

**THE  
ENERGY  
GARDEN**  
The Arboretum GATEway Project

## Overview

The Arboretum GATEway Project is comprised of three main gateways that will help transform it from being the back end of the UC Davis campus to its “backbone” with the construction of several new buildings on its south end. Each GATEway is named after the specific aspect of the Davis community it is attempting generating awareness about: The Arboretum Discovery GATEway, University GATEway and City Arts GATEway. Our focus is to develop the open area near the City Arts GATEway that will be the primary entrance for people coming from downtown, south Davis and the Arboretum itself. Currently, the open area consists of poppy flowers and grass— a land ready to be renovated with the \$2 million plus budget. Our goal is to create an environment that entices the public to not only visit more frequently, but also be welcomed by a nature driven space that tells a story about what is going on in their own community.

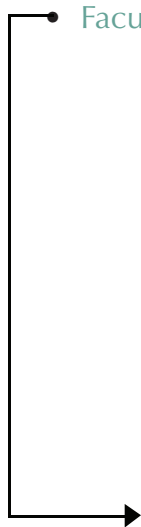
Our site, entitled The Energy Garden, is completely powered or built by environmentally friendly resources. From a bathroom constructed entirely of recycled material to a LED solar powered walkway, every aspect of The Energy Garden demonstrates the ubiquitous force of nature that surrounds us. The main area will consist of a green roof garden that shelters interchangeable exhibit that features work from the UC Davis campus. The rooftop itself will center around water wheel powered fountain that will circulate water through the coy pond. A section will also be designated for bike racks and bathrooms as well as a seating area with arbors providing shade for the benches. In addition to providing a serene environment in which people can luxuriate, discover and observe, The Energy Garden will be a place that people can come away from with a vast array of knowledge regarding UC Davis and nature ultimately inspiring them to explore the rest of the Arboretum.

# Visitor Analysis

The visitor analysis is comprised of various groups based on the priority they should be given in terms of how much the development of the site should be catered towards them. Each group can be represented by a persona, which is a model of a person who embodies the stereotypical characteristics of each group. Each persona is identified based on their name, age, location and arboretum use. Understanding how each of them fit into the different categories not only helps paint a more human-like depiction of the demographic, but is also used to create a design that addresses the audience's specific needs.

## Low Priority Groups (maintaining systems)

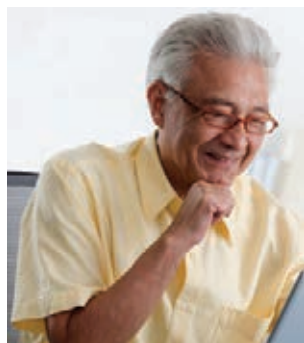
- Plant enthusiasts
- Animal enthusiasts
- Cyclists
- Faculty/Staff of UCD



**Name:** Dr. William Renelle, Professor of Plant Biology  
**Age:** 53  
**Location:** Davis, CA  
**Arboretum Use:** He is a professor teaching at UC Davis whose lab, called Plasmodelmata, focuses on plant taxonomy and horticulture. He relies on the Arboretum collections for tours and teaching of diverse plant families and genera. Students in his classes review their learning by touring the Arboretum independently throughout the quarter. The students that work in his lab find the Arboretum to be an extremely helpful resource.

## Medium Priority Groups (enhancing current systems)

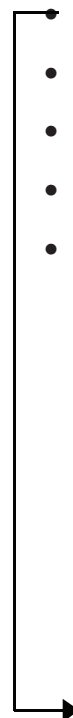
- Children
- Senior citizens
- UC Davis students
- Runners/joggers/exercise enthusiasts
- UCD Alumni



**Name:** Marty Lee  
**Age:** 68  
**Location:** Davis, CA  
**Arboretum Use:** Marty is a retired doctor from Kaiser Permanente who lives with his wife at home and has lived in Davis his whole life. He enjoys spending time in the Arboretum to read the Sunday newspaper and occasionally taking short strolls with his wife when they go on dates. The quiet serenity of the Arboretum in the late afternoon and wide availability of benches are what entice him spend his time there.

