Environmental Quality Advisory Board
Office of Environmental Initiatives
City of Scottsdale
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To: Desert Discovery Center Project Team
From: City of Scottsdale Environmental Quality Advisory Board
Date: June 29, 2016
Re: Recommendations for Desert Discovery Center Concept

The City of Scottsdale Environmental Quality Advisory Board does not take a position in support of or opposition to a Desert Discovery Center (DDC). Nor, does it take a position about the location of a DDC. That being said, EQAB makes the following recommendations:

Beyond the given of LEED Gold or preferably Platinum certification, the DDC should be a model for sustainable building in the Sonoran Desert. Moreover, it should be ***"transparently" green*** – ***showcasing its green attributes*** such that the facility itself provides an educational experience for how to live sustainably in our world-renowned desert.

This concept is beautifully exemplified by the Desert Living Center at the Springs Preserve in Las Vegas.[1] Integrated didactic art elements are one method of showcasing inherent design features:

> "The exhibit designers worked with the architects to build 25 interpretive sculptures into the buildings' architecture and site. Visitors exploring the site discover these intriguing sculptures that highlight the energy-saving aspects of the architectural design, such as cool towers, solar chimneys, reclaimed water, and straw bale and rammed earth walls."

The DDC should ***demonstrate*** a full spectrum of desert-appropriate strategies – from historically proven passive design (e.g., orientation, shading, strategically placed mass) to smart technologies. Water management and conservation (e.g., rainwater harvesting, efficiency, reuse) should be front and center.

Furthermore, the design of the DDC should anticipate and provide for environmentally responsible operation throughout a minimum 60-year building service life.

Finally, environmental sustainability and stewardship should be integral to and paramount in all DDC design, programming, operational, financial and business decisions.

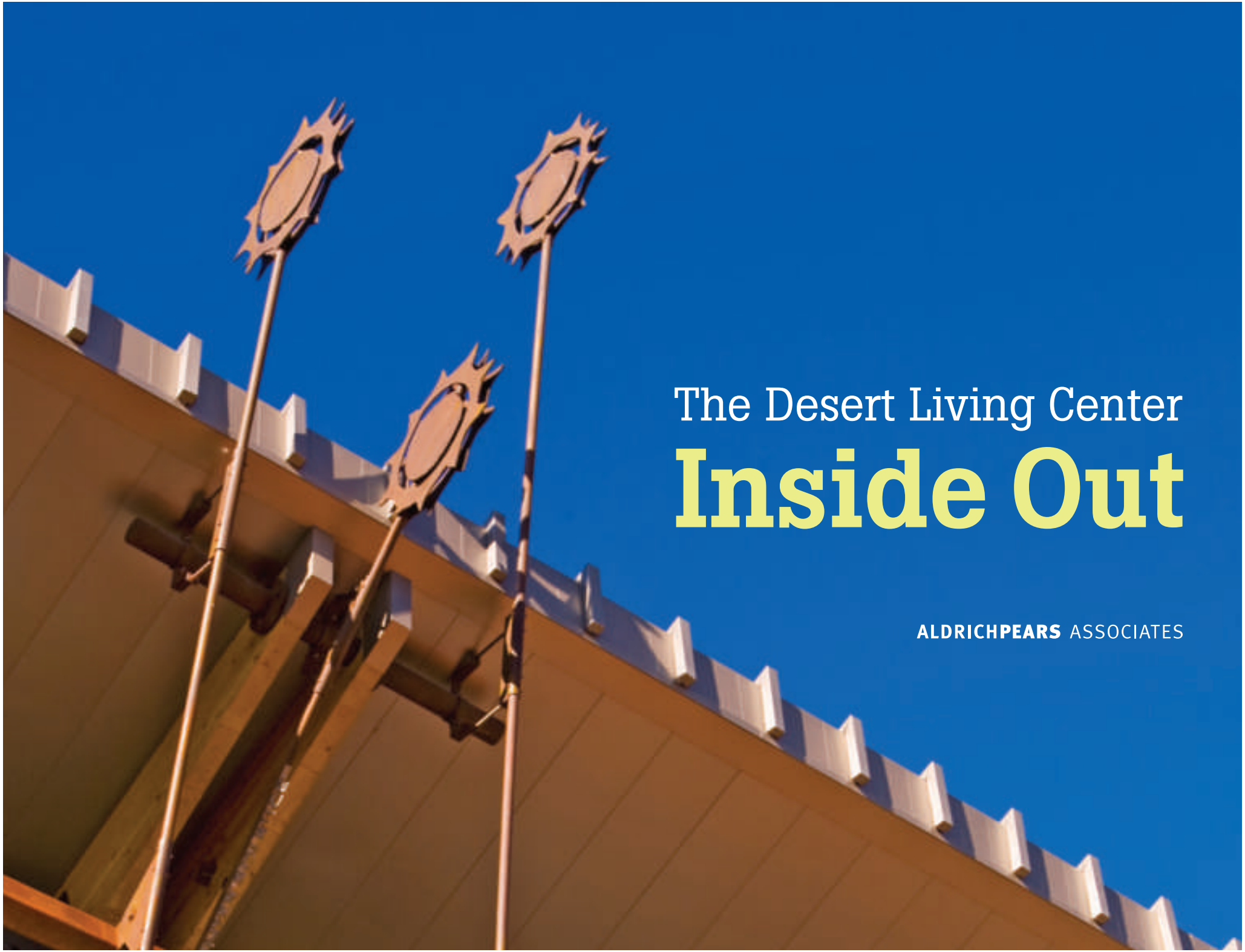
In sum, the DDC should be the exemplary project for sustainable building and living in the Sonoran Desert; the facility should showcase the site planning, design features, materials, and technologies that make it so.

