

Three tips for improving masonry repairs.

By Andrew deGruchy

Regarding “High-Lime Content” replacement mortars, Natural Cements, Patching compounds and the bunk about repointing and repair materials for vintage structures.

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The best bit of wisdom I received in the last 20 years came from a prominent sculptor and repairer of national monuments. At a seminar near Washington, D.C., I asked him, “What repair material do you use to patch stone and brick?”

Before he could answer, I reported what I had tried for various applications. I mentioned latex-modified stone patch materials, mineral-based materials, all the “You got to have a certification to use the material-materials,” and all the “We can’t tell you what’s in it or we’ll have to kill you proprietary-ingredient-containing materials.”

I remember the sculptor smiled and looked at me with patient, endearing eyes of sympathy toward how naïve I was and said, “Andy, they’re all lying to you.” He didn’t say anymore. He just went back to work. That statement, in my opinion, has a bit of truth and is more profound as time goes on than when he first said it 15 years ago.

In Lancaster, PA., we have the saying, “If a tourist sign reads ‘Amish,’ it probably isn’t.” So it is with many things in life, including “masonry restoration” materials. Caveat Emptor (buyer beware)!

Preservation consultants, manufacturers of repair materials and even masons like myself always start out with completely sincere attempts to solve problems. We all use techniques and information based on what is known and using the available materials to work with. The deception goes deep if any of us were to get carried away and think that everything we have is everything the building needs and stop remaining “teachable.” Someone who is not progressively learning becomes a danger to true historic building conservation and would best serve the industry by getting out of it.

Does one-size fit all for each manufacturer’s repair mortar line? The answer is “No.” You have to understand the properties of the materials you are trying to address and then choose the best fit of what are the available products, knowing and accepting the limitations of each when utilizing the different repair mortars for different jobs. You won’t know what works until you

have made mistakes or learned from someone who has made mistakes and were willing to admit it and change what they were doing.

I can write this article with authority because I have made many mistakes, changed some things, and now am a little more street-wise to filter through what is erring toward valid and what is pointing toward bunk.

Restoration mortars

The most pressing issues in masonry restoration, outside how or when to clean, is restoration mortars. Do four out of five dentists really want you to brush with lime like some of these dog-and-pony national show vendors try to tell you? “No.” Owners just want the building repaired correctly and go to trade shows looking for answers. Charlatans bark unsubstantiated information to mesmerize the naïve. The final order of events is confusion, more hype, getting duped without realizing it and innocently but effectively putting historic structures in a premature cycle of re-repair.

Tip #1

Manufacturers stray by playing with semantics in their product descriptions. My first tip is to be wary of lines like “lime-based’ material” or “conforms with (non-existing or non-pertinent) ASTM designation xxxx,” and fudging performance numbers in how or in what light the manufacturers (or their labs) state the facts.

Ultimately and rightly they print the statement you will find, “Not warranted to suit any intended purpose.” Guess what? You are on your own. In the event of a failure, it won’t be hard to prove some sort of in-field applicator error that throws the liability on the contractor. This serious concern is the motivation for you to find out all the facts.

Manufacturers should offer technically sound information and stick with some of their more technically sound products and not continue to find ways to keep justifying all their materials with questionable data just to sell something. Yes, that’s not right.

This article is not about worrying over the morality of what they are doing. It is up to them to learn and do the right thing. It is our job, the practitioners, to know when they are bluffing and not fall for it.

Real deal

There is no bluff when you look at what is still working on a historic masonry building and collect existing facts in order to reproduce the successful properties of the original material in order to gain a durable service life using a replacement material. An “in-kind” replacement of a successful performing material is the best type of repair. Often, the owner’s budget won’t allow for completely re-installing an authentic façade or re-casting building elements.

The theories behind the conservation of a cultural resource won't allow it either. You cannot just throw away tattered historic fabric and replace it. The building must be conserved by sheltering it and doing little, if any, intervention. But there is a meeting of the minds between the work of masonry restoration and the philosophy of masonry conservation.

