

# Habitat for Humanity South Sarasota County

Laurel Gardens #794  
Nokomis, FL



## BUILDER PROFILE

Habitat for Humanity South Sarasota County  
Venice, FL  
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## FEATURED HOME/DEVELOPMENT:

### Project Data:

- Name: Laurel Gardens #794
- Location: Nokomis, FL
- Layout: 3 bedrooms, 2 baths, 1 floor
- Conditioned Space: 1,290 ft<sup>2</sup>
- Climate Zone: IECC 2A, hot-humid
- Completion: March 2015
- Category: Affordable

### Modeled Performance Data:

- HERS Index: without PV 51
- Projected Annual Utility Costs: without PV \$863
- Projected Annual Energy Cost Savings (compared to a home built to the 2009 IECC): without PV \$615
- Builder's Added Cost Over 2009 IECC: without PV \$1,800
- Annual Energy Savings: 5,128 kWh

Low-income Americans face a disproportionate energy burden, spending more than 15%, and as much as 50%, of their incomes on energy while other U.S. households average just 4%, said Michael Sollitto, Habitat for Humanity South Sarasota County's Director of Construction. "These families are the ones who could benefit the most from home energy upgrades but they are the least able to afford them."

The Venice, Florida, based Habitat affiliate is working to change that. The affiliate is now constructing all of its homes to the high energy efficiency and durability levels of the U.S. Department of Energy's Zero Energy Ready Home program.

"For low-income families seeking a way out of the burden of poorly constructed housing with high rent and unaffordable energy bills, the energy savings and durability that the DOE program offers are so important. Energy-efficient construction offers untold potential for energy savings, improvements in health and safety, long-term affordability, and lower maintenance. The money saved by our home owners can be better used to improve the lives of their children and themselves," said Sollitto.

The South Sarasota Habitat affiliate has constructed 15 DOE Zero Energy Ready labeled homes to date. The simple, one-level, three-bedroom, two-bath, 1,200-ft<sup>2</sup> homes are true to Habitat's mission to provide safe, decent, and affordable homes to those in need but they go even further by providing home owners with low energy bills for the long term. The award-winning home this year, located on Dedication Court in Laurel Gardens, is expected to cost its owners about \$860 per year in energy bills, or roughly \$72 per month.



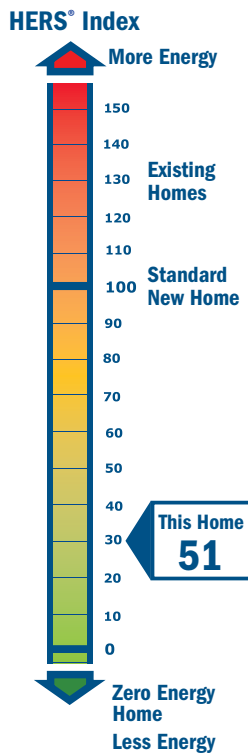
The U.S. Department of Energy invites home builders across the country to meet the extraordinary levels of excellence and quality specified in DOE's Zero Energy Ready Home program (formerly known as Challenge Home). Every DOE Zero Energy Ready Home starts with ENERGY STAR Certified Homes Version 3.0 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.

Habitat for Humanity South Sarasota County built this 1,270-ft<sup>2</sup> home in Venice, Florida, to the high energy efficiency and durability levels required by the U.S. Department of Energy's Zero Energy Ready Home program. The home is constructed of concrete blocks that are filled with two-part foam for added insulation value.



### 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 home achieves this by meeting the construction requirements of the DOE Zero Energy Ready Home program. Every home is certified to ENERGY STAR Certified Homes Version 3.0 and the U.S. Environmental Protection Agency's Indoor airPLUS. Each home meets the hot water distribution requirements of the EPA's WaterSense program and the insulation requirements of the 2012 International Energy Conservation Code. In addition, homes are required to have solar electric panels installed or have the conduit and electrical panel space in place for it.

“Our affiliate has totally embraced the concept of building homes better than code and employing energy-efficient and green building techniques,” said Sollitto.

The home has a slab-on-grade foundation with proper grading of the site to allow for drainage away from the structure. The concrete slab is raised 8 inches above grade per local code requirements. Gutters, downspouts, and rain barrels keep rainwater from pooling around the foundation.

The Habitat affiliate chose a common central Florida construction type—concrete masonry block walls. To increase the insulation value of the walls, the hollow cores are filled with a two-part foam product that hardens as it dries to provide insulation and sound proofing. On the interior side of the walls, they install 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, the drywall is attached. Most of the home's exterior cladding is stucco.

The roof framing and trusses are made of borate-treated lumber for protection against termites. A self-adhering underlayment covers the entire plywood roof deck. The roof is topped with ENERGY STAR-rated reflective shingles in a light grey color. The attic is unvented, sealed, and conditioned to provide a protected space for the home's HVAC equipment and ducts. A 5.5-inch-thick layer of open-cell spray foam coats the underside of the roof deck, providing an R-20-insulated, cool, conditioned space for the home's high-efficiency heat pump.

The vinyl-framed, thermally insulated, dual-pane windows have impact-resistant glass, and clear, low-emissivity coatings to minimize unwanted heat transfer. The windows have a U-factor of 0.32 and a solar heat gain coefficient of 0.22.



A continuous layer of rigid EPS foam insulation slows the transfer of heat through the walls. Borate-treated framing is more resistant to bugs and mold than untreated wood. The hurricane straps visible here, together with the roof's hip design, lack of soffit vents, and spray foam insulation, could help to keep the roof intact and in place in a hurricane.

