

Introduction to Lime in Historic Buildings



A pilot programme run by the
North East
Heritage Skills Project

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About the Project

The North East is home to 12,148 listed buildings. A high proportion of these, 8.5% of Grade I and Grade II* listed buildings are at risk. This is significantly above the national average of 3.6% and is the highest amongst the English regions.

Our regional heritage is irreplaceable and requires the highly trained skills of craftsmen and women who will maintain and care for it appropriately. However, these essential skills are in decline due to the fact that fewer and fewer people are being retained or trained within the region.

It is estimated that without intervention, in fifteen to twenty years heritage skills such as drystone walling, blacksmithing, millwrighting, joinery and stone masonry could disappear completely, placing an increased pressure on the provision of suitable repairs to these buildings.

The North East Heritage Skills project, initiated by the regional Historic Environment Forum, hosted by the North of England Civic Trust and funded by the Heritage Lottery Fund and English Heritage is working to identify the shortages and fill the gaps with innovative solutions.

This is done through the creation of working partnerships, identifying common goals and organising and publicising heritage events across the region.

The project has identified four pilots to undertake in its first year;

- Heritage Skills Days Programme
- Heritage Lottery Fund Bursaries provision across the North East
- Training the Trainer Programme for the NVQ III in Heritage Skills starting September 2007
- Regional Web Pages on the National Heritage Training Group's website www.nhtg.org.uk

Alongside the pilots are other projects such as events at Beamish and Bowes Museums, Information and Guidance sessions for people going self employed in Heritage Skills, Practical Workshop events, Heritage Skills Fair at Gibside in 2008 and much more.

If you would like to be kept in touch with the project or would like to become involved please contact;

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A North East Historic Environment Forum initiated project
Hosted by the North of England Civic Trust
Funded by the Heritage Lottery Fund and English Heritage

Meet the Team

Andie Harris – Heritage Skills Co-ordinator, North East Heritage Skills Project

Andie is responsible for raising awareness of heritage skills in the region and the co-ordination and development of the Heritage Skills Project. The aim of the project is to act as the catalyst and co-ordinator for the north east regional heritage skills industry, creating opportunities for all to participate in focused activities and events, through collaborative partnership working.

Nev Kirby – Building Manager, National Trust (North East and Yorkshire)

Nev has worked for the National Trust for 14 years. As part of his position of Building Manager Nev heads up the department responsible for maintaining the condition of National Trust properties in Yorkshire and the North East and looks after day to day repair, maintenance and projects for 3000 built structures. Nev is also an incorporated member of the Chartered Institute of Building.

John Ritchie MBE – Retired Clerk of Works, National Trust (North East and Yorkshire)

John worked for the National Trust for over 33 years before his retirement in October 2005. As Clerk of Works for the region John acquired many traditional skills, primarily in stone masonry and general building, including working with lime. John is currently back helping the National Trust as a volunteer, undertaking condition surveys on properties in the region. John was awarded an MBE in 2003 for services to the community and conservation.

Jason Ritchie - Project Building Surveyor, National Trust (North East and Yorkshire)

Jason started his working life in private building practice before joining the National Trust as a stonemason in 1990. As part of the Regional Building Team based at Wallington Jason worked on every property throughout the North East for 11 years until he landed the job as Building Technician based at the Scot's Gap office. From 2004 Jason is currently employed as a Project Building Surveyor at Scots' Gap.

Tony McNally – Works Manager, Historic Property Restoration Ltd

Tony has worked for Historic Property Restoration Ltd for the last 10 years, starting as a banker mason, carving, and fixing stone on many ancient monuments. He started a stonemasonry apprenticeship in 1980, and after working all over the country, decided to concentrate on the most interesting aspect of masonry, restoration. Tony is now a works manager, estimating and overseeing projects throughout the northern region.

Ray Stockdale – Technical Manager, English Heritage (North East)

Ray has worked for English Heritage and its predecessor Dept of the Environment Ancient Monuments Branch for the past 35 years. He started his career as an apprentice Stonemason at Scarborough, and then served a second apprenticeship at Fountains Abbey with the Department of the Environment, learning conservation skills and techniques.

