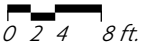
Linear, economical plan takes full advantage of the views

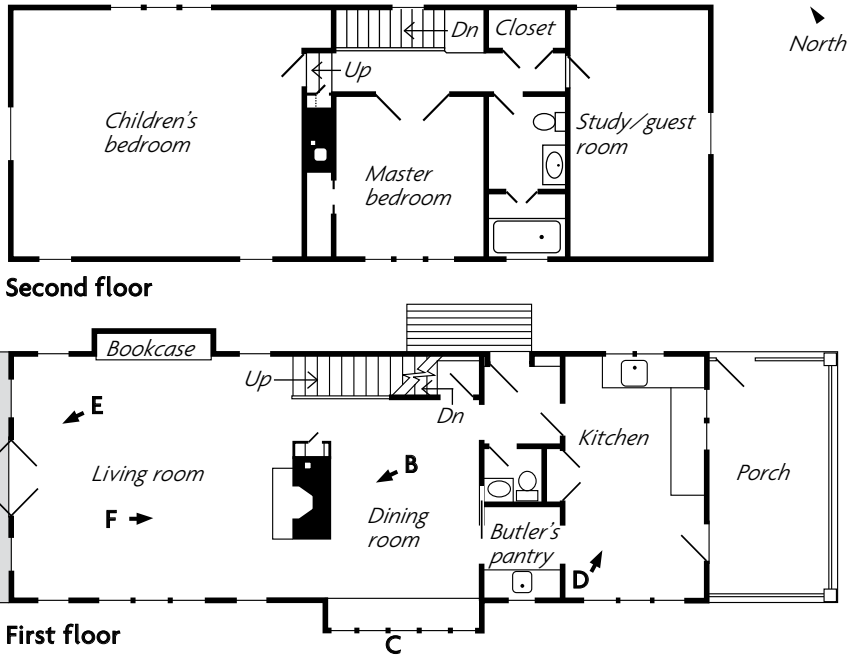
To stay within a tight budget, the authors held the basic floor plan to a narrow rectangular shape. The full-width kitchen and living room have views in three directions; the dining room is bracketed by open hallways and, with only one set of windows, is more secluded. Open porches at each end of the house provide fair-weather respite.

SPECS

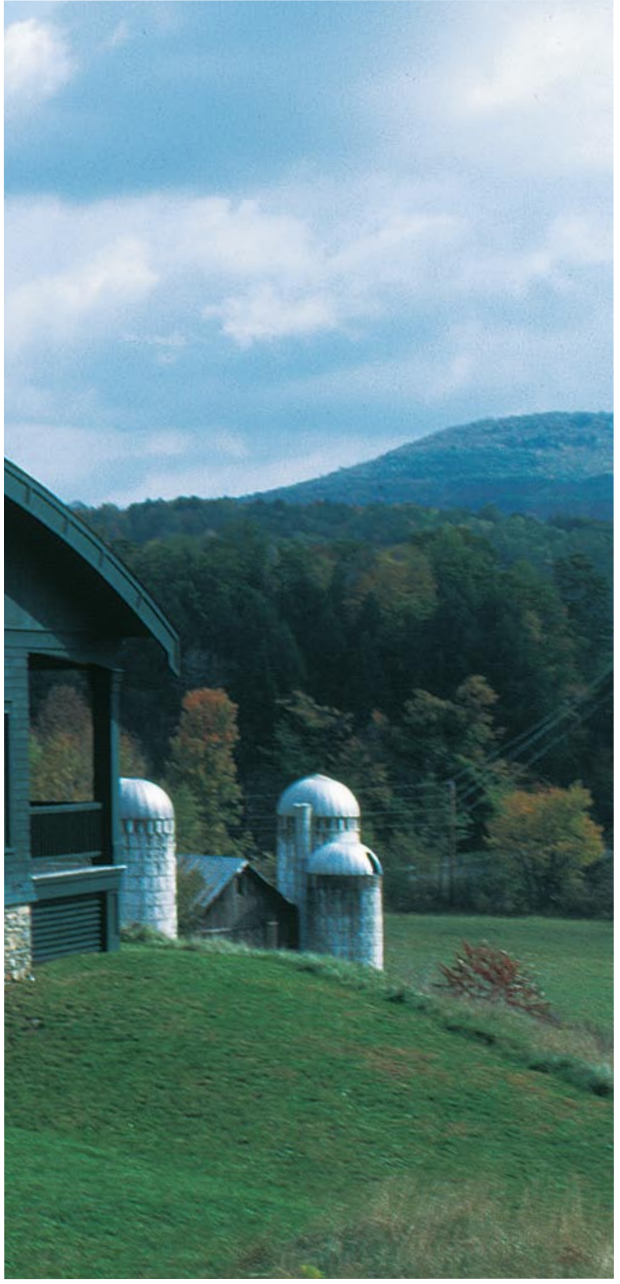
Bedrooms: 3
Bathrooms: 2½ (one in basement)
Size: 2,700 sq. ft. (including basement)
Cost: $95 per sq. ft.
Completed: 1997
Location: Cooperstown, New York
Architect: Altonview Architects
Builder: Steven Smith (G&S Construction)

