# Design Guide 8
# Stonework

## 8.1 TRADITIONAL WALLING

Locally quarried stone – most notably the distinctive pale or buff-coloured oolitic limestone – is a defining feature of the built character of West Oxfordshire, employed both as a walling stone and for roof slates. In the far north of the District (and reflecting a change in the underlying geology here) distinctive orangey, brown or rust-coloured ironstones are also found.

*Fig. 1 Traditional dry stone wall*

Walling stone was traditionally laid either with or without mortar. Field and property boundary walls in particular were often of dry stone construction (*see* **Dry Stone Walls** *below*); while the walls of buildings were generally constructed using lime mortar (*see* **Mortared Walls** *below*).

In both cases, prior to laying, the stones would be sorted into piles of random lengths but the same course height (c.75mm or c.175mm are typical course heights). The larger stones were generally reserved for the base or corners of the walls, for use as quoins; and for the door or window edges, for use as jambs.

The stones were generally laid level in regular courses; or, if the stones were highly irregular, then 'brought to course' by masking two or more thin courses by a larger quoin or jamb stone. A skilful blending of different course heights creates a pleasing and harmonious visual pattern, with neither the individual stones nor the mortar pattern being unduly obtrusive.

The stones were fitted together as closely as possible, so that very little mortar showed in the case of a mortared wall. Walls were laid to give a flat face on both sides, the irregular 'tails' of the stones pointing into the core of the wall. Any remaining voids would be packed tightly with bonded stone fragments. This method of laying gives a much greater thickness than a modern wall. The use of square stones (or 'jumpers') as random features is not locally traditional and should be avoided. Limestone is a sedimentary rock and should be laid with these layers parallel to the ground. If laid with its sedimentary layers parallel with the wall face, frost action will 'blow' the faces of the stones and progressively weaken the wall.

## 8.2 DRY STONE WALLS

Traditional dry stone walls are a key feature of the landscapes and settlements of West Oxfordshire, enclosing farmland and stitching together towns and villages. Dry stone walls vary in height, and may be topped by one of several coped finishes, depending on the use or status of the wall.

A dry stone wall should correspond in its appearance (profile and stonework) with adjacent and local patterns of walling. When rebuilding an old wall, every effort should be made to use existing stone, and to conserve lichens and mosses. New or replacement stone should be sourced from reclamation yards or local quarries, and match in its size, colour, texture and thickness the existing adjacent or nearby walling.

The three most common ways to top a dry stone wall are: a) with a random pattern of upright coping stones (sometimes referred to as 'cocks and hens', and traditionally used both for field and property boundary walls); b) with flat stone coping (traditionally used for higher status property boundary walls); or c) with curved mortar coping (a more recent finish).

