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Short Guide

Maintaining Your Home

General

HISTORIC SCOTLAND
ALBA AOSMHOR

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1. Introduction

Traditional and historic buildings are an integral part of the environment in which we live and work, and are widely valued for their character, form and local distinctiveness. However, they are often considered expensive to run and difficult to maintain. This need not be the case, although access to the right skills and materials can be harder than for more modern structures. When regularly and appropriately maintained, traditional building fabric is very durable. There are many buildings in Scotland in which the key components of masonry, roof, structural timbers and internal finishes are hundreds of years old and still fit for purpose. When compared with the design life of some modern structures (typically 25 to 40 years), such longevity should be seen as a benefit not a burden. It can also be viewed in sustainability terms, recognising the value of resource retention in a world where many materials are becoming scarce and expensive. Traditionally built properties are generally valued by the community and tend to be popular for housing. However, if older buildings are to continue to contribute to the fabric and amenity of Scotland's built environment they need to be appropriately cared for. This means regular maintenance and repair with the right skills and the right materials.

Broadly speaking, if water can be kept out of a building and key components protected, a building can survive almost indefinitely. This means maintaining intact roof coverings, properly functioning rainwater goods, keeping masonry elevations in good condition and routing surface water away from the building. The perceived maintenance burden of older structures can be attributed in large part to a pattern of general neglect, the use of inappropriate materials in past repairs that make the defects worse and simply poor workmanship. The lack of a maintenance culture in construction, largely due to the predominance of new build in the market, has meant that in the past even getting prices for work was difficult. This situation is improving considerably and many construction companies actively seek repair projects. The skills situation is also getting better, with increased training and qualifications in traditional repair techniques and materials. Traditional materials such as lime, timber, lead, cast iron, and appropriate paint types are also more widely available. Owners should be cautious about products and materials that are described as 'maintenance free'. This can also mean that they are simply unmaintainable; that is, they perform well until the point of failure, when they will have to be replaced in their entirety.

This Short Guide focuses mainly on the external features of a house, but also considers internal conditions as these can be indicators of problems elsewhere. While primarily aimed at homeowners, it will be relevant to anyone that is responsible for the maintenance of traditional buildings. This will include architects, surveyors, contractors, building and facilities managers amongst others. Advice is presented on understanding traditional buildings; key areas of maintenance; forming a repair and maintenance plan; carrying out inspections; identifying defects; and selecting contractors. More detailed guidance on the principles of repair is given in the Inform Guide series, and further advice for professionals is available in the Short Guide series.

2. Understanding traditional buildings

2.1 Vapour open construction

This guide is for the benefit of owners of traditionally constructed dwellings, which generally, but not exclusively, means those of pitched roof and solid wall construction built before 1919. Owners need to be aware that the fabric of such houses behaves differently from the fabric of those constructed using modern methods and materials, and generally comprises natural materials sourced locally or regionally. Many of these components, such as masonry, timber and lime, are vapour open (sometimes referred to as 'breathable') and this important property should be kept in mind when inspecting the building and planning repairs. Table 1 below outlines some differences between traditional and modern construction. Figure 1 gives a graphical interpretation of water and vapour movement in traditional construction. Of course maintenance is essential for all buildings, and many of the general principles will be the same whatever the age of your house.

Generally work to traditional buildings requires the use of a range of materials that are compatible with the existing traditional fabric. This allows the vapour open nature of the construction to be maintained so that moisture can be freely dispersed. These materials, which for the external structure are normally lime, stone, timber and slate, by virtue of their material properties or the way they are put together allow the movement of water vapour through the material or via moving air around them (Fig. 1). The use of modern impermeable materials in repairs may compromise this dynamic and lead to concentrations of water or areas of high humidity, both of which will provide favourable conditions for mould or timber decay. Areas where inappropriate materials are often used are repointing walls with cement-based mortars and painting stone walls with masonry paint. Sometimes on their own such interventions may not cause problems, but when coupled with other shortcomings in maintenance, such as blocked downpipes or defective stonework on a chimney, the fabric can rapidly start to suffer. Persistently damp or wet masonry can have structural implications.

Traditional house	Modern house
Vapour permeable construction allows moisture within the building to dissipate. Moisture is absorbed into the fabric, can pass through, and then evaporates when drying conditions occur.	Modern construction relies on a sealed external envelope. Water finding its way into the construction does not readily evaporate. Vapour barriers within the construction prevent internal vapour loads from passing through the fabric.
Thick walls (0.6 metres or more), in Scotland usually stone, with a large volume of lime mortar and some voids, giving a high thermal mass.	Relatively slender wall construction (typically 0.3 metres) with vapour barriers and/or cavities.
May not have a damp-proof course although many buildings have a basic system (slate or bitumen).	Damp-proof course prevents moisture transfer from the ground.
Good ventilation within voids in walls, floors and roofs essential to disperse moisture from the construction. Chimneys and flues help to remove internally generated moisture.	Largely sealed structure, trickle ventilation in windows and mechanical extractor fans in areas of high vapour load.
Generally composed of a limited range of natural materials with no preservatives.	Most construction products are mass produced and many are man-made. Timbers are treated with preservatives.
Relatively low levels of insulation.	High levels of insulation are normally incorporated into the design.

Table 1. Some of the differences between traditional and modern construction.

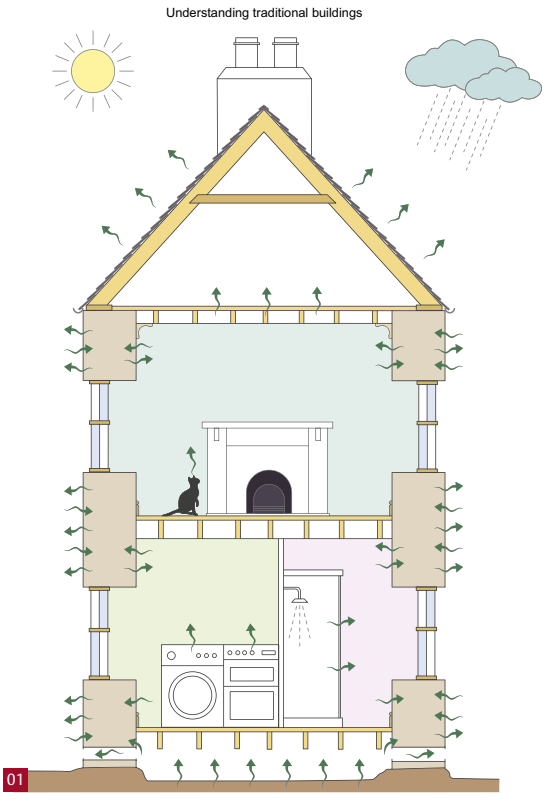

Fig. 1 Water vapour movement in traditional construction.

Fig. 2 Overhanging eaves on a 19th century building.

2.2 Traditional building detailing

Traditional and historic buildings take a variety of forms, with a range of architectural and decorative features. Such details can be perceived as simply adornment, which they often are, but in most cases they also have an important function for the structure which is generally that of shedding water from elevations and keeping masonry dry. Features such as relatively steep pitches on roofs, overhanging eaves, hood mouldings, projecting cornices, renders and drip details on masonry all improve the building's capacity to deal with rain, wind and snow (Fig. 2). As well as having a practical function such detailing contributes to the overall aesthetic of the building, giving depth and texture to elevations and rooflines. Sometimes the removal of external features, particularly chimneys, is thought to save on maintenance and reduce vulnerabilities, but such an approach results in a progressive loss of amenity. As a consequence the building can lose much of its character and will probably function less well.

2.3 Climate change

Traditional buildings are designed to cope well with Scotland's climate, as their longevity demonstrates. As our climate changes and extreme weather events become more common, maintaining our homes becomes even more important. Any maintenance regime should look for signs that the existing fabric is struggling to cope with increased rainfall and other changes in our weather. It may be necessary to adapt the traditional fabric through means such as increased capacity of rainwater disposal systems or additional detailing on chimneyheads, parapets and skew copes. If such adaptation is required it should be done in an appropriate way that complements the fabric, its performance and the character and appearance of the building. The Historic Scotland Short Guide 10: *Climate Change Adaptation for Traditional Buildings* gives advice in this area.

