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## Historic Environment Fund

# Advisory Standards

For repair and guidance for  
works to listed buildings

May 2019





This document should be read in conjunction with the  
**Historic Environment Fund Repair Stream Guidance** document.

## **ADVISORY STANDARDS OF WORK FOR REPAIRS TO LISTED BUILDINGS**

These Advisory Standards are intended to assist in the execution of works to historic and traditional buildings in Northern Ireland. In order to attract support from the Historic Environment Fund's Repair stream, the applicant's conservation advisor should develop proposals to standards of best conservation practice. It is equally important to ensure that works are supervised to a high standard on site until completion of the repair scheme. These Advisory Standards are intended to encourage such action and will be the standards against which applications for support will be judged. They will be subject to periodic review and update.

**HISTORIC ENVIRONMENT DIVISION**

**May 2019**



## ADVISORY STANDARDS OF WORK FOR HEF FUNDING

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## GENERAL INFORMATION AND CONDITIONS

These Advisory Standards of Work should form the basis of any proposed scheme and should be read in consultation with our booklet ***Historic Environment Fund Repair Stream: Application Form and Guidance*** which explains the assessment process including the conditions which will attach to letters of offer.

Listed Building Consent is required for any work that will alter the character of the building. For further information on this please refer to HED's publication *on the Department's website*:

<https://www.communities-ni.gov.uk/sites/default/files/publications/communities/consulting-hed-development-management-applications-consultation-guide.pdf>

This includes works to the interior as well as the exterior of the listed building as defined in Section 85 of the Planning Act (Northern Ireland) 2011. Funding applications in respect of a change of use or alteration of a historic building will not be considered unless Listed Building Consent has been obtained. Any alterations and demolitions must conform to the scheme as stamped approved by the relevant Planning Authority under Listed Building Consent, or as appropriate, Planning Permission, or as specifically referred to in the letter of offer issued by the Department. In cases where Listed Building Consent is required, close adherence to the conditions of the consent in terms of materials and execution will be essential. Failure to adhere to these standards and conditions may render the application ineligible for HEF funding.

Where changes require Building Control Approval, it is always advisable to apply for the Historic Environment Fund and for Building Control approval concurrently. Any conflict between this guidance and emerging site information or documentary evidence should be drawn to the Department's attention and the way forward agreed in writing before proceeding.

Bats are protected under legislation and it is an offence to disturb bats and their roosts. If the works involve actual or suspected disturbance to the habitats of protected species, eg. Bats, please follow the guidance issued by NIEA:

[http://www.planningni.gov.uk/index/advice/northern\\_ireland\\_environment\\_agency\\_guidance/standing\\_advice\\_15\\_bats\\_issue\\_01\\_may\\_2015-2.pdf](http://www.planningni.gov.uk/index/advice/northern_ireland_environment_agency_guidance/standing_advice_15_bats_issue_01_may_2015-2.pdf)

To comply with the conditions of the Fund, for projects requiring architectural or structural work which is anticipated to cost £10,000, or over, the Department has introduced a requirement that this is designed and supervised by a conservation accredited professional. Information on eligible accreditation schemes is provided in the Repair Stream guidance notes.

Your proposals must be accompanied by recent colour photographs, showing the problems for which funding is being sought from exterior and interior angles.

Completed work must comply with the provisions of the Planning Act (Northern Ireland) 2011 and the detailed conditions as set out in the Letter of Offer. For information on VAT, refer to HM Revenue and Customs Notice 708 [August 2016 update]. All material and workmanship must comply with the relevant British Standard or Code of Practice and BS 7913:2013 'Guide to the conservation of historic buildings' which should form the basis of works. It is important to note that the Department does not provide a professional contractual service.

Government operates an environmental management system to the requirements of ISO 14001 and the Department would remind all parties of the need to comply with relevant environmental legislation. Legislation covers, but is not limited to, waste management issues, water pollution, air pollution and appropriate storage of materials.

## **GUIDING PRINCIPLES**

Applicants should ensure that the approach by the owner and the design team follow best practice based upon internationally agreed principles. This begins with an understanding of the building's history and significance, the behaviour of materials and their construction, their function and how the building currently functions and the implications of change. It is important that the cultural significance of a building should not be compromised and the work should retain as much of the original fabric as possible by minimising interventions. This is set out in detail in BS 7913:2013.

Repairs to the existing fabric should adopt the traditional materials, craft skills and construction techniques found in the original building. Where circumstances allow, local materials should be used. In repair work, an important consideration is matching in new material with the existing; incorrect selection of material, often for perceived reasons of improved durability and lower cost, will result in shorter life repairs and accelerated damage to existing fabric.

The reuse of a building and the embodied energy it contains is inherently sustainable. The resilience and sustainability of a building needs to be considered in the widest possible sense; addressing reduction in operational energy alone by the use of complex or high embodied energy systems and products, may not be sustainable in the long term. Most traditional materials are by their nature of low embodied energy and low toxicity in their use.

Those involved in the preparation of scheme specification should satisfy themselves that the products specified or used in the works will not endanger the health of the consumers or others, cause significant damage to the environment during manufacture, use, or disposal, consume a disproportionate amount of energy during manufacture, use, or disposal, cause unnecessary waste because of over-packaging or because of an unusually short shelf life, or will contain materials derived from threatened species or threatened environments. All timber for the works should be supplied with written confirmation that it is sustainably produced. Large section hardwood timbers should come with the appropriate chain of custody.

Major replacement will seriously diminish the historic authenticity of the listed building. The work should therefore be planned with the intention to retain the maximum content of the historic fabric, with the emphasis being on repair rather than replacement. Your approach should be in accordance with BS 7913:2013 'Guide to the Conservation of Historic Buildings'. Among other things, this advises that:

- Proposals for repair or change should be based upon a **clear understanding of the significance** of a historic building (paragraph 4.1);

- when considering problems or defects proposals should be based upon ‘**a full understanding of the** constituent components/ materials and the origin of the **problem**’ (paragraph 6.3.1);
- Such work should be ‘the **minimum necessary** to stabilise and conserve the historic building, ensure its long-term survival and meet the requirements of any foreseeable new use’ (paragraph 6.4);
- It should seek to ‘retain the performance of the existing fabric’ (Paragraph 6.7) which is usually achieved by using **traditional materials and matching repair techniques**. ‘New materials and techniques should only be used where there is evidence that they perform satisfactorily in use’;
- Work should generally be **legible** i.e. repairs should be carried out without any attempt to disguise them, but should not be unduly obtrusive or unsympathetic. Different approaches may be adopted where aesthetic considerations are particularly significant’ (paragraph 6.8).
- If alterations are proposed as part of the work. ‘Such changes should be designed to minimise their impact on the significance of the historic building, and should avoid losing features that contribute to that significance’ (paragraph 6.16). They should generally be **reversible** i.e., new insertions, such as sub-dividing walls, should be contoured around original features and mouldings so they can be removed in the future, leaving the original fabric intact.