Thank you for the opportunity to comment.

Alisa McMahon

Alisa McMahon, Chairperson

[1] See "The DLC Inside Out" and "Desert Living Center and Gardens" attached.



The Desert Living Center

Inside Out

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The DLC Inside Out

Springs Preserve, Las Vegas, NV

The Desert Living Center (DLC) at the Springs Preserve in Las Vegas is designed to achieve Platinum LEED certification, the highest level of certification awarded by the US Green Building Council for Leadership in Energy and Environmental Design(LEED).

How Do Visitors Know?

A lot of work went into reducing the environmental impact of these five buildings that house a number of environmental education program spaces and interpretive exhibits. But how do visitors know that the buildings themselves are energy-efficient? The client wanted to be able to use their own buildings to teach visitors about sustainable building principles—and show that they were practicing what they preached. *The DLC Inside Out* project presented here is designed to accomplish just that.

Interpreting the DLC's Sustainable Building Features

The DLC Inside Out project includes a Welcome Gallery that provides an in-depth overview of the sustainable building techniques used at the site. The exhibit also includes 25 whimsical, interpretive sculptures scattered throughout the site that call attention to significant energy-saving components of the architecture. Discovering interpretive sculptures throughout the site delights visitors who have spent time in the Welcome Gallery, and intrigues those who have not.

Welcome Gallery

The Welcome Gallery is designed to feature a scale model of the site surrounded by pivoting touch-screen monitors. Visitors can manipulate the screen to discover the sustainable features found throughout the campus.

25 Interpretive Sculptures

The exhibit designers worked with the architects to build 25 interpretive sculptures into the buildings' architecture and site. Visitors exploring the site discover these intriguing sculptures that highlight the energy-saving aspects of the architectural design, such as cool towers, solar chimneys, reclaimed water, and straw bale and rammed earth walls.

Kids on scavenger hunts scour the site for these playful treasures, while architecture students use them as an educational tool, providing clues to the energy-saving architectural techniques being used.

Materials and Rationale

The designers used waste building materials like rebar, structured steel and glass to maintain the buildings' LEED standards, while creating a distinct visual language.

Red and blue finishes symbolize hot and cold, formed rebar represents wind direction, and recycled glass symbolizes water, creating sculptures that interpreted escaping heat, trickling water and moving air — events that are otherwise invisible.

Scale model

This Welcome Gallery exhibit features a scale model of the DLC site. Visitors can pivot touch-screen monitors to zoom-in on the site and explore flash animated explanations of the sustainable features.