2.4 Energy efficiency

Buildings are more energy efficient when they are kept well maintained. Loose or defective pointing, poorly maintained windows and damp masonry will all reduce the thermal performance of the building fabric, contributing to heat loss and increased energy costs. Gaps around doors, windows or floorboards allow heat to escape and cause draughts, reducing the thermal comfort of the occupants. Where building defects are causing masonry to become wet or impeding the evaporation of water from the building fabric, the building will not only feel colder but the wall will perform less efficiently as heat is transferred more rapidly through wet material.

Maintaining and repairing your building is probably the single most important thing you can do to improve its energy efficiency, and should be a priority before other improvements are considered. Maintenance should always be carried out before insulating a building, as water ingress or defects can impair the performance of the insulation and may result in further problems occurring. Guidance on improving the energy efficiency of traditional buildings is provided in Historic Scotland Short Guide 1: F*abric Improvements for Energy Efficiency in Traditional Buildings*.

3. Preparing a maintenance plan

3.1 Get to know your building

In order to draw up a suitable maintenance plan it is important to be familiar with your building and how it functions. Walking around your home and drawing up an inspection checklist is a good start and will help you to familiarise yourself with the building. Having drawn up a checklist of key areas, decide on the frequency of inspection for each item. Identify those items that you can inspect yourself and where you feel competent to judge their condition, and areas where you require professional help (e.g. to gain access to roofs). It is useful to keep a list of recommended tradespeople and professional advisors (if appropriate) for both inspection and repair work. On the basis of your inspection, draw up a plan for the maintenance of the property identifying work that will be required in the short, medium and longer term. You can then agree this plan with your selected tradespeople so that they can make advance preparations for any work and build this into their forward plan.

When assessing the features of your house it will be apparent that the more complex the plan form and roof arrangements the greater the need for an awareness of a range of potential problems. Extensions can be an area of weakness as they are not always provided with adequate rhones or downpipes (Fig. 3). The risk from such vulnerable areas is compounded if they are hard to access or where drainage has a complicated route with several branch pipes.

Fig. 3 Complex roof drainage is vulnerable to overloading and blockages.

3.2 Types of maintenance

By taking a long term view of the care of your property you can manage finances and resources to better effect, prevent the decay of elements which would lead to expensive interventions later on and maintain the value of your property. Maintenance generally falls into two categories: planned maintenance and reactive maintenance. Both have a place when looking after your home.

Planned maintenance

Formal planned maintenance is clearly important for large property portfolios, estates and commercial premises, but homeowners should also plan certain inspection and repair cycles. Generally these will be related to common and recurring maintenance tasks. As indicated above, rainwater goods are frequently liable to blockage, especially during the autumn when leaves clog rhones and cause overflows. A twice-yearly check and clearing out of rhones and downpipes should be a regular task. Below ground drainage that takes rainwater away from the building will also need periodic inspection and testing to ensure that water is draining freely. Windows and timber items should normally be re-painted every five years. Masonry should need very little maintenance, but where areas are defective it is worthwhile planning work in advance and incorporating other repairs as necessary to make best use of scaffolding.

Regular inspection allows maintenance to be planned in advance, rather than waiting for failure to occur. How often a building is inspected will depend on exposure, age, general condition and even its use. Generally a bi-annual inspection is appropriate, with additional checks after extreme weather or other unforeseen events. Table 2 shows likely planned activities.

Develop links with local trades and building professionals to establish a possible programme of works, probably for five years ahead or longer, bearing in mind the likely cost of work and how items should be prioritised. Focus on repair of items rather than replacement; historic materials are often of much higher quality than modern replacements. Establishing the cost and frequency of planned visits by certain trades will allow understanding of what can be covered from Table 2.

Reactive maintenance

In reality many maintenance tasks will be addressed reactively, for example a leaking gutter may only be repaired once the leak becomes noticeable or is causing water ingress, and it is likely that when work is set up to address defects then other works in the vicinity will also be addressed. For example if slates are being repaired it makes sense to inspect the chimney masonry and the security of the chimney cans as well as other roofing elements.

Established links with local trades will also allow a quicker response in the event of damage or accident; at these times knowing there is someone already familiar with the building can greatly assist in the speed and thoroughness of the response.

Inspection cycles and common maintenance actions				
	Frequency			
Element	**6 months**	**12 months**	**5 years**	**Possible action during inspection and other comments**
Rhones and downpipes	✓			remove debris and ensure water can flow freely; check for cracks in castwork.
Valley gutters	✓			remove debris and check for wear or punctures in the zinc or lead.
Parapet gutters	✓			remove debris and check for wear or punctures; check overflows; check stability of timber below.
Roof coverings	✓			remove any debris and plant growths; check for slipped slates.
Below ground drainage	✓			check drainage and ensure that water is being taken clear of the building.
External paintwork	✓			check for cracking or flaking paint, especially on south-facing and exposed elevations; re-paint normally every five years.
Sub-floor vents		✓		keep vents clear of debris and flaking paint or rust; check ground levels.
Limewash/painted masonry surfaces		✓		check for flaking or blistering - this may indicate increased moisture levels in the fabric especially at ground level.
Flat roofs		✓		remove debris and plant growth; clear any rainwater outlets.
Flashings/secret gutters		✓		check pointing and mastic work to the flashing; repair slipped or damaged metal elements; check for punctures to lead.
Windows		✓		check for areas of soft timber; check sand mastic junctions; check glazing putty for cracks.
Doors		✓		check for areas of soft timber, distortion, flaking paint or failing sand mastic junctions; oil hinges.
Rooflights/cupolas		✓		remove debris and plant growths; clean glass.
Parapets		✓		assess the condition of pointing and check for signs of movement or loose masonry.
Chimneys (viewed from ground)		✓		assess condition of pointing and security of the chimney cans.
Exposed stone features		✓		check condition of pointing, especially thin ashlar joints.
Masonry and pointing		✓		check for loss or damage to pointing, flaking stone, erosion or salt efflorescence.
Vegetation		✓		check that vegetation is not close up against walls and that roots are not choking drainage routes.
Chimneys (close inspection)			✓	remove plant growth; check soundness of masonry and security of chimney cans.
High-level timber bargeboards and finials			✓	check for timber decay and condition of paintwork; check integrity of fastenings with the roof timbers.
Harl/render			✓	check for areas of failure by surface tapping (bossed areas will sound hollow).
Ground levels			✓	make sure that garden or landscaping materials are not accumulating against walls.

Table 2. Frequency of inspections and likely actions

Fig. 4 Using the checklist during an inspection.

Fig. 5 Use of binoculars for an initial check on high areas.

3.3 Inspection

The size and complexity of your property will influence the length and content of the inspection checklist. A generic template for recording maintenance priorities can be found at the end of this document. Following a checklist allows the homeowner to take a structured approach to the inspection and to ensure that all the important areas and elements are inspected and assessed, whether or not a defect has been identified (Fig. 4).

For higher areas such as roofs and chimneys an initial check with binoculars from the ground is useful to get a feel for general condition (Fig. 5). A ladder will allow closer inspection but for a proper check it is recommended that you employ the services of a professional building surveyor or tradesperson to carry out this part of the work. You may of course wish to employ a professional to conduct the entire inspection. An increasing number of general building and roofing contractors offer an annual inspection and maintenance service.

When carrying out the inspection care should be taken to avoid damaging vulnerable features such as slate verges, rhones, downpipes and projecting stone features. Ladders should be handled with care and weight only put onto masonry or structural timbers. Avoid walking directly on slated or tiled roof surfaces.

