clay plasters

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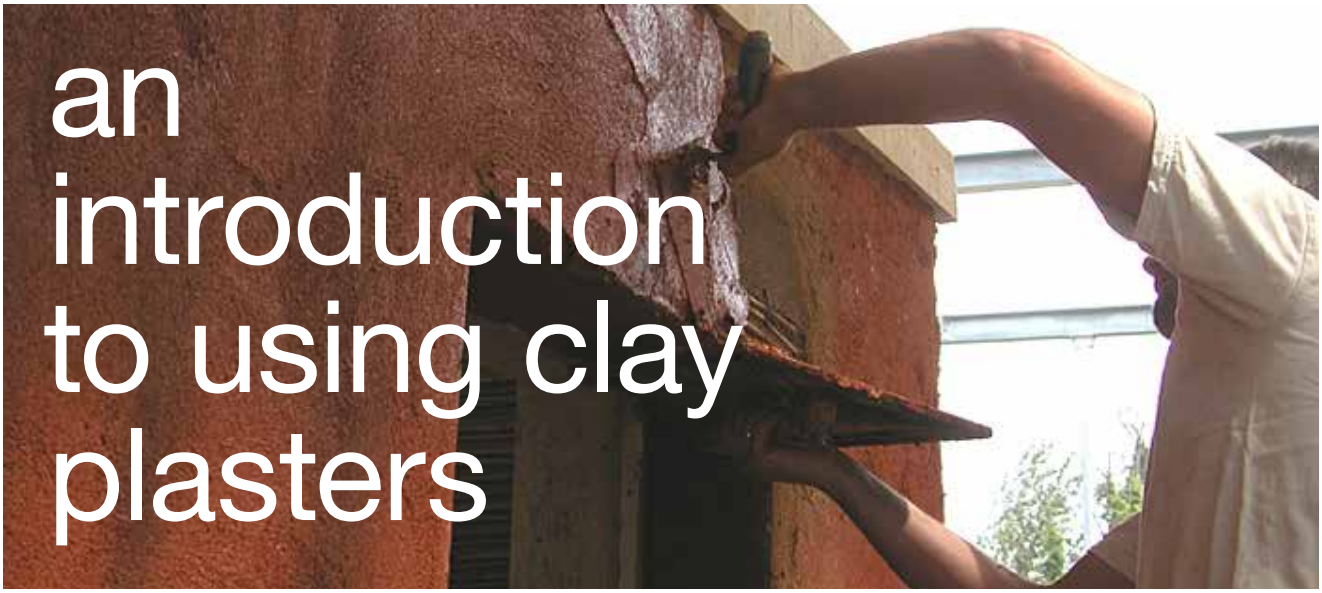

an introduction to using clay plasters

There is a respected tradition of building with clay in the UK, with many examples of cob (monolithic earth) buildings , rammed earth and masonry laid with clay mortar. Although the tradition of plastering with clay was almost lost in the UK, it has continued in Africa, the Middle East, and parts of Europe, especially in the former Eastern Bloc countries. In the last decade we have learnt from their expertise and now clay plaster has become more widely used in this country once again. Clay is best used for internal wall finishes unless it is extremely well sheltered on an exterior wall, such as on a verandah, as the exposure to weather would cause erosion. It is used to renovate old buildings, in ecological new builds using natural materials, and for modern conventional builds where a natural finish is required.

It is essential that the fabric of an old building is able to breathe. Cement and gypsum plasters have been used in old buildings without understanding their detrimental effect until the damage has been caused. The non breathable nature of these rigid plasters leads to moisture building up within a room or being trapped within the wall, leading to condensation and mould growth which creates unhealthy living conditions. Clay plasters will prevent these problems.

Clay is the plaster of choice for use in ecological buildings due to it's low embodied energy (the energy used to produce a product) its non toxic composition, the healthy living conditions it creates, its beautiful and tactile finish, and the fact that it can be recycled. Clay plaster protects the wall, creates good thermal mass to retain heat or to keep a room cool. Good acoustics can be achieved by creating softer more textured clay plastered surfaces, as sound waves are absorbed and reflected less than from surfaces that are hard and regular.

