

# GETTING STARTED With Brick Veneer

Tips for selecting,  
installing, and cleaning  
brick over wood-frame  
construction



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If you've never done it before, the process of bidding, planning, and executing brick veneer on a custom home can seem pretty intimidating. There are always a lot of unfamiliar details to think through whenever

by Steve Thomas

you work with a new material, and brick is no exception. Foundation design, structural headers, flashing and sealing around doors and windows all require a new way of thinking when the house is clad with brick.

Fortunately, brick has been around for a long time, and there are plenty of resources available. First, you should familiarize yourself with the Brick Institute of America (BIA, 11490 Commerce Park Dr., Reston, VA 20191-1525; 703/620-0010). For a dollar each, you can order the group's tech notes on just about any subject having to do with brick construction. (Tech Note 28 deals with brick veneer over wood-frame construction, for example.)

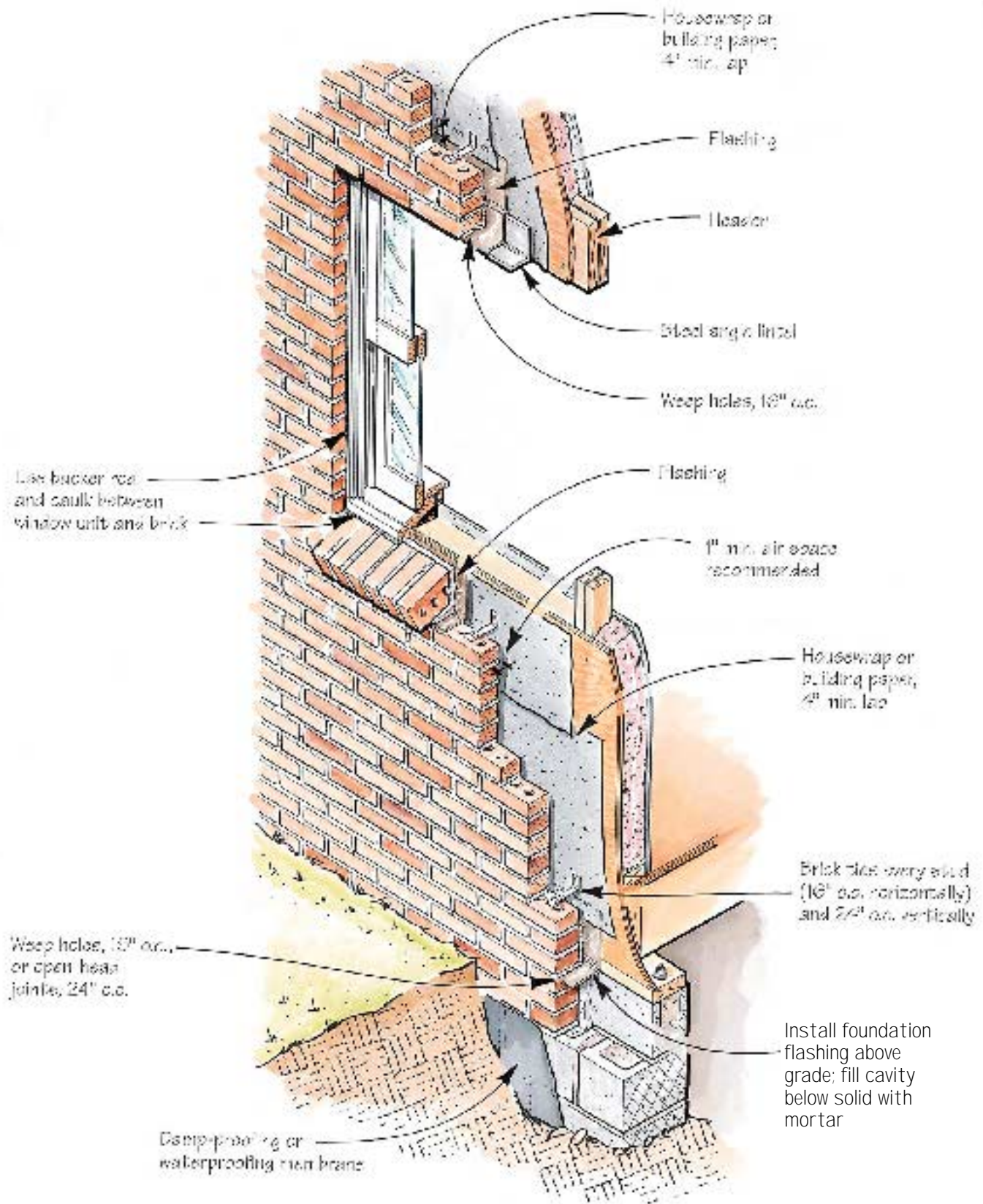
Next, secure a competent mason. Ideally, besides being a top-notch craftsman, your mason will be familiar with BIA standards. The mason will deal with details like sand and mortar, and getting the necessary accessories (steel lintels, flashing, brick ties, and so forth) to the job site.

