

The following rules should be followed when applying the render:

- 1 Three coat work is recommended for all but the smallest stucco repairs.
- 2 The first and strongest coat should be 9mm-16mm thick, combed to provide a key for succeeding coats, each of which should be thinner, and of the same strength or weaker (more porous) than the preceding one.
- 3 Finishing coats should be 3mm-10mm thick.
- 4 Undercoats should be left at least two days in the summer and seven days in winter, protected by ventilated covers, before the next coat is applied.
- 5 The top coat should be finished with a wood float and not overworked.

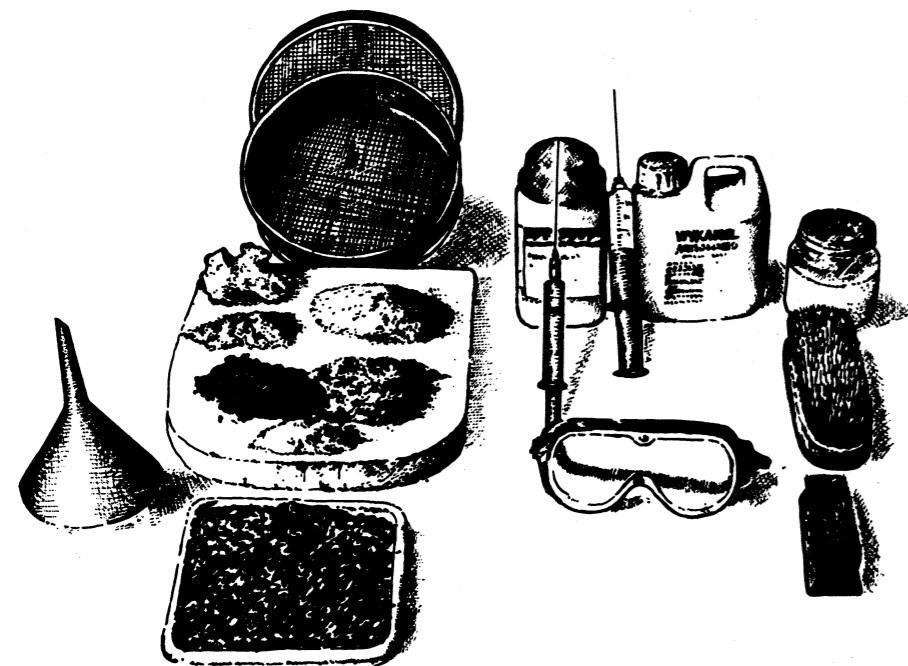
Mixes : the less cement used in the plaster mix the more movement is tolerated without cracking. Traditionally, plasters were always re-inforced with hay and straw, or for better quality plaster, chopped hair. Hair re-inforcement is still desirable in undercoats. Lime plaster mixes vary considerably in strength. The following mixes all have low shrinkages and have proved to be successful:

1 : 2 : 9. Cement : White Lime : Sand. A good all round plaster for repairing moderately strong lime renders. A small amount of cement is permissible.

2 : 5. Hydraulic lime : sharp sand, well graded. For repair of fairly weak original plaster.

3 : 1 : 6. White lime putty : Plaster of Paris : Sharp sand. Provides a very weak finishing coat for high class work.

All these mixes must be regularly maintained by application of a protective coating of paint, or preferably, limewash.



Typical selection of the conservators' tools and materials, including grouting funnel, aggregate sieves, lime putty, stone dust, brick dust and sand, filleting mortar, hypodermic syringes, intrusion aids, biocide, safety glasses and bristle and phosphor bronze brushes

PAINTING RENDERS

It is best to paint a larger area than the repair to assist the merging of the old with the new. Paint must not be applied to damp surfaces. Always avoid paint systems which trap moisture within the wall. Paint systems which can be applied to new plaster or render are : **Limewashes; lime casein paints; distemper (size bound); distemper (oil bound); cement paints; emulsions; "Silicate paint" (keim).**

Limewash: is traditional and the most effective of external "paint" treatments, but it is easily washed off and requires regular application. It can be purchased in a ready mixed form, only requiring the application of cold water. 4.5 litres of limewash should cover approximately 18 square metres. Lime fast colour pigments complying with BS1014 can be added. Some appropriate mixes are:

