

Restoration Guidelines No. M002 Re-pointing Limestone Mortar Joints

Introduction

Minimum intervention is the most appropriate approach when dealing with historic buildings and structures. However, the deterioration of pointed mortar joints of historic limestone buildings and structures can expedite deterioration if not repaired immediately or maintained regularly.

Re-pointing should only be carried out where the existing pointing has eroded and has become powdery, loose or has otherwise deteriorated by water penetration through joints.

If the pointing is firm enough that it has to be chiselled out, then it should be left in place as the removal process may damage the adjacent limestone.

Appropriate pointing prevents water ingress into buildings but also allows moisture to escape without damaging the limestone thus extending the life cycle of the building or structure.

Factors affecting pointing

Deterioration of pointing is usually due to inappropriate pointing technique, weather conditions or when little or no maintenance has been carried out to a building or structure. Moreover, the use of weak pointing mixes may deteriorate and become loose in a short period. On the other hand, hard mixes that include cement cause long term and often permanent damage to the stone. As a general rule, pointing should be softer than stone as a sacrificial material.

IMPORTANT: Portland based cement used as a mortar mix or part of a mortar mix for the purposes of pointing limestone joints is not considered acceptable under any circumstances.

Damage caused by improper pointing

Pointing was traditionally composed of a mix of lime and sand, however Portland based cement has been known to be used since its introduction in the late 19th century. Cement creates a hard mortar that is detrimental to the stone in the long term owing to the salts in it that eat away at the stone.

It is also more difficult to remove than traditional materials. The use of hard mortars also prevents the escape of moisture through the joints resulting in damage to the stone fabric that can eventually lead to spalling and de-lamination.

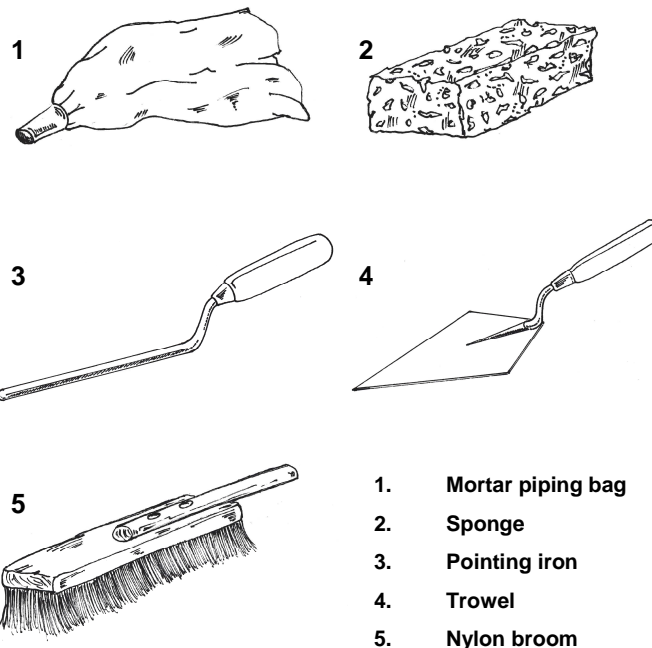
Removal of Pointing

The removal of pointing should only be carried out where the pointing is damaged and can be removed easily without the use of power tools or force. During removal of pointing, the joints should not be widened as this will affect the quality of the masonry and the characteristics of the building.

Tools for removal and re-pointing

The tools to be used for removal of pointing and re-pointing should be blunt and equal in size to the joint. In some cases, a number of different tools may be required for work on the same building owing to the difference in the width of some joints. Pointing irons and jointing tools are purposely made for this kind of work and are more suited than a general purpose trowel. Removal of pointing from very fine joints should be carried out using a flat blade such as a hacksaw or coping saw blade, without damaging the stone.

Accepted tools for this process include the following:



