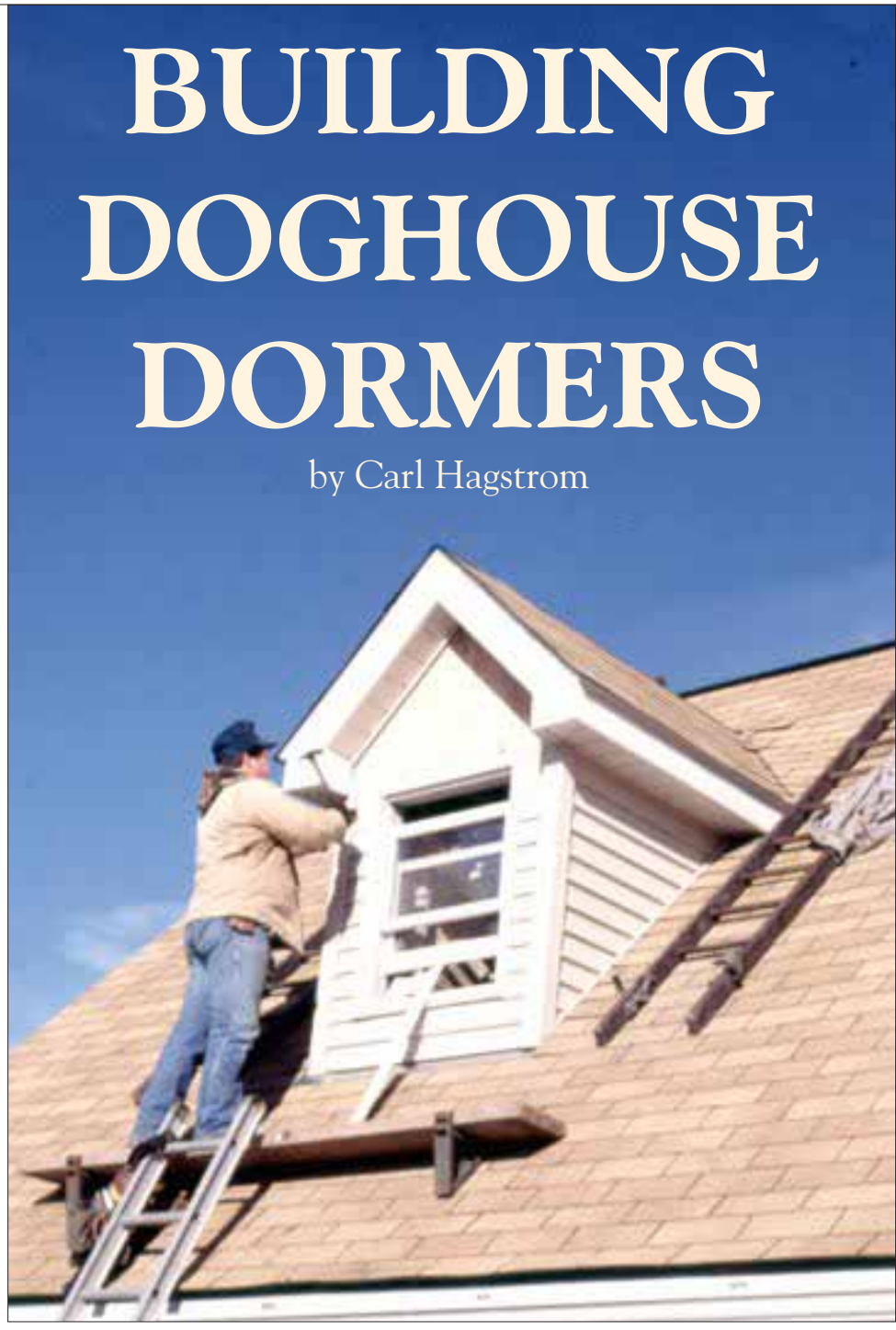
BUILDING DOGHOUSE DORMERS

by Carl Hagstrom



A well-proportioned dormer, sized right for the house, lends visual interest to a home's exterior, while providing light and ventilation to attic living space.

