Proper drainage for weep holes

To prevent moisture problems, specify effective weep holes and keep mortar droppings out of wall cavities

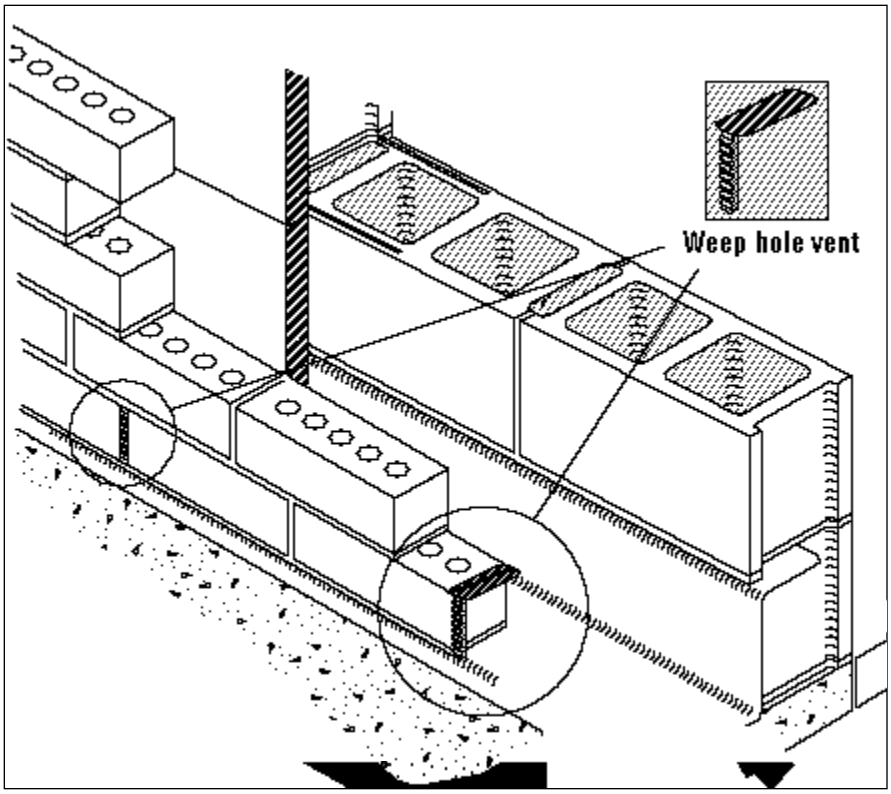
By Walter Laska

For a cavity wall to function properly, water that collects on flashing must be able to drain through weep holes to the exterior of the building. If weep holes do not function properly, water collecting in the cavity can infiltrate to the building's interior. For proper drainage, cavity walls must be detailed correctly and constructed to keep the cavity clear of mortar droppings and prevent weep hole blockage.

Weep holes must be placed directly above flashing and should be spaced about 16 to 24 inches o.c. maximum.

The most common types of weep holes are open head joints, louvered vents, rope wicks, tubes, cellular vents, or a combination of these.

Figure 1. Louvered vents often are used to keep insects out of cavities.



Types of weep holes

Open head joints. Unmortared head joints, spaced at regular intervals at the base of the cavity, are highly effective and are the easiest type of weep hole to construct. Because these weep holes create openings that extend the full height of the head joint, the cavity would need to be filled with mortar to the top of the base course to render them totally ineffective. In addition, full-height weep holes make it easy to verify that the weep holes are open to the cavity.

Louvered vents . Louvered aluminum or plastic vents sometimes are used in conjunction with open head joints to keep insects out of the cavity. Louvered weep hole vents are installed in the head joints as the wall is built (Figure 1). Vents come in a variety of colors and are recommended at the top and bottom of exterior glazed brick cavity walls.

Rope wicks. Cotton sash cord also is commonly used for weeps. The cotton fibers have a wicking effect that draws moisture from the cavity to the exterior of the building. However, weeping ability can be greatly impaired by mortar droppings building up

