Most brick veneer and concrete block backup walls perform as they should. But there are certain details—avoidable details—that can sabotage a wall’s performance. Watch out for them:

Air spaces that are too small

A 12-inch wall built with nominal 4-inch brick and 8-inch block results in a \( \frac{3}{4} \)-inch air space (Figure 1). The Brick Institute of America (BIA) and the National Concrete Masonry Association (NCMA) both recommend a minimum 2-inch air space (Ref. 1 and 2).

Air spaces smaller than 2 inches are difficult to keep clean. If excess mortar isn’t removed from the back of the brick veneer, a bridge can form to the block backup. This bridge can trap water that penetrates the veneer, preventing it from draining to the flashing and weep holes. The trapped water can cause efflorescence on the brick or wet spots on the interior face of the block backup.

The efflorescence and water leaks are difficult to stop. Removing the efflorescence treats only the symptom, not the cause. But repairing a \( \frac{3}{4} \)-inch-wide air space that is plugged with mortar is impractical. Removing the brick and widening the cavity are costly. An exterior coating can be applied to prevent water from penetrating the wall, but this also can be expensive. Avoiding the problem by detailing and constructing the recommended 2-inch air space is more economical (Figure 2). If board insulation is added to the air space, the width of the air space should be increased by the thickness of the insulation.

Slushed collar joints

ACI/ASCE 530, Building Code Requirements for Masonry Structures, permits filling collar joints of composite walls with mortar or grout. Because mortar is readily available on the jobsite, it’s usually used to fill collar joints less than 1 inch wide.

Problems can arise, though, when mortar is used. According to BIA, slushing collar joints with mortar isn’t effective because it’s difficult to completely fill all voids in the joints (Ref. 3). Often, mortar gets caught before reaching the bottom of the narrow crevice, leaving openings between the face brick and the backup units. Even...
when the joint is filled, the mortar can’t be compacted. The mortar doesn’t bond with the brick over the entire surface, leaving voids in the joint. Water can trickle down the back of the face brick, then run through these voids to the backup wall.

Using grout, with its fluid consistency, decreases the number of voids left in the collar joint. ACI/ASCE 530 thus allows twice the shear stress for grouted collar joints as it does for mortared collar joints.

Recessed brick courses

When a wall differs from normal bonding it must still perform properly. For example, a recessed brick course, commonly detailed to have a 3/8-inch offset, can block the cavity (Figure 3). If moisture enters the wall above the recess, it can’t drain to the flashing and weep holes.

This detail also can expose the cores of the brick below the recessed course. ASTM C 216 requires no part of any hole to be less than 3/4 inch from any edge of the brick (Ref. 4). If even a small part of a core hole is exposed, rain easily can enter the wall.

One solution is not to recess brick in drainage-type walls. Use a special brick shape or cut the brick so it doesn’t protrude into the cavity.

If a recess is detailed, use uncored brick above and below the recess to eliminate exposed core holes. Be sure to use the recommended 2-inch cavity or air space so more of the cavity remains unobstructed. And limit the amount of recess. A 3/8-inch recess gives a shadow effect, protects the core holes, and reduces the amount of cavity that is blocked (Figure 4).

Projecting a brick course, instead of recessing it, avoids the risk of blocking the cavity. However, any horizontal surface exposed to weather increases the chances of water penetration.

References


2. “Concrete Masonry Cavity Walls,” TEK 62, National Concrete Masonry Association, 2302 Horsepen Road, Herndon, VA 22070.


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