

# **Darley Abbey Mills Repair Grant Scheme**

**- a Guide to Specification Requirements and standards for grant-aided works**



## **Principles**

Any proposed works to listed buildings shall be in accordance with the principles of repair set out within the *Historic Environment Planning Practice Guide*, the sister document to the *Historic Environment Planning Policy Statement no. 5*. The section on Repairs in that document provides guidance on proposed works and should be read alongside this booklet.

These technical notes are taken entirely from the English Heritage guidance for grant-aided works in conservation areas funded under its own funding programmes. The notes represent good conservation practice that should be strictly applied by all those involved in carrying out repairs to listed buildings from the Architect or specifier to each and every site operative actually undertaking the works. The notes apply principally to schemes of full repair/restoration however the general conservation approach and philosophy should be followed even in undertaking simple, basic repairs to historic buildings.

## **Research, Analysis and Investigation**

Grant aided work should be based on a thorough understanding of the building and specific issues faced. The requirement, in most cases will be for a written or photographic specification, supported by drawings, which demonstrates an understanding of the nature of the building and provides sufficient information to be sure that the proposals will not have an adverse impact on the building or site. In some cases, additional investigation may be appropriate, such as a report from a building archaeologist.

## **Re-roofing**

Generally, roof works should be of a comprehensive nature and any necessary associated repairs (to the roof structure, chimneys, leadwork or rainwater goods, for example) should be undertaken at the same time.

Consideration should be given to the provision of a temporary roof to avoid damage to the building during the undertaking of the works.

## **Re-slating and Re-tiling**

Before tendering, adequate recording of existing details will be needed as the detailing generally should be reinstated to the original form, particularly at eaves, ridges and verges. Existing ridge and hip tiles or slates should be retained and re-set where possible, or should be replaced to match the existing.

Re-slating should be carried out re-using sound existing slates or tiles from the roof and/or new tiles or natural slates to match the existing and should be of an origin appropriate to the region. The slates/tiles should be fixed with copper nails to battens that have been fixed with stainless steel nails. The preference would be not to use reused and new tiles on the same pitch.

Verges, ridge and hip tiles, etc should be pointed neatly in an appropriately specified and agreed mortar designed to suit each individual location in terms of exposure and sensitivities of the masonry/ roofing.

Generally, new lead flashings should be provided at all abutments and chimneys and leadwork generally should be checked and renewed or repaired as necessary (n.b. cement fillets alone are not acceptable, but mortar fillets are, where they are the local tradition). Where additional ventilation is provided, this must be by an agreed method, which minimises impact on the character of the roofing.

### **Stone Slating**

(Reference should be made to the English Heritage Technical Advice Note *Stone Slate Roofing*).

Stone slates are a valuable and diminishing resource, and loss on stripping a roof is inevitable. Complete re-covering of a stone slated roof, therefore, should not be undertaken unnecessarily. Where unavoidable, stone slated roofs should be re-covered in matching good quality stone slates, re-using the existing slates as far as possible. If replacement slates are required, these should be new (where quarries exist and appropriate new slates can be obtained). English Heritage may be able to advise on the location of stone slate producers. Sound second-hand natural stone slates to match the existing in size, colour and texture as closely as possible may be appropriate but only if new materials are not available and if provenance is known. The slates should be re-laid double lap in graduated (diminishing) courses and fixed with oak pegs, or non-ferrous nails. Detailing should be reinstated to the original form, particularly to valleys, dormers, eaves and verges. The local technique and traditions should be adhered to.

New artificial or reconstructed "stone" slates of any type are not acceptable.

(Notes for pointing, leadwork and ventilation as for section on re-slating/ re-tiling).

### **Re-thatching**

(Reference should be made to English Heritage Technical Advice Note *Thatch and Thatching*).

Roofs should not be stripped completely unless they are thatched in water reed. Existing thatched roofs should be stripped back to a sound base, leaving historic base-coats in situ. Rethatching should be carried out in materials and styles that are traditional to that area. New thatching should be to a minimum depth of 300mm (12") with particular attention given to the traditional form of detailing at verges, eaves and ridges. Ridges and dormers should be finished as simply as possible and not worked into unnecessarily elaborate shapes.

