

CONTEMPORARY Net Zero

Hillsdale, New York

Set in the hills of upstate New York, this contemporary two-story Passive House features wall assemblies constructed of fire-resistant, water-resistant autoclaved aerated concrete (AAC) blocks—a first in North America. AAC is a lightweight concrete product that was invented in Sweden in the 1920s. The homeowner, Steven Bluestone, has extensive development experience and rebuilt three other residential properties on Staten Island using AAC, after the original homes were destroyed by Superstorm Sandy.

When Bluestone and his wife found the property that would ultimately be the site for their own home, they fell in love with the extensive south-facing views that its location affords. “On a good day you can see 25 miles or more to the south and 35 miles out toward the Catskills located on the other side of the Hudson River,” says Bluestone. The north-facing entry foyer seamlessly steps to a south-facing great room—kitchen and living and dining rooms—that takes full advantage of these views with ample triple-pane, Passive House-quality glazing. The house is designed for aging in place, with the master bedroom suite and laundry room on the same main level as the great room. Downstairs are a large guest bedroom, an office, and a recreation room.

Team

Builder-Owner
[Steven Bluestone](#)

Architect
[Bruce Coldham](#)

Certified Passive House Consultant
[Jordan Dentz](#)



Keeping the house snug, the AAC blocks serve as the air barrier in the wall assemblies, which are plastered on the interior. Exterior to the blocks are 4½ inches of polyiso insulation and fiber cement siding. Architect Bruce Coldham and Bluestone had to devise a board-and-batten system to attach these components, starting with pressure-treated 2 x 4s that were glued and screwed vertically to the AAC. These 2 x 4s were fastened on every 24 inches, and sheets of EPS insulation were fitted in between. Another 3-inch layer of insulation was overlaid on the first, secured by 1 x 4s that were attached to the 2 x 4s with long structural screws. To ensure no deflection, longer 1 x 4s were secured to the framing in the overhang above. The fiber cement siding hangs off of the 1 x 4s.

This draft-free house is comfortable in all seasons, even though the family set the thermostat at a slightly low 65°F or 66 °F in winter. “I feel fine walking around in short sleeves,” says Bluestone.

Concerned about climate change, Bluestone had initially targeted net zero energy use as a goal for the all-electric house, installing a 9.6-kW PV system. He has not only met but exceeded his goal—producing more energy than the family uses on an annual basis.



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Photos by Steven Bluestone

Passive House Metrics

Specific space heating demand	7.2 kBtu/ft ² /yr	22.6 kWh/m ² /yr
Specific space cooling demand	0.11 kBtu/ft ² /yr	0.4 kWh/m ² /yr
Source energy use intensity (EUI)	20,326 kBtu/person/yr	5,957 kWh/person/yr
Air changes per hour	0.05 CFM/ft ²	