a year to clear any debris (including bird nests) that may encourage insects and other pests, or potential sources of fires if in use. Use chimney dampers to reduce draughts where they exist (whilst maintaining some flow of air to ventilate rooms). Use a removable chimney balloon if chimneys are causing a considerable draught.
2.4.7 Ventilation	Clear away plant growth from around the building to allow air to circulate if there is evidence of areas of damp or condensation. Remove ivy and other climbing plants blocking air bricks or ventilators. Clean air bricks or ventilators and consider fitting fine mesh behind the ventilator to exclude rodents and insects.

The inside

Building element	Energy efficiency maintenance tasks
2.4.8 Walls	Identify and address the cause of any dampness indicated by patches of staining or peeling paint. Check hidden voids regularly for evidence of pests to prevent infestations.
2.4.9 Floors and ceilings	Note any staining on the underside of ceilings and inspect roof or under floors to find causes.
2.4.10 Windows	Open windows and doors on dry days during the summer months to allow water vapour to escape. Overhaul shutters to make use of them and upgrade curtains or blinds for improved thermal performance.
2.4.11 Doors between rooms	Replace brush seals that have become worn or deformed to reduce draughts between rooms. Ensure that door closers (such as the spring closer on fire doors) work to reduce draughts.
2.4.12 Heating	Commission an annual ‘routine’ check and service of your boiler. Bleed radiators once a month. Ensure your thermostat is operational and that timer settings are appropriate to your needs.

2.4.13 Lighting	Commission an electrical inspection by a qualified person at least once every five years. Upgrade bulbs for energy saving ones.
2.4.14 Ventilation	Clean fan vents of dust and cobwebs. Repair and replace with low carbon models if they have become inefficient.