



The University of Arizona: Continuing to Lead the Sustainable Way

Ralph Banks PE • published in the May 2013 issue

What is Sustainability? In its most simplistic vernacular, sustainability is a process of adopting and implementing policies, strategies, and technologies to achieve balance between societal needs and conservation efforts. Sustainable practices meet the needs of the present without compromising the ability of future generations to meet their needs.



Thomas W. Keating Bioresearch Building

Recognized as one of the world leaders in sustainability, The University of Arizona continues its mission to provide a comprehensive, high-quality education that engages students in discovery through research and broad-based scholarship by incorporating sustainability throughout the campus life experience.

Before the terms “sustainable” or “green” became widely used, the University of Arizona was already innovating, designing and constructing high performance, energy efficient buildings intended to last 50 to 100 years. Perpetuating that mission, the University is continually developing and improving its nationally recognized design and construction standards that require high performance materials, systems and methods and reflect our strong commitment to sustainable design.

Here at the Department of Planning, Design & Construction we are specifically focused on the built environment, fostering sustainability through the use of green materials, systems and methods while leading and facilitating creative innovation to benefit the University’s sustainability cause. Our basic goals are based on solid principles to provide high quality sustainable facilities that:

- Reduce waste generation and pollution
- Enhance building occupant comfort, health, well-being and productivity
- Utilize appropriate Sonoran Desert design
- Reduce Energy, water use and local infrastructure impact
- Maximize longevity and efficiency

As a way of validating and measuring these efforts, The University of Arizona registers its projects with the U.S. Green Building Council to achieve LEED © certification. LEED (Leadership in Energy and Environmental Design) is a standardized, nationally-accepted benchmark for the design, construction and operation of high performance green buildings. In recognition of these efforts the University received the 2012 Award for Most LEED New Construction Platinum Buildings from the Arizona Chapter of the U.S. Green Building Council. These

platinum rated buildings exemplify the highest achievable sustainable built environment and include Arbol de la Vida and Likins Hall Student Residences and the Student Recreation Center Expansion, the first LEED platinum university recreation facility in the country.

In recognition of this overall commitment to sustainability, the University of Arizona was named among the top “green” colleges in the country in The Princeton Review’s Guide to 322 Green Colleges: 2013 Edition.

Many significant examples of the sustainable built environment can be found and physically experienced across campus. These cover a spectrum of building types that include research, teaching, arts and recreation.

The Thomas W. Keating Bioresearch Building where interdisciplinary research is thriving and shaping the future, the BIOS Institute is harnessing a collaboration of five major disciplines Agriculture, Engineering, Medicine, Pharmacy and Science to find solutions to complex, biology-based challenges that affect us all in terms of preventing, treating and curing diseases, addressing environmental issues and more efficiently feeding our planet.



Manuel Pacheco Integrated Learning Center

The Manuel Pacheco Integrated Learning Center, created the first “green roof” in Arizona public architecture. The turf panel over the building is irrigated completely with reclaimed water and provides an excellent thermal mass that reduces the roof and wall heat loss/gain by more than 70% over a traditional above grade building while insulated skylights flood key areas with ample natural light. The HVAC systems continuously monitor the heating and cooling energy in the available outdoor air and sophisticated software control algorithms determine the optimum time to utilize this “free energy” to ensure both efficiency and comfort. Conditioned air, which is normally released from the HVAC systems to allow for fresh air intake, is channeled into the shaded central outdoor

courtyard to help temper that space from the extremes of our environment. This facilitates the outdoor courtyard serving as the lobby, circulation and queuing spaces for the lecture halls and classrooms in the building.



Architecture Building Expansion

The Architecture Building Expansion is “literally” a reflection of the school’s curriculum and a working laboratory for sustainable practices. The south side of the site is occupied by a water conservation demonstration garden showcasing five different Arizona ecosystems, where students and the public can learn about water efficient irrigation and native plants. Water captured from the roof deck and condensate from the HVAC system filters into a 12,000 gallon holding tank used for the garden’s irrigation system, resulting in an 87% reduction in the use of potable water for the garden. The architectural

vocabulary of the building is based on exposed building systems. The use of exposed mechanical, structural and architectural systems becomes an integral teaching tool for the students who occupy this building.



Stevie Eller Dance Theatre

The Stevie Eller Dance Theatre is inspired by dance and movement. Its sustainable design is apparent in its materiality and uniquely inherent in its form. A glass enclosed dance studio is supported by “dancing” steel columns above the entry porch and lobby. The studio’s transparency takes tremendous advantage of natural daylight while also serving as a beacon to the University’s Mall and gateway entry. The dance studios south facing glass is protected from the summer sun by a deep overhang. The east glass is creatively protected from solar gain by a woven steel fabric. This fabric has been allowed to naturally oxidize and therefore requires no paint or other treatment. The fabric wraps from the exterior, where it provides opportunities for dramatic night event lighting, through the lobby and into the performance theatre. In the theatre, the sculpted shape becomes the acoustic form necessary for the performance hall.



Student Recreation Center

The Student Recreation Center Expansion is The University of Arizona’s first LEED © Platinum registered project. Use and control of daylight is fundamental to the building’s character. Major building spaces are oriented to capitalize on the introduction of light from the north and south—the most controllable sun exposures. Solid walls on the east and west exposures and deep roof overhangs keep direct sunlight out of the building—minimizing thermal gain and controlling glare. Natural light introduces dramatically to the Fitness Room through a “fracture” of the roof plane and conveys through clerestory windows at the ceiling of this large, two story space. Large expanses of low emissivity glass allow views from and natural light into every space while maintaining an efficient building envelope. A translucent wall on the north side of the Multiple Activity Court provides a constant, even lighting level for gym activities. Occupancy sensors and multi-level, daylight-sensing lighting controls reduce unnecessary use of electric lighting throughout the building. Water harvesting principles are manifest throughout the site. The courtyard features permeable surfaces that serve as both recreation areas and rainwater infiltration basins. Swales and micro basins slow runoff and allow percolation—maximizing the benefits of available rainfall for the surrounding landscape.

In addition to providing sustainable built environments, the University is promoting and providing green energy generation to advance solar technology awareness and education on campus. Solar photovoltaic and solar thermal hot water installations can be seen on the rooftops of many campus buildings including; McClelland Hall, McClelland Park, Second Street Parking Structure, Hillenbrand Diving Center, the Student Recreation Center and Arbol de la Vida and Likins Hall Student Residences.



Solar generated hot water is utilized to heat the swimming pool at the Campus Rec Center



Solar photovoltaic and solar thermal hot water installations can be seen on the rooftops of many campus buildings

At the Student Recreation Center solar generated hot water is utilized to heat the swimming pool and drive an absorption chiller to provide chilled water building use. This was the first university recreation facility in the country to implement the use of solar generated energy in this unique manner.

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