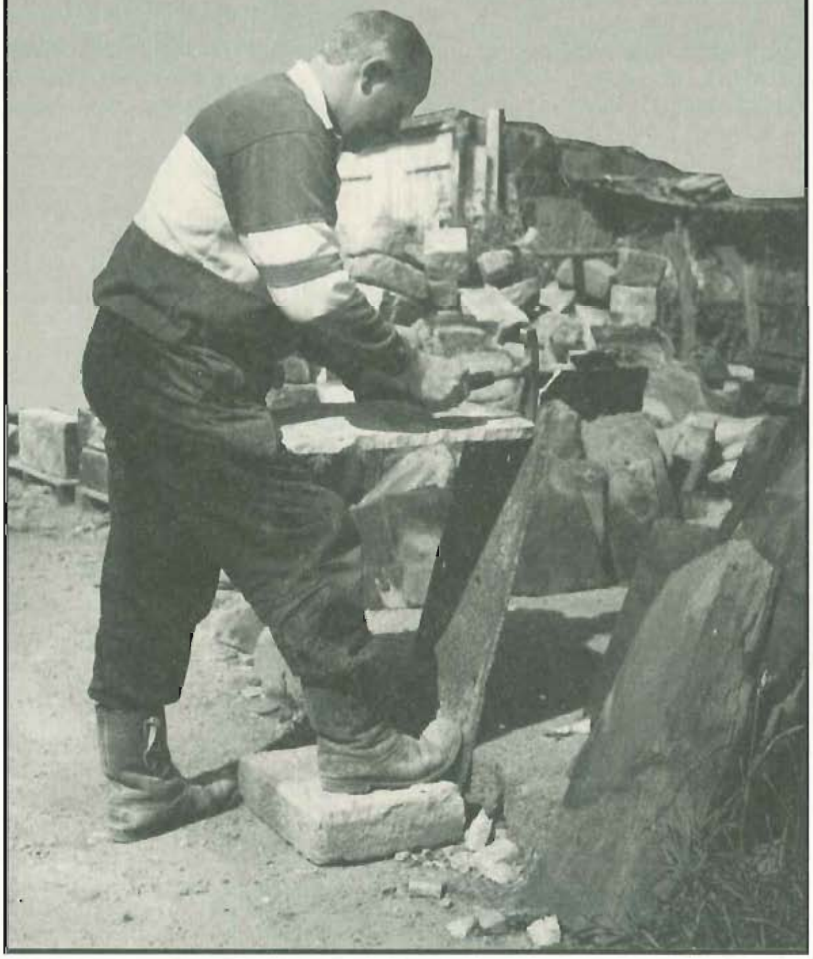
Derbyshire Stone Slate Roofs

Technical Advice and Model Specification



DERBYSHIRE County Council
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PEAK NATIONAL PARK

REPAIRS TO STONE SLATED ROOFS
TECHNICAL ADVICE FOR BUILDING OWNERS

1. WHAT IS SO SPECIAL ABOUT STONE SLATE?

Stone slated roofs are a familiar part of the Derbyshire landscape, with stone or 'grey' slates being used in towns, villages and farmsteads from the most northerly parts of the county, to within a few miles of Derby and Ashbourne.

Stone slate has been in use for many centuries and is an important part of the County's traditional building craft traditions. Today, stone slated roofs are becoming less common. Stone slate is costly, and the number of specialist craftsmen competent to lay it is quite small.

It is therefore important to ensure that, when stone slated roofs are being repaired or recovered, building owners and specifiers are aware of the correct procedures to be followed. Stone slating is unlike any other roofing practice, and it is important that a valuable and scarce roofing material is not misused.

A reference library of sandstone slates is held at the National Stone Centre at Wirksworth, near Matlock (telephone 01629 824833). Advice on supplies of stone slate can be obtained from the Heritage and Design Group of the County Council's Environmental Services Department (telephone 01629 580000 ext 7182).

A detailed report of a study into the potential to re-establish the roofing slate industry is available at the National Stone Centre and in the Local Studies Section of the County Library at County Hall in Matlock.

2. DOES MY STONE SLATED BUILDING NEED REROOFING?

Stone slates are heavy. They place great demands upon roof timbers and on the fixings of both roofing laths and stone slates. The stone slates themselves deteriorate in the same way as other stone building products.

Stone slates were traditionally fixed by wooden pegs. Pegs shrink with age, and they weaken and break. Peg slippage and breakage will allow the slate to slide down the roof. Individual slates can be refixed (see 8) but large numbers of slipped slates indicate that there has been failure of the original fixings, making reroofing necessary.