Photos taken at lettered positions.





Drawings: Mark Hannon



Arch-Top in the Valley

With a gracefully curving roof and Craftsman-style detailing, this modern house is designed with engineered framing and an eye on expansion

BY KURT OFER AND TERESA DRERUP

It was obvious the minute we first laid eyes on the site. The flat meadow, part of an old farm, looked south between rolling hills and seemed like the highest point in the valley. The views were great. We had no idea what the house would look like, but we knew exactly where it would be built.

After buying the property, we lived in a converted barn and began to churn out CAD drawings of our future home. In our architectural practice, we either renovate existing landmark structures or design new buildings with the dictum that the building has to look like it has "been there forever." Usually, that implies the literal interpretation of history and style, be it federal, Greek revival or empire Victorian. But for ourselves, we wanted to design a house that was modern with historical details and proportions; we especially liked the Arts and Crafts tradition. A trip to the recently restored Roycroft Inn in East Aurora, New York, was fundamental in our Arts and Crafts education; we even paid for our builder, Steven Smith, to go there before he started the construction. It was critical that we be on the same wavelength in terms of detailing.

A combination of modern lines and period detailing. Built atop a simple rectangle, the curved roof adds a contemporary look that blends well with the surrounding hills. Inside, painted paneling that recalls the Arts and Crafts movement is a decorative partition between the living and dining areas. Photo left taken at A on floor plan; photo right taken at B.

We also wanted the house to reflect the surroundings. After more than 20 attempts, we came up with the curved roof design (photo facing page), which echoes the shape of the hills and adds the modern feel we were seeking. Originally, we drew one parabola, but after realizing that the middle bedroom would be somewhat dark, we offset the two halves of the arc and added clerestory windows.

Narrow rectangular plan maximizes views and minimizes clutter

We believed that the house should help to simplify our lives. The austere plan is devoid of unnecessary space or spatial distractions; it just provides a backdrop for our activities, rather than shouting for attention to itself. The plan consists of a single long rectangle, 20 ft. by 56 ft. (floor plans, facing page). Be-

cause the house sits on the highest part of the valley floor, we have a true 360° view. Two hallways flank the long sides of the house; coupled with a strong visual connection to the outside, they give guests the impression of a larger house. By arranging the first-floor rooms in a linear fashion, we could have three-sided views from both the living room (top photo, p. 91) and the kitchen. In the middle with only one exposure, the dining room (photo p. 87) encourages a more inward focus and emphasizes the importance of family gathering together at mealtimes.

The arrangement of rooms responds directly to the daily cycle of the sun. On summer mornings, we can sit on the covered porch by the kitchen for breakfast as the sun rises, and later we can watch the sun set over the western hills from the living-room patio. The second floor consists of a master bedroom, a study/guest bedroom, one large room for all three children and a large bathroom. The second-floor ceiling follows the curve of the roof.

