

# The Carpenter's House

This smart Craftsman-style home was built with a keen eye for detail and energy efficiency

BY PETE MOLLIKA

I started my construction career by renovating old houses in Nashville, Tenn. After working through a few, I found that small Craftsman-style bungalows were my favorites. I completed all the finish carpentry on these projects and always tried to reproduce the details of the period accurately. The lack of ornate machine-cut profiles and the generous use of stained woodwork attracted my eye, and I liked how the smaller scale of these houses made them more affordable. I also liked the almost-rustic quality of the exterior details, which is well suited to homes in a rural setting.

After my wife and I moved back to her hometown in the hills of east-central Tennessee, we eventually found a good site for a new home, which I then started to design. I gravitated toward that same Craftsman-style bungalow, but with a small-cottage feel and modern

energy performance. The lot was well suited for a full basement, so I could also create office space and tool storage for my construction business while keeping the footprint small.

The result is a home whose rough charm blends modestly into the wooded site and whose seemingly small size belies the comfortable spaces within. Best of all, I designed a system of framing that allowed me to insulate the house for high energy efficiency at a low cost.

## Designed under the influence

The house's design was actually a blend of Craftsman influences. The specific inspiration for the exterior—with its waney-edged siding, natural stonework, and wide overhangs—came from a historic Adirondack-style meeting camp in our town. Started in the 1880s, the