Have you ever noticed how houses seem to grow with age? As the family gets larger, so does the house. One of the most economical ways to add living area to a house is to finish off the attic space, usually with a couple of dormers incorporated into the design. Dormers provide light and ventilation, and also add some visual "pop," both inside and out.

But many first-time dormer builders make the mistake of underestimating the complexity of building even small dormers. On the exterior, you must contend with framing, roofing, fascia, windows, and siding. If you're also finishing the inside, add insulation, drywall, paint, and trim to the list. Along with these tasks, you're faced with protecting a gaping hole in your customer's roof from the weather.

With good planning, however, and the ability to stay one step ahead of the work, a two-man crew can open the roof and dry-in a small dormer in a single day. This minimizes time the building is exposed to the weather and keeps costs down. The total cost for the dormers described

You can make them tight to the weather in one day if you plan ahead and prebuild your walls

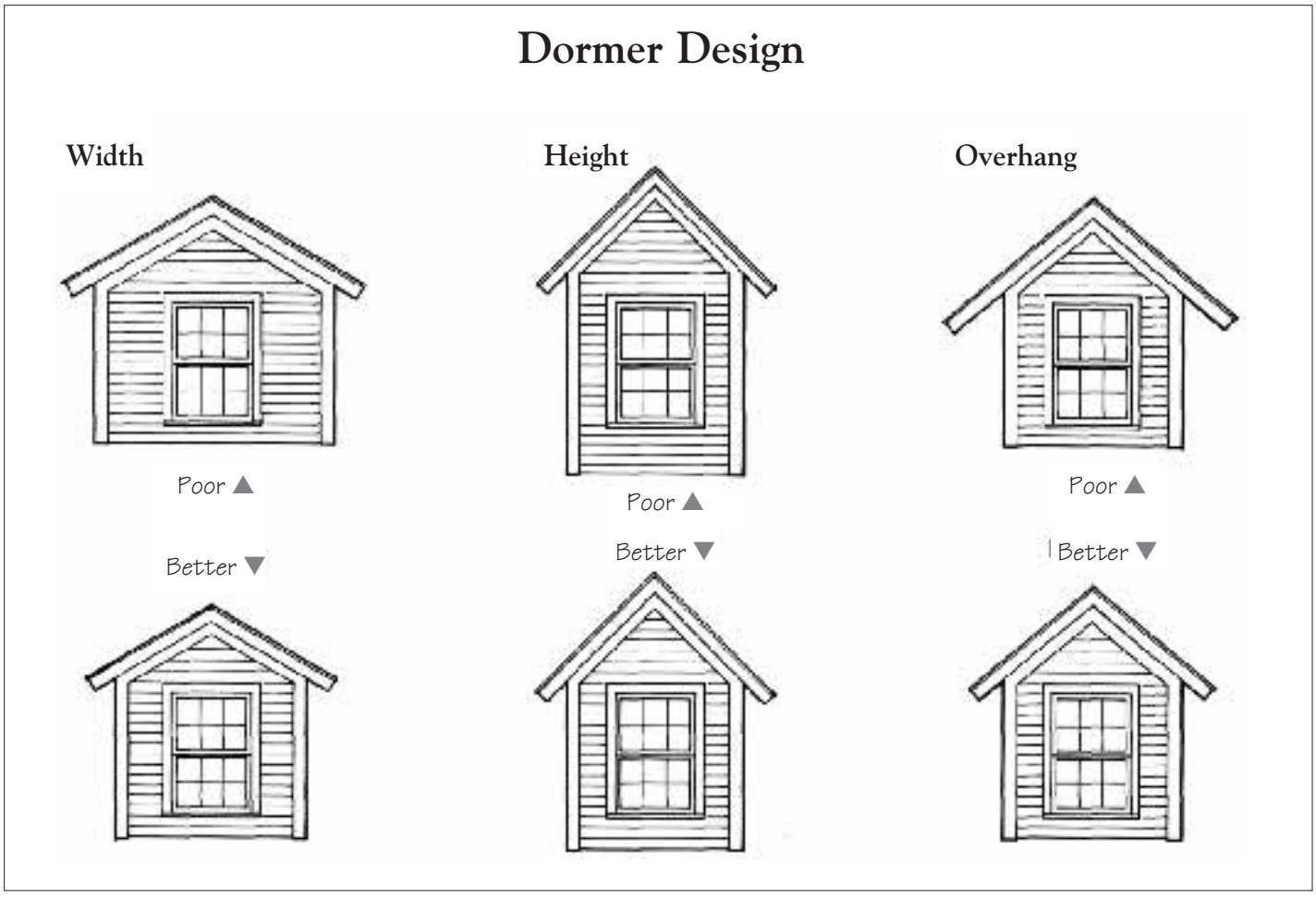


Figure 1. *Small doghouse dormers look best if they are not too wide (left) nor too tall (center). The author tries to match the pitch of the main roof, and keeps dormer overhangs in proportion to the dormer (right).*

in this article (including overhead and profit typical of rural Pennsylvania, where I work) is about $1,200 with an unfinished interior. About $400 of that is for materials — a wood double-hung window, vinyl siding and soffit, and asphalt shingles.

The Good, the Bad, and the Ugly

Properly designed, doghouse dormers don't attract much attention. But if they're poorly designed, they can stick out like a sore thumb.

Scale and proportion are the most important issues. Two small dormers on a modest Cape Cod design can look just right. But those same two dormers will look pretty silly on a stretched-out ranch house.

It's difficult to offer design guidelines that will apply to every situation. But there are a few general rules that will help you with the design (see Figure 1).

- ***Be careful with the width of the dormer***. Make the dormer wide enough to include window and corner trim, but not much else. Avoid shutters.
- ***Make overhangs proportional.*** A 2-foot overhang on a 4-foot-wide dormer can look top-heavy.
- ***Keep siding to a minimum under the window.*** I cover only as much wall as I need to — usually about 8 inches under the window — while still allowing for snow clearance.
- ***Match the main roof pitch***. There certainly are exceptions, but two different pitches can look terrible.

