

## External Natural Hydraulic Lime Renders and Interior Plasters

### General information

**Background Preparation:** follow good working practices, ensuring that the background is thoroughly clean. If removing vegetable growth using biocides check that these would not react with the render causing stains. If the background is saturated check for cracks or other causes of water penetration, (faulty gutters or drainpipes, cracks in the joints of terraced roofs etc.). Causes of damp should be remedied and cracks should be cleaned out, (packed with low fire clay tiles or slate if necessary) and sealed with an NHL pointing mortar and allowed to cure for 1 or 2 days before rendering starts. Where there has been prolonged water penetration through the core of the wall it might be necessary to grout the cavity. Always use NHL grouts (see separate specification).

**Suction Control:** if necessary, apply sufficient water to reduce excessive suction, especially on bricks and porous stone. On many occasions this is done the day before, if necessary several times with the last damping just before application starts. Apply water starting at the top of the structure.

Old bricks require more water than new ones. The top of the structure will dry out before the bottom. In base coats this means that scouring back and keying of the lower section might have to be done later than the upper section. **Always dampen down before applying subsequent coats**

**Keying:** Sometimes joints are raked back (normally 10mm), this is not always necessary with NHL renders unless the background is very smooth and not porous. Stipple or Spatterdash coats can provide adequate keying to the background. Criss-cross patterns using a pointed wooden lath are much preferred to combing when a key is being provided to the scratch coat.

**Repointing before Rendering:** if this is necessary it should be done with the same type of mortar used for the base coat in two coat work or the undercoat in three coat work.

**Dubbing Out:** on defaced surfaces or in areas with a large amount of damaged joints it might be necessary to apply a dubbing out coat (using a 4mm down well graded aggregate) to provide a relatively level surface. In most cases this will be sufficient and joints or holes will not have to be filled with rubble unless quite deep. When a dubbing out coat is used let it set sufficiently (8-10 hours) before keying it. The most efficient way to apply a dubbing coat is by harling. The strength should, as always, be compatible with the type of background but a strong mix is recommended (1:1.5 or 1:2) once the correct NHL has been chosen.

Apply base coat or scratch coat after approx. 2 days (more if very deep recesses have been filled) depending on weather conditions affecting drying out time.

**Setting Properties of NHL Mortars:** The setting properties of NHL mortars require much lesser time for protection against adverse weather conditions than fat lime mortars. Precautions are however necessary and, if in doubt, Womersley's Limited will be able to advise. The following are the main recommendations.

Mortars made with	Protect from frost, heavy rain, strong wind or direct sun for a <u>minimum</u> of: -
NHL 5	48 hours
NHL 3.5	72 hours
NHL 2	96 hours

The preferred form of protection is damp hessian cover which, with re-damping, will also contribute to curing the mortar.

Plastic sheeting is effective against rain but should not be touching against fresh work. If too tight they will also provoke trapping of condensation. Plastic sheets, unless they are bubble wrap, will not protect against frost.

Frost protection should be applied even if frost is not occurring at the moment of finishing the day's work but is forecasted during the night or within a short time (see suggested protection periods above) from completion of work. Work should not start in frost conditions or with temperatures below 5°C. In working with NHL 2 or in rendering with fine finishing coats, this should be 8°C.

Protection from drying winds or direct sun should be provided by using shading sheets or debris netting on scaffolding.

**Reworking:** NHL mortars can be reworked (up to 24 hours with NHL 3.5 and NHL 2). This is due to the absence of cement or gypsum in the lime and due to the minimal quantity of Aluminates. Reworking diminishes potential waste, allows preparation of some mortar to be left overnight so that a quick start can be made in the morning. When preparing an NHL mortar for later use, place it on a board after mixing and cover it to avoid contact with possible rain or sun. When re-mixing add the least possible water. In some cases no water at all. The plasterer's good judgement is required.

**Coloured NHL Mortars:** use only pure mineral or earth oxides in the measure of max. 3% and 6-7% of the weight of the binder respectively. Excessive amount of pigment will cause stains. Make sure that you homogenise the pigment and the lime well. For ease of application Womersley's Limited can supply pre-mixed pigmented NHL mortars with a wide range of colours

**Pigmented NHL Paints** are available in a wide range of colours. Preserving the beautiful tone of lime washes but with added strength and durability. Life span can be over 10 years, depending on the exposure. NHL paints can be washed to remove dirt (do not use pressure spraying). Use NHL paints within 24 hours from first preparation, whisk well before and during use. Always test coloured NHL mortars or paints on a small area. Let it dry for approx. 24 hours to check colour. Womersley's Limited also provide traditional lime wash.

### **THREE COAT WORK (For details of background preparation, suction control, keying and dubbing out see above)**

**A Stipple or Spatterdash Coat (optional):** can be used on strong, smooth and variable backgrounds. The normal thickness varies between 3 and 5 mm. This coat has to provide sufficient bonding to support the remaining coats of render. Use a strong mix (1:1.5 preferably). On soft or weak background use 1:2 or 2:5. Successive coats must be weaker than this coat. The thickness of the first coat depends on the nature of the background, the overall thickness required on the render and the keying function. On smooth cement surfaces use an SBR addition and cast on a first cast (stipple) to ensure good keying. If insufficient key is provided by this coat it will be unable to cope with the stresses created by subsequent coats.

