

Understanding Your Roof

Roofs have one functional purpose: sheltering the home from weather conditions: whether it is rain, snow, or sun. With the exception of structural integrity there is no one item of the home that is more important than the roofing system; because a faulty roof directly impacts every other part of the home including the ability of the house to maintain its structural integrity. The big culprit is water, because it not only destroys the interior but promotes rot and insect infestation that will eventually cause the home's structure to fail.

The type of roofing system that a homeowner or contractor will cover a home with depends on what part of the country it will be built. Weather conditions play a big part in the types of materials used and this has a direct impact on the cost of the roof.

Clay Tile Roofing

Today clay tile is a standard southwest roofing system and is available in many styles and colors. Although more expensive than asphalt or even metal clay shingles will last the lifetime of the home if properly maintained.

Pressed-Concrete Tiles

A competitor for clay tiles is the pressed-concrete roofing system. Not only can they mimic clay tiles in design, color and texture they can also be formed to look like wooden shakes and slate. They are also installed like the clay tiles but lighter, more durable and cheaper. Like clay they resist fire, rot, and fatigue and they won't corrode.

Metal Roofing

A metal roof is becoming an increasingly popular choice. There are several types of metal roofing such as terne (tin/steel alloy), copper, aluminum, galvanized steel, and vinyl-clad steel.

Some vinyl-clad steel manufacturers tout a life span of nearly 100 years; traditional painted aluminum or steel may last 35 years; terne lasting up to 50 years. Another modern "upper end" choice is a copper roof for both durability and appearance.

A metal roof must be flashed and fastened with the same type metal to avoid electrolytic action and subsequent corrosion. Metal roofing is relatively expensive, but the life span of some choices can be well worth the investment.

Asphalt Shingles

Asphalt roof shingles are the most common choice. They are available in many different colors, are relatively easy to install, and are relatively affordable in cost. They require little or no maintenance when new, but begin to crack and curl over time. Repairs are relatively easy to perform. The average life span of asphalt shingles is 15 to 20 years; high-quality shingles provides improved weather and fire resistance, and can last up to 35 years.

Cedar Shakes

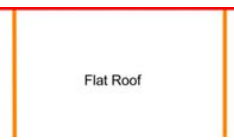
Cedar shingles or cedar shakes are popular choices, but are significantly more expensive than asphalt shingles. Cedar shingles can last more than 20 years; properly installed and maintained, cedar shakes have a life span of 50 years or more. Left untreated, both have a poor fire rating; they will warp, split, rot, and weather. Therefore, periodic treatment with a product made for that purpose is recommended. Cedar shingles and shakes are neither difficult to repair or replace.

Slate

Slate has been the mainstay of roofing for high-end homes and government buildings for centuries. It is heavy, expensive and requires a skilled crew to install. However, its beautiful colors will make any home a palace and the roof should last for as long as the home.

When making a choice on a roof system the homeowner should take into consideration how long he or she will be staying in the home and, as well, how much the roof will add to the resale value of the home.

Slopes & Design



Flat Roof

The flat roof in many instances isn't a totally horizontal roof. Many commercial buildings have slightly inclined flat roofs to allow water to run off. The main feature about a flat roof is that the total roofing deck is at the same level.

When they were first conceived for commercial use the roofs were covered with tar and gravel to give the protection some substance and strength. However, if the water was allowed to pool minute cracking due to sun and cold could allow water to leak in. Modern roofing techniques have all but eliminated this weakness using a continuous rubber or rubber-like membrane that is laid over the whole surface. These coatings are also successful in "green" applications, allowing grass and shallow-rooted shrubs to grow in a natural environment on top. Moisture from rain, instead of pooling, is kept up in the root system of the plant life.

Classifications of low slope roof membranes or systems.

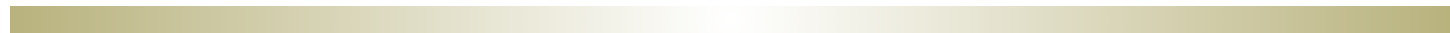
1. Built-up roof (BUR) membranes
2. (S.B.S)-modified bitumen sheet membranes
3. Single-ply membranes
 1. Thermoplastic membranes (e.g., PVC, TPO)
 2. Thermoset membranes (e.g., EPDM)

Most low-slope roof membranes have three principle components:

Weatherproofing layer or layers — the weatherproofing component is the most important element because it keeps water from entering a roof assembly.

Reinforcement — reinforcement adds strength, puncture resistance and dimensional stability to a membrane.

Surfacing — surfacing is the component that protects the weatherproofing and reinforcement from sunlight and weather. Some surfacings provide other benefits such as increased fire resistance, improved traffic and hail resistance, and increased solar reflectivity.