Items for a basic inspection might include:

- maintenance inspection checklist
- binoculars
- extending lightweight ladder
- notebook and camera
- heavy-duty gloves and trowel for removing plants and silt from gutters
- screwdriver or sharp metal probe/knife for checking soundness of timber and joints
- pocket mirror to help you look behind downpipes
- waist bag for holding equipment when on a ladder
- safety glasses for use when clearing debris above head height
- face mask for clearing dusty material or bird droppings

3.4 Safety considerations

Before undertaking an inspection you must assess any risks involved such as difficulty of access, slippery surfaces (on roofs, or for supporting ladders at ground level), loose or broken glass. You should wear a hard hat, eye protection and gloves when handling ladders and working around roofs (Fig. 6). A high-visibility vest may be appropriate in public areas. A facemask is also recommended if clearing debris or bird droppings.

Falls from ladders by homeowners working on or inspecting their property are a frequent occurrence. If you do decide to undertake the inspection yourself, make sure you use a ladder that is long enough for the task as this will reduce the temptation to reach or stretch which can be dangerous. One hand should always be kept on the ladder for support. Make sure the ladder is placed on a sound, level base and not on soft soil or gravel and always have a competent person at ground level to keep the ladder steady. Ladders can be fitted with an offset to keep the top of the ladder clear of overhanging eaves, but you should not rely on the strength of an eaves rhone to provide support for the top of the ladder – as well as being unsafe it can cause damage to the rhone. It is important to keep the ladder clear of power lines, particularly when moving it from one position to another. Do not climb the ladder in strong wind conditions or during inclement weather, as the rungs could become slippery.

Fig. 6 Handle ladders with care and use the right protection.

Mobile elevated work platforms (MEWP) or 'cherry pickers' are an alternative method of achieving safe access at height for inspection and maintenance. While not suitable for homeowner use, with a competent operative they allow hard-to-access areas to be inspected. Potential users should note that for use on a pavement or other public areas, a permit will be required from the local authority.

Buildings can contain materials which are hazardous to health. For example, in older buildings early paint layers are likely to contain lead, which is toxic if ingested or inhaled as dust, while insulation or lagging may contain asbestos. Appropriate precautions should be taken when undertaking any investigation or repair work which may disturb or expose hazardous materials. If you suspect that your property contains potentially harmful materials you should not undertake any work which may disturb or release the material, but seek advice from a suitably trained or qualified professional. Information and advice on appropriate health and safety for inspecting buildings, and the regulations covering substances hazardous to health (COSHH), is available from the Health and Safety Executive (HSE) website.

4. External areas

4.1 Rainwater disposal

Rhones, gutters and downpipes are an important part of the building function as they carry rainwater from the roof, ensuring that the structure remains dry. A blockage or defect can quickly result in high volumes of water saturating the building fabric. This is a serious matter which if not addressed promptly will result in damage to the masonry, internal finishes, plasterwork and ultimately structural timber (Fig. 7).

Rhones should be regularly checked for debris and blockages. The joints between the lengths of rhone should also be confirmed as sound and watertight. Rust marks will often indicate where a leak is developing (Fig. 8).

Check that downpipes are secured to the masonry with proper fastenings or brackets. Stained or damp masonry may indicate a failure of roof drainage (Fig. 9). During inspections the opportunity should be taken to clear leaves and debris from rhones (Fig. 10), but choked downpipes may require dismantling by a professional. To prevent leaves and blown material from entering downpipes, small wire 'balloons' can be fastened at the top of a downpipe.

Fig. 7 The masonry on this elevation has become saturated due to faulty rainwater goods.

Fig. 8 Rust marks between rhone sections indicate defective areas.

Fig. 9 Iron staining on a downpipe indicates cracked metal, while green growth on neighbouring stonework often means a blockage or leak.

Fig. 10 Clearing leaves from rhones.


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Fig. 11 This roof has been poorly maintained and is progressively failing.

Fig. 12 A missing slate in need of attention.

4.2 Slates or other roof coverings

The roof covering, typically slate or tiles, is the first line of defence against the weather and needs proper attention. While the amount of water that can enter by a single missing slate is limited, local decay of the sarking boards will follow, leading to further loss of slates. Poor repairs will exacerbate this (Fig. 11). Slate roofs have a finite life, although up to and beyond 100 years is quite common, depending on the type of the slate and the quality of the fastenings. On older roofs the slates sometimes become soft at the top, close to the nail, and can break off. The iron nails used to secure them to the sarking will eventually rust through; this is called 'nail sickness'. Individual slipped or broken slates can be secured using a 'tingle' - a strip of copper or stainless steel which is fixed to the sarking and hooked under the bottom edge of the slate, holding it in place. This avoids the need to strip the roof back if the slate is double nailed. A point may come where continued repair of individual slates is no longer cost effective, and re-slating may be required.

Look for broken, cracked or missing slates on the roof or on the ground, especially after extreme weather (Fig. 12). Slate repairs are likely to need a separate access arrangement. Slates at verges are particularly vulnerable to being dislodged.

4.3 Gutters, ridges, hips and valleys

In some buildings, particularly those of classical architecture, water is routed from a double-pitched roof into a lead gutter behind a parapet. Failure of the gutter in these areas is serious as significant amounts of water can penetrate the fabric through the wall head (Fig. 13).

Failure of parapet gutters can occur due to wear and cracking of lead, blockages or metal theft. Mortar skews can also fail, especially on exposed pitches, and continued water ingress in all of these areas will result in progressive damage to the sarking boards and ultimately structural damage (Fig. 14).

The top of a roof is finished with a ridge, normally formed from zinc, lead, fired clay or on occasion natural stone. Such elements are exposed and can be dislodged if the fastening or bedding fails. Thermal action can progressively lift the nails from zinc or lead on ridges and hips (Fig. 15) and eventually the ridge can be blown off. Ridge features will need to be refastened or re-bedded with a suitable mortar as appropriate.

The zinc or lead that forms the valleys can wear through by action of water, by puncture damage from falling objects or from cracking.


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Fig. 13 Saturation of a wall due to a blockage in a parapet gutter.

Fig. 14 A cracked mortar skew that is letting in water.

Fig. 15 A zinc covering to a hip where the nails are lifting. This will need re-fastening.

Areas of concentrated flow, and possible failure, are often indicated by staining (Fig. 16). Valleys and junctions do have a finite life; zinc valleys, depending on water flow, normally last 40–50 years. Suitably specified lead generally lasts much longer.

In time these points of staining can develop into small holes (Fig. 17) which, if left unattended, will admit enough water to allow timber decay to progress. A temporary repair using a proprietary sealing tape or material may be appropriate in the short term (Fig. 18).

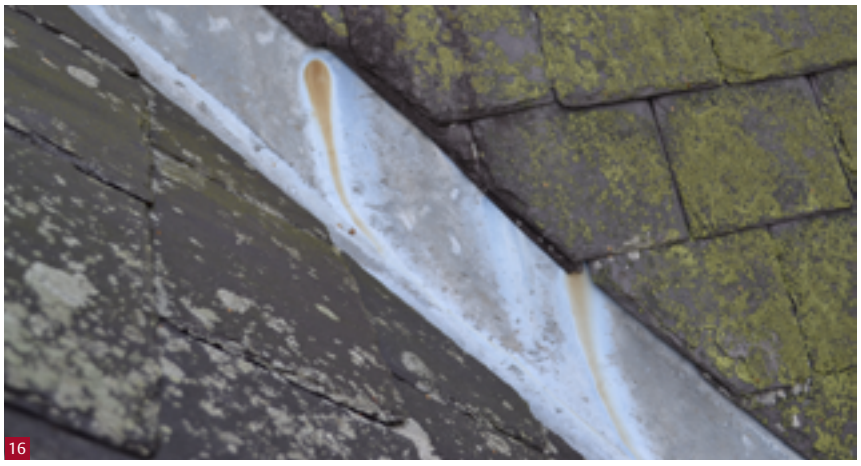
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Fig. 16 Staining on this lead valley indicates where holes in the lead might develop.

Fig. 17 A hole in a lead junction caused by long term concentrated water flow.

Fig. 18 Temporary repairs are suitable in some locations – here a proprietary repair tape has been used.