If you're not sure what would look best, make some scaled drawings. These don't have to be elaborate, but should include the main roof, the window (show any mullions and trim details), and the dormer roof (with anticipated overhangs). If you like the way it looks, you're in business. If it looks awkward, keep trying. If you haven't a clue, get some help from an architect or designer.

Site inspection. It's also important to examine the area where the dormer is going. Are there any wires or other mechanicals that need to be moved? Will kneewalls have to be repositioned? Are the existing rafters sized correctly? This inspection is easy if the attic is unfinished, but if the dormers are going in a finished space, it will take more time to locate potential problems.

Also, make sure you can get 4x8 sheet-goods to the interior, and look at the outside with an eye towards scaffolding — shrubs, porches, and chimneys can increase the difficulty of erecting staging.

Dormer Layout

The first step in laying out a dormer is to locate the centerline, and put a mark on the underside of the roof sheathing. (If the dormer is in a finished room, you'll have to remove enough drywall to provide access to the rafters.) On the rafter nearest the centerline, mark the height of the dormer ceiling framing. Since doghouse dormers are typically too small

Figure 2. *To reduce the amount of time the attic is exposed to the weather, frame the dormer opening from the inside and prebuild the walls. After cutting away the sheathing, pass the prebuilt walls through the opening (left), and install them in one piece (right).*

for anything but a flat ceiling, this mark establishes the top of the hole you're going to cut in the roof. To locate the bottom of the roof cutout, work backwards from the ceiling height mark: Subtract the height of the window header and the window, as well as the clearance between the window sill and the main roof.

Now work from the centerline to lay out the width of the dormer. Connect all these marks on the roof sheathing to create a rectangle: This represents the framed opening the dormer will require.

Beef up the roof. At this point, before you get out your reciprocating saw, step back and take a good look at how your dormer cutout will affect the overall structure of the main roof. Doghouse dormers tend to be small, and typically require cutting no more than three rafters. How you support these interrupted rafters depends on the rafter size, and the roof pitch and span. I recommend checking with an engineer before cutting large holes in a roof structure. But in many cases, doubling or tripling the adjacent rafters will give sufficient support.