Now part of the maintenance team for properties in the North East Region for English Heritage responsible for day to day maintenance and projects.

Introduction to Lime in Traditional Buildings

Historic background

Lime has been used in the construction and finishing of buildings for at least 4000 years. Before the mid 19th century local sources of lime were almost invariably used, although some lime was transported over greater distances by sea. Geology varies and, historically, local limestones (the raw material burned to make lime) produced a range of different types of lime, from relatively pure to eminently hydraulic. Many different types of lime were available, with different strengths and weathering properties.

Why use lime?

Why should we continue to use lime in the late twentieth and early twenty-first centuries? As a construction mortar, from mass foundations to walls, arches and vaults, lime is resilient and flexible, adjusting to minor settlement and accommodating thermal movement. It is ideal for structural repairs to lime-built masonry buildings.

For repairs and repointing of masonry work, lime mortar can be matched to the density of the stone (or brick), to minimise the risks of salt damage and stone decay. The use of lime mortar in wall cores, in joints and on the face of the wall assists in the exclusion of driving rain by 'mopping up' free water before it can penetrate to the building interior and encouraging re-evaporation to the outside air. As an external weathering coat, lime mortars in the form of harling or rendering, can provide a more effective coating than cement-based materials.

Good lime coatings do not suffer from the micro-cracking almost always present in cement-based coatings and, being resilient and flexible, they are also much less likely to develop cracks in response to minor movements of the underlying masonry. The porous nature of the material means that any minor cracks which do occur are less likely to admit water, and may even heal over a period of time by the slow action of dissolution and recrystallisation of lime.

Lime mortars are also used at roof level for bedding stone or tile ridges, for forming fillets and for parging slates and pantiles. Internally, lime mortar finishes (lime plaster) are breathable and non-toxic. They should be used without vapour barriers and will minimise condensation and promote a comfortable, healthy internal environment.

Lime can also be used for floors in the form of lime concrete or lime-ash flooring and for deadening between floor joists to reduce sound penetration and increase fire resistance. Limewash finishes, internally and externally, complete the picture and complement the breathability of the construction as a whole.

Definitions

Non hydraulic lime	= pure lime	= fat lime	= air lime
Hydraulic lime	= lime containing reactive silicates (hydraulic = works by action of water, will set in water)		= water lime
Hydrated lime	= treated with water		= slaked lime

(slaked, or hydrated, lime may be in the form of a dry powder or, with the use of a greater quantity of water during slaking, in the form of putty.) (The form of commercial hydrated lime available from builders merchants and used as a plasticiser in cement: lime: sand mortars is not suitable for making lime mortars.) Take care not to confuse 'hydraulic' and 'hydrated' lime - the results will be disastrous!

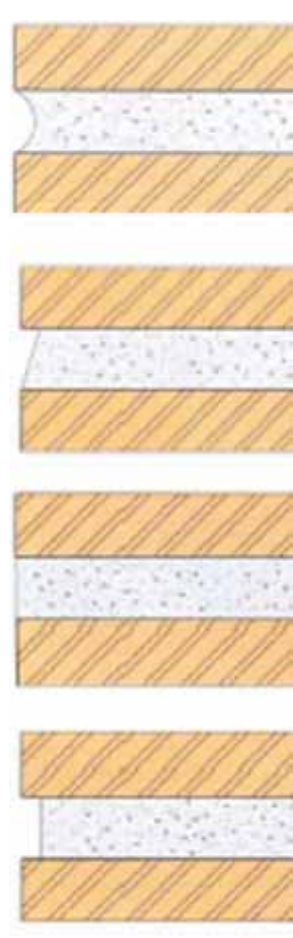


The principal applications for lime mortars are:-

Re-pointing

If original lime mortar has decayed or been replaced by unsuitable materials good quality re-pointing in traditional lime mortar will enhance both the appearance and the weathering performance of your building. Unfortunately re-pointing, more than any other maintenance operation is frequently poorly executed using inappropriate materials. The performance of traditional masonry buildings depends on the ability of the building fabric to transmit moisture vapour. Both stone and mortar naturally absorb a certain amount of water and, importantly, allow it to dry out again. If this process is inhibited or thrown out of balance by the use of impermeable mortars a number of problems may be

encountered including accelerated stone decay and water penetration. In addition, modern cement mortars appear harsh and unsympathetic in conjunction with traditional stonework.