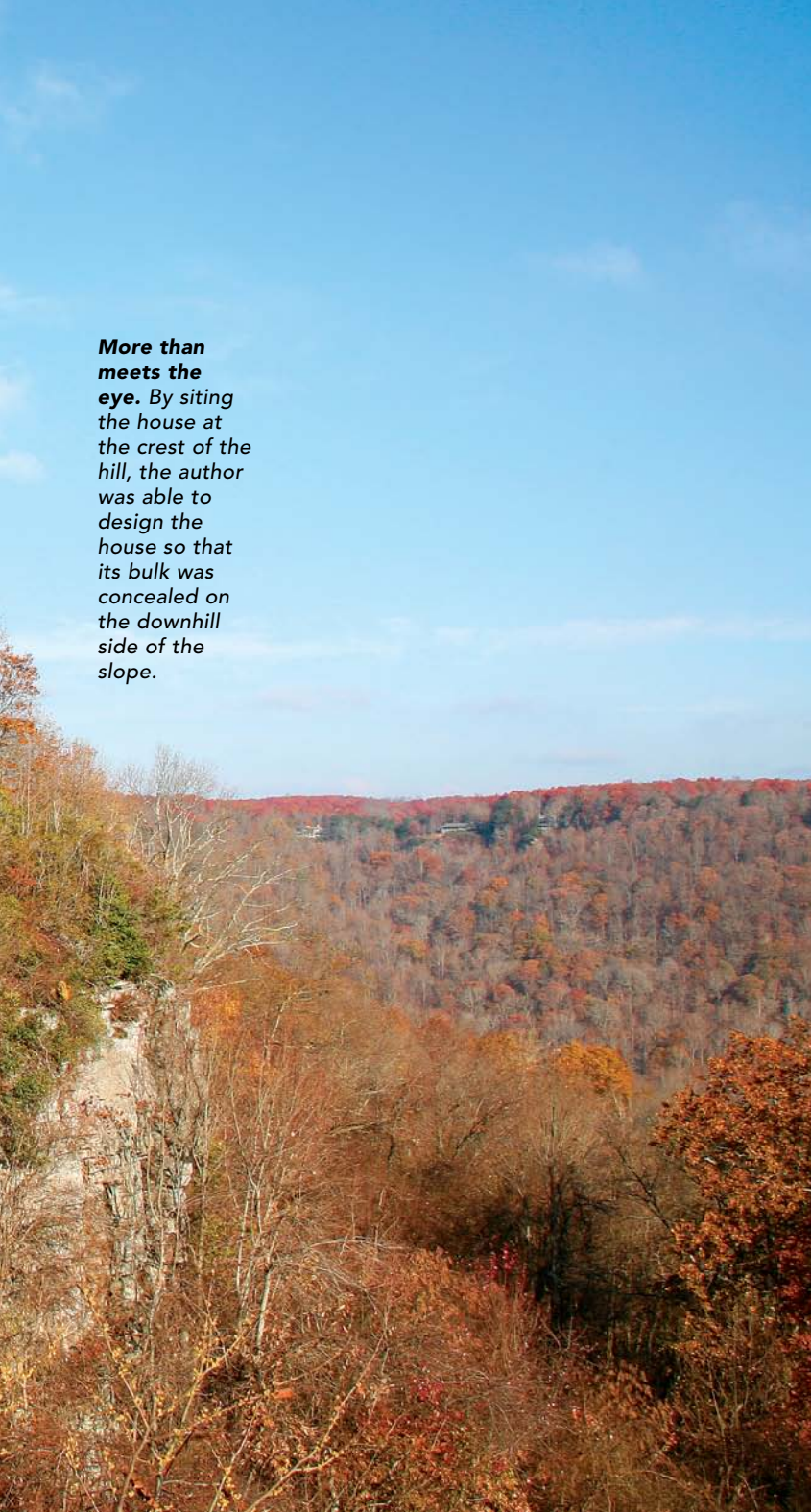


Adirondack camps were intended as large vacation houses and were built with peeled-log exteriors capped with rough-granite chimneys. When it came to the interior, I pushed for something a little more refined. The quartersawn white-oak flooring and cabinetry, the stained-glass light fixtures, the clear finished trim, and the smaller intimate rooms are part of a modern take on the broader Craftsman style.

To stay within the modest concept of a bungalow, I kept the main block of the house compact and the front elevation narrow. Small windows and a recessed front door help retain this sense of scale. Seen from the side, however, the house expands as the grade drops, providing the extra space we required. At the back, long windows set to floor level face south and east to capture both the view and solar gain.

#### **Deriving character from local sources**

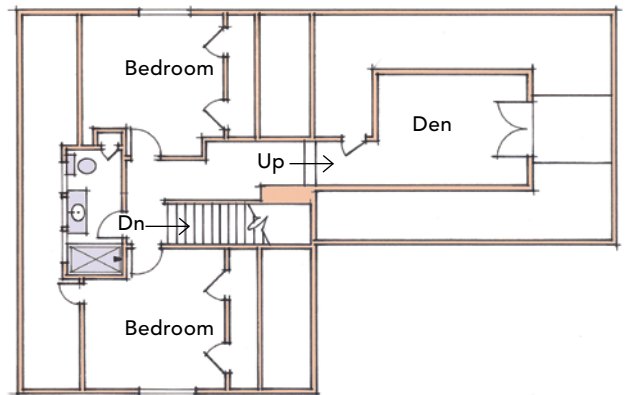
I used local materials when I could to make the house as much a part of the landscape as possible. Interior columns and porch posts came from poplar trees cut from the property. I cut the porch posts during the winter so that the bark would remain intact. I also installed poplar-bark shingles in the entry hall to tie into the bark-covered front porch post. The bark shingles and the live-edge



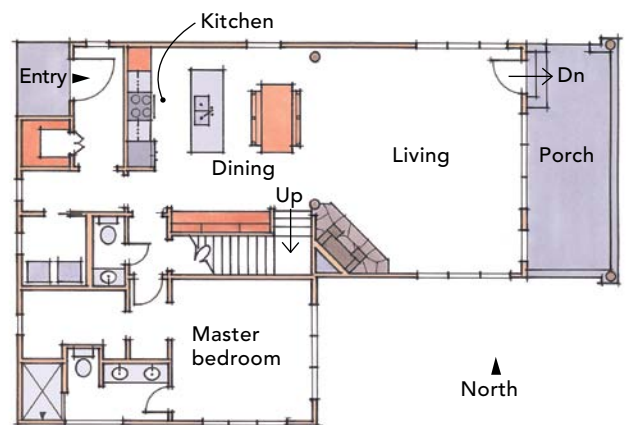
**More than meets the eye.** By siting the house at the crest of the hill, the author was able to design the house so that its bulk was concealed on the downhill side of the slope.

## A SMALL AND EFFICIENT FOOTPRINT

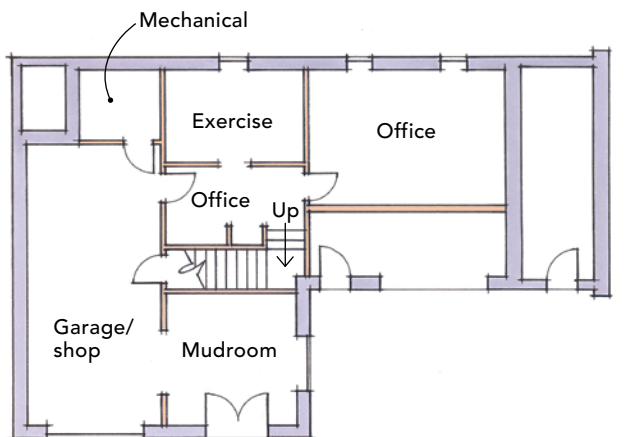
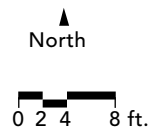
The author's main goal was to keep the footprint to a minimum while making the most of the interior space. He was able to net 2700 sq. ft. of conditioned space from a footprint of 1450 sq. ft. by including office and recreational space in the basement and by adding bedrooms, a full bath, and a study on the smaller second floor.



