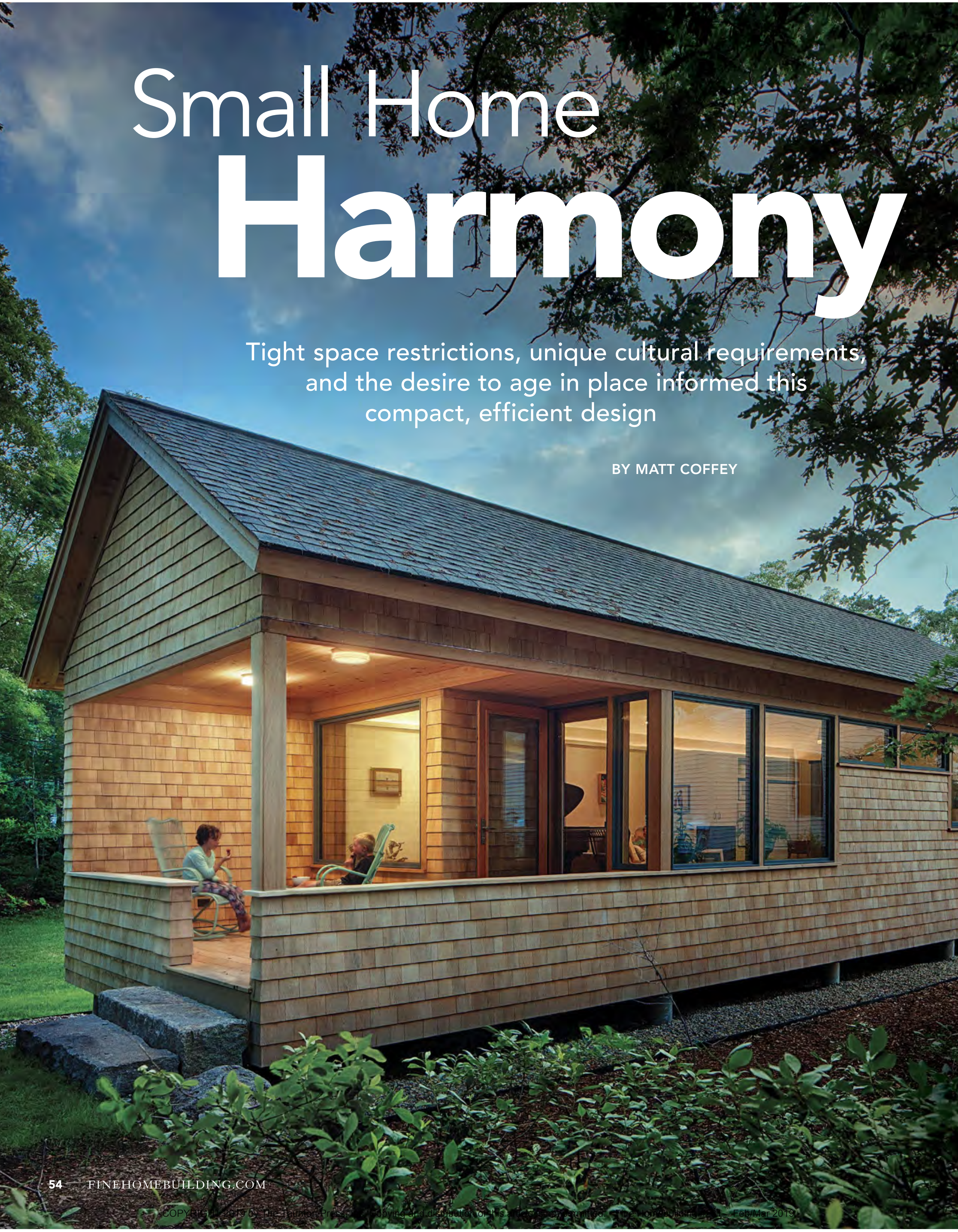
Small Home Harmony

Tight space restrictions, unique cultural requirements, and the desire to age in place informed this compact, efficient design

BY MATT COFFEY



Daylit and private. *A continuous stretch of windows along the length of the building brings light deep into the 14-ft.-wide interior, and narrow vertical windows are integrated into the 10-in.-thick north walls to balance views with privacy.*

Noteworthy wood. *The cypress trim and select millwork are made of old-growth timber harvested from river bottoms in Florida and Georgia. Reclaimed birch sinker logs from a lake in Vermont were used for the flooring.*

Ken and Fran Watson enjoy their two-story vacation home for its capacity to host friends and family, but it is far from the house they imagined for their retirement years. Wishing to build a second residence on their half-acre lot nestled in the heart of West Chop Woods, the couple approached South Mountain Company for our help.