Mortar Joint Profiles	
<p>The long-term performance of the brickwork is highly dependant on the correct mortar joint profile for the efficient shedding of rainwater. Brickwork that remains saturated is more susceptible to frost damage. The choice of joint profile should therefore be based on performance criteria as well as aesthetic considerations.</p> <p>These are the four most commonly used profiles.</p> <p>1. Curved recessed (bucket handle) An efficient joint with a softer appearance.</p> <p>2. Weather Struck An efficient and attractive joint giving the shadow effect of a recessed profile but better weathering properties.</p> <p>3. Flush A common profile that is efficient in terms of shedding water if tooled, but will alter dramatically the overall colour of the brickwork.</p> <p>4. Square recessed. An attractive profile- but it should only be used in a sheltered location. It is not recommended for free-standing walls or any exposed situations. The depth of recess should be kept to a minimum necessary to achieve the desired appearance, but should not be greater than 3-4mm. Recessed joints should not be used where there is danger of saturation occurring.</p>	 <p>The diagram illustrates four mortar joint profiles, labeled 1 through 4. Each profile is shown as a cross-section of two bricks (represented by orange hatched blocks) with mortar (represented by a light blue speckled material) in between. Profile 1 is a curved recessed joint, also known as a bucket handle joint, where the mortar is recessed into a smooth, curved shape. Profile 2 is a weather struck joint, where the mortar is recessed into a flat, rectangular shape with a shadow effect. Profile 3 is a flush joint, where the mortar is flush with the surface of the bricks. Profile 4 is a square recessed joint, where the mortar is recessed into a square shape.</p>

External lime coatings

Lime harling and to a lesser extent, flat renders, were widely used as external protective and decorative coatings. Harling was frequently applied to rubble masonry, first brought out to a level surface with pinnings and mortar. The technique of casting material onto a wall surface in the form of harling was widely used and some harling was finished by pressing back to achieve a flatter surface. Where a more formal finish was required, often in urban areas, a trowel applied lime render, or stucco, might be used, lined out to imitate ashlar stonework. External coatings of lime mortar are still the most effective method of weatherproofing solid masonry walls. The lime mortar in the form of harling or render forms a permeable coating that holds up water and prevents wind-driven water penetration. The permeability of lime-based materials allows moisture to evaporate from the masonry, and reduces problems of condensation.

Internal lime plaster

In traditional wall construction, lime plaster, either on wood lath or directly onto the masonry, provides a healthy breathable finish. For the repair of lime plasterwork, including decorative work, the use of similar materials is essential. Most early materials and techniques can be matched for repair and conservation work. Later decorative work often incorporates a gauging of gypsum. Lime plaster also possesses good thermal insulation properties.

Limewash

Limewash is a traditional external and internal finish for many stone and brick buildings, applied either directly onto the masonry surface or, more commonly, to a coating of lime harling, render or plaster. A good quality limewash, well applied and cured, will last for many years. Properly applied, limewash will penetrate the surface of a lime render or harling and form a bond with this backing. Limewash will successfully fill small cracks in renders and harling, and subsequent small fissures developing over time will be sealed by the redeposition of lime. As a vapour permeable material, limewash is the most effective and appropriate finish available for traditional buildings.



Guide to Mortar Specification

Non-Hydraulic Lime

For building purposes, high calcium, non-hydraulic quicklime can be used on-site for making 'hot lime' mortars. More commonly however, quicklime is slaked either to a dry hydrate or lime putty. In hydrate form, non-hydraulic lime is suitable for use as a plasticiser in a cement mortar. Lime putty is eminently suitable for mortars and particularly internal plasterwork when knocked up with sand and hair, but is not always suitable for outdoor use, particularly in environments with high relative humidity, as this affects the materials ability to carbonate. The required proportions of lime: sand will vary depending of the grading and void ratio of the specific sand.