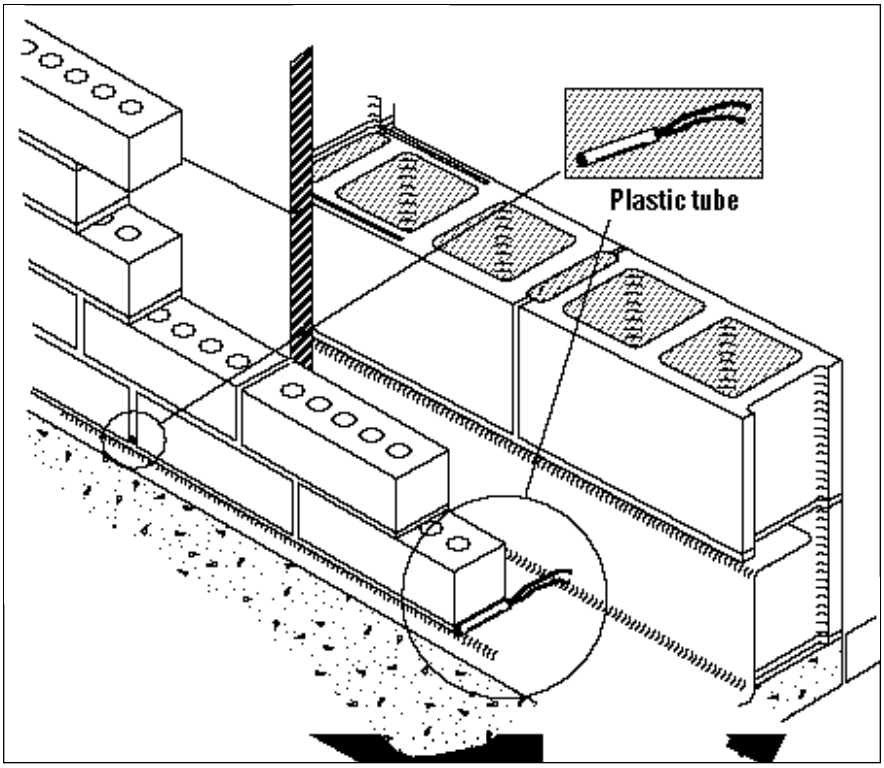


Figure 2. This vent features a screened plastic tube into which cotton wicks have been placed.

directly on the cord or rope, or by salts left in the rope after the evaporation of water.

Tubes. One-quarter-inch-diameter plastic or metal tubing, cut slightly longer than the thickness of the wythe, is mortared in place as the course immediately above the flashing is laid. Such weep holes are among the least noticeable and least effective. Because of the small diameter of the tubing, water is weeped out slowly and they can easily become plugged with mortar droppings.

A new product, which combines plastic tubing with cotton cord, produces an effective weep hole. The tube is capped at the outside end with a screen and plugged with cotton wicks at the inside end (Figure 2). This type of weep is effective as long as the cotton wicks are not covered with mortar.

Cellular vents. Plastic cellular vents consist of many small, adjacent passageways bonded together in one unit. The cross section is similar to that of a honeycomb (Figure 3). The cellular composition provides easy drainage for moisture along the full height of the head joint. The vents, which are available in various sizes and colors, are placed in the head joints as the wall is constructed.

Keep the base mortar-free

Some cavity-wall details require several inches of pea gravel in the base of the cavity to assure that water drains to weep holes. However, two problems exist. First, if open head joints with louvered vents are used, the pea gravel can create an obstruction where it butts up against the vents. Second, excess mortar can build up on top of the pea gravel just as easily as it can at the base of the cavity if pea gravel were not used. In both cases, drainage can be obstructed.

One way to minimize mortar-dropping buildup is to install 6- to 8-inch-wide sections of vinyl or nylon mesh directly above weep holes along the base course (Figure 4). The mesh prevents mortar from building up directly on or behind the weep holes,

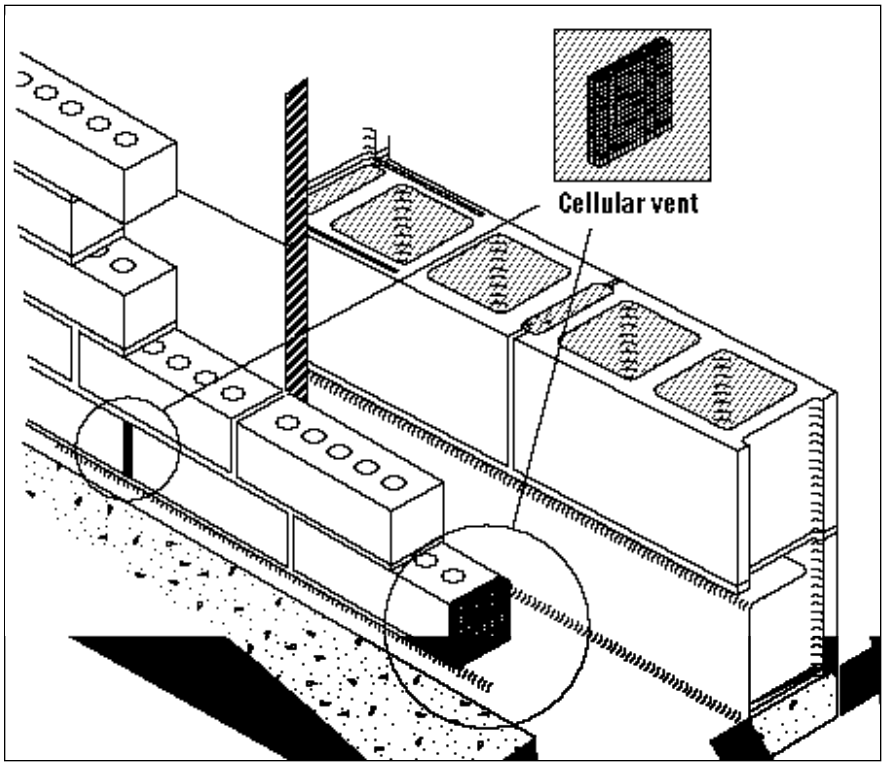


Figure 3. Plastic cellular vents resemble a honeycomb and come in various sizes and colors.

