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By Brent Ehrlich

SALVAGE JOB

RECYCLED BRICK ADDS VINTAGE APPEAL WHILE REUSING DURABLE BUILDING MATERIALS.

Clay. Shale. Water. When combined and heated, these simple, easily obtainable ingredients form brick, which is one of the toughest building products around. This material is so durable that some brick sections of the Great Wall of China are still standing after 2,300 years. Such durability, along with visual appeal, easy maintenance, and thermal mass, makes brick a good choice for green construction.

Even better, builders don't have to search the world for vintage versions of this building material. Demolished structures and ripped-up streets often yield old bricks that are still usable. Rather than letting such valuable vintage materials end up in a landfill, businesses throughout the country now salvage such brick and resell it to builders and others.

As appealing as recycled brick may sound in a home's marketing materials, though, builders should know that not all salvaged brick is created equal. You will want to determine whether this brick is right for your project.

Know your bricks

Though ingredients are similar, contemporary brick is different from its historical counterparts. Today's brick is fired at a consistent, high temperature under strict quality controls, which creates uniform bricks that are strong and weather-resistant. In contrast, early 20th-century manufacturing processes produced bricks of all sorts, such as pavers, facing brick, and backing brick.

Pavers, which were originally used for streets, were some of the first vintage bricks to be recycled because they are strong, virtually waterproof, versatile, and easier to reclaim than the brick used for buildings. This brick's durability has made it highly prized for both building construction and pavers; architects seek it out for its unique, darker colors.

But the brick from buildings of this period is different. Because the production process back then was inconsistent, it created bricks that differed in quality and properties, resulting in different uses for each kind. In general, this older brick can be more porous and usually comes in two basic types, facing brick and backing brick, both of which were used in the thick load-bearing walls of the day.

Facing brick was fired for a longer time, making it stronger and darker-colored. It was used on the exterior of walls because it resisted water better than the softer, lighter-colored backing brick, which should not be used for exteriors. (Light red varieties are often called salmon brick.)

Water permeability is the big problem, particularly when brick is used for exterior cladding. Backing bricks wick moisture in both directions, so making moisture control in a contemporary building envelope much more difficult. However, backing brick can be used indoors and, like any brick, dampens sound, maintains a consistent interior temperature, and doesn't require painting, which can help improve indoor air quality by not introducing VOCs into the living space.

Pavers, however, do not have some of the

Bricks carefully salvaged from old buildings that used softer lime-based mortar are cleaned, sorted, and reused as facing brick, saving resources and valuable landfill space.

Old brick pavers are hard burned, weather resistant, and strong, so they can be removed quickly, but carefully, using heavy machinery, without destroying the brick.

same challenges as building bricks. These pavers were "vitrified" under high heat, which makes them virtually waterproof and extremely strong, with a crushing strength that is two to three times that of concrete. When used in new building construction, these pavers should be as durable, if not more so, than contemporary facing brick. Though careful removal using heavy equipment is still critical, these street pavers are easier to reclaim than brick from buildings. Popular for upscale homes, they also work great as a traditional paver for patios, driveways, and walks.

Brick by brick

Obviously, builders will want to ensure they buy the right brick for their projects.

That can be harder than it looks with recycled building brick. Backing bricks and the more desirable facing bricks can mix during demolition, making sorting a challenge for brick recycling firms and builders alike. Because of this, the Brick Industry Association (www.brickinfo.org) cautions in its *Technical Notes on Brick Construction* against using salvaged brick for exteriors and load-bearing walls. The group says that even if bricks are separated cleanly, getting mortar to stick to salvaged brick can be more difficult than new brick and may lead to water penetration and a shortened lifespan for the product.

Purington pavers are durable and unique, so the brick on this lake house should still look great in a hundred years.

But if sorted and cleaned carefully, used properly, and the right mortar is chosen, then salvaged brick from old buildings may be worth considering by green builders.

Salvaging brick properly starts in the planning stage. "We have to be very choosy about the buildings," says Mike Gavin, co-owner of Gavin Historical Bricks, a firm in Iowa City, Iowa, that specializes in salvaged brick and pavers. "We look at turn-of-the-century buildings where the brick used lime-based mortar." This softer mortar comes off relatively easily, simplifying the salvage work. (Brick from post-World War II buildings is rarely salvageable because these structures were built with Portland cement-based mortars that created strong bonds between bricks. As desirable as that is in new construction, it makes separating the brick for reuse nearly impossible.)

To keep facing brick separate from backing brick, Gavin's contractors put up scaffolding and take walls down brick by brick. Once they are cleaned, the brick is ready for use. This method may seem time-consuming, but it results in a 100 percent brick recovery rate. "It is better than a wrecking ball," Gavin says.