“There are two major factors that need to be addressed when building a home in our part of the country—high winds and moisture,” said Sollitto. The affiliate employs moisture-resistant practices including slab-on-grade construction with concrete block walls, borate-treated trusses and framing, and a secondary water barrier on the roof. The hip roof design is more resistant to uplift in high winds than a gable roof design, a fact that is recognized by insurance companies in Florida who give home owners a discount for it. In addition to the metal hurricane strapping, which is required by code, the spray foam insulation the affiliate uses to insulate the attic also has a gluing effect, helping to hold the roof pieces together. Using an unvented rather than vented soffit design helps to keep both wind and wind-driven rain from entering the attic. Impact-resistant doors and windows provide better protection in hurricanes. Inside the home, the tile flooring, concrete block, and rigid foam can provide more moisture resistance than stud-framed walls, fibrous insulation, and carpet or wood floor coverings.

For further energy savings, the home is equipped with a SEER 15 air source heat pump. The heat pump and R-6 insulated flex ducts are located in the insulated, conditioned attic. To bring fresh air into the home, the builder installed a fresh air intake duct that brings air from a shaded spot outside the home to the return side of the heat pump air handler. The intake brings in fresh air and circulates it through the home when the central heat pump is operating. The intake duct has a MERV 8 filter to filter out dust, pollen, and other indoor air pollutants. The duct is equipped with an electronically controlled damper. The controller is set for an hourly run time and will bring the air handler 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.

For removal of moisture and stale air from the home, the home is equipped with ENERGY STAR-rated exhaust fans in the bathrooms that are timer-controlled to encourage longer run times. The bath fans and range hood fan vent outside. The garage is also equipped with an exhaust fan with an occupancy sensor to pull car exhaust and other pollutants out of the garage.

A highly efficient heat pump water heater provides hot water to the home with an energy factor of 2.4. Because the air source heat pump works by pulling heat out of the air, it can be effective year-round in Florida, especially when located in the garage where the heat pump's cool exhaust provides some beneficial cooling. All of the home's plumbing fixtures comply with the EPA's WaterSense criteria for water savings.

## HOME CERTIFICATIONS

DOE Zero Energy Ready Home Program, 100% commitment

ENERGY STAR Certified Homes Version 3.0

EPA Indoor airPLUS

Florida Green Building Coalition, platinum level

Florida Water Star

UF-IFAS Florida Friendly Landscape



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.



All of the home's lighting is energy efficient. About one-fourth of the fixtures are ultra-efficient LED-based lights, while 75% of the fixtures use compact fluorescent light sources. The home has five ENERGY STAR ceiling fans that are equipped with CFL lamps, which save energy and don't heat up like older bulbs. The cooling effect of the fans' air flow allows home owners to set the thermostat higher for additional energy savings.

High-efficiency windows keep out unwanted solar heat gain, while gutters and downspouts direct rainwater away from the structure. Native, drought-tolerant plants helped the home meet the requirements of the Florida Green Building Coalition's Florida Green Home requirements, Florida Water Star, and the University of Florida's Florida Friendly Landscape program.

and staff to provide the best built home within our limited budget. Our volunteers and staff go through intensive training on the building techniques and materials used in our homes," said Sollitto.

All of these measures helped the home achieve a Home Energy Rating System (HERS) score of 51. For comparison, typical homes built to the 2006 International Energy Conservation Code would score about 100. In keeping with the requirements of the DOE program, conduit and electric panel space were installed to make the home solar ready should the home owners wish to add solar panels to the roof at a future date. Because the home is so efficient and compact, Sollitto estimated that adding a 2-kW photovoltaic panel array to the roof could allow the home to achieve zero energy status; in other words, it could produce as much power as it uses in a year.

All of these steps have helped the Habitat affiliate to dramatically improve the quality and efficiency of their homes. To help their home owners get the most benefit from these high-performance homes, Habitat offers intensive training sessions for new home owners that include information on operation and maintenance of the systems in their homes.

"Our affiliate has come a long way in improving the quality of life for our partner families. The DOE Zero Energy Ready Home program has taken us to a new level of efficiency, quality, and commitment to our families. We are now truly building high-performance homes and we don't ever want to go back," said Sollitto. "We want to ensure that our families have a safe, decent, and affordable place to live for many years to come."

*Photos courtesy of Habitat for Humanity South Sarasota County*

## KEY FEATURES

- **DOE Zero Energy Ready Home Path:** Performance.
- **Walls:** Foam-filled masonry block. On interior is .75" rigid EPS foam board, .75" furring strips, corrugated paper-backed perforated foil-faced insulating vapor shield, .5" drywall. On exterior is stucco cladding.
- **Roof:** ENERGY STAR-rated reflective roof shingles; self-adhering underlayment.
- **Attic:** Sealed and conditioned attic; open-cell spray foam (R-20).
- **Foundation:** Slab on grade.
- **Windows:** Double-pane; argon-filled; vinyl framed; impact resistant; low-e; U=0.32; SHGC=0.22.
- **Air Sealing:** 3.34 ACH 50.
- **Ventilation:** Fresh air intake; MERV 8 filters; exhaust fans.
- **HVAC:** Heat pump; 15 SEER; 8.0 HSPF.
- **Hot Water:** Heat pump water heater.
- **Lighting:** 25% LED interior; 75% CFL.
- **Appliances:** ENERGY STAR-rated refrigerator, dishwasher, and ceiling fans.
- **Solar:** None.
- **Water Conservation:** All EPA WaterSense-rated fixtures; Florida Water Star; no irrigation system.
- **Other:** Borate-treated studs; low-VOC.