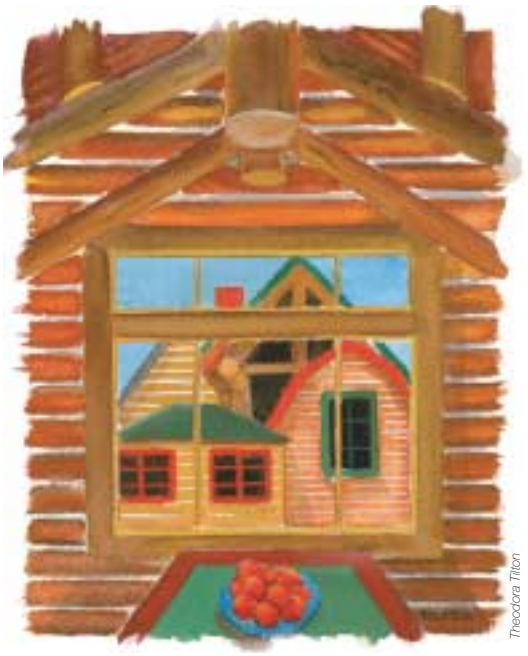
Peaking Interest

THERE'S MORE TO ROOFS THAN JUST TOPPING THE WALLS



Theodora Tilton

Q: How do I choose a roof system?

A: Log homes have many roof options, with many implications. A low-pitch roof with a flat ceiling, for example, is a good choice when your budget is tight.

Whether built on site with lumber or using manufactured trusses, roofs typically use the least amount of material (least roofing area exposed to the weather, finished ceiling area, insulated area and least volume of wood used in framing). Energy-wise, the insulated area is the least, but the volume contained between the roof and ceiling offers the greatest level of insulation (whether blown-in or batt). When additional appeal is desired, scissor trusses and other custom truss designs can provide them without blowing the budget.

Low-pitch roofs provide less resistance to wind, so they perform well in regions where there are strong winds. Although wind can blow snow off the roof, the low pitch doesn't encourage accumulated snow to slide off like higher pitches do. Where shedding snow is desirable, remember to protect entrances and walkways by incorporating features that will divert snow as it slides down the roof.

And because the low-pitch roof with a flat ceiling is the starting point, let's look at the volume that it encloses. A flat ceiling with insulation defines the least volume of conditioned air. This means that less energy will be used to heat and cool that area solely because there is less air to condition.

A cathedral ceiling (where the ceiling follows the slope of the rafter) is a popular feature in custom-home design. The least expensive option for cathedral ceilings is to frame with lumber or engineered wood (e.g., I-joists, trusses, etc.), concealing them with wood paneling or a gypsum ceiling. The depth of the rafter dictates the depth of insulation that can be used (a 12-inch nominal rafter is actually 11-1/4 inches, less a 1-inch air space for venting, leaving room for a 10-inch-thick insulation batt).

In colder climates, the depth of the rafter may be selected for insulation depth, even though the structural requirements would permit the use of a smaller rafter. Conversely, in warmer climates, it is likely that the structural needs would control the selection over thermal requirements.

There are energy benefits to cathedral ceilings, too. Although it is recognized that a greater volume of air needs to be heated and cooled, the convection of the air in the space can be utilized. Because hot air rises, ceiling fans can be used in the winter to recycle heated air toward the floor. Utilizing venting skylights or other devices can promote passive cooling to vent hot air during the summer. Clerestory windows can be incorporated into roof designs for this venting function, as well as for day lighting.

A desirable aesthetic may be to add timber-framing members inside the structural roof. This attractive option allows you to see timbers in a price-sensitive manner. Added for appearance rather than structure, the timbers can be set further apart or be smaller in size. They can also be added to accent a cathedral ceiling intersection, such as where a gable dormer intersects the main roof. When you start thinking about a timber roof, you may have the option of round or square-sawn material. The round timbers may be milled to a uniform diameter or debarked and left with the natural taper of the log.

This brings us to the upper end of the roof options: a fully timber framed roof. There is often more wood used in a timber roof than the prior options, but the real cost impact occurs above the timber frame. Commonly, a structural decking is used above the timbers (i.e., 2-by-6-inch tongue and groove), although an acceptable option is to use paneling with structural materials above that.

The insulation options are the heart of our budget

concerns. The most common insulation methods are using framing lumber to create a cavity for insulation and an airspace, to build up one or more layers of rigid insulation (two layers are recommended so that the seams can be overlapped), to install strapping to leave a venting air space or to install structural insulated panels (SIPs).

One or all of the above options can be integrated into a particular building design. A popular approach is to employ the more expensive feature over the living area (great room, kitchen, dining room, family room) and be more budget conscious for the ceiling-roof over the bedroom wing. Although dormer and porch framing commonly reflects the main roof, this is not a rule.

Overhangs are the last feature to consider when designing the roof. Overhang lengths vary be company and by region of the country. It is generally accepted that roof overhangs that are long enough to shed water and sun from beating on the log walls improves the appearance and durability of the wood. Not unlike with any other wood-sided building, the wood surface of a log home suffers under repeated wear caused by wind, sun and water.

Providing shade with extended overhangs is an option, but be aware that the length also affects how the roof is connected to the wall, as overhangs are also a factor in calculating uplift forces from wind. In wildland areas, overhangs may be less desirable due to potential heat buildup under them during fires.

Regardless of where and what you build, the overhangs will need help. Diverters, diffusers and gutters are highly recommended to move water runoff from the roof away from the log wall. This includes areas where decks, cellar doors, chimney constructions, lower roofs and such cause falling runoff to splash back on the log surfaces. Besides overhangs, porches and other architectural features, wood finishes and on-going maintenance will protect the log wall. The amount and type of maintenance is a function of the exposure of the wall to the weather and sun.

If a wide overhang is desired, be sure that the framing system is properly sized and spaced to account for it. Structural aspects will be a consideration when overhangs extend greater than 24 inches. The cantilevered beam function of wide overhangs can increase the required depth of the framing used.

Rob Pickett of Rob Pickett and Associates (www.robpickettandassoc.com), a housing-technology consulting firm in Hartland, Vermont, is a specialist in log and timber building systems and a past president of the Log Homes Council. Submit questions for this column to robpickett@vermontel.net.