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QUINQUENNIAL INSPECTIONS

Information Paper 4

Use of Lime Mortar and Plaster in Older Churches & Chapels

Most churches and chapels constructed before the early 20th century were built using lime mortars and plasters. In most cases non-hydraulic lime was used, not to be confused with hydrated lime which builders add to a cement mix to improve its workability. Non-hydraulic lime, sometimes referred to as lime putty has an open pore structure which allows it to take in moisture and readily release it. Used as a mortar in solid masonry it is very strong, yet flexible.

All buildings move over time and with the seasons, and lime mortar gives some flexibility to movement, unlike harder cement mortars. If cement mortars are used for re-pointing traditional solid wall buildings, they prevent rainwater evaporating at the joints. Instead, rainwater percolates into the brick or stone below and stays there going through the freeze-thaw process until the masonry is exploded (called spalling). Unlike a cement joint, a lime mortar joint is highly porous. It is designed to absorb rainwater during wet weather and release it during dry, windy or sunny conditions. It is called a sacrificial building element, ie, it can be replaced easily unlike the masonry, which is difficult and expensive to replace.

Internal lime plasters to walls and ceilings offer the same benefits of moisture absorption and evaporation. Where internal wall plasters are replaced using non-porous cement or gypsum materials, water can be trapped in the wall behind the plaster. This can lead to the plaster failing and coming away, and decorations being spoiled. The same principle applies to exterior walls that have been coated with cement renders.

Non-hydraulic lime mortars and plasters are not usually available at normal builders' merchants, but they are available from specialist retailers. They do exist in sufficient numbers and will deliver. The challenge is finding a builder with the skill and knowledge to use it. Re-pointing masonry with lime mortar takes longer than re-pointing with cement and so will cost more.

Pragmatism is key to your finances. If masonry has weathered mortar joints, you may not necessarily need to re-point it – yet! If there are no signs of internal damp in those areas and there is no joinery or timbers connected to that area, then it may be acceptable to defer re-pointing until funds are available. However, the very weathered areas should be prioritised for early treatment.

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A challenge of re-pointing in lime mortar is colour-matching. For the first few years, lime mortar can look very white, but it dulls down over time. Colour can be toned down depending on the sand/aggregate colour used in the mortar mix. (By the way, the sand is also a special type). You can buy 'biscuit' samples of mortar mixes from specialist builders' merchants to compare against your specific building to get a good match. Mortar can be bought ready mixed and ready to use in plastic buckets or larger builder's bags. If properly stored it does not go off. Lime putty has been found buried deep in the ground in Roman digs and was still useable!

It is a good practice to re-point as much of an elevation as possible in one year so it looks consistent and pleasing to the eye.

You should avoid re-pointing walls using lime mortar in the winter – from November to April, as the cold and frosty weather delays the hardening process and can damage the lime mortar. When engaging a builder you should employ somebody with appropriate experience and expertise in the use of lime products.

Care should be taken when repairing and restoring Listed Buildings or those in a Conservation Area where planning approvals may be required. If in doubt, consult your local Conservation Officer about any approvals that are required and in respect of materials and techniques to be used.

About Stephen Barlow

Stephen is a practicing chartered surveyor and RICS registered valuer with 35 years experience who set up his own practice in 2002. Stephen specialises in surveying churches, particularly providing Quinquennial condition reports which are required every five years as part of planned preventative maintenance programmes. Stephen's clients include numerous Methodist Church circuits and the East Midlands United Reformed Church. Stephen also advises local authorities and private clients with regard to building defects and pathology.

If you wish to discuss any services offered please contact Stephen for informal advice. He is happy to provide examples of Quinquennial reports to prospective new church clients.

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