

Habitat for Humanity South Sarasota County

Laurel Gardens
Nokomis, FL



BUILDER PROFILE

Habitat for Humanity
South Sarasota County Inc., Sarasota, FL
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FEATURED HOME/DEVELOPMENT:

Project Data:

- Name of Project: Laurel Gardens
- Location: Nokomis, FL
- Layout: 3 bedrooms, 2 baths, 1 floor
- Conditioned Space: 1,290 ft²
- Completion: May 2014
- Climate Zone: IECC 2A, hot-humid
- Category: Affordable

Modeled Performance Data:

- HERS Index: without PV 51
- Projected Total Annual Energy Cost Savings: \$613
- Projected Annual Utility Costs: without PV \$862
- Annual PV Production Revenue: \$1,284
- Annual Energy Savings: without PV 5,110 kWh

Like all Habitat for Humanity affiliates, the South Sarasota County, Florida, Habitat promises its families “affordable, safe, and decent housing” and that’s what the six families who signed up for housing at the affiliate’s new Laurel Gardens expected. They got more than they bargained for. Every home has been certified as a U.S. Department of Energy Zero Energy Ready Home. That means every home qualifies for ENERGY STAR Certified Homes Version 3.0, meets the U.S. Environmental Protection Agency’s Indoor airPLUS criteria, meets the hot water distribution requirements of the EPA WaterSense program, and meets DOE’s strict energy efficiency and zero energy readiness requirements.

The South Sarasota County Habitat affiliate participates in Florida’s water efficiency WaterStar program and goes beyond ENERGY STAR 3.0 requiring builders to certify their homes to ENERGY STAR Certified Homes Version 3.1. In addition, the affiliate has committed to meeting the platinum level of the Florida Green Building Coalition’s Green Building Standard, which is equal to or better than LEED or the National Association of Home Builders’ (NAHB) Green Building Standard. The landscaping around the six-home cluster known as Laurel Gardens was designed using the University of Florida’s Florida Friendly Landscape (FFL) standard, which specifies drought-tolerant, heat-tolerant plant and turf that are native rather than exotic species.

“These are probably the most durable, sustainable energy-efficient homes we’ve ever built,” said Michael Sollitto, South Sarasota Habitat’s Director of Construction.

Sollitto is a big proponent of green and energy-efficient construction programs like DOE’s Zero Energy Ready Home program because it improves the energy savings and also sets a high bar for construction quality. “It just makes sense for affordable houses. We don’t want families having to worry about a lot of maintenance because shoddy work was done in construction,” said Sollitto.



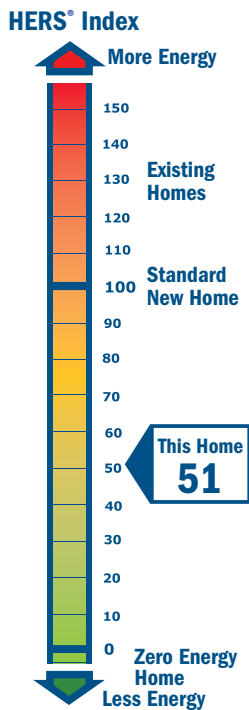
The U.S. Department of Energy invites home builders across the country to meet the extraordinary levels of excellence and quality specified in DOE’s Zero Energy Ready Home program (formerly known as Challenge Home). Every DOE Zero Energy Ready Home starts with ENERGY STAR Certified Homes Version 3.0 for an energy-efficient home built on a solid foundation of building science research. Advanced technologies are designed in to give you superior construction, durability, and comfort; healthy indoor air; high-performance HVAC, lighting, and appliances; and solar-ready components for low or no utility bills in a quality home that will last for generations to come.

A 5.5-inch-thick layer of open-cell spray foam coats the inside of the attic ceiling, providing an R-20-insulated, cool, conditioned space for the home's high-efficiency SEER 15 heat pumps. Most of the framing is borate-treated wood, which resists termites and mold.



What makes a home a DOE ZERO ENERGY READY HOME?

