THE MASONRY EDGE

FLASHING...Tying the Loose ends

INTRODUCTION

Masonry has proven itself to be one of the most durable building materials available. Three common types of masonry wall systems are cavity walls, veneer walls, and composite (barrier) walls. The main issue when designing a quality wall system is controlling water that penetrates the wall system. A successful system uses flashing to perform two functions: to prevent water penetration at copings and below openings, and to direct any water that has penetrated the wall back to the outside above openings and at the wall base. The flashing strategies herein are tried and true techniques which can help create a long lasting, durable masonry wall system.

The arrow indicates a properly installed exposed metal drip, hardly noticeable from a few feet away.

METHODS OF INSTALLATION

The proper detailing and installation of flashing is critical. A masonry wall's longevity can be drastically compromised if standard methods and procedures are not applied. Unconventional flashing methods, teamed with a designer's oversight, can produce detrimental results, such as: efflorescence, mortar deterioration, spalling brick, excessive wall movement and interior moisture damage.

LOCATIONS

After a complete examination of the wall system, a designer might consider flashing in numerous areas. Five of the most common areas are:

- Above wall openings.
- Below wall openings. (window sills, etc)
- On shelf angles.
- At the wall base, or where the wall structure rests upon the foundation.
- At the top of the wall/parapet.

Installation Over Wall Openings

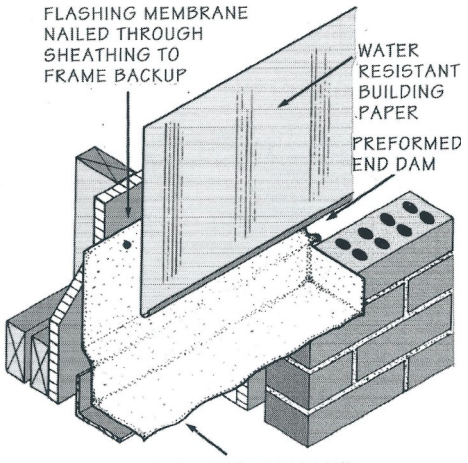


FIG. 1

If not properly flashed, all masonry wall openings possess a potential moisture problem. In brick veneer systems there are two distinct methods for properly installing the flashing membrane, as shown in Figures 1 & 2. In Figure 1 the flashing membrane* is turned up at the ends and placed inside the head joint, forming a dam. This acts as a directional aid, guiding water through the weep holes to the exterior surface of the wall. In Figure 2 a self adhesive preformed end dam is laced under the flashing membrane. (shown on top of flashing in the drawing for clarity). Figures 3 & 4 show the complex detail required to properly flash a brick veneer bay window. Preformed end dams are used in a stair-step fashion, culminating with a flashing tray and weep hole to direct collected water out of harms way. Preformed self-adhesive corners are also available for base flashing as shown in Figure 5.

FIG. 2

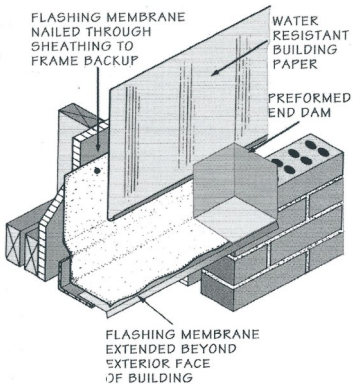
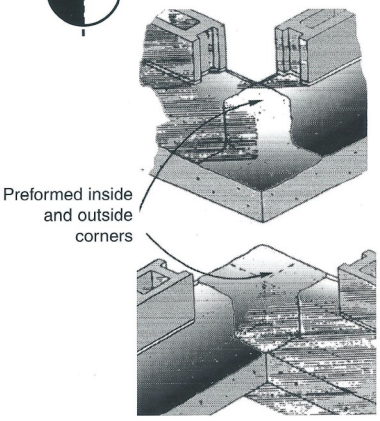