Some things have to wait when you stick to a budget

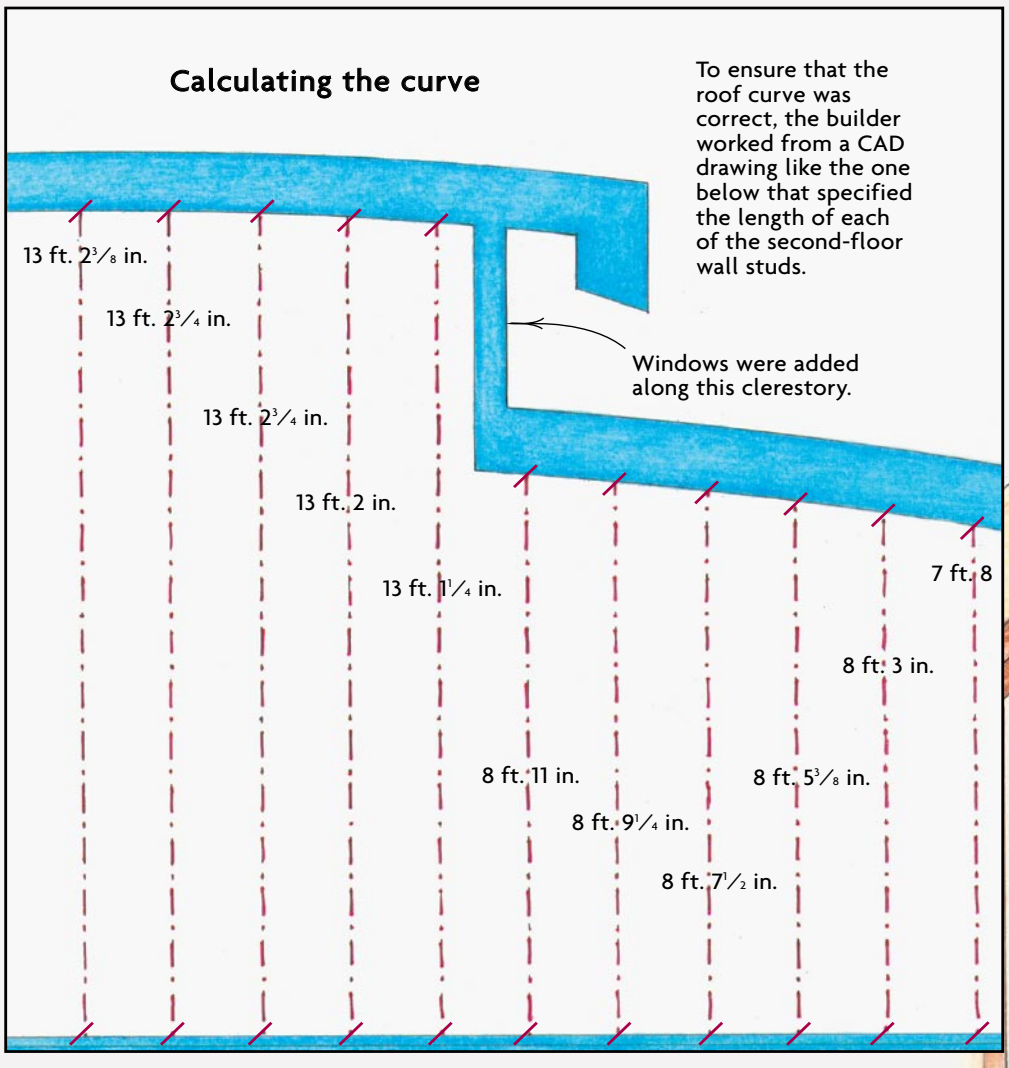
We always urge our clients to invest in the highest-quality materials and finishes they can afford, even if it means delaying some smaller phase of the project. Our house is a textbook example of this credo. The porch railing was added a year after we moved in, and the second floor is still without window trim, baseboards or finished flooring. However, these incomplete items don't decrease our enjoyment or the livability of the house, and we have the satisfaction of knowing that everything that has been built is of the highest quality and will give us many years of worry-free service.