original concept sketch

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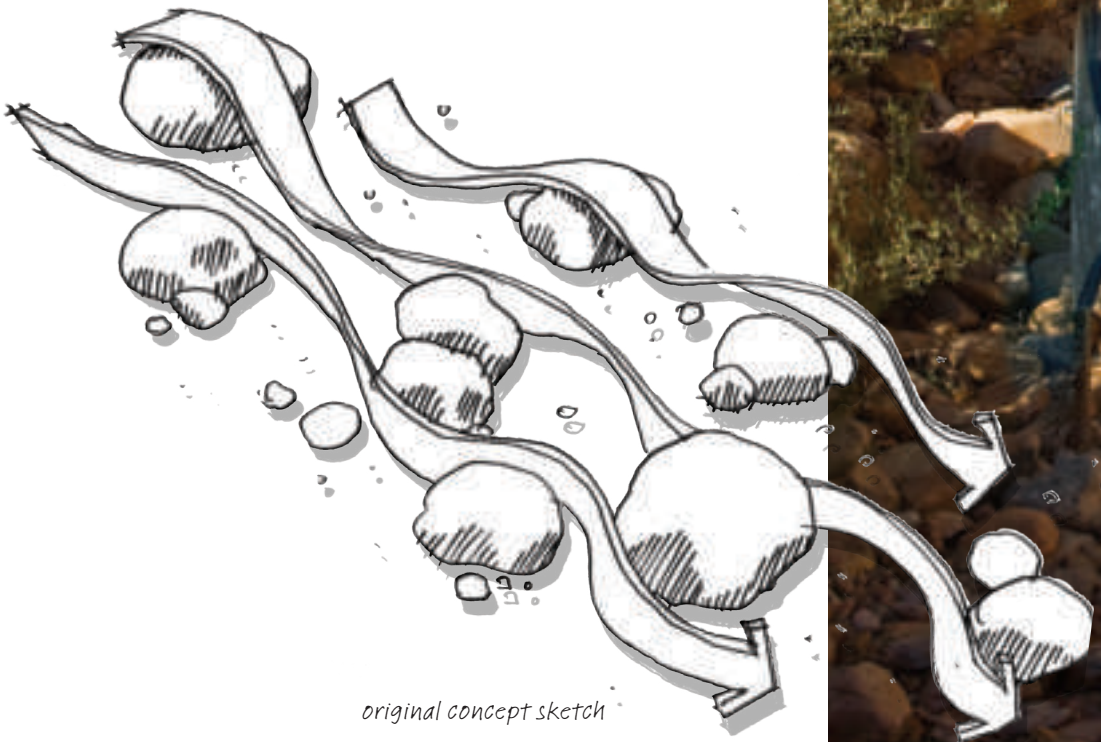
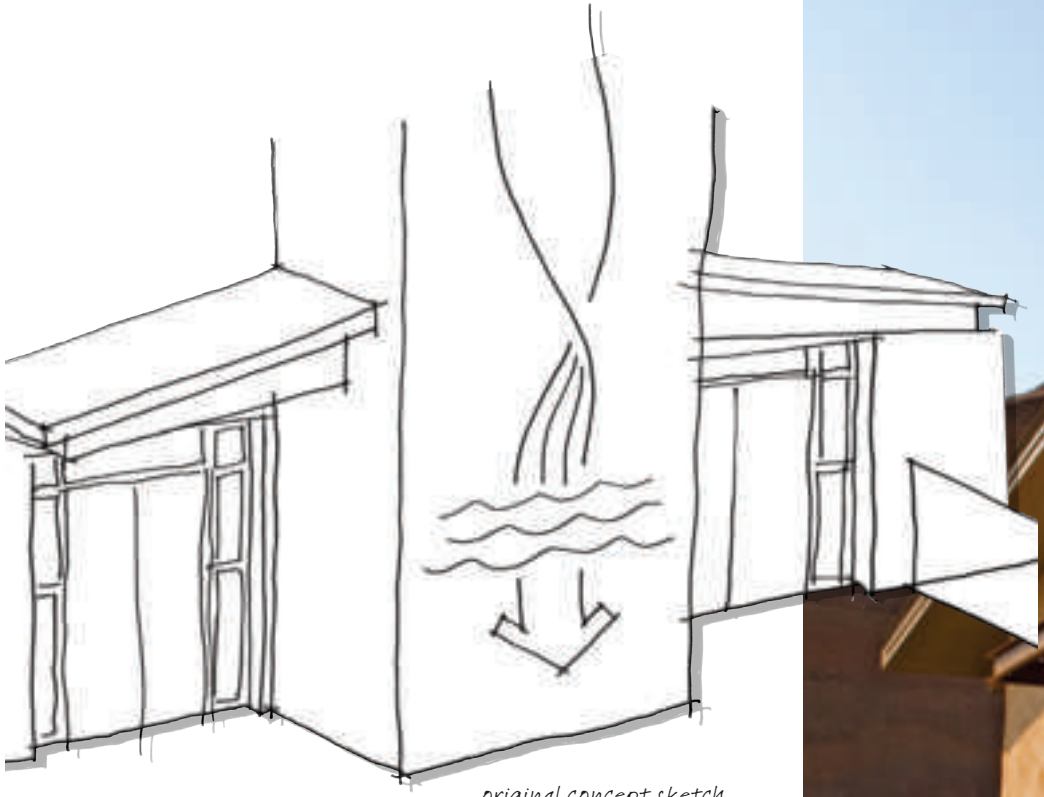
Arroyos conserve water

This arroyo is usually dry; the sculpture represents water which flows through the arroyo during desert rainstorms. Water is funneled into wetlands for treatment and reuse.



