

# ROOF-TO-WALL INTERFACE DETAIL FOR NEW CONSTRUCTION

By Patrick J. Conway, AIA



Figure 1 – Typical roof-to-wall scenario.

## Introduction

One of the most common call-backs for “leaky roofs” may not have anything to do with the roof at all, but rather an improperly detailed and constructed interface between the roof and wall. This article discusses how to properly design and build a roof-to-masonry cavity wall interface detail (Figure 1).

## Early Decisions

Successful roof-to-wall interface details begin with the designer. First, it is critical for the producer of construction documents to realize that this detail needs to be developed, drawn (ideally at a scale of 3" = 1'-0"), and referenced by building section. Too often this protocol is overlooked and construction decisions are delegated to “others” to figure out in the field.

Project specifications should reference this critical detail and suggest coordination between related trades in a preconstruction meeting. For example, when a roof terminates at a masonry cavity wall, the mason and the roof installer need to coordinate an appropriate elevation for masonry through-wall flashing, to provide clear-

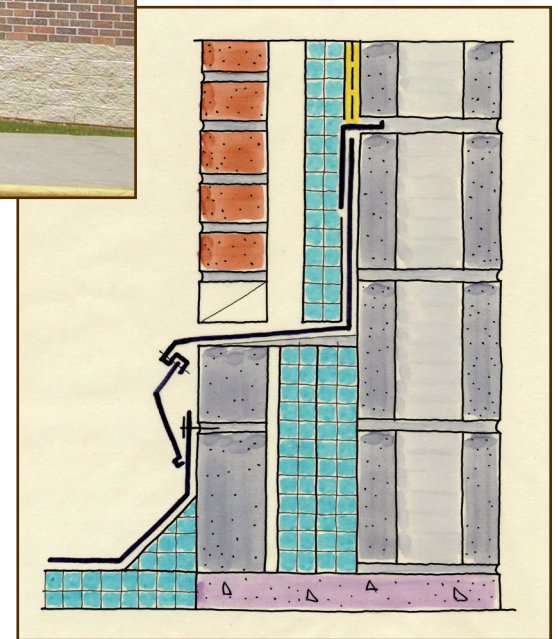


Figure 2 – Detail represents proper connection of roof termination and two-piece stainless steel flashing to create a continuous water-resistive barrier.



Figure 3 – Connected roof termination to through-wall flashing.

ance for tapered insulation systems, flashing steps, ballast thickness, and snow (Figure 2).

Roofing industry standards recommend wall flashing to be an absolute minimum of six inches above the finished roof membrane, preferably eight to 12 inches.

#### Construction Issues

Once this detail has been discussed in a preconstruction meeting, the next step in building a successful roof-to-wall interface detail is to schedule and conduct proper installation inspection. The project superintendent, quality control representative, masonry foreman, lead roofer, and other related parties should oversee installation.

Key observation points include:

- Masonry wall flashing set at correct elevation.
- Use of durable and properly installed masonry flashing materials.
- Provisions for, and connection of, wall flashing and roof termination (Figure 3).

#### Moisture Management Basics

Exterior wall systems may take on water from both external and internal sources. Wind-driven rain will attack wall systems from the outside, while air leakage from the building interior may contribute moisture inside wall assemblies in the form of vapor condensation

(depending on geography). Therefore, walls need to have the ability to dissipate moisture, either by drainage or evaporation, before it becomes problematic.

With increased understanding of moisture management dynamics for exterior wall systems, superior walls today are built to both drain and breathe; masonry cavity walls lead the way.

#### Masonry Cavity Walls

Masonry cavity walls are designed to have two wythes separated by an air space. This wall technology has an integral drainage plane behind the veneer wythe,

allowing an opportunity for air to circulate behind the veneer to dry the wall from the inside out, via natural convection.

Through-wall flashing is a key component for successful moisture management of masonry cavity walls. Depending on wall design, through-wall flashing should be located at the above-grade foundation wall, under wall caps and copings, under masonry sills, and anywhere the vertical drainage plane is interrupted by a wall element or roof.

It is important to understand that the roof-to-wall interface is an interruption in the vertical drainage plane. If this detail fails, building occupants will know about it because the leak is above their heads and likely will be expressed in the form of water entry into the building interior.

#### Masonry Flashing Systems

Properly installed through-wall flashing systems for masonry walls should follow project specifications and details. These construction documents should meet or exceed applicable model, local building codes, and approved industry standards.