Repairs should be comprehensive in scope, using appropriate techniques or methods of construction and high quality natural or traditional materials normally on a like for like basis. Substitute or artificial materials are generally unacceptable on supported projects. Where an argument is made for a substitute, this should be agreed through consultation and formal consent from the relevant authorities through a formal application for Listed Building Consent from the local council.

## SPECIAL EMPHASIS

It has been the experience of the Department that certain specific aspects of conservation need to be emphasised in the context of conservation works in Northern Ireland:

**It is the policy of the Department to encourage the use of lime in the repair of historic buildings, and to minimise the use of cement. Mortar mixes for building, re-pointing, plastering and rendering should be agreed in advance with the Department and provision made for sample panels to be provided.**

**It is very important that, wherever possible, the original roof structure of thatched buildings is retained in-situ and augmented as necessary to give stability and support to the thatch. It is also important that thatch is renewed in as traditional a manner as possible, including the use of scraws and scallops. Whenever the recoating of the entire thatch roof is proposed, it is preferable that a local source of thatch material is used. If imported, then traditional techniques should be employed in laying the thatch. This will help ensure continuity of traditional practice until a supply of local material can be found.**

**Inappropriate replacement of windows or parts of windows can have an effect on the historic and visual integrity of listed buildings. It is important that the advice on windows, offered in 'Openings' section [pages 26-31], be noted carefully.**

**The appearance of roofscapes can be damaged by the insertion of ill-conceived ventilators and inappropriate replacement of skylights and other visual clutter including additional ladders and access systems. Care should be taken to avoid this as alternatives are usually possible without major visual disturbance.**



## ROOF

### Roof Structure

Ensure the roof structure is sound. Where there is significant sign of movement in the roof structure, advice from an engineer experienced in the repair of historic structures may be required. Historic timber to roof structures should be replaced with appropriately treated material after detailed inspection for rot, insect attack and structural weakness, spliced to sound timber.

When deemed necessary by a conservation professional, provide additional structural support to the roof conforming to an agreed scheme. Repair damaged timbers using new preservative treated timbers run to the original profile and treat rot or insect attack locally as required. Timbers should be spliced in line rather than cheek bolted. Where possible separate timbers from damp stonework with a DPC and allow free ventilation where practicable. Check the provision of ventilation to roof voids. If additional ventilation is required, locate discreetly and create using traditional materials-e.g. lead

Provide access for future maintenance. The opportunity should be taken to provide adequate safe access for maintenance and repair. Where required provide attic walkways to allow safe inspection and maintenance of these spaces. Locate ladders and access hatches discreetly.

There will be a presumption that roof timbers will be retained, repaired and locally spliced rather than wholesale replacement. An entire structural element such as joist or truss should be replaced only where a significant proportion of the original has been lost.

### Slating and Tiling

Understand the original build-up and design the repair, including the use of underfelt where appropriate, to suit the circumstances. Where different types of slate are used across differing building phases as part of the natural evolution, these characteristics are to be respected. Re-slate using sound original slates recovered from the site together

with matching slates brought in as required to make up the required number. Samples of slate to make up broken or unsuitable slates should be agreed before purchase. Slates are recommended to be laid to exactly match the laying pattern using slates of the same shape as originals. This includes number of courses and their sizing. Reused slates should not be redressed as a matter of course. Slating/tiling to be fixed with non-ferrous nails. Nails are recommended to be copper, aluminium alloy or silicon-bronze of appropriate lengths to suit the roof details.

Replacement slates to be natural slates from an agreed source and should replicate the original in colour, size, thickness and coursing: Tiles to be matching clay tiles. The new slating/tiling must course in with adjoining roof surfaces of the same profile, colour, size and glaze [as appropriate]. The original eaves, verge and parapet details are to be retained without the addition of timber trimmings, fascias, etc.

Mortar fillets at skews to be reinforced with expanded non-ferrous metal reinforcing lath and formed on top of code 4 soakers.

## **Chimneys**

Pots – missing or defective chimney pots to be replaced to match the original form indicated by documentary or site evidence. Where there is no evidence of the original, use pots that are in use on buildings of similar period in the vicinity. Ensure the number of pots accurately reflect the number of flues. Chimneys not in use should be cleared of debris and terminated with a vented weathered top and a vent at the bottom of the flue to allow free air circulation.

Stack - repair (see sections on brickwork/stonework as appropriate). Note the character of the original brickwork including bond, brick type, sizes and mortar pointing profile. Survey and record location of types of decay to inform repairs required. All brickwork repairs to accurately follow the original shape and size including corbel courses and other decoration of matching colour, size, hardness and porosity.

Flashings – consideration to be given to the retention and value of historic leadwork. Life expired and unrepairable weatherings and lead flat roofs should be renewed in new milled or cast lead conforming to the recommendations of the Lead Sheet Association.

Line flues remaining in use; work to comply with the latest British Standards. Chimneys not in use to be cleared of all debris and them terminated with inset wire gratings.

Ventilating caps are to be fitted to the head of disused flues. Ventilators are to be fitted to fire places which have been closed up.

### **Metal Coverings and Flashings, Lead, Zinc, Copper etc**

Flashings – consideration to be given to the retention and value of historic leadwork. Life expired and unrepairable weatherings and lead flat roofs should be renewed in new milled or cast lead conforming to the recommendations of the Lead Sheet Association.

Weathering to lead flats roofs to be in new milled or cast lead as follows:

- i cupola, astragal and rooflight cover flashings to be minimum code 5;
- ii flashings, secret gutters, dormer cheeks etc to be lead code 6;
- iii valleys to be minimum code 7;
- iv short gutters or small areas of flat roofs without foot traffic may be minimum lead code 7;
- v all other flat roofs or gutters on geotextile underlay to be code 8;
- vi ridges to be code 8 and fixed with clips of minimum code 8 lead, copper or terne-coated stainless steel.