## High Priority Groups (creating new systems)

- High school students
- Out of town visitors
- Prospective students/parents
- Small business owners/community groups
- Grade school teachers



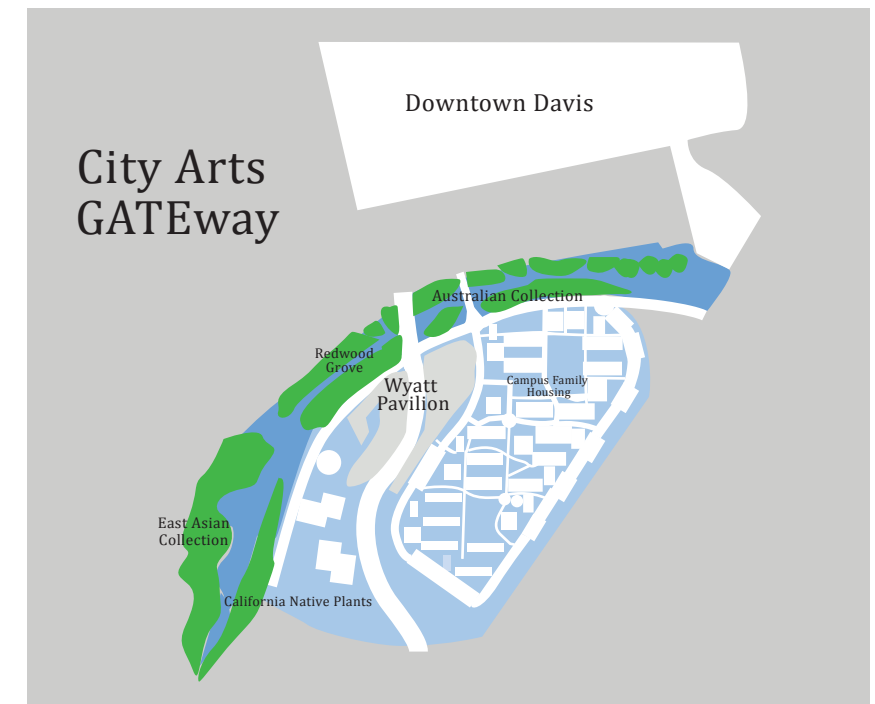
**Name:** Jack, Jill, Jennifer, Janet, John  
**Age:** 14-18  
**Location:** Davis, CA  
**Arboretum Use:** High school students are the most infrequent users of the Arboretum. They are part of a demographic whose interests are constantly changing. Most of them come from Davis Senior High school. Since they usually travel in small groups, their experience in the Arboretum would be much different from someone who is visiting alone.



# Site Analysis



The UC Davis GATEway has become a location of great interest for both university and community advocates due to the great deal of expansion on the south end of the Arboretum as well as its accessibility and aesthetic appeal. Since the Arboretum lies ten feet below street level, to enter and exit would require patrons to walk up and down hill. The poppy field slopes down approximately five feet below street level from right to left and becomes level with the sidewalks leading in and out of the GATEway. There is a tunnel beneath the train tracks on the opposite side of the poppy field which allows easy access for community members. It is also surrounded by sidewalks all along the water and leading up to the downtown area. The water ends with a levy sloping up to a gravel path occupied by passing bikers and joggers and is the flattest area for design.



**Clockwise Starting from Top:**

- A panoramic view of the site from Lake Spafford to the construction buildings.
- A map of the City Arts GATEway.
- A map of the site with measurements of the perimeter of each area as well as labels for each point of entry ranked starting with number one as the highest frequency of access.

## Points OF Entry

**1** This is the main point of entry through which the highest number of patrons come through to visit the Arboretum. People coming from Downtown Davis must pass through the Davis Commons to arrive at this area.