### **Leadwork**

(Reference should be made to English Heritage Advisory Guidance Note *Lead Roofs on Historic Buildings*).

All flashings, soakers, cappings, valley and gutter linings and other weatherings should be in lead, as a minimum, to the weights and details recommended by the Lead Sheet Association, as described in the *Lead Sheet Manual* plus the latest addendum's. Unless otherwise agreed, flat roof coverings, including to internal wells and dormer windows, should match the existing or otherwise be in lead. Ventilation may not always be beneficial. Appropriate consideration should be given to the soundness of any old lead or where conditions are likely to change e.g. where insulation or a new heating system has been installed.

The replacement roof construction in total should be considered, in case of condensation risk and possible underside corrosion. This risk can be reduced by not roofing in damp conditions and avoiding damp materials. Ideally, re-roofing should take place between April and July (avoiding the autumn).

## **Rainwater Goods**

Ineffective rainwater collection and disposal is a major source of building deterioration. Where rainwater goods are undersized, liable to blockage, badly maintained and inefficient, they pose a risk to historic buildings.

Generally, any new or replacement rainwater goods required should be in cast iron, to the original pattern. Cast aluminium gutters may be acceptable in cases where the original section is no longer obtainable in cast iron. Gutters and rainwater goods originally of a different material, such as lead, stone or timber, should be replaced accordingly, unless otherwise agreed. Appropriately designed new overshoots and weirs, detailed to discharge water clear of hoppers and catch-pits should these become blocked, can also be grant-eligible.

## **Structural Timber Repairs**

(Refer to *Timber Decay in Buildings*, B Ridout, English Heritage/ Historic Scotland 1999).

Repairs to structural timber should be made by splicing or bolting in sound replacement timber of similar scantling and species wherever possible, retaining all existing timber of historic value.

A detailed specification and drawings must be approved for the repair or reinstatement of a timber-framed building or historic roof structure before any work is undertaken, and it is expected that these will be based on a careful and comprehensive survey of the existing structure.

Exposed structural timbers such as oak timber framing should always be repaired in new green oak (e.g. for new elements) or kiln-dried oak (e.g. for face patching and similar small repairs). Second-hand material should not be used. Surface treatments such as stains should not be applied to exposed new oak frame repairs. Specialist advice should be sought concerning any existing timber carrying decoration, carpenters marks etc. that may be of historic importance. Where painted decoration is found it may be necessary to employ a UKIC accredited conservator to advise on significance, condition and repair.

Traditional timber repairs are preferred, and any proposed mechanical repair method to structural timbers should be approved, as should the overall structural proposals. Large sections of timber required for replacement should not be formed by laminating smaller sections. Generally, in situ resin repairs to structural timbers are not acceptable, and it is important to maintain flexibility at joints in order to allow for some movement in the frame. Shakes in structural timbers should not be filled for cosmetic reasons.

Historic softwood, due to its production, generally has a greater resistance to fungal decay than modern softwood and therefore cutting out and replacement with modern "equivalent" should be kept to a minimum.

All infill panels of historic interest (e.g. wattle and daub) should be retained wherever possible: the form and detailing of any new infill panels required should be agreed. If previously covered by lime render, repaired timber framing generally should be re-rendered with lime based materials and not exposed.

## **Stonework Repairs**

Repairs to stonework should be carried out in natural stone to match the existing in both colour and texture, obtained where possible from the same quarry and beds as the original, and a detailed specification for this must be agreed before work starts.

As much historic fabric as possible should be retained. A knowledgeable professional adviser

should be able to prepare a specification utilising the full range of repairs to stonework; ranging from adequately detailed and specified mortar repairs to stone replacement. Both the professional adviser and contractor need to have adequate skills and knowledge of traditional materials and quality conservation repair.

Generally, stone that has lost its structural quality or is too badly decayed should be carefully cut out and matching replacement stone pieced in. Replacement stone should be cut to the full dimensions of the existing blocks, unless otherwise agreed and face patches should never be less than 100mm deep. Samples of any new stone to be used should be approved: the face of new stone should be tooled to match the original unweathered finish, and all saw marks should be removed.

