

Client: Bejarano Family
 Architect/Developer: Arizona State University (ASU) Stardust Center
 Design/Build Team: Daniel Glenn, Design Director, Ernesto Fonseca, Construction/Energy Modeling, Partners: Hoopa Valley Tribal Community Conservation Corp, Valley of the Sun Habitat for Humanity, and Americorps
 Town of Guadalupe, Navajo FlexCrete

NOV 2005 Community Design
 MAY 2006 Construction Design/Build
 OCT 2006 Substantial completion
 DEC 2006 Completion of construction
 JAN 2007 Occupied



Photo: Michael Pyatok

DESERT DESIGNED

The Guadalupe House is a low-cost home designed for the harsh desert climate of the Valley of the Sun, and reflects the unique cultures of the Latino and Yaqui communities of Guadalupe. It is a multi-generational house, designed to be expanded over time and accommodate several generations living in one household. With a passive solar design, photovoltaic panels, water-cooled solar-powered air conditioning, and aerated concrete walls of Navajo FlexCrete, it requires minimal external energy to operate.

CORE PROJECT EMPHASES:



LESSONS LEARNED

- There is value in a community working together with universities in the development of new designs and materials for new housing.
- Culturally relevant, sustainable housing can be adopted on a larger scale for new housing developments.

BEST PRACTICES

- Passive cooling ventilation, passive solar heating, photovoltaic solar panels were incorporated.
- Grey water reuse and rainwater harvesting together with a series of cisterns are featured.
- The house is designed to reflect and celebrate traditional Mexican culture.
- The project makes use of Navajo FlexCrete, a light-weight highly-insulated and tribally produce material.

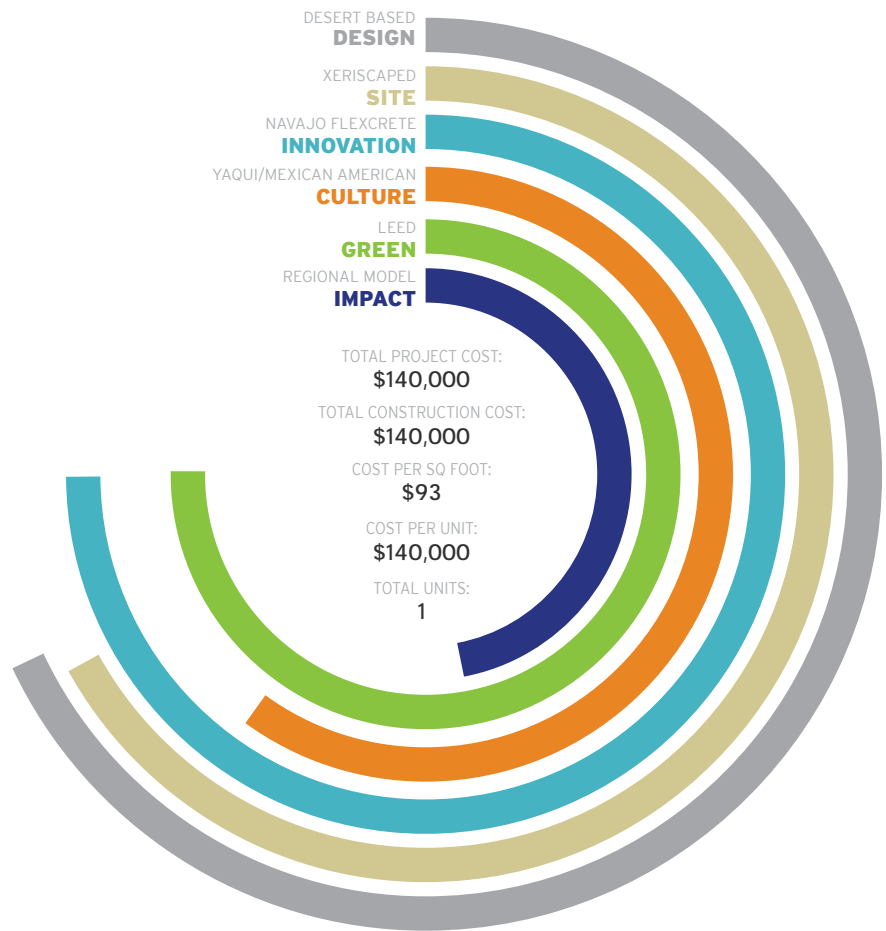


Photo: Michael Pyatok



Photo: Michael Pyatok



Single Family



Southwest

● ● GUADALUPE HOUSE

CULTURE

Guadalupe is a predominantly Pascua-Yaqui and Mexican-American community between Phoenix and Tempe. Its residents have preserved a degree of cultural and geographic uniqueness while participating in the economic and political structures of Phoenix's society. Many components of the home are designed to meet the standards for minimal energy usage. The outside courtyard is equipped with a shaded trellis and water fountain to keep it cool and comfortable. The courtyard additionally serves as a place for traditional large family gatherings. The carport serves as an outdoor ramada. Other cultural elements include a combined kitchen/dining/living area, making the kitchen the heart of the home. As a multigenerational household, a separate casita serves as a room for a young adult or child. On the porch there is a specially designed niche for the Virgin of Guadalupe.

PROCESS

Public meetings were held to develop the design of the home, with the participation and support of the city council and mayor. Meetings were held in the town hall, which included design workshops and presentations/discussions of the design concepts. Educational presentations included information on regional and Yaqui traditions, design techniques, and case studies to respond to the desert climate.

DESIGN

This home was designed as a prototype for the town of Guadalupe, its climate, and its culture. The design was developed in a "kit-of-parts" workshop process with community members and the homeowners, the Bejarano family. Several key elements came out of this process, including a courtyard-style design for cross-ventilation; and the creation of a large shaded outdoor space for large family gatherings; the separation of the master bedroom for the elder homeowners from the bedrooms for their adult children; the inclusion of a "casita," a small, separate guest room for visiting family members or adult children; the capacity to expand the home upward, to add additional rooms or an apartment for the expanding family; the incorporation of a carport, both for cars and as a outdoor "ramada," a shade structure to use for large family gatherings; and the centrality of the kitchen opening directly to the living/dining areas.



Drawing by ASU Star Dust

“ This project is helping us build a dream home, but in an affordable way, we love the design of our new home and look forward to living in it as a family - Olivia Bejarano, homeowner ”

GREEN

This Leadership in Energy and Environmental Design (LEED) for Homes Gold project focuses on utility reduction and low-maintenance core design principles, with a minimal cooling need and reducing heating. Sunlight is largely used in place of artificial lighting, and proper shading and orientation protect the home during summer months. Thick walls made of Navajo FlexCrete provide an insulation that maintains a balanced temperature within the home year round, reducing heating and cooling requirements. Rooftop solar panels donated by ASU's Photovoltaic Energy Lab are expected to provide 90 percent of the home's electrical energy needs. Other green features include a tankless water heating system, ENERGY STAR windows, and highly-insulated rooftop structural panels with a non-toxic coating that reflects solar heat. The roof is also a rainwater-harvesting system that collects water for future use, with a potential savings of 5,000 gallons per year. A grey-water collection system was integrated into the design for the dual-flush toilets and irrigation of the courtyard.



Photo: Michael Pyatok