

EEBA SUCCESS STORY

Homes for Health and the Environment, LLC • Ridgefield, Connecticut

Design Philosophy and Application

Using his broker's license, Trolle started by purchasing a 21.5 acre building site and subdividing it into five building lots of 3.1 to 4.6 acres (lot sizes dictated by 3 acre zoning). Then he teamed up with a "green" architect, Tom Hartman of Coldham Architects, and a building science / mechanical consultant, Bill Rock Smith, to design and build a Health House. Working with Trolle's design concept, the team refined the plan and construction details. Acting as GC, Trolle was able to find subcontractors willing to adapt their standard practice to incorporate the building science that the Health House criteria required. This evolved into a positive exchange of information as Trolle learned building basics from his contractors and taught them the basics of heat, moisture, and air flow in relation to a house envelope.

Trolle is now working on strategies for building performance housing at a cost that will be competitive with the market. The publicity generated by the Health House has brought many lookers and several potential buyers to HHE, and Trolle is confident that there is a niche market for the type of house HHE builds. Trolle plans to build a second speculative house this Fall and has two custom house assignments scheduled for Spring starts.

Conneticut Health House Features:

Mechanical System Characteristics

- Sheet-metal ductwork sealed with mastic
- High-efficiency media filter and HEPA filter on a bypass loop
- Energy recovery ventilator
- Central dehumidifier on a bypass loop
- Sealed combustion water heater, 95% efficient
- Hydro-air air handler
- Central air conditioning

Measured Performance Characteristics

- Total envelope ACH at 50 Pa = 646
- House pressure WRT outside = too low to measure
- Zonal pressures = none greater than 0.3 Pa
- Series leakage = none: basement is conditioned, attic is unconditioned but has no ducts, and garage is detached (with breezeway connection)
- Duct leakage = 0% leakage to outside
- Ventilation = 105 cfm low/144 cfm high, balanced system

Envelope Characteristics

- Area: 2,200 sf finished space; 2,720 sf conditioned space
- Walls: 9.5" truss wall with 2 x 4 structural and 2 x 2 interior with R-36 blown cellulose and urethane spray foam in band joists
- Ceiling/Roof: Scissors truss with R-53 blown cellulose and urethane spray foam in eaves
- Basement: Pre-cast concrete stud wall with R-5 XPS and R-19 batts, and R-10 XPS under 4"

slab

- Cement-fiber siding installed on 3/8" rain-screen over 30 lb. building felt
- Interior air-flow retarder: Air-tight drywall with EPDM gaskets, low-expansion foam, and sealants.
- High-performance fiberglass windows with EPS in frame/sash, warm-edge spacer, low-E, argon-filled
- House is oriented with largest glass area and 11/12 roof facing south ready for active/passive solar devices

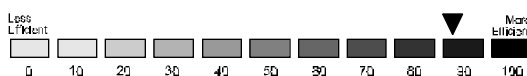
Additional Indoor Air Quality Measures

- Pre-finished maple strip flooring throughout with linoleum in bathrooms
- Low-VOC kitchen cabinets and counters, as well as interior doors, trim, subfloor, and finishes
- Passive radon control upgradeable to active control
- Central vacuum ducted to exterior
- Range hood with maximum 250 cfm ducted directly to exterior

Estimated Annual Energy Use and Cost

Space Heating:	34.6 MBtu/yr	\$368
Space Cooling:	4.4 MBtu/yr	\$129
Water Heating:	18.1 MBtu/yr	\$194
Totals:	57.1 MBtu/yr	\$691

Energy Star Rating: 92.8



About the Builder

Michael Trolle

Mike Trolle is managing member of Homes for Health and the Environment, LLC (HHE), founded in 1998. This past summer, HHE became the first builder in Connecticut to complete an American Lung Association Health House, which also earned Energy Star designation. The current interest in indoor air quality issues led to five newspaper articles on the house, including a half page article in The New York Times, as well as two television news spots.

Trolle has a BA in geography, an MA in literature, an advanced business certificate from the University of Connecticut's MBA program, and is a licensed real estate broker. His previous work experiences include teacher of English and commercial real estate leasing. He began studying residential building science in 1998 by surfing the "net" to find out how to turn his interest in sustainable residential design, development, and construction into a career. This led him to design/build courses at Yestermorrow in Vermont, and to building conferences, including Affordable Comfort, NAHB's Green Building Conference, NESEA and EEBA, at which he was able to learn the fundamental concepts of residential building science and network with others in the field.