

Portland Cement Mortar Wrecks Historic Buildings

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The most common mistake in historic masonry preservation is using the wrong mortar. By wrong, we mean a mortar that is not compatible with the masonry units, or one that contains Portland cement in any quantity.

Portland cement is sometimes compatible with certain hard stones in terms of hardness, but it is never the right choice because it is not breathable and does not last long enough to qualify for historic preservation. It is not an historic material, and it is inferior to lime mortars in most respects.

The photo here illustrates an extreme example of what happens when soft, historic brick is pointed with Portland cement mortar.



The mortar shown is Portland cement. It is so much harder than the brick. But the other problem here is that the porous bricks take on moisture from the atmosphere, precipitation, and the building's interior, and the Portland cement will not let it pass. That is true even if it is a Type O (low Portland content) mortar. There is no breathability or flexibility, so it chisels away at the brick, and causes moisture to freeze in the wall instead of escaping.

Why is Portland cement used?

Portland first came into common use in the early 1900's in this country. It was first made in the U.S in 1907, and by the 1940's was pretty universal. Masons liked it because it sets relatively fast, so buildings could go up faster. When using lime mortar, the set times are longer because it is a different chemical process altogether. If the mortar sets fast, you can lay more bricks at a time. Everybody likes fast!!

The problems inherent in Portland make it far inferior to lime mortar in the long run. Sure, you may get the building up a few weeks sooner. But it is going to be coming apart a few decades sooner too!

It is counterintuitive to use mortar that is softer rather than mortar that is harder. After all, wouldn't you think that harder is better?

Someone unfamiliar with the different kinds of mortar thinks so. But it is just the opposite. Mortar doesn't have to be all that hard unless it's a 20-story building. For most historic buildings, the compressive strength doesn't have to be 1/10th the strength of Portland mortar.

Remember, the most important characteristics of mortar are 1) breathability and 2) flexibility. Portland is fine for building skyscrapers and Hoover Dams. But when restoring an historic structure, going back to a compatible mortar means using lime mortar.

Brookline uses Lancaster LimeWorks supplies natural lime putty, mortars, and limewash to the historic preservation industry. Contact us at 717-207-7014 today to order.