STAR Performance

Architect Alison Alessi helps an East Dennis family meet their net-zero energy goals.

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Orientated toward the views of distant Cape Cod Bay, the custom-designed Carrara marble island with dual built-in wine cabinets was sited in relation to the three south-facing windows behind it to maximize the natural light that falls on the workstation.

GABLED AND GRAND, Quivet Neck is a noteworthy private residence. Located on an eight-acre parcel of wildlife-rich land, the Shingle Style home is three stories tall and comprises roughly 3,600 square feet of energy-efficient space. It is the work of A3 Architects, a Dennis, Massachusetts, based firm specializing in green architecture.

A3 Architects' mission is to design modern homes that incorporate super insulation strategies, efficient heating and cooling systems, and renewable energy sources. The house, in its entirety, is impressive for its green features, which include a photovoltaic solar array, 12-inch-deep walls filled with high-performance insulation, an optimized building envelope and low mechanical loads—together they work to meet the net-zero criteria of producing as much energy as is used.

The kitchen demonstrates many of the principles at play throughout the house. A showstopper for its balanced aesthetic, the room is also to be appreciated for the ways in which it functions. For instance, the custom-designed Carrara marble island with dual built-in wine cabinets was sited in relation to the three south-facing windows behind it to maximize the natural light that falls on the workstation. "The more natural lighting we have in these open spaces the better," says architect Alison Alessi, a certified passive house designer and principal of A3 Architects. She notes, too, that the room receives morning and afternoon light on all four sides, which limits the need for artificial light. Toward that same end, a high Hopper-style awning window was added to admit extra light.

The windows also help to seal the building envelope, which reduces heating and cooling demands. "We spent a lot of time thinking about windows and the properties of the glass," notes Alessi, explaining that the solar heat gain coefficient, which indicates how much energy gets through the glass, is a key passive-design strategy. "That is important because it's heat coming in that you don't need to pay for." She chose Canadian-made Loewen windows for the south-facing side of the kitchen, as they have a high solar heat gain coefficient and bring in a lot of warmth. It is interesting to note that they were not used for the north-facing windows, which afford views but don't take in heat. "It's a problem putting a lot of windows on the north," says Alessi. "It's an energy penalty. We are always trying to balance that."

Electric Energy Star appliances were chosen for their top-tier energy-efficiency rating. Alessi points out that the entire house runs on electricity—a conscious decision. "I think people are increasingly leery about bringing gas into their homes," she says, adding that a moratorium on new gas hook-ups on the Mid-Cape has affected the way designers approach projects.

The kitchen's distinct character comes in part from its cathedral ceilings, stained Douglas fir trusses, reclaimed white oak floors and orientation toward the views of distant Cape Cod Bay. But beyond its aesthetic appeal lies a highly intentional, eco-friendly design, which is what both Quivet Neck and A3 Architects are all about.

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