



## Builders Challenge

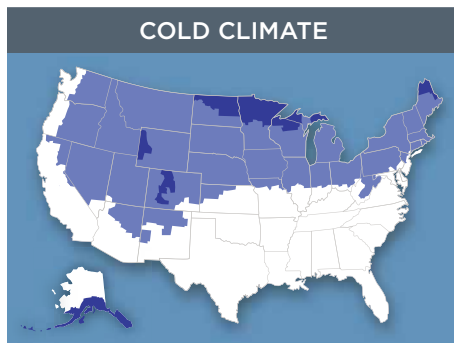
Recognizing Energy Leadership in Homebuilding

## High Performance Builder Spotlight

# Cobblestone Homes

Saginaw, Michigan

Cobblestone Homes of Freeland, Michigan, achieved a HERS index of 37 without photovoltaics or -4 with PV on this Builders Challenge -certified home in Bay City, Michigan.



### BUILDER PROFILE

**Builder:** Cobblestone Homes, LLC  
Freeland, Michigan  
[www.cobblestonelifestyle.com](http://www.cobblestonelifestyle.com)  
Melissa Wahl, Vice President  
989-692-0140, [info@cobblestonelifestyle.com](mailto:info@cobblestonelifestyle.com)

**Year founded:** 2001

**Homes Built:** 40 in 2009, average 28/yr

**Average Price:** \$180-240,000

**This Home:** The Vision Zero, completed June 2010, 3,504 sq. ft., 1 story plus basement, \$151/sq. ft.

Cobblestone Homes' quest to understand building science led to construction in 2010 of the "Vision Zero Project," a demonstration home that has earned a DOE Builders Challenge certification and achieved a HERS index of -4 with photovoltaics and 37 without PV. Built as a learning project for Cobblestone Homes, the 3,504-ft<sup>2</sup> home located in Bay City, Michigan, also serves as showcase for energy efficiency. Cobblestone Homes has committed to keeping the Vision Zero Home open for a year for public tours and seminars for builders associations, realtors, and colleges. Over 60 educational displays have been set up throughout the home. "Essentially, the home is a living building science museum," said Melissa Wahl, vice president for Cobblestone Homes.

For wall insulation, on the north, east, and south walls of the home Cobblestone used two 1-inch layers of styrofoam with tongue and groove joints that are staggered and taped at the seams over OSB. To demonstrate a different technique, on the west wall of the home, 1 inch of structural insulated sheathing is applied without OSB. Wall cavities are filled with 5 inches of sprayed urethane foam for an R-30 insulation value. The rim joists are also filled with urethane spray foam. In the attic, 2 inches of urethane foam is sprayed over the ceiling deck and topped with 14 inches of blown cellulose for a combined R value of R-62. The poured concrete basement walls are insulated inside with 1.5 inches of Dow Chemical Thermax and outside with 2 inches of Dow Chemical Perimate and waterproofing. The rigid foam is taped at the seams and serves as an air and vapor barrier. Air sealing is further enhanced by gluing drywall to framing, foaming around door and window frames, gluing and nailing the subfloor to floor trusses, and gasket sealing electrical boxes.

A ground-source heat pump located in the conditioned basement provides heating and cooling. A desuperheater on the ground-source heat pump preheats domestic hot water. The water is further heated by a solar thermal water heater and stored in a 50-gallon holding tank that has an electric backup heater if needed. Cobblestone chose to install both the desuperheater and the solar thermal system to try out both technologies in this demonstration home; in a typical application the two would not be installed together.

An energy recovery ventilator provides conditioned ventilation. ENERGY STAR appliances and lighting, including 11 LED fixtures, add to the energy savings.

Cobblestone Homes develops a detailed construction schedule to assist in quality control and sequencing on all its projects. The schedule is available to all team members via a secure website. Cobblestone Homes schedules inspections after installation, of the foundation, framing, insulation, and trim, and at punch-out. Blower door tests are used along with thermal imaging and smoke pencils to check for air leaks during construction and after drywalling.