Complex junctions and details unique to the building should be drawn at a large scale sufficient to illustrate how these areas are to be constructed. Flashings are to be inserted into joints sufficiently deep to allow the joint to be pointed. Existing joints should be used wherever possible. Lead should be isolated from lime mortar by a protective coating. The use of sacrificial flashings where slating discharges into valleys and parapet gutters is encouraged. On flat roofs, hollow roll joints should not automatically be replaced with wood cored roll joints, consideration should be given to the historical context, the roof pitch and any likely foot traffic.

## Thatch

### General Principles

These roofs are now a scarce and highly valued historic resource. Repairing traditional thatched roofs requires careful investigation and consideration.

### Maintenance of Thatched Buildings

Thatch should be inspected regularly for damage especially following bad weather. Thatch, once settled, should not be stood on, or otherwise subjected to point loading. Any sinking or sagging at the ridge or of the roof pitch should be investigated promptly. Holes made by nesting birds or by vermin should be filled as soon as possible. Moss should be removed and any repair made when thatch is slightly damp. Thatch must be well ventilated and the building heated.

Thatch can be vulnerable to becoming damp or even saturated during prolonged periods of wet weather. This can be exacerbated by coverings of moss or other materials which hold water. Thatch should be kept free from moss growth, fungus and other debris or vegetation that may hold water. It is important to keep thatched buildings heated and ventilated to maintain a dry roof. Thatched buildings which are unoccupied or otherwise left unheated and ventilated will quickly deteriorate and eventually fail. Where the building is used as a holiday home an inbuilt ventilation system is recommended. Keeping windows open can prevent dampness and rot throughout the building

Proposals for the repair of traditional thatched roofs should follow for the original as far as possible and include details on the repair or replacement of structure, substratum and thatch type. Replacement work and stripping back of thatch should be limited to the minimum required which will allow historic layers of roof covering to remain where possible. Detail must be provided in any estimate of works to thatched roofs of:

- proposed area of work;
- proposed method of fixing;
- proposed depth of new thatch covering;
- proposed extent of repair to substratum [if required]
- proposed work to structure [if required].



This is required to give assurance that the work is undertaken by competent thatchers and provide reassurance to owners and the Department about the quality of workmanship. For minor repairs, it is recommended that defective thatch is cut out in localised areas and repaired using the same material and the same thatching style as the rest of the roof covering.

It is important that thatch is renewed in as traditional a manner as possible, including the use of scraws and hazel scallops. Build-up can be achieved using traditional scraws or horticultural turf laid to provide underlay where scraws prove difficult to procure. The use of screws, spikes and wire is not generally acceptable and will not attract funding.

Only in exceptional circumstances will it be accepted that the thatch is replaced in its entirety. In these circumstances, recoat all the defective areas of the roof using a thatching material agreed in advance with the Department. The new material must have an acceptably low nitrate and phosphate content and should if possible be locally sourced. If a certificate of analysis is not provided, the Department reserves the right to require one to be obtained. The style of the new thatch must replicate the existing unless the Department specifically agrees to an alternative.

Bluestone may be sprayed or the thatch dipped in bluestone prior to placing on the roof. Either way, the method is to be declared before work begins. For the longevity of the roofing material, the bluestone must be re-applied every two years.

Renew flaunching to chimneys, gables, etc. Mortar fillets at skewers can be reinforced with expanded non-ferrous metal reinforcing lath and formed on top of code 4 lead soakers. Protect eaves, ridge etc. using wire mesh or netting. Pre-treat material with approved preservatives and fire retardants. Where consideration is being given to the provision of a fireproof barrier below the thatch, these details should be discussed with the Department.

Check the provision of ventilation to roof voids. It is important in schemes of extra insulation that ventilation is retained below thatch roofs. Spark arresters to be fitted to flues where they are in close association with thatched roofs.

## **Asphalt**

Where an asphalt roof is damaged and leaking, this should be lifted and replaced with new asphalt laid in coats strictly in accordance with the instructions of the Mastic Asphalt Council. Sand dusted surface is preferred. If an insulated mastic asphalt roof is required, solar reflective surfaces and insulation are not eligible for assistance. Lead overflashings should be detailed in accordance with the recommendation of the Lead Sheet association.

## **Metal roofs**

Repairs to copper roofs should replace copper trays as closely matching the original but with details, gauge of copper and underfelt as recommended by the Copper Sheet association.

Corrugated iron as a roofing material or wall cladding should be replaced with new galvanised corrugated iron to the original profile and using fixings to match the original.

## **Bitumen felt covering**

Where bitumen felt covering was the original and historically correct flat roofing on a flat roof, modern equivalents such as single ply membranes may be considered for support. Perimeter details should remain broadly the same as for the felt original. Note these membranes will not be considered as acceptable as a replacement for roofs that were originally finished in lead, zinc, copper or mastic asphalt.

## **Decorative Roof Trim, Barge Boards, Fascias, Soffits, Finials etc**

Retain as much original material as possible. Where necessary, cut out decayed material and replace in timber matching the original species, visible grain characteristics and ensure it is suitably treated for the location. A section of the original trim to be retained on site until after the final Departmental inspection has been completed.

## Skylights and Ventilators



Original cast iron skylights are usually sound and should be repaired and reused rather than replaced. These are to be painted as outlined in the Rainwater goods section below. Generally repair, renewing broken glass and decayed flashings and framing all as original designs. Where replacements are required, replace with new rooflights to the same size, detail, material and appearance including distance from roof plane but incorporating thermal breaks and alloy castings. Note the detail and spec to be approved in writing prior to installation.

Original cast iron and sheet metal roof ventilators should be retained and overhauled or replicated in full where beyond repair.

## Lightning Conductors

Overhaul the existing installation replacing any defective components and retesting. Early lightning conductors can be retained and integrated into the new system. Fixings should be secured in joints rather than stones and conductor lines are to be discreetly located behind or beside other building elements such as downpipes or buttresses.

Where a replacement system is deemed necessary, provide a new installation conforming to latest BS standards. Lightning Conductor systems can result in considerable visual intrusion on the historic structure. Where the appearance of the building will be affected then Listed Building Consent will be necessary.

## Rainwater Goods



Check that the existing rainwater goods are adequate to control and discharge water safely. Ensure that incidences of increasingly heavy rainfall as a result of climate change have been anticipated. If not, the competent professional should submit proposals for additional installations. Note that alterations may require Listed Building Consent.

Where cast iron rainwater goods are sound, ensure they are clear and flowing freely. Where broken damaged, missing or in non-original materials such as uPVC, replace to match original profile and detail in cast iron or heavy cast aluminium.

Ensure maintenance access exists at ground level. Ground drainage to be checked and made fully operational to ensure water is being conducted properly away from the building. Digging within archaeologically sensitive areas such as graveyards may require an archaeologist and may require a licence. You should contact the Department for advice.