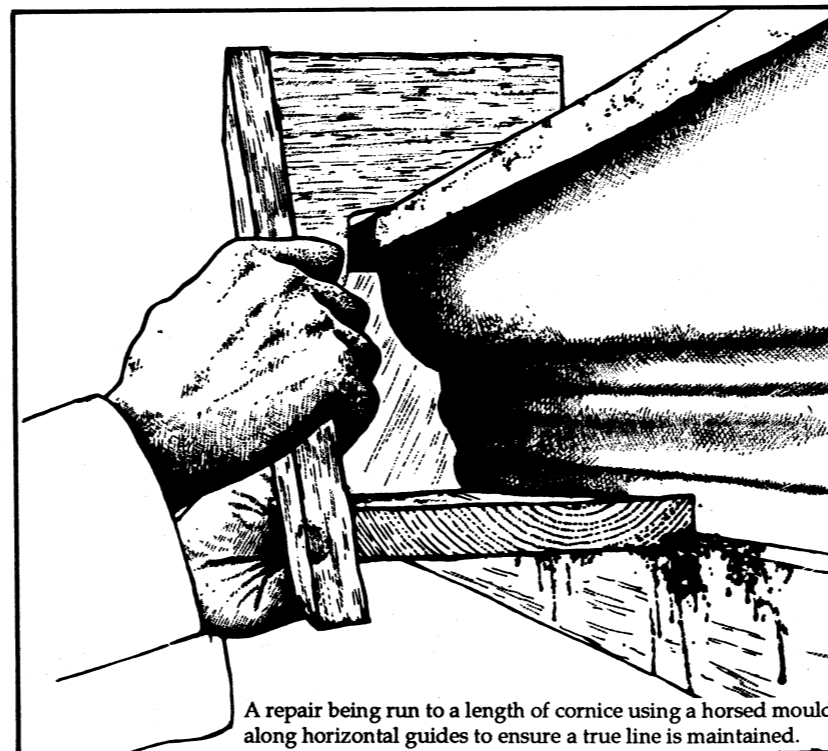
Cream: 4-6lbs ochre: 8 gallons of lime putty.

Fawn: 6-8lb umber and 2lb Indian Red and 2lb lamp black: 8 gallons of lime putty.

Buff: 6-8lb umber and 3-4lb lamp black: 8 gallons of lime putty.

Apricot: 14lb raw sienna and 11lb red ochre: 8 gallons lime putty.

The limewash should be applied to a clean surface with a large 100mm brush, worked well into the surface and allowed to dry before a second and third coat is added.



A repair being run to a length of cornice using a horsed mould along horizontal guides to ensure a true line is maintained.

FURTHER ADVICE

Much of the work associated with the repair of renders and plasters requires the services of a skilled contractor. The details contained in this leaflet should help you to recognize problems and discuss with the professional you employ the extent of necessary repairs, the materials to use and the future maintenance. You are advised to obtain at least two estimates for necessary repairs and ask your builder to provide a detailed itemised list of what is included in the quotation.

For further advice, contact your Local Planning Authority who should be able to draw your attention to any special requirements necessary for instructing your contractor. They can also provide information about the Historic Building Grants available and give details of the other leaflets in this series.



Advisory Leaflet 7

MORTARS PLASTERS & RENDERS



Plasters and renders are binder pastes and fillers applied to a wide variety of masonry and lightweight backgrounds to weatherproof a building. They can be employed as an infill and as cladding on a timber framed building.

This leaflet aims to make owners aware of the common mixtures for plasters and renders and how to repair and maintain them. It has been produced jointly by Surrey County Council and the eleven District Councils to provide advice, without prejudice, for the owners of, and those working with, historic buildings.

