Civano Homes Combine Solar and Sustainability Principles to Create a New Eco-Community

**Project:** SolarBuilt LLC Homes at Civano  
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**Location:** Tucson, AZ

Rear entry to unit showing garage with photovoltaic panels and dry creek landscaping, (Photo Credit: Margot McDonald)

**Demonstration**

Recognized by Sunset magazine in 2004 as the “Best New Community,” Civano is a diverse housing development in Tucson’s challenging Sonoran Desert. Builders and developers established the following sustainability goals for the community that includes planning elements espoused by the “New Urbanism.” The goals of the development are to:

* Significantly reduce energy consumption (all Civano homes are designed to use 50% less energy than a typical home of the same size)  
* Significantly reduce potable (drinking) water consumption,  
* Reduce internal vehicle miles by building a pedestrian-friendly neighborhood,  
* Reduce landfill destined solid waste, and,  
* Integrate working and living environments.

Several home-builder corporations participate in the project, allowing potential buyers an array of design options in the selection of the features of their home. All of the builders however must meet Civano’s sustainability goals.

The project in this case study has been built by one of these home-builders who have focused on achieving regionally appropriate architecture that addresses aesthetics as well as energy and resource efficiency.

**Project Description**

The community of Civano rests on the southeastern edge of Tucson on an 818-acre site. In addition to the housing development that is zoned for residential and live-work occupancy, there are common spaces including a community garden, recreation areas, and a community center.

The homes by SolarBuilt LLC are designed to reduce energy through a well-insulated, high thermal mass building envelope that is also constructed using environmentally friendly building materials. Back-up heating is accomplished by means of a gas furnace or radiant floor heating and additional cooling is available from an air conditioning unit with an efficiency rating SEER 12. Ceiling fans add to interior comfort and owners are provided with the option of replacing the air conditioner with a high performance evaporative cooler.

Measures have been taken to ensure good indoor air quality as well as energy efficiency. For example, a garage separate from living space reduces the potential for exhaust reaching the interior, internal fans exhaust to the outdoors, and healthy interior finishes are used that minimize off gassing and dust collection.

Electricity for the homes is generated by a 2.58 kW DC array of photovoltaic panels located on the garage roofs. Solar hot water systems are installed to pre-heat (or fully heat, depending on sunshine availability and hot water demand) domestic hot water. A solar distiller is also available as an option to the unit.

Indoor-outdoor relationships are enhanced through porches on the east-west sides. In one unit type (SolarCourts), every room has a connection to the outdoors. Exterior spaces designed for thermal comfort increase livability and effectively extend the size of the living unit. A “Flex space” on the street frontage easily accommodates live-work scenarios that can include office or retail uses.
Examples of Sustainably Harvested or Environmentally Friendly Building Products

- **Exterior Walls**: Integra Masonry Block Walls with blown-in foam insulation and recycled-content steel studs.
- **Exterior Finish**: Low maintenance exterior with no exposed wood or stucco.
- **Roof**: Engineered wood framing members. Corrugated, rusted metal roof and metal trim used over Great Room. Garage roof uses recycled content steel trusses.
- **Concrete Floor Finish**: Stained and scored concrete floors reduce use of carpeting and wood as floor finishes.
- **Interior finishes**: No chemical drying agent in Murco-brand drywall compound. Non VOC paints used.
- **Lighting**: Daylighting is supplement by energy efficient fluorescent lighting.

Examples of Water Conservation and Efficiency

- **Rainwater catchment**: Roof drainage directed to irrigate landscape and to drainage swales for site retention and groundwater recharge.
- **Reclaimed water**: Reclaimed water used for irrigation.
- **Xeriscaping**: Native and drought tolerant plants used in landscaping.
- **Water conservation**: Low flow plumbing fixtures used.
- **Greywater systems**: Dual plumbing installed for eventual use of greywater system.

References


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May 2004