Rick Yelton, editor-in-chief of this magazine, stated it correctly to me on the phone. "The term 'masonry preservation' brings the two worlds closer together."

If you are attempting masonry restoration with a preservation mindset, then all of the least invasive methods are key. If the option of an in-kind replacement is eliminated, repair mortars become the topic to explore. But which are least invasive and what does that mean?

The theory guiding whatever you do to perform a repair for good preservation is that you should not introduce a new reason for premature failure to the masonry or cause some adjacent problem to other parts of the building. Architectural conservators always like you if the repair effort is durable, yet reversible. To utilize a least invasive method of intervention means that what you don't permanently alter the structure and/or change what is working so well in the dynamics that caused its longevity.

I unashamedly sell St. Astier natural hydraulic lime from France. I would drop it in a heartbeat if I could get an equivalent replacement made in this country. I am a tradesman that only brought the material to the warehouse to solve my own building requirements and not with the intent to jump on the plaid-suit salesman's bandwagon chasing people down the street to use it for every medicinal purpose.

I wrote this article because I want to further improve true historic resource conservation. This article looks at limes and their performance properties: "What it is, is what it is."

Tip #2

Limestone is over 8% of the earth's crust, so it is everywhere. Burned and hydrated type S lime is cheap, but is not considered by many as the best choice for restoration mortars. Low temperature burned lime (burned with reactive silica) creates hydraulic properties (sets when you add water). Limestone containing silica occurs naturally, even in the U.S., though no one produces it here at the moment. Therefore, I import the product from France.

The French lime works tremendously for certain applications. I also like good old U.S.A. type S hydrated lime to add plasticity and to control the setting time when combining it with Portland cement to make mortar for use in modern work.

However, I don't first suggest repointing an historic brick or stone building, laid in lime/sand bedding mortar, with anything containing Portland cement. Even weak concentrations of Portland cement have a reaction with salts that form in old buildings from weak carbonic acid that is absorbed in rainwater. With every increment of Portland cement that is increased, so

does water retention within the walls. The pinnacle of excellent historic masonry conservation is not about keeping water out as much as it is about how quickly water is re-released into the atmosphere. Combine Portland cement with trapped moisture attracting salt and the damage is inevitable.

Tip #3

If anything you are building or fixing has a “friable center,” such as a strawbale building, adobe, crumbly lime/sand bedding of historic stone, or brick, the exterior pointing, stucco, and whitewash must be as flexural as possible and as liquid and vapor permeable so that salts reach the surface and are flushed off. St. Astier natural hydraulic (NHL) limes work. The company reveals what the free lime content is that affects the modulus of elasticity, the autogenous healing properties, and the permeability that allows salts to get flushed from the surface. You can mix a grade of the lime with certain ratios of sand to “dial-in” what are known final performance properties that each of your applications is calling for.

Manufacturers say, yes, we have hydraulic limes.” Actually they mean they have ordinary gas-fired type S hydrate and they mixed in a pozzolan (usually Portland cement.). They respond, “No, we add fly ash or china clay or brick dust.” My question to them is, “Where is the performance numbers?”

Pharaoh and his magicians tried to duplicate the 10 plagues of Moses thousands of years ago just to diminish what they didn’t have. Correctly burned Natural hydraulic lime possesses innate qualities that are beneficial for good masonry conservation. It could be quarried and produced here in the US. Stewards of one-of-a-kind irreplaceable cultural resources should not settle for using bailing twine or whatever is lying around the house to properly carry out their conservation work.

I am past the point of trying to figure how to make what is available work just because it is cheap. It is not worth it since the bulk of an expensive repair is getting the scaffold and labor in-place and should not include having to do repairs over prematurely because of the inconsequential cost of mortar for the job, whether the mortar is from France or anywhere else.