Here at SLCT, we always recommend lime putty which has been matured for a minimum of 90 days prior to use, and has a minimum bulk density of 1.35kg/ litre. Lime putty with a lower bulk density will have a higher water and lower lime content—excess water means greater drying shrinkage. Lime putty is normally available both by the tonne and in 25kg bags or tubs. Well made and properly cured non-hydraulic lime mortars may readily achieve strengths of up to 3N/mm² over a period of time. BS EN 459-1 covers building lime classifications. In the UK lime putty is manufactured by, and available through, a network of specialist suppliers.

Natural Hydraulic Lime

Natural Hydraulic Limes (NHL's) are available only as a dry hydrate, commonly in 25kg bags, although modern silo systems are becoming available for large scale works. Classifications for hydraulic limes in BS EN 459-1 are based on minimum strength requirements;

Feebly hydraulic limes	NHL 2	2 N/mm ² @28days
Moderately hydraulic limes	NHL 3.5	3.5 N/mm ² @28days
Eminently hydraulic lime	NHL 5	5 N/mm ² @28days

Whilst strength development is relatively fast for cement mortars, lime mortars strengthen over a much longer period of time—this must be considered when specifying such materials. Natural Hydraulic Limes are produced primarily in Continental Europe, and are available through a network of specialist suppliers in the UK. Widely used materials include those produced by Cimpor (NHL5 only), Otterbein, SOCLI and St. Astier (all NHL 2, 3.5 & 5). Given the wide range of NHL's available, here at SLCT, we evaluate suitability of materials based on an evaluation of the performance requirements for conservation and repair mortars. Evaluation of issues such as performance in use, ease of use and compatibility are all integral to the specification process. NHL's require to be gauged by weight to take into account the wide variation in relative bulk density of hydrates. This will ensure adherence to any specification and avoid inconsistency in colour and texture.

Aggregates in Lime Mortars

The current standard for aggregates in mortars, renders, harls and cements is BS EN 131 39. Ultimately aggregates must be suitable for their purpose—whether for new work or for conservation and repair work. For the latter, it may be necessary to match aggregates visually in terms of colour and texture—this can be achieved easily through mortar analysis and grading of the aggregate. SLCT hold the Scottish Aggregates database (on behalf of Historic Scotland) which holds data on around 1,000 different commercially available aggregates.

Mortar Specification

Characteristics of repair mortars should always be based on an holistic evaluation of the building which can then lead to the determination of performance requirements for the specific situation. Performance requirements cover a range of issues such as performance of the mortar in use, its ease of use, and compatibility with original and/or other surviving historic materials. There may, in some cases, be a conflict between specific requirements and judgement will be required in achieving a final specification. To determine if new materials will be compatible with surviving historic materials, information on both old and new materials must be available. Analysis of original/surviving historic

mortars should be carried out to provide relevant information on their constituents and performance. Technical information and performance data available for new materials can then be evaluated against information on existing materials. Issues to consider include:

Performance in use

The hardened mortar should have:-

- adequate vapour permeability.
- an appropriate degree of capillarity for the proposed use.
- a water absorption rate not significantly greater than the host substrate.
- a modulus of elasticity which reflects the built condition and scale of the works.
- sufficient tensile strength to suit the construction requirements.
- compressive strength to suit the construction requirements (usually quite low).
- a bond strength sufficient to achieve a good wind and watertight bond, never greater than the host masonry, nor so feeble as to result in separation of mortar, leading to capillary ingress of water at masonry/mortar interface.



Ease of use

- The fresh mortar should have appropriate workability characteristics to allow the work to be undertaken correctly.
- The mortar should remain workable for a sufficient length of time to allow appropriate finishing.
- The mortar should achieve an adequate degree of frost resistance at a sufficiently early age to avoid potential freeze/thaw risk.
- Requirements for protection and curing should be taken into account at the specification stage.

Compatibility with original historic materials

- The hardened mortar should have a vapour permeability similar to, or greater than, that of adjacent historic materials.
- The hardened mortar should be visually compatible with surviving mortars and/or with the original appearance of the building.
- Where practicable the new mortar should reflect the historic integrity of the original materials and methods of construction.

