RECOGNIZING ENERGY LEADERSHIP IN HOMEBUILDING

BUILDERS CHALLENGE

Building America SM
U.S. Department of Energy
Research Toward Zero Energy Homes

High Performance Builder Spotlight

John Wesley Miller Companies

Tucson, Arizona

A Neighborhood Beyond the Norm

Within walking distance of the downtown commercial and business district of Tucson, Arizona is the Armory Park del Sol community, offering homeowners a convenient place to live in an urban setting. State-of-the-art technology is *standard* in all the homes, and includes photovoltaic (PV) electric power generating systems and solar hot water heaters.

> "Education and a willingness to learn about energy efficiency can drive sales."
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> **JOHN WESLEY MILLER** JWM COMPANIES

"We were told it couldn't be done," chuckles John Wesley Miller, owner of John Wesley Miller Companies, which built the development, "But it's done well. We've always been involved in pushing the envelope of energy efficient building." With assistance from the National Association of Home Builders (NAHB) Research Center, a Building America partner, features and construction techniques were selected to ensure that typical houses in the community exceeded code by 55 percent. All of the homes are pre-wired for the PV system and pre-plumbed for the solar thermal system to allow for easy installation at any time. A JWM prototype house produces more energy than it needs, annually.

Insulation from the Elements

The interior comforts of a home can be difficult to shield from the extreme outdoor conditions found in Arizona. But after years of experience, JWM Companies has discovered several practices that protect against the temperature swings found in desert climates.

Masonry Construction

An Armory Park del Sol home has a masonry concrete-filled wall superstructure consisting of steel-framed interior walls, concrete floors, and exterior insulation, including a 3-coat stucco system finish. This masonry construction provides excellent thermal mass storage to protect the indoor environment from outdoor conditions. A side benefit for homebuyers is its soundproofing properties. In addition, the plumbing and electrical lines run through the walls and ducts are in conditioned space so no additional air sealing is needed, creating a very tight house.

HVAC System

JWM Companies works with a professional engineer to review house plans to assess the placement of ductwork and the proper sizing of HVAC equipment. At Armory Park del Sol, the ducts were sealed with mastic, tested for air leakage, and enclosed in soffits below the insulation along the central core of the house. Transfer grilles across doorways and a central return equalize air pressure throughout the house. The careful attention to the HVAC system and its placement further contributed to the tightness of the construction.

Windows

Inferior windows can contribute to air leakage or heat transfer, which is why Milgard dual pane argon gas-filled windows were chosen for Armory Park del Sol homes. The spectrally selective coatings on

BUILDER PROFILE

John Wesley Miller Companies
www.armoryparkdelsol.com

Founded: 1956

Development: Armory Park del Sol

Square footage: 977 to 2,026 square feet (2-3 bedrooms and 2 baths)

Price: $373,000 - $932,000

Awards: 2007 Livable Communities Award; Arizona Innovation Award (2007); Metropolitan Pima Alliance Common Ground Award 2006, and more.

This builder is described in Building America's Solar Best Practices.

U.S. Department of Energy
Energy Efficiency and Renewable Energy
Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable

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BUILDER SPOTLIGHT

John Wesley Miller Companies

The Southwestern architecture cleverly hides the rooftop PV and solar heater units from passersby.

KEY FEATURES

- 1.5 Kilowatt PV system with 25 year guarantee
- Copperheart Solar Hot Water Collector with 10 year guarantee
- Seisco Instantaneous Water Heater
- R-38 Ceiling Insulation or better
- Milgard Dual Pane, argon gas-filled, Low-E2 Windows with lifetime guarantee
- 14 SEER High Efficiency Heat Pump
- Masonry wall superstructure
- Copper water lines
- Universal accessibility design with 3 foot wide doorways and halls on single level floor plans
- Low infiltration: 2.9 AcHsc

these windows protect occupants from the heat and glare of the daytime sun, while the low U-value of 0.31 prevents indoor heat loss during the night.

Working Together

Over the years, John Wesley Miller Companies has formed several beneficial relationships that enhance their business practices. Longstanding relationships have been formed with local subcontractors and periodic meetings are held with staff and trades to review building practices and discuss issues. This ensures that all parties are on the same page when working with new techniques or materials. The company has also formed a strong bond with Tucson Electric Power (TEP), the local utility. During the building of Armory Park del Sol, TEP performed periodic quality inspections on every home during and after the construction process. The utility also offered rebates for solar systems of $2.40 – $3.00 per installed watt, for a total rebate of $3,600-4,500 per house.

The Bottom Line

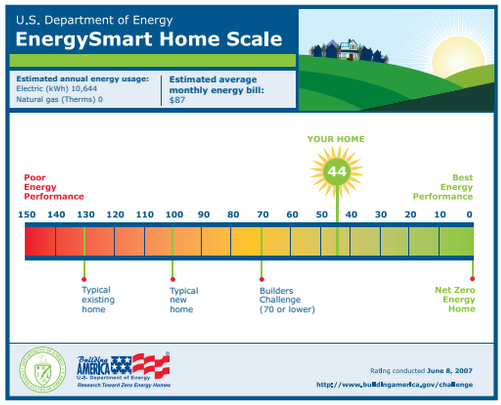
"People who are naturally inclined to educate themselves are typical customers," notes Miller. "About 80% of our buyers looked us up on the web first. We probably have more Ph.D.s living in our little development than any other part of town. This doesn't mean you have to be a genius to appreciate the homes we built," he went on, "But it shows that education and a willingness to learn about energy efficiency can drive sales."

U.S. Department of Energy Builders Challenge

DOE has posed a challenge to the homebuilding industry—**to build 220,000 high performance homes by 2012**. Homes that qualify for this Builders Challenge must meet a 70 or better on the EnergySmart Home Scale (E-Scale). The E-scale allows homebuyers to understand—at a glance—how the energy performance of a particular home compares with others. Through the Builders Challenge, participating homebuilders will have an easy way to differentiate their best energy-performing homes from other products in the marketplace, and to make the benefits clear to buyers.

The figure to the right shows an E-Scale for John Wesley Miller Companies. The E-scale is based on the well-established Home Energy Rating System (HERS) index, developed by the Residential Energy Services Network. To learn more about the index and HERS Raters visit www.natresnet.org.

To learn more about the Builders Challenge and find tools to help market your homes, visit www.buildingamerica.gov/challenge.



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For more information visit www.buildingamerica.gov. The website contains expanded case studies, technical reports, and best practices descriptions.

The Building America Program

Building America is a private/public partnership sponsored by DOE that conducts systems research to improve overall housing performance, increase housing durability and comfort, reduce energy use, and increase energy security for America's homeowners. Building America teams construct test houses and community-scale projects that incorporate systems innovations. The teams design houses from the ground up, considering the interaction between the site, building envelope, mechanical systems, and other factors, and recognizing that features of one component in the house can greatly affect others. More than 40,000 energy-efficient houses have been built by the seven teams to date.