Although zoning allowed for an additional structure, it could not exceed 600 sq. ft. of interior space, so an efficient floor plan was key. The Watsons also had a list of must-haves, which included room for a grand piano, discreet storage for sheet music, and a covered porch. The house had to be comfortable for two people, with space for an occasional guest; it needed to function well acoustically; and it had to feel private, have lots of daylight, and be easy to maintain.

Laying out the floor plan

We began our floor-plan design by asking how compact we could make the bedroom and the bathroom in order to assign more square footage to the public space. Fran and Ken were comfortable with the idea of very modest accommodations and small closets, which allowed us to stretch the west wing to a comfortable size.

Privacy was a leading consideration, too. Because there is less than 60 ft. between the main house and the neighbor's house, we pivoted the west wing 15° to the north. This "kink" in the floor plan opened the entry and shifted perspective from the living space

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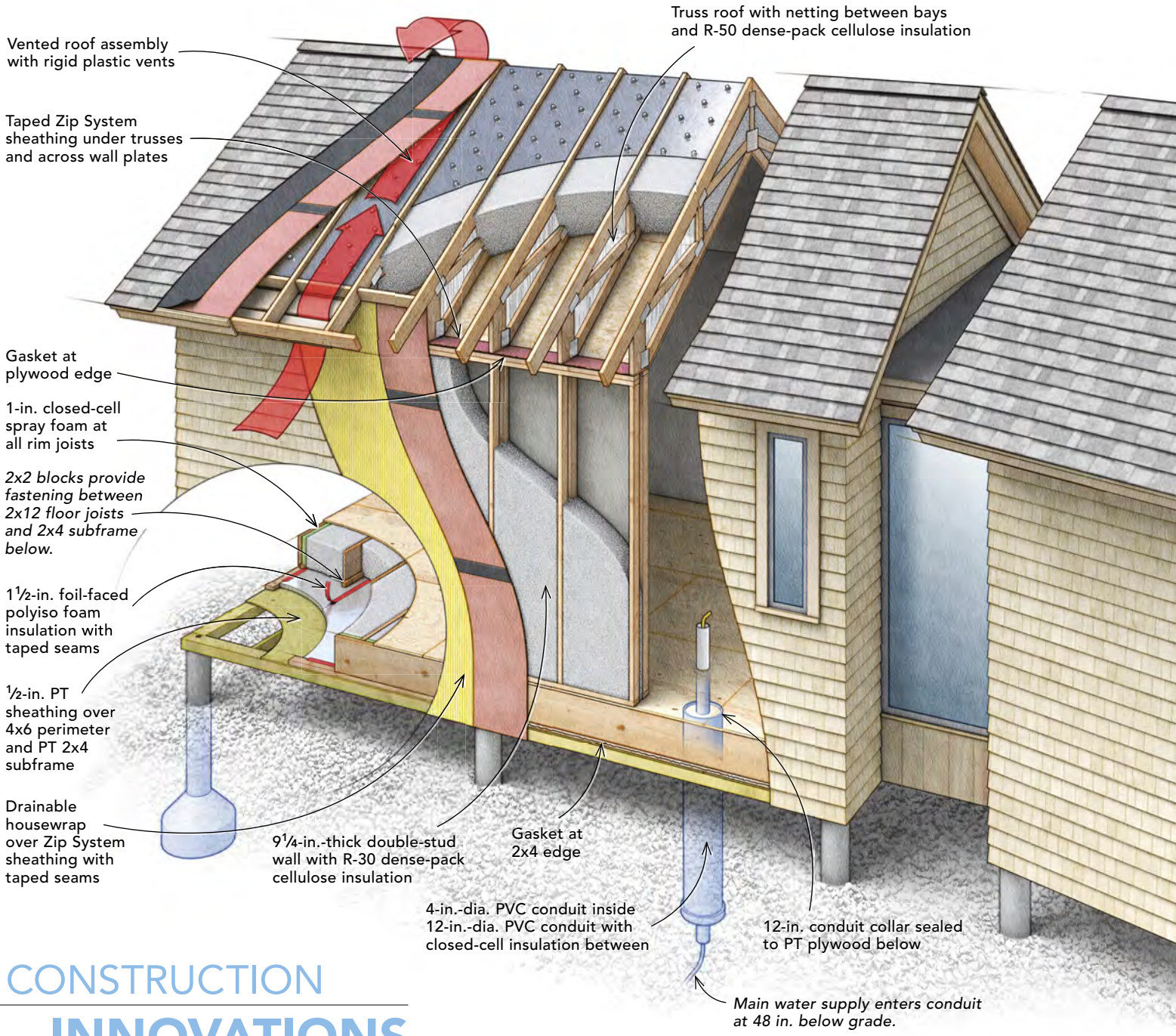


CONSTRUCTION INNOVATIONS

A SITE ANALYSIS REVEALED that the back side of the property would be the ideal location for the new house, despite the homeowners' initial plan to build into the hillside at the front. We realized that if we used a pier foundation, we could abut the septic system and the leaching fields, optimizing the remaining buildable strip of land. The septic code dictates that basements and crawlspaces be a minimum of 20 ft. away from a leaching field. Slab-on-grade foundations can be 10 ft. away. If you build on piers, you can build adjacent to a septic system as long as the piers do not disturb or undermine the system, access from above is maintained, and it is permitted by the local building department and board of health.