“Building energy efficiently has played an integral role in the growth of the company annually despite the economic downturn. Building homes that are energy efficient and durable has allowed us to build a strong reputation for innovation, integrity, and quality. Homeowners tell us they are even more pleased with their homes after moving in. Warranty issues after the sale are very limited,” said Melissa Wahl, vice president for Cobblestone Homes.



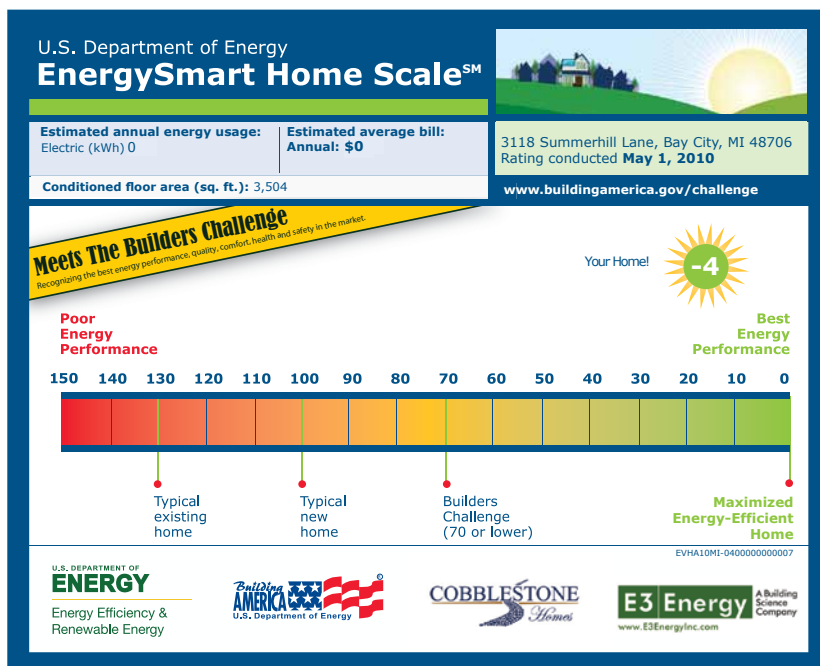
Cobblestone chose a solar photovoltaic product that integrates into the roof providing weather protection like asphalt shingles, while producing electricity.

**Key Features**

- **HERS Score:** 37 without PV, -4 with PV
- **HVAC:** Ground-source heat pump, in conditioned space, manual D duct design
- **Duct Leakage:** 5 cfm at 25 Pascals
- **Blower Door Test:** 288 cfm at 50 Pascals
- **Ventilation:** ERV
- **Walls:** 1-inch styrofoam over OSB on N, E, S walls; 1-inch structural insulated sheathing on W wall; taped seams; 5 inches (R-30) sprayed urethane foam in cavity
- **Attic:** 2 inches of spray urethane foam on ceiling deck plus 14 inches of blown cellulose for R-62, vented attic
- **Rim Joists:** 5 inches sprayed urethane foam inside, 2 inches rigid foam outside for R-40.5 total
- **Basement:** Poured concrete wall with 2 inches XPS on outside, coated with waterproofing; and 1.5-inch rigid foam on inside for R-20 total foundation wall. Two 1-inch layers of rigid foam under slab
- **Windows:** ENERGY STAR, U=20, SHGC=0 on south, SHGC=0.20 on N, E, W
- **Appliances:** ENERGY STAR refrigerator, clothes washer, dishwasher
- **Lighting:** All energy efficient, 11 LEDs
- **Solar:** 12-kW PV roof shingles
- **Water Heating:** Desuperheater on ground-source heat pump plus solar thermal, and electric backup

**U.S. Department of Energy Builders Challenge**

DOE seeks to give every consumer the opportunity to buy a cost-neutral, net-zero energy home anywhere in the U.S. by 2030. Homes that qualify for this Builders Challenge must achieve a 70 or less on the EnergySmart Home Scale (E-Scale) which is based on the Home Energy Rating System (HERS) index (www.natresnet.org). The E-Scale allows homebuyers to understand—at a glance—how the energy performance of a particular home compares with others.



To learn more about the Builders Challenge and find tools to help market your homes, visit [www.buildingamerica.gov/challenge](http://www.buildingamerica.gov/challenge).