The weight of stone slate causes deformation - sags and hollows, in the roof line. The roof timbers have generally given under the weight, and if this deformation is severe, repairs to the structure will be necessary. For this, the roof covering will usually have to be removed. Stone slate is subject to deterioration by weathering. Sometimes, the tops of slates become very soft, or the peghole becomes enlarged and breaks. The sandstone is liable to laminate, and becomes more absorbent and liable to frost damage. A large number of cracked or spalled slates means that the roof covering needs replacement.

3. WHERE CAN I GET ADVICE ON ROOFING REPAIRS?

Not all roofing contractors can carry out repairs to stone slated roofs. Find a contractor who regularly carries out repairs to stone slated roofs. Ask for examples of completed jobs involving stone slating, and go and look for yourself. Look for:

1) Stone slates which are laid evenly, and which do not vary in thickness in the same row or course.
2) Stone slated roofs, where the sizes of slates diminish evenly from the lowest part of the roof, (the eaves), to the top (the ridge).
3) Roofs where the slate is in good condition, without cracked or broken slates, slates with damaged edges or missing corners.

Ask a roofing contractor for a diagnosis of the roofing problem. Seek more than one opinion, where possible. If in doubt, consult the local authority's Conservation Officer who should be able to offer an independent opinion. If you cannot find a suitable contractor, your Conservation Officer will know of contractors capable of repairing stone slated roofs using the correct procedures.

4. WHAT DOES REROOFING IN STONE SLATE INVOLVE?

When providing an estimate for a replacement stone slate roof, an experienced roofing contractor will take the following points into account:

1) The provision and erection of a suitable scaffold.

2) The removal of the existing stone slate and ridge tiles. These should be brought to the ground, ready for sorting and grading. This cannot be done properly on the scaffold.

3) The removal of the existing laths, cleaning down of the existing roof timbers, and the brush treatment of the original roof timbers with 2 coats of a liquid fungicide/insecticide.

4) The replacement of defective roof timbers with timbers of matching size. New timber should be vacuum impregnated with a preservative.

5) The covering of the rafters with underslating felt or other membrane conforming to British Standards and Building Regulations.

6) The sorting of the sound slate into stacks of the same size, each stack to form a single course of slate on the roof. Slates should be stacked vertically, with pegholes to the ground, thus allowing the slates to be sorted by thickness, as well as length.

7) The supply of extra or replacement slate to allow the completion of the range of courses necessary to recover the roof. (Replacement slate is sold by the tonne, each tonne providing sufficient slate for 7-8 square metres of roof covering depending upon the thickness).

8) The fixing of new "Tanalised" laths, laid to permit the fixing of stone slates to diminishing courses, using stainless steel nails.

9) The fixing of the stone slates, including an under eaves course, to diminishing courses, one course at a time, using copper or aluminium nails or pegs. The tails of the slates are to be traditionally bevelled, and are to overlap the heads of the slates two courses below by a minimum of 75mm (vertical overlap). The slates are to overlap the vertical joints of the course below by a minimum of 75mm (horizontal lap). Both kinds of lap are required to ensure that the roof covering will be waterproof.

10) The repair of roof leadwork around chimneys, where roofs and walls meet (abutments) or where roof slopes meet (roof valleys). The correct code (thickness and weight) of lead must be used, and the work must be carried out in accordance with the recommendations of the Lead Development and Lead Sheet Associations. An allowance is to be made for any lead salvaged from the roofing work.

11) The fixing of ridge stones or tiles and their careful pointing with a lime mortar. The mortar joints should be kept as narrow as possible.

12) Any clearance, or repair of gutters and other parts of the rainwater disposal system should be carried out prior to the dismantling of the scaffold. Upon completion, all surplus materials not belonging to the owner should be removed from the site.

5. HOW MUCH OF MY SLATE WILL BE REUSABLE?

Your roofing contractor is not a clairvoyant. He cannot estimate the amount of salvage slate until all the slate is on the ground. You should ask the price of replacement slate. Slate is sold by the tonne.

By measuring the roof, your contractor will be able to calculate the area covered, and the amount of slate needed to cover that area. He can therefore calculate the cost of slate, and thus the maximum likely cost of slate to be purchased. Sound slate from the roof can be used for reroofing or its value can be calculated, and the client credited with the value of the material.

