



TECHNICAL ADVICE

Hybrid Mortars

TAN4

The Blending of Hydraulic and Non-Hydraulic Lime

There has been much discussion and disagreement concerning the blending of hydraulic and non-hydraulic lime. Those in favour of such hybrid or complex mixes can provide many examples of their successful use. English Heritage took a more cautious approach and declared a temporary moratorium on their use on grant-aided projects as the hybrid mortars were thought to have been implicated in a number of failures.

The current situation is that it is agreed that a small proportion of non-hydraulic lime (either as hydrate or putty) can be added to hydraulic lime mortars to improve workability, but it must be understood that a reduction in strength of mortar will result.

A mortar in the proportions of 4:1:10-12 (NHL natural hydraulic lime: non-hydraulic lime: aggregate) is agreed to be acceptable should improved workability be found to be necessary.

The chemistry of hydraulic lime is complex and available analytical data on hybrid mix performance suggests a higher reduction in compressive strength than would be expected due to the addition of non-hydraulic material.

The blending of hydraulic and non-hydraulic materials can in theory range from hydraulic hydrate with 5% putty added, to putty with 5% hydraulic hydrate added, and every variable in between. The end-product will have vastly different performance properties.

Recent developments

Recent analytical study has found that currently available hydraulic limes appear to be achieving higher compressive strengths than previously thought. All reliable data indicates an inverse relationship between strength and permeability, and there is growing concern that modern hydraulic limes might be both too strong and insufficiently permeable for use on traditional buildings.

With this in mind, it is thought sensible to revisit hybrid mortars and in certain situations consider other blend ratios, possibly up to a 50/50 blend of Natural Hydraulic Lime and non-hydraulic lime.

Note that a small proportion of hydraulic lime should never be added to non-hydraulic mortar.