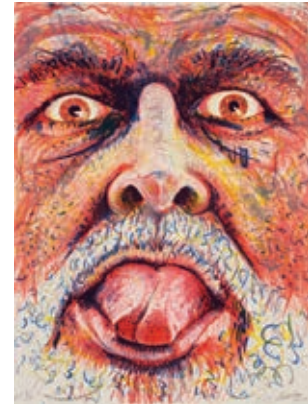
**2** Runners, joggers pass through this entry way to continue their exercise trails and visitors pass through this way to get to the Downtown area. This range of traffic makes it the second most frequented entrance.

**3** This path is used primarily by student bicyclists who are on their way to campus. Due to the fact that these bikers usually do not stop to actually enter the Arboretum it is rated as having the lowest number of visitors.



# Content Analysis

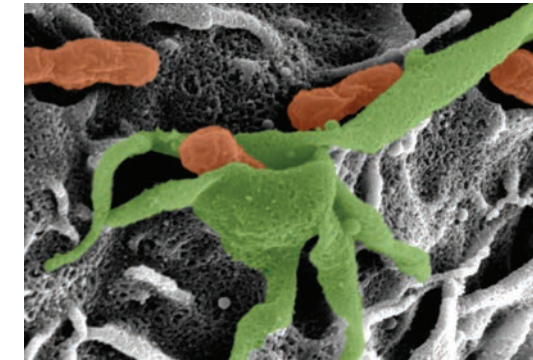
## College of Letters & Sciences



## College of Veterinary Medicine



## College of Biological Sciences



## College of Engineering



## College of Agricultural and Environmental Sciences



Understanding the needs of the university is a fundamental step in designing the content of the Arboretum GATEways project. Research was conducted on each of the five colleges in the university to assess what elements of their work they would like to highlight:

- Humanities
- Health
- Environment
- Energy
- Agriculture



# Operational Analysis

Most of the inspiration for this project came from the information gathered through the Operational Analysis exploration. This process researches various narrative environments that represent a mood board of the style of design we are trying to achieve. Overall, these images found of outdoor landscapes communicate a highly nature driven atmosphere that is not only eco-friendly, but beautiful.

## Necessary Elements

- Bathrooms
- Outdoor & indoor furniture
- Signage
- Vegetation

## Consultation Groups

- Students (recruited interns)
- Staff/faculty
- Volunteers
- Community Members

## Narrative Environments

- Classrooms/community space
- Restaurants/Cafes
- Indoor/outdoor exhibitions
- Landscapes/gardens



**Clockwise Starting from Top Left:**

An aerial view of the landscape of the De Young Museum.

Garden display of minerals and shrubbery; the main inspiration for our landscape design.

A green rooftop that provides shade as well as vegetation.

A series of landscape views of Turtle Bay.



