

2017

Sinatra Living: Team Las Vegas DOE Solar Decathlon 2017 Application Summary

University of Nevada, Las Vegas. Solar Decathlon Team.

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University of Nevada, Las Vegas
Principal Investigator: David James, PhD. PE F.NSPE
Project Title: Team Las Vegas

Objectives

For the DOE Solar Decathlon 2017 competition, Team Las Vegas proposes a housing prototype that seeks to meet a rising regional and national demand for sustainable homes that offer safety, independence, diagnostic capability and comfort to the elderly and disabled populations. The primary goals of this project are to meet the physical and psychological needs of an aging-in-place market while simultaneously creating a sustainable design for life in the Mojave Desert.

Description

To accomplish these objectives, Team Las Vegas is focusing on an interdisciplinary approach, strengthening the empirical basis of design from the beginning of the project. The resulting design will integrate smart-home and health monitoring technology with architecture and renewable energy to appeal to both the target demographic as well as potential builders.

Methods

Team Las Vegas has identified several key principles for successful elderly and disabled design, each of which were met with appropriate strategies:

- Careful attention to orientation and lines of sight
- Providing a safe and secure environment with the use of monitoring and diagnostic technologies, screens and automated locks
- Offering a sense of autonomy through spatial design and deliberate furniture and fixture selection
- Spatial balance between public and private spaces
- Stimulation of both the senses and intellect with integration of social and activity spaces, abundant landscaping, and daylighting

Developing an effective design for the harsh climate of the Mojave Desert presents its own unique set of challenges which were addressed with their own relevant design approaches:

- Building orientation to maximize daylighting and minimize heating loads
- Use of bifacial photovoltaic panels for increased renewable energy production
- Separation of building skin and photovoltaic panels from core of house to prevent thermal bridging, reduce heat loads, and allow for natural ventilation
- Overhangs, screens, and landscaping to create shade and prevent harsh direct light

Impact

It is the intention that the finished house will serve as a prototype for the integration of cutting-edge monitoring technologies in conjunction with a modern understanding and approach to healthcare such that it improves the quality of life of the resident. A permanent post competition location in the Las Vegas Medical District or as part of the Downtown Project will expose the house to a multitude of visiting medical professionals and entrepreneurs, showcasing the successful application of Team Las Vegas' design goals to a national and international market.