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Fig. 19 The aftermath of a storm – the masonry from this chimney stack is now on the pavement below.

Fig. 20 Staining around this chimney indicates water ingress.

4.4 Chimney stacks

Chimneys and areas of high-level masonry are often overlooked as they are difficult to access and inspect, but their exposure to the elements and consequent potential for damage is considerable. Additional attrition from flue gases means that masonry on chimneys and gables often decays more rapidly here than elsewhere. Keeping these areas in good repair is important for the integrity of the fabric. It is also necessary for the safety of those using the building, and of passers-by who may be at risk of falling masonry, particularly as more extreme weather events are predicted (Fig. 19).

During an inspection the condition of the masonry should be carefully assessed. The cope and chimney should be secure and the pointing around the chimney stack and the masonry of the chimney should be in good condition. Staining around the base of the chimney and the gable end (Fig. 20) can indicate defective masonry and pointing.

4.5 Windows

Timber sash and case windows have proven to be very durable and are often made of a quality of timber no longer available today. However, they can suffer decay in certain circumstances and repairs will periodically be required. Generally windows facing the prevailing wind and weather are more vulnerable. Areas of weakness are generally lower down the window, at the meeting rail and the cill area. Check the condition of the cills by pressing with a small screwdriver – soft timber will indicate timber decay and repair will be required. There may be evidence of past repairs as this is a vulnerable area (Fig. 21). Where accumulations of paint layers have built up and are splitting, water can become trapped leading to accelerated decay.

The glazing putty should be checked for cracks or decay. The condition of the paint on the putty is important, as it keeps the water out of the astragals. Failed putty will flake off in sections and should be replaced (Fig. 22).

4.6 High-level joinery and other features

There are often timber components in a building at high-level including barge boards, timber verges and finials. Their exposure means that they take a lot of wear, and decay can be hidden by virtue of their distance. What may appear sound from ground level may not be so when checked by pressing the timber with a screwdriver (Fig. 23). Attention to these areas is essential if costly repairs later on are to be avoided.


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Fig. 21 A decayed timber window cill.

Fig. 22 Cracked and missing glazing putty; this will admit water and cause damage to the astragals.

Fig. 23 Checking integrity of this bargeboard with a screwdriver has found it to be soft with areas of rot.


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Fig. 24 Brattishing on a villa in Edinburgh.

On some buildings there are decorative elements in cast iron, called brattishing (Fig. 24). Due to their exposed nature and hard-to-access location such features can be fragile. They should be retained to maintain the character of your property, but will need to be periodically painted and should be kept securely fixed into the timber or the masonry.

4.7 Wall masonry

On exposed elevations the condition of the masonry pointing is important. Failed or washed out pointing will allow wind-driven rain into the wall fabric, resulting in further saturation and decay. The masonry on exposed gables is particularly vulnerable. Decay is often made worse by cement-based repairs. If mortar comes away easily with a firm scrape from a trowel or wooden scraper (Fig. 25), or cement pieces come off readily in chunks, then it is likely to need attention. In more sheltered areas a longer term view of masonry and pointing can be taken and works programmed into a wider repair scheme.

Fig. 25 The lime mortar on this wall is now weak and friable and the wall needs re-pointing.

Fig. 26 Testing a gulley and below ground drainage with a bucket of water.

Fig. 27 A clay rodding eye allows access to clear blocked drains.

4.8 Below ground drainage

Directing rainwater away from a building and down to ground level is important, but it must also be taken clear of foundations. This process is generally not visible, but drainage failure can lead to damp interiors, settlement of foundations and the cracking and accelerated decay of masonry. Below ground drainage can be easily checked by using a hose or bucket to pour water into the gulleys at the foot of a downpipe and observing how quickly the water drains (Fig. 26). Water should run freely and quickly down the drain.

Slow drainage or ponding in a gulley indicates a blockage. This can be addressed by the use of drain rods into the drainpipes, normally through access points called rodding points or rodding eyes (Fig. 27). These take various forms, from modern plastic ones to older ones of fired clay, and are normally aligned along the line of the drain, clear of walls and obstructions.

Some downpipes go straight into the drains with no access points (Fig. 28). Not only does this make clearing blockages difficult, but in the event of a blockage the water backs up the downpipe, saturating the masonry.

Fig. 28 A closed downpipe with a blockage; the water is backing up and overflowing causing saturation of the adjacent masonry, which is now showing green.

Where possible, drains with no access points should be modified to an open gulley to allow inspection and cleaning. This level of remedial action is probably beyond the capacity of most homeowners, but understanding drainage routes and access points will allow the homeowner to identify potential maintenance issues.

4.9 External ground levels

Progressively rising ground levels to the outside of a building can result in higher levels of moisture in traditional walls, especially if they do not have a proper damp-proof course. As a minimum the ground level should be below the ventilation grilles or, where these are not present, below the junction of the wall and the foundation course. This is often well below the level of the internal floor joists. Figure 29 shows a suitable ground level relative to a ventilation grille following remedial work. Where ground surfaces adjacent to the building are hard landscaped, for example with concrete or tarmac, increased splash back and run off can increase dampness in low-level masonry.

Addressing this type of problem is often more a question of landscaping rather than building work, but it can make a significant difference to internal conditions (Fig. 30). In addition to lowering ground levels or introducing soft landscaping, damp areas can be improved internally by the use of breathable paint and improved sub-floor ventilation.


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Fig. 29 The correct ground level relative to a vent grille. The green colouration on the vent stone indicates how far the ground level had previously been raised.


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Fig. 30 The ground levels were lowered around this 19th century cottage, improving internal conditions.

5. Internal areas

5.1 Mains water and domestic plumbing

The mains water supply coming into a building is now often at a higher pressure than it was in the past, and therefore leaks in older plumbing are common. Major leaks manifest themselves quickly, but minor leaks continuing for several years can be more serious as they will progressively cause damage and timber decay, particularly dry rot, which may go unnoticed for some time.

Most plumbing is copper with soldered or compression joints, whilst some modern systems involve plastic pipes with push-fit connections. Checking for, and detecting, leaks can be difficult, but low water pressure and a slight vibration of tap fittings can indicate a leak. Vulnerable areas are often outside, where the mains connection enters the property and where use of the stop cock or 'toby' has weakened adjacent pipe work. It is prudent to be sure exactly where this is located and how it can be turned off quickly should any part of the piping fail. In some places where the stop cock is underground, a long 'T bar' or key is needed to operate it. Cisterns for lavatories have overflows that often are routed out through the wall; if the ball cock in the cistern fails, the water will overflow out of the building and run down the wall. While in the short term this is good because it protects the internal fabric, if it happens persistently it will result in saturation of the masonry and consequent damage to the interior (Fig. 31). Homeowners should also check for lead pipes in their domestic supply, particularly in outside areas. Lead pipe work should be replaced with copper.

5.2 Heating systems

Wet central heating systems generally rely on a network of pipes taking the heated water around the house to the radiators. Such pipes, like the mains water, can leak, admitting water to the fabric. Dropping pressure in a system will indicate a leak, and measures should be taken to identify it; often this is at the radiator valves. Boilers and heating systems, particularly those that are gas-fired, should be inspected by a suitably qualified engineer. An annual boiler service is a good precaution.

5.3 Electrical systems

While some older buildings have been comprehensively re-wired, it is common for electrical wiring to have been modified and adjusted piecemeal over the years. This can result in a mixture of cabling, often introduced at different times and to different electrical standards particularly regarding earthing regulations. There may also be a variety of fuse and trip systems which may not conform to modern electrical standards. These haphazard electrical arrangements may work, but it is sensible to consider rationalisation in order to validate what you have and ensure that the occupants and the building are protected. The National Inspection Council for Electrical Installation Contracting (NICEIC) recommends that electrical systems are checked every ten years.


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Fig. 31 A cistern overflow has saturated the masonry below. This will cause damage to the stone and internal timbers.

Fig. 32 Distortion and decay of a skirting board can indicate damp in adjacent masonry.