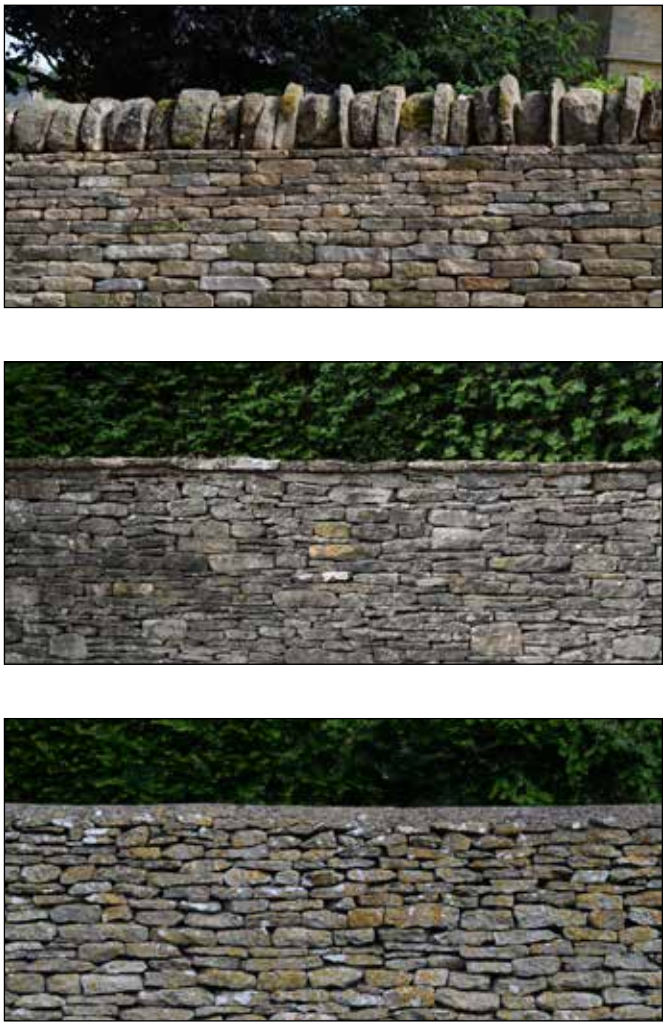

*Fig. 2 Random upright coping (top); flat stone coping (middle); curved mortar coping (bottom)*

## 8.3 MORTARED WALLS

In mortared walls, the horizontal mortar between the courses (the 'bed') and the vertical seam between stones in the same course (the 'perp' or 'perpend') should be as thin as possible (on average no more than *c.*10mm). Any projections on the stones which may enlarge the joint should be trimmed with a walling hammer or bolster. Stones should be selected to be compatible in shape with their neighbours. Courses should be laid level on top, with any variation in shape taken up in the top of the bed joint below.

*Fig. 3 Recent traditional mortared wall*

The mortar must be allowed to set slightly before it is finished. Finishing can be done with a trowel, brush or the corner of a butterfly wall tie. Care should be taken to avoid smearing mortar on the stone faces. The joint should be given a flush or concave surface, slightly recessed from the corner (arris) of the adjoining stones. Projecting (ribbon) pointing, which traps moisture in the wall, is not traditional for the District and should be avoided.

The preparation and use of mortar is of particular importance, both for the appearance and the longevity of the wall. Dense, cement-rich mortars are not appropriate for limestone, as they do not allow the free passage of moisture from the wall. The colour and texture of the mortar must relate to the chosen stone. When dry, the mortar should be the same colour as, but slightly lighter than, the adjoining stone. The local tradition is for mortar with a fairly gritty texture.

Building stone was traditionally used in a range of finishes, depending on the date, status and use of the building:

## 8.4 RUBBLE OR ROUGH DRESSED STONE

The stones, roughly squared-off or used as found, were sorted according to size, and laid in uneven courses. A harmonious and pleasing overall appearance was achieved by the skilful blending of courses of different height, sometimes by 'bringing to course' two or more narrower stone courses.

This finish is a characteristic of the District's field and property boundary walls, with the stones generally laid dry; and of many of the District's vernacular houses and cottages, laid with lime mortar – particularly those belonging to the C17 and C18.

*Fig. 4 Traditional rubble stone wall*

## 8.5 DRESSED STONE

The stones were squared off to give a more pronounced uniformity of size and shape, leading to stone courses (and thus walling) of more consistent overall appearance. The greater uniformity allowed for narrower mortar beds between courses, and a flatter and more even overall appearance to the stonework. This finish is characteristic of the District's C18 and C19 vernacular houses, and in particular higher status detached properties of this period.

*Fig. 5 Dressed stone*

A characteristic Victorian variation, found particularly on houses of the late C19, was for the stone to be squared off, but for the face of each stone to be given a rougher, raised finish.

## 8.6 ASHLAR STONE

The stones were sawn to give a finely squared-off finish, with flat faces and sharp edges. They were laid near-flush with one another with narrow, inconspicuous joints, to give a wall face of pronounced flatness and evenness. This finish is especially characteristic of higher status houses of the C18 and C19. However, ashlar stone was also used for the quoins, window surrounds and chimneys of houses otherwise constructed from dressed stone.

*Fig. 6 Limestone ashlar*

*Fig. 7 Natural limestone stone slates*

## 8.7 STONE SLATES

Natural stone 'slates' represent a highly important and distinctive application of the local limestone as a roofing material. Good quality stone slates were sourced from a number of local quarries in the District. Historically, however, the eponymous Stonesfield Slates have been especially highly regarded for their quality and evenness.

Rather than being split with chisels, stone slates were formed by spreading the stones on the ground and allowing them to split naturally by frost action. The resultant stone slates were laid on roofs in diminishing courses, with the smallest slates nearest the ridge.

This roofing material is especially characteristic of local vernacular houses, cottages and agricultural buildings of the C17 and C18 and remains a conspicuous and precious feature of both Listed and non-designated buildings throughout the District (frequently being highlighted in List entries in the case of the former).

