

The James Learning Center

A learning center in central Arizona teaches visitors about all types of sustainability issues, including green building

BY CHARLIE POPECK



Courtesy, Catalyst Architecture



Christopher Barr

▲ Charlie believes places like the James Learning Center (upper right) are key to teaching the general public about the importance of sustainable construction.

On a recent weekend outing to Prescott, Ariz., I had the pleasure to tour the James Learning Center at the Highlands Center for Natural History, which turned out to be a wonderful learning experience. Located on an 80-acre site in the Prescott National Forest just outside of the quaint town of Prescott and approximately 90 miles north of Phoenix, the Highlands Center is a vibrant, community-supported center that provides critical environmental education for people of all ages.

The center offers educational programs on many topics, including how the area provides a transition zone between the southern and western Basin and

Range deserts and the Colorado Plateau to the north. The relationship of how native plant and animal species (like the Abert's squirrel) interact with and provide valuable functions for the surrounding forest were also very interesting subjects to explore.

My favorite part of the Highlands Center, as you might have guessed, is the LEED Gold-certified building at the heart of the development — the James Learning Center.

The center is an excellent example of how a building can blend in with its surrounding environment. It has many common-sense green building features incorporated into its design, such as structural timbers harvested

from the surrounding forest and walls made of natural stone. My three favorite design elements of the structure were its passive solar design, its butterfly roof and its constructed wetland.

Passive Solar Design

In an effort to save money on heating and cooling, the building was designed to take advantage of the solar resources that Mother Nature provides for free. The structure is optimally oriented to harvest sunlight, with most of its windows facing south to permit the most efficient heat gain. Clerestory windows, located along the full length of the building, provide more than enough natural light to brighten the gift shop and



Courtesy Catalyst Architecture

roof collects nearly every precious drop of rain that falls upon it and directs it into two collection systems — a funnel and underground pipe on the east side, and a local schist rock cistern on the west side. Both of these systems slow the flow of water, allowing it more time to soak into the soil and nourish the extensive variety of native and adapted vegetation around the facility.

Considering how important water conservation is, especially in the desert, the butterfly roof design is a fascinating way to display green building technology in a simple, easy to understand manner, enhancing the educational mission of the organization.



Courtesy Catalyst Architecture

direct daylight into the building, providing an enhanced indoor environment for workers and visitors alike.

Butterfly Roof

The butterfly, or V-shaped, roof is the most attractive architectural feature of the building. It provides a stunning visual as you pull into the parking lot and approach the structure. What's really interesting is how the shape of the roof mimics nature. The roof's arrangement and shape is much like desert plants that use the V-shape of their leaves to collect rain and direct it to their roots.

The natural green-colored, standing-seam metal

other interior portions of the building. The stained concrete floors and natural stone interior provide thermal mass that stores heat from the sun during the day, then radiates it back into the building at night.

Passive cooling is provided by large window overhangs, which will eventually be covered by native vines that are planted at the base of the windows and are currently being trained to cover the overhang structures. High-efficiency, properly placed windows provide natural ventilation and cross-ventilation, and will provide additional cooling effects throughout the building. Light shelves located over the windows

▲ The center's operable north and south clerestory windows were designed to ventilate the building when needed.

► The windows were also sized for maximum solar gain and daylighting, with minimal heat loss.

Constructed Wetland

Adding to the water conservation message is the constructed wetland located adjacent to a separate restroom facility. Considering that the center is located far from any city sewage system, a method of treating the black water from the restroom building had to be provided. The constructed wetland acts as a treatment facility, duplicating the complex processes that occur in natural wetlands, in which water, plants, animals, microorganisms and the environment interact to improve water quality.

Microorganisms in the wetland's soil feed and filter the grey water from the restrooms as it moves through a two-pond system. The water then recharges back into the wetland, providing nutrients to the wide variety of native plants. These plants are

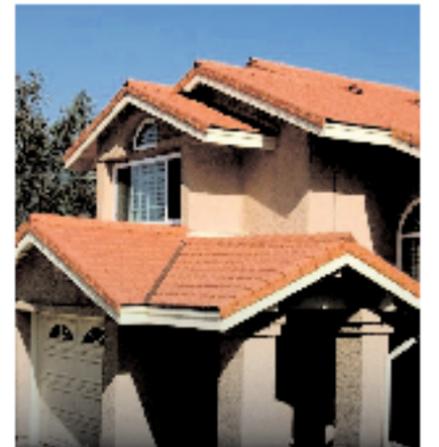
typical of those that thrive in the moist conditions of natural wetland habitats found in northern Arizona, and also provide habitat for moisture-loving wildlife species.

In my opinion, projects like the James Learning Center are the key to teaching the general public about the importance of sustainable construction and caring for our environment in a responsible manner. Although green building is only a part of the curriculum the facility provides, the sustainability information is presented in a way that illustrates how important our buildings are in the context of the ecosystems in which they are constructed.

I highly recommend visiting the James Learning Center at the Highlands Center for Natural History if you're ever in central Arizona, but make sure that you bring your hiking boots, as the surrounding trails are some of the best I've experienced.

For more information about the James Learning Center or the Highlands Center for Natural History, call 928-776-9550 or visit their website at www.highlandscenter.org.

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