5.4 Ventilation

If the exterior of a building is maintained in a sound condition, and the building is adequately heated and ventilated, then apart from damage through wear and tear the interior of the property should generally remain sound. However, certain changes to the interior, such as refurbishment of windows or changes to fireplaces, can reduce ventilation and upset the balance of moisture exchange in an older property. Blocking up fireplaces can often lead to concentrations of humidity in the closed flues. A removable chimney balloon or loose fitting hearth board is a more suitable way of controlling ventilation. For occupant and building health, adequate ventilation should be maintained. For example if windows are draught proofed, new trickle vents may be required.

5.5 Attic space

Roof areas can be hard to access and therefore defects may only be detected from inside the building. For example, staining on the underside of the sarking boards can indicate a problem with the slates. For this reason regular checking of the attic is good practice. The introduction of insulation into attics causes conditions to change, leading to lower temperatures in the roof space and reduced air circulation. This can result in condensation on timbers and nail heads. Adequate roof ventilation is required through provision of slate vents or vents at the eaves and ridge.

5.6 Timber floors

Floor joists in contact with damp masonry are at risk from timber decay, especially where external ground levels have been raised. Indications of possible timber decay include a musty smell, distorted paint finishes and twisting of finishing joinery such as skirtings. A change in levels on a timber floor can indicate problems. The external damp loading can be compounded by vinyl wall coverings and multiple layers of paint, resulting in areas of high relative humidity behind skirtings and other finishes. This invariably leads to timber decay and damage (Fig. 32).

The table at the end of this document identifies some of the more common problem areas. Some may be hard to see and access, and this often means that they will have been neglected.

5.7 Damp treatments and damp-proofing

In heated and well-ventilated traditional buildings, where the fabric is functioning as originally intended, damp in its various forms should not be a problem. However, in many traditional structures modern interventions have progressively affected the vapour open dynamic, leading to increased humidity and moisture in the fabric. A series of works then invariably follows, each one seeking to cure the symptoms of the previous but rarely addressing the root cause. These can include injecting chemical damp-proof courses, tanking or applying proprietary damp-proof finishes. Damp-proof treatments should be considered with caution, as they rarely provide a long term solution and may simply mask or divert the problem.

6. Assessing defects and carrying out repairs

6.1 Assessing and understanding defects

On completion of an inspection the cause of any identified defects should be established and suitable repairs made. When repairing traditional buildings effort is often wasted addressing the symptoms of a problem or failure and not the cause. For example, blistering paintwork on masonry or plasterwork is often replaced with more of the same product, instead of understanding why it is happening, and using a more appropriate form of paint that works with the fabric instead of against it (Fig. 33).

A table of *Common Defects and Remedial Action* is included at the end of this document. It is not definitive, but gives an outline of common symptoms and solutions.

The *Inform Guide* series is a set of leaflets that describe common issues concerning traditional buildings such as leadwork, masonry repair and windows. The series can be accessed online via the Historic Scotland website. The leaflets are a good introduction to key issues, and although not comprehensive they will allow you to ask the right questions. Other titles in the *Short Guide* series give more practical details on carrying out such work. You might wish to use these guides when discussing works with a building professional or a contractor.

6.2 Carrying out repairs

When repairs are necessary you will need to engage the services of a competent tradesperson. They should be familiar with the needs of older buildings and have experience in the use of traditional materials. Repairs that are unsympathetic to the original construction will not only affect the character of the property, potentially reducing its value, but may result in accelerated decay and consequent need for further remedial work. A typical example is the use of impermeable cement mortar on sandstone masonry, which can cause accelerated decay to the stone (Fig. 34).


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Fig. 33 The use of the wrong type of paint on this masonry has resulted in blistering.

Fig. 34 Accelerated decay of masonry due to the use of the wrong mortar.

Professionals such as surveyors, architects and engineers may be required for larger or more complex repair works. Conservation accreditation of the professional used may be required for particularly sensitive projects. Architects and surveyors in Scotland are accredited by their professional body. The Royal Incorporation of Architects in Scotland (RIAS) and the Royal Institution of Chartered Surveyors (RICS) hold details of members with an accreditation in building conservation. Details can be found in the *Contacts and further reading* section of this document.

Before engaging any contractor it is advisable to assess their knowledge and experience by asking for examples of previous work, seeking references and if possible visiting a recently completed project. Some trade federations can recommend members with heritage experience, particularly in areas such as roofing and leadwork.

It is important that work is specified correctly to ensure that the methods and materials for any large repairs are appropriate for the building, and your appointed professional should be able to manage that. Discuss the repairs with them at the area needing attention and be very clear exactly what is going to be done. On some types of work, such as pointing, a sample panel many be appropriate (Fig. 35). When considering repairs be cautious of solutions that are easy for the contractor to deliver but which may not be a good match for what already exists.

Fig. 35 Discuss the repairs on site with the contractor; samples may be needed.

When selecting contractors, you might find it useful to do the following:

- arrange to meet with selected companies/tradespeople before repairs become necessary;
- discuss your anticipated maintenance and repair needs and assess the attitude, experience and knowledge of the company with respect to traditional buildings;
- seek information on past repair work they have carried out on traditional buildings and ask them to give you references for some of their recent projects;
- contact previous clients to check their satisfaction with work carried out and, if possible, visit the site to see for yourself;
- do not select on the basis of cost alone as this may result in an unsatisfactory repair;
- build up a good relationship with your selected tradespeople so that they become familiar with your property and understand its needs;
- when engaging a company rather than an individual tradesperson, make sure that the people who will actually work on your property have the necessary experience and skills; and
- be cautious about the proposed use of new products or systems and tend toward proven, established, traditional methods.

In buildings such as tenements it will often be necessary to organise common repairs. This involves agreement between all owners of the properties in a building, and the cost then being shared. Some buildings will have a scheme for this in place or will have a factor who will assist. It is important that repairs and maintenance tasks are not unduly delayed by difficulties in obtaining agreement as this will only increase costs for owners in the long run. A guide to managing these issues has been produced by Consumer Focus Scotland (2009).

6.3 Sourcing materials for repairs

To maintain the character of your house it is important that the materials and components used in repairs match as closely as possible, and are compatible with, the original materials and components. Often your contractor will have to source these materials from specialist suppliers rather than the local builders' merchant. While many standard items such as chimney cans, lead, sarking boards, zinc ridges and some aggregates are readily available, some materials such as lime, stone and slate might need a special order from further afield and be more expensive. Stone for repairs should be matched with the existing masonry and procured from an appropriate quarry. There are a number of companies in Scotland that offer a stone matching service based on analysis of the existing material. Cast iron elements such as railings, finials and some rhone and downpipe profiles are often of a standard pattern and might well be held in a foundry's stock (Fig. 36). Materials that are both appropriate and matching may not always be readily available for repairs, and holding a stock of spare materials such as slates is often worthwhile.

Fig. 36 A foundry stock of standard castings; such materials can be easier to procure than is often supposed.

6.4 Keeping records

Retaining the maintenance inspection checklists together with records of repair work carried out, the contractors or tradespeople involved, dates when work was undertaken and the costs, will offer a valuable historical record for you and future owners of a building. The presence of such a record will provide evidence of the care you have taken of the property whilst in your ownership and will reassure potential purchasers. It is also useful to keep a photographic record of the repairs.

7. Statutory consents

Generally works covered in this guide, described as repair and maintenance, do not require listed building consent (LBC), but if you plan to undertake any work which may affect the character of the building you should always check with your local planning authority to find out if the building is listed and if consent is required. Changes that may seem minor, such as stone cleaning or painting all or part of the house, re-roofing with new materials or replacement of timber doors and windows, may have an impact on the building's character and will normally require consent. Buildings within a conservation area may need planning permission for external work that affects the character or appearance of the building.

Your local authority planning department will be able to tell you if your house is a listed building or within a conservation area, and most list descriptions are also available on Historic Scotland's website. The list description will identify the building and usually give some history and background to the property. In addition, your local authority may employ a conservation officer who can give advice on appropriate materials and methods of repair.