Industry standards for through-wall masonry flashing include:

- 8-inch minimum vertical flashing rise between masonry wythes.
- Flashing top edge securely fastened



Figure 4 – Sagging initial through-wall flashing (under new metal flashing) creates an internal gutter that leaked.

so it does not pull away or delaminate over time.

- Flashing support (when needed) so it does not sag when spanning the air space separating the masonry wythes (Figure 4).
- 6-inch minimum flashing laps, sealed with compatible sealant, even when using adhesive flashing.
- Horizontal leg of flashing minimally level; ideally, positively pitched to the outside.
- Not allowing flashing to terminate within the wall (Figure 5).
- End dams at interruptions of horizontal flashing to contain water.
- Weep holes adequately spaced with durable and breathable weep hole inserts.

It is important to note that craftworkers are required to build details as presented in the construction documents and not by assumed “industry standards.” All devia-

tions from construction documents need approval through a proper sequence of communication along contractual lines; i.e., masonry contractors submit requests for information (RFI) to their contract holder (construction manager, general contractor, etc.), and not typically to the designer.



Figure 5 – Water runs around end of concealed flashing.

#### Flashing Selection

Flashing is available in many different materials, such as stainless steel, copper, copper composites, adhesive rubberized asphalt membranes, and EPDM. Note that

PVC flashing has been omitted from this list. Some light-gauge PVC flashings are not UV-stable and have been discovered brittle and fractured inside walls.

Flashing materials have many characteristics. However, the three most important through-wall flashing attributes for roof-to-wall interfaces are: durability, fewest laps possible (laps are leakers), and ability to resist sagging.

If the flashing on the project does not have the above positive attributes for the roof-to-wall interface detail, consider switching material to minimize risk. In all likelihood, there are few lineal feet of this detail on the project. Return on investment is significant when factoring in the likelihood and cost of future repairs (Figure 6).

#### EPDM Through-Wall Flashing

Some builders prefer to use approved alternate materials at the roof level, regardless of what flashing may be specified for the rest of the project. Better flashing materials for this critical detail include through-wall stainless steel or 40-mil (1.0 mm) flexible EPDM membrane flashing.

To facilitate efficient installation, some manufacturers are now marketing flexible EPDM through-wall masonry flashing systems in appropriately sized roll widths to meet specified dimensions. This material is thinner and more workable than typical roofing membrane stock at 45-mil (1.12 mm) or 60-mil (1.5 mm).

EPDM has the advantage of being durable during construction, UV-stable, and will not ooze out of the wall. Furthermore, EPDM has far fewer laps compared to any other flashing material, such as most adhesive flashings (Figure 7).

