

# Stone Walls

## Stone-built walls

Stone in its various forms is a traditional building material which has been used in the construction of buildings for a very long time. Traditionally, buildings constructed using stone had solid walls, often at least 500mm (over 18 inches) in thickness.

In more recent times stone has been used as an external facing for cavity walls (a cavity wall is one with two separate 'skins' stitched together by some form of wall tie). Stone used in construction has usually been obtained from sources local to the building.



There are several common methods of construction using stone:

- Solid construction with:
  - ◆ random arrangement of the individual stones
  - ◆ exposed stones set in even horizontal courses
  - ◆ dressed stone facings in courses, backed by randomly placed stones
- Cavity construction using stone in even horizontal courses for the external face of the wall.

A further variation is the use of reconstituted stone blocks as the facing for cavity walls in place of the more common brickwork. Stone is also sometimes seen as an infill in traditional timber framing, where the main framework remains exposed externally.

## Solid stone walls

The construction of a solid wall (random stone, coursed stone, dressed stone, etc.) makes little difference to its performance as a building element. The actual method of construction is likely to have been governed by local practices and availability of materials and by the era in which the building was constructed.

Traditionally, solid stone walls were constructed using lime mortar, and, if present, internal plastering, was also lime-based. The lime mortar is both porous and flexible. Moisture is readily absorbed into the mortar during rainfall, and is able to evaporate away leaving the wall relatively dry.

The thickness of the walls is usually such that moisture does not reach the internal surface of the wall in sufficient quantity to cause a problem. However, moisture rising from the ground tends to be retained, since the rate of evaporation seldom exceeds the rate of absorption. This can result in unsightly staining of internal plaster finishes. In extreme cases the degree of dampness can lead to health problems, since the atmosphere within the property remains humid.

Stone walls were traditionally constructed with no provision of a damp proof course, but from around the early part of the twentieth century it has been normal practice. However, an injected chemical damp proof course in a solid stone wall will seldom completely eradicate rising dampness, but will usually result in a significant reduction in the amount of dampness present in the wall.

Older stone walls will have been built on very shallow foundations, often consisting of no more than a line of large stones laid in a very shallow trench. Such foundations are more likely to suffer settlement or be affected by subsidence. The flexibility of lime mortar is an advantage.

If minor structural movement occurs the deformation of the wall will be spread across a series of joints, and any resulting cracks are likely to be almost invisible. This is in contrast to cracking in modern cement based mortar where the cracks are usually concentrated into one or two joints, and are usually very readily visible.

Solid stone walls tend to absorb and retain heat. In winter months the walls radiate the heat back into the property, whilst in summer the heat is radiated externally. The walls are therefore able to ensure that the building is cool in summer and warm in winter.

## Stone-faced cavity walls

Cavity walls which are faced with stone are constructed in a very similar fashion to brick-faced cavity walls. The external part of the wall is normally of greater thickness in the case of stone, since it is not usually possible to obtain regularly sized pieces of stone which are similar in thickness to a standard brick.

The cavity in the wall will provide additional weather resistance which assists in preventing water penetration to the inner part of the wall and also offers a degree of thermal resistance to heat loss. If the cavity is insulated this will further decrease heat losses.

It is usual for a cavity wall, even when constructed using stone facings, to be provided with a damp proof course. Thus rising dampness is less likely to occur.

In some parts of the UK, where stone construction is commonplace, a substitute material has been used to construct buildings in order to reduce construction costs whilst matching the appearance of nearby traditionally built stone buildings.

## Maintenance and repairs

This material is reconstituted stone, which is basically a concrete block formed by using crushed natural stone in a cement matrix. The blocks are formed in moulds, and appear very similar to natural stone. The blocks are laid in courses, usually as the external facing of cavity walls.

Whilst these reconstituted stone blocks provide an appearance which is pleasing to the eye, they do have a potential drawback. This type of block is prone to thermal movement, and it is very common to find visible cracking which extends through the joints, primarily from top to bottom of the wall. The cracking is caused by the block-work expanding in warm weather conditions, and contracting when temperatures fall again.

The cement mortar is not able to accommodate the movement and tends to crack. The cracking is unsightly, but usually has no structural significance. In many cases, repairing the cracks provides only a temporary improvement in the appearance of the wall, because further thermal movement produces more cracks either at the same location or nearby.



Whilst stone walls are relatively durable, it is likely that over a long period of time the lime mortar will be eroded. This can lead to an increase in water penetration, which is not desirable. External pointing should ideally be kept in good condition.

It is important to ensure that if the wall was first constructed using a lime mortar, then the same material should be used for repair works. This will ensure that the wall retains its flexibility, and more importantly its porosity.

The same principle applies to the repair of internal lime-based plaster finishes. In some cases, using the wrong type of mortar can damage the stone. If the property is a Listed Building, or if it is situated within a Conservation Area, special planning provisions will apply, and repairs or modifications will need to be carried out within fixed guidelines. You should contact your local planning office if you think this applies to you.

In all cases it is wise to seek professional advice prior to commencing maintenance and repair works. Unfortunately, finding a professional to help is not always easy. A local surveyor who specialises in older properties can advise on suitable materials for use, and may also be able to provide guidance on the choice of a suitable contractor. Alternatively, you can ask for recommendation from other building owners. Organisations such as the National Trust do use specialist contractors and may be able to recommend local specialists.



## Insurance costs

The cost for reconstruction of a property built of stone will be greater than the cost for a property of similar size and age which is built of brick. As a result, insurance premiums for stone-built properties are likely to be higher than for properties of brick construction.

© 2010 National Energy Services Ltd

Disclaimer regarding general information:

This fact sheet is one of a series, made available by the membership schemes owned and operated by National Energy Services Ltd. They are only intended as general guides to provide background information, and whilst all reasonable steps have been taken to ensure their accuracy, neither National Energy Services Ltd., nor the membership schemes operated by it, can be held liable for any errors or omissions contained herein, nor any loss or damage howsoever arising from the use of this fact sheet, or variants of it.