RETROFIT Improvements

Making Homes Safer & More Resilient in Disaster-Prone Areas

Flash and Seal Roof Penetrations

SCOPE

This document provides homeowners with an overview of approaches for flashing and sealing roof penetrations to help discussion with a roofing contractor.

PURPOSE

Proper flashing and sealing of roof penetrations prevents rainwater from leaking into the roof structure and house below.

BENEFITS

- Minimizes the risk of structural damage to the roof deck and framing due to water intrusion
- Minimizes the risk of moisture damage to the interior of the house that can cause mold and mildew

RETROFIT OPPORTUNITY

This retrofit can be done when repairing a roof or replacing the roof covering.

HAZARD AND RISK

Deteriorated or incorrectly installed flashing at roof penetrations such as plumbing vents, chimneys, and skylights can allow rainwater to enter through the roofing that can damage the roof structure and interior finishes. Visible water stains are usually the first indication water has leaked through the roof. Water will travel through the path of least resistance and may leave a stain far from where it first penetrated. Homeowners can inspect for water intrusion at roof penetrations by carefully looking for signs of leakage in the attic, water stains on the roof sheathing or even walls below, wet insulation, and deterioration of roof coverings and roof deck. The flow of water on the roof should be observed from inside if possible and outside while it's raining and afterwards.

Figure 1. Damage of Ceiling Due to Water Intrusion. (*Source: rytechinc.com)*

SOLUTION

Water intrusion at roof penetrations can be prevented by proper flashing. Flashing is required at plumbing vents, masonry and metal chimneys, exhaust vent caps, dormers, and skylights. Flashing must be integrated with the roof covering (e.g., shingles) and roof underlayment and installed shingle-fashion such that the top layer of the roofing or flashing laps over the bottom layer to prevent water from draining behind the bottom layer. Roofs should be inspected periodically, and flashing repaired or replaced as needed.

Figure 2. Damaged Shingles and Rotted Roof Deck. (*Source: mullinsgc.com)*

Figure 3. Integrating Roof Penetration Flashing with Shingle. (*Source: finehomebuilding.com)*

TIPS

- Flashing at penetrations should be repaired or replaced by a professional roofing contractor.
- Inspect for rainwater leakage at roof penetrations, during and after a heavy rain, from within the attic and from outside.
- Look for shingles that are loose, broken, missing, or deteriorated.
- From the attic check wood for signs of rot and metal for rust.
- Inspect gutters and downspouts and other flashing at roof-wall intersections, roof valleys, and drip edges along rakes and eaves.
- Do not rely on sealants as a substitute for proper flashing.
- Apply flashing cement or sealant at flashing/underlayment for enhanced sealing in high-wind regions.

COST

Costs can vary considerably depending on local rates and how much work the roofer is doing. The costs below are estimated ranges for a roofer to replace existing flashing; replacement would be less expensive during a roof replacement:

- Vent pipe flashing: $100-200
- Skylight flashing: $250-500
- Metal chimney flashing: $500-900
- Masonry chimney flashing: $500-900

Sometimes replacing deteriorated flashing is the easiest solution to preventing water leakage at roof penetrations. In other cases, roof shingles may have to be removed to facilitate repair or replacement of damaged roof sheathing or flashing. It is important to choose products designed for the application to minimize leakage.

Enhanced sealing practices in high-wind and hurricane-prone regions can further reduce the risk of leakage at flashing due to wind-driven rain. Enhanced sealing practices, such as installing sealant between the flashing and roofing underlayment, can be integrated with the flashing and underlayment.

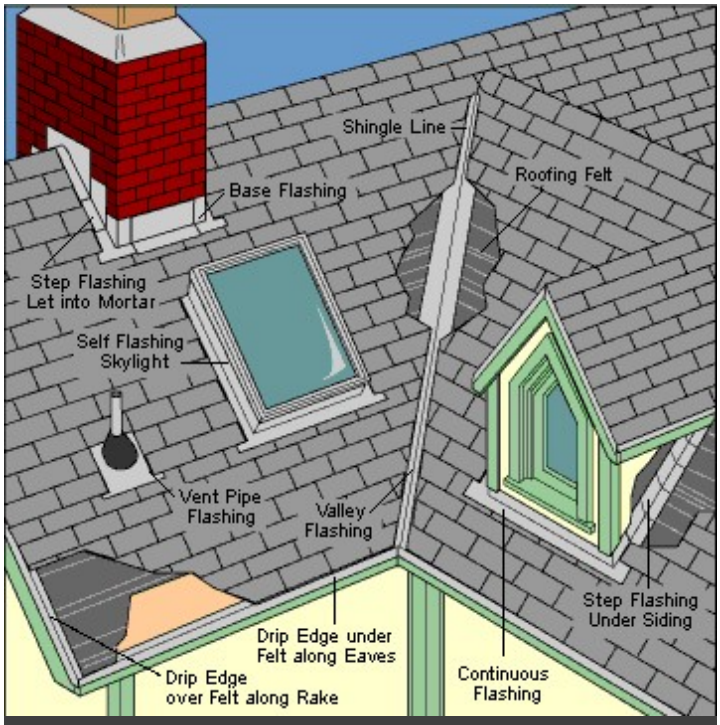

Figure 4. Methods of flashing and sealing around roof penetrations

Step flashing - Step flashing is used where the roof meets a wall or chimney. It is installed in steps along with shingles so water flows down the flashing to the roof. For chimneys, step flashing is installed over the base flashing.

Counter flashing (not shown) - For a masonry chimney, counter flashing is installed over step and base flashing and embedded in the masonry.

Vent pipe flashing - This is a cylindrical flashing used at the vents. The height of the cylindrical flashing allows the water to flow from the flashing into the shingles of the roof.

Materials like plastic, copper, aluminum and steel are used for flashing. Modified bituminous roofing tape may be used to aid the roof flashing.

(Source: hometips.com)

ADDITIONAL RESOURCES

1. Insurance Institute for Business & Home Safety (IBHS): Tips on Hiring a Roofing Contractor https://disastersafety.org/hurricane/how-to-protect-your-home-from-hurricanes/
2. Journal of Light Construction: Roofing Details That Work https://www.jlconline.com/how-to/roofing/roofing-details-that-work_o

NAHB National Association of Home Builders

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