Clem Labine's

Traditional Building

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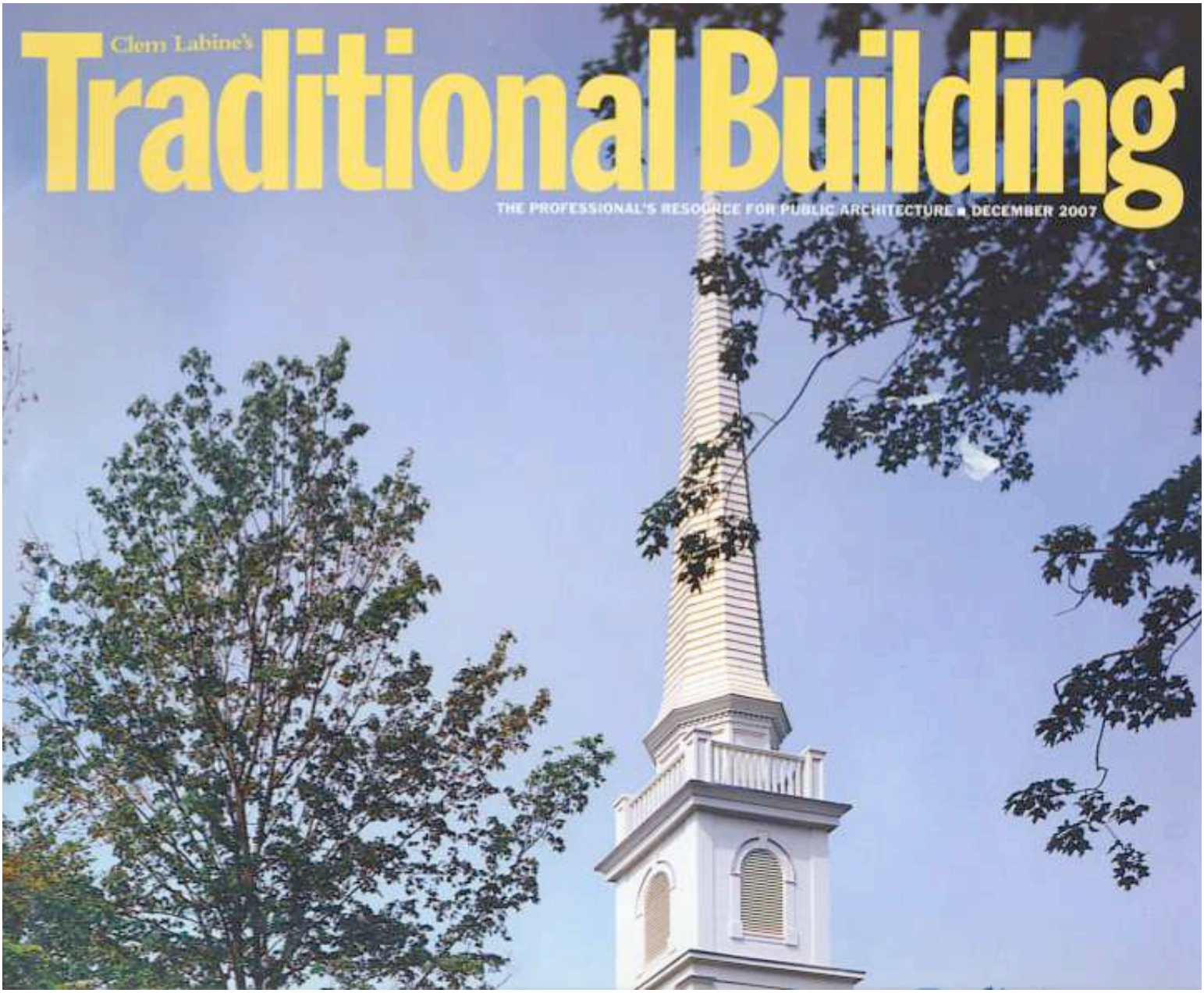

Working with Historic Brick

Four options are available for repairing damage on historic brick structures.