Stone should always be laid on its natural bed, unless otherwise specified and new stonework should be laid to match the existing wall (e.g. as ashlar work, or coursed squared rubble). All replacement stone details should be cut accurately to the original pattern and profile; this is particularly important for cornices, mullions, hood moulds and other architectural features. Where the existing stone is badly eroded, replacement details should be agreed before work starts. Dressing off should be limited to the removal of dangerous or loose material, and should be carried out with a bristle brush: chisels, particularly claw chisels, should never be used.

Areas of unsound stonework should be carefully rebuilt as agreed, re-using as much of the existing stone as possible. Unless otherwise approved, resin-based in situ "plastic" repairs to stonework are not acceptable. The skill-full building up of lost areas with soft tile and lime mortar and lime based finish to match the surrounding masonry, may be acceptable.

### **Masonry Re-pointing**

(Refer to EH Practical Building Conservation Technical Handbooks Volumes I & II, EH Video *Making the Point*).

Re-pointing of external masonry should be kept to the absolute minimum necessary and comprehensive re-pointing for cosmetic reasons is not acceptable.

The joints should be carefully raked out manually to a depth of at least two times the width or 18-25mm (3/4"-1"), depending upon the width of the joints, flushed out, then saturated with clean water to limit suction and the new mortar pressed well in. Cutting out of existing mortar with a mechanical disc is not acceptable, and will prejudice grant-aid to other eligible work.

Decayed or damaged bricks should be cut out carefully; using hand tools only and replaced with sound bricks to match the existing in size, type, colour and texture. Where structurally necessary, agreed areas of unsound brickwork should be carefully re-built, re-using the existing bricks where possible.

Stonework or brickwork should be re-pointed or bedded in an appropriate mortar mix (that is, one weaker and more porous than the adjacent masonry and usually in a lime-based mortar). Mortar mixes should be designed to suit each individual building, location and exposure. The material, texture and colour of the "original" construction mortar should be determined and matched.

Proprietary coloured mixes or colouring additives should not be used. Joints should be finished to match any specific "original" feature (e.g. lined-out or tuck pointed mortar joints in brickwork).

In some instances, mortar analysis may be appropriate to determine original binder/ aggregate types, ratios, colours etc and grading of sand. EH can give advice on companies able to undertake such work.

The use of putty lime, rather than hydrated lime, should be encouraged, as should the

preparation of coarse stuff (i.e. mixed sand and lime, kept covered until needed). Samples of mortar mixes, finishing and surface texture should be agreed on site prior to undertaking the work.

In exposed positions, the addition of cement may be appropriate, but no weaker than 1:3:12 (research has also shown that adding less than half a part of cement: lime can adversely affect the frost resistance of the mortar). Mixes stronger than 1:2:9 may be inappropriate on historic masonry.

Alternatively, carefully considered mixes based on hydraulic limes may be appropriate. Care should be taken if "hybrid" mixes of hydraulic and non-hydraulic lime are proposed as the binder in mortar. Research shows that in proportions less than 5-7% of total mix, the addition of non-hydraulic lime putty to hydraulic lime/sand mortar can help the workability - through air entrainment, thorough whisking or use of a screed mixer can have the same effect. In large quantities, however, the addition of lime putty can have a detrimental effect on the performance of the mortar.

The specification for repointing should also take into consideration the time of year/ provision of skilled craftspeople/ aftercare needed and be detailed enough on items such as placing, compaction and protection of mortars to ensure high quality work.

The joints should be filled with new mortar as far back as possible between the stones and finished flush, then brushed back with a bristle brush to expose both the aggregate and the edges of the adjacent stone - compacting the joint and promoting carbonation. Joints should on no account be struck, or finished proud of the masonry face to form "strap" or "ribbon" pointing, or feathered over the edge of eroded blocks. Care should be taken to finish the joints to match the surrounding work and the width of the original joints should not be increased.

Where the existing masonry is generally eroded, the face of the mortar should be kept back to the point at which the joint remains the original width. Repointing should not increase the width of the original joints. Mortar for re-pointing should be coloured by the use of appropriate sand to match the original joints before weathering. Proprietary coloured mixes or colouring additives should not be used.