original concept sketch



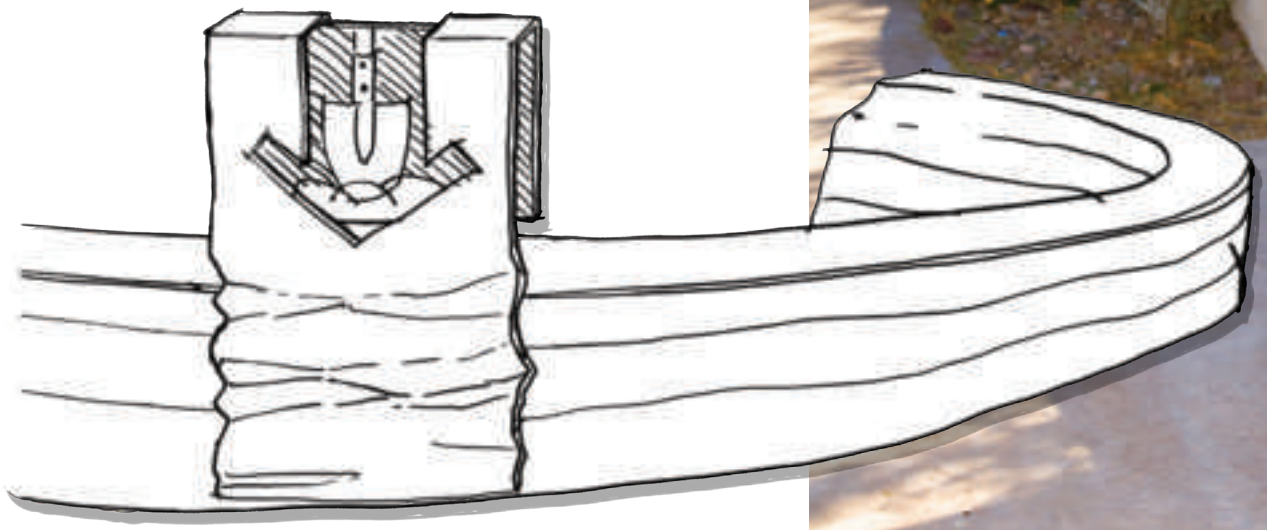
original concept sketch

Cool towers cool buildings

This cool tower captures the passing breeze, funnels it across wet pads and into the room below, naturally cooling buildings without AC.

Rammed earth walls use local dirt

Layers of dirt are shoveled between forms and compacted down, slowly building rammed earth walls at the DLC.



original concept sketch

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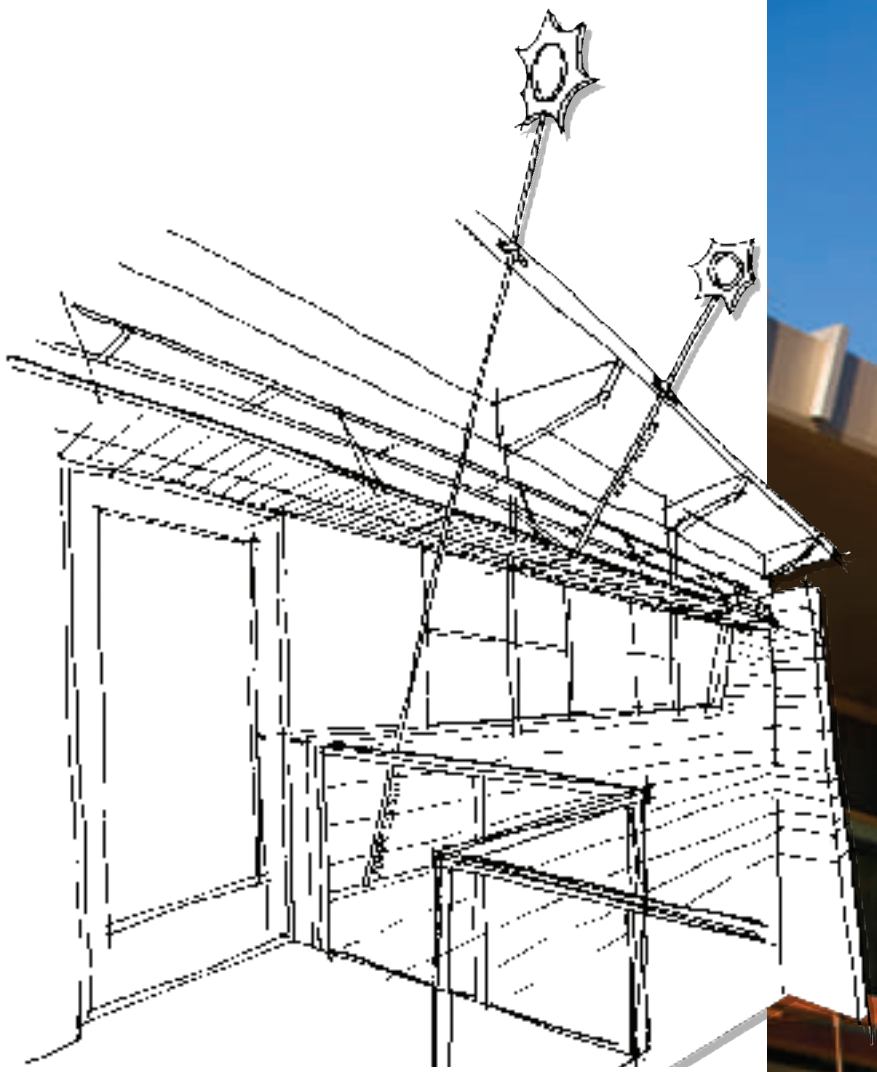


