



# The New American Home 2017

## Thermal Shell

- Unvented and air sealed attic with average R-21 Icynene.
- Window windows and patio doors with low-e coating and argon gas fill to limit solar heat gain air tightness
- Openings and penetrations sealed to achieve 4.73 natural air changes under blower door testing at 50 Pa
- cfiFoam core filled CMU with Fi Foil and 3/4" unfaced extruded polystyrene foam board wall insulation system on exterior masonry walls (R16.2)
- Large overhangs to aid in protecting the home from the harsh Florida sun
- Energy Star rated roof to aid in keeping the home cool
- Light colored exterior to assist in reflecting the sun

## HVAC

- Space conditioning provided by Trane XV20I Variable Speed 19 – 19.25 SEER
- Variable speed compressors in outdoor heat pump units adds efficiency and quietness
- Mechanical ventilation provided by Honeywell DR90 Ventilating Dehumidification System
- Space conditioning system located entirely within conditioned space

## Hot Water

- Propane-fueled Bosch tankless water heaters (EF = 0.95) provides the hot water

## Electrical

- 100% of all interior and exterior lamps are energy-efficient LED lighting
- ENERGY STAR®-rated appliances, including dishwasher, refrigerator, freezer, and clothes washers
- 17.1 kW Solar Photovoltaic (PV) system

## Energy Efficiency and Innovation

As the NAHB's official show home, The New American Home is a symbol of energy efficiency and innovation. The home exhibits cutting-edge products from manufacturers all over the world.

The New American Home 2017 (TNAH) is designed to exceed the requirements for certification to the Emerald level of the National Green Building Standard™. Its energy-efficient features can be used in homes in a hot-humid climate at any price point with similar energy savings. The home is also targeted to be certified with the EPA Energy Star program as well as the Indoor airPLUS program.

Two Trails, Inc. worked closely with NCHI to ensure energy efficiency and innovation in TNAH 2017. This home boasts a confirmed **HERS Index of 0! It is expected to consume 122% less energy** than if it were built to code (2009 IECC), and is expected to be 100% more efficient than the average new code-built home. At this level of energy efficiency, the home is designed to provide over \$5,497 in annual energy savings to the homeowner.



ΤΩΟ ΤΡΑΙΑΣ, ΙΝΧ.

8955 Υ.Σ. ΗΩΨ. 301N NO. 386, ΠΑΡΡΗΣΗ, ΦΛ 34219 ΠΗ:941-776-8680. ΦΑΞ: 941-776-8789  
ΩΩΩ.ΤΩΟΤΡΑΙΑΣ.ΧΟΜ



### **Key Energy Features**

The New American Home 2017 achieves a very high level of energy efficiency. The most noteworthy features of TNAH 2017 include the air tightness of its thermal shell and the use of solar energy.

The home uses solar energy to power a portion of its electrical systems, space conditioning and hot water systems. The 17.1 kW Photovoltaic (PV) system will provide approximately 100% of the annual electric energy needs for the home. A synchronized system of nine (9) Bosch natural propane-fueled tankless water heaters satisfies all the hot water needs.

### **Systems Engineering Approach**

The systems-engineering approach unites segments of the building industry that have previously worked independently of one another.

The concept is simple: systems-engineering can make America's homes cost effective to build or retrofit and energy efficient to live in. Energy consumption of new houses can be reduced by as much as 40% with little or no impact on the cost of construction. Similar performance can be achieved in existing homes.

To reach this goal, the Phil Kean Designs Building team worked with their building partners to produce a home that incorporates energy and material saving strategies from design through construction. First, the team analyzed and selected cost-effective strategies for improving home performance. Next, the team evaluated design, business, and construction practices within individual partnerships to identify cost savings. Cost savings could then be reinvested to improve energy performance and product quality. For example, a design that incorporates new techniques for tightening the building envelope enabled Phil Kean Designs to install smaller, less expensive heating and cooling systems. The savings generated in this process can then be reinvested in other high-performance features to further reduce energy use. Proving the efficiency of the system-engineering approach to construction, this home's HERS Index, without the use of the Photovoltaic system is 54, which is 46% more efficient than the construction of the average new home.

The "pilot" or "test" home is the field application of solution design. The team assisted Phil Kean Designs in building TNAH 2017 according to strategic design, then tested each system for efficiency and made any necessary changes to increase efficiency and cost effectiveness. Before additional houses are built, these changes are incorporated into the design. This process of analysis, field implementation, reanalysis, and design alteration facilitates ultimate home performance once a design or retrofit strategy is ready for use in production or community-scale housing.

Understanding the interaction between each component in the home is paramount to the systems-engineering approach. Throughout design and construction, the relationship between building site, envelope, mechanical systems, and other factors is carefully considered. Recognizing that features of one component can dramatically affect the performance of others enables the Phil Kean Designs Building team to engineer energy-saving strategies at little or no extra cost.



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