**Undercoat/Scratch Coat:** to be applied 2 days (or more, depending on atmospheric conditions) after completion of the stipple coat. Its strength should be marginally less than the first coat. Thickness can vary according to the overall thickness required but it is normally between 10 and 15 mm. It must not be applied over 20 mm thick. If this is required it should be done as an extra coat (two intermediate coats) each not above 20 mm. The thicker the intermediate coats the longer the waiting time before each application. Provide a criss-cross key, creating 25-35 mm diamonds, with a pointed wooden lath.

**Rendering on Different Materials:** Where different materials meet, and where there are timber lintels and other changes in the background material it is necessary to insert a metal mesh at the joint (at least 100 mm. each side). Consider the different suction characteristics of the background material. Curing is of extreme importance. 10% Prompt Natural Cement can be added to speed up the key between the lath and the plaster. Hair or Alkali Resisting Glass Fibre can be added to the first coat applied to metal lath to increase the bond and tensile strength.

**Float Coat:** to be applied 3-4 days (or more, depending on atmospheric conditions) after completion of the scratch coat. Its strength should be less than the previous coat. The thickness should be kept between 10 and 15 mm.

**Ensuring a Level Surface:** to achieve a uniform and level surface fix vertical timber battens on the wall at 2-2.5 m. interval. If the wall is uneven use spacers and check that battens are straight with a plumb level. Screed off excess mortar between battens with a wooden straightedge spanning between the battens. When battens are taken down, fill in strips with the same mortar. An alternative is to make running screeds 10 cm. wide at regular intervals using the battens as described above and applying the float coat in between them.

Scour back and key with a devil float after initial setting. Check for shrinkage during the first 2 days and, if necessary, lightly dampen the relevant area, scour back and re-key. Do not apply a finishing coat for 3-7 days, until undercoat is adequately firm and any small amounts of shrinkage are complete. This is especially critical on timber lathed ceilings.

**Finishing Coat:** Use NHL 3.5 or NHL2, 5mm max. for smooth or light textured finishes, 7-8 mm for coarse external finishes (tyrolean, roughcast etc.) This can be applied in two thin coats immediately after each other. Stock up finishing sand in one go, especially if no colouring or paint finish is being used. The mortar should always be weaker than the preceding coats, consult Womersley's Limited if in doubt. Interior work can be finished with a fat lime mortar mixed at a ratio of 1:1, with a fine silica sand.

**Note:** in all renders, coats should be applied firmly to exclude air and any excessive moisture. Suction needs to be carefully controlled at all times.

**Reworking:** all NHL mortars can be re-worked due to the absence of cement, gypsum and excessive aluminates in the binder. Please consult your Womersley's Limited.

## **Plastering with NHL 2**

NHL 2 is a Natural Hydraulic Lime that contains 45% free lime. It assures a traditional lime finish with the added strength and durability of NHL products.

Background preparation: clean well. Rake out joints to provide a key (at least every other joint). Clear any loose mortar. Wet background well (old bricks will absorb a lot of water) to control suction and minimise shrinkage.

**Base Coats:** 1:2 ratio. NHL 2 : well graded sharp sand 3mm down to 0.075. Thickness: 10mm approx. Wait until initial set has taken place and when mortar has picked up enough scour back, on first coat. In three coat work key in criss-cross pattern with pointed wooden lath, on the final float coat use a devil float to form a key, to accept finishing coat

Before applying subsequent coats wait for a strong enough set (4-6 days) dampening the surface before the next application

Finishing coat: 1:2.5 ratio with finer well-graded sand (1.18mm down to 0.075 mm) Thickness: 3-4mm. A wooden float finish will accept painting better. Do not induce quick drying by heating the area. Check for shrinkage for the first few days. If necessary cure minor shrinkage by spraying a light water mist or applying a thin coat of Lime Wash .

**Plastering on Wooden Lath:** Wood lath backgrounds should be well wetted the day before, and again 2 hours before work proceeds. The constant principal is that at no time should the lath be so dry that it will absorb moisture rapidly from the first coat when it is applied. If the wall becomes dry in patches, these areas should be damped again to ensure uniform adhesion.

Hair must be added to all but the finishing coat, (alkali resisting fibres in the case of metal lath). The mortar for the first coat should be stiff enough to hold up when laid, but sufficiently plastic to squeeze easily through gaps between the laths. The first coat should be laid in a diagonal direction across the lath. After the surface has steadied up provide a criss-cross key with a pointed wooden lath. The first coat should be mixed at a ratio of 1:2 and laid to approx. 12mm. Subsequent coats are applied and looked after in the same way as is described above.

If you have any questions or queries please do not hesitate to contact Womersley's Limited on Tel 01924 400651 or call in at our workshop.