**Second floor**



**First floor**



**Basement**

### SPECS

- |                                |                                       |
|--------------------------------|---------------------------------------|
| <b>Bedrooms:</b> 3             | <b>Completed:</b> 2013                |
| <b>Bathrooms:</b> 2½           | <b>Location:</b> Monteagle, Tenn.     |
| <b>Size:</b> 2700 sq. ft.      | <b>Cabinets:</b> Keel Cabinets        |
| <b>Cost:</b> \$182 per sq. ft. | <b>Designer/builder:</b> Pete Mollica |

# A BUNGALOW OF ONE'S OWN



white-pine siding came from neighboring North Carolina.

Installing white-pine siding over 30-lb. felt was an alternative to the more expensive technique of building a rain screen. The 1¼-in.-thick siding, which is not beveled, creates its own airspace when lapped. The corners were detailed by weaving a piece of 30-lb. felt behind each joint.

The stones for the fireplace were gathered on-site. I spotted the stone that I would use for the lintel perched on the edge of a cliff about 50 ft. from the house. Despite its heft, I wound up hauling it out by hand. All of the exterior stone was locally harvested as well.

I trimmed the great room with walnut that had been cut from my wife's family property. It had spent three decades drying in my father-in-law's attic and had great color. Mike Keel in Winchester, Tenn., built the cabinets with locally sourced quartersawn white oak. A sawmill 30 miles away provided the cherry and poplar trim that we used throughout the interior. The regional standard, southern yellow pine, was used for the frame.

## Framing for insulation

Our area has a relatively unique climate: The winters are cold, but there's enough heat and humidity in the summer to warrant nearly constant air-conditioning. Keeping utility costs low requires a high-performance

**Warm and spacious.** The open space of the kitchen and dining area occupies the center of the house and derives much of its welcoming character from the white-oak cabinets, flooring, and built-in hutch (inset). The custom light fixtures are from [oldcalifornia.com](http://oldcalifornia.com), and the cabinet hardware is from [richelieu.com](http://richelieu.com).

approach to both insulation and HVAC design. However, I wanted to keep floor-joint sizes down and roof-edge profiles low to maintain the look of a small, old cottage, which meant that I couldn't run ductwork through tall floor trusses or build up the roof with exterior rigid insulation.

My framing plan was influenced by the orientation of the house and by where the insulation would have the greatest impact. Much of the wall area on the first floor is filled with windows that face south and east and that provide solar gain during winter months. Walls that face west and northwest have fewer windows and are well shaded during summer months. There is very little wall surface upstairs, as most of the space is

tucked under the roof, and the greatest portion of the basement walls is below grade.

With these considerations in mind, it didn't seem worth the expense to build double-stud walls. Instead, I decided to focus the insulation budget on the basement and roof and to use traditional framing everywhere except the roof. There, the framers installed double offset rafters, collar ties, and kneewalls to stop thermal bridging and to add the space for a system with an extremely high R-value. Like a good hat and a pair of wool socks, the basement and roof insulation would help everything in between to stay warm.

As a custom builder, I have used all types of insulation in many different applications, and I like closed-cell foam in a wall for its