All cast-iron pipe work to be prepared, primed and painted in accordance with manufacturer's written instructions using a high performance paint specification. Paint new cast iron goods before site assembly and make good joints, chips and fixings immediately after fixing. The final colour may be selected using evidence gained in the cleaning process or to a colour agreed with the Department.

Overhaul and replace defective sections using cast iron of a matching profile, reset falls and seal joints. Dismantle and replace using matching cast iron. Only where the whole system is demonstrably beyond repair can heavy section cast aluminium be considered



as an alternative to cast iron. Cold rolled aluminium components will not be accepted. PVC or other plastic will not be accepted.

Provide overflows and additional down pipes if there is evidence of saturation of the system. At ground level provide trapped gullies, inspection chambers, rodding eyes, etc., to assist in continuing maintenance.

## WALLS

### WALLS EXTERNAL

#### Plaster and Render Finishes



One of the first tasks may be to remove inappropriate materials and methods of repair and replace with the appropriate stucco/render. However, removal should only be carried out if this does not put greater risk on the original fabric. It may also be necessary to cut out defective areas of the original that cannot be saved.

Cut out areas that are decayed or loose, cracked or open. Area to be removed to be a complete wall surface (between edges), taken to a natural break or related to an architectural feature and all as agreed with the Department. In such instances, carefully remove cementitious render avoiding the use of power tools. Replace, reproducing all original mouldings, details, etc., as original, and fill cracks.

Where a modern cement-based render is to be removed, the Department advises that best conservation practice indicates that a non-cement-based render mix is the appropriate replacement where the original render/mortar is lime-based.

## Brickwork



When pointing is contemplated, joints should be raked out to a depth of 25 mm and repointed using a lime: sand mortar. Joints are to be finished flush or slightly recessed from the adjoining brick faces. As it can be damaging to the adjacent brick arrises to remove well-adhered cement mortar, it is often better to avoid removing sound cementations pointing. Where cracked and open, carefully remove cementitious mortar with fine masonry chisels avoiding power tools.

Rake out joints to a depth of 25 mm only those joints where the absence or failure of mortar is adversely affecting bricks or walls or where strong sound mortar is causing decay or is visually disruptive and re-point using a lime: sand mortar. Raised pointing or strapped, weathered or otherwise tooled finishes will not be accepted unless prior approval has been given.

Replace decayed bricks with second hand or new clay bricks or brick slips to imperial sizes using bricks of accurately matching colour, size, hardness and porosity.

Following brickwork repair, rake out loose or crumbly mortar and re-point using a pointing tool and application technique similar to that used originally with a mortar spec to suit the age of the building and the strength of the brick.

## Stonework



Where significant structural movement, settlement cracking or other evidence of a compromised structure is identified, advice from an engineer experienced in the repair of historic structures may be required. Discuss the proposed remedial works with the Department at the earliest possible opportunity.

## Masonry Repair

Carefully remove any vegetation while avoiding damage to the masonry. From the scaffolding, brush down loose stone (with bristle brushes, not wire) and tap the existing surface to ensure the face of the stone is sound. Where the stone face is eroded or crumbly and this does not pose a threat to the weathering function (eg cills), the structural integrity or the architectural interpretation of the building, it is advisable to leave in place for attention at some time in the future.

Where soft, cracked or crumbly stones are identified as a threat to the structure or weathering, or significantly detracting from the architectural composition and integrity of the building, they may be carefully cut out and indented with a matching stone that respects the existing stone joint pattern. Where it is necessary to replace missing, broken, cracked or eroded stones with new stone, ensure that the new stone is a

suitable replacement for the original in terms of colour, texture, porosity, crushing strength and weathering properties.

Remove any redundant fixings, surface-mounted cables, television aerials and extraneous ferramenta - including redundant drainage branch pipework. Where services cables or aerials are required, discreetly route them behind internal finishes. This services-related work is not grant eligible. Exposed surfaces of new stone should be hand dressed to match the original face or tooling. Avoid the use of power tools on any exposed surface of stone. Cut replacement stone on the correct geological bed for the circumstances of its use in different elements of the building. Lay on a full mortar bed, grout behind and point fully to ensure loads are taken by the new stone. Indented face stone should have a minimum bed depth of 150 mm. New stone should not be distressed or toned down to match original.

Avoid the use of restoration mortars on face work or margins. Mortar made from lime, sand and graded matching stone, may be acceptable for small “pocket” repairs in otherwise sound stone and where lying water and subsequent frost damage may be considered a risk.

### **Joints in Ashlar Masonry**

Where ashlar masonry is quite tight with few open joints, avoid repointing this masonry. Re-point open ashlar joints by raking out loose or crumbly mortar by hand with a hacksaw blade or similar and hose joint clean. Angle grinders and power drills must not be used. Their use may invalidate any offer in its entirety.

Wet joints and re-point the narrow joints using putty lime mortar and fine light coloured sand. Take care to protect the arrises to avoid staining on the ashlar. Brush off any loose mortar. Ensure stones are not stained by water used to sponge off any mortar residue. Protect pointing while it is curing in accordance with best practice. Do not open joints which were originally dry built such as some harbour walls. Only those joints where the absence or failure of mortar is adversely affecting stones or walls or where strong sound mortar is causing decay or is visually disruptive should be re-pointed.



When free space has been created, mortar may be freed from the stone by working back into this space. Pointing should be raked out to a minimum depth of 25mm and the joint hosed clean. Pointing to be well packed into the joint and finished to match the original style of the masonry. Where appropriate, the correct numbers of pinning stones to maintain the mortar/stone ratio of the wall indicated in the original build. Stones used for pinning repair in rubble masonry should have the same colour, surface treatment and edge dressing as the surrounding masonry.

Where appropriate, locate, cut out and replace decayed dowels and cramps. Stainless steel or other approved non-corrosive material to be used for all replacements. Where areas of walling are to be taken down, number, dismantle, clean, redress, store and rebuild all in their original positions.

### **Abutment Pointing**

The joint between joinery and masonry is to be pointed with either of the following: a traditional site mixed mastic comprising burnt mastic sand and boiled linseed oil placed against a suitable stop; or a lime mortar pointing placed against a suitable backing stop. Where a building is harled/ rendered, the use of lime mortar to fill this joint will allow the harl/ render to be brought up to the joinery. This should be placed after joinery fascias have been decorated to ensure good protection of the fascia. For metal window that are a feature of the original design, alternative mastics may be considered for agreement with the Department.