Third, a good salesperson at your local brick supply house can do a lot for you when it comes to choosing the right brick to use and making sure that any special-order items like precut jack arches are in on time for the job.

## Brick Choices

If you're building a custom home where your customer wants to choose the brick, the first step is to get the client into the brick showroom to find out what he or she has in mind. It's surprising how many different images the word "brick" can conjure up: red, pink, orange, tan, gray, smooth, textured, handmade. Most brick supply companies stock several types that meet the needs of most customers. But occasionally a customer will want something else, and, unfortunately, there are literally thousands of different bricks to choose from. A good salesperson will present a reasonable number of samples and help the homeowner sort through them. Hopefully, the salesperson will know of a couple of houses built with the brick the client is interested in;

## Details for Durable Brick Veneer



**Figure 1.** The brick veneer wall rests on a shelf at the top of the foundation, and is anchored to the wood framing by galvanized metal ties at regular intervals. An air space (the Brick Institute recommends 1 inch) behind the brick allows any water that penetrates to drain down to the weep holes at the base flashing. Window and door heads are similarly flashed.



most people have difficulty visualizing how a brick will look by seeing only a sample on a plaque in a showroom.

The salesperson should also remind your clients to make sure the brick (and mortar) selected works in harmony with the colors and textures of the roofing, window cladding, siding or stucco, trim, and so forth.

**Brick durability.** If you build in a cold climate, one thing you'll want to be certain of is that the brick chosen can withstand repeated freezing and thawing without spalling. Many bricks have the Grade SW (severe weather) designation, but keep in mind that the so-called severe weather zone on the weathering index map runs all the way from Canada to Louisiana. Your best bet is to rely on the experience of your mason and brick yard. Certain bricks will have proven themselves in your climate.

**Avoid used brick.** Used bricks, often found at demolition companies, come in a lovely range of reds, oranges, and salmons, and can often be had at a pitance. These are typically the interior wythes from old buildings. They exude a patina of age and charm that is irresistible to some buyers. You can use these with confidence inside the house, but if you put them outside in a frost/freeze zone, they'll absorb water and disintegrate practically right before your eyes. Old brick may also have contaminants on the surface that will prevent the mortar from bonding, letting in even more water.

**Contract protection.** Sometimes the client will insist on using a brick that you know has spalling problems in your climate. Protect yourself (the supplier and mason should do the same) by getting the homeowner's signature on a form that spells out your concerns and acknowledges that the client has been briefed about the consequences.

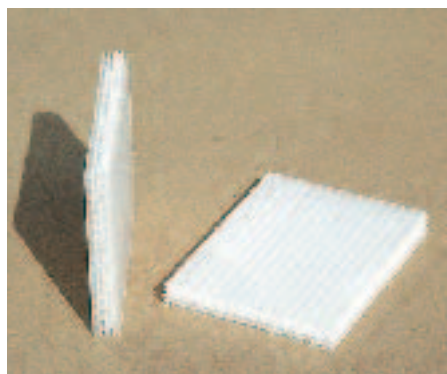
**Brick cost.** Depending on the size and type of brick, markup and freight costs, and the quantity of brick required, the price can range from 23¢ (for a cored modular brick) to 65¢ per brick (for a historic-reproduction handmade brick).

Modular bricks have been the norm for years, although in our market, over-

size brick such as Queens and Engineers are getting the builders' attention. The reason is that while these larger bricks may cost more per unit, it takes far fewer of them to complete the job (about 5.5 brick per square foot compared with 7 brick per square foot for modular). The mason can complete the job much faster and, as a bonus, will use less sand and mortar (because of fewer head joints).

### Delivery of Materials

It's the builder's responsibility to ensure there's a place for the brick to land on the job site. Ideally, flat gravel areas are available — flat so the cubes



**Figure 2.** The Cell Vent, from Dur-O-Wal, is designed to provide better weep drainage than rope or plastic tubes while not allowing insects to enter the wall cavity, as happens when head joints are left unmortared for drainage.

don't "explode" when the bands are broken, and gravelly so the brick doesn't sink in the mud typically found on most job sites.

If possible, the delivery truck should disperse the brick around the house, thereby saving the mason a hellish carry to brick the back of the building. If the grade is too steep to get a boom truck around back, the mason will either have to hump the brick from the front to the back or rent a skid steer to move it.