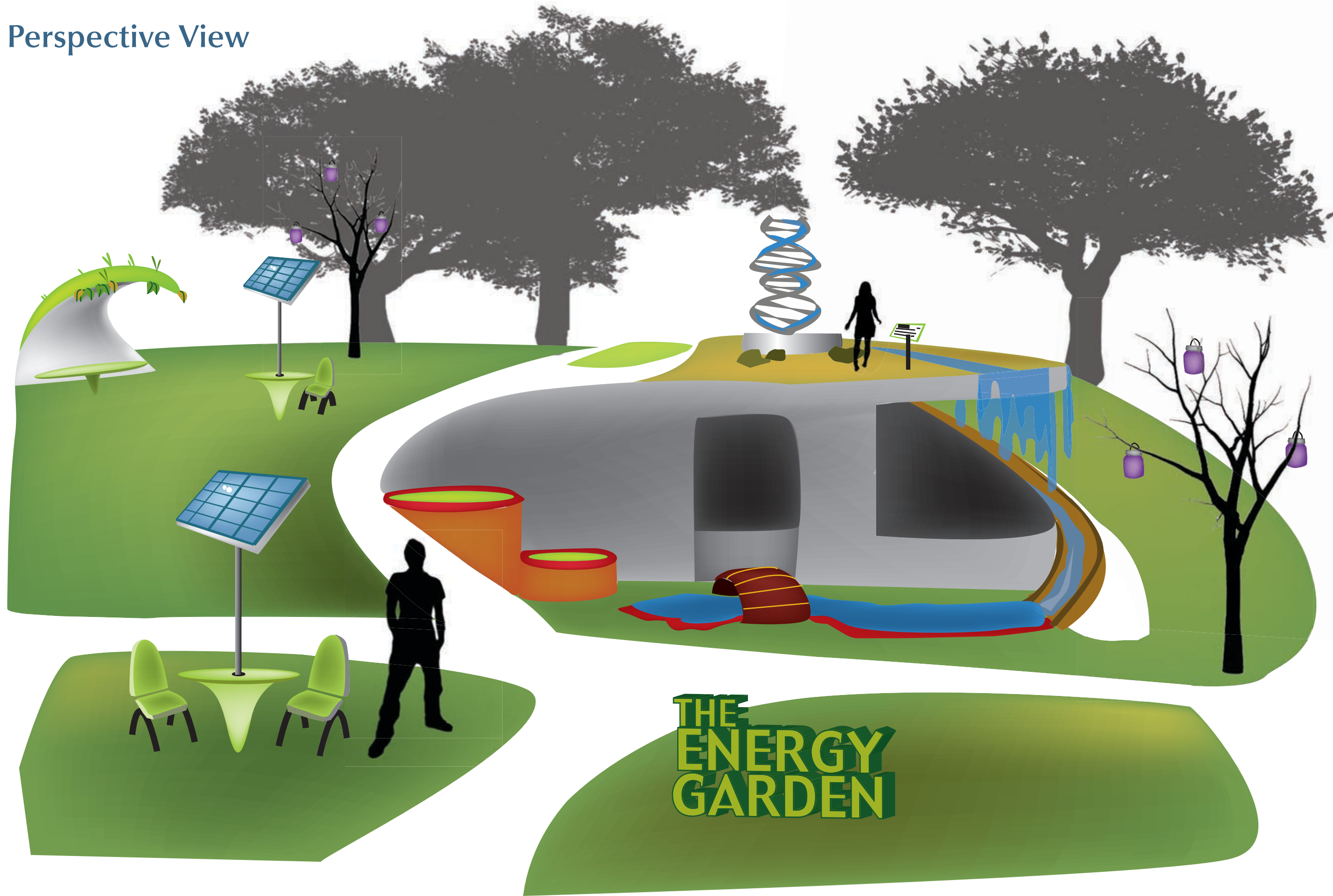


# Plan View



This plan shows an overview of The Energy Garden. Every element of the garden has a function and maintains sustainable design. The garden makes use of water and solar energy as well as recycled materials. It truly is efficiency at its finest. The area centers around a subterranean exhibit beneath a green roof garden. Inside the exhibit is an open space that will showcase interchangeable displays from UC Davis students. A section for seating is also designated at the south end of the site while bathrooms and bike racks occupy the area closest to Downtown Davis. We wanted to make the area welcoming for everyone to access as not only a UC Davis site, but also a place for people to picnic at and enjoy.

