



## Building America Case Study Whole-House Solutions for New Homes

# Insight Homes

Deep Creek | Seaford, Delaware

### PROJECT INFORMATION

**Construction:** New home

**Type:** Single-family

**Builder:** Insight Homes, Rob Lisle  
(302) 337-0400  
[www.itsjustabetterhouse.com](http://www.itsjustabetterhouse.com)

**Size:** 1,400 to 3,300 ft<sup>2</sup>

**Price Range:** \$220,000 to \$280,000

**Date Completed:** 2011

**Climate Zone:** Mixed-humid

**Team:** IBACOS

### PERFORMANCE DATA

**HERS Index:** 49-56

**Projected annual energy  
cost savings:** \$1,405

**Incremental cost of energy-  
efficiency measures:** \$7,660

**Annual mortgage  
payment increase:** \$612

**Annual net cash flow  
to homeowner:** \$793

**Billing data:** Average monthly power bill  
of \$92.68 for the years 2009 and 2010

Insight Homes of Bridgeville, Delaware, has worked with Building America's IBACOS team to refine its home designs to achieve HERS scores of 49 to 56 on 40 to 70 homes per year. For Insight Homes, energy efficiency sells. Marketing its homes exclusively based on energy efficiency, Insight Homes sold 38 homes in 2009, 54 in 2010, and 70 homes in 2011, and had a long backlog of orders for new homes in 2012.

As a builder in humid East Coast climates, Insight Homes pays particular attention to moisture management and ventilation issues. The poured concrete wall foundation is coated on the exterior with an asphalt-based moisture blocker. The interior conditioned crawlspace walls are lined with continuous R-10 extruded polystyrene rigid foam (XPS). The earthen floor of the crawlspace is covered in two layers of polyethylene sheeting, taped and sealed at all penetrations, and lapped up each wall and sealed with furring strips to ensure a moisture capillary break from the house.

The high-efficiency HVAC system includes a 96% AFUE two-stage propane-fired furnace and a 16 SEER air conditioner. The ducts are located in the sealed, conditioned crawlspace and consist of a sheet metal trunk and R-6 insulated flex duct branches. Two central returns in the main living space and door undercuts provide balanced house pressures. This tested duct system leaks less than 3% of its air with less than 1% leaked to outside the home. Finally, integrated bathroom exhaust fans are timer-operated to satisfy ASHRAE 62.2 ventilation requirements.

Insight achieves airtight construction and an improved thermal envelope with advanced 2x6 framing at 24-inches on center. Walls are insulated with dense-packed netted and blown-in fiberglass to R-23. The attic is insulated to R-38 with loose-blown fiberglass. Blower door tests show a maximum of 3.0 air changes per hour at 50 Pascals of pressure.

*(Photo top left)* Insight Homes successfully markets its homes based on energy efficiency and has increased sales every year since opening in 2009.

## KEY ENERGY-EFFICIENCY MEASURES

### HVAC:

- 96% AFUE two-stage propane-fired furnace
- 16 SEER split system AC unit
- Sheet metal trunk with R-6 insulated flex duct branches in sealed, insulated crawlspace
- Duct blaster test: 3% total leakage
- Ventilation: Integrated exhaust fans with run time to satisfy ASHRAE 62.2
- Kitchen and bath fans vented to outside

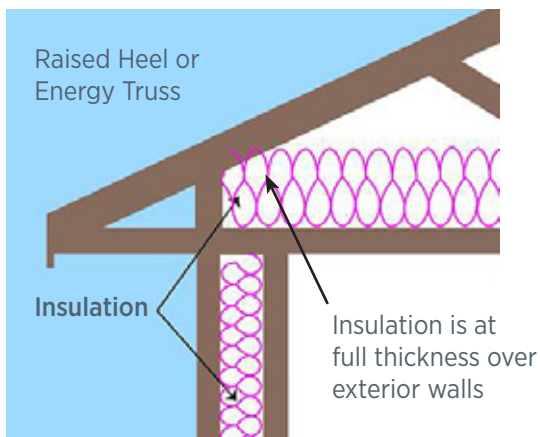
### Envelope:

- Advanced framing: 2x6, 24-inch on-center walls
- Wall insulation: R-23 dense-packed netted and blown-in fiberglass
- Windows: Vinyl-framed, double-glazed, low-e, argon-filled; U=0.26, SHGC=0.19
- Attic: R-38 loose-fill fiberglass
- Blower door test: 3.0 ACH50
- Unvented sealed crawlspace with R-10 XPS insulation continuous on the interior of the walls, and earthen floor covered in two layers of poly sheeting, taped and sealed at all penetrations and fastened to foundation walls with furring strips.

### Lighting, Appliances, and Water Heating:

- 100% CFL
- tankless water heater and central manifold plumbing distribution

For more information, please visit: [www.buildingamerica.gov](http://www.buildingamerica.gov)



Insight Homes are built with raised-heel energy trusses, which can accommodate a full 14 inches of insulation over the whole ceiling deck including the top plate, eliminating cold spots along the tops of outside walls.

## Lessons Learned

- Insight built 36 identical houses, three at a time, keeping a similar floor plan but experimenting with system combinations and energy-efficiency techniques to devise the best combination of measures while maintaining a sales price equal to comparably sized homes in Delaware.
- In addition to its conditioned crawlspaces, Insight employs several measures to keep water and moisture out of homes, including French drains, a whole-house dehumidifier, rain troughs built into the window sills, and flashing tape around windows.
- The company's owner, Rob Lisle, indirectly promotes his homes' energy efficiency through frequent speaking engagements at building conferences and a local weekly radio call-in show he hosts on green building.
- Insight continues to experiment to improve its energy performance. It is working with IBACOS on two side-by-side test houses—one with Insight's standard energy-efficiency features and the other with an advanced HVAC system that includes a super-efficient heat pump paired with a tankless water heater that can provide backup heating.

"Our company's mission is to develop systems and approaches that demonstrate to other builders how they can also build energy-efficient, healthy, and durable homes at cost-competitive prices."

*Rob Lisle, owner of Insight Homes*

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For more information, visit:  
[www.buildingamerica.gov](http://www.buildingamerica.gov)

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The U.S. Department of Energy's Building America program is engineering the American home for energy performance, durability, quality, affordability, and comfort.