BEST PRACTICES 2011

San Diego City College Career Technology Center

The Career Technology Center provides updated and expanded facilities for high-demand vocational programs at the college. The project earned LEED Gold certification for its sustainable design and construction, exceeding district requirements and providing a model for smart growth in an urban setting.

Award Category
Overall Sustainable Design

Green Features
High-density urban infill and brownfield remediation

64% construction waste diverted from landfill

Rooftop and vertical wall photovoltaic systems

55% reduction in indoor water consumption

Drought-tolerant and low-maintenance landscaping design

Systems commissioning

Informational signage for sustainable features

Annual Energy and Cost Savings
27% greater efficiency than Title 24 standards

1240 MBtu

$23,200

Size
88,000 ft²

Cost
$63.1 million

Completion Date
April 2010

San Diego City College's nursing, cosmetology, and photography programs are enjoying modernized instructional and career training space at the Career Technology Center (CTC), a new 88,000 square foot facility that will allow student enrollment to double for all three programs. With numerous sustainable design strategies and features, the building is the first on campus to earn LEED certification at the Gold level, and only the fifth to do so in the San Diego Community College District.

Exterior view of the Career Technology Center. Photo: San Diego Community College District.

Sustainability at the CTC begins with the building's site. This five-story urban infill project increases the area's development density, replacing several single-story buildings and ground level parking that formerly existed on the site. However, repurposing this previously developed property was not without its surprises. During the initial excavation the project team discovered an unexpected pocket of petroleum-based soil contamination, most likely the by-product of auto mechanic shops operating under laxer environmental laws in place years ago. Remediation was performed for 8000 cubic yards of contaminated soil, turning the CTC into a model for smart growth through brownfield redevelopment.

The project's urban location provides convenient access to alternative modes of transportation, with stops for seven bus routes and two trolley lines located within walking distance. An eleven-story attached parking structure is available for those driving to the facility. The benefits of the parking structure extend beyond providing a place to leave a car, however. Its strategic placement on the east side of the classroom building reduces solar loads by shading the shorter structure, lowering cooling requirements in the classrooms. The parking structure is entirely naturally ventilated, with the exception of a partial basement area, eliminating fan energy consumption.

Roughly 28% of materials are sourced regionally from within 500 miles of the building, and over 50% of wood products are from FSC-certified forests.

The south exterior wall of the parking structure is clad with a vertical photovoltaic array, which at 34 kW was thought to be the largest in the country at the time of construction. The system is positioned to maximize renewable energy generation in winter months, and to shade the garage from heat gain in the summer. A second photovoltaic system is located on the roof of the classroom building. The 17 kW roof array, mounted at a 17 degree slope, maximizes output during summer months. Together these systems are predicted to generate 71,500 kWh annually, reducing building energy costs by nearly eight percent.

The project team further reduced energy use through a series of strategic design decisions. The two stair towers in the classroom building are located at the perimeter to enable passive ventilation of accumulated solar heat gain. This approach also encourages vertical circulation via the stairs rather than the elevator,

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Additional Awards

LEED-NC Gold

Contacts

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Project Team

Architect: Carrier Johnson + CULTURE

Civil Engineer: RBF Consulting

Structural Engineer: KPFF Consulting Engineers

Mechanical Engineer: MA Engineering

Electrical Engineer: ILA Zammit

Landscape: McCullough Landscape Architecture

Construction Manager: Rudolph & Sletten, Inc.

Propositions S & N Program Manager: Gafcon, Inc.

More Information

http://public.sdccdprops-n.com/Projects/City/Pages/1122.aspx

saving energy and promoting healthy habits among building users.

Daylight harvesting was a design priority throughout the CTC. In the classroom building, southern facades are stepped back to allow daylight penetration at several corners, and extensive glazing on the northern exposure maximizes daylight and views. Glazing on the west side of the building has either a 40 percent ceramic frit coating or is shaded by vertical perforated metal panels to allow for views and daylighting while controlling heat gain. Work and study areas in the building are equipped with daylight controls and occupancy sensors to further reduce electric loads.

Vertical photovoltaic array on garage structure. Photo: San Diego Community College District.

Due to its multiple energy conservation approaches and year-round renewable energy production, the CTC will use 25 percent less energy than allowed by Title 24. The building underwent thorough commissioning during its initial occupancy to ensure that systems were performing as designed. Another evaluation will take place after one year of operation to assess how actual energy performance compares to modeled estimates.

Water use at the CTC has been reduced dramatically, both in the building and on the grounds. A 55 percent reduction in indoor water use is expected from the waterfree urinals, dual-flush toilets, and low-flow lavatory faucets. Drought-tolerant plantings and synthetic turf reduce irrigation water demand by 57 percent. An additional benefit of the landscape design is its low maintenance requirements, which has generated positive feedback from the college's landscape staff.

The CTC is thought to have to largest vertical solar array in the country at the time of its construction.

The project team took several steps to ensure that the completed building provides users with a high level of indoor air quality. Low-emitting materials are used extensively throughout the project to reduce off-gassing of potentially harmful pollutants. An indoor air quality management plan was implemented to control pollutant sources during the construction and pre-occupancy phases. Just prior to occupancy, the building was flushed with outside air for eleven days to remove particulates and provide a high level of occupant comfort upon occupancy. Walk-off grates at ground floor entryways are included to capture contaminates from foot traffic and help maintain air quality.

LESSONS LEARNED

Shortly after the CTC opened, a few students expressed concern that the parking garage stairwells were underlit. The college performed foot-candle measurements throughout the structure and found that lighting levels met or exceeded state recommendations. At the suggestion of the students, the campus installed mirrors in the stairwells to improve visibility and enhance a sense of security in these spaces. The solution has resolved the issue and created goodwill between administrators and students. David Umstot, SDCC District Vice Chancellor of Facilities Management, stresses the importance of being responsive to the needs of building users and taking corrective action whenever feasible.

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.