# Perspective View

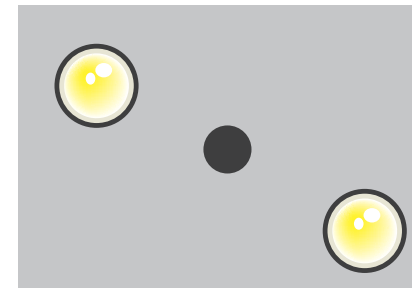




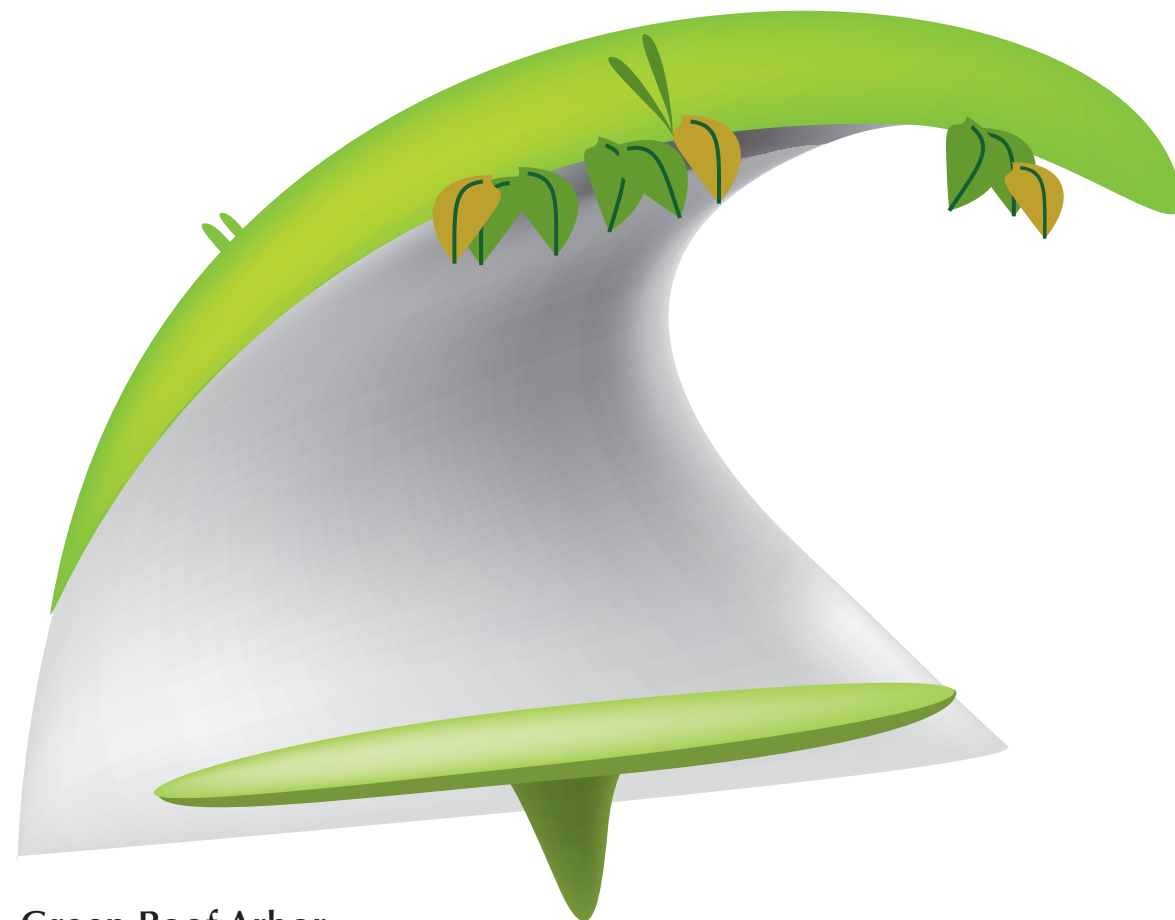
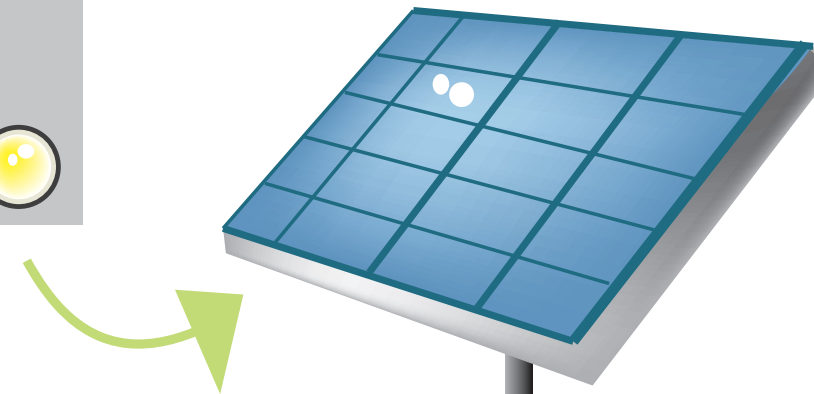
# Seating Elements

