

## ROOFING OPTIONS

There are a number of things to consider when selecting a new roof system. Of course, cost and durability head the list, but aesthetics and architectural style are important, too. The right roof system is the one that balances these four considerations.

**Asphalt shingles**—which possess an overwhelming share of the U.S. residential roofing market—can be reinforced with either organic or fiberglass materials. Although shingles reinforced with organic felts have been around much longer, fiberglass-reinforced products now dominate the market.

**Organic shingles** consist of a cellulose-fiber (i.e., wood) base that is saturated with asphalt and coated with colored mineral granules. To fight fungus growth in warm, wet climates, they are available with special algicide granules.

**Fiberglass shingles** consist of a fiberglass mat, top-and-bottom layers of asphalt, and mineral granules. Typically, a fiberglass mat offers greater durability, but its manufacture is important.

**The fire resistance of asphalt shingles**, like most other roofing materials, is categorized by Underwriters Laboratories Inc. (UL) Class A, B, or C. Class A is the most fire-resistant, while Classes B and C have less fire resistance. Generally, most fiberglass shingles have Class A fire ratings, and most organic shingles have Class C ratings. UL Class A fire ratings are available for certain products that incorporate a factory-applied, fire-resistant treatment.

A shingle's reinforcement will have little effect on its appearance. Both organic and fiberglass products are available in laminated (architectural) grades that offer a textured appearance. Zinc or copper-coated ceramic granules also can be applied to either organic or fiberglass products to protect against algae attack, a common problem in hot, humid climates. Both types of shingles also are available in a variety of colors.

**Wood shingles and shakes** are made from cedar, redwood, southern pine, and other woods. Shingles are machine-sawn; shakes are hand-hewn and rougher looking. Their natural look is popular in California, the Northwest, and parts of the Midwest. A point to consider: Some local building codes limit their use because of concerns about fire resistance. Many wood shingles and shakes only have a UL Class C fire rating (or no rating at all).

**Tile—clay or concrete**—is a durable but fairly expensive roofing material. "Mission-style" and "Spanish" round-topped tiles are used widely in the Southwest and Florida, and flat styles also are available to create French and English looks. Tile is available in a variety of colors and finishes. Note: Tile is heavy. If you are replacing another type of roof system with tile, you will need to verify that the structure will support the load.

**Slate** is quarried in places such as Vermont, New York, Pennsylvania, Virginia,

and Canada. It comes in different colors and grades, depending on its origin. Considered virtually indestructible, it is, however, more expensive than other roofing materials. In addition, its application requires skill and experience. Many old homes in the Northeast still are protected by this long-lasting roofing material.

**Metal**, primarily thought of as a commercial roofing material, has been found to be an attractive roofing alternative for home owners. There are a variety of metal shingles intended to simulate traditional roof coverings, such as wood shakes, shingles, and tile. Apart from metal roofing's longevity, metal shingles are relatively lightweight, typically have a Class A fire rating, have a greater resistance to adverse weather, and can be aesthetically pleasing.

**Synthetic roof products** simulate various types of traditional roof coverings, such as slate and wood shingles and shakes. A point to consider: Although synthetic roof products may simulate the appearance of traditional roof coverings, they do not necessarily have the same properties.

We recommend that you look at full-size samples of the proposed product, along with manufacturers' brochures, or visit a building that is roofed with that product before making a buying decision.

## **All roof systems have five basic components:**

Roof structure: the rafters and trusses constructed to support the sheathing.

Deck/sheathing: the boards or sheet material that are fastened to the roof rafters to cover a house.

Underlayment: a sheet of asphalt-saturated material used as a secondary layer of protection for the roof deck.

Roof covering: shingles, tiles, etc., that protect the sheathing from weather.

Drainage: the features of the roof system's design, such as shape, slope, layout, etc., that affect its ability to shed water.

Flashing: sheet metal or other material laid into the various joints and valleys of a roof system to prevent water seepage.

## **VENTILATION IS KEY**

One of the most critical factors in roof system durability is proper ventilation. Without it, heat and moisture buildup in the attic area combine to cause rafters and

sheathing to rot, roof 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 winter. Proper attic ventilation will help prevent structural damage caused by moisture, increase the life of the roofing material, 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. An ideal attic has:

A gap-free layer of insulation on the floor to protect the house below from heat gain or loss.

A vapor retarder under the insulation next to the warm ceiling below to stop moisture from rising into the attic.

Enough open, vented spaces properly located to allow air to pass in and out freely.

A minimum of 1 inch (more space is preferred) between the insulation and roof sheathing.

The requirements for proper attic ventilation may vary greatly, depending on where the home is located, as well as the home site's conditions, such as exposure to the sun, shade, and atmospheric humidity. Nevertheless, the general 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 (i.e., soffits) and near the ridge.

## EVEN ROOFS HAVE ENEMIES

**Sun:** Heat and ultraviolet rays cause roofing materials to deteriorate over time. The deterioration can occur faster on the sides facing west or south.

