



## Building America Case Study Efficient Solutions for New Homes

# Attention to Details in High-Performance Homes

Leland, North Carolina

### PROJECT INFORMATION

Construction: New

Type: Single-family

Partners:

Pacific Northwest National Laboratory  
[www.pnnl.gov](http://www.pnnl.gov)

Energy Smart Home Plans  
<http://www.energysmarthomeplans.com/>

Florida H.E.R.O.  
<http://www.floridahero.com/>

Builder: Heritage Buildings, Inc.

Size: 2,396 ft<sup>2</sup>

Date Completed: 2011

Climate Zone: Hot-Humid

### PERFORMANCE DATA

Projected annual energy cost:

Heritage Home: \$1,465  
2009 IECC: \$2,308

Incremental cost of energy-efficiency  
measures: \$5,000

Incremental annual mortgage  
(30-year, 7% interest): \$350

Annual cash flow: \$396

## North Carolina Builder Gets Serious About High-Performance

Building America partners Pacific Northwest National Laboratory, Energy Smart Home Plans and Florida H.E.R.O. recently worked with North Carolina-based builder Heritage Buildings, Inc., to make the conversion to high-performance building in the hot-humid regions of the Atlantic seaboard. Searching for new marketing opportunities, Heritage purchased a home plan from ESHP and built a home achieving 56 on the HERS Index with only minor additional costs, despite having little on-site technical assistance.

The result was so successful that Heritage now offers high-performance upgrades to its clients on a regular basis, for \$5,000 per home. These additional energy efficiency measures will also result in significant savings on energy costs. For example, compared to a neighboring home that is representative of a home built to the 2009 International Energy Conservation Code (IECC), which North Carolina recently adopted as a basis for its state residential energy code, the Heritage home is projected to save \$843 annually in energy bills. A North Carolina

	Heritage	Neighbor
HERS	56	86
Size [ft <sup>2</sup> ]	2,396	2,780
Building Leakage [ACH50]	3.41	5.38
Duct leakage [CFM25 out]	46	157
Heat pump	16 SEER/9 HSPF	13 SEER/7.7 HSPF
Water heater	Tankless propane (0.82 EF)	50 gallon electric (0.9 EF)
Attic insulation	R-38 w/ radiant barrier	R-30
Wall insulation	R-15	R-13
Ventilation	Balanced	None
Windows	Low-E 0.32/0.33	Low-E 0.35/0.35

## High-Performance Appearance:

### Fact or Fiction?

Below are pictures of neighboring homes. The upper has standard features (HERS 86), the home in bottom photo has high-performance options (HERS 56).



In addition to being energy efficient, high performance homes are more durable and comfortable than conventional homes. Customer satisfaction is important for generating sales leads and understanding the cost of home ownership is important to sales.

code-built home typically results in homes achieving HERS Index levels around 85.

Many of the high-performance improvements did not come with significant additional costs, but did require more attention to detail. For example, following ENERGY STAR's Thermal Bypass Checklist. To make sure air sealing details were not overlooked in the field, Heritage builder Vic Sikka routinely returned to the construction site to personally seal any holes created by electrical and plumbing installations.

Marketing high-performance homes involves helping buyers understand the value of energy efficiency. Heritage Buildings found that understanding the total cost of home ownership was important to selling the value of high-performance improvements.

## Lessons Learned

- Low utility bills and great customer satisfaction can help builders differentiate their product in the market.
- This builder found that following the EPA Thermal Bypass Checklist was a low-cost way of improving the thermal envelope and reducing energy costs.
- Attention to details, such as filling holes left by electrical teams, is key to any high-performance effort. This, along with other high performance measures, will save homeowners in a high performance Heritage home \$396 a year over a 30-year mortgage.



Many high performance improvements require attention to detail rather than a large investment. Electrical and plumbing holes were carefully sealed. Sill plate gasketing was used to seal sheetrock to the top plate. This is one of many low-cost improvements listed on the ENERGY STAR Thermal Bypass Checklist.

"The builder's commitment to improving their product is seen in the results they achieve."

*Vic Sikka, President  
Heritage Buildings, Inc.*