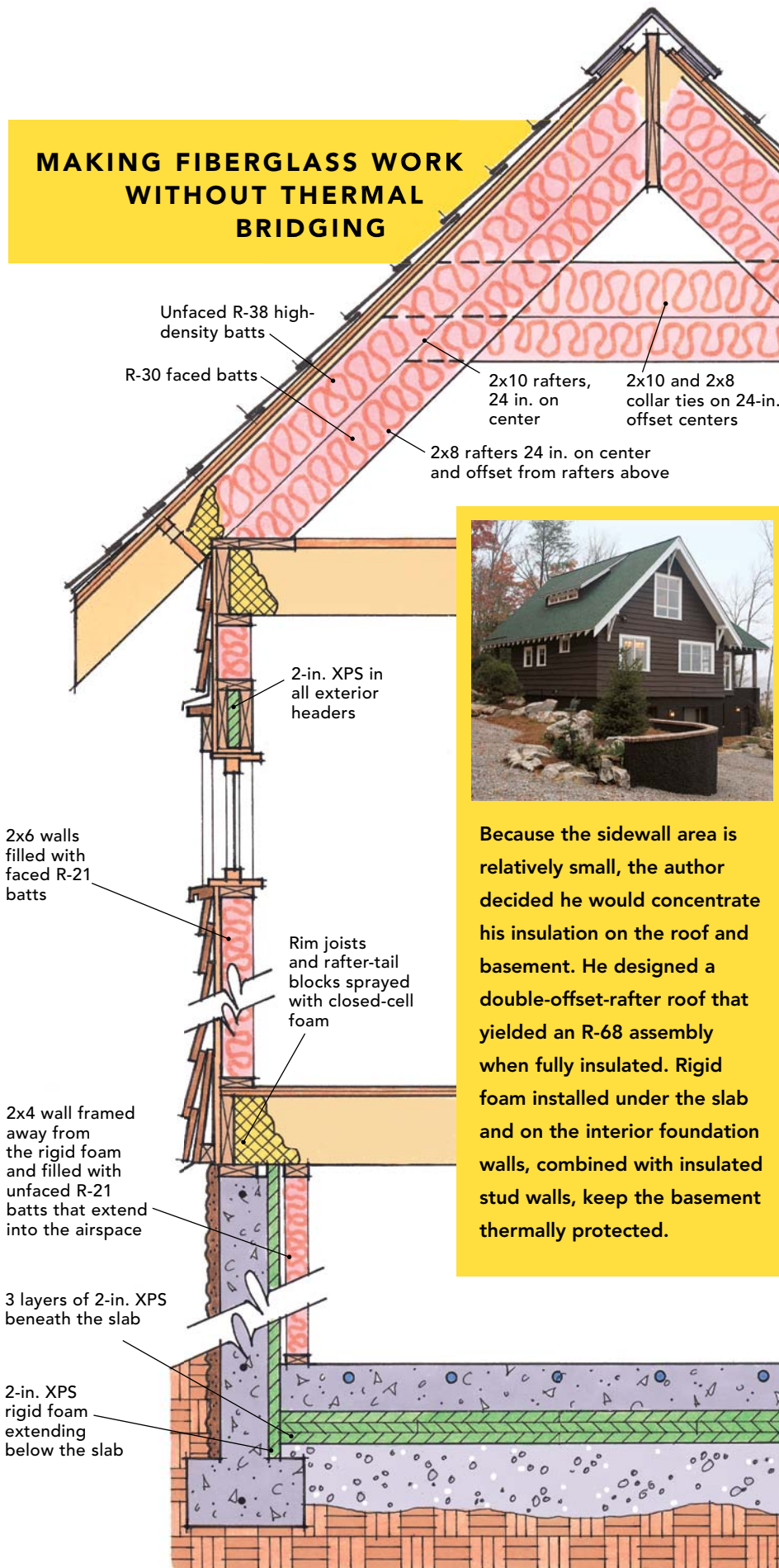
To view a slide show of this home, go to [FineHomebuilding.com/extras](http://FineHomebuilding.com/extras).



**Home for a craftsman.** Bound by tall windows that offer cliff-top views, the living room is trimmed with walnut boards that play off the white walls and oak floor. The vibrant brown color of the walnut (inset) is the result of air-drying rather than kiln-drying.



## MAKING FIBERGLASS WORK WITHOUT THERMAL BRIDGING



Because the sidewall area is relatively small, the author decided he would concentrate his insulation on the roof and basement. He designed a double-offset-rafter roof that yielded an R-68 assembly when fully insulated. Rigid foam installed under the slab and on the interior foundation walls, combined with insulated stud walls, keep the basement thermally protected.

high R-value. However, here I thought that I would get the most benefit from insulating the roof and basement with fiberglass. To get an R-68 roof, I would need just as much framing depth for open-cell foam as for fiberglass. Closed-cell foam would have worked at about 10 in. of depth, but closed-cell foam won't allow moisture to penetrate beyond the roof sheathing. If I did have a leak, I might not detect it until the sheathing was damaged, so I decided to play it safe and use fiberglass. Fiberglass needs a tight envelope, however, which was created here by using Zip System sheathing on the walls and roof, by sealing all wall and roof penetrations with caulk or canned foam, and by spraying the rim joists with closed-cell foam.

Below the roof, I insulated the 2x6 sidewalls with R-21 batts and included a layer of XPS (extruded polystyrene) foam in the headers. I also wrapped the interior foundation walls with a 2-in. layer of XPS and placed a 6-in.-thick layer beneath the slab. To increase the R-value of the basement, I framed 2x4 perimeter walls filled with R-21 batts.

### An uncomplicated path to comfort

The HVAC system is a water-to-water geothermal unit that feeds radiant tubing in the basement slab and five wall-hung fan units. The ductless system takes up very little space and allows for compact framing cavities. As an alternative to the expense of an ERV, I used 600-cfm bath fans and a through-wall fresh-air intake in the basement stairwell.

The house is easy to condition, and overall, it has proven to be an energy-efficient, low-maintenance home. During winter, the cold air is tempered by the warm air rising from the radiant-heat slab in the basement. In summer, the warm air mixes with cool basement temperatures.

Building my own home was exciting. I could make decisions quickly and move the project along without all the usual communications between homeowner, architect, and builder. I also enjoyed doing all of the interior trimwork myself, something I don't get to do much anymore. Finally, I appreciated having to figure out how to get the most bang for the buck in today's world of high building costs. □

Pete Mollica builds custom houses in Monteagle, Tenn. Photos by Charles Bickford.