INSPECTING SLOPED ROOFS

by Ron Passaro

How to spot current or future problems when inspecting residential steep roofs

I have been a full-time home inspector for the last seventeen years. Prior to that, I was a building contractor and before that, I earned my living as a carpenter. What I have tried to do in this article is share with you some of the things I have come across over the years when inspecting different types of sloped roofs and their flashings.

Asphalt Roofing

The asphalt strip shingle is by far the most common residential roofing material. It is the easiest to install and has a life expectancy of 15 to 25 years on the average, depending on the quality of the material and the skill and care used in installation. As a result, it is the yardstick by which most of us measure life expectancy and cost of all types of roofing. Although asphalt shingles are fairly cost-effective, they have a number of drawbacks and problems we see as house inspectors.

Because asphalt roofing is so simple to install, the job is often done by homeowners, or unskilled workers. Improper installation can cause a host of problems, from cosmetic to physical damage.

Sometimes cosmetic problems such as misaligned shingle courses may alert the inspector to other defects in the roof, such as improperly fastened shingles. Loose shingles can result from nails being driven in the wrong location on a shingle, or from nails too short to catch the deck below.

Stapling machines can also cause problems. These can push fasteners right through the surface of the shingle and destroy their holding ability. Broken or missing shingles are the outcome, as well as tears at the slot lines, all perceivable by a brief visual scan of the roof surface.

Using care in putting on a roof initially—snapping lines, choosing long enough nails, applying seal-tab or self-sealing strips—will all result in a better roof.

On closer inspection, a number of other clues present themselves which might indicate roofing problems. Loss of the granular surface of the shingles indicates that the material is approaching the end of its service life. The greatest contributing factor to this condition is exposure to the sun: The south side of a roof wears out considerably sooner than the north side because of its more constant exposure. Lack of good attic ventilation will also cause the shingles to dry out and lose their granular surface. While little can be done about solar exposure, improving attic ventilation can reduce the problem.

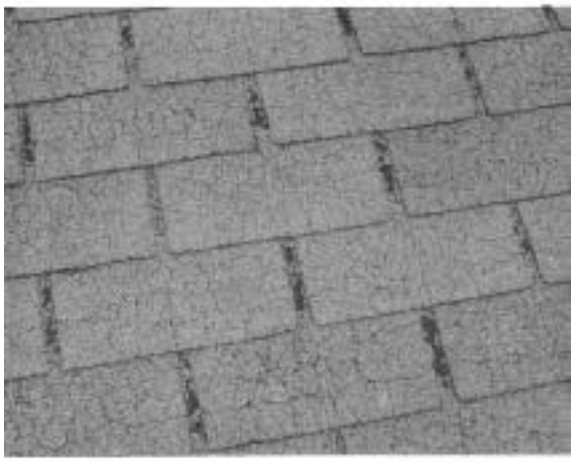
A certain amount of physical damage to the roof surface is caused by foot traffic—by the original tradespeople, by maintenance people, or by TV workers positioning antennas. Traffic on the roof once the job is done should be kept to a minimum.

Hail, wind, and tree branches (falling or rubbing on the roof) can break shingles or cause holes—sometimes making a complete reshingling job necessary. You can temporarily patch holes with tar or roofing cement, but these are stop-gap measures at best. Once holes begin to appear on the roof surface, replacement is the only certain cure. Trimming overhanging foliage will limit the harm caused by windfall or abrasion.

Reroofing is not without its difficulties either. During a home inspection, we frequently see multiple layers of roofing materials—sometimes up to

These shingles have buckled into "birds' mouths," caused by aging and a lack of attic ventilation.

In the 1970s, some manufacturers skimped on the amount of asphalt coating on the underside of the shingles — causing them to cup.



Asphalt shingles wear out first at the slots between tabs—where the water runs. Note where the granular surface has worn away.

These drooping shingles lack support from either a wood or metal starter course. A properly installed metal drip edge will support the first course and direct rain into the gutter.

