

Technical Specifications for Cotswold Oolitic Limestone Walls

Preamble

This leaflet is one of a series produced by the Dry Stone Walling Association to give guidance on the particular aspects of the craft of dry stone walling. It should be read in conjunction with "Technical Specifications for Dry Stone Walls". Before providing specific details for the Cotswold wall the following points should be noted:

- Dry stone walling is a skilled craft and should only be done professionally by certificated wallers. (DSWA operates the only tiered nationally recognised practical skills certification schemes). Contractors should use professional wallers, and monitor the quality of the wall during construction.
- Compared with other areas of the country the stone is smaller, and can therefore take longer to build, thus reflecting higher building costs.
- Certificated amateur wallers should be capable of building and repairing small field and garden walls.
- Newly quarried Cotswold stone varies in colour from golden through mellow honey and grey to almost white depending on the area and strata being quarried. It is important to match stone colour and type before commencement of wall repair and building.
- Oolitic limestone walls are one of the most noticeable features of the Cotswold hills and valleys. The stone is used for almost any structure, from houses, cottages, barns and field and estate boundaries.
- Limestone is relatively soft when freshly quarried and can absorb moisture. This property dictates how the wall should be built, allowing water to be shed from the stone, and wall interior.
- The finished wall should be straight and true along its length with a good batter. Curved walls and walls on undulating ground should follow the contour of the land and adjacent paths or roads.
- When the wall is to be built on a slope greater than 20% the courses should be laid horizontally. Thus building should commence from the lowest section of the wall with horizontal foundation trenches being dug as the wall progresses up the slope.
- One of the main differences between walls in other areas of the country and of those in the Cotswolds is the lack of large stones for foundations, through stones and toppers, therefore any large stones should be set aside before building.

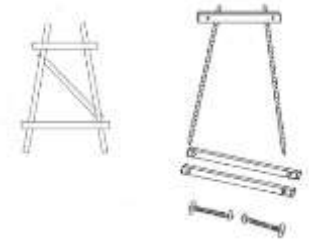
Guidelines

Dimensions: Most field walls are approximately 1.0–1.2metres high with a base of 600-700mm and width under the cope of 400mm. The batter (slope inwards) of the wall is usually 1:12, or 1:9. Low vertical walls may be built in garden construction, but lack stability if built to any height.

Foundations: Little settlement occurs in Cotswold walls as the soil is thin and therefore the trench need only be 10-20cm. deep, depending on the ground. Large stones should be used and placed against the sides of the trench achieving a level top and well pinned with rough wedge shaped stones under the back edge. Stones should be placed with their length running across the width of the wall. There should be no movement of these stones.

Building stones: The main body of the wall is made up of two of sides of carefully shaped stones, which may be laid in courses or randomly. Since limestone absorbs water, the stones are laid with a slight tilt to the outside edge, allowing water to be shed from the stone. Whether old or new stone is being used, stones should be selected so that the larger stones are used in the lower courses, gradually decreasing in thickness as the wall progresses. Stones should be dressed so that a face and camber is achieved before the stone is laid. There should be no gaps between stones, or under stones resulting in "letterbox" gaps. Front pinning must be avoided, but thinner stones can be built into the wall to level up coursing.

Batter: A-frames are used to enable the builder to achieve an even batter on each side of the wall. Frames can be made in different sizes depending on the height required (see diagram).



Through and three-quarter through stones: These are large stones that need to be selected at the beginning of the build. They are laid across the width of the wall at half-height to tie the two faces together. They should be supported across their length with packing stones, and are usually placed at one metre intervals along the wall. Three-quarter through stones are more often used in the Cotswolds walls due to the lack of larger stones. These are laid to overlap in the middle of the wall.

Cope stones: Ideally these should bridge the width of the wall, resting on stones on either side. In field and boundary walls, they are usually of various shapes, heights and widths, but must be placed so that there are no visible gaps between each stone and they must retain a vertical position. Small thin stones are then dropped into the vertical gaps, thus tightening the whole cope. Where there are no large stones available double copes can be used, but care should be taken to interlock stones from side to side.

Wall heads: The building of wall heads presents a problem, as there are rarely large enough stones to bridge the full width of the wall except near the top. It is therefore common practice to use the 2 on 3 technique rather than the 1 on 2. Most stones will require considerable dressing to achieve a good wall head.

Concrete and Mortar: Concrete can be used for foundations where large stones are unavailable or the ground does not provide a firm and solid base. However, this should not be seen as a cheaper or easier method of wall building as the main advantage of a true dry stone wall is that it settles into and moves with the ground without creating holes and fissures. In walls where concrete has been used as a cope, it is common to see a gap between the concrete and final course. This can be due to the settlement of the wall and/or the trapping of water between cement and limestone, destroying the top layer of stones.

Mortar mixes should contain a high proportion of lime and a minimum content of cement. Care should be taken to use sand that will provide a similar colour of mortar to the stone. Recommended proportions are as follows:

1 part lime: 3 parts sand **OR** 1 part cement: 3 parts lime: 11 parts sand **OR**
1 part cement: 2 parts lime : 8 parts sharp sand

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