By Loretta Hall

"Hard as a brick" doesn't mean indestructible. Restoration work on historic buildings often involves fixing bricks that have been damaged in various ways. Some are simply broken from impacts. Others are disintegrating because of improper maintenance. One common maintenance problem is using the wrong type of mortar when repointing (replacing deteriorated joints between bricks). Because they were fired at lower temperatures than modern bricks, pre-20th-century bricks are relatively soft. They absorb and release water, expanding and contracting in the process. The lime mortar used with them was even softer, so it was able to cushion that movement. Periodically, the mortar deteriorates and has to be replaced. Using more rigid, less porous cement-based mortar traps water inside the bricks and keeps them from expanding. The resulting pressure slowly crumbles the constrained bricks.

Another type of problem is that bricks produced 100 years ago were fired in coal-fueled beehive kilns with uneven heat distribution. Under-heated bricks, which were softer and less durable, were set aside for interior use. Sometimes, these softer bricks were mis-categorized and mistakenly used on exterior walls, where they could not withstand the assaults of weather.

Regardless of what caused the deterioration, building-restoration specialists can choose from four techniques for fixing historic bricks.

If a brick is badly deteriorated, the best solution is to replace it, according to John Speweik, an historic-masonry specialist with U.S. Heritage Group. "You have to make sure that you have something else to put in there that matches," he says, emphasizing that the replacements must match in performance characteristics as well as appearance. Speweik's first strategy is to search the site for available bricks from the original construction. For example, he might take them from out-of-sight places such as foundations or attic walls.

The potential problem with harvesting bricks from interior walls is that they may be the softer bricks that were under-heated in the kiln. Sometimes these are called "salmon bricks" because of the lighter, pinkish color they had when new. Over time, that distinctive color diminishes, making it very difficult to distinguish the softer bricks from harder ones that were suitable for exterior use. "Generally, you can tell by clinking two bricks together," says Speweik. "If it's a high-pitched ringing sound, they're evenly fired through and that tells you they are a harder brick. If you clink two bricks together and they have a dull clunking sound, then

Built in 1892 to house the Brigham Young Academy, this eclectic Victorian building (above) sat empty from the early 1970s until restoration began in 1997. It suffered severe deterioration during the decades it was vacant (left). Damaged bricks were repaired or replaced with historically appropriate salvaged bricks. Photo: courtesy of Child Enterprises

y probably aren't going to survive very well on the exterior. The [illegible] test is not completely reliable, however. "There really isn't anything you can do absolutely ensure that it's not an interior brick. It's a risk you take."

Speweik made his most exciting find recently while restoring a house built 1874. At some point, a smokehouse on the property had been taken down, and bricks had been used to make walkways and a large patio. "When I realized I s standing on original bricks, I couldn't believe how valuable it was," he says. was like a gold mine. We could actually use those bricks for the restoration of house."

Using original bricks also preserves historical authenticity. When a 19th-tury Brigham Young Academy building in Provo, Utah, was rehabilitated to come the new city library, replacement bricks were salvaged from several adja-t buildings that were being demolished. Those buildings were from the same and were constructed of the same type of locally manufactured bricks. Using reclaimed bricks was environmentally responsible as well as respectful of the ginal character of the building. The recycling process was even reminiscent of its tial construction. When it was erected in 1892 to replace a previous academy acture destroyed by fire, bricks were removed from the burned-out shell and sed in the new building despite their discoloration.

If original bricks are not available, an antique brick supplier may be able to pr vide similar ones. But that process can be tricky. "There were many, many bri makers all over the country. Getting an exact match is very difficult because you ha to find something specifically in that area," says Mike Gavin, co-owner of Gav Historical Bricks of Iowa City, IA. He asks potential clients to e-mail his company digital image of the brick to be matched, along with the dimensions. "We look our selection of products we've reclaimed all over the country. We know where get the brick, and we usually know the general history and age of the brick that reclaim," says Gavin. "If we think we have a good match, we send them a sample our brick so they can put it right up to their existing project for comparison."

