



## Builders Challenge

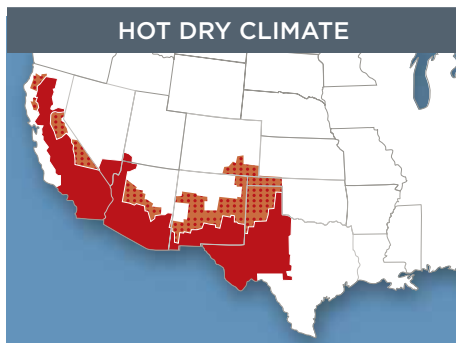
Recognizing Energy Leadership in Homebuilding

## High Performance Builder Spotlight

# Ferrier Custom Homes

Fort Worth, Texas

Reclaimed exterior 85-year-old barn siding camouflages 21<sup>st</sup> century building science technologies like structural insulated panel walls and a high-performance SEER-18 heat pump in this zero-energy DOE Builders Challenge-certified home by Ferrier Custom Homes in Fort Worth, Texas.



### BUILDER PROFILE

#### Ferrier Custom Homes

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**Year Founded:** 1980

**Number of Homes Built:** Average 4 homes per year

**This Home:** The Zero Energy Casita, 1,015 sq. ft., completed 4-26-10

Ferrier Custom Homes' "Zero-Energy Casita" in Fort Worth, Texas, packs a whole lot of building science know-how into its compact 1,015-ft<sup>2</sup> frame. Like all of Ferrier's homes since 2008, it meets the strict energy-efficiency requirements of the U.S. Department of Energy's Builders Challenge. The home scores a 30 on the Home Energy Rating System (HERS) index. It also meets the requirements of ENERGY STAR for Homes, LEED for Homes, Green Built Texas, and the National Association of Home Builders Green Standard.

### Energy Efficiency Measures

To meet the energy-efficiency requirements of these programs, Ferrier uses structural insulated panels (SIPS) for walls and roofs. On this home, Ferrier used 10.25-inch R-50 SIPS on the roof under a standing seam metal reflective roof and 6.5-inch R-30 SIPS on the walls properly sealed at all seams and covered with a layer of house wrap plus a layer of drain wrap for an air-tight, high-thermal-performance shell. Because the home is so airtight (it tested at 2 air changes per hour at 50 Pascals), an energy recovery ventilator (ERV) is incorporated into the air conditioning system to bring in fresh air, which is filtered with a MERV-13 HEPA filter and tempered by the ERV's heat exchanger.

The SIPS roof provides an insulated attic to house the 9-EF, 18-SEER air source heat pump and ducts. An electric tankless water heater is located within 14 feet of all hot water faucets to provide hot water via a loop manifold and PEX pipes that are insulated under the slab.

To ensure follow-through on its energy-efficient designs, Ferrier screens and trains its subcontractors. Superintendents are trained personally by Don Ferrier and participate in national education programs as well as local training events, many hosted by Ferrier. Don is himself a local and national trainer and speaker on building energy efficiency. Superintendents conduct daily walkthroughs of the site as well as numerous specific inspections to ensure that HVAC, ducts, house wrap, SIPS, windows, air sealing, and other details are installed correctly.

Following the motto "a passive home requires an active homeowner," Ferrier provides its homeowners with a comprehensive owner's manual describing the operation of the home's appliances and HVAC equipment, even including

a schedule for cleaning the ERV filter and a starter kit of non-toxic cleaning products. Rebate and tax credit forms are also included.

The Zero Energy Casita earned a \$2,000 tax credit for siting a 3.7-kW wind turbine on the property. Landscape practices like retaining and planting native species, recycling 80% of construction debris, collecting rainwater, and mulching with shredded lumber waste helped Ferrier earn green certifications.

**Bottom Line**

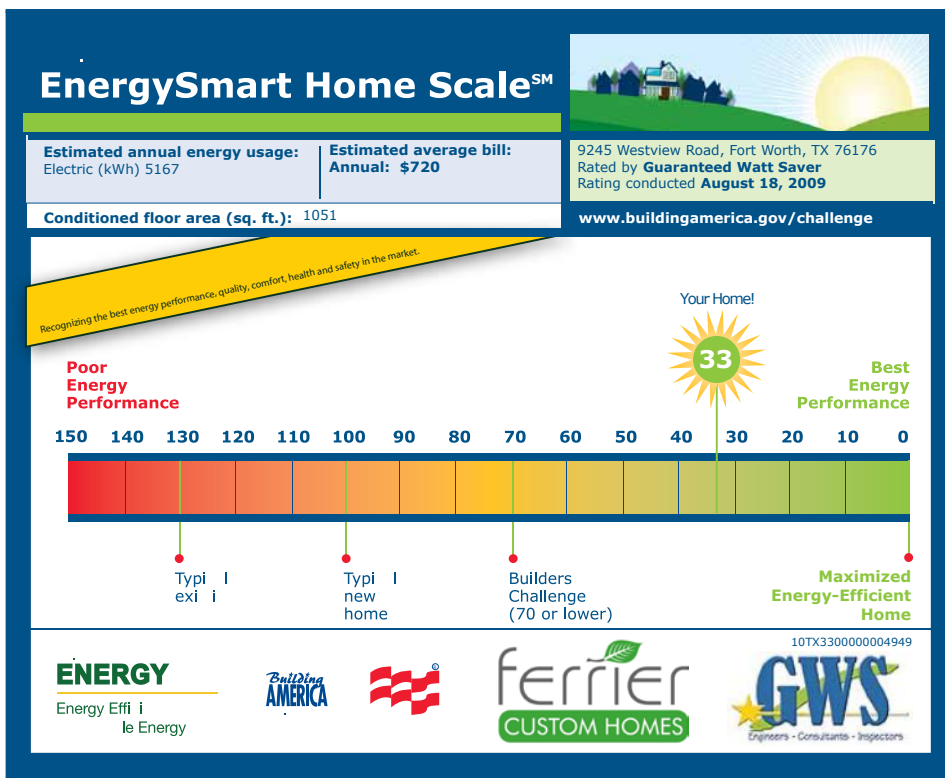
“Extreme energy efficiency is not a sideline for us—it is all we do,” said Heather Ferrier, general manager of Ferrier Custom Homes.



The home is designed to take advantage of passive cooling and heating.

**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](http://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).

**Key Features**

- **HERS Score:** 30
- **HVAC:** Air source heat pump 9 EF, 18 SEER
- **Ducts:** R-4 insulated 100% in conditioned space
- **Ventilation Type:** ERV with MERV 13 filter
- **Air Sealing Details:** SIP walls and roof sealed at all joints, at sill around windows and doors, at holes in envelope
- **Walls:** R-30 SIPS, house wrap plus drain wrap
- **Foundation:** 6-mil polyethylene under slab, over dirt
- **Roof:** R-50 SIPS with reflective metal roof
- **Windows:** Wood-framed, low-E, gas-filled, U=0.29, SHGC=0.19
- **Appliances:** ENERGY STAR refrigerator and dishwasher
- **Lighting:** 24 CFL and 2 LED out of 26 fixtures = 100% energy-efficient lighting
- **Blower Door Test:** 581 cfm at 50 Pa (or 2.12 ACH at 50 Pa)
- **Renewable Energy:** A 3.7-kWh wind turbine
- **Water Heater:** Tankless electric
- **Other Sustainable Features:** Programmable thermostat, lighting controls, PEX manifold plumbing, passive solar design