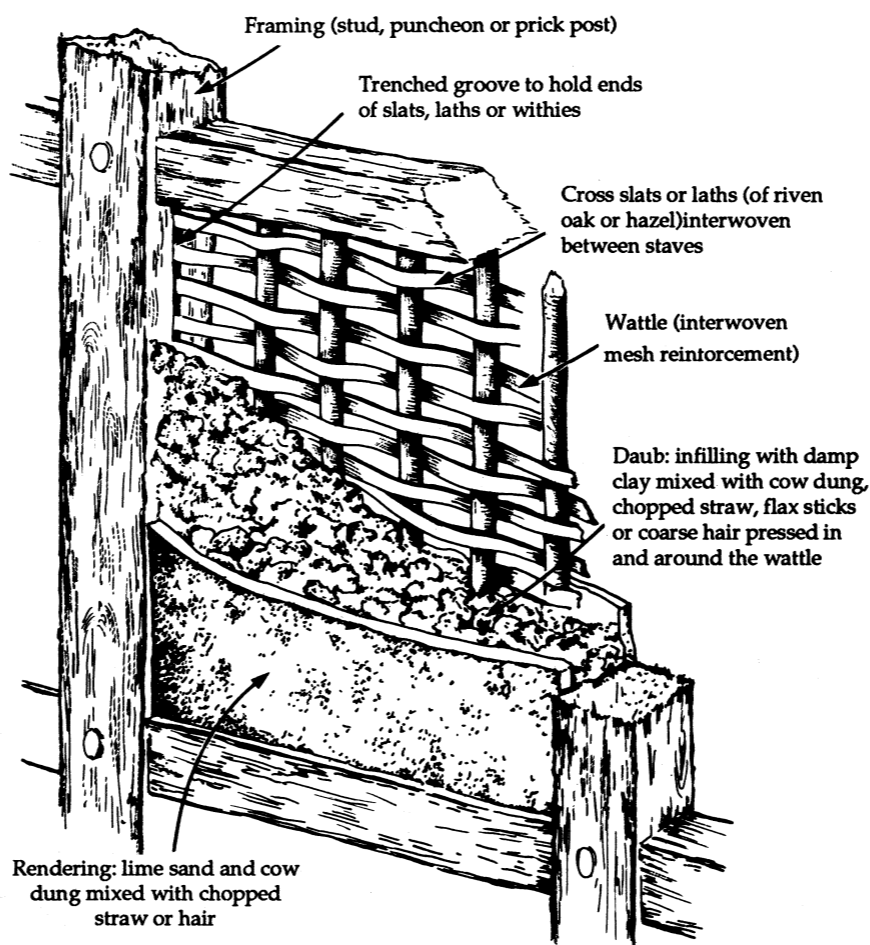
SIMPLE RULES OF THUMB FOR THE USE AND REPAIR OF RENDER

- 1 Do not render or plaster over a surface that is not already rendered without obtaining prior Listed Building consent.
- 2 Use a suitably qualified contractor, preferably one with knowledge of historic buildings and traditional lime plasters and renders.
- 3 Identify the type of render used on your building. If in doubt, seek specialist advice from your Local Authority .
- 4 Do not use waterproof renders that provide an impermeable skin. These will trap moisture, causing damage to the underlying fabric. This is particularly true of modern hard cement renders.
- 5 On historic buildings as much of the original render as possible must be retained. Decorative finishes such as Rustication and Pargetting must be respected and moulding profiles must be replicated.
- 6 New render should be of the same ingredients and match colour, texture, and porosity of the existing, unless a later, cement-rich render has been used. If this is the case then it should be stripped off and a traditional, lime-based render should be substituted.
- 7 Care is needed to ensure good adhesion. On timber framed buildings it is usually the laths and their fixings that are prone to failure, causing bulging or breaking away of the render. It is usually best to re-render on new laths.
- 8 It is important when applying coats of render that the first coat should be strongest, and each successive layer should be thinner and of the same strength, or weaker, than the preceeding.
- 9 When painting a render ensure the paint will allow the surface to breathe.

Cover: Where an area of plaster has detached from its backing, the conservator is flushing and grouting using a hypodermic syringe through an absorbent sponge cushion

HISTORY OF USE

In medieval times, timber framed buildings were infilled with wattle and daub. The daub was a mortar-like clay applied thickly to both sides of a wattle framework, allowed to dry and then rendered over with a smoother, lime plaster. Later it became common practice to cover the whole building, including the timber frame. Until the eighteenth century the only material in general use was a mixture of common lime and coarse sand with the addition of animal hair or straw for strength and to prevent shrinkage cracking. The result was a soft and absorbent plaster which was capable of some movement without cracking, and able to absorb moisture which could subsequently dry out externally. Since the end of the nineteenth century, the introduction of hard cement plasters has produced very high strength, impermeable renders which will not allow movement without cracking. Water then enters through the cracks and is trapped, thus causing further damage, especially in winter.