original concept sketch

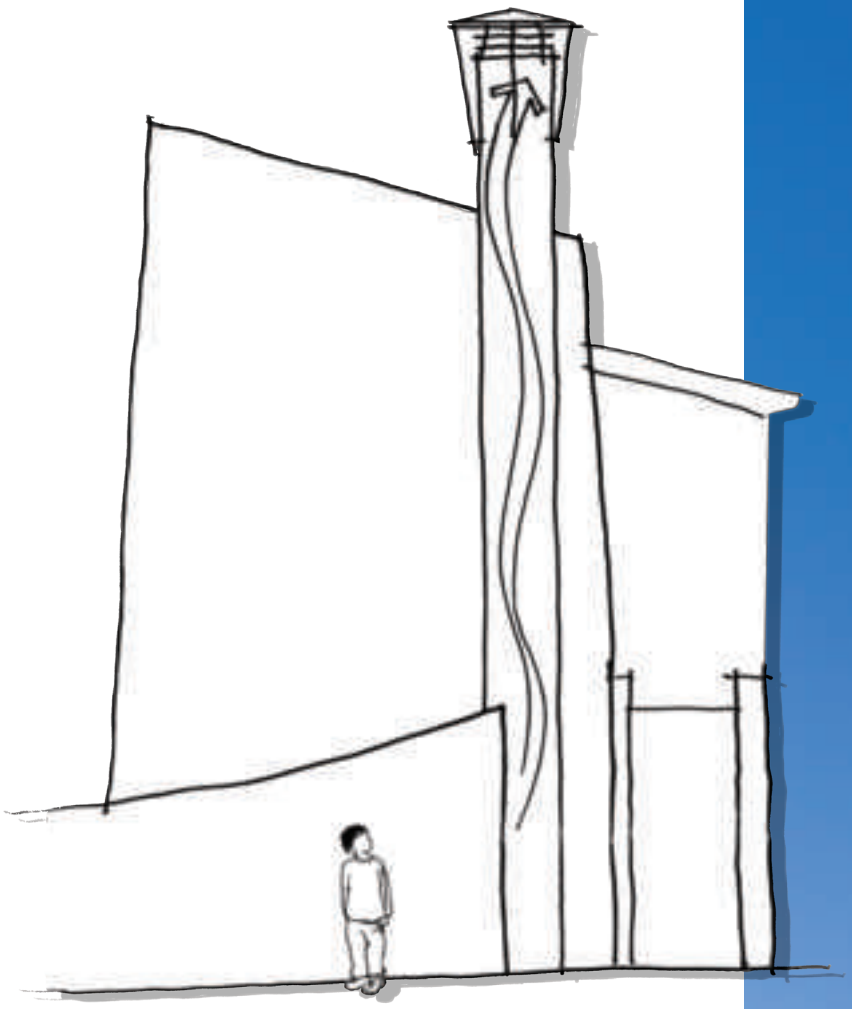
Daylighting saves energy

Overhangs shade the DLC's walls during hot summers. Light shelves bounce sunlight into the buildings during cool winters.

Straw bale is a natural insulator

Straw bale, a waste product, is used as a building material at the DLC. Straw bale's thermal capacity keeps buildings at comfortable temperatures.

