



Residential Roofing: The Steep-Slope Solution





DIAMOND ROOFING
COVERING ROOFS GREEN

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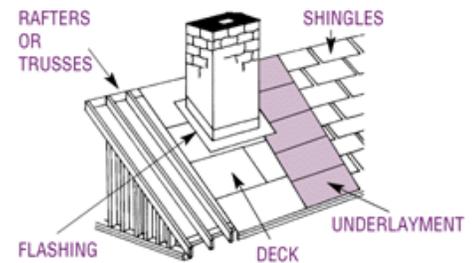
Buying a New Roof & Getting Your Money's Worth



A new roof system is a big investment and the National Roofing Contractors Association hopes the following information will make you a more knowledgeable consumer and, when the time comes, a smart roofing buyer.

Roof System Components: All steep-slope roof systems (i.e. roofs with slopes of 25 percent or more) have five basic components:

1. **Roof Coverings:** Shingles, tile, slate, or metal and underlayment that protects the sheathing from weather
2. **Sheathing:** Boards or sheet material that are fastened to roof rafters to cover a house or building
3. **Roof Structure:** Rafters and trusses constructed to support the sheathing
4. **Flashings:** Sheet metal or other material installed into a roof system's various joints and valleys to prevent water seepage.
5. **Drainage:** A roof system's design features (such as shape, slope, & layout that affect its ability to shed water



Ventilation & Insulation Are Key: One of the most critical factors in roof system durability is proper ventilation. Without it, heat and moisture build up in an attic area and combine to cause rafters and sheathing to rot, shingles to buckle, and insulation to lose its effectiveness. Therefore, it is important never to block off sources of roof ventilation (such as louvers, ridge vents, or soffit vents), even in the winter. Proper attic ventilation will help prevent structural damage caused by moisture, increase roofing material life, reduce energy consumption, and enhance the comfort level of the rooms below the attic.

In addition to the free flow of air, insulation plays a key role in proper attic ventilation. The requirements for proper attic ventilation may vary greatly, depending on the part of the United States in which a home is located, as well as the structure's conditions. Nevertheless, the general ventilation formula is based on the length and width of the attic. NRCA recommends a minimum of 1 square foot of free vent area for each 150 square feet of attic floor—with vents placed proportionately at the eaves and at or near the ridge. An ideal attic has:

- A gap-free lay of insulation on the attic floor to protect the house below from heat gain or loss
- A vapor retarder under the insulation and next to the ceiling to stop moisture from rising into the attic
- Enough open, vented spaces to allow air to pass in and out freely
- A minimum of 1 inch between the insulation and roof sheathing

Even Roofs Have Enemies: A roof system's performance is affected by numerous factors. Knowing about the following will help you make informed roof system buying decisions:

- **Sun:** Heat and ultraviolet rays cause roofing materials to deteriorate over time. Deterioration can occur faster on the sides facing west and south.
- **Rain:** When water gets underneath roof covering, it can work its way to the roof deck and cause the roof structure to rot. Extra moisture encourages mildew and rot elsewhere, including walls, ceilings, insulation, and electrical systems.
- **Wind:** High winds can lift the roofing material edges and force water and debris underneath them. Extremely high winds can cause extensive damage.
- **Snow & Ice:** Melting snow often refreezes at a roof's overhang where the surface is cooler, forming an ice dam. This blocks proper drainage into the gutter. Water backs up under the roof covering and seeps into the interior. During the early melt stages, gutters and downspouts can be the first to fill with ice and be damaged beyond repair or even torn off a house.
- **Condensation:** Condensation can result from the buildup of relatively warm, moisture-laden air. Moisture, in a poorly ventilated attic, promotes decay of wood sheathing and rafters, possibly destroying a roof structure.
- **Moss & Algae:** Moss can grow on moist wood roof coverings. Once it grows, moss holds even more moisture to a roof system's surface, causing rot. In addition, moss roots also can work their way into a wood deck and structure. Algae also grows in damp, shaded areas of the roof system. Besides creating a black-green stain, algae can retain moisture, causing rot and deterioration.
- **Trees & Leaves:** Tree branches touching a roof will scratch and gouge roofing materials when the branches are blown by the wind. Leaves on a roof system's surface retain moisture and cause rot and in gutters block drainage.
- **Missing or Torn Shingles:** The key to a roof system's effectiveness is complete protection. When shingles are missing or torn off, a roof structure and home are vulnerable to water damage and rot. The problem is likely to spread nearby to other shingles and missing shingles should be replaced as soon as possible.
- **Shingle Deterioration:** When shingles are old and worn out, they curl, split, and lose their waterproofing effectiveness. Weakened shingles easily are blown off, torn, or lifted by wind gusts. The end result is structural rot and interior damage. A deteriorated roof systems only get worse with time and should be replaced as soon as possible.
- **Flashing Deterioration:** Many apparent roof leaks really are flashing leaks. Without good, tight flashings around chimneys, vents, skylights, and wall/roof junctions, water can enter a home and cause damage to walls, ceilings, insulation, and electrical systems. Flashings should be checked as part of a biannual roof inspection and gutter cleaning.