**Sand.** It sounds obvious, but once a certain type of sand has been delivered to a house, all subsequent sand deliveries should be of the same type. We routinely stock two grades for mixing mortar. One is gray and fine, the other is

brown and coarse. The mason may prefer one or the other, but to switch sand in the middle of the job will result in a change in the mortar's color.

Once the mason begins laying brick, he should draw brick from several cubes at a time, not consume one cube and go on to the next. This minimizes the opportunity for patchy or splotchy walls due to normal variations in brick color that result from the manufacturing process.

### Construction Details

Here in Ohio, typical practice is to pour footers large enough for 12-inch block or poured concrete foundation walls. At finished grade, an 8-inch "termite" block caps off the block work on the inside of the wall. The resulting 4-inch-wide shelf supports the brick veneer, while the wood framing sits on top of the 8-inch block (see Figure 1). The brick, typically about 3<sup>5</sup>/<sub>8</sub> inches wide, is laid so that an air space is left between the back of the brick and the framing. In commercial work, a 2-inch space is often specified; in residential work, a 1<sup>1</sup>/<sub>2</sub>-inch gap is not uncommon, though the mason has to be careful not to let mortar droppings clog the air space.

Typically, the first three courses of brick are laid directly on the 12-inch block below, and grouted solid to the face of the 8-inch block. This hides the block wall where it dies below grade.

**Flashing.** The mason then installs flashing over the top of the third brick course, bending it and running it up the side of the plywood sheathing. The flashing tucks under the building paper or housewrap, which should overlap it by 2 to 4 inches.

We like W.R. Grace's Perm-A-Barrier Wall Flashing (Grace Construction Products, 62 Whittemore Ave., Cambridge, MA 02140; 800/354-5414), which is 40-mil self-adhering membrane. This material tolerates the alkalinity of mortar better than the less-expensive vinyl flashings on the market. It also cannot be ripped and is "self-healing" if punctured. It may not necessarily be as good as copper, but it's cheaper and easier to install.

Make sure, if the housewrap is already in place, that the mason lifts its bottom edge and installs the flashing underneath. And as in any good cladding job, you lap the housewrap or building paper properly as you move up the building. Essentially, you're applying a weather barrier over the sheathing, all of which will eventually be covered by the brickwork. The goal here is to provide water integrity. Should water ever get past the brick, it will run down the wall and onto the flashing.

**Weep holes.** To allow any water to drain out of the air space, the mason leaves weepholes above the flashing. Each mason has his own preference, but the usual choices are cotton rope or plastic tubes every 16 inches, or to leave an empty head joint (no mortar at the end of the brick) every 24 inches.

Considering how slowly the rope allows water to pass and how easy it is for the tubes to get clogged with mortar droppings, I think empty head joints are the best option. They're sometimes avoided for aesthetic reasons, or because they allow insects to get into the wall. A new plastic product called Cell Vent, from Dur-O-Wal (3115 N. Wilke Rd., Arlington Heights, IL 60004; 847/577-6400), attempts to solve both problems. It's designed to fit in the head joint of a modular brick; the polypropylene cell structure allows water to pass but keeps out the bugs (Figure 2). The white color also lessens the visual effect of an empty head joint, which shows up as a dark shadow line. The main problem with the product is that it's too expensive compared with the other weep methods.

### Workmanship

You'd be surprised how many times we've had homeowners call and complain, "Your bricks leak." Bricks do *not* leak. Yes, they will accept and hold moisture, but even in a wind-driven rain, water will not blow through bricks. Rain will, however, blow through inadequately mortared head joints.

Go out in the field and watch a typical mason's crew lay brick. Generally, a pass of mortar is laid down, bricks are

"squished" or settled into this bed of mortar, and whatever squeezes out is scooped off with the trowel and applied to the head (end) of the brick. Another brick is picked up for a repeat of the same procedure, and so it goes until the house is done.

Herein lies a serious problem. While there may be enough mortar in these head joints to strike a nice concave or V-grooved joint, these *partial* head joints are often later blown out by some bozo with a powerwasher attempting to clean the brick after the job is done. This is one of the most common sources of leaks that I see. Head joints should be *fully* mortared.

### Arches and Headers

Executed correctly, arches, whether flat or round, are one of the nicest details of brick construction. Too often, though, they are done poorly (see "Brick Faux Pas"). To attempt to field-cut arches, unless you have a highly skilled craftsman laying the brick, is a virtual guarantee for a visual mess. Better to plan ahead and order factory-made arch kits. Although custom-made arches are expensive — anywhere from \$30 to \$75 or more per running foot — the quality of the finished product and the time saved may well be worth the price. Custom arches are available in flat (jack), semicircular, segmental, and elliptical styles.