Frequently asked Questions

What is lime?

In the context of building, lime is basically a binder – the original ‘cement’. Lime binders are used to make mortars, plasters, renders, concretes and limewashes, having been in use for at least 10,000 years.

Why should I use lime?

Lime mortars have certain characteristics which make them the most appropriate material for repairing buildings constructed or finished with lime. Lime mortars allow traditionally constructed (mass wall) buildings to ‘breathe’, unlike modern OPC mortars which can be virtually impermeable to moisture, trapping it within the walls and leading to dampness and decay internal.

Where can I get lime?

‘Builders lime’ (CL90) is available from most local builders merchants, but is generally not suitable for making lime: sand mortars. A number of specialist lime mortar suppliers exist throughout the UK and abroad. However, be aware that suppliers will have a vested interest in selling you their materials (whether appropriate or not). It’s always best to seek independent advice on the correct materials for the job – it could save you time and money!

What type of lime should I use?

There are a wide range of different lime mortars available, all with different characteristics, and suitable for different applications. Non-hydraulic limes (CL90) are commonly available as ‘lime putty’, in 25kg bags or by the tonne. Natural Hydraulic Limes (NHL) Mortars are commonly available in 25kg bags from a wide range of manufacturers. NHL’s come in a range of classifications based on compressive strength in N/mm² at 28 days: NHL 2, NHL 3.5 & NHL 5. Generally, the greater the compressive strength, the lower the vapour permeability and flexibility of the mortar. Mortars should be always be fit for their purpose, taking account of issues such as; the current performance requirements in use, ease of use, and compatibility with original historic materials.

Is there an environmental benefit in choosing a lime mortar over cement?

With a growing emphasis on the need to reduce energy consumption and reduce CO₂ emissions there is an argument for the use of traditional limes. The production of many natural hydraulic limes offers a significant reduction in energy, compared to that required to produce Portland cements.

When is re-pointing required?

Re-pointing is necessary when existing mortars have weathered to reveal open or recessed joints, which are vulnerable to water penetration. Where existing, original mortar appears sound, it should be left undisturbed. Often, only patch pointing is required – this can be easily done by having a sample of mortar analysed to reveal its constituents, and using a ‘matching’ sand.

Should I remove any existing cement pointing?

In most cases, yes, as cement mortars can damage adjacent masonry and can cause moisture retention within the walls. However, there may be cases where removal will cause substantial damage to the adjacent masonry – careful judgement based on the success of small trial areas should determine whether or not removal is appropriate or not, and this must be carefully considered against any existing problems with the building or structure, caused by the presence of cement pointing.

Can I do lime pointing myself, or should I employ a competent tradesperson?

We would normally advise that you employ a competent tradesperson with the appropriate experience – you should always ask for examples of previous work carried out, and satisfy yourself that they will carry out the work to your expectations. Sample panels should always be carried out for approval at the earliest date.

How do I choose a suitable mortar for pointing masonry?

Firstly, as a basic principle, the mortar should always be weaker than the surrounding masonry. Issues such as substrate type and condition, site exposure, time of year, ease of use and compatibility with existing mortars must also be considered. The choice of aggregate is also an important factor. Sharp, well graded concrete and building sands are generally used in lime

mortars – for most pointing where mortar joints are 10mm or wider, a sharp concrete sand is usually appropriate.

How do I match the colour of a lime mortar?

The colour and texture of a sand has a considerable impact on the appearance of the finished mortar. The fine aggregate particles give a lime mortar its colouring; the larger fragments give its texture. Most lime binders are white, light grey or cream in colour, and therefore the colour reproduction of the sand is excellent, compared to OPC mortars.

How do I make sure I get lime pointing right first time?

The successful use of lime mortars relies heavily on the use of good quality, appropriate materials, and on adequate preparation of the wall surfaces. Curing of lime mortars is critical, and can be more onerous than that curing for cement mortars (depending on the time of year and local environment).

What is limewash?