## Background Information

Solar panels collect solar radiation from the sun and actively convert that energy to electricity. Solar panels are comprised of several individual solar cells. These solar cells function similarly to large semiconductors and utilize a large-area p-n junction diode. When the solar cells are exposed to sunlight, the p-n junction diodes convert the energy from sunlight into usable electrical energy. The energy generated from photons striking the surface of the solar panel allows electrons to be knocked out of their orbits and released, and electric fields in the solar cells pull these free electrons in a directional current, from which metal contacts in the solar cell can generate electricity. The more solar cells in a solar panel and the higher the quality of the solar cells, the more total electrical output the solar panel can produce.

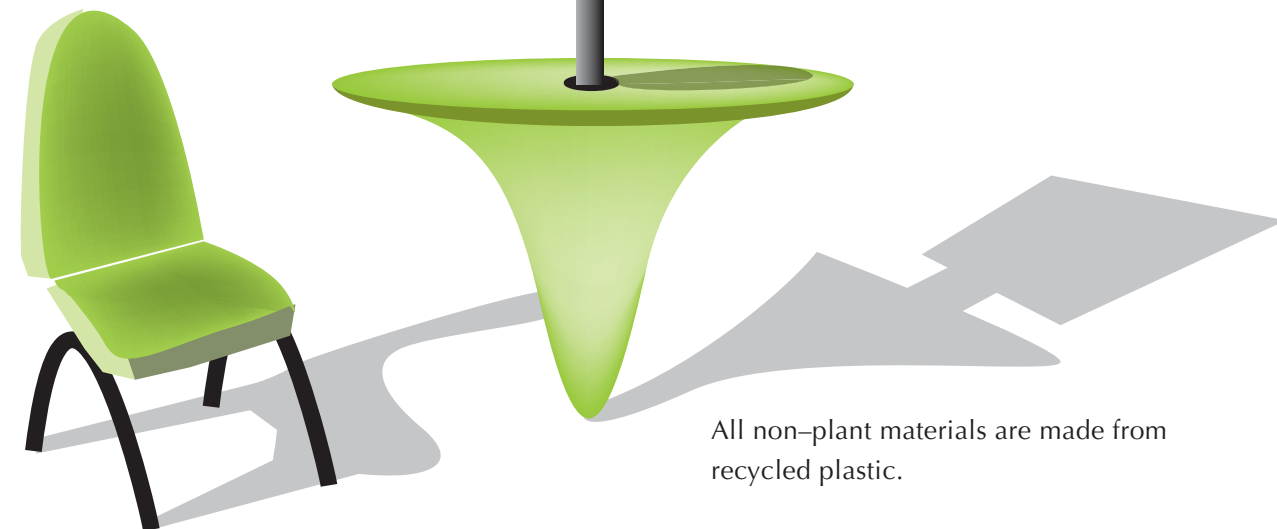


Lights are located beneath the solar panel



### Green Roof Arbor

The green arbor combines a beautiful atmosphere with a shaded sitting space that is ecologically friendly.



All non-plant materials are made from recycled plastic.

