Making the Most of SKYLIGHTS

Tricks for letting in daylight with style

by Doug Walter, AIA

Sunlight is nature's antidepressant. Have you ever noticed how the tables by the windows fill up first in a restaurant? Or how, in winter, people cross the street to walk in the sun? My personal belief about daylight in houses is that no one should have to turn on a light during the day in any room. This article will focus on skylights, which are often the most dramatic and effective way to make a difference in the daylighting of a new or existing home.

Why Skylights?

I think the reason that most people respond so positively to skylights is that they restore the natural canopy effect of being outside with a bright sky overhead. In effect, skylights are a way of bringing "pieces of sky" to important spaces in the home. They're an ideal way to highlight activity areas, such as kitchen islands, dining rooms, main stairways, hallways, or even a special piece of furniture. We use sun tubes to illuminate small utilitarian areas like closets, toilet rooms, and back stairs. The punch of daylight spilling into an area draws people to it, especially if it's deep within a wide floor plan where outside windows are impossible. The unexpectedness of daylight in such situations is a delight.

Energy efficiency. There's no reason to get all worked up about heat loss through a skylight or two. We use skylights that are typically 6 square feet, and always spec the highest efficiency flat-glass skylights possible, with a clad wood frame. When used in a home that has 200 or 300 square feet of windows and doors, the energy loss is not only insignificant, but when compared to the energy saved by not having to turn on electric lights during the day, probably a net gain.

A much more important energy-related concern is that of overheating during the warm months. In southwestern states, it can be a problem 12 months of the year. For that reason, it is our practice to use skylights carefully on the west and south, but more liberally on the east and north slopes of a roof.

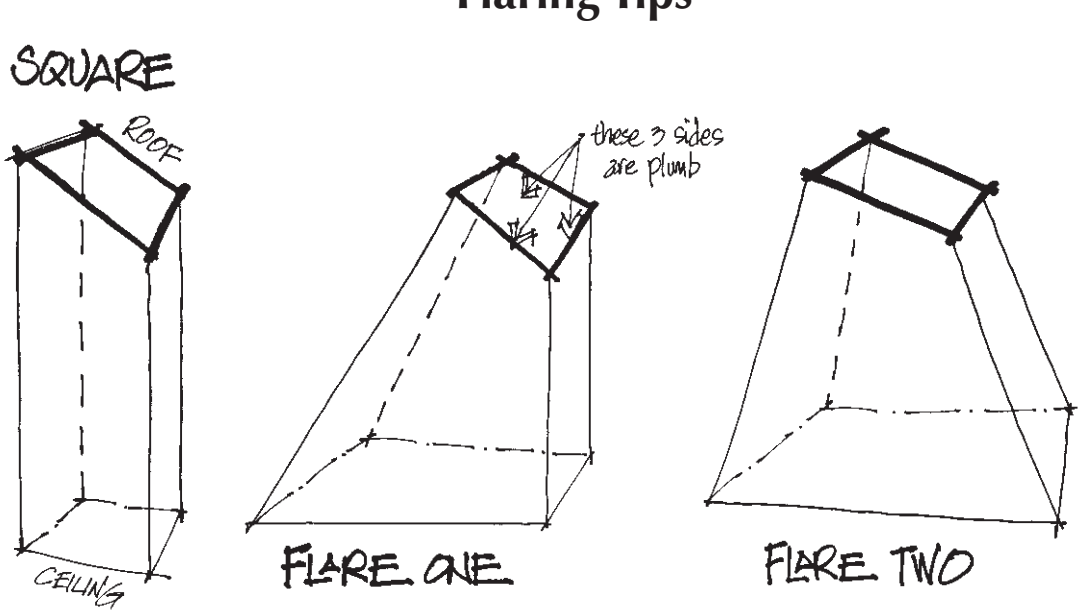

Figure 1. A perfectly plumb skylight shaft is simple to build, but yields a ceiling opening smaller than the skylight itself (at left). Flaring one face of a shaft — usually the "uphill" face nearest the peak of the roof — allows light to penetrate more deeply, especially when the sun is low (at center). A narrow space, such as a hallway, is a natural location for a shaft with two flared faces (far right).

Skylight Shafts

Unlike windows — which are just openings punched through a relatively thin (4- to 9-inch) wall — many skylights require you to bring the daylight down through a 4- to 9-foot (or more) attic space. To complicate things even more, the best location for the skylight itself — away from hips and valleys on the back slope of the roof — won't necessarily be directly above where you want the light coming down through the ceiling. Balancing these conflicting needs can be a real challenge, but it also offers some rewarding design opportunities.