Samples of mortar colour/ texture and joint finishing and the checking of depth of compaction within the joint, may be appropriate.

## **External Cleaning**

The inappropriate specification and undertaking of building cleaning may irreversibly damage building fabric and needs to be carefully considered.

Reference should be made to technical advice on this subject and assessment, trials and specification need to be fully considered before any work is undertaken. The time of year/ porosity of the material or presence of ferrous fixings may also make water washing unsuitable.

An independent specialist, if agreed to be appropriate, should carry out any external cleaning of brickwork or stonework, to an approved detailed specification. Where surfaces have historic finishes, a report by a UKIC accredited conservator may be necessary.

Acceptable techniques may include cleaning by the following methods:

Limestone - low pressure, low volume water or soft dry abrasive or alkaline chemical cleaning and rinsing.

Sandstone brick and Terracotta - alkaline chemical degreaser and low concentration hydrofluoric acid cleaner and thorough cleaning.

(For good practice refer to N. Ashurst: *Cleaning Historic Buildings Volumes 1 and 2 and British Standard BS8221-2:2000*) For risks associated with cleaning sandstones refer to Historic Scotland Publications *Stonecleaning* in Scotland Research publications- Research Summary and 3 parts, 1991 Historic Scotland/ Robert Gordon Institute of Technology).

A specialist conservation contractor should always undertake cleaning. No abrasive or high-pressure cleaning techniques should be used, particularly unregulated grit or sand blasting. Cleaned surfaces should not be treated with any form of sealant or silicone water repellent.

## Rendering

Re-rendering and render repairs generally should be carried out in a lime mortar mix or an appropriate mix based on an analysis of original material. The mix and character chosen should match the strength of the original rendering or stucco, unless otherwise agreed.

New rendering should generally be applied in three coats, and no metal beads or stops should be used externally; arrises and angles should be formed in the traditional manner. Cracks in existing render should be cut back to the masonry face and the surrounding render undercut to provide a key. Coursing (or blocking) lines should be reinstated in areas of new render, where appropriate.

Samples of new render should be agreed before the commencement of work. The specification, Consideration should be given to the moisture content of the masonry where cement based render has been removed - and possible drying out time needed before re-coating.

Cornices, window surrounds and other mouldings should be re-run *in situ* with a template in the traditional manner, building up in coats to the full original profile and accurately formed: mouldings should be copied from an undamaged existing section cleaned of all paint. It is important for all existing features requiring repair to be recorded by photographs, drawings and templates, if necessary, before work starts.

Subsequent redecoration of rendered areas should with traditional lime wash/silicate paints/alkyd oil paints where appropriate (n.b. mineral paint may bond irreversibly to an historic substrate and may sometimes be inappropriate): otherwise, with a smooth, water-permeable masonry paint system. Textured or impermeable sprayed coatings are not acceptable. The proposed colour scheme for redecoration should be agreed.

## Windows, Doors and Other External Joinery

Existing windows and/or external doors should be retained and repaired wherever possible; it is important to retain and repair surviving early casements and glass. The quality of early twentieth century timber, glass and fittings and those of earlier date should be respected. If replacement is unavoidable, the new windows should be accurate replicas to the original design, in terms of construction, arrangement of panes and detail. Timber sections, especially mouldings, should be to the original **size** and profile; this is of particular importance for glazing bars and meeting rails to horizontal sashes. Double-hung sliding sashes should be without horns (unless the original sashes were to this pattern) and should be hung on cords with weights. Spring balances for sashes are not acceptable. The quality of the timber for repairs should be stated e.g. for high quality softwood repair, the heartwood of a stated timber species and vacuum pressure impregnated may be appropriate.

Existing old, especially crown, glass should always be protected from damage, retained and re-used in new windows, as replacement with modern float glass will always adversely affect the appearance. New door and window furniture should be to the original pattern. New and/or repaired external joinery should be painted with an appropriate exterior joinery paint and not stained.

## **Ironwork**

Decorative ironwork, such as balconies, canopies or railings, should be carefully repaired in a technique and the same material i.e. cast or wrought iron and not mild steel. If absolutely necessary, features may be reinstated accurately to the original pattern and detail, in a similar material (unless otherwise agreed). Existing decorative ironwork requiring repair or replacement should be recorded by photographs or drawings before work starts, and the existing paint finish analysed to determine the original colour scheme. Drawings for any new/replacement ironwork will be required for approval.