Figuring out the floor frame

Because we were building on piers just 18 in. off the gravel bed, we were faced with the problem of how to insulate and seal the raised-floor system. We had originally planned to build the floor frame upside down on sawhorses—skinning it with rigid foam and pressure-treated plywood for an airtight layer—and then use a crane to flip it over. Instead, we built a skeletal 2x4 floor frame—just enough of a frame to allow us to put down the first layer of PT plywood and the rigid foam. Working from above, we taped the rigid-foam layer in the floor assembly; the plywood below it was not taped because it was outside of the air barrier. We then built

Drawing: John Hartman

a more conventional 2x12 floor frame on top of that. The subfloor above was taped to keep water out of the assembly during construction, but it was not meant to be an air barrier, so when we pulled up the lightly tacked strips of subfloor to insulate the floor cavity, we did not retape those seams. We had the air-sealing we wanted, and the construction sequence didn't require a crane. Moreover, we didn't have to think in reverse to lay out the plumbing and ductwork.

Regulating the water lines

To get water into the house, we wanted to maintain above-freezing temperatures in the water supply line without electric-resistance heat tape, so we decided to build a custom conduit. The town-supplied water comes up from 4 ft. below grade, and right where it turns to enter the building, we built a custom-insulated double-wall PVC conduit. The ground temperature and the ambient indoor-air temperature thermally regulate the conduit, which is essentially borrowing 55°F from the ground plus warmth from inside the house.

A sheathing lesson

The roof-truss assembly was another component we developed along the way. Because of its low-environmental impact, we wanted to use dense-pack cellulose insulation wherever possible. Putting the air barrier on the roof interior and transitioning it to the exterior at the wall enabled us to do a vented roof and to use all cellulose.

Above the top plate, where we were transitioning the air barrier from inside to outside, we had to tape every seam. There were a lot of nooks and crannies to seal, and this had to be done perfectly or there would be the possibility of a breach. Next time, a better option might be to use eaveless trusses and to run the air-barrier sheathing right up to the roof sheathing. Then we could add a second layer of 2x4s or 2x6s above that, run those out, and add sheathing above that structure. In other words, we would frame a cold roof, using that whole second layer of framing and sheathing as a vented assembly.

DESIGN FOR **AGING IN PLACE**

People are increasingly interested in planning their homes around possible future needs. To address that, we developed a three-tiered checklist for aging in place. It has become part of our design process and is now presented to every client.

Each level represents an increase in cost and complexity. We try to incorporate all of the Level 1 provisions (shown below) in every project. We offer Level 2 and Level 3 options to give clients choices if they want to take visitability and accessibility to a higher standard. We've found that most clients are interested in incorporating at least some of our Level 2 and Level 3 suggestions.

ABSOLUTES FOR VISITABILITY

- At least one bath on first floor
- At least one zero-clearance threshold entry
- 32-in. clearance for doors at all visitable spaces

SITE AND ENTRANCE

- No-step route to be 1-in-12 slope; pathway slope of 1-in-20 minimum preferred
- Accessible entry-door threshold to be 1 in. maximum, with bevels above finished floor surface on both sides
- Weather protection from elements to fully cover accessible entry door

INTERIOR CIRCULATION TO VISITABLE SPACES

- Readily visitable spaces via a no-step route to include a full bathroom, bedroom, kitchen, and dining and living space
- Cased openings to be 32 in. wide minimum (34 in. minimum for door slab)
- Level changes in circulation route to visitable spaces via a ramp to be less than 1-in-12 slope
- Minimum 38 in. wide (finished) halls to serve visitable spaces

BEDROOM

- First-floor bedroom (or future bedroom) with 36 in. minimum clearance on one side of bed preferred

HALF-BATHROOM

- Minimum ¾-in. plywood walls or adequate blocking for grab bars at toilet and shower in visitable bathroom at 33 in. to 36 in. above finished floor (2x12 blocking needed for fiberglass units)

FLOORS

- Maximum ½-in. thresholds between floor surfaces in accessible spaces

SWITCHES AND CONTROLS

- Electrical switches to be centered 48 in. maximum above floor
- Thermostats at 48 in. maximum or remote controlled

FIXTURES AND HARDWARE

- Lever handles on doors

For a printable PDF of South Mountain Company's full checklist for aging in place, visit FineHomebuilding.com/magazine.