FIG. 5



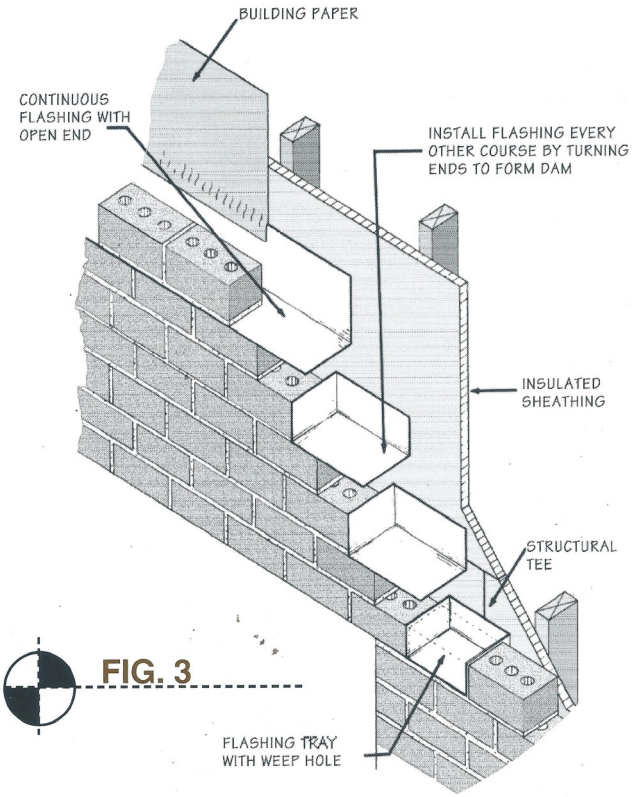


FIG. 3

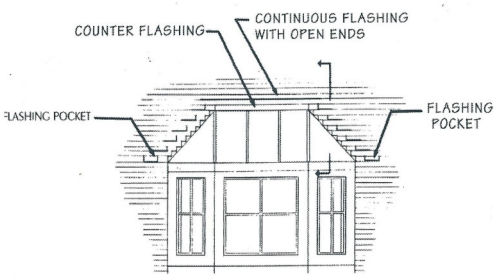


FIG. 4

Below Wall Openings & On Shelf Angles

Installation Over Wall Openings

The installation of the Flashing for a sill condition is similar in both cavity and veneer wall systems. See Figure 6 & 7. An end dam is used once again to act as a moisture deterrent. The flashing collects any entrant water, and the end dam ensures that the water will be directed to the exterior. Weep holes are installed to an avenue of egress for the moisture. Ideally the end dam would be placed 6" to beyond jamb lines above all wall openings.

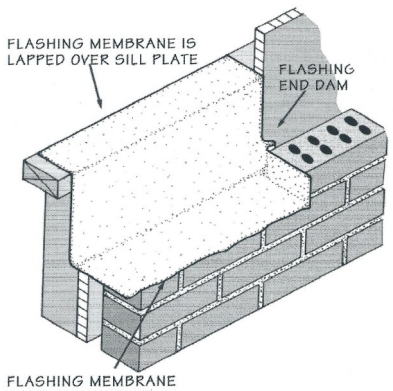


FIG. 6

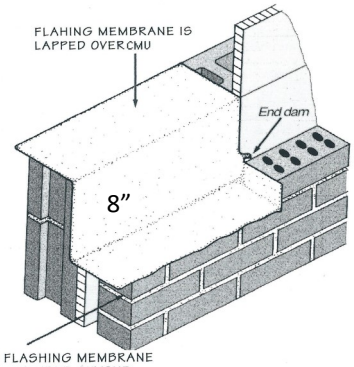


FIG. 7

On Shelf Angles

Shelf angles create a continuous horizontal break within the cavity, obstructing the vertical flow of moisture through the air space. If special attention is not given to the detailing and installation is not given to the detailing and installation of shelf angles, moisture infiltration, efflorescence and brick spalling can occur. See Figure 8a. Due to the above factors, specifying the minimum amount of shelf angles will reduce the possibility of moisture damage.

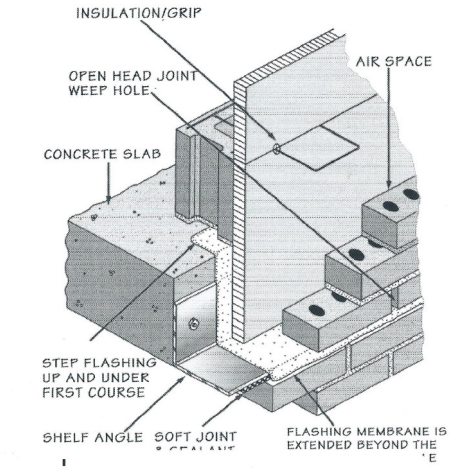


FIG. 8a

If possible, an alternative method of design is to eliminate all shelf angles at all floor lines and bear the exterior wythe of the masonry on the foundation as shown in Figure 8b. This eliminates potential problems inherent in shelf angle design. The wythe of masonry can support its own weight for several stories, while wall ties provide lateral stability.