Diamond's Residential Roofing Products: New Construction & Roof Replacements

Choosing A Steep-Slope Roof System



Architectural Shingles:

CertainTeed, GAF, Malarkey, Owens Corning, Tamko

The most common steep-slope roof covering is asphalt shingles. Standard asphalt shingles are made of asphalt over a reinforcing mat covered with a surfacing of colored, manmade ceramic granules. The shingles are manufactured at a factory in two common styles: three-tab and laminated. Laminated asphalt shingles are also commonly referred to as “architectural” or “dimensional” shingles. Many asphalt shingle manufacturers produce impact-resistant versions of their products.



Stone Coated Steel Tiles:

Gerard Roofing Technologies

Architectural metal roof systems are commonly used as a steep-slope water-shedding system. Metal systems include metal panels, metal shingles, and metal shingle panels. Stone-coated steel tiles are a type of metal shingle panels and often simulate wood shakes and shingles.



Designer Shakes, Slate & Clay Tiles:

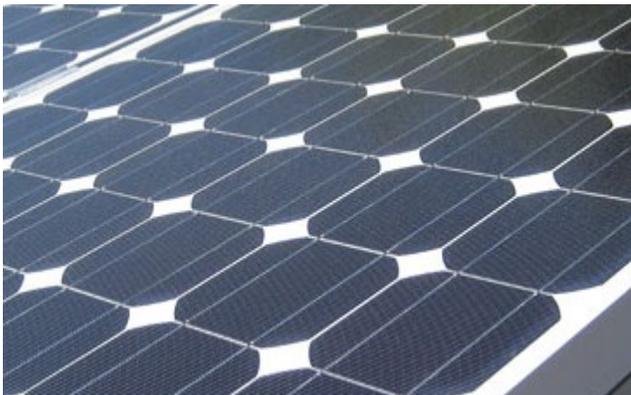
DaVinci Roofscapes, Ludowici, Monier Lifestile, Westile

Synthetics—This covering, primarily in shingle form, can be made from recycled plastic or other synthetic materials. Synthetics are fairly new to the roofing market and are gaining popularity. They are molded into shapes and available in different colors.

Wood Shakes—Wood shakes, usually made of cedar, also are commonly used water-shedding coverings for steep-slope roof systems. Wood shakes are hand-split and typically thicker and heavier than wood shingles. Wood shakes are applied as overlapping units to form a water-shedding cover.

Slate—This covering, created from natural rock, has been used since ancient times. It is often seen on historic structures in the US and throughout Europe.

Clay Tiles—Clay tiles have been used since Egyptian times. Available in different colors and textures, these tiles are molded at factories and attached to roofs at job sites. They are particularly popular in warmer climates.



Solar Photovoltaics & Roof Accessories:

Roof Gutters, Downspouts, & Snow Guards

Solar Photovoltaic Kits—Diamond Solar Solutions

Solar Powered Ventilation—Attic Breeze

Roof Skylights—Natural Light Tubular Skylights

See Diamond Solar Solutions' website at www.diamondsolarsolutions.com and Steep-Slope Roof Accessories Brochure for more information.

100 McArtor Road, PO Box 37
Dodge City, KS 67801

Phone: 620 225 2622 | Fax: 620 225 6862

2720 Amherst Avenue
Manhattan, KS 66502

Phone: 785 537 8008 | Fax: 785 537 9899

Steep-Slope Roof Flashings

Defining Flashings: Flashings serve a vital role in the performance and life of steep-slope roof systems. Flashing is a component used to weatherproof or seal a roof system at any area where the field is interrupted, such as a chimney or vent pipe, or where the field terminates at walls and edges. These interruptions and terminations always need to be properly flashed to keep out the elements. Special attention must be given to flashing when they're installed and maintained because most roof system leaks occur at flashings.

Common Steep-Slope Flashings Include:

- Vertical walls
- Chimneys
- Eave and gutter edges
- Rake edges
- Vent pipes
- Attic vents
- Equipment mounting curbs, such as skylights and exhaust vents

Flashing Performance: Steep-slope flashings must withstand the forces put on a roof system including: 1) movement between building components, and 2) high winds battering against leading edges and field of a roof system. Therefore, flashings are a critical component of a roof system. The term flashings is commonly used as both a noun and a verb. For example, a chimney typically requires a flashing (a noun), and you also may see directions for flashings (a verb) a chimney. In this case, flashing a chimney means the act of installing materials that shed water around this penetration in a steep-slope roof.

Flashing Height: All steep-slope flashings should be installed to a minimum height of 4 inches above the plane of a roof system.

Step Flashings: Step flashings are individual pieces of sheet-metal material used to flash walls, around chimneys, dormers, and such projections along the slope of a roof. Individual pieces are overlapped and stepped up the vertical surface.

Counterflashings: Most flashings provide the use of an additional component, called counterflashings, over the top edge. Counterflashings provide additional weatherproofing by covering the top edge of a vertical flashing. Sometimes siding materials on adjoining walls serve as counterflashing.

Flashing details: For some tile roof systems and for most metal panel roof systems are specialized and unique to each system with many flashings requiring custom fabrication.



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