original concept sketch



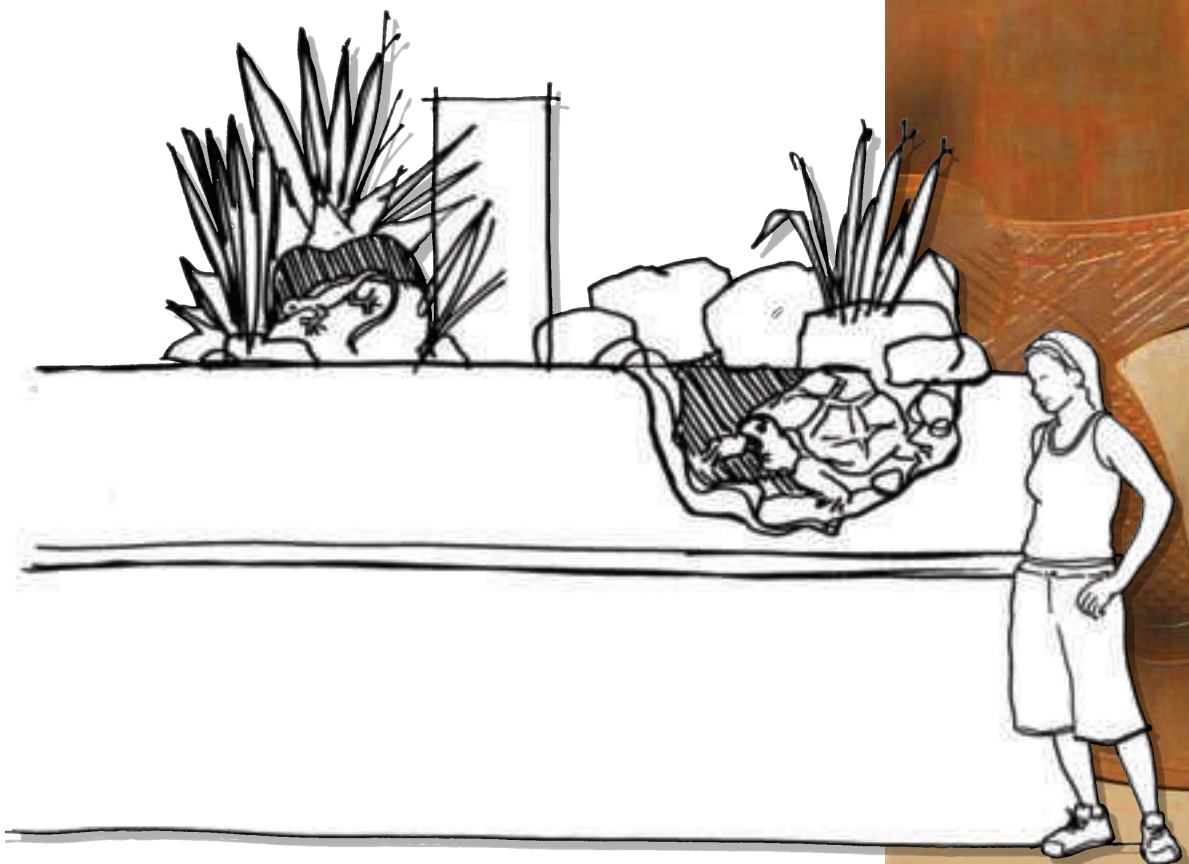
original concept sketch

Solar chimney reduces energy needs

This solar chimney heats up creating a vacuum that pulls air from the building, up its shaft, increasing natural ventilation.

Berming provides natural insulation

The desert tortoise burrows underground to keep cool in the heat, and warm in the cold. The DLC took advantage of the earth's natural insulation and stable temperatures too, by building into the site instead of on top of it.



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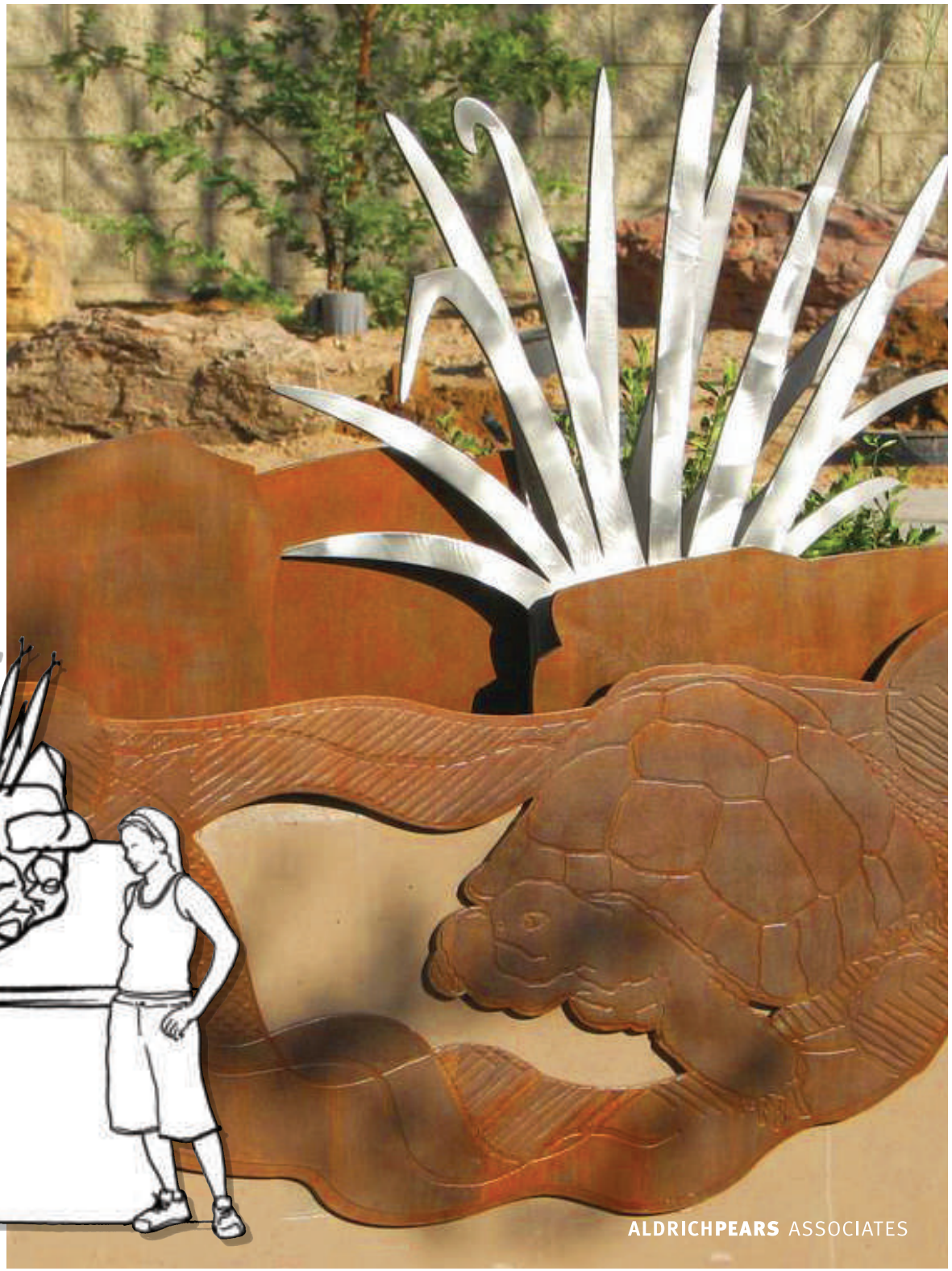