There may be other regulations which impact on the maintenance of your building. These can include regulations affecting flora and fauna (such as bats and nesting birds), or regulations related to hazardous materials, which may need to be taken into account when considering more significant repair works. For major repairs and alterations a building warrant may be required; advice should be sought from local authority building control.

8. Conclusion

This Short Guide describes the importance of maintenance to older buildings, and how with the right care and attention they can last a long time. Homeowners play an important role in the care and maintenance of the traditional built environment and can easily learn the basic skills required to maintain their own properties. An inspection regime that identifies common defects will allow potential or existing problems to be addressed early, preventing further deterioration and saving money in the longer term. Understanding how older buildings work and procuring the right skills and materials for repairs will result in a better functioning, more durable and more attractive building.

9. Contacts and further reading

Contacts

Royal Incorporation of Architects in Scotland (RIAS)
www.rias.org.uk

Royal Institution of Chartered Surveyors (RICS)
www.rics.org/uk

Federation of Master Builders
www.fmb.org.uk

Historic Environment Service Providers Recognition (HESPR)
www.ihbc.org.uk/hespr

Health and Safety Executive
www.hse.gov.uk

Further reading

Consumer Focus Scotland (2009) *Common Repair, Common Sense: A short guide to the management of tenements in Scotland,* available online at http://www.consumerfocus.org.uk/scotland/files/2009/10/Common-Repair-Common-Sense-summary-lowres.pdf

Davey, A., Heath, B., Hodges, D., Ketchin, M., Milne, R. (1995) *The Care and Conservation of Georgian Houses, (4th Edition)*, Butterworth Architecture

Gilbert, J. and Flint, A. (1993) *The Tenement Handbook:* A practical guide to living in a tenement, Rutland Press

Historic Scotland (2002) *Sash and case windows: A short guide for homeowners*

Knight, J. (ed.) (1995) T*he Repair of Historic Buildings in Scotland*, Historic Scotland, Edinburgh

Historic Scotland has published a range of free technical literature on the maintenance and repair of traditional buildings. The Inform Guide series is normally where a homeowner should start. These can be found at: **http://conservation.historic-scotland.gov.uk/informguides**

For more in depth information the Short Guide series will be of use to owners and professionals. These can be found at: **http://conservation.historic-scotland.gov.uk/shortguides**

Historic Scotland has also carried out research on improving energy efficiency in traditional buildings and this is described in a range of Technical Papers. These are found at: **http://conservation.historic-scotland.gov.uk/techpapers**

For specific site reports on buildings, the Refurbishment Case Study series describes the physical interventions that were carried out. The majority of these concern energy efficiency, but some titles describe repair and maintenance works to traditional and historic buildings. These are found at: **http://conservation.historic-scotland.gov.uk/casestudies**

10. Glossary

Astragal	*the bar separating panes of glass in a window.*
Bargeboard	*the board fixed along the gable of a house to cover the roof timbers and prevent rain from driving in.*
Blocking course	*plain course, usually stone, forming a low parapet superimposed on a cornice and usually concealing a gutter.*
Brattishing	*the ornamental cresting of cast or wrought iron crowning a roof, but sometimes also found applied to cornices and other ornamental features.*
Cement mortar	*mortar introduced in mid-19th century in which the binding agent, hydraulic Portland cement, is mixed with fine aggregate.*
Crowstep	*steps on a gable upstanding from the plane of the roof.*
Cupola	*small domed roof structure, often glazed.*
Downpipe	*a pipe to carry rainwater from a roof to a drain or to ground level.*
Eaves	*overhanging edge of a pitched roof.*
Fanlight	*glazed area above a door. More correctly called an over-door light if rectangular rather than semi-circular, semi-elliptical or segmental.*
Flashing	*usually lead, copper or zinc forming an upstand at a wall/roof junction to prevent water ingress.*
Gutter	*a channel along the eaves of a roof for the removal of rainwater.*
Gulley or gulley trap	*an opening into which rain and waste water is collected before entering the drain.*
Harl	*Scottish form of roughcast in which the mixture of the aggregate (small, even-sized pebbles) and binding material (traditionally sand and lime) is dashed on to a masonry wall. In traditional harls the aggregate is in the mix (wet dash), while in modern practice the aggregate is dashed separately (dry dash).*
Hip	*the external angle formed by the sides of a roof when the ends slope backwards instead of terminating in a gable.*
Lime mortar	*traditional mortar for buildings, a mixture of slaked lime and aggregate.*

Margins	*protruding masonry framing an opening or emphasising the angle of a building. Most are raised (usually adopted when the building was to be harled but sometimes used decoratively).*
Meeting rail	*the horizontal mid-rail of a vertical sliding sash window.*
Parapet	*low wall or barrier at the edge of a balcony, bridge, roof, terrace or anywhere there is a drop. May be ornamented, pierced or plain.*
Pointing	*the treatment of exposed mortar joints in masonry or brickwork.*
Rhone	*horizontal gutter for the collection of rainwater.*
Ridge	*the highest part, or apex, of a roof where two slopes meet.*
Sarking	*the rough boarding, nailed on top of rafters, onto which slates are nailed.*
Skew	*sloping tabling, sometimes coped, finishing a gable which is upstanding from the plane of a roof.*
Sash and case	*a form of window in which the glazing slides in two parallel frames within the case, the upper sliding outward of the lower.*
Sub-floor vent	*small ventilator installed in external walls between a suspended timber ground floor and ground level to ventilate the space below the floor.*
Valley	*the internal intersection between two roof slopes.*
Verge	*the projecting edge of the roof, overhanging the gable.*
Water bar	*a bar inserted in a joint (as between the wood and stone cills of a window) to prevent passage of water.*

Maintaining your home – A short guide for homeowners

TABLE OF COMMON DEFECTS AND REMEDIAL ACTION

Things to look for	Likely cause/s	Suggested repairs
ROOF		
Slates or tile		
Broken, slipped or missing slates	Corroded nails (nail 'sickness'). Mechanical damage (wind or ladders/traffic). 'Soft' slates – movement in wind causes slate to disintegrate at nail holes. Decay of timber sarking or tile battens.	Carefully check whole roof. Re-nail slates that are in good condition with copper nails. Replace broken slates with good quality, matching slates. Strip back slates, replace decayed timber with pressure-preserved timber, replace with roofing paper and fasten slates with copper nails.
Missing or displaced ridge cappings. Dampness in roof timbers at ridge.	Wind damage. Inadequate fixing or bedding of ridge cap. Corrosion of fixings (metal capping).	Replace missing ridge tiles with matching tiles. Where the design is ornate, the ridge tiles may have to be specially made. Tiles should be rebedded in mortar and nailed to sarking – special attention should be paid to those at leading edges. Ensure fixing of metal ridges is with nails appropriate for the type of metal to avoid bi-metallic corrosion.
Moss	Wind-blown soil in joints encourages moss growth – can cause water to penetrate below slates/tiles.	Brush out all moss and soil from slates/tiles – remove debris from roof. Avoid high-pressure water washing.
Lichens	A sign of low atmospheric pollution – usually not damaging.	
Green algae	Common on damp, shaded surfaces – usually not damaging.	
Dormer windows		
Slipped/displaced lead/zinc flashings and valleys, internal water stains	Wind uplift, corroded metal fixings, decayed timber supports for fixings, bi-metallic corrosion of metal flashing (wrong metal used for fixing).	Strip back lowest courses of slates/tiles – replace any decayed timber. If flashing/valley metal is sound, redress the metal and fix with correct fixings – otherwise renew.
Cast iron roof lights		
Water penetration	Build up of debris (soil/leaves etc.) behind top upstand – rainwater gets below lowest slates/tiles.	Clean out all debris, especially from below lowest course of slates/tiles.
Broken/cracked glass	Wind/mechanical damage, frame corrosion, poor fixing of glass.	Replace glass. If iron frame corroded replace with conservation grade rooflights to match original.
Valley and parapet gutters		
Overflowing outlets	Build up of detritus and plant growth in gutter blocking outlet. Inadequate gutter or outlet capacity.	Clean out gutter and outlet. Where inadequate capacity of outlet is the problem, the outlet should be redesigned and rebuilt to improve flow.
Water stains/leaks in rooms/ spaces below	Blocked outlet, damaged gutter lining, poorly executed repairs, snow build up in gutter (no snow boards to gutter), thaw water drawn up below slates. Defective flashings and/or mortar fillets at gutter upstand.	Check for decay of concealed timber and replace where necessary. Where metal gutter has been damaged, replace damaged section with metal of matching weight and ensure adequate laps and joints. Where snow build up is a recurring problem in gutters, install boards at eaves to prevent snow sliding into the gutter. Replace damaged flashings and refit lead tacks, rake out and replace mortar joint and fillet to full depth of tack with lime mortar.
Eaves gutters and downpipes		
Water staining of walls, extensive algal growths. Gutters sagging or with inadequate falls	Blocked outlets/gutter causing build up of debris and plant growths, leaking joints, cracked/broken pipes (often by ladders), corrosion of cast iron elements. Sagging rhones due to corrosion of rhone hooks or decay of timber to which fixed.	Replace broken/corroded gutters and downpipes with matching materials (usually cast iron) and design. Leaking joints may simply need recaulking. Typically, slated roof straps fixed to the sarking boards below the lowest course of slates should be replaced when corroded or broken.
Flat roofs		
Internal – plaster cracks, bossed plaster, water stains/ damp patches	Failure of roof covering or flashings at abutments, leaks at built-in gutters and outlets, inadequate falls, physical damage (from sharp implements, wind etc.), poor repairs. Condensation on the underside of tile roof covering can cause decay of roof timbers.	Problems can be complex and repairs can range from the replacement of a single lead sheet to a complete redesign and reconstruction of the roof. Improved drainage and ventilation of the roof space usually required. Specialist advice should be sought.