Limewash is probably the earliest form of paint – basically a mixture of slaked lime and water. Limewash was commonly used as a finish for harling and render, but was also used internally. Locally derived natural earth pigments were traditionally added to a limewash providing a wide range of ‘regional’ colours. Limewash is also suitable for use on walls and ceiling internally and when correctly applied is a durable material. Limewash can be made up on site from lime putty or weak hydraulic lime, or alternatively can be purchased ready made and coloured from specialist suppliers.

Why should I use a limewash?

Limewash protects underlying lime coating and masonry as it acts as sacrificially. It also remains vapour permeable thus allowing moisture to evaporate from the building fabric. Most modern masonry paints have very low vapour permeability (if at all) and will trap moisture within a wall or building, leading to greater problems of internal dampness and timber rot. Modern masonry paints also tend to peel and crack, and are affected adversely by UV light, unlike limewashes.

How many coats of limewash should be applied?

It really depends on what type of limewash is being used, how exposed the building is, and how accessible it is for future maintenance. Often limewash, made from lime putty, requires around 6 coats initially, but certain types of limewash such as 'Superfine' may require less. As with any paint coating, limewash will require recoating periodically to maintain its appearance and ability to protect the underlying coating or masonry

Can I limewash onto a cement based render or coating?

Limewash works best on backgrounds with a moderate to high level of suction, i.e. other lime mortars or coatings, sandstones and softer fired bricks. However limewashes with additives are available from specialist suppliers which will provide an improved bond with more difficult or low suction backgrounds. Specialist advice should always be sought with regards to their correct specification.



National Trust Building Team limewashing



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Yorkshire and the North East

LIME

Lime Slaking

- Raw material limestone quarried from ground
- Burned at 1200° F - this becomes Calcium Oxide = Quick Lime
- When mixed with water this becomes Calcium Hydroxide = Slaked Lime or Lime Putty
- Slaked Lime or Lime Putty Absorbs Carbon Dioxide from the atmosphere = carbonation to form Calcium Carbonate again
- I.e. goes full circle



National Trust Building Team

Lime for Building Re pointing

Burned limestone mixed with water in a bath or similar is called slaking. This is stored in tanks underground. The longer it is stored wet the better quality it will become. Mixed with various sands it becomes Course Stuff. Course Stuff mixed with a silica i.e. pozzalanic additives or brick dust. This makes lime mortar to be used to build or re-point masonry

Please see the following for all mixes used on the workshop day



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Lime Plastering

- A finer Course Stuff mix for plastering consists of a two or three coat system
- Hack out area to be plastered, brush down and dampen area
- Apply course mix over surface, this is called a scratch coat, using a metal comb scratch over surface
- Apply second coat again scratch over lightly this time
- Apply final coat of lime putty and silver sand
- Float off to leave a smooth surface
- Continual working of surface needed

Lime Pointing

- Clean out joints and perps to a depth of approx 30mm
- Wash down before pointing in Lime Course Stuff with pozzalanic additives (to make the lime mix set).
- Point using a finger trowel and a hand board – keep pointing into joints, not buttering onto stone work.
- Make sure joints are full and pressed in
- When dry brush off with a hard bristle brush to show aggregate and clean off stone work
- Alternatively wash down to expose aggregate

Lime Washing

Lime washing is a decorative finish to internal and external walls; it will let the wall breath. Apply a lime wash mix lime putty with water to form a lean emulsion mix. You must sieve all lime wash before application. It is necessary to apply many coats for a good finish – approx. 10 coats. The final two coats should be mixed with tallow or linseed oil. One egg cup to a two gallon bucket. This provides a waterproof surface. Cover all areas before application and redo every few years.



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Yorkshire and the North East

Rebuilding Stonework

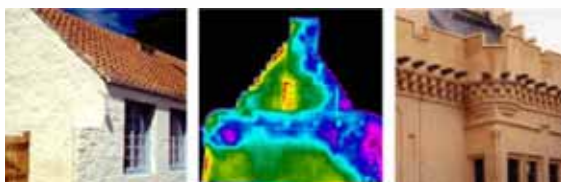
Stone is sourced locally from Wallington estate. Stone quoins are built up the external corner and other stone built in between in a hydraulic lime mix. Mark up with a wax crayon on stonework to ensure stones are put back in correct location. Once stone work is complete it will need to be pointed in a lime putty mix.