Clay tiles, like slate, are vulnerable to physical damage. Since clay tile is not waterproof, the membrane beneath the tile must also be inspected for leakage.

Not all slate is created equal. White efflorescence and brown stains indicate that these 40-year-old slates are delaminating and absorbing water, and have only ten or so years left of useful life.

Older chimneys were flashed through to the flue tile. Few modem chimneys, however, are flashed correctly. Common mistakes are no base flashing, no counter-flashing, or too shallow penetration into the masonry. Leakage around this chimney led to rotted plywood decking.

The cold-tar repairs to this valley will not last long. The flashing is copper and is appropriately installed in stepped sections—but it still failed before the slate roofing.

four layers on an existing roof! This is simply bad practice, and violates the building code in most places. Many municipalities prohibit the use of more than two layers. The best way to install a new roof is to remove all previously installed material first.

Cupping, curling, or "bird's mouth" are other conditions we often observe. This is where the edge of a shingle has turned up or under, or where the corners have separated, resembling the beak of a bird. We believe they are caused by manufacturing the shingles with an inadequate amount of asphalt coating on the underside. The condition is accelerated by a lack of ventilation. The best defense is to use a good grade of shingle and assure proper roof ventilation.

The first course of shingles is another trouble area we often notice. Many times the first course has bent down into the gutters, or edges have broken off or worn prematurely. In older construction, a wooden starter course was used to stiffen the first layer of shingles, but over the years this wood may have rotted, allowing the roof edge to droop. Today, a metal starter course or drip edge is used and works significantly better than the old method. A properly installed metal starter course will direct the drip line to the center of the gutter.

Slate Roof

Slate-surfaced roofs are also popular in our area. They tend to be better installed than asphalt shingles because of the skill needed to do the job.

One of the first problems we often encounter inspecting a slate roof is that the ridge cap has loosened. Simply punching a hole through the ridge cap and nailing it into place does not do the job, but a perfect method of fastening has not been developed. The best method still seems to be installing a copper ridge cap. It is more expensive than the wood or aluminum often used today, but since the slate will generally outlast almost any type of flashing or fastener, it makes sense to keep the roof trouble-free as long as possible.

Like asphalt shingles, slates are vulnerable to physical damage, only more so. Slate is very brittle and can crack under pressure. These roofs should never be walked on without proper scaffolding. Repairs to slate roofs are difficult and require skilled workers. Replacing one broken slate could result in damage to others, so extreme care is needed in doing this job.

In order to evaluate the longevity of a slate roof, it is helpful if a home inspector knows the origin of the slate materials. Buckingham slates from Virginia tend to be longer lasting than the Bangor slate produced in Pennsylvania. Some of the signs of wear that can be observed in slate are white rings that form on each slate, indicating approximately fifteen years of life left. When the white stains turn to brown, the roof has eight to twelve years remaining.

When examining a slate roof, an inspector must pay particular attention at the ridges, valleys, and dormers, or wherever a roofing section changes direction. The various joints that occur at these transitions are highly susceptible to leakage or breakage due to freezing and thawing cycles. Annual inspection and care of these areas will greatly diminish the need for extensive repairs.

Clay Tile Roofs

Clay tiles are also used in our area, although less than asphalt or slate. They are as durable and as good as slate, if not better. But they tend to be the most expensive of the materials used. Clay tile is not waterproof, and must therefore have a sub-roof below the tile to keep the structure watertight. As a result, an inspector often finds the tiles in good condition, while the sub-roofing beneath is worn out and prone to leakage. In most cases, the only cure for this problem is to replace the entire roof surface. Damage to tile roofs is similar to that seen on slate roofs and the maintenance procedures are the same.

Wood Shingles

Yet another popular roofing material is the wood shingle. These are generally not of uniform size and require particular attention and skill during installation. We often find that the joints between wood shingles are too tight, which causes warping when the shingles become wet and expand. If the joints are too loose, as the roof weathers, they line up with joints on the courses below, allowing water to penetrate to the roof deck. When installers try to stretch the coverage by laying a larger exposure than appropriate, the likelihood of joints lining up between courses is multiplied. These conditions are almost impossible to correct and usually require reroofing the entire area.