Gable Roof

The framework for the gable roof is a series of rafters spaced 12 -16" inches apart and decked with a sheathing of plywood, oriented strand board (osb) or, in the past, tongue-and-groove lumber. The roof sits on the walls that transfer the load to the foundation.

The downside of gable roofs is that they can act as a giant sail in the face of high winds that can find an anchor under the eaves. The upward pressures cause a failure in the truss system that is designed for downward weight.

Steep-Slope Roofing

There are five classifications of steep slope roof coverings.

1. Asphalt Shingles
2. Concrete tile
3. Metal roof systems
4. Slate tile
5. Cedar Shakes & Shingles

Steep-slope roof systems typically are composed of individual pieces or components installed in shingle fashion. Steep-slope roof assemblies typically consist of three primary parts:

Roof deck — a roof deck is the structural substrate and usually is a wood-based material such as plywood or oriented strand board (OSB).

Underlayment — underlayment provides temporary protection until a roof covering is installed and provides a secondary weatherproofing barrier. Sometimes underlayment is referred to as "felt" or "paper."

Roof covering — the roof covering is the external watershedding material

Barn Roof



Like a gable roof except each roof side is divided into two parts which slope in at different angles. The upper part of this slope maintains a shallow angle while the lower part is quite steep. This structural design gains headroom on the upper level enabling more usable space. So this design also works in homes where the upper levels are not encumbered by a low, sloping ceiling.

Because of their height and upper gable surface area they also can trap winds cause them to defeat on the gabled ends. The good news is that the eave space is slim so high winds cannot rip at it.

Hip Roof



This is a type of roof where all sides slope gently downward. Square versions of this design are shaped like a pyramid, in other words each roof triangle has the exact same dimensions. If the roof style is on a rectangular home then the opposite sides are equal.

Appearing now mostly on cottages and bungalows this style was very popular for bungalows in the 1950's as they were easy to build. Supporting the roof is a complex array of trusses so that building the roof takes more time. In addition, storage space is limited by the loads of timber in the attic. However, this makes the roof stronger and, in addition to its low profile, is more likely to withstand hurricane-force winds than the normal, gabled roofs. A "mansard" roof is a hip roof with two different roof styles.

The downside with hip roofs is that they are susceptible to snow loads because the slope is so shallow. This is offset by the incredible strength of the truss system.

Flashing

The purpose of flashing is to direct the flow of water that leaks into the intersection down and away from the interior of the structure to the topside of the roofing material. In every case, the top edge of the flashing passes underneath the underlayment, the upper pieces of flashing pass over the lower pieces, and the lower edge of the flashing always passes over the top of the roofing material. In such a manner, the flashing never directs the flow of water to the bottom side of the underlayment, never putting it in contact with the wood structural panel sheathing.

Valley flashing

Protects the valleys where two roof planes meet. This material is available with a V- or W-shaped profile and is placed over the top of the building felt before the roof's finishing material is installed.

Step flashing protects the joints between the roof deck and chimneys or dormers. Step flashing fits to each course of shingles and appears to “step” up the wall of the chimney.

Vent pipe flashing fits over flues or pipes. The shape of vent flashing is typically a cylinder with a wide flange at the base, which is lapped into the shingles as the roofing is installed.

Drip edges are strips of flashing material that run along roof eaves and rakes to prevent water from seeping under the finished roof along its edges.

The majority of roof leaks occur in locations where the plane of the roof is interrupted by a ridge, another roof intersecting at an angle, a wall or penetration. Even the simplest of rooflines has dozens of potential leaks sites due to chimneys, ridges, valleys, etc. Proper detailing around these areas, as detailed in the diagrams, is critical to prevent these leaks.

Metal flashing material is generally soldered or brazed. Similar to welding, the brazing process bonds two pieces of metal into one single piece. In many cases, flashing components have to wrap around corners or be spliced together, and in these cases they can be soldered or brazed to ensure a strong, durable joint.

Also, remember that both temperature and humidity can cause roofing materials (shingles, wood sheathing, flashing) to expand and contract with seasonal changes. The flashing materials will continue to be leak-proof if they can withstand this movement of the roofing materials. Well engineered and properly installed two-part flashing can handle this movement with no problem. Two-part flashing systems consist of a base flashing—often step-flashing—that is laced into the finished roof material. The base is then covered by another metal flashing piece lapped over it. The second piece should not be fastened to the base, so the two pieces can move against each other independently when the roofing materials shift with seasonal change.

What's the difference in 15, 25 and 30+ year shingles?

The longer the life of a shingle, the thicker it is as it contains more asphalt. The additional thickness enables the shingle to resist damage caused by overall weather conditions; such as, wind, snow, sun and rain. Also, thicker shingles will increase the re-sale value of your home because they last longer, have a longer warranty period and are more aesthetically pleasing.