- 1 **BASELINE**
ENERGY STAR Certified Homes Version 3.0
- 2 **ENVELOPE**
meets or exceeds 2012 IECC levels
- 3 **DUCT SYSTEM**
located within the home's thermal boundary
- 4 **WATER EFFICIENCY**
meets or exceeds the EPA WaterSense Section 3.3 specs
- 5 **LIGHTING AND APPLIANCES**
ENERGY STAR qualified
- 6 **INDOOR AIR QUALITY**
meets or exceeds the EPA Indoor airPLUS Verification Checklist
- 7 **RENEWABLE READY**
meets EPA Renewable Energy-Ready Home.



The Habitat affiliate builds about 10 new homes each year and occasionally renovates homes as well. Its construction practices have increasingly focused on energy efficiency, said Sollitto, who left custom home construction to join the affiliate. The six homes in the Habitat affiliate's Laurel Gardens project all scored in the low 50s on the Home Energy Rating System (HERS) score. A typical code-built home would score a HERS 80 and most existing homes average HERS 120 or higher. In keeping with DOE's Zero Energy Ready Home program criteria, conduit and extra electrical panel space have been installed so that solar photovoltaic panels and solar water heating can be added in the future. With the addition of 2 kW of PV panels, the homes could achieve true zero energy status, meaning they would produce at least as much power in a year as they consume.

The Habitat affiliate has demonstrated that these remarkable levels of achievement are possible with very reasonable measures which, according to Sollitto, don't increase the construction cost more than \$1,500 per home over a home built to ENERGY STAR Certified Home Version 3.1 standards. "The Zero Energy Ready Home program allowed us to look at some of the methods we were already employing to build efficient homes and showed us how to maximize those systems for increased efficiency," said Sollitto.

Sollitto starts with concrete block walls and a slab-on-grade foundation, which is a common construction type in Florida. Local code requires that the concrete slab be raised 8 inches above grade and the garage is set 4 inches down from that.

Sollitto fills the open cells in the concrete block with a two-part foam product that hardens as it dries to provide insulation and sound proofing within the wall. On the inside of the wall he installs a 3/4 inch layer of rigid expanded polystyrene (EPS) foam board. Over that is installed 3/4 inch furring strips, then a layer of corrugated-paper-backed, perforated foil insulation with the foil facing toward the air space made by the furring strips. Over this is attached drywall. Most of the home's exterior cladding is stucco. In the small sections at the front of the home where fiber cement lap siding is used as an architectural element, the affiliate applies a water proofing paint-on product to the concrete block, then attaches the fiber cement siding.

On the roof, a secondary water barrier of peel and stick membrane is attached to the entire plywood roof decking. This is covered with ENERGY STAR-rated reflective shingles in a light grey color.



One-fourth of the homes' lighting fixtures are LED-based; the remaining lights are compact fluorescent. ENERGY STAR dishwashers and refrigerators further reduce energy use. Each home has five ENERGY STAR-rated ceiling fans to help reduce the need for air conditioning.

The Habitat affiliate sprayed 5.5 inches (R-20 worth) of open-cell foam along the underside of the roof to insulate and air seal the attics, providing a conditioned space for the HVAC equipment that protects the air handler and ducts from Florida's intense sun and humidity. Local code does not require a firebreak (thermal barrier of drywall or intumescent paint) over the spray foam when it is installed in the attic as long as it's not used for storage. Over the soffits, which are not vented, plywood is attached then covered with wire lathe and stucco.

The homes' higher efficiency model SEER 15 heat pumps and R-6 insulated flex ducts are located in the conditioned attics. Fresh air intakes with mechanical dampers bring in filtered outside air to provide fresh air to the homes, which are tightly air sealed. (Airtightness is measured at 2.8 air changes per hour at 50 Pascals.) An electronic controller on the damper and air handler fan brings the fan on for several minutes every hour to cycle fresh air through the home even if the thermostat does not call for heating and cooling. In addition, the bathrooms have timer-controlled exhaust fans and the garage is equipped with an exhaust fan with an occupancy sensor.

There are only 10 windows in each home. The Habitat affiliate purchases them locally at a very good price. The vinyl-framed, thermally insulated, dual-pane windows have impact-resistant glass, low-emissivity coatings, a U factor of 0.32, and a solar heat gain coefficient of 0.22.

Each home is equipped with high-efficiency lighting including 25% LED and 75% CFL fixtures. Each home also has five ENERGY STAR-rated ceiling fans.