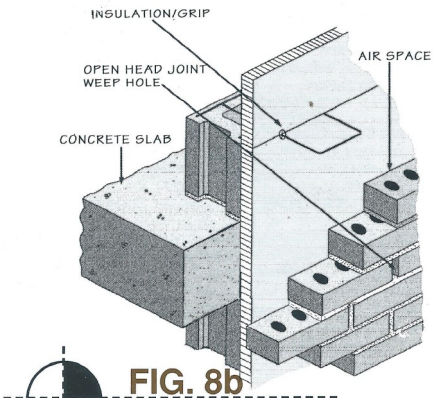


FIG. 8b

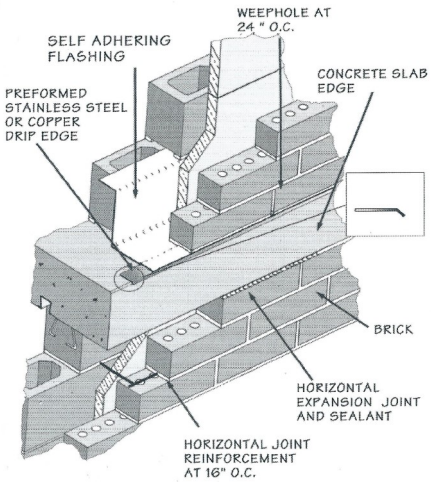


FIG. 9

Another strategy is to bear the exterior wythe directly on the floor slab. See Figure 9. However, thermal bridging makes this type of system less energy efficient, and more reinforcement may be required in the slab to support the wall. Also, exposed slabs are susceptible to moisture infiltration, so special details must be developed to prevent wind driven rain from penetrating beneath the flashing and into the building. Flashing must be set in a continuous bed of mastic, or a self adhering flashing must be used to prevent the wind driven rain from entering beneath the flashing.

Installation at Wall Base

Moisture which does penetrate the wall, gradually travels downward. This makes the base the most vulnerable location for moisture accumulation. A continuous flashing must be properly installed above grade. Various methods of installation for both veneer and cavity wall systems are shown in Figures 10 & 11. Proper weeping to provide moisture drainage is crucial. Weep holes can be created in several ways. Some of the most common methods are: leaving head joints open, use of removable oiled rods, and installing plastic or metal vents (not tubes), in lieu of mortar in head joint. Cotton sash cords placed 16" O.C. Will also serve as an excellent weep. There is no universal method. Different situations will require different methods. The specific type of weep hole is not critical as long as weep holes are properly installed at required locations in the proper spacing.

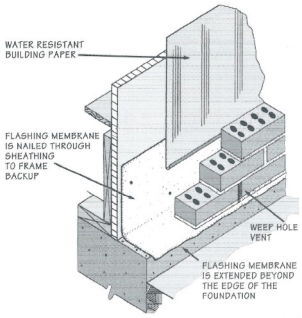


FIG. 10

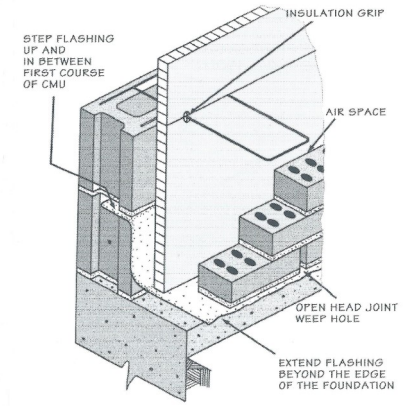


FIG. 11

Keeping Cavity Walls Clean

Wall type	Air space
Veneer (wood frame)	1"
Veneer (steel frame)	2"
Cavity Wall (with rigid insulation)	1"
Cavity Wall (with no insulation)	2"
Cavity Wall with insulation & drainage panel	0 to3/8"
Glazed brick veneer*	2"

*When using glazed brick veneer, provide vents at top & bottom of wall

A cavity wall is a drainage-type wall system. In a drainage wall, some water will penetrate the exterior wythe of masonry. The water then flows down the inside face of the masonry, is collected by properly installed flashing, and exits the wall through weep holes. Typically, the effective drainage space, or air space varies from system to system. This space should be 1" for veneer work and cavity walls with closed cell insulation; and 2" for veneer on steel studs, or cavity walls without insulation. For proper drainage, it is important that this air space is free of mortar droppings, which can trap water within the wall system where it can cause damage. It requires a great amount of effort for the mason to keep mortar from dropping down into the cavity. Various techniques such as beveling the mortar bed away from the cavity and drawing a piece of wood up the cavity to collect mortar droppings can help keep the cavity clean. One recent innovation is the utilization of an insulated drainage board. (Figure 12) This system provides a narrower wall with an unobstructed drainage path, eliminating the need for a clean airspace.

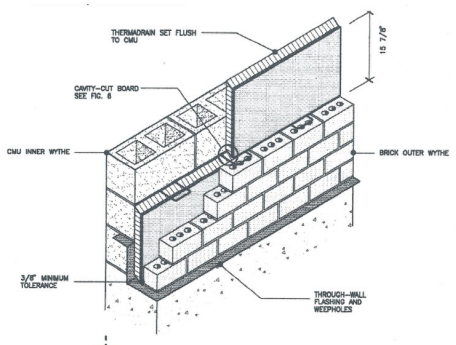


FIG. 12

DISCLAIMER NOTICE

This guide contains technical information on masonry wall systems. It provides some of the basic information required to properly design and detail these systems. This booklet does not cover all designs or conditions. The information presented illustrates only the principles that are involved.

The information contained in this booklet is based on the available data and experience of the technical staff of the Masonry Advisory Council. This information should be recognized as suggestions which, if followed with good judgement, should produce positive results.

Final decisions on the use of information, details and materials as discussed in this booklet are not within the purview of the Masonry Advisory Council, and must rest with the project designer, owner, or both.

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