To capitalize on the views, we wanted as much glass as possible. However, windows cost money, so we followed the example of the Craftsman-style homes we had admired and used simple off-the-shelf windows, often in groups of two or three. Although we don't have walls of glass, the continuity of the views is implied as the undulation of the hills continues from window to window, a concept we learned from Christopher Alexander's *A Pattern Language* (Oxford University Press, 1977). We enjoy being able to monitor the changing weather from hour to hour and season to season, and placed the furniture in the middle of the living room so that we could to take full advantage of the views.

Building with additions in mind

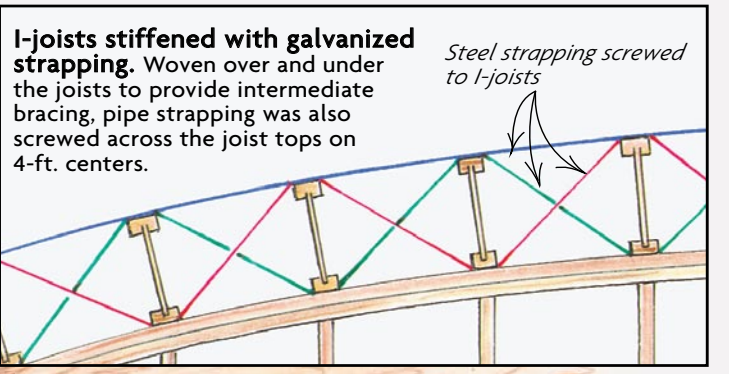
Many of our clients wish to add onto their houses. Most of these older homes have al-

Arc of the roofline is broken to admit light. When the authors realized that their first roof design of a single parabola would create a somewhat dark middle bedroom upstairs, they stepped down one portion and added clerestory windows in the intervening space. Photo taken at C on floor plan.