### **Concrete**

Commission an independent investigative specialist report on the condition of the concrete and repair the structure accordingly. The report should include such techniques as use of a cover-meter to establish the depth of cover to the reinforcement and include core samples at strategic locations to enable analysis of the depth of carbonation, chloride content and quality of concrete. Remedial works may include treatment with corrosion inhibitors and repair of spalling by breaking out poor concrete, cleaning or replacing reinforcement and repairing concrete to match the original finish. Consider treating repair locally with corrosion inhibitor to prevent localised sacrificial corrosion.

## Lime Mortars for Building, Pointing and Harling

Lime mortars have significantly different working properties to cement mortars. Advice on procedures and suitable mixes can be obtained from professional advisors fully conversant in the practise and principles of use of lime. Specialist advice is available. Care is required to fully understand the nature of the original mortar and the function of a mortar used in the repair scheme, the location, detail and visual appearance, as they may not fulfil the same requirements. Mortar specification for repairs should not adversely affect the weathering of adjacent masonry.

All works to be undertaken by fully trained masons with experience of historic building work. Lime mortar mix for indenting or pointing should match the original mortar and be informed by careful analysis of original build mortar samples. It should be prepared in advance to achieve maturity and may require a hydraulic content to achieve a predicable set and avoid lime leaching. Pozzolanic materials may be added to putty lime mortars to aid setting. Lime and sand for the mix is to be carefully selected to ensure the mix has a suitable self colour, even if it is to be limewashed. Hot lime work can be appropriate when rebuilding and consolidating wall core taking care to include pozzolan to control free lime carbonisation and risk of leaching. Ensure lime mortar work is undertaken in appropriate weather conditions and protect lime mortar from sun and rain until cured in accordance with best practice. Earth mortar exists in some early buildings. Care should be taken to identify, analyse and carefully reproduce where repair is required.

Harl is to be applied in accordance with traditional harling (or throwing) techniques. Samples of the original harl should be analysed to clearly identify the various constituents e.g. shell, aggregate, lime proportions etc. The new harl should have a wide range of aggregate grading and replicate any local mix or application traditions. Render coats may be thrown or trowel applied. Quality and appearance of work to be determined by sample panels. Harling/rendering to be applied using a lime mortar mix in 2 or 3 coats. Site operations should ensure that flashings, rainwater goods and external joinery are fitted at the appropriate time in order to ensure a good finish to the harl/render.

Where a lined out “ashlar” appearance is to be made, this is to be undertaken to a pre-determined pattern of joints. The ruling tool is to be appropriately shaped in order to provide lines of the correct depth, consistency and cross-section.

### **Limewash**

Historic limewash can have several constituents ranging from natural pigments, tallow and other organic additives. As with other mortars, an analysis and sample panels should be carried out before the specification is finalised. Limewash should be applied to a pre-wetted surface. Multiple coats will be required as it should be applied in sufficiently thin coats (the consistency of skimmed milk) to allow carbonation. Limewash should be screened from rapid drying in accordance with best practice. Where the limewash is exposed to drying winds or temperature, repeated wetting of the screens will be necessary. Layers of limewash should not be applied if the appropriate attendance to control rapid drying is not possible. Regular maintenance coats will be required over subsequent years.

### **DPC**

The installation of Installation of new chemical DPCs are not considered eligible and should not feature in a scheme as the long-term effect of chemicals on the masonry is not known. Appropriate DPCs may be considered for situations such as under copes etc. lead-cored sanded bitumen DPCs may be preferable. Consideration should instead be given to the use of breathable floors eg. limecrete flooring as an alternative (see Floors below).

### **Removal of Algae from Masonry**

Where water has caused moss and algal growth on masonry, the area is to be scraped clean with wooden spatulas and cleaned down to remove all organic debris and soil prior to re-pointing. The source of moisture encouraging such growth is to be addressed in order to prevent re-growth. The use of a biocide may be acceptable within a HEF scheme but is not eligible for funding and the approach and method should be discussed and agreed in advance with the Department.

### **Removal of Paint from Masonry (not eligible for HEF Repair funding)**

The use of a paint remover is acceptable in a support scheme but is not eligible for assistance. It is necessary to analyse the paint type to establish the least damaging paint removal method. Paint and graffiti removal should be tested and approved for use on that particular stone type before approval to proceed is given. Chemicals used on stone are to be neutralised immediately after use as recommended in the manufacturer's written instructions.

### **Removing Paint from Historic Buildings**

You should always be cautious if you are planning to remove any paint from historic surfaces. If multiple layers of paint are stopping windows from functioning properly, or are obscuring architectural details or, alternatively if an inappropriate paint has been used, you should always test a small trial area in an inconspicuous place before carrying out widespread removal. There are several ways of removing paint. The most appropriate method will depend upon the type of product you are removing and the surface you are stripping it from. Steam stripping, sandpaper and washing with water are the safest methods.

### **Poultices**

Poultices are applied to painted surfaces and left for a period of time. When they are removed they draw the paint away or loosen it sufficiently so it can be easily taken off. Poultices are useful for removing paint from decorative work, such as cornices, as well as plain timbers. They are also useful for removing 19th and 20th century stains and varnishes from timber beams. The use a poultice may be recommended if you are reintroducing a traditional distemper scheme. This is because distemper, which is a water-bound glue paint, will not adhere to the timber surface if there is a barrier of stain or varnish left.

### **Chemical Solvents**

Chemical Solvents can be very effective in removing oil based paints but over-zealous scraping and repeated washing down can cause damage. Most paint removers are very toxic.

## **Burning Off**

Burning off with a blowtorch should be avoided. It is extremely dangerous in an old building and poses a serious risk of fire and the possibility of lead pollution. Hot air strippers do not carry the same risk but have been known to ignite flammable materials in sash boxes and thatch.

## **Pressure Blasting**

Pressure Blasting will remove paint but can also damage the surface of the material being cleaned. There are lots of variations of blasting available which use various abrasives, but they can all potentially cause irreversible damage to the surface of fabric if too much pressure is used. If you think this method is appropriate for your building, always make sure that you employ a qualified and experienced contractor and carry out a test patch on a small, inconspicuous area and discuss the proposals with the Department in advance. The test patch results must be approved by the Department's conservation architect before a large area is cleaned. On listed buildings, you may need listed building consent to carry out such work.