ENERGY STAR refrigerators and dishwashers are included in every Laurel Gardens home. All of the homes' plumbing fixtures are low flow and EPA WaterSense-rated, which is a DOE Zero Energy Ready Home requirement.

The Habitat affiliate selected a hip roof design for the homes. This design is more resistant to hurricane forces than a roof with gable ends and, in fact, homeowners get a discount on their insurance because of it. The affiliate uses borate-treated lumber in parts of the home and hurricane strapping is installed as required by local code.

HOME CERTIFICATIONS

DOE Zero Energy Ready Home Program

ENERGY STAR Certified Homes
Version 3.1

EPA Indoor airPLUS

Florida Green Building Coalition, Green
Building Standard, platinum

Florida Water Star

University of Florida Institute of Food
and Agricultural Sciences Florida
Friendly Landscaping



Every DOE Zero Energy Ready Home combines a building science baseline specified by ENERGY STAR Certified Homes with advanced technologies and practices from DOE's Building America research program.



A heat pump water heater provides hot water to the homes' plumbing fixtures, which all meet the U.S. EPA WaterSense or Florida Water Star Standard criteria.

To make sure that construction crews and volunteers are well informed during builds, the affiliate holds weekly meetings for the construction supervisors and uses comprehensive building plans with clear checklists. Homeowners participate in the construction of their own and other Habitat homes, providing 300 hours of sweat-equity as part of the purchase. The homebuyers are also required to go through a new homeowner training program that includes information about the energy-efficiency features in the homes.

According to Sollitto, participating in the DOE Zero Energy Ready Home program makes sense on many levels. "We measured the costs against the benefits of building energy-efficient, durable, sustainable homes. Most of the grant programs we work with require ENERGY STAR certification. We realized we were already doing a lot of this, so let's see how we can improve an already great product and get recognized for it. By building these efficient, affordable homes, we are able to qualify for more grant programs that allow us to help more people in the community and build more homes," said Sollitto.

"Most builders think it costs too much or it's too difficult to achieve. It's not. Habitat affiliates throughout Florida have embraced the idea that affordability is directly linked to efficiency. Our building program has come a long way to provide some of the most durable and efficient homes available for new homeowners. If Habitat can do it, so can the rest of the industry," said Sollitto.

Sollitto is a former custom home builder and shares this advice with other custom home builders. "If you want to be a step above the crowd, if you want to be known as the builder who is providing a better product for your homeowners and for the community, you need to be involved in the DOE Zero Energy Ready Home program. If Habitat can do it for under \$100,000, imagine what a builder could do with a half-million dollar home."

Photos courtesy of Habitat for Humanity South Sarasota County, Inc.

KEY FEATURES

- **DOE Zero Energy Ready Home Path:** Performance
- **Walls:** CMU foam-filled concrete block; exterior stucco; interior ¾ in. rigid EPS foam; ¾ in. furring strips; foil-faced paper-backed corrugated insulation with foil facing air gap; drywall; total wall R-15 to R-17
- **Roof:** Sealed attic insulated under roof deck with R-20 open-cell spray foam; hip roof design; ENERGY STAR reflective asphalt shingles
- **Foundation:** Slab on grade raised 8-in. above grade
- **Windows:** 2-pane, thermal insulated, vinyl-framed with foam filling; low-e, impact-resistant windows with U=0.32 and SHGC=0.22
- **Air Sealing:** 2.8 ACH 50
- **Ventilation:** Meets ASHRAE 62.2; fresh air intake; controller operated damper and air handler fan for hourly ventilation; timed exhaust fans in bathrooms
- **HVAC:** 1.5-ton heat pump; HSPF 8.4, 15 SEER
- **Hot Water:** Air-source heat-pump water heater in garage; EF 2.40
- **Lighting:** 25% LED; 75% CFL; 5 ENERGY STAR ceiling fans
- **Appliances:** ENERGY STAR refrigerator and dishwasher
- **Solar:** None installed; solar ready for up to a 2-kW PV system
- **Water Conservation:** EPA WaterSense faucets, showerhead, toilets
- **Other Features:** Meets UF/IFAS Florida Friendly Landscape (FFL) standard; jobsite waste is 100% recycled