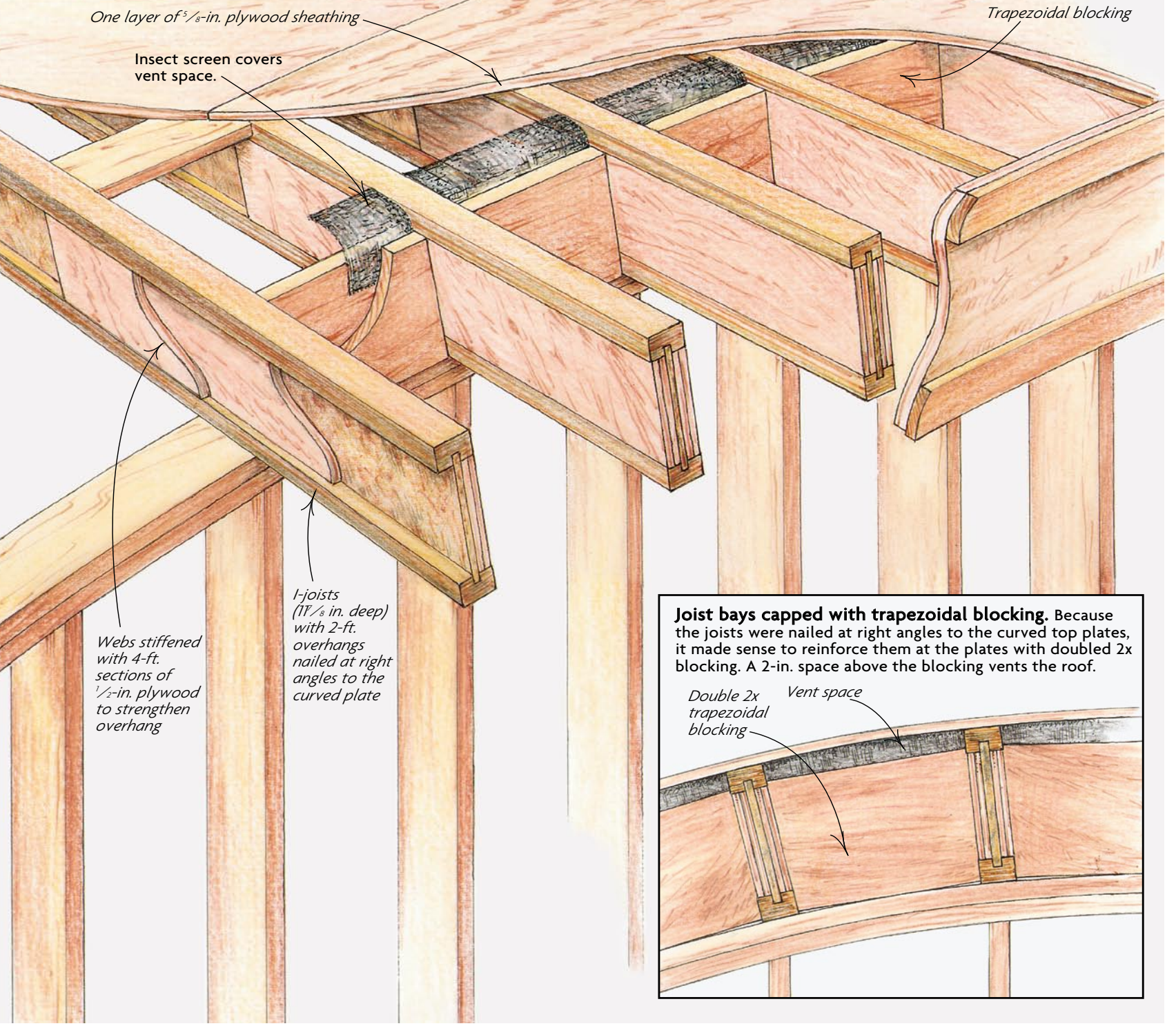


ENGINEERING A CURVED ROOF

Faced with the prospect of using expensive custom-curved rafters that ran the length of the roof, the authors thought that they might be able to run the joists across the width of the roof. They sought the advice of a structural engineer, who suggested that they span curved plates with I-joists. The joists were braced with steel strapping to ensure a rigid structure before the sheathing was applied.



I-joists stiffened with galvanized strapping. Woven over and under the joists to provide intermediate bracing, pipe strapping was also screwed across the joist tops on 4-ft. centers.



Joist bays capped with trapezoidal blocking. Because the joists were nailed at right angles to the curved top plates, it made sense to reinforce them at the plates with doubled 2x blocking. A 2-in. space above the blocking vents the roof.

A practical kitchen that cleans easily. Tiled floors and walls along with stainless-steel work surfaces make a durable kitchen that's easy to maintain. At left, pots and pans ride on a stainless-steel rack fitted with rubber wheels. Photo taken at D on floor plan.

ready had two or even three previous additions, with the end result often being a mish-mash of rooms and poor overall circulation. We wanted to build ourselves an affordable house that could be expanded when we needed to have some extra room. Because we have three children under the age of 8, we wanted them all together and near our bedroom. As they get older, however, the children will need separate rooms that are away from our bedroom.

Taking this situation into account, we've planned a long, narrow one-story bedroom wing that will project north from the stair location. This plan also gives us the opportunity to increase the size of the present mud-room and also to modify the entry sequence so that it will be better sheltered from the west wind. A second addition could be a garage/studio at the northern end of the children's wing.

With the kids off in their own wing of the house, the second floor could then become a master suite, complete with study, bathroom, bedroom and balcony overlooking the living room. With this plan in mind, the living-room ceiling is designed to be easily removed (there's no plumbing or electrical wires located there to complicate things) up to the curved roof plane. Our builder sandwiched a ⅜-in. by 5½-in. steel plate between the two top plates of the living-room walls for lateral stability if the ceiling were to be removed later on.