Such careful demolition has another benefit. Using a wrecking ball to demolish a building could result in microfracturing that would compromise the surviving bricks' strength, even if they appeared OK to use, according to John Lambert, an expert in historic masonry and founder and president of Abstract Masonry Restoration in Salt Lake City and Boston. In contrast, removing brick by hand using a diamond blade grinder along the bed joint to weaken the mortar, along with the judicious use of a rubber mallet, keeps bricks from being damaged during the reclaiming process. (Lambert also recommends removing any remaining lime-based mortar left after brushing by washing the brick in a mild acidic solution, followed by rinsing with a power washer. Starting with a clean brick will ensure a tight bond to the new mortar.)

It's not just the act of brick reclamation that qualifies as green. Gavin Historical Bricks also tries to be as energy-efficient as possible in the preparation and distribution of these building materials. After the brick is cleaned and sorted, it is processed by workers at the salvage site and delivered straight to local builders. This saves fuel, shipping, and storage costs.

Back alleys to mansions

Unfortunately for bargain hunters, salvaged brick does not come cheap. Quality used brick is usually a high-end building product that is delivered clean and ready to use. Prices vary depending on the type of brick and its availability, with facing brick fetching about $5 per square foot and pavers garnering roughly $7 per square foot. Shipping can cost extra. There are many different kinds of brick available from both salvage companies and manufacturers, so comparing direct costs is difficult, but, in general, contemporary brick will be less expensive than salvaged brick, and prices usually include shipping.

Not all salvaged brick is expensive, however. Some can be obtained from buildings being torn down near a jobsite, which saves on transportation costs. (However, you must ensure that demolition crews sort the brick carefully.) Integrating this local brick into a project can help a new home fit into its surroundings and maintain the visual integrity of the old neighborhood.

Conversely, if you want your home to stand out in a new community, salvaged brick can do that too, by giving your house the appearance of a home that's been in that location

Brick Type	Source	Advantages	Disadvantages
Pavers	Old streets	> The strongest salvaged bricks. > Weather-resistant, with a distinctive aged look.	> Expensive and heavy to transport. > Availability can be inconsistent.
Facing brick	Exterior layer of old building walls	> Available in a variety of colors and shapes, including oddly shaped "clinkers."	> Must be carefully removed from old buildings to keep them sound and intact. > Quality varies, making them unsuitable for structural use. > Transport can be expensive.
Backing brick	Interior layer of old building walls	> Light and less expensive than pavers or facing brick. > Suitable for interior use.	> Not intended for exterior or structural use. > Susceptible to water damage. > Not as strong as facing brick.

for years. Of course, brick manufacturers argue that they can create a similar look using contemporary brick, with the security of a consistent product, but the worn, varied look of salvaged brick is difficult to re-create exactly.

Mortar essentials for recycled brick

Salvaged brick has been used with great success in some of the most beautiful homes in the United States, but standard practices need to be followed to make sure this vintage brick continues to endure. To avoid moisture damage, keep water off the structure as much as possible, of course, by using proper flashing, good drainage, and wide overhangs on roofs.

But the most critical decision you can make is choosing the right mortar for salvaged brick, which must accomplish multiple tasks. Mortar acts as a wick to transport moisture from the brick, serves as a "sacrificial" layer that fails before the brick (which is harder to replace) will, and finally, provides a cushion that protects the brick.

Special care must be taken with this mixture. "The mortar needs to be formulated so that it is not only softer, but also more water-vapor-permeable than the brick being used," explains Lambert. That's because salvaged brick from buildings does not shed water like contemporary brick. Instead, this older building material absorbs trace amounts of moisture, releasing the water through evaporation, both through the brick and the mortar.

With a poor mortar choice, brick has the potential to trap moisture and crack, spall (where the face of the brick falls off), or wear prematurely, especially in cold climates. To avoid these problems in new home construction, Lambert recommends having salvaged brick tested before installation to meet basic ASTM standards for compressive strength, flexural strength, water vapor transmission, and freeze/thaw resistance. With these results, you can then choose a mortar that will match the brick and provide the best bond and protection.

Obviously, using recycled brick for pavers or interior or exterior walls requires a touch more care and thought. But, if properly handled and installed, salvaged brick can save energy, resources, and landfill space while adding a distinctive look to a new home. "People won't confuse our product with new brick, but they like the way the bricks look and like the idea of using a green product," says Gavin. "We think it is the right thing to do." GB

BRICK RECYCLERS

Salvaged brick for new construction and pavers for driveways, walks, and patios:

> Gavin Historical Bricks
www.historicalbricks.com

> Antique Brick Warehouse
www.antiquebrickwarehouse.com

> **Salvaged brick for new construction; pavers for driveways, walks, and patios; and brick tiles for walls, paving, and floors:** Vintage Brick Salvage
www.bricksalvage.com