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inspiring change by design

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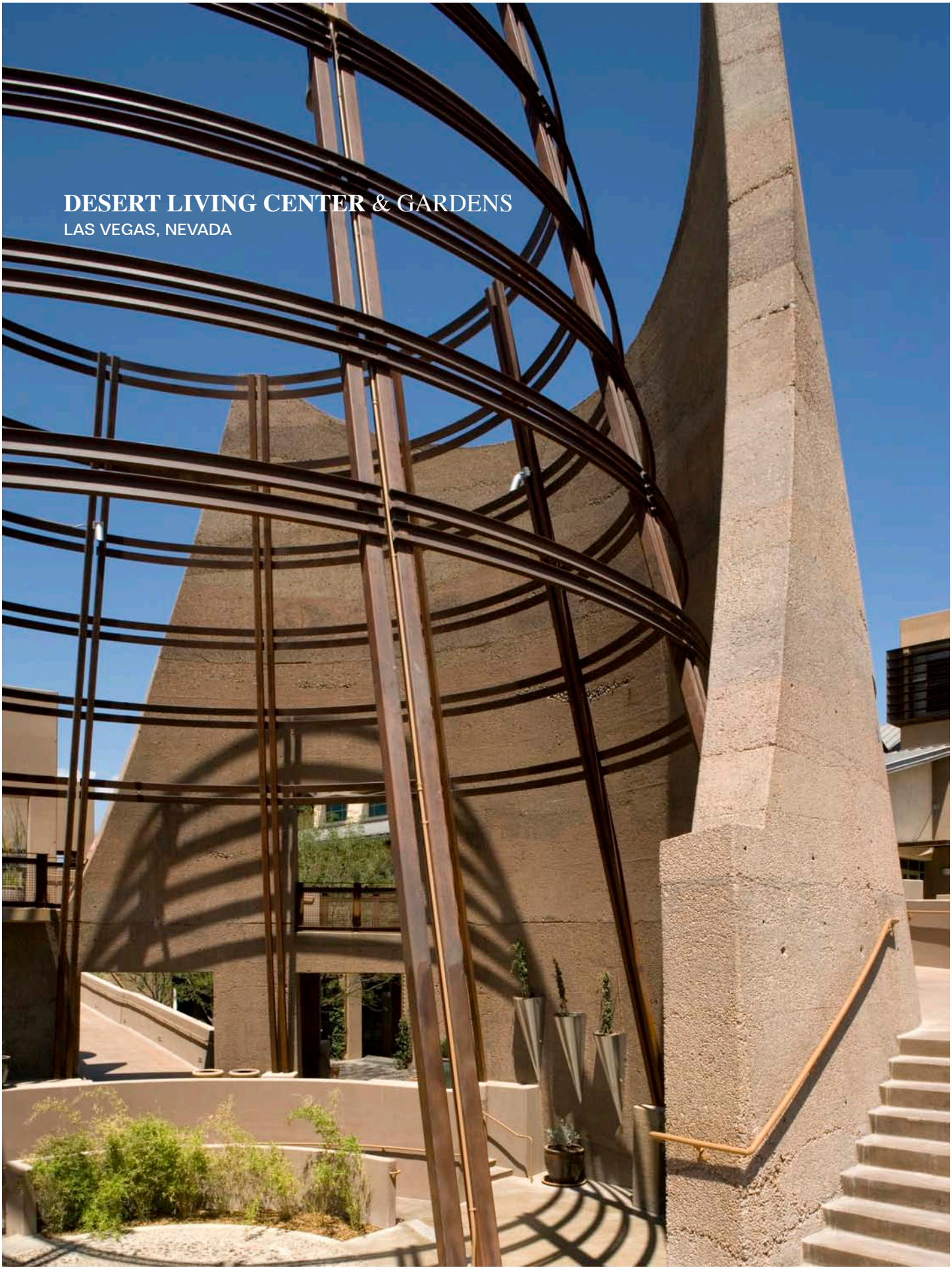