Design with flare. If you plumb down from all four corners of a skylight in a sloped roof to a flat ceiling, you end up with an opening that is smaller than the skylight itself, resulting in a relatively small gain in daylight for the time and effort invested (see Figure 1). In most cases, it's well worth flaring at least one of the four faces of the shaft. Our preference is to flare the top face — that is, the face nearest the roof peak — because this allows deeper penetration of the daylight, especially in the winter months when the sun angles are low. Another option is to flare both the top and bottom faces of the shaft. That can be especially effective where the sides are confined within a hallway or other narrow space.

Do the twist. It's also possible to flare three or all four faces of a shaft, although this involves some tricky geometry. Because each framing member must travel a different distance from the sloping sides of the skylight to the flat ceiling plane, the side faces of the three-sided flare will describe parabolic planes — essentially, planes that have been twisted — rather than the usual flat planes. The resulting shaft can be dramatic, but allow some extra time for framing and fitting the drywall, which may have to be moistened to take the required curve.

Finally, we often use skylight shafts as giant ceiling coffers (Figure 2). That's a good way to lift the apparent height of a space to give it a more important feel.

Grouping and Placement

The deeper the shaft, the more we start to think about stacking or ganging multiple skylights (Figure 3). In bringing shafts down between roof trusses that are 2 feet on-center, this is your *only* option to give a room

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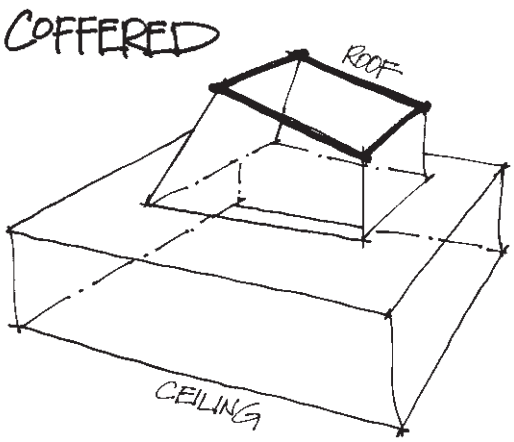

Figure 2. Before remodeling, this ranch kitchen felt dark and cramped, in spite of its 8-foot ceiling. The flared skylight shaft acts as a giant ceiling coffer to admit light and define the space (above). Another option is to terminate a flared shaft within a square-sided coffer (left).

Grouped Skylights

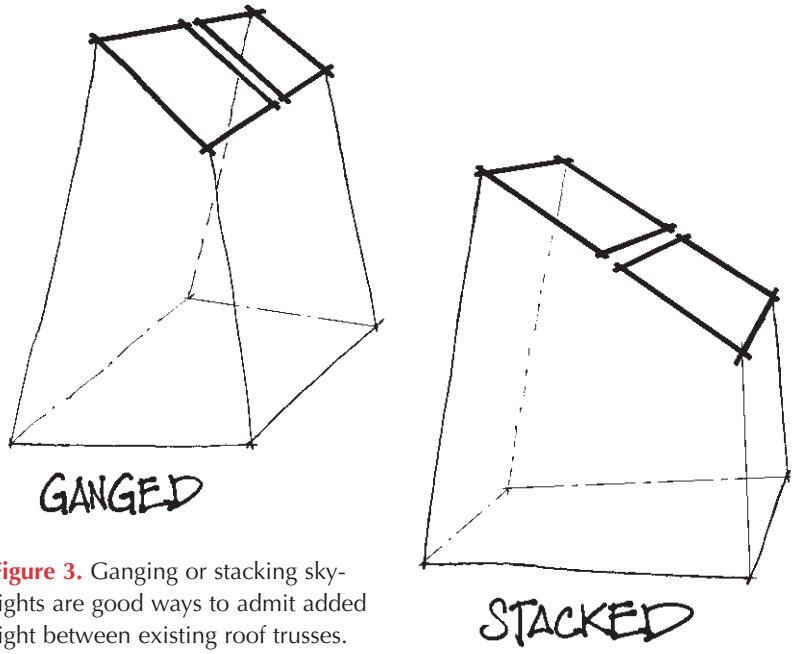

Figure 3. Ganging or stacking skylights are good ways to admit added light between existing roof trusses.