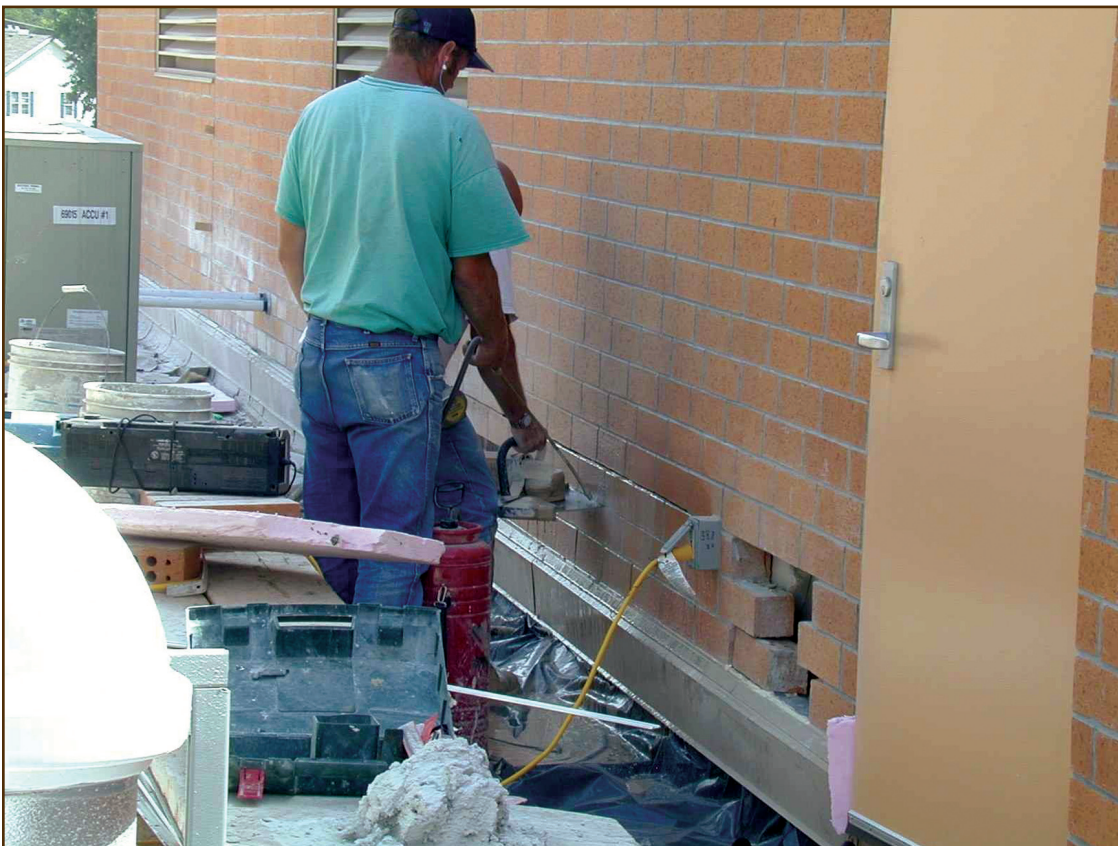


Figure 6 – Costly through-wall flashing repair four months after initial installation.

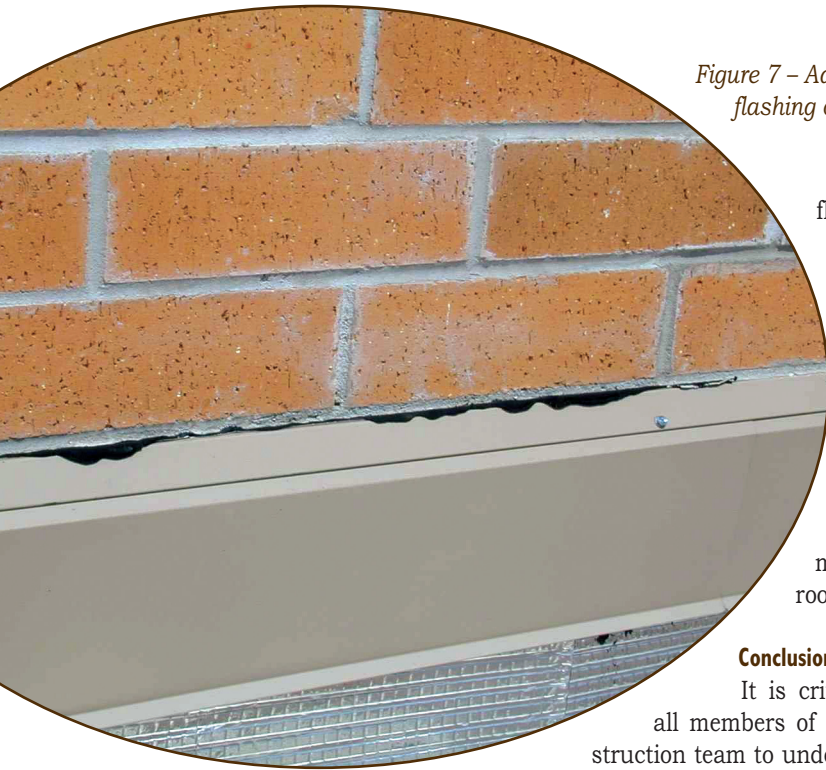



Figure 7 – Adhesive rubberized flashing oozing out of wall.

When using EPDM flashing, remember to secure the top and bond the bottom edges securely to a rigid drip edge with chemically compatible accessories such as sealant or tape. It is this metal drip edge that will ultimately connect to the roof termination.

**Conclusion**

It is critically important for all members of the design and construction team to understand the potential pitfalls of roof-to-wall interface details and the headaches they may cause. The next time a call comes in for a leaky roof at the intersection of the classroom wing and the taller gymnasium wall, check out both the roof and wall system details. 

A typical piece of stainless steel flashing is 10 feet long, while EPDM comes in 50-foot rolls and is workable in long lengths, unlike adhesive flashings. It also conforms to irregularities in building construction, unlike metal.

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**SPRI REPORTS INCREASED SHIPMENTS**

Shipments of low-slope roofing membranes by members of SPRI, the national organization representing sheet membrane and component suppliers to the commercial roofing industry, ended 2004 on a high note. Most materials saw double-digit increases over 2003. TPO thermoplastic shipments were up 18% in 2004. Thermoset shipments, up 17%; and APP modified bitumens, up 20%. No year-to-year comparison was available for "other thermoplastic" shipments, while SBS modifieds "also posted gains," according to SPRI.



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