



Award Category

Overall Sustainable Design

Green Features

Climate-responsive massing and orientation

Mixed-mode cooling with automatic and manual operable windows

Radiant heating and cooling

Advanced lighting controls

Cool-colored roof and planted roof garden

Extensive recycling of existing structure

FSC-certified wood

Rainwater capture and re-use system

450 kW PV array

Annual Energy and Cost Savings

1,780 MWh

50% energy cost savings

Size

206,000 ft²

Cost

\$104 million

Completion Date

January 2014

San Diego State Conrad Prebys Aztec Student Union

When San Diego State University outgrew their student union, the student body made a bold statement using a familiar architectural vocabulary. California's largest LEED Platinum education building combines high performance with an enduring architectural style and state-of-the-art facilities.

The Conrad Prebys Aztec Student Union is the first major sustainable new construction on the SDSU campus. It replaces a beloved but ill-equipped former facility that, in its day, had won an award for its modernist design. In contrast, the new building is a return to the historic architecture of the campus core, although at a larger scale. At 206,000 square feet and 4-stories, the project contains a new 300-seat theater, a 6000-square-foot gym, a bowling alley, three dining facilities, a major ballroom, retail space, and twice the amount of office and meeting space than the former student union.



A generous arch welcomes students and visitors to the central courtyard. Photo: Pablo Mason Photography.

The ambitious project was fourteen years in the making. After it proved too costly to renovate the old building, a student referendum to remodel the well-loved facility was supplanted by a new measure in 2009 to create a new, LEED Platinum building. At the height of the recession, the students' commitment to achieve LEED certification was an important stipulation, as it elevated the request for new spending on an iconic part of campus infrastructure with many measurable and positive impacts.

Contrary to earlier interpretations of historic campus architecture, the direction for this

project was informed by a deeper consideration of California mission-revival architecture, using vernacular forms that evolved to provide comfort in the warm, dry San Diego climate, well before the advent of air conditioning.

The massing and organization of the building was rooted in this climate response: tightly-grouped masses with shallow floor-plates organized around a series of courtyards and exterior, covered walkways. Vaulted spaces, deep overhangs, recessed windows, arcades and balconies were incorporated to enhance passive performance, and also to evoke the open yet protected sun-baked buildings of the past.

According to Glen Brandenburg, Director of Facilities and Sustainability, people visiting the campus can be heard asking "where's the new building?" which to him is a real testament to the project's success.

By executing the historic features faithfully, the end result is a highly energy-efficient building.

The new complex also builds on the old student union it replaced, both in literal and symbolic gestures. The project recycled or reused 85 percent of the previous building's concrete, glass and aluminum, and cherished features were preserved,

including a historically significant mural, which was rescued from the old lounge and given new prominence in the new ballroom. A beloved, aging sycamore tree was salvaged for an art piece for the council chambers.

The design team, led by CannonDesign and P2S Engineering, saw the project's wide diversity in user groups and space types as an opportunity, grouping similar program elements together to optimize various conditioning strategies. On the cooler east side of the building, a low-energy, low-pressure variable-air-volume (VAV) system using large amounts of outside air made the most sense

Additional Awards

LEED-NC Platinum

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More Information

<http://www.utsandiego.com/news/2014/Feb/14/majoring-in-envy-at-new-aztec-center/>

<http://www.p2seng.com/conrad-prebys-aztec-student-union-sdsu/>

<http://www.cannon-design.com/projects/project-catalog/aztec-student-union/>

for spaces with high loads and ventilation demands, such as the bowling alley, theater and food service areas.

On the west side of the building, a dining area relies on natural ventilation assisted by a radiant system and ceiling fans. In the office areas, a dedicated outside air supply (DOAS) system is combined with a radiant system. Strategies to reduce electric lighting — roof monitors, clerestory windows and task-ambient conditioning — also help to reduce cooling and lighting loads. To further reduce ventilation energy use, CO₂ sensors were added in high-occupancy spaces.

The fitness center on the south side of the building was designed to alternate between air conditioning and natural ventilation. A manual switch near the front desk and a signal tied to outside conditions indicates when it is okay to shut off the AC.

The design leverages architectural features such as exterior circulation to downsize HVAC equipment and reduce costs.

It was assumed that combining so many different strategies would increase costs. However, according to the lead engineer, “the radiant plus DOAS system came out \$2 per square foot less than VAV.” Overall, the HVAC system is designed to consume 40 percent less energy than state energy standards.

The project was contingent on student involvement, and student leaders were engaged throughout the process. The design unfolded through a series of workshops in which the design team presented and evaluated a range of sustainable strategies.

The design includes a 450 kW photovoltaic array, including 355 kW installed over a nearby parking-lot. Demand-side energy management was implemented through the building management system, to cycle or limit certain equipment during high demand times.

The building is also extensively submetered; the facilities team monitors plug loads and lighting to explore deviations from assumptions and to provide feedback for users. Regarding the challenge of influencing energy-use behavior, Brandenburg remarked that “convincing others to make that extra effort, when you’re dealing with different programs requires some creativity.” The student group “Green Love” plans to install a public energy dashboard and encourage “zero waste events,” to allow staff and students to become accustomed to compostable products and other food service best practices.



The massing borrowed heavily from historic architecture, with narrow floor plans, courtyards, and many self-shading features. Image: SDSU.

LESSONS LEARNED

For such a large project, the market for energy-efficient technologies can evolve over the course of design and construction. Had the team foreseen the evolving market for LED lighting, they might have made a greater push to include it on the project.

Another important lesson was that a complex program with diverse spaces offers many different ways to reach sustainability goals. However, coordination with the many tenants of these spaces — through lease agreements, guidelines for build-outs and other means of coordination — becomes a critical component for the team to consider early in the process, before retailers and tenants finalize plans.

Best Practices case studies are coordinated by the Green Building Research Center, at the University of California, Berkeley.

The Best Practices Competition showcases successful projects on UC and CSU campuses to assist campuses in achieving energy efficiency and sustainability goals. Funding for *Best Practices* is provided by the UC/CSU/IOU Energy Efficiency Partnership.

