

Best of the Best
in Residential New Construction

HONOR AWARD

Category:
Innovation

Winning Home:
Whitchurch Passive House Cottage, Middlesex, VT

Builder:
Montpelier Construction

Certified Passive House Consultant:
Indigo Ruth-Davis



The Whitchurch Passive House Cottage is a locally harvested and cut timber-frame structure, embodying an evolution in construction practices. It is thermal bridge free, superinsulated, airtight in envelope, and green, with extremely low energy demands.

Behind the locally harvested and milled cedar cladding and 80% hemlock frame, the cottage utilizes advanced European membranes and tapes to provide airtightness and moisture protection. The thermal envelope above grade is a foam-free superinsulated cellulose. The full conventional basement foundation, walls, slabs, and footings are insulated with slab EPS. Interior and exterior airtight membranes maximize moisture protection and insulation performance. The roof is free of sheathing and foam, and solely insulated by cellulose and wood fiberboard.

At PHIUS / RESNET testing 0.28 ACH50, the final blower door test came in at less than half the PH standard leakage rate required for PHIUS Passive House certification. This phenomenal result in airtightness ensures a significant decrease in the amount of bulk air moving through the envelope, and the conditioning energy recovery ventilator (CERV) by Build Equinox reduces the building's energy demand dramatically. The house is net-zero ready, and the homeowners are very happy and comfortable.

Square footage/conditioned area	979 sq ft
Conditioned volume	14,400 cubic ft,
Energy rating index points	pre renewables 35; post renewables 5
R-values	Vaulted Ceiling: R-81.0; Foundation Walls: R-64.0; Above Grade Walls: R-59.0; Slab: R-64.0 Edge, R-32 Under
Windows NFRC U-factor & SHGC	U-value: 0.140, SHGC: 0.620
Ventilation Strategy	Balanced: ERV, 85 cfm, 88.0 watts
Heating	Air Source Heat Pump
Air change/hour at 50 Pascals	0.28
Heating MMBtu/year and cost/year	7.8/\$355
Cooling MMBtu/year and cost/year	1.8/\$84
Hot water MMBtu/year and cost/year	.3/\$16
Lights/appliances MMBtu/year and cost/year	10.9/\$496
Service charges/other	\$135
Photovoltaics	-17.8/\$-812
Total MMBtu/year; cost/year	3.1/\$274
Other attributes	Efficiency Vermont High Performance Home EPA Energy STAR® Version 3 Homes Federal Energy Policy Act 2005