

## Re-pointing with Lime

### General Principles

As a general principle surviving original lime-based materials should not be removed unnecessarily and the original appearance of the masonry should be retained as far as possible. To blend in the new work re-pointing mortar will need to be matched to weathered original material in terms of colour, surface texture, and finished profile.

Upon completion re-pointing must be durable and offer protection from wind, rain and frost. It must be sufficiently impermeable to deny wind driven rain penetration but permeable enough to allow free evaporation without a concentration of moisture in the stones, which may then become vulnerable to accelerated decay.

The success of lime mortars depends as much on appropriate conditions and techniques of use as it does on the materials themselves. Skilled craftsmen and good site practice are of fundamental importance.

### Site Preparation

Consideration should be given to the conditions in which the mortar will be used, and if necessary a fully protected scaffold should be provided. Ensure that all the necessary materials, appropriate equipment and tools and adequate protective covers are available before work starts.

### Preparation for Pointing

Carefully pick out, non-original cementitious mortar, taking care not to damage stonework, and examine surviving original mortar behind. Carefully rake out loose decayed mortar back to sound original lime mortar. Generally speaking only mortar which can be raked out, rather than cut out, should be removed from the joints. Provided a sound backing mortar is present and a compatible lime mortar is being used it should not be necessary to cut deeply into the original mortar to provide a key.

However, when working with dense impervious stone or in situations where the wall core mortar is unlikely to provide an adequate bond to new mortar, it will be necessary to rake out to provide sufficient depth for the new lime mortar. As a general rule the depth of a joint for re-pointing should be around twice its width.



### Preparation of Lime Mortars

Any cutting out, as opposed to raking out, should be carried out using tools with suitably narrow blades, which will not damage adjacent stones. If mortar cannot be removed without damaging masonry then serious consideration should be given to leaving it in place.

The presence of dust and loose material within joints prevents new lime mortar from forming an adequate bond with the stone and with existing mortar. After removal of old mortar loose material should be brushed out and the joints flushed with a fine jet of water to remove dust and debris.

Do not add water to normal pointing mortar, the mix will return to a plastic state when thoroughly worked and should retain its shape when moulded in the hand. It should be sticky but not wet and should cling to the underside of an inverted trowel or hawk.

Check that joints and adjacent stones are damp but not wet before re-pointing. Absorbent stones will require sufficient wetting down to prevent rapid suction of moisture from the new mortar, but impervious stones may require only minimal dampening. For re-pointing the objective should generally be to control suction to a level that will not immediately draw water from the mortar and thereby result in excessive drying shrinkage and a friable mortar. Reduced suction will also minimise the risk of staining from lime being drawn into the stone.

Excessive wetting of impervious masonry will only serve to add additional water to the new mortar and weaken the bond between lime mortar and masonry. The thickness of non-hydraulic mortars should not exceed around 15mm and new material within the depth of the wall should be allowed to firm up before the joint is fully filled. With absorbent sandstone's this may require a day or so between layers, but depending on weather conditions, mortar placed in impervious masonry may require considerably longer. When working with moderately or eminently hydraulic limes it will usually be possible to build out in slightly thicker layers. For work involving deep tamping, particularly in exposed locations and with dense impervious masonry, it may be appropriate to use a moderately hydraulic lime or a gauging of hydraulic lime in a non-hydraulic lime mortar to provide some initial hardening of mortar within the depth of the wall.

The use of appropriate tools and careful working are essential in achieving sensitive re-pointing work. Prepared mortar should be pressed firmly into the joints with a small tool, pointing key or small wood tamper, small enough to fit into the joint without causing damage to adjoining stones. The thickness of mortar should not exceed 15 to 20mm and material within the depth of the masonry should be allowed to firm up and start to carbonate before being covered by further mortar.

The mortar should be used as stiff as possible to avoid staining of adjacent stones, and any overspill washed off immediately with clean water. The use of small hand sprays is a convenient way to wash down individual areas of masonry whilst avoiding erosion of the newly filled joints.

Slightly overfilling the joints at this stage will provide the opportunity to work the mortar back to an acceptable profile and finish as it hardens up. The mortar should be pressed back into place as it dries out to ensure good compaction and eliminate shrinkage cracking.



#### **Filling Voids and Deep Joints**

Place mortar well back into deep joints and voids then pack the cavity with small pieces of sandstone or similar absorbent material, such as soft burnt clay tile or brick, firmly tamped into the new mortar. It is essential to keep the overall volume of mortar in one place to a minimum and to thoroughly compact the mortar. The use of porous material will assist carbonation.

Some masonry, particularly rubble work, was originally constructed with numerous small pinning stones which contributed to the overall stability of the masonry, reduced the quantity

of expensive lime required and minimised the effects of drying shrinkage in the mortar. Replacement pinnings should be built in as the work proceeds, ensuring that their size, character and relationship to the masonry generally are matched to surviving.

## Finishing Techniques

When the mortar has stiffened up (which may take anything from about 6 hours to a week or more and will vary according to type of lime, type of stone and local conditions) surfaces of the joints are ready to be finished.

Finishing techniques vary but the main aims of all finishing processes will be to remove laitance from the surface and leave an open textured finish, to compact the mortar fully into the joint and ensure a good seal to the stone, and to give a visually acceptable finish. The processes employed may involve a lightly scraping off excess mortar from previously overfilled joints to leave an open-textured flush surface to the mortar

Other techniques might involve tamping the surface of the mortar with the end of a stiff bristle brush to compact the material and provide an open-textured surface; light scraping of the mortar surface with a wooden spatula or with the side of a pointing key to expose some of the aggregate. It will usually be necessary to carry out sample panels to establish appropriate techniques.



With all Finishing techniques correct timing of the work in relation to hardening of the mortar is absolutely critical and the importance of this stage of the process and the care required to carry it out should not be under-estimated. Provided the joints have been adequately filled and compacted, skilled time and effort will be more productively employed at the finishing stage than during the process or actually placing the mortar in the joints.

\* Pointing \* Plastering \* Eco-build \* Stonework \* Lime Wash \* Natural Paints \* Carpentry \* Rendering \*  
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