# Lighting Elements



The Sun & Moon Jars will be hung from tree shaped lamp posts to provide lighting for the seating areas. They also will be set below the walkway under each panel to illuminate the perimeter of the site a night time. The gentle glow and energy efficiency for the Sun & Moon Jars make them the perfect lighting tool for The Energy Garden.

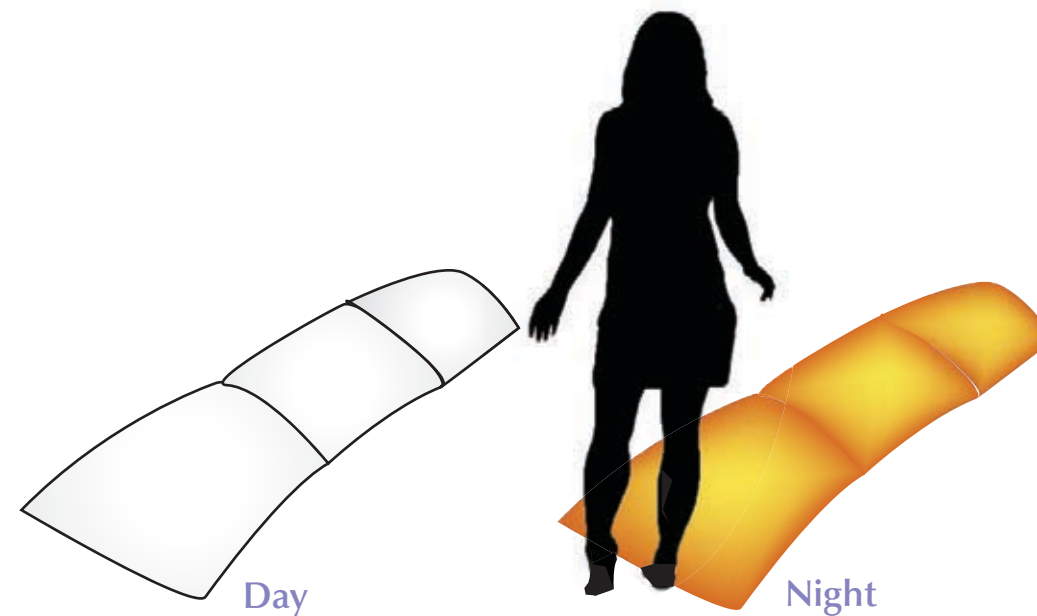


Tree Shaped Metal Lamp Post

## Sun & Moon Jars

Captured inside the Sun and Moon Jars are a highly efficient solar cell, a rechargeable battery and low energy LED lamps. When the jar is placed in direct sunlight the solar cell creates an electrical current that charges the battery over a few hours. This energy is then used at night to power the three LED lamps inside the jar.

The light is diffused by the frosted jar and give the appearance of sunlight emitting from the sun or a cool moon glow (warm colored LED lights are used to give a more natural and warm light). You may have noticed that there is no switch on the Sun Jar– in fact there are no visible controls at all– but rather a light sensor inside that automatically activates the LEDs when it gets dark or the lights are turned off.