It may not be possible to locate matching bricks if the originals are an uncon mon size, color or texture. In that case, reproductions may be ordered from one the few producers that still use beehive kilns. "That's typically a costlier optic just because you set up for a small production of bricks," says Gavin, who som times contracts with a custom brick maker. "We have had a lot of good luck, esp cially when it's a real unusual texture and that's what's most important to them

Another alternative is to purchase new sand-struck bricks, which have a rou surface texture and may be designed to have irregular edges and corners. "C

this case, deterioration is occurring because cement mortar has been used to replace the re compatible lime mortar. The brick is rapidly decaying without the protection of its fire in, which has flaked away. Photo: courtesy of U.S. Heritage Group

A line of tar marks the edge of a porch roof that was removed from this building. The thic tar cannot be removed efficiently, and the bricks will have to be replaced. Photo: courtesy U.S. Heritage Group

Bricks damaged by unprofessional repointing (mortar replacement) were cut from this wall using a brick-and-mortar saw. Substitute bricks were inserted into the wall so skillfully that the repaired section is indistinguishable from the rest of the existing wall. Photos: courtesy of U.S. Heritage Group

bricks were made in molds lined with sand, and the sand helped to release the clay when they were hard enough to flip out of the mold," explains Speweik. "There are companies that make sand-mold brick today. Those tend to match historic bricks better."

When attempting to introduce non-original bricks into an historic structure, it is important to match not only the size and appearance of the existing bricks but also their functional properties. In particular, bricks manufactured using more modern techniques may be harder and less porous. Those used during the 18th and 19th centuries absorbed 20 to 25 percent of their weight in water, although under-fired bricks could absorb 35 percent of their own weight. By comparison, early-20th-century bricks typically absorbed no more than 10 percent of their weight in water. Inserting incompatible bricks into an existing wall prevents the façade from operating as a coherent structure.

"Repairing bricks is cheaper, and you probably can do a better job of matching what's on historic buildings with repair mortar, as opposed to buying new brick," says Dennis Rude, president of Cathedral Stone Products of Hanover, MD. His company formulates brick repair mortar to match the color and texture of existing masonry.

"I suppose a rule of thumb might be if a third or half of a brick is missing, then it's a candidate for replacement, but it doesn't have to be," says Rude. "It can still be repaired. It just has to be repaired with exactly the right material." Preparing the surface correctly and applying the material properly are also crucial. The company sells its Jahn brand brick-repair mortar only to installers who have completed a three-day training class.

The Jahn product was used to reconstruct some brick surfaces on the Provo City Library. "We take out all the [material on the] face of the brick that's deteriorating really bad, put this Cathedral Stone product in it, give it the texture of the brick around it and then stain it," says Richard Child, president of Child Enterprises of Springville, UT. Depending on the desired texture, the application is finished by rubbing or dabbing the surface with a sponge, or scratching it with a wire before the repair mortar has completely set up. "When we're done you can hardly tell the difference," says Child.

U.S. Heritage Group also makes a repair mortar that can be customized to match the color and texture of existing bricks. "Using our brick-repair product is pretty easy," says Speweik. "However, it's just like cooking or anything else. You have to practice before you actually do it on the wall, to get comfortable with the setting time of the materials and how to finish the surface and get it to look like you want it to look."

Sometimes, only the exposed surface of the brick on the exterior face of a wall has deteriorated, due to weathering, painting or harsh cleaning methods such as sandblasting. The original hard crust (called the fire skin) remains intact on the unexposed, rear surface of the brick. If the body of the brick is still structurally sound, the exterior appearance of the building can be restored without replacing or patching the brick. "You can remove the brick, turn it around, and reinsert it," says Rhonda Maas of Building Restoration Specialties of Denver, CO. "We once did an entire façade that way." ■

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Original bricks may be found on historic properties in easily overlooked places such as walkways, lawn borders, rubbish piles or footings laid to support modern garbage cans. Photo: courtesy of U.S. Heritage Group