TABLE OF COMMON DEFECTS AND REMEDIAL ACTION (continued)

Things to look for	Likely cause/s	Suggested repairs
ROOF		
Parapets, skews and crowsteps		
Open joints, wet stains below, woody plants.	Defective mortar joints and pointing between cope, skew and crowstep stones.	Rake out mortar joints, completely remove all plants and their roots, replace with lime mortar and repoint.
Loose/dislodged cope stones	Storm or impact, inadequate fixing, open joints.	Some cope stones are fixed with metal dowels to adjacent stones or to stones below. If fixing dowels damaged or missing, replace with phosphor bronze or stainless steel dowels. Bed the stones in lime mortar and repoint.
Wet sarking (roofboards) in roof space	Cracked/missing mortar fillets at junction of slate and skew/crowstep upstand or defective lead 'secret' gutter or skews.	Replace sarking that has wood rot. Replace cracked or missing mortar fillets. Clear secret gutters of any blockages (including slipped slates). Replace lead and/or fixings if damaged.
Chimneys		
Cracks (less than 2mm wide) in masonry/harl	Shrinkage due to rapid drying out. If cracks are wider than 2mm – seek professional advice.	Cracks of narrow width can be left but wider cracks, or recent cracks, should be investigated by a structural engineer.
Plant growth	Defective mortar joints at chimney head.	Remove all parts of the plants, especially roots. Rake out joints, replace and repoint with lime mortar.
Out of alignment	Seek professional advice.	May be a significant structural problem. Seek advice from a structural engineer.
WALLS		
Exposed stone		
Stone decay	Seek professional advice. Repair may not be necessary.	Stone can decay through natural weathering or by stone cleaning. Badly decayed stone (not just surface damage) should be replaced with matching stone with the same properties as the original. Repair of stone using coloured mortar (plastic repair) is not recommended.
Open joints, missing or crumbling pointing	Exposed elevations, excess water from poor detailing.	Rake out joints, replace and repoint with a lime mortar that matches the original mortar. Do not use a hard cement-based mortar unless this has been used for the original mortar (e.g. on granite walls late 19th century or later), and check adjacent details.
Lichen/algal growths	No action required normally unless algal growth is due to leaking pipes (rainwater or plumbing overflows). Algae can indicate a problem of excessive dampness requiring investigation.	Removal with bristle brush or wooden scraper may be appropriate.
Soiling	Cleaning of sandstone is not recommended as it can damage the stone.	
Lime staining	Often a sign of excess water in masonry, often at parapets where there is no damp-proof course (DPC) below the cope	Eliminate source of moisture, may require installation of DPC below cope stones.
Fine cracks at stone mortar interface	Shrinkage of mortar – no action required if stable.	
Cracks extending through stone or wider than 2mm wide	May have structural significance. Seek advice from a structural engineer.	
Harl/render		
Fine cracks/crazing	Shrinkage cracks due to hard/strong mortar.	Cracks allow water running down the wall to penetrate into the core of the wall. Patching of affected areas unlikely to be a solution. Pick off existing harl and replace with a lime mortar harl to an approved specification.
Detachment	Inadequate bond to substrate/undercoat – too strong mortar for topcoat.	See above.
Flaking/powdering	Weathering.	Any minor defects in a lime mortar coating should be dealt with as soon as possible, by careful patching and/or the application of a limewash.

TABLE OF COMMON DEFECTS AND REMEDIAL ACTION (continued)

Things to look for	Likely cause/s	Suggested repairs
WALLS		
Structural openings		
Distortion of opening	May be of long standing due to settlement or changes in ground support conditions. More recent movement may be due to ongoing problems such as decaying timber safe lintels.	Employ a structural engineer to investigate causes of movement, using non-destructive techniques where possible. Once any structural defect is remedied, window and door frames should be set plumb, level and square in openings to ensure correct operation.
Walls wet stained and/or salt efflorescence at ground level	Splash back of rainwater from surrounding ground. High water table in adjacent soil due to lack of surface drainage at wall or broken surface-water drain	Where salts are due to winter salting of adjacent road, gently brush off surface salts with soft nylon brush and rinse down masonry with clean water at regular intervals to flush out salts. Where the problem is ground water, install a French drain at the base of the wall.
Missing or slipped lead flashings. Damp areas internally	Wind damage, inadequate fixing to wall, thermal movement due to insufficient joints in lead flashing. Flashing not performing function, mortar pointing above flashing missing – allows water to get behind flashing.	A common source of dampness. Refix or replace lead flashing, set into a raggle (slot or groove) cut into the wall and repoint with lime mortar.
Ivy and other woody plants firmly attached to surfaces	Self-seeded or deliberately planted – can cause damage to stone and mortar joints.	Ivy can be damaging to masonry and should be removed. Cut out section of root near ground level and apply poison to the cut. Ivy allowed to die and then removed (can take up to two years).
SASH AND CASE WINDOWS		
Cills		
Visible gap	Twisted casement frames or weights being prevented from performing full travel in weight box.	Check and free snagged weights. Remove lower sash and piece in additional timber to bottom rail.
Missing or defective cill bedding mortar	Deterioration of (lime) mortar bedding from external sources such as driving rain or other concentrations of water (e.g. from overflowing rhones).	Rake out defective material, place replacement bedding mortar, thoroughly packing it to the full depth of the cill. Rake back to form a recessed drip below the edge of the frame.
Timber decay	External weathering accelerated if lack of paint finish, or where timber comes in contact with damp masonry.	Replacement of either front or whole cill using new matching timber can be done with window in situ. Routing tools will be needed to form proper joints in the frame.
Other components		
Meeting rails not level	Twisted, warped or excessively worn sashes.	Check sash cords. Remove both sashes and piece in new timbers to each side to square up sashes.
Missing or defective mastic or other sealant between wall and window	Deterioration due to ageing process or where actual movement in either the timber frame or masonry has caused mastic to fail. Applying paint to mastic can accelerate loss of flexing properties.	Cut out defective mastic. Ensure packing of any excessive gap between the frame and masonry wall, using a suitable packing material. Use lime mortar to seal over the packing material and finish with a fillet of burnt sand and boiled linseed oil mastic in front to waterproof the joint.
Timber decay generally	External weathering. Water running down glass is often concentrated on ledges by wind pressure.	If internal parts of frame decayed, remedy source of water ingress. Cut out and replace decayed timber, or entire piece if necessary. Sashes may have to be removed to carry out repairs. Chemical treatments are rarely necessary on dense pine or oak window joinery.