If the slate removed is in poor condition, or it has been repaired with cement mortar or covered with hessian and tar (as is sometimes the case), it will have little or no value. Sound slate, however, which is damaged or cracked, can be redressed and reused.

Replacement slate is almost always salvaged from other sites. It should be of sound quality and compatible with the slate found on the building being reroofed, if the two types of slate are to be mixed.

6. WHAT KIND OF ESTIMATE DO I NEED?

Ask your roofing contractor for a detailed estimate for the reroofing works which includes the items shown in part 4 of this leaflet. Make sure it contains VAT, if it is chargeable, and allowances for salvaged slate and lead if appropriate. Make sure that allowance is made for unforeseen work (such as replacement timbers). These extras, if not taken into account, can mount up to a considerable sum. If an estimate is inclusive of the cost of additional slate, ask how much slate has been allowed for, and its cost.

7. IS THE WORK SUBJECT TO A GUARANTEE?

You should ask the contractor whether the work is guaranteed, and for what period. It is reasonable to expect the workmanship and the materials supplied to be subject to some form of guarantee and a reputable contractor will be prepared to stand by his work. You should establish whether or not a guarantee is being offered before confirming that work can proceed. You are entitled to ask for a written guarantee.

Before paying your roofing contractor, you should ensure that all the items specified in the estimate have been satisfactorily completed. If items have been left unfinished, you may choose to withhold part of the cost until completion. When you pay your contractor, ask for a receipt.

8. CAN SMALL AREAS OF THE ROOF BE PATCHED?

Small areas of damaged slatework can be repaired without stripping the roof. An experienced roofing contractor can patch small areas of damaged slating, or remove and replace individual slates. Scaffolding will not usually be necessary, but proper ladders should be used to prevent damage to other slates. Replacement slates are usually bedded on mortar, as they cannot be nailed without stripping other areas of slating. However bedding mortar should not be visible. Normally, adjacent slates can be raised on wooden wedges whilst the defective slate is removed.

HEALTH AND SAFETY

Derbyshire County Council is concerned to promote all aspects of public safety. It is important that all building works are carried out in accordance with the requirements of Health and Safety legislation and specifically the various Construction Regulations 1961, 1966 and 1989.

Where the County Council is grant aiding building work failure to comply with the regulations may mean that the officers are unable to inspect the work and this may prejudice payment of the grant.

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DERBYSHIRE STONE SLATE ROOFS

SPECIFICATION CLAUSES FOR STONE SLATE ROOFING

1 Scaffolding

1.1 The Contractor is to provide a full working scaffold supported independently from the building, with all necessary ladders, hoists, etc, to give safe access at eaves level.

1.2 All scaffolding is to be erected to comply fully with current Health & Safety legislation and to avoid actual or potential damage to the building fabric, especially window glass, from pole ends, clamps, clips or other devices. Plastic put-log caps must be used.

2 Stripping

2.1 Before any stripping commences, count and record the number of courses on each roof slope and the slate length of each course (ie, from peg hole to tail), plus any special details.

2.2 Carefully strip to ground level, stone ridges and slates and set aside all sound materials for re-use, including those which can be dressed down in size. All slates which are laminating are to be rejected, unless they can be redressed.

2.3 Carefully remove all slate laths, de-nail rafters, clean down all timbers and remove all loose debris from roof spaces.

3 Timberwork

3.1 Original timbers are to be retained if at all possible. Defrassing of worm affected timbers is to be kept to a minimum to avoid unnecessary loss of original fabric.

3.2 Replacement timber is to be dried to a moisture content of between 15 and 20% and be of matching size and species to that being replaced unless otherwise specified.

3.3 Softwood is to be pressure-impregnated with preservative before being brought onto site and any cut-ends or bored holes are to be liberally treated with insecticide/fungicide (not harmful to bats) before being built in.

3.4 All in-situ timber preservative treatment is to be carried out in accordance with the Control of Substances Hazardous to Health Regulations 1988, the Health & Safety at Work, etc, Act 1974, and the Control of Pesticides Regulations 1986, using material not harmful to bats.

4 Slating Underlay

4.1 A suitable underslating felt or membrane is to be fixed over the rafters with large headed clout nails, to perform in accordance with BS 5534, the Code of Practice for Slating & Tiling and to meet the requirements of Parts C4 and F2 of the Building Regulations for resistance to water penetration and the prevention of condensation in roofs.

4.2 The underlay is to comply with BS 747 1F or 5U and be fixed with a minimum vertical lap of 150mm and a horizontal lap of at least one rafter space.