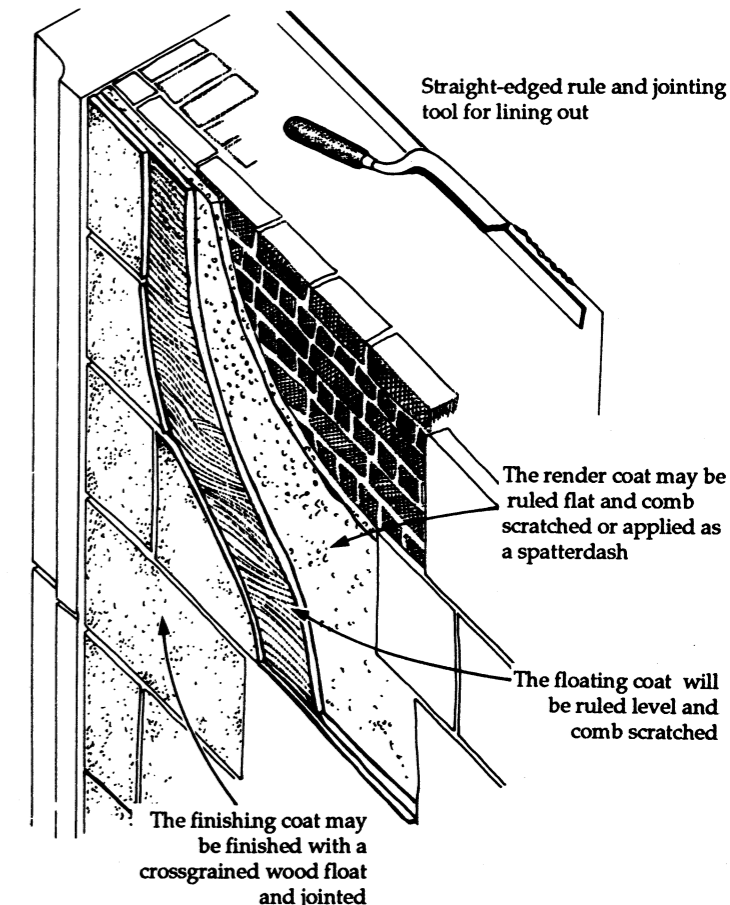
Rendering: lime sand and cow dung mixed with chopped straw or hair

TYPES OF RENDER

The commonest types of render are as follows:

- 1 Low strength daubs, usually applied in a single, thick coat onto wattle or laths. Requires regular lime washing or painting.
- 2 Low to medium strength renders based on lime applied in two or more coats onto brick, stone, unbaked earth, wattle or lath. Requires regular lime washing or painting.
- 3 High strength renderings based on hydraulic cements and applied in two or more coats onto brick, stone or lime-based undercoats. Usually painted for aesthetic reasons.
- 4 Medium strength oil mastics usually applied in one thin coat onto brick, stone or lime-based undercoats. Also used to model details. Usually painted for aesthetic reasons.
- 5 Medium strength gypsum or lime/gypsum renderings in two or more coats on brick, stone or lath. Not suitable for damp climates.

External rendering : lime and cement stucco



IDENTIFYING THE CAUSES OF FAULTS

- 1 **Surface crazing:** usually caused either by shrinkage cracking due to dirty aggregate, excessive early strength, dense impervious mix or gypsum added to Portland cement.
- 2 **Separation:** can occur either at backing level or between coats. Usually the result of water penetration, stronger coat placed on a weaker coat, excessive thickness of coats or lack of adequate key between coats.
- 3 **Surface crumbling:** can also be accompanied by efflorescence. Caused by salt contamination from aggregates or rising damp.

REPAIRS

Cutting out damaged render: areas which are extensively cracked, or are sounding hollow, should be cut out to the backing, with square edges. Before applying new render certain procedures should be followed:

- 1 Remove all dust, loose material, efflorescence and organic growth. If necessary treat with fungicide.
- 2 Hollows and depressions should be daubed out. Each coat of render should not be thicker than 12mm.
- 3 Adequate key must be ensured by raking out joints to 16mm depth or scoring preceeding undercoat. Where there is no key, a rough splatter-dash coat of 3-6mm should be applied.
- 4 Where changes in backing occur, the junction between materials must be bridged with non-ferrous or bitumen coated galvanised mesh or stainless steel expanded metal and covered with a 3-6mm splatter-dash coating.
- 5 Before applying new render the background should be dampened to reduce suction, especially in hot weather.