

LIME MORTAR WORKMANSHIP & MATERIALS**I GENERALLY**

- 1.1 All goods required for the works shall be in accordance with the relevant British Standards specification and all work shall be carried out in accordance with current Codes of Practice and current Trade Association Publications.
- 1.2 The Contractor shall pay due regard to established practice in the field of traditional conservation repair, and construction, and shall observe, perform and complete the works in a manner, using materials and techniques generally accepted as conforming to the standards acceptable by a reasonable interpretation of current conservation practice.
- 1.3 All materials described shall be of traditional type and where there is doubt the Contractor shall seek further guidance from the Architect
- 1.4 All timbers employed in the work unless otherwise specifically noted shall be pressure injected pre-treated against decay and attack, and the Contractor shall supply certificates to that effect if requested.
- 1.5 Generally, unless otherwise specified all fixings shall be copper, phosphor bronze or stainless steel. Ferrous fixings and component shall only be used where specifically called for.
- 1.6 All mortar and plaster mixes shall be made up as scheduled and directed on site and samples of the stuff and samples of the work in place shall be provided for approval, including adjusting and remaking as required.
- 1.7 The specification and drawings detail the works to be undertaken under respective trade or skill discipline. In all cases the generally recognised standards shall be observed.

2.0 TEST PANELS/BISCUITS – LIME MORTAR GENERALLY

- 2.1 Once safe access allows but prior to re-scheduling and the formal commencement of work, test mixes of lime based mortar and plaster should be formed on non-fixed test panels, this ready for approval by the Architect.

3.0 REMOVAL OF MORTAR FROM BRICKWORK GENERALLY

- 3.1 Improper cleaning can lead to deterioration of the masonry units and the dislodging of immediately adjacent mortar. New mortar joints in the vicinity are especially susceptible to damage until fully cured (2-3 months),
- 3.2 Loose mortar is to be removed using a stiff natural bristle or nylon brush, using plain water if required.
- 3.3 Mortar that has hardened should be removed with care with a wooden paddle or, if necessary, a chisel. All work is to be completed by hand.
- 3.4 Complete a small test area in a concealed location and allow for its review by the Architect before proceeding further.

4.0 REPAIRING/ RENOVATING/ CONSERVING MASONRY OR CONSTRUCTING NEW MASONRY**GENERALLY / PREPARATION****4.1 RE-POINTING OF FACING BRICKWORK**

- Repairs to immediate working area and as required.

4.4 ADVERSE WEATHER

- Frozen materials: Do not use. Do not construct new masonry or re-point historic masonry in temperatures below or when temperatures may fall below 5 degrees centigrade.
- Air temperature: Do not bed masonry units or re-point:
 - In cement gauged mortars when at or below 3°C and falling or unless it is at least 1°C and rising (unless mortar has a temperature of not less than 4°C when laid and the masonry is thoroughly protected).
 - In hydraulic lime:sand mortars when at or below 5°C and falling or unless it is at least 3°C and rising.
 - In non hydraulic lime:sand mortars in cold weather without approval.
- Temperature of the work: Maintain above freezing until mortar has fully set.
- Rain and snow: Protect masonry by covering during precipitation and at all times when work is not proceeding.
- Hot conditions and drying winds: Prevent masonry from drying out too rapidly.
- New mortar damaged by frost, heavy rain or high temperatures: Rake out and replace.

5.0 POINTING / REPOINTING**5.1 PREPARATION FOR REPOINTING**

- Removing mortar:
 - Work from the top of the working area downwards.
 - Remove carefully and without damaging adjacent masonry, arises or widening joints.
- Recess for re-pointing: Form a neat recess of depth not less than 25mm. When mortar beyond this depth is loose and friable and/ or cavities are found seek instructions.
- Dust and loose debris: Remove and dampen joints to control suction as necessary.

5.2 POINTING GENERALLY

- Preparation of joints: As per section 5.1 above.
- Mortar: As per section 7 below.
 - Mix: As per section 7 below.
- Mix: 1 : 3 Natural Hydraulic lime (St Astier) NHL 2: Sand. New work to use NHL 3.5 lime
- Sand source / type: 50/50 fines and washed 3.4mm sharp/grit. Sand of a pale colour but subject to approval by the architect.
 - Joints: Tamped back with a stiff bristle brush over irregular masonry or flush for bricks.

5.3 POINTING WITH TOOLS/ IRONS

- General: Press mortar well into joints using pointing tools/ irons that fit into the joints, so that they are fully filled.
- Face of masonry: Keep clear of mortar. Use suitable temporary adhesive tape on each side of ashlar joints where necessary. Finish joints neatly.

5.4 FINISH TO JOINTS

- General: After the initial set has taken place, joints are to be TAMPED not brushed, to remove laitance / excess fines and give a coarse texture.

6.0 PREPARATION OF MORTARS FOR POINTING**LIME:SAND MORTARS****6.1 MIX PROPORTIONS**

- Specification: Proportions and special requirements for mortar materials are specified within section 5 above.

6.2 SAND FOR LIME:SAND MORTARS

- Type: Sharp, well graded.
 - Quality, sampling and testing: To BS 882 or BS 1200 as appropriate.
 - Grading/ Source: As specified elsewhere in relevant mortar mix items.
 - Samples of sand to be provided to the Architect prior to commencement of work.