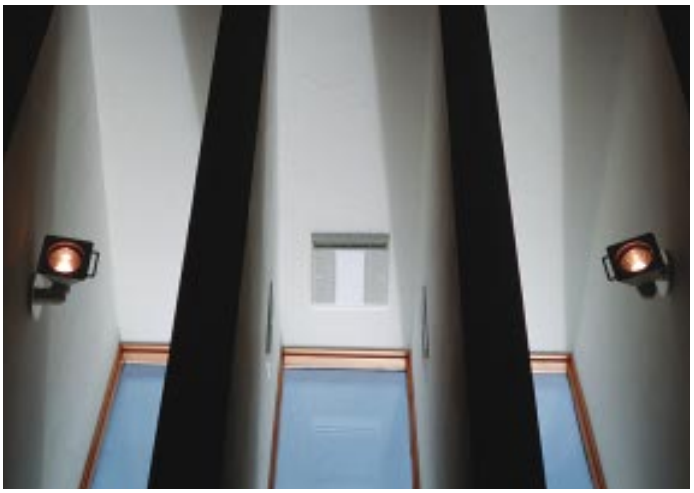

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Figure 4. Three 20-inch-wide shafts defined by roof trusses are interconnected by heating louvers, allowing excess summer heat to be exhausted by a thermostatically controlled exhaust fan.

significant punch (Figure 4). No matter what the length, a single 2-foot-wide shaft will probably look lost in a 12x15 room, so we group two, three, or four together.

Deep and narrow shafts have the unexpected side benefit of softening the entering sunlight by bouncing it off the shaft interior. That can be especially useful for balancing the lighting in rooms that have only one outside wall, as these rooms tend to have a problem with glare. With all the light coming from one direction, it's as if you were in a cave with all the light entering through the mouth. If we are using skylights mainly to balance lighting in a room, we are likely to locate the shaft close to a wall, so the light can bounce off it.

Another imaginative possibility for an exceptionally deep shaft — especially one that punctures one floor plane on its way down to another — is to direct some of that light into the upper space by way of a window (Figure 5).

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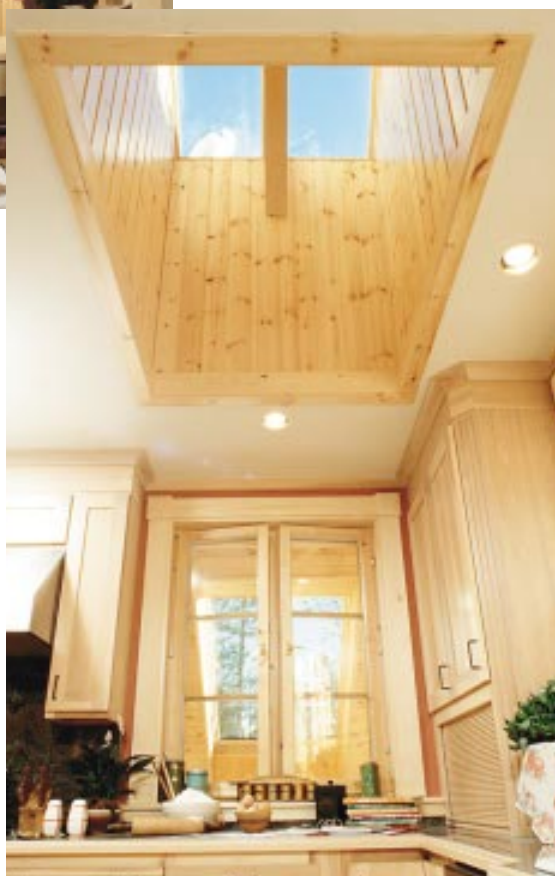

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Figure 5. Ganged skylights admit daylight to the kitchen through a wood-paneled shaft (right). An opening to the study loft above the kitchen allows the same skylights to illuminate that space as well (above).

Other Options

Skylights are just one of the tools in our daylighting kit. We also use transoms, clerestories, dormers, solar tubes, glass block, and inside glass. All of the stacked windows and skylights we use have the same purpose: to lead the eye upward toward the sky, and help the occupants feel a connection with the outdoors. It's been said that the number one reason people remodel is for more light. A bright, well-lit remodel is a strong, silent salesman for your business, and one that potential clients never fail to notice and admire.

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