



Builders Challenge

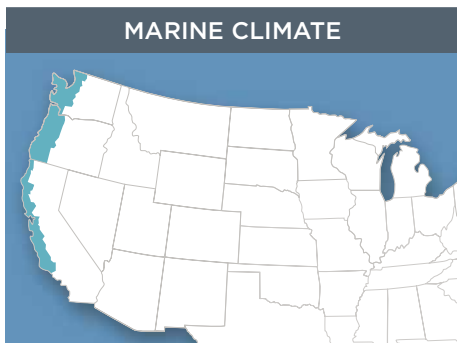
Recognizing Energy Leadership in Homebuilding

High Performance Builder Spotlight

Scott Homes Inc

Olympia, WA

Scott Homes worked with DOE Building America research partner Washington State University Extension Energy Program on this home in Olympia, Washington, that achieved a HERS index score of 51.



BUILDER PROFILE

Scott Homes Inc.

Scott Bergford, Olympia WA
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Business Started: 1984, 10 homes per year

This House: 2,265 sq. ft. 1 story, includes apartment; \$122/sq. ft.; under \$300,000

Completion Date: May 2010

Energy-Efficiency Commitment: All Builders Challenge, all Northwest ENERGY STAR, all NAHB Emerald Green, All Built Green 5 star



A highly insulated building envelope combined with super-efficient equipment inside helped custom home builder Scott Bergford score a low 51 on the HERS index for his newest home in Olympia, Washington. Bergford worked with U.S. Department of Energy Building America research partner Washington State University Extension Energy Program to find ways to cut energy usage on the 2,265 ft² home, which was completed in May 2010.

The home's snug shell includes 6.5-inch-thick SIPs walls sealed at all joints and around door and window frames with caulk and foam. For design reasons, trusses were used on the roof instead of SIPS, but to maintain the airtight envelope, 3 inches of closed-cell spray foam was sprayed over the ceiling deck, then covered with 16 inches of blown cellulose to provide an insulation value of R-50 total.

Inside the home, the heating system is radiant floor heating laid in the home's slab foundation, with the fluid heated by a ground source heat pump, which also provides domestic hot water with an efficiency factor of 3.3 to 1 (i.e., for every \$1 of electricity the heat pump uses it produces \$3.30 worth of heat). The builder took advantage of passive solar heating by placing most of the home's windows on the long, south-facing side of the home allowing the low winter sun to heat the thick concrete thermal mass floors. Strategically placed porches and eaves block high summer rays and the home's thick insulation helps keep indoor temperatures cool in summer without air conditioning.

A cost-effective, energy-efficient exhaust fan runs continuously to provide code-required ventilation. ENERGY STAR appliances and 75% CFL lighting add to the energy performance.

As an extra precaution in the Northwest's often damp construction season, Bergford hires a contractor with a large portable dehumidifier to dry out the house after framing and before drywalling. A blower door test and thermal imaging evaluation are also done at this stage. On this home, final results showed 2.4 air changes per hour at 50 Pascals.

“We were awarded builder of the year in 2009 (from NAHB’s EVHA program) for a house constructed three years ago, but because of our partnership with Building America and WSU to constantly improve our building system efficiencies, the houses we are building today (just three years later) are even more efficient than that house,” said Bergford.

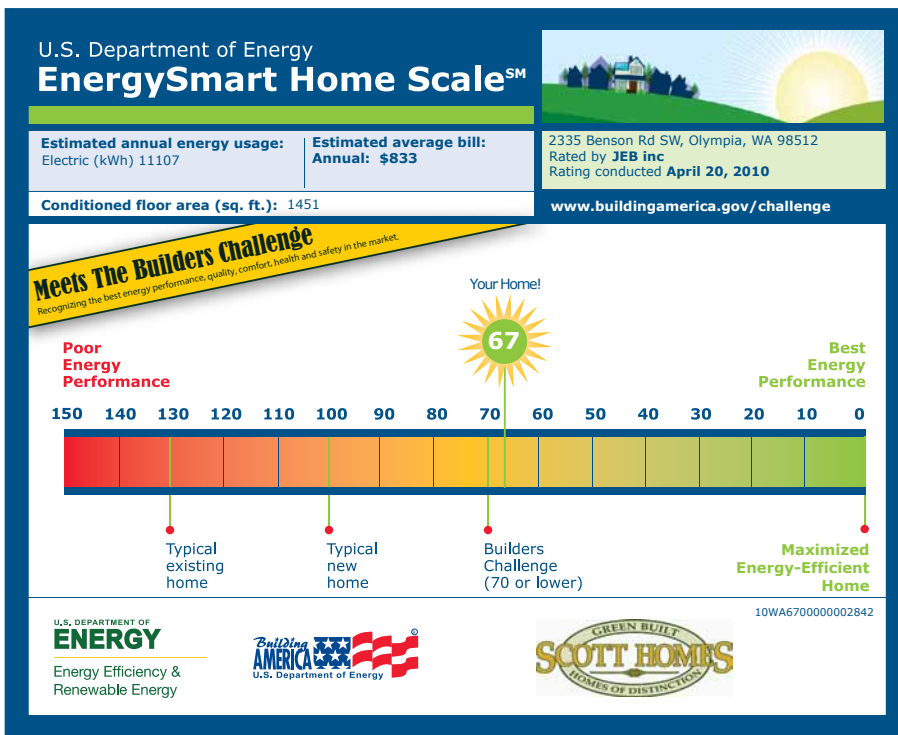
Bergford’s commitment to continuous improvement includes third-party testing all of their houses with staff onsite during testing to learn what can be improved in the next home. Bergford’s production team meets weekly to discuss problem areas and ways to improve. Staff attend three or four energy-efficiency conferences each year and Bergford pays to send both his construction supervisors and subcontractors to local ENERGY STAR and building association classes.



SIPS walls and a foam-sealed attic provide a tight thermal shell, while a ground source heat pump provides energy-efficient radiant floor heat and domestic hot water.

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.

Key Features

- **HERS Index:** 51
- **Foundation:** R-10 rigid foam insulated slab
- **Wall Construction:** Structural Insulated Panels, Tyvek house wrap
- **Wall Insulation:** R-28.5 (SIPs)
- **Ceiling Insulation:** 16 inches blown cellulose over 3 in. of closed-cell spray foam for R-50
- **Windows:** Low-e, gas-filled vinyl; U=0.28 and U=0.30: SHGC=0.30
- **HVAC:** 3.3 COP ground-source heat pump with in-floor hydronic radiant distribution; No cooling or mechanical ventilation
- **Water Heating:** 3.3 COP ground source heat pump with 60-gallon storage tank; PEX manifold delivery
- **Ventilation:** 2-speed, 70 cfm fan
- **Lighting:** 10% ENERGY STAR-rated fixtures; 75% CFLs
- **Appliances:** ENERGY STAR refrigerator, dishwasher, and clothes washer
- **Duct Leakage Test:** N/A
- **Blower Door Test:** 770 cfm @ 50 Pa (2.4 ACH @ 50 Pa)
- **Energy/Green Building Programs:** Builders Challenge; Building America partner; ENERGY STAR; Olympia Master Builders, Built Green