# Signage

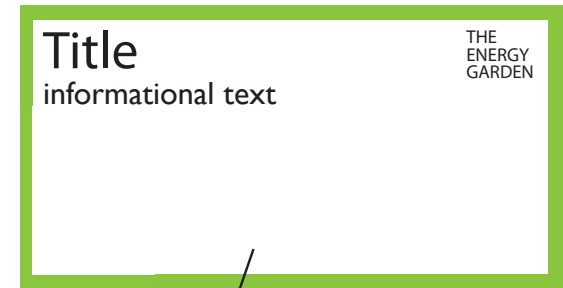
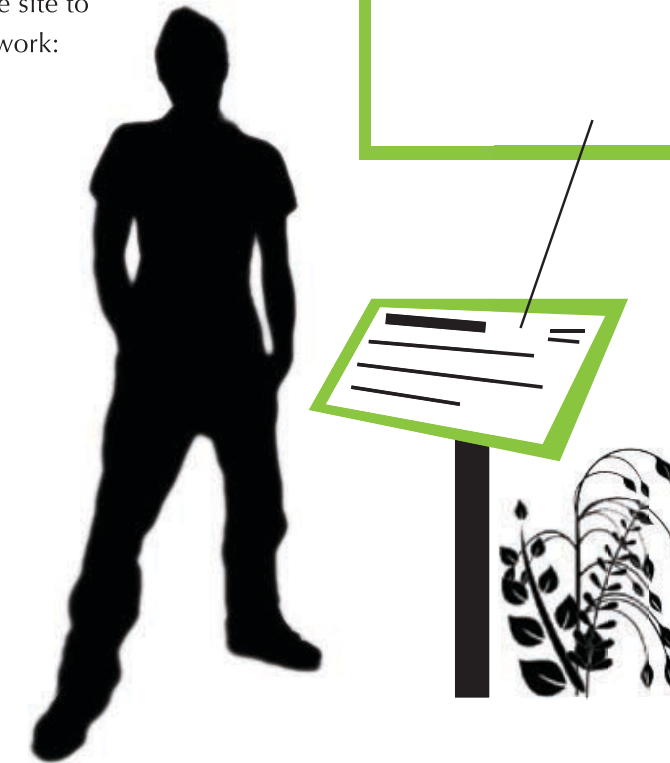
## THE ENERGY GARDEN



### Information Posts

This signage would be scattered throughout the site to explain the following elements and how they work:

- Medicinal plants
- Geology rock garden
- Fountain
- Water wheels
- Coy pond
- Ground construction material
- Bathroom construction material
- Benches
- Lights
- Pathway



### Main Entrance Signage

This three-dimensional sign that is made of stone, cement and rocks, will be the first element of The Energy Garden people will see when they enter. It will be placed at the most frequently visited entrance facing Downtown Davis. The design has many benefits:

- **Easy to read from a distance**– high visibility will entice people to come visit the site
- **Hard and durable**– allows it to withstand wear and tear of patrons and the weather
- **Sits on the ground**– a unique design that allows it be climbed on



### Bathroom Signage

These signs make it easy to distinguish each bathroom door and are consistent with our themes of growth and sustainability.

# Garden Details



## Green Wall

New technology has provided a way for building exteriors to serve as vertical gardens. For our design, we envisioned a vertical garden on the side of the subterranean exhibit structure. This will cover its entire visible exterior helping it to blend in with the landscape. The transition from a seemingly normal vegetative exterior to a highly ornamented interior will create an experience for visitors that they won't forget. The vertical garden helps to unify the Earth with the urban landscape furthering the integration of The Energy Garden into the Arboretum scenery.



## Recycled Plastic Wood



## Water Wheel

For our design our main concept is energy efficiency with natural power. The water element is represented through our water wheels which help circulate and power the flow between the coy pond and the DNA Fountain.

## DNA Fountain

In the center of the roof on the subterranean structure is the DNA Fountain which represents the studies of the College of Biological Science at UC Davis. Water begins at the top of the sculpture and flows down the double helix into the fountain and proceeds in different directions out of it. One stream flows to the top of the trough while the other flows off the side of the building dropping down into the trough. People inside the exhibit will be able to see the water cascading down in front of them through the opening of the building.



## Recycled Plastic Ground Reinforcement



## Coy Pond

In front of the subterranean structure we wanted to include a coy pond. Not only is it aesthetically pleasing and peaceful but it provides an ecological habitat for coy fish and amphibians.

## I-plas

The bathrooms will be constructed completely out of recycled plastic wood and its floors will be covered with recycled ground reinforcement. Each of these elements are environmentally friendly, but are still able to maintain the integrity of the landscape. Additionally, they are extremely durable and weather resistant, perfect for an outdoor public area.