Photographic record (before and after) should be kept

SUGGESTED MIXES

<p>Mixture for Building <u>Hydraulic mix</u> 1 part hydraulic lime 1 to 3 1 Styford concreting sand 1 Marine sand 1 yellow Sherburn</p>	<p>Mixture for Pointing <u>Lime Putty mix</u> 1 to 3 1 part putty lime 1 Styford concreting sand 1 yellow Sherburn ½ Marine sand ½ brown building sand ¼ Pozzalanic material</p>
<p>Mixture for Pointing <u>Hydraulic Mix</u> 1 part St Astaire NHL 3.5 1 to 3 1 Styford concreting 1 Marine sand 1 Yellow Sherburn</p>	<p>Lime Washing Lime putty watered down to emulsion consistency Apply 9 coats All tallow or linseed oil for shelter coats at least 2 coats</p>
<p>Mixture for Plastering <u>Undercoat</u> 1 part lime putty 1 to 3 2 yellow building sand 1 Styford Tease in horse hair</p>	<p>Finish Coat 1 part Fine silver sand 2 to 1 1 part lime putty</p>

Information contained within this leaflet provided with kind permission from:



The Scottish Lime Centre Trust has been providing advice on the use of lime based materials for the conservation of traditional buildings since 1994. Re-launched for 2006 as Charlestown Consultants our expanded team can now provide a wider range of services to the building conservation industry including:

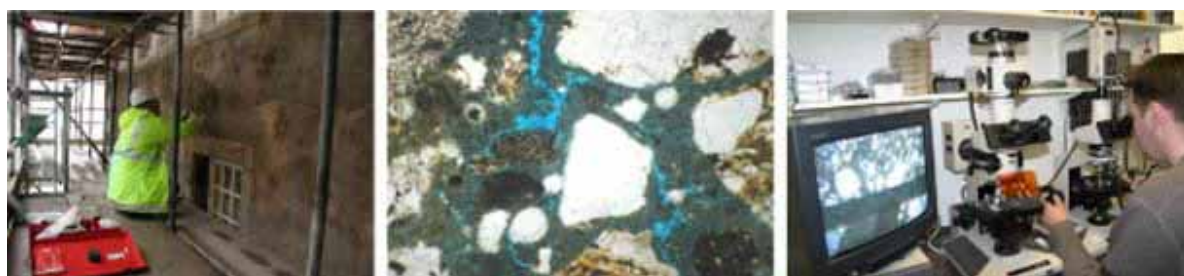
- Inspection & investigation of historic buildings
- Identification of defects & problems
- Identification of historic surface finishes
- Recommendations for conservation work
- Preparation of job specifications
- Building materials analysis & matching
- On-site training and SQA accreditation
- Preparation of on-site sample panels

Contact the Scottish Lime Centre Trust on:

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Charlestown
Fife
KY11 3EN

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Heritage Skills Project Events 2007

14th June	Heritage Skills Symposium – Shortage, Gaps & Solutions	Beamish Museum County Durham
15th July	Heritage Skills Day - Introduction to Lime	Wallington Estate Northumberland
22nd July	Mini Heritage Skills Fair	Bowes Museum County Durham
22nd July	Heritage Skills Day – Introduction to Dry Stone Walling	Ingram Valley Northumberland
29th July	Heritage Skills Day – Introduction to Dry Stone Walling	Walltown Quarry Northumberland
26th September	Heritage Skills Day - Introduction to Lime	Wallington Estate Northumberland
8th – 12th October	Heritage Skills Workshops As part of National Construction Week	To be arranged
14th October TBC	Heritage Skills Day - Introduction to Lime	Wallington Estate Northumberland

Coming up

11th – 13th July 2008	2nd Heritage Skills Fair	Gibside Newcastle upon Tyne
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The programme is developing and other events will be added. For further details and booking, please contact;

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