TABLE OF COMMON DEFECTS AND REMEDIAL ACTION (continued)

Things to look for	Likely cause/s	Suggested repairs
EXTERNAL DOORS[1]		
Softwood door and frames		
Localised decay	External weathering accelerated by poor maintenance of paint finishes, poor detailing allowing water access to unprotected timber, direct contact with wet masonry.	Replacement of decayed wood. Only remove wood that is decayed and splice in new sections.
Missing or defective components	Deterioration due to ageing process, wear and tear and/or localised decay.	Replace missing components with matching items. May be available from an architectural salvage yard.
Door does not close properly	Mechanical damage to metal or timber water bar. Poorly fitted doorstops, door dropped due to joints opening up (snapped mortices), failure of hinge (or screw fixing) or timber swollen by moisture.	Repair or replace water bar, set into a mortar or mastic bed. Realign or replace damaged doorstops. If door has dropped due to decay or movement in joint, glue, wedge and clamp the joint or strengthen joint by adding metal plate across the corner. Old loose dowels should be carefully driven out and new dowels glued in place. Identify cause of high timber moisture content and rectify; ease the door sufficiently to allow it to open but take care not to remove too much wood as door will shrink as it dries out.
Water enters at threshold	Mechanical damage, door twisted, poor seal at door jambs allows water to run down inside edge of door and onto internal floor.	Mechanical damage to timber threshold plates is common – replace damaged threshold plate. For water getting between edge of door and jamb, adding a flexible weather strip to door stop may be sufficient.
Water enters at frames	Missing or detached pointing/mastic.	Cut out defective mastic or pointing. Ensure adequate packing of any excessive gap between door frame and masonry using a suitable packing material. Use lime mortar to seal over the packing material and finish with mastic made from burnt sand and boiled linseed oil to waterproof the joint.
Defective paintwork	Deterioration of old paint system may indicate high moisture levels in underlying timber.	Check moisture levels in timber and correct associated defects. Remove loose paint layers back to a sound base, prepare and re-paint door using an appropriate paint system.
OTHER		
Sub-floor vents		
Covered over with soil, paving, bricks or timber/ metal plates	Lack of knowledge. Ventilation below timber ground floors is essential to prevent high moisture levels in timber floors.	Excavate back soil or paving to at least 150mm below the level of the floor vent. Sometimes the house owner will fit plates across the vents to reduce draughts – these should be removed and all vents checked to ensure there is an adequate air flow.
INTERNAL		
General		
Pungent or musty smell of damp	Condensation, water ingress, leakage from water supply and waste-water pipework, especially in concealed spaces.	Check and rectify any sources of water ingress. If problem is condensation, increase ventilation rates to avoid stagnant air pockets, especially in cupboards. May require installation of vents in cupboards, opening up of sealed fireplaces etc.
Walls and ceilings		
Black or brown mould growth	Condensation, water ingress, leakage from water supply and waste-water pipework.	See above.
Water staining	Water ingress, leakage from water supply and waste-water pipework.	Check source of water ingress and rectify.

TABLE OF COMMON DEFECTS AND REMEDIAL ACTION (continued)

Things to look for	Likely cause/s	Suggested repairs
INTERNAL		
Timber skirtings, floorboards, window shutters		
Splitting, cupping, sponginess of wood	Raised moisture content due to water ingress, contact with damp masonry, leakage from water supply or waste water pipework, raised humidity levels due to water vapour production and/or inadequate ventilation.	Symptoms indicate presence of wood rot. Open up area around the rotted timber, identify the source/s of high moisture and rectify. Ensure adequate ventilation of voids behind skirtings and plaster, allow timber to dry out. Replace all decayed timber. If the area affected is extensive and/or dry rot is suspected, seek professional advice from consultant experienced in the environmental control of rot.
BUILDING SURROUNDS		
Metal railings, gates etc.		
Rusting, blistering of paint	Corrosion.	Do not paint over rust. Remove rust and paint by wire brushing, hand sanding or scraping. Apply three-coat paint system.
Stonework		
Cracking or spalling of stone copes, gate piers and steps	Corrosion and expansion of metal posts and fixings.	Dismantle entire assembly, clean out securing holes, dowel joint the fractured stone and reassemble ironwork by reversing process. Where this is impracticable, set uprights in a resin plug.
Stone flagged paths		
Green/black algae, slippery surface	Poor surface water run-off.	Lift and realign path to provide water run-off. Applying fungicide will be effective for only a few months.
Sunken areas	Soil settlement, possibly over drains or other tracks.	Excavate soft spot and backfill with well-compacted material to same degree as adjacent sound soil.

HOUSE MAINTENANCE CHECKLIST

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Date of inspection ..... Your name .....

Elevation – use appropriate idenification (e.g. north, south etc.) .....

Element	Component/Material	Defect present		Nature of defect	Notes – add any extra information e.g. precise location, seriousness of defect, urgency of repair.
		Yes	No		
Pitched roofs	Slates/tiles				
	Dormer windows				
	Rooflights				
	Cupolas				
	Ridges				
	Hips				
	Metal flashings				
	Parapet				
	Iron brattishing				
	Blocking course				
	Skews/crowsteps				
	Other features				
Flat roofs	Roof covering				
	Upstands/parapets				
	Junction with main roofs/ walls				
	Built-in drainage				
	Verges				
	Eaves				
Roof drainage	Valley gutters				
	Parapet gutters				
	Hopper outlets				
	Eaves gutters				
	Rhones and downpipes				
Chimneys	Chimney stacks				
	Copes				
	Pots and cans				
Walls	Stonework				
	Joints/pointing				
	Harl/render				
	Margins (openings)				
	Sub-floor vents				
	Ground level				
	Other features				
Bay/oriel windows	Masonry walls				
	Stone mullions				
	Corbels				
	Roof covering				
	Blocking course				
	Flashings				
	Roof drainage				
Windows	Window 1, 2, 3 etc.				
Doors	Door 1, 2, 3 etc.				Refer to timber door inspection checklist.
Other elements	Porch				

TIMBER DOOR INSPECTION CHECKLIST

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Door No ..... Date of inspection ..... Your name .....

Overall condition of door: Excellent ☐ Good ☐ Satisfactory ☐ Poor ☐

Element	Defect	Tick if present	Notes – add any extra information e.g. precise location, seriousness of defect, urgency of repair.
Frame	Loose fixing to opening		
	Missing mastic/mortar at wall leading to water penetration		
	Open joints in frame		
	Flaking or missing paint		
	Timber decay in posts/door stops		
	Evidence of previous repairs, including metal strengthening angles		
Fanlight or transom light	Open joints in timber elements		
	Timber decay		
	Broken/cracked glass		
	Missing or defective putty		
Door	Gaps at doorstop leading to water penetration or draughts		
	Door not closing properly		
	Door twisted		
	Door dropped at one side		
	Open joints at rails and stiles		
	Timber decay in rails and stiles		
	Flaking or missing paint		
	Cracks/shakes in door panels		
	Missing/broken beads		
	Timber decay in beads or mouldings		
	Timber decay in weather moulds/ drips		
	Broken or cracked glass panels		
	Missing or defective glazing beads/ putty		
	Evidence of previous repairs		
Threshold	Door cill loose		
	Water bar missing, deformed or loose		
	Timber decay in cill		
	Missing or defective cill bedding mortar/mastic		
	Drainage channel blocked or broken		
Other features			

General comments: Note any extra information you consider relevant, e.g type of door (panelled, flush etc.), type of panels, type of ironmongery, type of glass etc.

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