5 Slating Battens & Fixings

5.1 Fix 50mm x 25mm vacuum-impregnated preservative treated, softwood counter battens, over the underlay, with 63mm stainless steel nails at 300mm centres.

5.2 Fix 50mm x 25mm vacuum-impregnated preservative treated, softwood slating battens with 63mm stainless steel nails, at spacings to suit the slate lengths. Butt ends are only to meet over rafters. If counter battens are used longer nails are required in accordance with BS 5534.

5.3 Slates are to be nailed with 50mm-63mm large headed copper or aluminium nails 8 gauge (minimum diameter 3mm) driven into the centre of the battens. Large slates to have two nails if necessary in separate holes.

OR

5.4 Slates to be hung with 7mm diameter, large-headed aluminium pegs 38mm-63mm long. Each slate to be re-drilled to suit the peg, or pegs (two) in the case of very large slates.

OR

5.5 Slates are to be hung with tapered oak or treated softwood pegs lightly hammered into pegholes to give a tight fit and with the heads cut down to avoid rocking of the next course.

5.6 Pegged slates (without underlays) are to be half-torched with hair : lime mortar, from below, to seal the joints and secure the pegs. Torching mortar is to be comprised of 1 part lime putty to 2 parts aggregate; the aggregate being 9 parts sand and/or crushed limestone and 1 part pozzolanic material such as brick-dust or PFA (pulvarised fuel ash).

The hair is to be clean, grease-free, ox, goat or yak hair in the proportions of one handful of hair to one bucketful of mortar, teased out and evenly combined with the mix.

6 Slating

6.1 Sound, salvaged slates are to be cleaned of all loose debris, sorted to length and thickness and arranged in stacks equivalent to each course length, stacked vertically on their heads (ie, pegholes downwards).

6.2 The roof is to be reslated using the sound slates previously removed, with deficiencies made up with sound slates brought on site to match in type, colour and thickness.

6.3 The reslating is to use as nearly as is practicable the same number of courses as came off and be evenly graded from the largest at the eaves to the smallest at the ridge.

6.4 Trimming of slates for valleys, etc, and redressing is to be done with hand-tools to ensure a cropped, not sawn, finish.

6.5 Each course of stone slates is to have a minimum head and side lap of 75mm to ensure the roof covering will be water-proof. The gauge is to be reduced where a course of shorter slates is introduced, to ensure the minimum head lap.

6.6 Lay a double course of slates at the eaves, with a minimum 75mm overhang, the undereaves course being fixed or bedded solidly in mortar on the wall-head and set to induce sufficient "tilt" in the first few courses that only the tails of the slates rest on the course below.

6.7 Slates are to lie evenly without rocking and be graded in thickness from one side of the roof to the other, avoiding sudden changes in thickness and gaps between courses.

7 Valleys

7.1 Valleys between adjacent roof slopes are to be renewed/formed with preservative treated softwood valley boards overlaid with non-bituminous underlay or building paper, with milled lead sheet laid in accordance with the recommendations of the Lead Sheet/Lead Development Associations' "Lead Sheet Manual", and the trimmed edges of slates pointed in mortar.

OR

7.2 Sloping valleys are to be formed with valley slates, resting between and below the courses of the adjacent roof slopes which must have the same number and sizes of courses.

8 Ridges, Abutments and Verges

8.1 Abutments to parapet walls and chimneys are to be finished with Code 4 lead soakers and Code 5 flashings.

OR

8.2 Abutments to parapet walls and chimneys are to be finished with Code 4 lead soakers and a neat mortar fillet reinforced with stainless steel expanded metal mesh where it would be difficult to insert flashings and/or there are overhanging coping stones to protect the fillet.

8.3 Ridge-stones are to be relayed on a bed of 1 : 2 : 9 (cement : lime putty : yellow sand) mortar and the joints carefully finished with a minimum of exposed mortar.

8.4 Verge slates are to be bedded on 1 : 2: 9 (cement : lime putty : yellow sand) finished with mortar pointing between the underside of the slates and the masonry, and stippled to match the rest of the pointing.

9 Eaves Gutters

9.1 Eaves gutters are to be cast-iron and to be fixed directly to the external wall face, on galvanised steel brackets or stone or timber corbels, without the use of fascia boards.

OR

9.2 Eaves gutters are to be wrought from solid timber to match the existing profile, preservative treated and erected on galvanised steel brackets or stone or timber corbels, painted inside with two coats of bituminous paint.

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