Adding full-length sister rafters is easy in an unfinished space. If the ceiling is finished, however, be sure to cut back enough drywall to add rafters. Slipping a rafter between the sheathing and the finish ceiling is not worth the trouble: It's almost impossible to do this without damaging the finish materials, and you can't get a

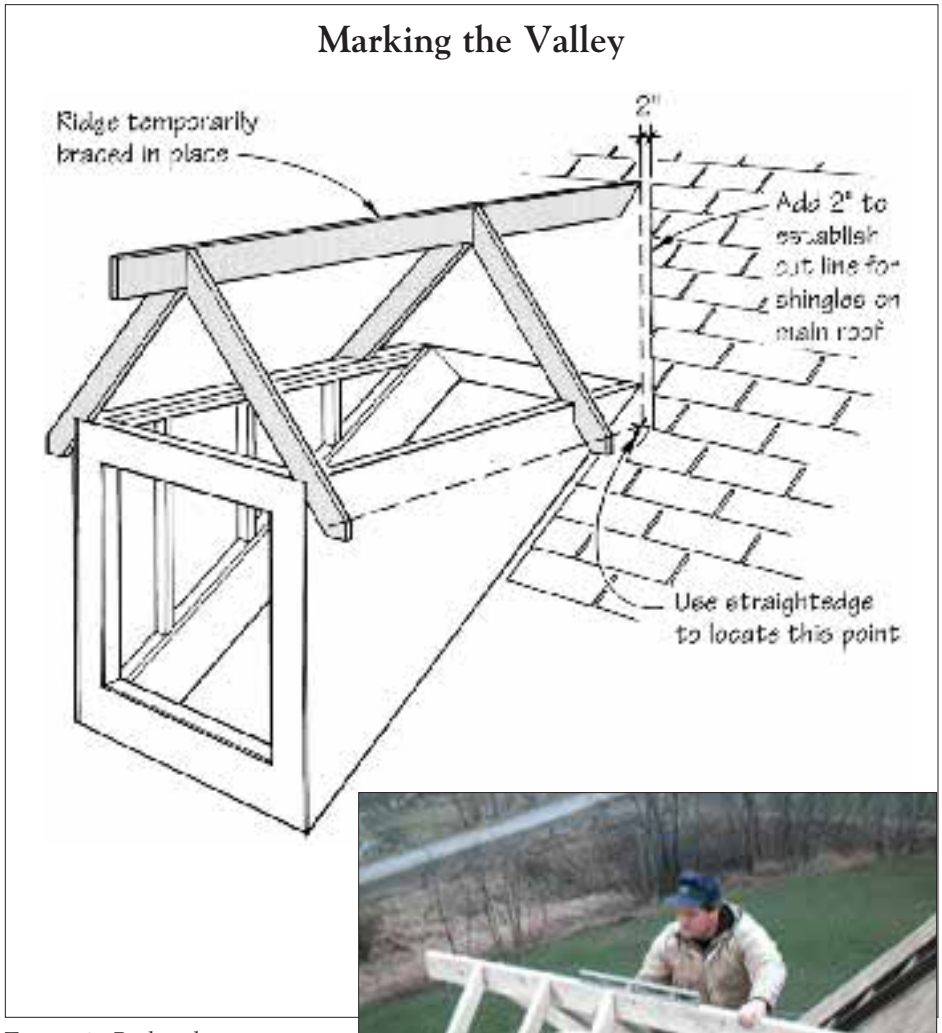


Figure 3. *Rather than use complicated math to locate the valley, level the ridge in place, supporting it temporarily by several pairs of rafters (right). Then use a straightedge to mark the point where the dormer eaves intersect the main roof (above).*

Figure 4. *Use a plate to catch the edge of the roof sheathing in the valley, and to provide solid nailing for jack rafters (left). Where the dormer eaves intersect the main roof, provide a rafter with a bevel cut that matches the main roof pitch (above).*

solid connection at the inaccessible upper end.

Prefab the walls. Depending on the size of your crew and the complexity of the existing framing, you may want to frame the opening from the inside. You can also use your layout marks to build the triangular dormer sidewalls (Figure 2, previous page), and to precut your rafters. Performing all this work before breaking through the roof allows two carpenters to frame, sheathe, and shingle a dormer in less than eight hours.