New or repaired ironwork should be painted with a gloss, or other technically appropriate paint system, to the original colour scheme. Any alternative colour scheme proposed should be agreed.

## **External Works**

Boundary walls, fences and gates should be repaired to match the existing, or reinstated to the original design. The installation and design of any new such elements must be approved.

External paving should be in appropriate natural materials, such as stone slabs or granite setts, to match the existing in size, depth, coursing pattern and pointing profile where relevant and/or laid in the traditional manner.

A detailed scheme for any external landscaping proposed, including any planting, lighting, signage and street furniture must be submitted for approval.

## **THE APPLICANT, OR THE APPLICANT'S AGENT, SHOULD MAKE SURE THAT THESE ADVICE NOTES ARE DRAWN TO THE ATTENTION OF THE CONTRACTOR(S) WHO WILL CARRY OUT THE WORK.**

For more detailed guidance on repair techniques, you are advised to refer to the following English Heritage publications:

Brereton C     *The repair of historic buildings: advice on principles and methods.* London 1991, 1995

Ashurst J&N    "*Practical Building Conservation*" Series: Aldershot, 1988, 1989, 1990:-

Volume 1 - *Stone Masonry*

Volume 2 - *Brick, Terracotta & Earth*

Volume 3 - *Plasters, Mortars & Renders*

Volume 4 - *Metals*

Volume 5 - *Wood, Glass, Resins, Technical Biography*

(Please note that some detail within the books may have been superseded by more up to date research e.g. *Smeaton Phase I*: JM Teutonico, I. McCaig, C.Burns, J. Ashurst. *Smeaton Phase II*: JM Teutonico and BS 8221-2:2000 *Cleaning and Surface Repair of Buildings*: Building Research Establishment)

Ridout B *Timber Decay in Buildings the Conservation Approach to Treatment* SPON  
London 1999

English Heritage Transactions Series:-

Volume 1 - *Metals* (1998)

Volume 2 - *Stone* (2002)

Volume 3 - *Earth* (1999)

Volume 4 - *Timber* (2002)

Volume 5 - *Thatching in England 1790-1940* (1999)

Volume 6 - *Thatching in England 1940-1994* (2000)

Volume 7 - *Timber* (2001)

Letts J *Smoked Blackened Thatch, English Heritage & University of Reading 1999/2000*

Teutonico J-M (ed) *English Heritage Directory of Building Limes*, Donhead, Shaftesbury 1997

Chapman S & Fidler J (ed) *English Heritage Directory of Building Sands and Aggregates*  
Donhead, Shaftesbury 2000

English Heritage videos:

*Framing Opinions: Protecting our Legacy of Old Windows* (1994)

*Making the Point: Pointing Brickwork the Traditional Way* (1994)

Free English Heritage Technical and Advisory Notes (examples) :-

*Stone Slate Roofing* (1998)

*Anthrax and Historic Plaster* (1999)

*Graffiti on historic Buildings and Monuments: methods of removal and prevention*  
(1999)

*Framing Opinions (7 booklets)* (1994-1997)

*Lead Roofs on Historic Buildings* (1997)

*Thatch and Thatching* (2000)

**For a full list of current publications and free technical notes, contact English Heritage Customer Services, PO Box 569, Swindon, SN2 2YP, Telephone 01793 414910.**

*Further examples of relevant publications which should also be referred to:*

Ashurst N *Cleaning Historic Buildings:*

*Volume 1 Substrates, Soling & Investigation*

*Volume 2 Cleaning, Materials and Processes*

*(both London 1994)*

The Lead Development Association/Lead Sheet Association *The Lead Sheet Manual Volumes 1-3* 1990-1991

Also guidance notes such as those produced by the Society for the Protection of Ancient Buildings (SPAB) e.g. Technical Pamphlet *The need for Old Buildings to Breathe*.

The following organisations also produce guidance notes:

The Georgian Group  
The Victorian Society  
Historic Scotland