SPECS

Bedrooms: 1

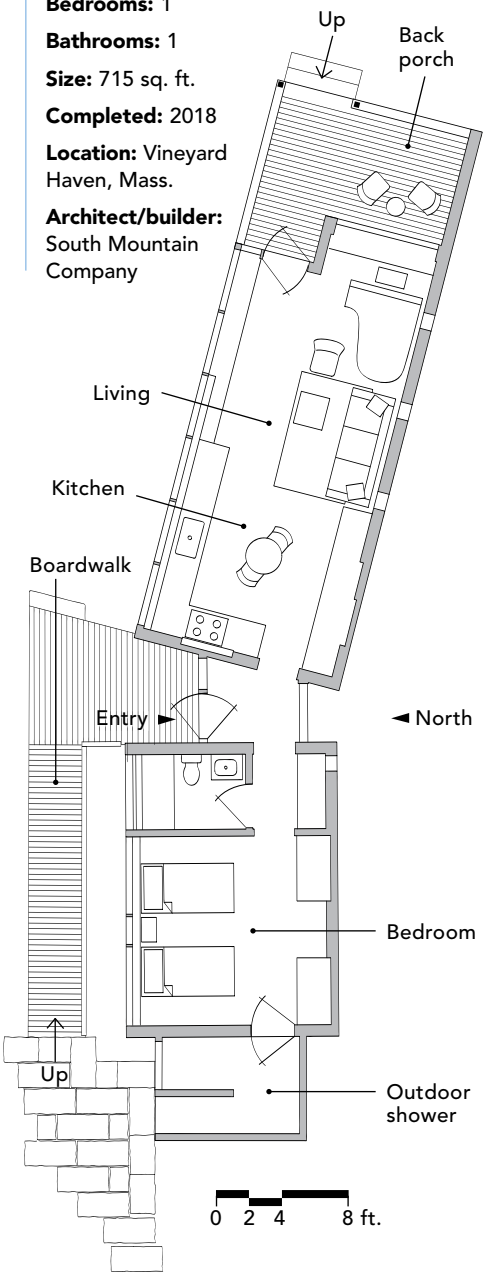
Bathrooms: 1

Size: 715 sq. ft.

Completed: 2018

Location: Vineyard Haven, Mass.

Architect/builder: South Mountain Company



TAKING THE LONG VIEW

For comfortable aging in place, we kept everything on one level. The transition from the driveway to the boardwalk and all the way through the house to the back porch is flush—that includes the finished deck, terrace, outdoor shower, and entry.

Built for sound. *The piano sits beneath a 12-ft. ceiling and beside the porch door, which was brought into the conditioned space rather than made flush with the window to optimize the acoustics and save square footage.*

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toward the adjacent woods. We concentrated the glazing on the side facing away from the main house, and the modest entry is fully glazed from floor to ceiling to feel open and inviting. As a result of these efforts, when one is in the new house, nearby buildings are largely obscured from view.

Solving the piano puzzle

The grand piano was the bear in the room. We wanted to position it out of the way, yet make it a focal point. And it was important that the person playing it wouldn't feel cramped. To accomplish this, we bumped the west gable end out 3 ft. This subtle shift reallocated space from where it wasn't needed (a small porch entry door) to where it was (the piano niche). We terminated the southern glazing at this juncture to create a solid exterior wall against which the outswinging door could latch. Sheet music would be stored beneath the large window looking onto the porch, whose sill would extend 20 in. and serve as the top of a custom cypress cabinet with simple bypassing doors.

To get the acoustics right, we worked with Doug Sturz from Acentech. Our initial schematics divided the house into two volumes with shed roofs, but in order to get the volumetric requirements for high-quality acoustics, Doug suggested a minimum ceiling height of 12 ft. He also explained the need for a mix of solid walls (which could be softened with a tapestry or acoustical panels) and hard surfaces (such as windows) off of which the sound could travel. An open shelf above the porch entry door would add volume without increasing square footage. In lieu of a cost-prohibitive, acoustically optimized ceiling, we opted for a smooth plaster finish. The homeowners knew from experience that small changes in the room, such as a piece of additional furniture or a wall hanging, can affect acoustics. In the process of moving in, they intentionally utilized space to "fine tune" their home.

We recently visited Ken and Fran and found them settled right in. Ken had set up recording equipment by the piano. After performing his latest composition, he shared this sentiment with us: "We have such appreciation and respect for the design, engineering, detail, uplifting spirit, and harmony of our home. We will age happily because we live in this superbly planned and impressively built home." □

Matt Coffey is co-owner of South Mountain Company on Martha's Vineyard in Massachusetts. Photos by Bob Gothard.

Floor-plan drawing: Patrick Welsh