## **Removal of Invasive Vegetation from Masonry and Immediate Vicinity [not eligible for HEF Repair funding]**

The main vegetation trunks are to be cut and roots treated with suitable systemic weed killer in accordance with the manufacturer's instructions. Larger growths of vegetation may be cut into smaller areas (creating a grid) prior to treatment. This will identify areas where growth persists and allow subsequent treatment to be more selective. More than one treatment may be necessary applied over a period of time. The vegetation adhering to the masonry is to be left until dead, and then carefully removed by gently teasing the mat away from the building taking care to sever roots that penetrate the masonry. Larger vegetation should be removed by hand weeding ensuring that all roots are removed to avoid leaving potential paths for water ingress as they decay. Stones that are found to be loose are to be held in place by wooden wedges until consolidation work is undertaken.



## OPENINGS



Window (and door) openings establish the character of an elevation. They play a vital role in overall appearance and quality, internally as well as externally. They should not generally be altered in their proportion or details.

### **Windows : Leaded Glazing and Zinc Camed Glazing**

Before beginning a repair to leaded or zinc camed windows, a report should be commissioned from a glass specialist to schedule the works required to bring the window construction into a good state of repair. This report should be sufficiently detailed to give an outline of the works proposed with the associated costs and give a brief outline of the importance of the glazing and identify any unique attributes that may require more in-depth investigation.

### **Leaded Glass Protection**

Remove any inappropriate window protection and make new window protection in woven or welded non-ferrous or stainless steel wire mesh with a pitch and strength

designed to meet the risk and made by a skilled wireworker to accurate templates. Protection should follow the glass line and not cover stone tracery. It should be fixed using non-ferrous fixings into joints in the masonry, back from the outside stone face but suitably spaced away from the glass to give maximum protection.

To increase protection in vulnerable areas, consider toughened glass or, where weight is an issue, clear polycarbonate, however this can discolour and is only acceptable in such cases. Clear sheet material should be fitted behind mesh but not against the leaded glass and be installed with adequate ventilation at top and bottom.

### **Windows Generally**

Windows should be overhauled and repaired wherever possible by carefully splicing in new matching timber to accurately follow the original profile using traditional techniques and glue. Enhanced levels of funding to repair windows are provided under HEF Repair funding at a rate of 35% for repairs to historic windows. In exceptions where windows are beyond salvage and new replacement windows are required they should be single glazed and manufactured from matching timber accurately following the original design and profiles. These will be funded at a rate of 20%- subject to available funding.

Replace broken and missing glass. Cut out the old putty and protect the rebate with paint before applying the new putty and re-glazing.

### **Original Glass**

Original historic glass (crown, cylinder, plate, patterned or coloured glass or glass with seeds, reams or other notable impurities) should be saved for re-use. The use of a proprietary putty lamp can be valuable in removing old putty without damaging the glass. Modern cylinder, Vauxhall, crown, float glass or horticultural glass may be used for replacements depending on the original glass type to be found on the building. These may vary on a single building or elevation. Match glass type to original examples on site or to date of building construction. Any patterns established as a result of the evolution of the building should be respected. Overhaul stained, painted and other decorative glass including leaded lights.

Sashes, casements, frames and box frames to be repaired, replacing decayed sections to replicate the original members in all detailing.

The majority of listed buildings have vertical sliding sash windows of one pattern or another. Weights, cords, pulleys, catches, hinges, stays and fasteners should be overhauled, reused, or replaced to match. Where windows in vernacular buildings have not, historically, had weights and cords, they do not need to be installed. Sliding sash windows in plastic are never acceptable.

Replace only badly decayed windows as agreed with the Department, using a sustainably-sourced hardwood or an American pine with new painted timber units. Hardwood units must have a metallic primer. New units are to replicate the original vertically sliding sashes or hinged casements. The position of the frame within the reveal and the amount of the frame that is exposed must also replicate the originals. An original window unit must be retained on site until the final Departmental inspection is complete. Cills of window frames should be hardwood.

Damaged masonry sills should be repaired, or removed and set aside for re-use, or replaced with profiles matching the old with special attention given to the depth of the leading edge. Replacement (new) sills should have a drip mould.

Decayed or failed heads should be replaced using pre-cast concrete or timber to replicate original. All corners of frames and sashes should be mitred square. Corners rounded with a router will not be accepted.

Provide weatherproofing strips and gaskets, from specialist supplier, to improve performance. This work will attract support.

It is important not to introduce sash horns to window frames were there were none originally, or to use an incorrect shape or profile. Such changes are inappropriate in that they change the character of the window. Trickle ventilators in any location [on the window] are not acceptable – such ventilation as may be required by Building Control is to be provided by other means. Any required ventilator should be selected to satisfy conservation criteria.

It is usually impossible to install double glazed units in existing frames without altering the character or appearance of a listed building. Listed Building Consent is quite likely to be refused for such an alteration because the form and detailing of windows is so often a key architectural element of historic buildings. The more complicated the glazing pattern the more difficult it will be to double glaze and for the installation to meet acceptable conservation standards. Owners who wish to apply for Listed Building Consent must detail the timber profiles for each component part of the proposed double glazed windows.



### **Shop Fronts**

Shop Fronts– repair [funded at 35%] or replacement [funded at 20%], copying exactly the original configuration and individual timber profiles. Parts of the original window must be kept on site for reference for inspection. The installation of security shutters, (particularly the roller type), will be resisted by the Department. New illumination and signage must be submitted for Listed Building Consent. Where found, period detailing surviving behind later alterations should be restored

### **Painting Shop Fronts**

Shop fronts dating from before 1950 were traditionally a single dark colour with lettering on the window or a hand painted sign above. Standard corporate shop front colour

schemes are often not appropriate for an historic shop front. A well maintained shop front with traditional choice of colour and a hand painted sign makes a distinctive and attractive statement.

### **Steel Windows**

Window (and door) openings establish the character of an elevation. They play a vital role in overall appearance and quality, internally as well as externally. They should not generally be altered in their proportion or details.

Repair of steel windows, casements, frames and sections should be removed off site, stripped back and decayed sections removed and new ones welded to replicate the original members in all detailing, galvanised and powder coated. The position of the frame within the reveal and the amount of the frame that is exposed must also match the originals and is to be agreed with the Department. Catches, hinges, stays and fasteners to be repaired and any beyond repair new replicas installed. Proprietary glazing putty is available for glazing twentieth century metal windows.

Damaged masonry sills are to be repaired, or removed and set aside for re-use, or replaced with profiles matching the old with special attention given to the depth of the leading edge. Replacement (new) sills should have a drip mould if present on original.