Opening the Roof

With the dormer hole framed, but the sheathing still intact, drive a 16d nail up through the roof at all four corners. From outside on the roof, enlarge the rectangle formed by the nails by adding the wall framing thickness (including the sheathing), plus one inch for flashing clearance. Remember, there is no wall at the top.

After marking out this rectangle with a chalk line, use a straightedge and utility knife to cut through the shingles (plan on using a half dozen blades). Remove all the shingles within the scored area. Then use the original nail holes to mark out the framed roof opening, and cut out the roof sheathing with a circular saw. In an unfinished attic, be careful not to allow the sheathing to drop through the first-floor ceiling.

Figure 5. *When roofing the dormer, slide the new shingles up under the existing ones. This eliminates the need for a perfect cut on the dormer shingles and gives extra protection at the new valleys.*

Now remove any shingle nails that will get in the way of the step flashing for the sidewalls of the dormer. I use a slate ripper or flat bar to carefully lift the shingles, removing all nails within 6 inches of the opening. Be sure to get *all* of the nails at this point — trying to do it after installing the dormer walls is a nightmare.

Marking the valley. Instead of using a lot of math to figure out where the valley falls, I prefer to mark it by temporarily installing a few rafters (Figure 3, previous page). First, bring up your two prefabricated sidewalls and tack them in place, with temporary braces across the front to steady them. If you didn't precut the rafters earlier, lay out and cut four of them now. Tack one pair at the front of the dormer, and another pair back as far as the main roof will allow, letting the ridge cuts rest against each other. Then cut a ridge board about 6 inches longer than you will need, and cut the angle of the main roof on one end. Slip the ridge up between the rafters so it's flush with the tops and resting on the main roof. By holding a straightedge along these temporary rafters, you can mark the top and bottom of the valley formed by each roof plane of the dormer and the main house. This procedure will take some juggling if you're working alone, but two people can handle it easily.

Before you cut the shingles at the valley, disassemble your temporary rafters to get them out of the way. Also raise the valley layout line a couple of inches higher on the main roof plane, as shown in Figure 3. This allows for the thickness of the dormer roof sheathing, and gives you enough room to slip flashing up under the main roof shingles.

Cut through the shingles and remove them, using the same technique as before. Once again, it will be necessary to reach up and under the main roof shingles to remove nails that will get in the way of the valley flashing. This time, however, you'll need to remove all the nails 12 inches back.

Some builders avoid this "deep reach" by removing and tabbing back shingles around the valley area to provide access, and then reinstalling the shingles after the flashing is in. But if you can't salvage all of the shingles, you run the risk that the newer replacement shingles will vary slightly in color. My cut-back method confines any color variation to the dormer roof planes, where it tends to be less noticeable.

