Is flashing dangerous without a drip?

Metal drips can be eliminated from flashing with the right materials and details

By Donald G. McMican

Installing flashing without a drip is a dangerous practice, designers and contractors are often warned. And yet, in practice, flashing is often cut off at the face of the wall rather than being extended to form a drip. Have designers or contractors ignored this warning? Can flashing route water out of the wall without a drip?

Most masonry experts have recommended use of a drip edge at the outlet end of the flashing system. This routes water draining from the wall out and away from the wall's face. First, we will look at a few of these recommendations. Although I agree that stainless-steel drip edges are effective, there are some aesthetic and functional reasons why that may not always be the best detail. I will therefore conclude this article by proposing what I have found to be a workable and durable alternative to drip edges.

Donald G. McMican

Metal flashing edges without drips can be effective at lintels and shelf angles.

What the experts have said

One primary source of information on quality masonry construction is *Technical Notes on Brick Construction* by the Brick Industry Association. The first of a series of three notes on water resistance states that "flashing should extend beyond the face of the wall to form a drip. "Termination of through-wall flashing behind the exterior face of the wall is a dangerous practice and is not recommended" (Ref. 1).

In a classic *Masonry Construction* article from 1989 (Ref. 2), Norbert Krogstad notes that architects sometimes specify that flashing be held back from the face of wall to conceal the edge. When that is done, water can run around the lip of the flashing and re-enter the wall below. In an attempt to address this concern, some architects specify embedding the end of the flashing in caulk, hoping that this will keep water from getting under the flashing. Whether the flashing is properly constructed or not, inconsistencies in sealing the edge and shrinkage of flashing in cold weather frequently lead to failure of the caulk bond and an incomplete flashing sys-

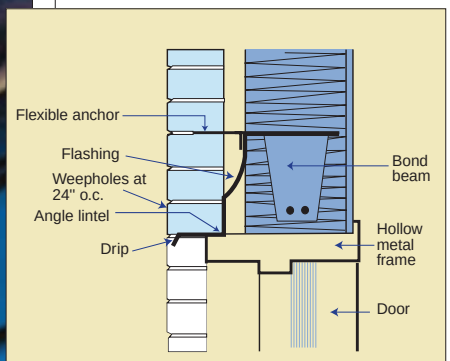

Figure 1

Christine Beall's suggested detail for flasing at a lintel.

tem. Krogstad recommends that a metal-edged drip be formed and that sealant be placed between the bottom of the flashing and the masonry below. Metal is recommended because most other flashing materials cannot be formed into a drip or exposed to weather. Metal is also ideal because it's difficult, if not impossible, to recaulk plastic flashing after 10 or 20 years without damaging it when removing old caulk.

Two other later recommendations seem to lessen the importance of extending flashing. Christine Beall points out that "flexible membrane flashings cannot be formed into a drip, but they should still be projected beyond the wall face and trimmed flush after the brick is placed. The most important thing is not to stop the flashing short. If you do, water can find its way around the flashing and back into the wall." (Ref. 3). Walter Laska also points out that "flashing must be extended beyond the outer wythe of masonry or at least be terminated flush with the exterior face of the masonry. This has been a recommended standard for years; yet some designers still specify that horizontal flashing legs be terminated within the outer masonry wythe. At certain locations, such as foundations or above window openings, flashing can be terminated flush with the outer face of the wall. However at shelf-angle locations, the flashing should be extended beyond the face of the wall and formed to create a drip" (Ref. 4).

These recommendations, however, do not entirely solve the problem. Although cutting the flashing off flush with the wall is better than cutting it off over the brick cores, it does not prevent water on the flashing from re-entering the wall. And wind-driven rain can still be forced into the wall between the flashing and the masonry below when this joint is not sealed.

A detail similar to shelf angles is found at the bearings for lintels above openings. Beall recommends that the flashing angle downward at the edge of a lintel (Fig. 1). This detail does not, however, address the condition at the bearing for a steel lintel, which is similar to that at a shelf angle. The lintel bearing should be detailed to prevent moisture from re-entering the wall at the masonry jamb below the lintel.