When inspecting older wood roofing, we generally find the shingles attached to cross-furring, which allows the roofing material to dry at the same rate from above and below. More recent installations tend to go directly on plywood subroofing. The plywood method, although acceptable by many standards, is inferior to the older method, since any moisture that collects beneath the roof covering can delaminate the plywood and leave rotted, unstable materials below the finished roof. This technique also shortens the life of the shingles. As home inspectors, we feel that cross-furring is preferable and should continue to be used.

Trouble areas with wood shingles, like those with slate, are generally at the joints, such as hips, ridges, or other places of transition or intersection. It is extremely important that these areas be properly flashed.

Although wood shingles are a superior roofing material with a relatively long life expectancy, we often find problems related to inadequate fasteners. Hot-dipped, galvanized nails are much better than the electro-plated galvanized nails found on the market today.

Fungus growth on wood shingle roofs tends to be greater than on the other types discussed. The roots of the fungus extend below the joints and allow excess moisture to accumulate. This causes the wood to rot or wear prematurely. Fungus can be curtailed or eliminated by the use of various chemicals available today. (See "Restoring and Treating Wood Shakes and Shingles," this issue.)

Flashing

Flashing is worthy of close scrutiny by the home inspector, especially around skylights and chimneys. Flashing used to be installed by skilled metal workers using quality materials (generally copper). Today it seems to be done by almost anyone who is available. As a result, the quality of flashing has deteriorated and the problems have multiplied.

Flashing is often applied with no thought given to the roofing materials around it, or to the weather conditions that will cause it to expand and contract. Valley flashings, for example, should be done in "steps," rather than

one continuous length, with the steps carefully lapped and properly nailed to allow for normal movement. Also consider the material. Aluminum flashing is less expensive, but has a relatively short lifespan. Particularly with slate and tile roofs, nothing less than copper flashing should be used.

During our inspection we often find that step flashings have been applied but without counter-flashing. This is as good as no flashing at all. Always be aware of the need for counter-flashing.

Often, rips or tears develop in flashing, and the most common remedy is roofing tar. However, this is only a temporary solution, and proper flashing should be put in place as soon as possible.

Skylights have become increasingly popular in the last several years, and they come in all styles, from the inexpensive plastic bubble types to the better quality ones with prefabricated curbs. We find that almost without exception, skylights suffer from some leakage problem. Some type of cricket or saddle must be installed on the upper slope of the skylight to divert water around the edges. Adequate overlaps in the flashing are also necessary or any shrinkage or settlement in the skylight area could result in a leak.

During extended rains, the chimney can only absorb so much water before it begins to leak to the interior of the building. The old method of returning the counter flashing into the flues prevented this.

One of the most surprising problems we find in our inspections is that in some new construction, the flashing around chimneys has been entirely omitted! This is rare on older structures, since the flashing was often built-in when the chimney was built.

Flashing around a chimney is particularly important because any water seepage at those joints can deteriorate the chimney from within. The water can also penetrate into the attic cavities, and in severe cases, reach all the way to the living areas. Most of our inspectors agree that chimney flashing is so critical that only copper should be used.

During periods of extended rains, the chimney structure can only absorb so much water before it begins to shed the water to the interior of the building. The old flashing method of returning the counter flashing into the flues prevented this from occurring. The method used today of tucking the counter flashing into a raked-out brick joint, which usually extends no more than ½ inch into the brick face, offers no protection against extended rains.

Although this article doesn't describe every type of problem home inspectors find on sloped roofs, it does cover some of the more common ones, and will help you be on alert for those. ■

Ron Passaro is the founder and first president of the American Society of Home Inspectors (ASHI). He is also the president of Residential Inspection Technology, Inc., a home-inspection firm based in Bethel, Conn. The views expressed in this article are solely the author's and do not represent the position of ASHI.