

Repointing lime mortar joints

Heritage construction skills



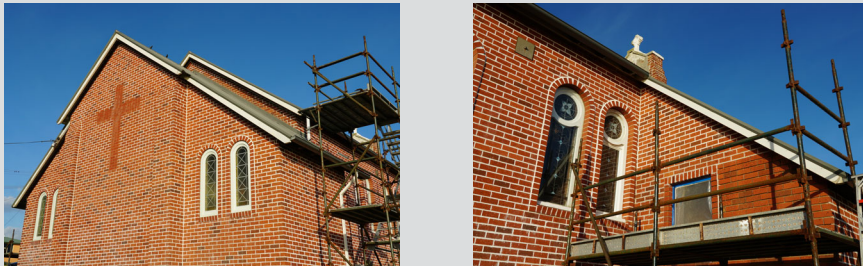
Keystone
TASMANIA

REPOINTING LIME MORTAR JOINTS

In this case study, John Stronach (Builder) and Ray Wiltshire (Heritage Trade Skills Presenter) describe the process of repointing lime mortar joints in brickwork.

Context

John and Ray are undertaking mortar repairs and brick repointing at the Star of the Sea Church (Stanley).



Star of the Sea Church (Stanley)

Advantages

There are a few key advantages of using permeable lime mortar to repoint joints in brickwork:

- It enables the brickwork to 'breathe' (i.e. it allows moisture to move and evaporate through the joints)
- It enables the brickwork to tolerate and absorb small amounts of movement without cracking
- It conserves and protects the character, integrity and heritage value of the brickwork.



Repointing lime mortar joints in brickwork

Challenges

There are a number of challenges associated with using lime mortar to repoint joints in brickwork:

- Analysing and matching the original mortar
- Removing salt from the bricks
- Ensuring there is sufficient moisture in the bricks
- Ensuring the mortar doesn't dry too quickly.

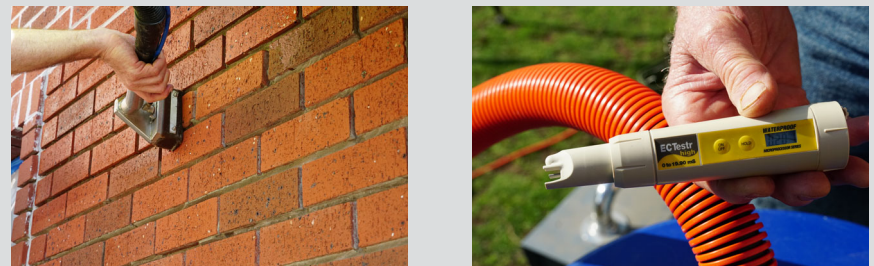


Gathering a sample of original mortar for analysis

Solutions

There are a few handy 'tricks of the trade' when using lime mortar to repoint joints in brickwork:

- Engage a specialist to analyse and match the original mortar
- Use a captive head-washing system to remove salt from the bricks
- Use a conductivity meter to confirm the ratio of remnant salt in the bricks before repointing
- Always damp down brickwork before, during and after repointing
- Avoid repointing in hot and/or windy conditions.



Captive head-washing system and conductivity meter

REPOINTING LIME MORTAR JOINTS

Step 1 - Planning

- Photograph brickwork in original state for future reference
- Determine extent and cause of mortar deterioration
- Analyse mortar to determine an appropriate colour and composition
- Obtain historical data (e.g. mortar used in similar structures)
- Obtain project data (e.g. work instructions and specifications)
- Determine signage and barricade requirements.



Determining extent of mortar deterioration

Step 2 - Preparing lime mortar

- Select tools and equipment (e.g. safety goggles, protective clothing, mortar board, buckets, shovel, watering can, forced action mixer)
- Select materials (e.g. coarse and fine sand, quicklime, water)
- Pour and mould an appropriate ratio of sand and quicklime onto the mortar board (e.g. three parts sand to one part quicklime)
- Carefully pour an appropriate ratio of water over the sand/quicklime mixture (e.g. one part water to two parts sand/quicklime)
- Allow the sand/quicklime mixture to slowly absorb the water (*this is known as 'sand-slaking'*)
- Leave the mixture to steep overnight
- Once the mixture is effectively slaked, shovel it into the forced action mixer and mix for 20-30 minutes, adding water as required
- Pour into storage buckets
- Label and date the storage buckets
- Allow to cure for approximately two to three months.



Preparing sand-slaked lime mortar

Step 3 - Preparing joints for repointing

- Select tools and equipment (e.g. plugging chisel, scraper, raking tool, score and snap knife, hammer, captive head-washing system, conductivity meter, hose)
- Place a strong plastic drop-sheet and other floor protections at the base of the brickwork
- Carefully remove decayed mortar
- Rake out joints to an appropriate depth (minimum 20-25mm)
- Remove loose dirt and salt with a captive head-washing system
- Confirm ratio of remnant salt with a conductivity meter
- Damp down brickwork and joints with a hose.



Preparing joints for repointing

"Removing decayed mortar is a delicate job"

Ray Wiltshire (Heritage Trade Skills Presenter)

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Step 4 - Repointing lime mortar joints

- Select tools and equipment (e.g. hawk, pointing trowel, finger trowel, gauging trowel, striking iron, water sprayer)
- Add ground slag to lime mortar and mix to a workable consistency
- Damp down brickwork and joints (before, during and after pointing)
- Start from the top of the brickwork and work downwards
- Compact lime mortar into joints (with force) to ensure a good bond
- Remove surplus lime mortar from brickwork
- Discuss ongoing damping with property owner (the bricks and joints must remain damp for a few days to allow lime mortar to cure)
- Photograph brickwork in finished state for future reference.



Repointing lime mortar joints

Result

- The lime mortar must be stable and durable (i.e. it must have *cured*)
- The pointing must look clean and sharp, and it must maintain the authenticity, character, integrity and heritage value of the property.



Deteriorated mortar joints



Repointed lime mortar joints

Background

This case study supports the development of heritage trade skills in Tasmania. It is part of a broader set of support materials that have been developed by Keystone Tasmania.

Acknowledgements

Special thanks to John Stronach, Ray Wiltshire, Father Alexander Obiorah and the Circular Head Parish.

Want to learn this heritage trade skill?

If you are interested in learning how to repoint lime mortar joints, contact Keystone Tasmania to register your interest in a training course.

❖ 03 6223 7804

❖ email@keystone.com.au

❖ www.keystone.com.au