In the article, "Selecting Through-Wall Flashing" (Ref. 5), Carolyn Schierhorn reviews the various flashing materials and points out that cost should not drive the decision-making process for flashing selection. Self-adhering rubberized asphalt flashing has seen growing popularity among designers and masonry contractors because it is easy to install and is somewhat self-healing. But, when self-adhering rubberized asphalt flashing is cut off at the face of the wall, as is often done with other flexible flashings, its exposure to ultraviolet light causes a breakdown of the asphalt coating, which results in asphalt blisters forming along the edge of the flashing at the face of the wall. Metal flashings, on the other hand, do not deteriorate and can be extended from the face of the wall to form a drip. They are, however, difficult to bend and solder at seams. A combination of metal flashings at exposed areas, and flexible flashings at concealed areas, may be a good compromise.

In Krogstad's Troubleshooting column "Metal Drip Edge" (Ref. 6), he first points out that "lap-joints in the metal drip edge must be watertight." He also notes that it is "important that the flexible flashing be fully bonded to the metal drip edge, even if the metal edge has an upturned leg in the back. ... Rubberized asphalt flashings are commonly used in conjunction with metal drip edges to facilitate good bonding between the flashing materials." Finally he states that "a metal drip edge must have well-sealed corners. Corners that are not properly sealed will leak."

In Christine Beall's book, *Masonry Design and Detailing* (Ref. 7), she presents several details to illustrate various flashing options and points out potential concerns with each. A detail developed by Smith, Hinchman, and Grylls Architects in Detroit, uses a two-piece flashing to eliminate the need for a drip at shelf angles (Fig. 2) while performing like metal drip edges.

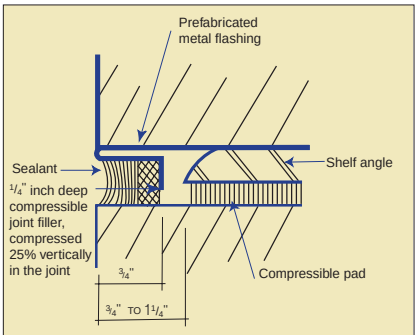

Figure 2 Shelf angle detail

Developed by Smith, Hinchman and Grylls Architects, Detroit, adapted with permission of McGraw-Hill Inc. (Ref. 7)

More recently, Krogstad's Troubleshooting column titled "Why Use Drips" (Ref. 8) responded to a question regarding the elimination of drips. "When sealant is placed between the bottom surface of the flashing and the top of the masonry below," he stated, "drip edges are not absolutely required for the flashing to perform. If the drip is eliminated, the sealant will stop the water from re-entering the wall. But adding a drip would force water to shed away from the sealant bond surfaces."

Selecting the right flashing materials and details

Schierhorn (Ref. 5) notes that deciding which flashing materials to specify and install is not easy. Many options are available and many circumstances must be weighed. She quotes Christine Beall as emphasizing that "in the real world of writing specs and creating designs for new construction, the owner imposes budget constraints on the designer. You have to look at the whole

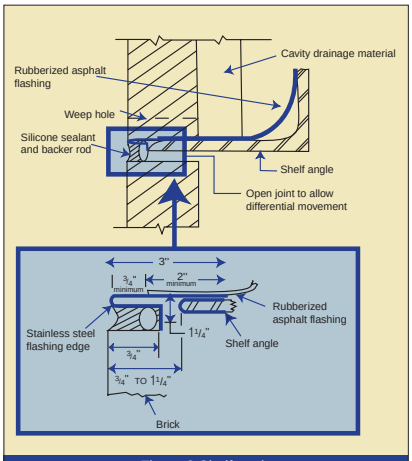

Figure 3 Shelf angle

Suggested flashing detail at a shelf angle. Some required elements have been omitted to focus on showing how to get water out of the wall.

picture and try to find the best flashing you can for your particular situation."

Some questions that may help to identify the quality you need in a flashing system are:

1. What is the building's projected life?
2. Will the building be torn down or rehabilitated in 25 years?
3. What is the quality of the labor force that will install the flashing?
4. Will there be onsite inspection during construction?

The answers to these questions will help you to answer the more general question of whether the life-cycle costs of the materials and details are compatible with each other and with the intended use of the building.

One possible solution: no drips

In developing a detail that would lead to a successful flashing, even without drips, the following parameters should be considered:

1. The flashing must extend to the face of the wall. If the flashing is terminated within the wall, some of the water collected on the flashing will inevitably flow back under the flashing and into the wall, creating water-related problems, efflorescence, migration to the interior of the building, and corrosion of the shelf angle.
2. From an aesthetic consideration, eliminating the drips is desirable, yet water must not be allowed to re-enter the wall.
3. Without drips, the sealant under the metal edge is easier to install and monitor, so it is less important that water be directed away from this joint.