Re-Pointing

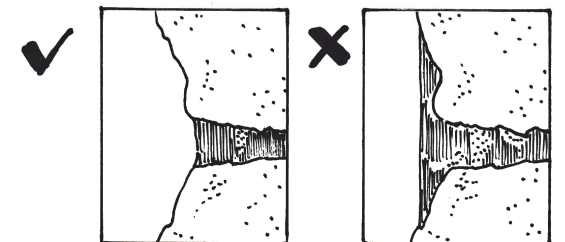
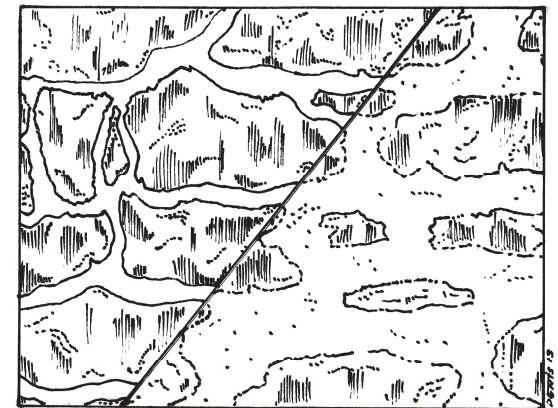
Re-pointing may be carried out on **coursed** stonework or **rubble** stonework (Not including rubble walls which is addressed in other Restoration Guidelines)

The mortar mix should be similar in composition to that being replaced both in texture and colour, incompatible materials should be avoided. The materials should be one part hydraulic lime to two parts sand, then mixed with water into a workable paste.

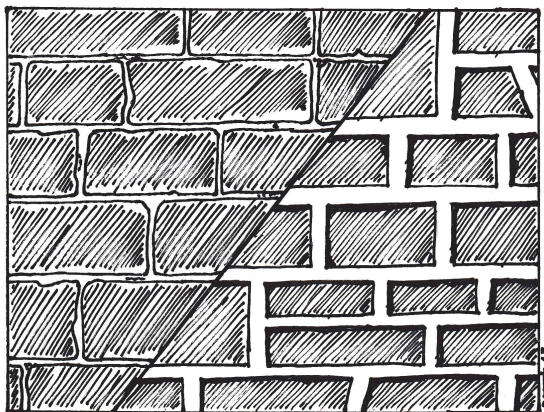
The depth of the pointing should be up to twenty millimetres deep. If the joint is deeper, the pointing should be carried out in multiple layers allowing the previous mix to completely dry prior to proceeding.

Pointing should always be finished with a slightly recessed (no more than 1 to 2 millimetres) or flush joint. Strap (protruding) or ribbon pointing is not acceptable within historical buildings as they are not considered traditional methods.

See below for acceptable and unacceptable methods for pointing:



Rubble Stonework

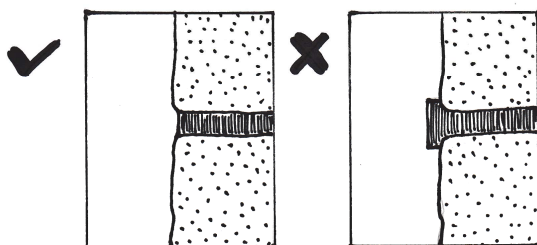


Maintenance

Prevention is better than cure. Regular care and maintenance of the building can reduce the need of re-pointing large areas. Maintenance should be carried out on a regular basis to all facades.

A successful maintenance program is the key to the long term preservation of any historic property and its components. Records should be kept in the form of a maintenance log for selecting compatible materials and subsequent repairs.

The primary purpose of the maintenance program is to control and mitigate deterioration. As soon as deterioration in the pointing is noted, it should be carefully removed and re-pointed as per these guidance notes.



Summary

Do's:

- Wear protective clothing to reduce the risk of accidental injury;
- Conduct trial patches on unseen or inconspicuous areas;
- Carry out research before deciding on a particular material to be used;
- Ensure that the new pointing is flush or slightly more recessed than the stone work being pointed;
- Respect the fabric of the historic structure including the pointing being repaired.

Don'ts:

- Do not remove historic pointing that is still in a good state;
- Do not widen the joints further while removing the original pointing;
- Do not re-point the joints in such a manner that the end result is closer to plastering or results in protruding plaster;
- Do not use general purpose tools for specific works such as a trowel for pointing of thin joints.



Pointing using a mortar piping bag

References

A list of references can be found at:

<http://www.mepa.org.mt/heritageguidelinesforrestoration>

Notes

This and other Restoration Guidelines have been prepared by the Malta Environment and Planning Authority for promoting good practice for restoration works pursuant to the Structure Plan for the Maltese Islands, 1990 and the Urban Conservation Area Design Guidance, 1995.

Other Restoration Guidelines available from <http://www.mepa.org.mt/heritageguidelinesforrestoration> can help you ensure that all conservation work required is carried out according to best practice.

Every effort has been made to ensure that the information contained in this document is correct. Any suggestions or for additional information please send your comments or request to <http://www.mepa.org.mt/contactusform?id=21>

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