Provide weatherproofing strips and gaskets, from specialist supplier, to improve performance. This work will attract grant aid. Trickle ventilators are not acceptable. Any required ventilator should be selected to satisfy conservation criteria and approved by the Department. A sample window must be approved prior to manufacture and/or ordering by the Department. The installation of double glazing requires Listed Building Consent. Applications for LBC must detail the steel profiles for each component part of the proposed double glazed windows.

### **Secondary Glazing (not generally eligible for HEF Repair funding)**



Secondary glazing may be fitted on the inside but this should follow the glazing divisions of the window and not foul or damage any shutters or the opening of the window. Secondary glazing is not grant eligible unless an historic installation

## **Doors**

Original doors, both external and internal, and their encasements are important elements in listed buildings and wherever possible they should be retained. Where necessary, original doors should be overhauled, together with the ironmongery, frames, fanlights, side lights and decorative encasements.

Only replace decayed components where there is clear evidence of failure and replicate the originals in detail and material. Where agreed with the Department, remove the doors and frames and encasements and replace. External doors are to be made from an approved hardwood or an American pine. The details and dimensions for replacements are to be copied from the original sheeted or panelled units and all mouldings are to replicate the original. The finish is to be traditional opaque paint or, where appropriate, painted and grained. Hardwood must have a metallic primer. An original door is to be retained on site until after the final Departmental inspection.

Where ½ hour fire doors are required the original doors are to be upgraded and reused where possible. Doors with integral fanlights must not be used. Decayed or failed heads to be replaced using pre-cast concrete or timber to replicate original. Weatherproof by fitting seals, gaskets or projecting weatherboard.

## **Painting of External Joinery**

Paint external joinery, using traditional methods and using good quality oil-based paint including preparation as recommended in the paint manufacturer's written instructions. Ensure paint is not spread onto adjacent masonry. Window colour to be as original from scrapes, or off-white. Avoid brilliant white for pre-1920 buildings. Consider the use of traditional lead paints on grade "A" listed buildings- information on derogations can be obtained from the Department.

## OTHER INTERNAL WORKS

### FLOORS

#### Timber Floors

The removal and replacement of original/existing timber floors, in any location, is not recommended. Concrete sandwich floors on the ground floor can compromise the equilibrium of the building with respect to damp. Remove only decayed material and replace - new structural units are to be treated. Treat existing timber against insect and fungal attack. Specialist work must be covered by a guarantee.

Where agreed, strip out the decayed area of the floor, rebuild tassel walls, incorporating a DPC or DPM, and replace wall plates. Replace the flooring with T&G or butt-jointed timber boards and provide under floor ventilation. Where necessary, strengthen, installing additional structural members to an approved design. In order to minimise future damp penetration to walls, the Department considers that an alternative to a standard, sandwich concrete floor is appropriate, for example, a timber suspended floor, as above, or a 'breathable' limecrete floor construction.

#### Solid Floors

Excavate and lay new solid floor to an agreed specification incorporating sub-floor drainage, reset original pavings, where necessary, lay new pavings to replicate the original.

#### Joinery, Architraves, Panelling, Skirtings, Stairs etc.

Cut out defective sections and replace to replicate the original detailing and mouldings. Dismantle, store for reuse, repair and refit. *Where agreed*, replace with new material to match the original detailing, mouldings, designs and finishes. Paint all repaired and replaced joinery work using a traditional opaque paint. Re-stain and polish using natural waxes. Products containing silicones are not to be used. Re-gild as before and restore other detailed specialist work.

**Plasterwork:**

One of the first tasks may be to remove inappropriate materials and methods of repair and replace with the appropriate plaster. However, removal should only be carried out if this does not put greater risk on the original fabric. It may also be necessary to cut out defective areas of the original that cannot be saved.

**Lath and Plaster**

Drylining: (ineligible for funding) the use of lining systems/methods should be discussed with the Department. In many cases it is necessary only that the building be allowed to dry out, after which traditional plastering methods are appropriate.

Remove areas of defective plasterwork having first made a full record of all decorative work using casts, photographs, drawings, etc., as appropriate. Replace defective timber support work and re-plaster reproducing all detailing and decorative features to replicate the original. New internal plasterwork, whether on existing surfaces or new, should be lime-based; where appropriate, support systems should be traditional i.e. timber laths on timber battens/framing (for stud walls.)

**Finishes**

Historic buildings, whether formally listed or not, were constructed with very different materials and technology to modern buildings and therefore they need a completely different approach to their maintenance. Solid wall construction works by using the mass of the walls to control the movement of moisture, in the form of water and water vapour, into and away from the building to maintain a comfortable living environment. Traditional, solid walled buildings were constructed with porous materials which absorb moisture during damp conditions and release it by evaporation on dry days, allowing the building to breathe.

The painting of any previously unpainted exterior surfaces, brick or stone work for example, is not normally encouraged. Not only could this result in an inappropriate visual change it could also lead to damage to walling materials. The type of paint used on external surfaces is also important to consider. Most modern external paints provide a

water tight barrier which can have the same effect as using concrete render trapping water in walls which rely upon evaporation to prevent long term damp problems occurring. Traditionally lime wash was used for external painting and is still the best option when repainting historic lime render and other historic materials. This can be coloured by the addition of pigment to the top few layers, but it is important to be beware that limewash lightens as it dries leaving a much more subtle colour than originally mixed. There are modern “breathable” paints available but check carefully with the suppliers regarding their suitability for your particular building.

Historic surfaces which do not look like they have been painted before, whether brick, plaster or wood, should be left unpainted. Sometimes experts who know where to look can find fragments of paint which can be analysed. Serious consideration can be given to reinstating colour washes with the appropriate materials. Otherwise, you should not paint **the** surface. Apart from damage which can be caused by non-breathable masonry paint, the character and appearance of the building will be completely changed, often irreversibly.

### **Limewash**

Pure limewash is the simplest and cheapest paint available. It is also the most “Breathable”. It is made by mixing mature lime putty with water. Basic limewash is white, but a beautiful range of colours can be made by adding pigments such as ochre and raw sienna. Before applying limewash the wall should be sprayed with water so that it is damp when the paint is applied. Limewash hardens in the same way as lime mortar – by absorption of carbon dioxide from the atmosphere, which combines with the lime (calcium hydroxide) to form calcium carbonate, binding the lime wash to the substrate. Limewash must dry out very slowly to ensure that it has fully carbonated. It should be applied in several thin coats - usually 3 or 4 coats are needed on bare stone or new lime plaster. If it is applied thinly and allowed to dry out slowly it will form a durable paint, which will not come off onto clothing unless it is excessively rubbed.