6.3 STORAGE OF LIME:SAND MORTAR MATERIALS

- Sands and aggregates: Keep different types / grades in separate stockpiles on hard, clean, free-draining bases.
- Ready prepared non-hydraulic lime putty: Prevent drying out and protect from frost.
- Non-hydraulic lime:sand mortar: Store on clean bases or in clean containers that allow free drainage. Prevent drying out or wetting and protect from frost.
- Bagged hydrated hydraulic lime: Store raised off the ground in dry conditions.

6.4 MAKING LIME:SAND MORTARS GENERALLY

- Batching: By volume. Use clean and accurate gauge boxes or buckets.
- Mixing: Mix materials thoroughly to uniform consistency, free from lumps.
- Contamination: Prevent intermixing with other materials, including cement. Keep plant and banker boards clean.

6.5 READY TO USE HYDRAULIC LIME: SAND MORTARS

- Manufacturer: Singleton Birch Limited; Tel: 01652 686000
- Product reference: St Astier Naturally Hydraulic Lime.
- Strength: NHL 2 for masonry work, NHL 3.5 for new brickwork.
- Mix: 1 : 3, lime : washed sharp sand for general wall areas.
- 1 : 2.5, lime : washed sharp sand for exposed surfaces that face prevailing winds and rain.

6.6 KNOCKING UP HYDRAULIC LIME:SAND MORTARS

- Knocking up before and during use: Achieve and maintain a workable consistency by compressing, beating and chopping. Do not add water.
- Equipment: Roller pan mixer or submit proposals.

7.0 MORTARS**7.1 MORTAR MIXES**

- Specification: Proportions and additional requirements for mortar materials are specified above.

7.2 SAND FOR LIME: SAND MASONRY MORTARS

- Type: Sharp, well graded.
 - Quality, sampling and testing: To BS EN 12620.
 - Grading: As detailed above.
 - Source: Contractors choice to be approved by the Architect.

7.3 MAKING MORTARS GENERALLY

- Batching: By volume. Use clean and accurate gauge boxes or buckets.
- Mix proportions: Based on dry sand. Allow for bulking of damp sand.
- Mixing: Mix materials thoroughly to uniform consistency, free from lumps.
 - Mortars containing air entraining admixtures: Mix mechanically. Do not overmix.

7.4 ADMIXTURES FOR SITE MADE MORTARS

- Air entraining (plasticizing) admixtures: To BS EN 934-3 and compatible with other mortar constituents.
- Other admixtures: Submit proposals.
- Prohibited admixtures: Calcium chloride, ethylene glycol and any admixture containing calcium chloride.

7.5 MAKING HYDRAULIC LIME: SAND MORTARS

- Mixing hydrated hydraulic lime: sand: Follow the lime manufacturer's recommendations for each stage of the mix.
- Water quantity: Only sufficient to produce a workable mix.

7.6. HYDRAULIC LIME MORTAR FOR REPOINTING

To the areas indicated carefully rake out areas of loose, perished, friable root fibre infested or otherwise defective general pointing using hand tools only. Angle grinders and other mechanical tools are not permitted.

Take particular care not to damage the arrises or to widen or enlarge the joint width. Rake out the mortar to a depth of at least 25mm and clean out all debris and loose stuff, using as necessary air brushes to ensure complete removal.

Dampen the joints and flush out with a clear biocide and prepare for re-pointing.

Make up samples of mortar for approval and carry out trial areas for experimental purposes. Adjust, re-make and agree as necessary with the Architect. Remove rejected samples and re-prepare for final work.

Pointing mortar shall be composed of 1 part NHL 2 hydraulic lime and 3 parts aggregate. New brickwork shall employ NHL 3.5 lime.

The aggregates shall be sharp grit sand washed free of loam and clay with a good proportion of sharp 3 - 4mm grit so as to aid adhesion. Where directed and for fine jointing the proportion of grit may be reduced and finer sharp washed sand substituted to which may be added a small proportion of stone dust.

Samples of mixed aggregate shall be put up for approval, and after agreement the mix shall be recorded and thereafter strictly adhered to unless varied by written instruction.

The mortar shall be properly mixed, adding the minimum amount of mortar and used within 2 hours of mixing.

Place the mortar into the prepared joints, packing the joints solid and driving the stuff fully home so as properly and fully to fill the joint.

Ensure that the joint is full by using a wood or metal plate to compact the material into the void. Fill the joint to within 2mm of the face or as directed, and after the initial set has taken place lightly go over with a stiff brush to give a stippled finish.

During periods of rapid drying, either by general temperature, sunlight or wind ensure that the joints are prevented from rapid drying by spraying with fine water sprays and covering with sheets of wet Hessian. Ensure that drying takes place steadily over a period of not less than 7 days.

Eroded, perished or root fibre infested fine or rubbed joints are to be raked out to a depth of at least 25mm using either specially made narrow bladed tools, or hacksaw blades, with particular care taken to avoid any damage to the arrises of the existing stone. Joints are to be blown clear of dust and washed out with a clear biocide prior to repointing.

To fine ashlar and similar joints provide temporary plastic strips above and below the joint being repointed so as more accurately to place the mortar and drive fully home into the joint using either a metal plate or narrow bladed pointing tool.