Based on these objectives, I have found that the following materials will result in a functional and durable flashing:

- Self-adhering, rubberized asphalt flashing is ideal because of its flexibility, self-healing property, and ease of bonding to adjacent surfaces.
- A stainless-steel metal edge should be used because it eliminates possible galvanic action that can occur with copper while retaining long-term durability. This material eliminates the staining common with copper flashing and is more durable than galvanized flashings. It also allows the rubberized flashing to be installed in accordance with the manufacturer's recommendations and the joint below the flashing to be sealed. The metal edge also means that any future repairs to the sealant joint will be more easily made and won't affect the flashing system. Resealing a flexible flashing edge or even a drip edge is difficult and can result in damage to the flexible flashing, bending of the drip edge, or sealant adhesion failure.
- Silicone sealant has a longer life than other sealants and so is preferred. Proper preparation of the bond surfaces is important to reduce the likelihood of premature adhesion failure.
- A cavity drainage material and weep system can ensure positive drainage of moisture on the flashing. Pea gravel is often used, but it can be plugged by mortar droppings that form a solid cap over the gravel and prevent the moisture from reaching the weeps. Pea gravel can also cause soiling of the face of wall from dust that rinses out and drains from the weeps.

Based on the development parameters and material preferences, I have developed details that result in a complete flashing system without using drips. Figure 3 shows a flashing detail at a shelf angle. Note that in this detail, some project requirements have been omitted so we can concentrate on the flashing and the need to direct water out of the wall.

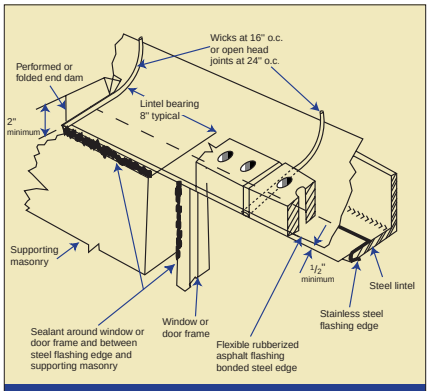

Figure 4 Lintel

Suggested flashing detail at a lintel.

Figure 4 shows a similar detail for lintels. The portion of the lintel that is bearing on the masonry below is similar to a shelf angle except that there is no gap under this part of the lintel. The metal edge could be omitted between the jambs (over the opening), but it is often easier to align both ends of the metal edge if one full-length piece is used. By being continuous, the metal edge also forms a drip in front of the lintel and reduces the possibility that moisture will be wind-blown back to the joint between the lintel and the door or window frame.

The final decision

The recommendations from others that I have described here were selected because they all relate to treatment at the outlet

end of the flashing. To get a more complete understanding of the various products, their role in masonry, and how flashing should be installed, you should review these resources, other previously written articles about flashing, and the Brick Industry Association's recommendations.

In designing a flashing system, you will need to understand the intent of the overall project's design recommendations, review the project requirements, and address any discrepancies that might exist between the various recommendations. Once the design is finalized, it should include recommendations on materials that are compatible with each other and with the design intent. Ultimately, whether or not drips are used must be decided based on the specific conditions of each project.

References

1. "Water Resistance of Brick Masonry Design and Detailing — Part I of III," *BIA Technical Notes on Brick Construction 7*, re-issued February 1998, Brick Industry Association.

2. Norbert Krogstad, "Reasons Flashing Fails," *Masonry Construction*, November 1989, pages 490-492.

3. Christine Beall, "Flashing Is Key to Leak-Free Masonry," *Masonry Construction*, March 1991, pages 102-104.

4. Walter Laska, "Why Extending Flashing Is Critical," *Masonry Construction*, December 1997, pages 675-677.

5. Carolyn Schierhorn, "Selecting Through-Wall Flashing," *Masonry Construction*, April 1995, pages 175-183.

6. Norbert Krogstad, "Metal Drip Edge," *Masonry Construction*, July 1998, page 393.

7. Christine Beall, *Masonry Design and Detailing*, 1997, McGraw-Hill Inc., 11 W. 19th St., New York, NY 10011.

8. Norbert Krogstad, "Why Use Drips" *Masonry Construction*, March 1996, page

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