## Brick Faux Pas

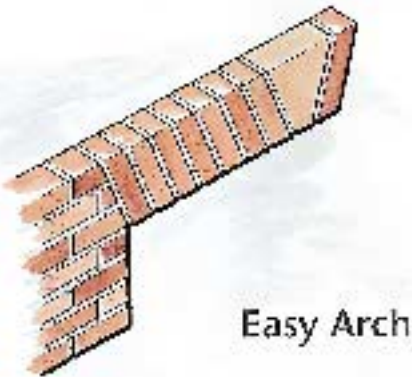
**T**he skinny, odd-sized bricks next to the keystone in Photo A are evidence of a poorly executed jack arch. In Photo B, note the "shim" brick at the top of the arch, and the thick and uneven mortar joints. Both arches also have a "saw-tooth" bottom edge instead of a nice, straight line. (For a proper arch, see Figure 3.) Photo C shows a common error: Instead of saving a solid brick for the end of this sill, the mason has used a cored brick, then tried to conceal it by filling the hole with mortar. As Photo D shows, using too small a steel angle can result in a sagging window head, or worse. Photos by the author.







**Figure 3.** With a correctly installed factory-made jack arch (photo, above), the center brick is perfectly vertical, while the bricks to the left and right are tapered and skewed symmetrically at an ever-increasing angle. Note that the top and bottom of the arch are perfectly parallel and that the height of the arch matches the brick coursing. “New concept” arches (drawing, at left) use a keystone and a series of bricks all cut with exactly the same shape. They lack the authenticity of a true arch kit, but are less expensive.



A jack arch is essentially a brick “plug” in the wall atop a door or window (Figure 3). It accepts the downward load of the brick above and pushes out to the left and right. A true jack arch does not require a steel angle to support it (a good thing, since steel rusts over time). The bricks at the center of the arch are vertical; as you move toward the sides of the window, the taper of the brick increases (a 70-degree skew at the edge is typical).

One note of caution: If using true structural jack arches, make sure you have mass to the left and right to take the transferred load. If you place a wide arch too near a corner of the house you could have a “blow out” (Figure 4). If in doubt, consult an engineer or knuckle under and install a steel angle.

Most manufacturers offer “new concept” or “easy” arches, which are not structural and will require steel support. These are less expensive but look somewhat artificial when compared with a classic jack arch. Easy arches depend on a keystone (either brick or limestone) to establish the angle of skew. The rest of the bricks are cut with parallel sides with exactly the same angle, instead of tapering.

**Steel.** Whenever arches are not in the budget, use properly sized steel angles

atop doors and windows. Using too small an angle will result in a “sagging” appearance (see “Brick Faux Pas”), which is not only unsightly but alarming when you consider the weight of the brick above.

We stock 3x3<sup>1</sup>/<sub>2</sub>x1<sup>1</sup>/<sub>4</sub>-inch angles for openings less than 6 feet in width. For larger openings, a 5x3<sup>1</sup>/<sub>2</sub>-inch angle is

## Brick Blowout



**Figure 4.** Caution: A loadbearing arch (no steel angle) placed too close to a corner can cause a blowout.

used. Note that steel angles are not generally attached to the framing. They are laid across the opening, then flashed similarly to the shelf at the foundation. This allows the brick and the wood framing, which have different rates of expansion and contraction, to move independently of one another.

In the case of extra-wide openings like garage doors, however, we burn holes in the steel and provide lags and washers for attaching to the wood header.

## Cleanup

All brick manufacturers put cautionary wording on their literature and every cube of brick against the use of acid for brick cleaning. Application of straight acid to a dry wall will undoubtedly remove surplus mortar film from the brick, but it will also forever alter the appearance of the brick and instantly age the mortar 20 years as well as change its color. All the effort and expense of selecting and laying the brick veneer on a home can be undone in an hour by an unskilled cleaner.

Many manufacturers take the unrealistic approach that if the bricks are properly laid they should not need cleaning at all. Nice try, guys, but in the real world it's a pretty routine requirement. Get the manufacturer's recommendation for cleaning the particular brick you're using. Some bricks can tolerate pretty strong cleaning agents, while others will tolerate only water. Sure Klean 600 and Vana Trol are two of the most commonly specified cleaning products (ProSoCo Inc., P.O. Box 171677, Kansas City, KS 66117; 800/255-4255). Even with these weak acid/detergent solutions, the manufacturer still advises wetting the wall first to avoid “burning” or “shocking” the brick.

Check the manufacturer's literature each time you clean brick and be sure that your cleaner uses only the approved product. As an extra precaution, buy the cleaner yourself, then have the professionals apply it.



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