



# The New American Remodel 2019

## Proposed Thermal Shell

- Unvented and air sealed attic with a closed-cell spray foam insulation system (R-38)
- Windows and patio doors with low-e coating and argon gas fill to limit solar heat gain and optimize air tightness.
- Kingspan's Kooltherm, Fi-Foil M-Shield, and spray foam insulation on exterior walls (R-37)
- Large overhangs to aid in protecting the home from the harsh Nevada sun

## Proposed HVAC

- Daikin Multisplit VRV Air Conditioning with a proposed SEER of 24.5
- Multiple Air Handling Units provide individual room climate control
- Mechanical ventilation provided by Air King
- Space conditioning system located entirely within the conditioned space

## Proposed Hot Water

- ENERGY STAR®-rated tankless water heaters with an efficiency (EF) of 0.95
- Insulated hot water lines utilized throughout the project

## Proposed Electrical

- 100% of all interior and exterior lamps are energy-efficient LED lighting
- ENERGY STAR®-rated appliances
- ENERGY STAR®-rated variable speed pool pumps

## Designed Energy Efficiency and Innovation

As one of the NAHB's official show homes, The New American Remodel (TNAR) 2019 is a symbol of energy efficiency and innovation. The home exhibits cutting-edge products from manufacturers all over the world.

TNAR 2019 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 climate at any price point with similar energy savings. The home is also targeted to be certified EPA Energy Star program as well as the Indoor airPLUS program and DOE Zero Energy Ready Home.

Two Trails, Inc. worked closely with Studio G Architecture to ensure energy efficiency and innovation in TNAR 2019. This home has a preliminary HERS Index of 58! A fantastic improvement from the pre-remodel HERS Index of 135! It is 42% more efficient than the average new code-built home and designed to have a 43% reduction of energy usage from pre-remodel levels. At this level of energy efficiency, the home is designed to provide over \$1,621 in annual energy savings to the homeowner.

## Designed Water Efficiency

In addition to energy savings, this home is designed to achieve approximately a 51% reduction in water use from pre-remodel levels. This remarkable water use reduction is made possible using low-flow water fixtures and a high-efficient irrigation system. Water saving features include:

- Kohler low-flow, EPA WaterSense certified 1.2 GPM lavatory faucets and 1.28 GPF toilets
- Natural, indigenous landscaping, high-efficient micro spray, drip-lines and irrigation controller contributed to the outdoor water use reduction

## Designed Indoor Environmental Quality Features

Indoor Environmental Quality encompasses the conditions inside a home, and their effects on residents. The New American Remodeled Home 2018 incorporated innovative strategies, creating an indoor environmental quality that enhance the lives of homeowners, protects occupants' health, and improves quality of life. Indoor Environmental Quality strategies include:



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- Low-VOC paints and finishes and low-VOC interior adhesives and sealants
- MERV 13 space conditioning air filters
- HVAC ducts sealed during construction to prevent pollutants from construction activities from entering the system
- Whole Building ventilation system configured to allow the correct amount of fresh air in to the home

### **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 Studio G Architecture team are working 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 Studio G Architecture 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 preliminary HERS Index, without the use of a Photovoltaic system is 58, which is 43% 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 Studio G Architecture in designing TNAR 2019 in accordance to strategic design, modeling to maximize building efficiency of each system and directed the team to increase efficiency through cost effective decisions. Before additional houses are built, these changes are incorporated into the design. This process of analysis, field implementation, reanalysis, and design alteration facilitate 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 Farina and Sons Building team to engineer energy-saving strategies at little or no extra cost.



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