in the outer wythe is at least three times greater than the area of unintentional openings in the backing wall, then the air pressure in the cavity will be about the same as the outside air pressure. In practice, however, the ratio is often increased to 10:1 to provide a factor of safety that ensures equalization. Aesthetically, rain screen vents look best if they are located at the same spacing as the weep holes in the lower course of the wall.

9.4.1 Prevent Moisture Accumulation

An important consideration in the design of masonry walls is the proper location of flashing and weep holes. Although moisture penetration can be limited through good design and workmanship, it is virtually impossible to entirely prevent moisture from entering a masonry wall. Without proper flashing, water that does penetrate the wall cannot be diverted back to the exterior. Continuous flashing should be installed at the bottom of the wall cavity and wherever the cavity is interrupted by elements such as shelf angles and lintels. Flashing should be placed over all wall openings, and at all window sills, spandrels, caps, copings, and parapet walls (*see Fig. 9-30*). Single-wythe walls can drain moisture through ungrouted cores and also require flashing at the same coping, parapet, head, sill, and base locations (*see Fig. 9-31*). Flashing in single-wythe walls can be installed using conventional brick or CMU, or using a special proprietary flashing block design licensed to various block manufacturers (*see Fig. 9-32*). All masonry walls should all be set on a recessed ledge at the slab edge so that flashing and weeps are below the finish floor elevation, and a minimum of 6 in. above finish grade.

The top of the vertical leg of the flashing should be installed so that water cannot flow behind it (*see Fig. 9-33*). The flashing should also extend beyond the face of the masonry so that moisture collected on the surface cannot flow around the edge and back into the wall below. Metal flashing can be turned down and hemmed to form a drip, but plastic or rubber flashing must be extended during placement and then cut off flush with the wall after the units are laid. Bituminous flashing or metal flashing with bituminous coatings requires installation with a separate metal drip (*see Fig. 9-34*) to avoid exposure to the sun, which can cause bleeding, emulsification, and staining. Special flashing details at shelf angles are shown in Chapter 10. Flashing should be continuous around corners (*see Fig. 9-35*), and at horizontal terminations the flashing should be turned up to form an end dam (*see Fig. 9-36*). Where masonry abuts door jambs, curtain walls, storefront systems, or other cladding materials, stop flashing in the first head joint adjacent to the interface and form an end dam. Where structural framing interrupts the backing wall, flashing should be continued across the face of the framing, and the gaps between the backing wall and columns or spandrel beams should be sealed against air and moisture penetration (*see Fig. 9-37*).

Flashing at window penetrations is also critical in preventing water penetration. Where backing walls are of stud frame and sheathing, the substrate must be wrapped and protected from moisture damage (*see Figs. 9-38 and 9-39*). Windows and doors that are recessed even slightly from the face of the wall will be better protected against leaks than those installed flush with the masonry, particularly when construction tolerances cause the window locations to fall outside the plane of the wall (*see Fig. 9-40*). Sheathing that is not inherently moisture resistant must also be protected with a layer of building paper, felt, or building wrap. Only a few sheathing materials are

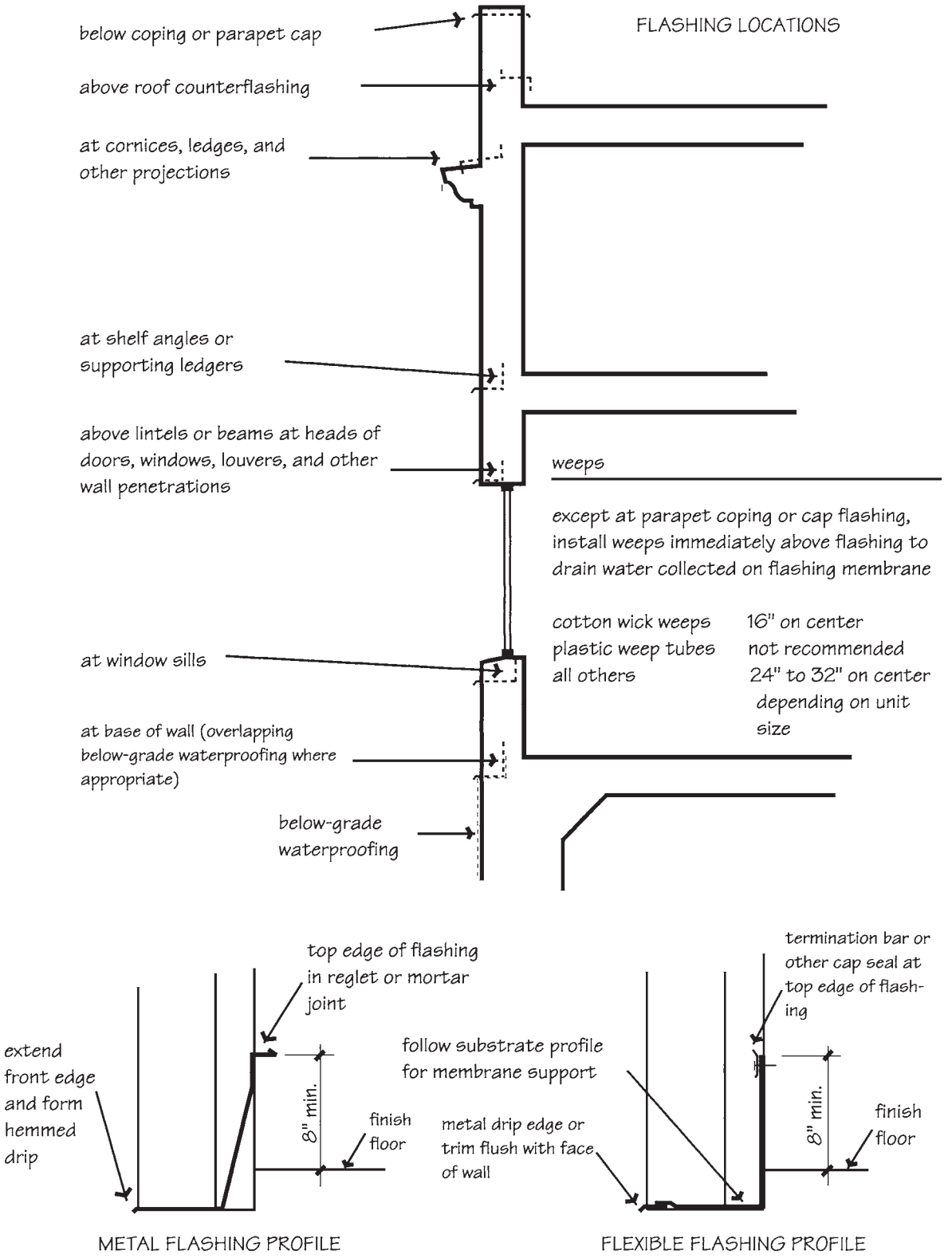

Figure 9-30 Masonry flashing and weep placement. (*From Beall and Jaffe,* Concrete and Masonry Databook*, McGraw-Hill, New York, 2003.*)