Coloured limewash can be affected by variations in the substrate resulting in subtle variations in tone that is part of its charm. It is most suitable for the interior of barn conversions, where it can be painted directly onto stonework or for decorating lime

plaster in cottage interiors. It is highly permeable, copes well with condensation, inhibits mould growth and is suitable for walls subject to low levels of rising damp as it can allow water to evaporate harmlessly. Lime washed surfaces have a soft chalky appearance that refracts light and gives a real depth of colour not found in other paint types.

### **Distemper**

Distemper has a very similar appearance to limewash when it is used on external walls and will also stick to cement renders.

### **External Woodwork**

#### **Lead Paints**

Lead Paints were historically used for decorating windows, doors and other timber features. The use of lead paints was banned in 1992 except for use on listed buildings, when they can still only be used under licence. Lead paints are very durable and should be painted over rather than removed, for both historical and health reasons.

#### **Linseed Oil Paint**

Linseed Oil Paint is an excellent and safe natural alternative to lead paints. It is a high quality environmentally-friendly product which has unbeatable wood caring properties when used directly on bare wood. It also adheres well to most synthetic paints. When it is applied correctly, linseed oil paint has a longer life than modern synthetic alkyd paints. It also has the advantage of a one-pot system for primer, undercoat and topcoat.

#### **Lime Paint**

Lime Paint is made from pure, high calcium, hydrated lime with 5% acrylic. Mineral or earth oxides added for colour. Lime paint is only suitable for external walls, with the exception of churches. It is supplied as a powder in tubs and can be mixed with water on site.



## **Pozilime**

Pozilime is made from a hydrated lime with PVA and linseed oil. It is suitable for use on cement renders and previously painted surfaces.

## **Modern Natural Paints**

A range of modern natural paints is now available. These paints have been produced as much for the benefit of the environment and health of the painter as for historic buildings. They are based on various ingredients, such as citrus oils, plant extracts, natural clays and casein, which are mixed in various combinations. These paints are easy to use, allow surfaces to breathe and can provide an alternative to limewash and distemper.

## **Synthetic Alkyd Resins and Cement Paint**

These are the paints which are usually available at the local store. They give a flat, bright colour lacking in the variation and subtlety of traditional colourwashes and are unsuitable for traditional historic fabrics which need a breathable finish. They do not adhere successfully to natural decorative finishes, which can prompt some manufacturers to recommend all previous coatings are removed. Synthetic paints have the added disadvantage that they are not biodegradable.

## **Sealers**

Sealers should never be used on historic surfaces. They are designed to stop moisture entering the walls by providing a non-permeable coating. They provide a dry, sound, surface for new work if they are used before decorating and are only effective in modern buildings with cavity walls which are designed to block out moisture. However, the fabric of historic buildings works completely differently. It does so by managing the movement of moisture, including the escape of any moisture generated within the building. This is done through the use of permeable materials which allow the fabric to 'breathe' (holding water vapour on damp and wet days and drying out through evaporation on dry days). Sealers prevent the fabric from breathing and will trap any moisture already present in the walls. This will make the walls damp, causing the structure to decay. The moisture

may be drawn to the surface in warm conditions, causing the finished surfaces to bubble or peel off. The fundamental principle when caring for an historic building is to maintain the breathability of the fabric at all times by using vapour permeable products.

### **Internal Plaster**

Clean all surfaces. The specification is to be agreed as appropriate, carrying out research using scrapes etc. to establish the nature of previous painting schemes and restore the painting scheme as agreed with Department. Paint all repaired and renewed surfaces using lime wash, clay-based paints or emulsion.

## **RESILIENCE TO WEATHER**

### **Surface Water Disposal and Land Drains-**

The resilience and the sustainability of building elements and materials are affected by increased frequency of unusual weather events such as rapid and significant temperature and storm conditions with severe wind forces and intense and prolonged rainfall. To cope with this, owners should review the size and cross section of gutters, hoppers, overflows and downpipes. Around the perimeter of the listed building generally overhaul piped drains and shores, replace defective components and leave in full working order. To assist in continuing maintenance, provide gullies, catch pits, inspection chambers, rodding eyes and soak-aways.

Excavate for and provide new perforated rigid pipe land drains including all necessary gullies, catch pits, inspection chambers, rodding eyes and soak-aways all conforming to an agreed scheme.

Provide detailed drawings and specification of all alteration and installation of drains, pipes, gullies, gratings, haunchings etc., for Departmental approval.

The use of extensive areas of concrete around the perimeter of old buildings is to be discouraged. Permeable finishes are recommended in these areas to ensure good drainage, never compromising the main drainage from the listed building.

## External Pavings, Gates, Railings, Boundary Walls and Planting



Repair metalwork replacing defective and missing components and paint as appropriate. The identification of mild steel, cast and wrought iron should be ascertained at an early stage to guide subsequent works.

### Cast Iron

Each project should be assessed and the most appropriate repair technique(s) employed given the application, materials and historic importance. In certain circumstances cast iron may be welded by specialists using high nickel electrodes, or brazed using aluminium bronze. Plate repairs or pinning by drilling and tapping adjoining components may also be appropriate. Cold metal stitching may also be feasible. Re-casting missing components using traditional techniques might also be considered. Design and quality should match existing.

### Wrought Iron

Wrought iron should be removed for repair by proven experts in this field. To correctly repair wrought iron, use of suitable quality recycled wrought iron is preferable to steel. Pure iron has no superior corrosion resistance to steel and should not be used in preference to wrought iron for historically correct repairs.

### Decorative and other Metal Work Repair

Weathervanes, roof ventilation louvers, railings, gates or other historic architectural ferramenta may be considered for repair as part of the eligible works. Flame cleaning, needle gunning or blast cleaning may be appropriate. Chemical cleaning should be avoided, particularly for cast iron due to the porosity of the material. Weathervanes may be gilded.

### **Metalwork Protection**

Generally new steel (not cast or wrought iron) should be galvanised following manufacture. Suitable long life paint treatments for ironwork, such as zinc rich primers, and micaceous iron oxide build coats should be considered for use and applied in accordance with manufacturers written instructions. Hard shell epoxy paints should not be used on cast iron; dry film thicknesses should strike a balance between protection and loss of detail.

For the repair of stonework see “Stonework” section of this schedule.

Replace defective or missing areas of paving using matching materials.

Lift pavings, set aside for reuse, excavate and prepare a new bed and relay original materials to falls.



To help communities to enjoy and realise  
the value of the historic environment.

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**Front Cover Image**

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