Stone slates, as well as being significant for their architectural and historical interest, are also, by virtue of their method of creation, significant in terms of the District's cultural heritage. For all these reasons, natural stone slates should be retained or replaced on a like-for-like basis wherever possible (either sourced from a salvage yard or from one of the quarries still producing natural roofing slates).

In the case of Listed Buildings – and particularly where the presence of stone slates is cited in the List entry – proposals to replace natural stone slates with an alternative material (including reconstituted stone tiles) will generally not be supported, on the basis that such a change is likely to be harmful both to the character and fabric of the Listed Building.

This also applies to a partial re-roofing where, for example, two roof slopes might be stripped of their natural stone slates in order that enough original slates may be salvaged to re-roof one slope in naturals (the other being roofed in artificial stone slates). This latter change would still entail harm to

the character and fabric of the Listed Building, even if carried out to a discreet roof slope, and would potentially represent one step in a cumulative loss over time.

## 8.8 ARTIFICIAL STONE

The purpose of artificial stone is to replicate the character and appearance – and specifically the colour and texture – of local natural stone. Artificial stone is available in 100mm thicknesses, to allow the formation of an outer skin. In order to give the most natural appearance possible, artificial stone should be employed in a wide range of course heights and stone lengths.

*Fig. 8 Artificial stone wall*

The stone should be laid in courses of randomly varying height, and with stones of varying length within each course, to give a harmonious overall effect. If a narrow range of course heights and stone lengths is used, the finished wall will have a mechanical and repetitive appearance. Again, the use of square stones (or 'jumpers') as random features is not locally traditional and should be avoided. Larger stones can be used at the corners (as quoins) and to define window or door openings.

Artificial stone should also be laid with a *c.*10mm average bed joint and a *c.*10mm average vertical 'perp' joint. The joint profile should be slightly recessed, matching that of natural stone; and the mortar should be similar in colour, but slightly lighter than, the artificial stone. Difficulties frequently arise when using grey Portland cement or dark sand. A pale buff to neutral colour is generally appropriate for artificial stone, but the shade will depend on the choice of artificial stone.

## 8.9 SAMPLE PANELS

In order to demonstrate the natural or artificial stone type, laying pattern, mortar colour and finish for a given building project, a sample panel using the material should be constructed of at least 1m x 1m surface area.

The sample panel must be constructed apart from, but within the context of, the development. It should be in a position on the site where it can remain until practical completion, as it will serve as the standard against which all other stonework will be assessed.

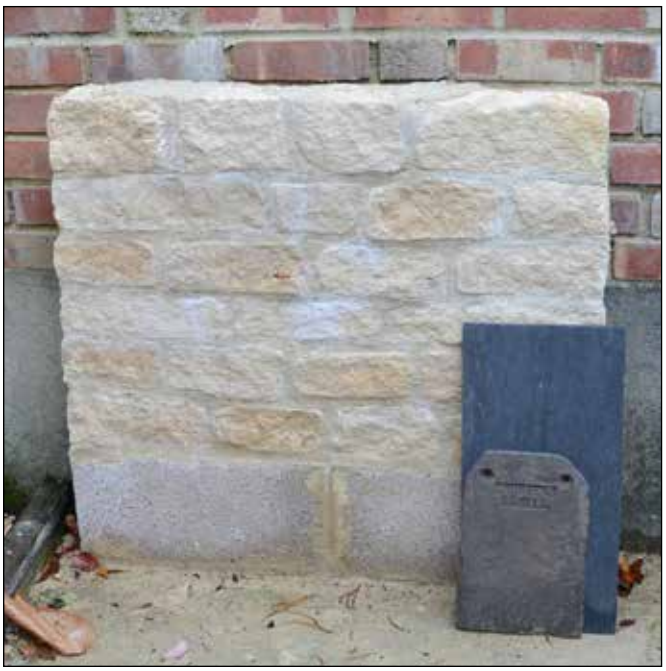

*Fig. 9 Natural stone sample panel and proposed roofing materials*

Common problems with sample panels include: mortar joints that are too wide (i.e. more than *c.*10mm); the use of untraditional 'jumpers'; and mortar that is either darker than the adjoining stonework or of a poor colour or texture match.

When complete, the sample panel should be protected from frost and rain, and the mortar allowed to dry out before an inspection is requested. Until the sample panel has been approved in writing, no external stonework should be carried out, even below the damp proof course.