**Rain:** When water gets underneath shingles, shakes, or other roofing materials, it can work its way to the deck and cause the roof structure to rot. The extra moisture encourages mildew and rot elsewhere in the house, including damaged walls, ceilings, insulation, and electrical system.

**Wind:** High winds can lift the edges of shingles (or other roofing materials) and force water—and debris—underneath them. Very high winds can do extensive damage.

**Snow and ice:** Melting snow often refreezes at the roof's overhang (where the surface is cooler), forming an ice dam and blocking proper drainage into the gutter. Instead, the water backs up under the shingles 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 torn off the house.

**Condensation:** Condensation can result from the buildup of relatively warm, moisture-laden air. Moisture in a poorly ventilated attic promotes decay of the wood sheathing and rafters, possibly destroying the roof structure. The solution may be to increase attic ventilation through the use of larger or additional vents so the attic air temperature will be closer to the outside air temperature.

**Moss and algae:** Moss can grow on wood shingles and shakes if they are kept moist by poor sunlight conditions or bad drainage. Once it grows, moss holds even more moisture to the roof surface, causing rot, and its roots actually work their way into the wood. Algae also grows in damp, shaded areas on wood or asphalt shingle roof systems. Besides creating an ugly black-green stain, algae can retain moisture, causing rot and deterioration. Trees and bushes should be trimmed away from the house to eliminate damp, shaded areas, and gutters should be kept clean to ensure good drainage.

**Trees and leaves:** Tree branches touching the roof will scratch and gouge roofing materials as they are blown back and forth by the wind. Falling branches from overhanging trees can damage—or even puncture—shingles and other roofing materials. Leaves on the roof system's surface retain moisture and cause rot, and leaves in the 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, the roof structure and interior of the home are vulnerable to water damage and rot. The problem is likely to spread—nearby shingles are easily ripped or blown away. Missing or torn shingles should be replaced as soon as possible.

**Shingle deterioration:** When shingles get old and worn out, they curl, split, and lose their waterproofing effectiveness. Weakened shingles are easily blown off, torn, or lifted by wind gusts. The end result is structural rot and interior damage. A deteriorated roof system only gets worse with time, and it 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 sneak into the house and cause damage to the walls, ceilings, insulation, and electrical system. Flashings should be checked as part of a twice-yearly roof inspection and gutter cleaning.

## CHOOSING A CONTRACTOR

Buying a new roof system is an important investment. Before you spend your money, spend some time learning how to evaluate the roofing contractor who may be doing the work. You should insist on working with a professional roofing contractor. NRCA wants to assist you in getting the kind of results you expect—a quality roof system at a fair price. All roofing contractors are not alike, and NRCA recommends you prequalify your roofing contractor to get the job done right the

first time. The following guidelines will help in your decision: Check for a permanent place of business, telephone number, tax identification number, and, where appropriate, a business license.

Don't hesitate to ask the roofing contractor for proof of the insurance he carries. In fact, insist on seeing copies of his liability and workers' compensation insurance certificates. Make sure the coverages run through the duration of the job. Many building and home owners have been dragged into litigation involving uninsured roofing contractors. Also, if a contractor is not properly insured, the owner may be liable for accidents that occur on the property.

Check to see if the roofing contractor is properly licensed or bonded. Some states have specific licensing requirements, and others do not. Your state's Department of Professional Regulation or Licensing Board will have this information.

Make sure the contractor is financially stable. A professional roofing contractor can provide current financial information about his company.

Look for a company with a proven track record that readily offers client references and a list of completed projects. Call these clients to find out if they were satisfied.

Insist on a detailed written proposal and examine it for complete descriptions of the work and specifications, including approximate starting and completion dates and payment procedures.

Have your contractor list the roofing manufacturers with which his firm has licensed or approved applicator agreements. Most materials require special application expertise to achieve a quality roof system that will last.

Have the contractor explain his project supervision and quality-control procedures. Request the name of the person who will be in charge, how many workers will be required, and the estimated time of completion.

Check to see if the contractor is a member of any regional or national industry association, such as NRCA.

Call your local Better Business Bureau or Department of Professional Regulation to check for possible complaints filed against the contractor.

Carefully read and understand any roof warranty offered, and watch for provisions that would void it. (See NRCA's Consumer Advisory Bulletin Roofing Warranties for detailed information about this subject.)

Choose a company committed to the safety and education of its workers. Ask the contractor what kind of safety training he provides for his workers and what industry education programs they have attended. The best roofing contractor is only as good as the workers who actually install the roof system.

Keep a healthy skepticism about the lowest bid. If it sounds too good to be true, it probably is. Many fly-by-night contractors seem attractive with their below-cost bids but often are uninsured and perform substandard work. Remember, price is only one of the criteria for selecting a roofing contractor. Professionalism and

quality workmanship also should weigh heavily in your decision.

## SEVEN COMMONLY ASKED QUESTIONS

### Q. How can I know when a roof system has problems?

A. All too often, roof system problems are discovered after leaking or other serious damage occurs. Periodic (twice-a-year) inspections often can uncover cracked, warped or missing shingles; loose seams and deteriorated flashings; excessive surface granules accumulating in the gutters or downspouts; and other visible signs of roof problems. Indoors, look for cracked paint, discolored plasterboard, and peeling wallpaper as signs of damaged roof areas.

