How to use lime successfully

The most common use of lime now is either in repair or repointing of historic walls. Other leaflets are available on how to use lime successfully, from repointing to building from scratch.

Further Information

Further information and advice on lime mortars other conservation practices and principles can be found at various web-sites, including:

www.buildingconservation.com
www.greenspec.co.uk

Further reading is also suggested, including:
Lime in Building – Jane Schofield
Hydraulic Lime Mortar – Donhead Publishing
Practical Building Conservation vol 3 – John & Nicola Ashurst / English Heritage

Suppliers of lime in the region include:
Lime Green, Much Wenlock
The Traditional Lime Co., Cheltenham
Ingarsby Conservation, Leicester
Lime Works Ltd, Cambridge, Gloucs
Old House Store Ltd, Henley on Thames, Oxon

A number of companies and organisations run lime training days for professionals, contractors and home owners.

English Heritage publish specialist technical advisory leaflets which are available free from www.helm.org.uk

The Society for Protection of Ancient Buildings (SPAB) have information on traditional construction methods, and hold training days and courses for their members, detail of which can be found at www.spab.org.uk

It is important to note that when working with Listed Buildings, special consent (Listed Building Consent) may be required for some works. It is advisable to check with the Council's Conservation Officer prior to starting any such works. If consent is necessary, a sample panel of brickwork and pointing may be required as a condition of any consent.

For further information and advice on the historic environment you can contact us in the following ways:

Writing:
Wyre Forest District Council
Economic Prosperity and Place Directorate
Wyre Forest House
Finepoint Way
Kidderminster DY11 7WF

Email:
conservation@wyreforestdc.gov.uk

Telephone:
01562 732536

This document can be made available in other languages (including British Sign Language) and alternative formats (large print, audio tape, computer disc and braille) on request from

Wyre Forest District Council
by telephoning 01562 732928
or by e-mailing
worcestershirehub@wyreforestdc.gov.uk
What is Lime mortar?

Lime mortar is a traditional building material, generally used for laying brick and stone walls. It tends to be creamy white in colour, with flecks of darker harder elements, called aggregate. It is generally softer than cement, and in its raw form can be found as a powder similar to cement (bagged lime or hydrated lime), or as a soft putty ready for mixing with sand and aggregate. It is created from burning limestone to produce quicklime, which is then mixed with water (slaking).

Lime is also a very “green” material to use. Both cement and lime produce carbon dioxide during their production, but lime reabsorsbs this carbon dioxide as it sets, whereas cement does not.

Why use lime instead of cement?

Lime and cement fundamentally act in different ways; whereas cement creates a very strong bond with brick or stone, like superglue, lime acts more like a sandwich filler, not bonding the bricks together, but creating a bed for them to lie on, giving the wall some flexibility of movement.

These differences are extremely important when deciding which to use. Historic buildings move very slightly, expanding and contracting with changes in temperature, and lime mortar allows this to happen. It also allows evaporation of water moisture from the building, through the mortar joints rather than through the brick or stone of the wall. As a result, there is no requirement for any damp-proof course or membrane when using lime.

Cement, on the other hand, creates a very rigid structure, and does not allow for any movement, unless expansion joints are put into the brickwork.

It also prevents water moisture evaporating from the building, forcing water through the bricks rather than through the joints, resulting in damp being retained in the building. As a result, damp proof courses and/or membranes are always necessary to ensure the building lives, works and breathes as it should. If cement is used, even for pointing, this will often fail, as the building will move slightly, but the cement will not, and thus crack, leaving areas for water ingress into the wall and the building. Once water is in the wall, the freeze-thaw process will occur, will result in structural damage, such as structural cracking to the wall, and ultimately failure in the mortar and the structure.

What are the different types of lime used for?

There are two principal types of lime: putty/ hydrated, or hydraulic.

Lime putty or hydrated lime is the standard lime used for construction, where a strong structural bond is not required. It is the most common type of lime, and is used in most buildings from barns through to domestic houses. It is generally softer than the brickwork, and can often be scraped off with a finger nail. It is created from a pure limestone, and is the most readily available. It is always better to use a putty rather than a powder or hydrated lime, as the latter is an inferior product due to its course particle size.

Hydraulic lime is created when the limestone has impurities in it, such as blue clay. The clay particles act as a strengthener in the lime (a pozzolan), and also enables the lime to set under water. It is generally used for structural walls, where strength is very important, and/or where a set is required underwater. Structures such as canal walls and locks, and bridges are often constructed with a hydraulic lime rather than a putty. It is not generally suitable for using on buildings as it produces a hard set not dissimilar to cement (but retains the flexibility of lime).

How to mix and store lime

Unlike cement, lime putty can be stored in an airtight container, and will be better and easier to work the longer it is stored. The general mix of a lime is not dissimilar to that of cement – as a general guide, the mix should be one part lime to three parts sand. However, when adding aggregate, such as crushed limestone, Metakaolin, or crushed brick and tile, the quantity of sand needs to decreased accordingly: if one part aggregate is used, then a mix of two parts sand and one part lime would be used.

The mixing process is also similar to that of cement – adding water to the active ingredient. However, lime does not need as much water as cement, and the consistency should be that of a cottage cheese – much thicker than you would use for cement. Once mixed, it can still be stored in an air tight container until needed.