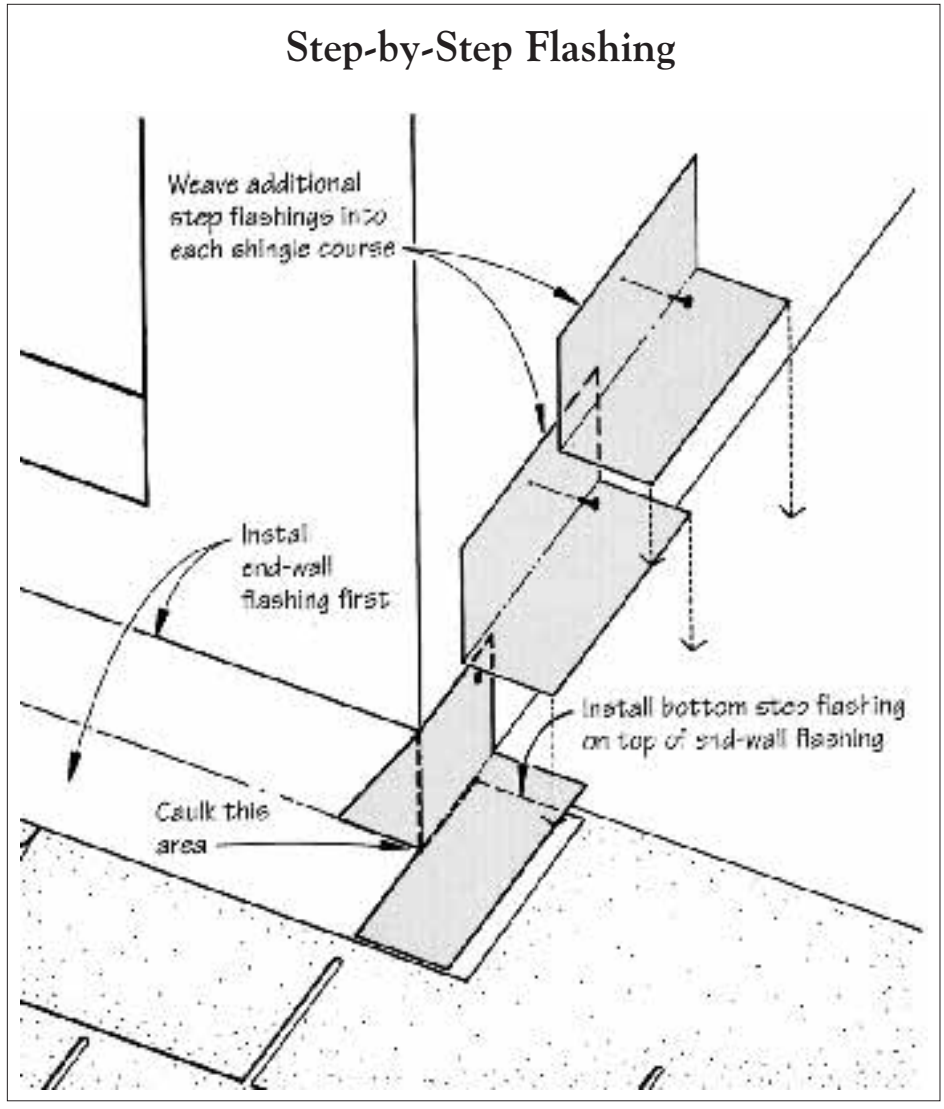


Figure 6. *When flashing a dormer, install the end-wall flashing first, then work up the roof with step flashing at each shingle course. Attach each step flashing with one nail in the dormer wall sheathing.*

Framing, Flashing, and Roofing

After the shingles are cleared out, assemble the dormer rafters. Be sure to butt the last pair of common rafters snugly against the main roof to provide solid nailing for your subfascia (Figure 4). And always cut a rafter that will fall at the transition point between the fascia and the valley. I also install a plate at the valley to support the edge of the dormer roof sheathing. After the rafters are installed and the roof is sheathed, slip the valley flashing under the main roof valley shingles. I use 24-inch prepainted aluminum coil stock.

This job is best done by two people: one person to lift and hold up the shingles while the other feeds the flashing. If you missed any nails earlier when clearing the space for this valley flashing, now is when you'll find them. You can still remove a nail at this stage, but it's much more difficult with the dormer roof in the way.

With the valley flashing installed, start the dormer roof shingles at the gable end and work towards the valley. Slip the last dormer shingle in each course under the main roof shingles as far as you can (Figure 5). This eliminates the need for a precise cut at the valley and provides a measure of extra protection.

Start the flashing below the window with a piece of end-wall flashing, caulked at the corner (Figure 6). Flash the sidewalls with pieces of 7x7-inch aluminum step flashing, fastening each piece to the sidewall with one nail. Cut a tab into the first piece of step flashing and bend it around the corner of the end wall. Then weave step flashing into each course of shingles, running the step flashing up beyond the soffit line as far as possible.

Finally, staple tar paper or housewrap on the dormer walls, making sure it laps over the end-wall flashing and step flashing. You now have a weathertight dormer. If you have any time left in the day, you can install the window, and start the fascia and soffit work. Depending on the soffit material, securing the soffit where it meets the main roof can be a challenge. Vinyl soffit is no problem — just slide the soffit pieces back through the F-channel and fascia. With a plywood soffit, however, you'll need to nail a block on the beveled dormer rafter at the valley intersection to keep the soffit from disappearing up into the dormer overhang. The pitch of the main roof will act as a wedge to press the soffit tight against this block. When it's wedged in tight, nail it off where you can reach it. ■

Carl Hagstrom, a builder in Montrose, Pa., is a contributing editor to the Journal of Light Construction.