



Brick Mortar Joints Raise Questions

By John Leeke

Restoration and remodeling projects always wind up with a short list of details that require attention — a punch list. Similarly, writing this column produces a punch list of questions and comments from readers that need to be addressed.

James Koger writes from Los Angeles:

"Recently I inspected an old, turn-of-the-century, Philadelphia brick row house, and there is one thing that bothers me. I noticed the mortar joints were very thin, averaging about 1/8 inch. Is it possible joints of this thickness were constructed on purpose? Or, could poor mortar dissipate (grain by grain) over time?"

Thin mortar joints, sometimes called "butter joints," were often used from the late 18th century throughout the 19th century. Early masons knew the purpose of mortar was to hold the bricks apart — gravity holds them together. So the mortar only had to be thick enough to allow for irregularities in the shape of the brick. It makes a cushion that relieves the stress points that could crack bricks under load if they touched within the joint.

I frequently see 1/8-inch to 1/4-inch joints used with water-struck bricks. These have a more regular size and shape than common sand-struck and early handmade bricks. Pressed bricks were developed during the last half of the 19th century. They were even and straight with sharp edges, which made thinner joints practical.

The soft lime mortar commonly used then provided just the right cushioning effect and could even "heal" itself if small cracks developed from shifting loads. But soft lime mortar is not very resistant to the weather. A thinner joint exposed less mortar to the weather and so lasted longer than a wider joint.

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Weathering could only affect mortar near the exposed surface. Except in extreme, localized cases of water damage, the back of the joint would remain its original thickness. It's unlikely the mortar would dissipate evenly from the whole joint over an entire wall or building. I suspect your bricks were originally laid with the thin joint you see now.

Kurt Eikhof of Construction Engineers Ltd. in Grand Forks, N.D., asks:

"How do you remove deteriorated mortar from masonry joints when they are very thin, approximately 1/8 inch wide? What kind of tools are needed?"

For any width joint the mortar should be cleared out to a depth that is two to three times the width of the joint. For an 1/8-inch-wide joint that means 1/4 inch to 3/8 inch deep. For wide joints, I recommend using chisels that are no broader than half to three-quarters the width of the joint. This is to prevent damage to the edges of the bricks. But chisels as small as 1/16 inch just won't hold up.

The thin blade of a mortar rake slips into narrow joints without damaging them (see Restoration Primer, 8/90). Using a pulling action with a rake is less tiring and more controlled than pounding with hammer and chisel. On thin joints, you don't need the power of a hammer anyway.

You used to be able to buy mortar rakes. The last supplier I knew of was Silvo Hardware of Milwaukee, Wis., but they dropped the item a few years ago. Now I have them

made at the local machine shop or blacksmith shop.

For extremely thin joints, I have made mortar rakes out of heavy-duty linoleum knives. The blades of these tools are about 1/16 inch thick with a fat, comfortable handle. I regrind the blades into a hook shape (see Figure 1). It requires occasional regrinding. I once used up a half-dozen knives on one job. Still, it made the work go quickly enough that the cost was justified.

Another possibility is a high-pressure water spray. We have tested this on a few jobs. It will work with relatively soft lime mortar, but you need an operator who can perform the work with some sensitivity.

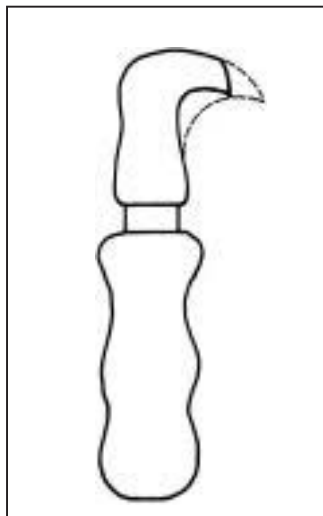
Master mason Dale Edminster of Mason-Art Co. in Tampa, Fla., writes:

"I've been doing historic masonry for about 10 years now and have found it darn hard to get someone to make any kind of commitment on the specifications for repointing and plastering. I feel it should be part of the engineer's or architect's job to state the proportions of the mortar, methods of removal, etc. But I'll be darned if I can get any answers. Could you give a list of publications that get more into the details and chemistry of masonry?"

You're right. Even though these professionals are schooled and licensed, they don't have all the answers. They often depend on tradespeople to know the correct details. *Introduction to Early American Masonry, Stone, Brick, Mortar and Plaster* by Harley J. McKee (now out of print) and *Masonry: How to Care for Old and Historic Brick and Stone* by Mark London are both good references on the details of early masonry. The London book is available from The Preservation Press (1600 H St. NW, Washington, DC 20006; 202/673-4200).

For more on the technology of masonry, try *Aberdeen's Magazine of Masonry Construction* (426 S. Westgate, Addison, IL 60101; 708/543-0870). ■

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A good tool for cleaning out thin mortar joints can be made by grinding a new profile on a heavy-duty linoleum knife.