How are Clay plasters Breathable, Flexible and Moisture regulating?

Clay plasters are made up of unfired clay particles mixed with sands and natural fibres. Clay is a mineral created by the erosion of rocks, and is the finest particle of earth. It works well with other natural materials within a wall structure such as masonry with lime mortar, timber, cob or straw construction. Clay is vapour permeable, allowing imperceptible air changes through the wall to prevent the build up of moisture and to create a healthy environment within a building. The flexibility of the clay allows for some natural movement associated with older buildings without the cracking that may result from using rigid gypsum plasters.

Moisture regulation occurs when clay absorbs excess moisture from within a room. This is drawn in by capillary action through pores in the clay, and is released when the humidity levels drop, creating optimum humidity and minimising damp and wall moulds. Five times more moisture can be absorbed by clay than gypsum plasters. A minimum of 15mm of clay plaster should be used to achieve this result.

Using Clay plasters.

Clay plaster undercoat, a mix of clay, well graded sand and fibre, is used to provide the main body of the plaster build up. The small lengths of chopped straw, hemp or glass fibre give it reinforcement and tensile strength and reduce the risk of cracking. Hemp and straw will also provide some additional insulation to the wall.

The finish top coats contain no fibre and a finer sand, creating a smoother finish.

Plastering with Clay

To create a durable, breathable, moisture regulating internal finish, the building construction should have achieved all expected settlement and should be dry. Clay needs a surface to grip to and care should be taken to ensure that the plaster adheres well to its base, and that the wall is prepared so that no part takes up more moisture than another. All junctions between surfaces and materials must be treated with care, covering them with hessian or jute.

The internal surface of the wall should be carefully prepared. Solid absorbent surfaces such as brick, stone, concrete block and plasterboard should first be prepared with Prepbond Q or similar. These materials along with unfired clay bricks should be wetted down before application to control excessive suction of moisture from the plaster. If a surface is less absorbent it should be treated with clay slip (clay mixed with water to form a thick slurry like double cream).

If the wall is smooth, such as rammed earth, a key needs to be created by roughening the surface. Straw bales should be trimmed and clay slip applied before plastering. If the key for the plaster is to be achieved by fixing reed matting to the wall, all joints should be scrimmed with jute and brushed with clay slip.

Undercoat should be applied in 2 coats on most surfaces excepting fired clay blocks with thin bed joints which need 1 undercoat of 10-12 mm. This undercoat is reinforced with chopped straw, hemp or glass fibre. Clay plaster top coat of 4mm can then be applied, making sure it bonds well with the undercoat.

Plastering with clay can be done by any plasterer, although it is advisable that someone new to using clay would first have some practice with an experienced practitioner. As it dries at a slower rate than gypsum plasters the time pressure is reduced and it is easier to create the desired finish. The wall can also be reworked with the addition of water, and any clay plaster that falls to the floor can be collected and used again. A steel trowel will bring the clay to the surface, so a wooden or plastic trowel is preferable. If a more organic finish is desired the clay can be applied by hand without the use of a professional plasterer.

Suitable Clay Plaster Finishes

Clay plaster can be finished in a variety of ways, depending on the client's requirements. Options include the textured finish of the undercoat with fibres visible, or a finer top coat. The finish coat can contain the natural earth tones found in the clay, have mineral pigments and or mica added. Ionic Clay plasters supplied by Womersleys offer the customer a full range of under coat and top coat plasters. Sculptural forms can easily be created on the wall surface. The wall can then be treated with casein distemper, lime wash, breathable natural emulsions or clay paint.

Training on using clay plasters is available at Womersleys Ltd and through Strawworks in West Yorkshire, who also offer training and design straw bale buildings contact :strawworks@gmail.com. This paper has been prepared with Strawworks.

Further Advice

Further advice and support is available from
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www.strawworks.co.uk
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