

Re-Pointing and rebuilding in Lime Mortars

- Where existing lime pointing is in good condition do not remove.
- Usually the depth of a joint for re-pointing should be around twice its width and a minimum of 25mm.
- After removal of old mortar, loose material should be vacuumed and the joints flushed with water to remove dust and debris.
- Ensure raking out and removal of cementitious mortars is done carefully by hand, to a minimum depth of 25mm, with a square back, not rounded. Ensure all mortar is removed from top and bottom of joints.
- The lime pointing mortar should be sticky but not wet and should cling to the underside of an inverted trowel. Mortar used for rebuilding will be slightly wetter. Check that joints and adjacent stones are damp but not wet before re-pointing.
- 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 or pointing iron, small enough to fit into the joint without causing damage to adjoining stones.
- The thickness of mortar applied in one pass 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.
- Before pointing commences place mortar well back into any voids and pack these areas with small pieces of sandstone or similar absorbent material, such as soft burnt clay tile or brick, firmly tamped into the new mortar.
- Use pinning's of slate or sandstone as necessary in joints over 12mm wide, damping down pinning's before use & tapping gently into place to the full depth of the joints.
- When the mortar has stiffened up 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 back mortar or tamping the surface of the mortar with the end of a stiff bristle brush. With all Finishing techniques correct timing of the work in relation to hardening of the mortar is absolutely critical and real importance of this stage of the process.

Lifting and Re-bedding Coping Stones on a Parapet Wall

- Carefully assess the condition of the coping stones and the parapet wall to determine the extent of work required.
- Document the placement and orientation of each coping stone for accurate reinstallation.
- Set up scaffolding or access equipment as needed to safely reach the parapet wall.
- Lift each coping stone carefully, using appropriate lifting equipment if the stones are heavy or difficult to manage.
- Clean the underside of the coping stones, removing old mortar and debris.
- Store the coping stones safely nearby, keeping them in order for reinstallation.
- Remove old mortar and debris from the top of the parapet wall.
- Check the wall for stability and integrity, making any necessary repairs.
- Mix a traditional lime mortar, suitable for bedding the coping stones. The mortar should be compatible with the existing masonry in terms of strength, porosity, and thermal expansion.
- Apply an even bed of lime mortar on the parapet wall where each stone will be placed.
- Re-bed each coping stone in its original position, ensuring it's level and properly aligned.
- Remove excess mortar and clean the edges for a neat finish.
- Drill holes into the coping stones and the parapet wall for the resin fixings, being careful to minimize damage.
- Inject Rawl resin into the holes as per the manufacturer's instructions.
- Insert stainless steel dowels or fixings into the resin, ensuring a secure and stable fit.
- Prepare a lime mortar mix for pointing, matching the colour and texture of the original mortar.
- Carefully point around the coping stones, ensuring the mortar is well-compacted into the joints.
- Tool the joints to match the historic profile and ensure effective water runoff.
- Clean any mortar smears or residues from the coping stones and parapet wall.
- Conduct a final inspection to ensure all coping stones are securely fixed and the mortar is finished to a high standard.

Methodology for Cutting Out and Replacing Bricks

- **Initial Survey:** Carefully assess the condition of the bricks to determine which ones need replacement.
- **Recording:** Document the brickwork's layout, bond pattern, and any unique features. Photographs and sketches can be useful here.
- **Matching Bricks:** Source replacement bricks that match the original in size, colour, texture, and material. This may involve sourcing reclaimed bricks or having new ones custom-made.
- **Compatibility:** Ensure the physical properties (like porosity and thermal expansion) are
- **Cutting Out:** Using hand tools like chisels and mallets, carefully cut out the mortar around the damaged bricks. Power tools should be used sparingly, as they can cause excessive damage.
- **Extraction:** Gently remove the bricks, avoiding damage to surrounding masonry.
- **Cleaning:** Clear the cavity of all debris, old mortar, and dust.
- **Dampening:** Lightly dampen the replacement bricks if they are highly porous, to prevent them from absorbing water from the mortar too quickly.
- **Sizing:** Trim or shape the new bricks if necessary, ensuring a snug fit.
- **Mortar Mix:** Prepare a lime-based mortar mix that matches the old mortar in strength, colour, texture, and composition.
- **Testing:** It's advisable to test the mortar mix on a small, inconspicuous area or use samples to ensure compatibility.
- **Applying Mortar:** Apply a layer of mortar to the cavity, then butter the end of the brick with mortar before placing it.
- **Placement:** Carefully position the brick in the cavity, tapping it into place with a mallet. The brick should be aligned with the existing masonry.
- **Jointing:** Ensure that the mortar joints match the existing ones in width and profile.
- **Tooling Joints:** Once the mortar starts setting, tool the joints to match the surrounding areas.
- **Cleaning:** Remove any excess mortar from the brick faces.
- **Curing:** Protect the new brickwork from extreme weather conditions during curing. Lime mortar requires adequate time to carbonate and harden.
- **Covering:** Use hessian cloth or polyethylene sheeting if needed to provide protection.
- **Quality Check:** Inspect the replaced bricks to ensure they are properly integrated into the existing masonry.
- **Colour Matching:** If required, use colour washes or shelter coats to blend the new bricks with the old ones.
- **Minimal Intervention:** The focus should be on replacing only those bricks that are structurally unsound or severely deteriorated.

- Conservation Ethics: The work should aim to preserve as much of the original material as possible and be reversible.
- Skilled Craftsmanship: The work should be carried out by professionals experienced in working with historic buildings.