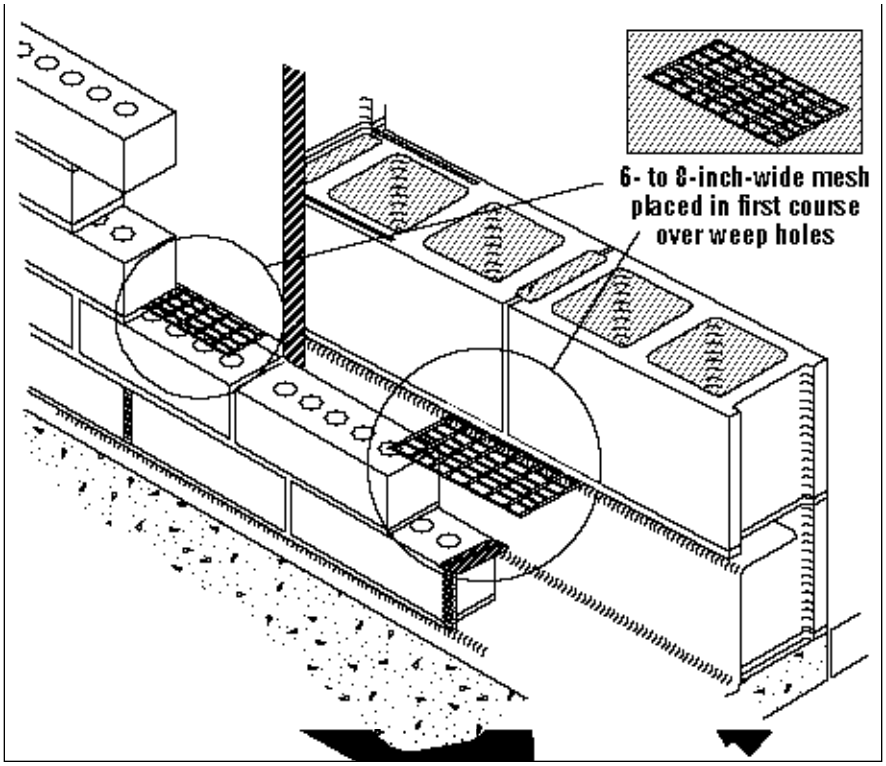


Figure 4. Vinyl mesh can be placed directly above the base course to help prevent mortar buildup in the cavity bottom.

while providing a path for water drainage. However, to be effective, this method requires strict quality control; if any of the mesh sections are misplaced or deleted, the detail is ineffective.

Another product is fabricated of a nylon fiber mesh cut into a unique, trapezoidal configuration. The mesh is inserted in the airspace between the insulation and brick, at the base of the walls where weep holes exist. The mesh is said to distribute mortar buildup in a way that creates clear paths for water to drain through weep holes (Figure 5). The mesh is claimed to be effective regardless of the type of weep hole used.

Prevent mortar buildup

The best way to assure proper drainage of water is to maintain a cavity that is free of mortar droppings. This requires good workmanship and construction.

First, the architect must specify a cavity with an airspace at least 1½ inches wide. This provides the mason ample space to remove extruded mortar on the inner surface of the wythe with the tip of the trowel. To minimize mortar extrusions, bevel the mortar bed thin toward the cavity side (Figure 6). This technique was successfully used on Chicago's Harold Washington Library and Embassy Suites Hotel. Beveling mortar this way can be done easily by running the trowel along the edge of the brick. It's a matter of replacing one motion—furrowing the mortar—with another.

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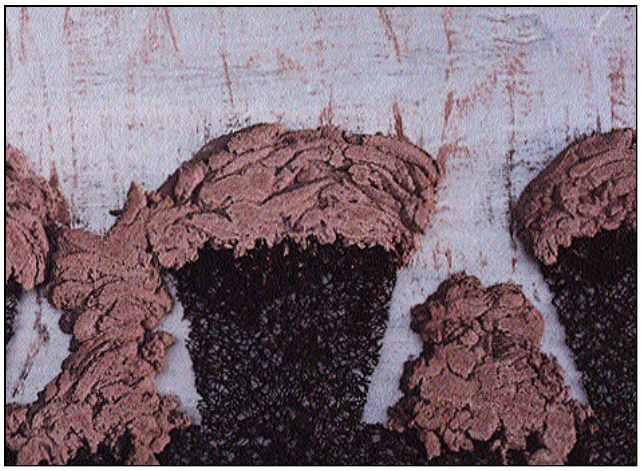

Figure 5. A new type of nylon fiber mesh is said to distribute mortar buildup in a way that creates clear paths for water to drain through weep holes.

Figure 6. Beveling the mortar bed away from the cavity helps prevent mortar extrusions that can all into the cavity.

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