Engineered framing makes a curved roof feasible

After we had settled on the curved roof form, the challenge became how to build this house for nearly the same price that we might build, say, a gable-roof house.

We first investigated the price of curved glulam beams; however, at $800 each for 15 of them, we quickly realized that this option was not going to work budget-wise. Then we asked ourselves whether the roof members couldn't span the other direction. Our structural engineer, Mark Hallan of Lamont Van

Windows and doors provide a continuity of view. The house's narrow rectangle allows views in three directions from each end of the house. Photo taken at E on floor plan.

Crafting a comfortable living room. Inexpensive light sconces made from painted colanders, built-in shelves and simply detailed trim near the ceiling add to the ambience of the living room. Photo taken at F on floor plan.

De Valk Engineers, confirmed that we could use I-joists to span the width of the building (drawing p. 89) as long as the joists were sufficiently braced by the roof deck and by intermediate bracing. Mark devised a construction sequence in which the contractor started installing the joists at the top of the roof. A rigid structure was created by securing the topmost seven joists. Long metal straps were screwed 4 ft. o. c. to the top flange of each joist as it was installed to hold it in place until the roof was sheathed. Additional metal straps were woven over and under each joist to secure the bottom flanges.

Getting the curve right was also critical because of the way it had to meet the ends of the house. Our solution was to give Steven Smith, our builder, the exact length of each second-floor wall stud. Because we drew the entire project on CAD, this task was simple. We numbered each stud and gave it a length. From this information, Steve drew the arcs on the subfloor, laid out the studs and verified that the lengths were correct. He cut the angle at the top of each stud based on the layout on the floor, built the wall, then tilted it into place.

When visitors see the curved pergola rafters on the end of the house (photo p. 86), they assume that the entire roof was framed longitudinally. To make the pergola, Steve cut the same radius into 2x12 Douglas-fir members. The crosspieces were then notched into the longitudinal pieces.

Spending money for materials where it matters

Because of the gradual radius that resulted in a low pitch for the roof, our material options were limited to copper or aluminum. We discussed the options with our roofer, Dave Surovy. His analysis of the situation was that although an aluminum roof would cost substantially less, copper would last three or four times longer and would develop a nice patina over time. Put into this perspective, copper did not seem like such an extravagance, even at $12 per sq. ft. Dave used a standing-seam installation of 8-ft. lengths of copper to allow for expansion and contraction.

We sided the house with stained cedar shingles below and vertical siding above (just the reverse of most Arts and Crafts homes), a feature that allowed us to incorporate a flared skirt detail at the bottom edge of the house. To vary the texture of the southern elevation, we had our mason, Phil Zenir, finish the exposed side of the walkout basement with 6-in. local fieldstone (photo p. 88), meticulously fitted and mortared at the back edge.

For the interior, we wanted natural materials that would be beautiful, simple and relatively maintenance-free, and that would actually improve with age. Armed with these criteria, we selected antique vertical-grain heart pine for the living-room and dining-room floors (photos left), as well as for the stair treads and handrail. Although expensive, the flooring (reclaimed from a Southern river) brings an incredible warmth to these rooms. A simple trim band implies a crown molding in the living room (photos left). It consists of a 1x8 whose shallow decorative kerfs were cut on a table saw; short battens hold the trim off the wall, creating an interesting shadowline. We painted colanders ($13 each at the local kitchen-supply store) and suspended them by dowels over bare light bulbs to make dramatic light sconces. In the kitchen (photo facing page), we chose ceramic-tile floors and walls, stainless-steel countertops with large integral sinks and wall-mounted faucets for a more commercial, durable approach. Radiant-floor heat throughout the basement, first floor and second-floor bathroom was the obvious choice for a heating system in a house with so many low windows (and young children). The bedrooms are hot-water baseboard. □

Kurt Ofer and Teresa Drerup are partners in Altonview Architects and live just outside Cooperstown, New York. Photos by Charles Bickford.