DESERT LIVING CENTER & GARDENS

LAS VEGAS, NEVADA

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Project Architect/Designer

Client Reference:
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Las Vegas Valley Water District
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Las Vegas, NV 89153
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Awards:
2008
LEED-NC Platinum Certification
U.S. Green Building Council

2007
High Performance Building Award
Sustainable Building Industry Council

Best Public Green Building Project
Southwest Contractor Magazine

Best Landscape/Hardscape Project
Southwest Contractor Magazine

Project of the Year
Society of Landscape Architects, NV

Award of Excellence for Commercial, Retail, & Mixed Use
Society of Landscape Architects, NV

Honor Award, Built Category
American Institute of Architects, NV

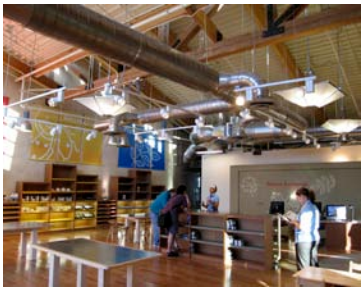
2003
Small Firm Award
"Special Market Brochure"
Society for Marketing Professional Services

Publications:
Metropolis, October 2007

Southwest Contractor, December 2007

Las Vegas Home & Design, March/April 2008

Architecture Las Vegas, 2008



lucchesi galati
PEOPLE • PROCESS • PLACE

The 54,000 s.f. Desert Living Center is an action-based public outreach and applied research facility designed to "promote sustainable life in the Mojave Desert." Through dynamic, ongoing education programs, the Center serves as a catalyst for individual and community change from being "*in* the desert" to being "*of* the desert."

The five acres of conservation gardens demonstrate desert-appropriate water and energy-conserving design solutions by applying current knowledge and technologies.

Garden exhibits are used to further Mojave education, conservation and protection, planting design, landscape lighting, "how to" areas for irrigation and planting. Also included is a constructed wetland for treatment of all gray and black water for the entire Preserve site, to be reused in the DLC toilets and gardens.

The Desert Living Center and its integrated Demonstration Gardens has received LEED Platinum Certification, having met design objectives specific to sustainable sites, water efficiency, energy and atmosphere, materials and resources, and indoor environmental quality.

Design Principles

The basic design of the Desert Living Center reflects the local environment at every opportunity, beginning with solar orientation to optimize the benefits of the sun as a lighting and heating source. It continues underground by utilizing the earth as a thermal insulator for the structures by integrating the buildings into the land. It then carries above ground where the mass and thickness of walls assist in protecting heat gain and loss. Thermal mass is achieved through the use of rammed earth and cast-in-place concrete construction. Additionally, through the use of straw bale construction, the buildings are able to achieve very high insulation values, which protect the inside environment from the intense Las Vegas heat. The five-building facility utilizes long roof overhangs to protect the buildings from summer heat gain while allowing the low sun of winter to warm the interior spaces. Cool towers and courtyard designs are intrinsic to reducing heating and cooling loads.

Technologies for the Desert Living Center are incorporated throughout the facility, but are not a primary focus in the design. Due to the rapid change of technological advances, a product that may be cutting-edge today could be outdated in two years. The technologies that are used work as a compliment to the basic sustainable design principles. These include automated window openers to take advantage of natural ventilation, advanced cooling strategies, radiant floor heating systems, light photocell sensors, solar hot water heaters, and reclaimed water systems, to name a few.

"It really looks like a desert project. It belongs here, and it integrates into its site extremely well."

Jury, AIA Nevada Design Awards, 2007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"CHANGE IS
AND THOSE
LOOK ONLY
PAST OR THE
ARE CERT