5 PRESERVE THE LARGER ENVIRONMENT

In addition to controlling energy use, the systems and materials in the house actively promote conservation. In the kitchen, a Tapmaster foot control (www.tapmaster.ca) at the kitchen sink helps to cut down on water waste, as do dual-flush toilets in the bathrooms. Appliances are energy efficient. The house is also a model of reuse. The main-level floors are reclaimed antique heart pine (www.longleaflumber.com) and local bluestone. Kitchen countertops are wood and concrete (www.jaaronwoodcountertops.com) rather than imported stone. Sixty percent of the kitchen cabinetry was salvaged; new structures were built of formaldehyde-free plywood. In the bathrooms, remnant marble was used for shower-seat and bath thresholds, with an antique wood top and reclaimed base for the master-bath vanity.

In addition to recommending that work sites be sealed off during repairs, the job-site guidelines included using window fans to create negative air pressure and HEPA vacuums to clear dust at the source.

make informed decisions at every step," says ZeroEnergy architect Stephanie Horowitz. "It was a calculated process, whether decisions were made for design reasons, health reasons, or energy reasons."

At the outset, the team developed a guide to construction practices for the contractors and subs to follow. Sweeping or using a shop vacuum, which spreads particulates, were prohibited. Ventilation and heat-recovery systems were sealed until all construction work was complete, which avoided having to rely on postconstruction cleaning to remove contaminants from the system.

Even with all these precautions, contaminants still slipped through. "There are things you specify in advance, but then there are myriad products that come onto a job that are generic that aren't chosen by the architect or the general contractor," says Horowitz. On this project, the culprit was a hardening agent mixed in with the adhesive used to affix a marble seat in the master-bath shower. Kauffman Tharp noticed the smell the moment she walked onto the site. Aedi's response was instantaneous: The seat came out, fans were turned on to ventilate the space, and the heat was turned up to "bake out" the substance.

Insulate well
A layer of 2-in. XPS helps the house to maintain comfort year-round with less reliance on mechanical systems. Inside, Icynene open-cell foam was applied to wall cavities. Although the R-value of open-cell foam is lower than that of closed-cell foam, it is vapor permeable and off-gasses less.

Promote drying with an airspace
Furring strips between the drainage plane and the fiber-cement siding create an airspace that allows the exterior wall assembly to dry if needed.

Photos this page, top left and bottom, and facing page, bottom: Lisa Kauffman Tharp.