### Q. What are my options if I decide to re-roof?

A. You have two basic options: You can choose a complete replacement of the roof system, involving a tear-off of the old roof, or a re-cover over the existing roof, involving only the installation of a new membrane and surfacing. If you've already had one re-cover over your original roof, check with a professional roofing contractor to see if your deck can support a second re-cover.

### Q. My roof leaks. Do I need to have it totally replaced?

A. Not necessarily. Leaking can result because some flashings have come loose or a section of the roof system has been damaged. A roof system failure, however, generally is irreversible and results from improper installation or choice of materials or from the installation of a roof system inappropriate for the building.

### Q. Can't I just do the work myself?

A. Most work should not be do-it-yourself. Professional roofing contractors are trained to safely and efficiently repair or replace a roof system. Novices can harm a roof with improper roofing techniques and severely injure themselves by falling off or even through a roof in need of repair or replacement.

Home owner maintenance should be confined to roof system inspections in the fall and spring to check for cracked or curling shingles and to cleaning rain gutters filled with dead leaves and other debris. If you must see the roof for yourself, use a firmly braced or tied-off ladder equipped with rubber safety feet. Wear rubber-soled shoes and stay on the ladder (and off the roof), if possible.

### Q. How long can I expect my roof system to last?

A. The condition and lifespan of your roof system will depend on the type of roof system you have, the effects of your local environment, and the maintenance the roof system has received. According to the American Society of Home Inspectors, asphalt shingles generally last 15 to 20 years; wood shingle/shakes, 10 to 40 years; clay/concrete tiles, 20+ years; slate, 30 to 100 years; and metal roofing, 15

to 40+ years.

Roofing product manufacturers offer a variety of warranties on their products. Take a close look at those warranties to see what responsibilities and financial obligations they will assume if their products fail to reach their expected lifetimes.

**Q. What will a new roof system cost?**

A. The price of a new roof system varies widely, depending on the material selected, the contractor doing the work, the home itself, location of the home or building, local labor rates, time of year, and more. To get a good idea of the cost for your roof system, get three or four estimates from reputable contractors in your area. Keep in mind that cost is only one factor, and it must be balanced with the quality of the materials and workmanship.

For each roofing material, there are different grades—and corresponding prices. Plus, there are a variety of styles and shapes. You need to look at the full product range and make a choice based on your budget and needs.

Within the roofing profession, there are different levels of expertise and craftsmanship. Pick a contractor who is committed to quality work.

**Q. How can I determine my annual cost?**

A. When mulling over your roofing options, the following formula may help:

Total Cost (materials and labor) ÷ Life Expectancy of Roof (in years) = Annual Cost

## WORDS YOU SHOULD KNOW

**Deck/sheathing:** The surface—usually plywood or oriented-strand board (OSB)—to which roofing materials are applied.

**Dormer:** A small structure projecting from a sloped roof, usually with a window.

**Drip edge:** An L-shaped strip (usually metal) installed along the edges of the roof to allow water runoff to drip clear of the deck, eaves, and siding.

**Eave:** The horizontal lower edge of a sloped roof.

**Fascia:** A flat board, band, or face located at the outer edge of the cornice.

**Felt/underlayment:** A sheet of asphalt-saturated material used as a secondary layer of protection for the roof deck.

**Fire rating:** UL system for classifying the fire resistance of various materials.

Roofing materials are rated "Class A," "B," or "C," with "A" materials having the highest resistance to fire originating outside the structure.

**Flashing:** Sheet metal used to prevent the seepage of water around any intersection or projection in a roof, such as vent pipes, chimneys, valleys, and the joints at vertical walls.

**Louvers:** Slatted devices installed in the gable or soffit (the underside of the eaves) to ventilate the space below the roof deck and equalize air temperature and moisture.

**Oriented-strand board (OSB):** Roof deck panels (4 feet x 8 feet) made of narrow bits of wood, laid down lengthwise and crosswise in layers, held together with a resin "glue." Often used as a substitute for plywood sheets.

**Penetrations:** Vents, pipes, stacks, chimneys—anything that sticks up through the roof deck.

**Rafters:** The supporting framing to which the roof deck is attached.

**Rake:** The inclined edge of a roof over a wall.

**Ridge:** The top edge of two intersecting, sloping roof surfaces.

**Sheathing:** The boards or sheet materials that are fastened to the roof's rafters to cover the house.

**Slope:** Measured by rise in inches for each 12 inches of horizontal run: A roof with a 4-in-12 slope rises 4 inches for every foot.

**Square:** The common measurement for roof area is—100 square feet (10 feet x 10 feet).

**Truss:** The engineered components that have supplemented rafters in many newer houses. They are designed for specific applications and cannot be cut or altered in any way.

**Valley:** The angle formed at the intersection of two sloping roof surfaces.

**Vapor Retarder:** A material designed to restrict the passage of water vapor through a roof system or wall.