BEST PRACTICES 2010

De Anza College Mediated Learning Center

With forward-looking learning environments and highly sustainable features, this project will house digital media tools that will modernize the academic experience. The project aims to transform a little-used area of campus into a major learning center, and create one of the college's touchstone buildings.

Award Category

Overall Sustainable Design

Green Features

Sited on previously developed land

Orientation optimizes PV operation and daylighting

HVAC design nearly eliminates fan-powered ventilation, heating and cooling

48% reduction in water consumption

Building commissioning

Green housekeeping

Annual Energy and Cost Savings

26% greater energy efficiency than Title 24 standards

193,000 kWh

$47,000

Size

66,900 ft^2

Cost

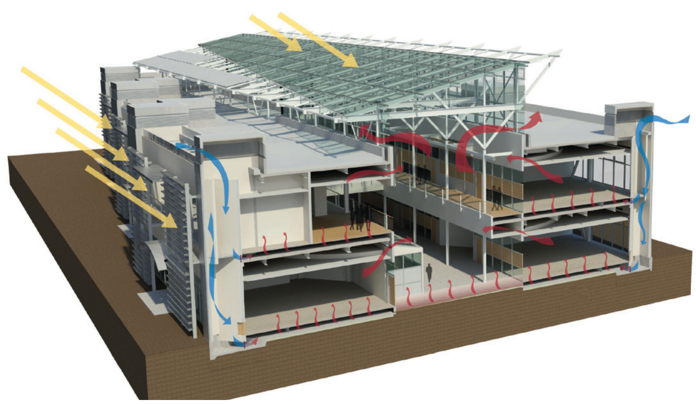
$56 million

Completion Date

Scheduled for completion Fall 2012

The Mediated Learning Center at De Anza College sets a new standard for digital learning by enabling students to access academic content through a wide variety of digital media formats. The building has a dedicated television recording studio, editing suite and broadcast space to support programming, recording and transmission of lectures. Classrooms are planned to enable online, collaborative instruction in real-time. The project is targeting LEED-NC Platinum certification from the U.S. Green Building Council.

The building was initially planned with a north-south orientation to reduce construction costs and minimize changes to existing campus infrastructure. However, further investigation by the design team revealed that an east-west orientation was highly preferable for solar energy collection and daylighting. Inspired by the opportunity to significantly reduce energy use, the college decided to re-orient the facility and take advantage of these site factors. The result is a highly efficient building that employs sophisticated technologies and design strategies to reduce its environmental impact.



Section through atrium shows the center's passive and renewable energy systems. Image: Ratcliff.

The heart of the Mediated Learning Center is an airy, two-story atrium that creates space for social interaction and circulation under a fritted, high-performance glass skylight. This defining design feature is also a major component of the building's unique buoyancy-driven air circulation system, which will ventilate over 80 percent of the building without fan power. The system will produce high levels of indoor air quality by supplying 100 percent outside air at all times and providing six air changes per hour.

The heart of the project is a central atrium that serves multiple environmental, social, and architectural functions.

The buoyancy-driven system operates by drawing in outside air through tower-shaped air intakes on the rooftop. As the air passes over cooling coils and the temperature decreases, it falls downward through a large shaft into the underfloor plenums serving the first and second floor. Heating coils warm the air as needed to meet occupant comfort criteria, at which point it is supplied to the building interior through local floor diffusers. As air is warmed by occupants and equipment, it rises along with indoor pollutants to ceiling exhaust shafts, which direct air into the atrium where it is ultimately exhausted through clerestory louvers.

The center uses an underfloor air distribution system to deliver air directly into the occupied zone. This system can reduce energy use and improve perceived indoor air quality by allowing for warmer supply air temperatures and encouraging thermal stratification. Space heating and cooling is provided by a radiant floor system that circulates hot or cold water through tubes embedded in the concrete slab.

2010

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Additional Awards

Targeting LEED-NC Platinum

Contacts

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Project Team

Architect: Ratcliff

Civil Engineer: Sandis

Structural Engineer: Forell/Elsesser Engineers, Inc.

MEP Engineer: WSP Flack + Kurtz

Landscape: Office of Cheryl Barton

Contractor: Sundt

Program Manager: Gilbane Maas

More Information

www.deanza.edu/measurec/mlc.html

www.ratcliffarch.com/projects/DeAnzaMLC

The 2030 Challenge: www.architecture2030.org

On-site renewable energy systems at the center will reduce annual energy costs by nearly 28 percent. Photovoltaic panels totaling over 6000 ft^2 will cover sloped roof surfaces. Over 1500 ft^2 of solar thermal collectors will provide both domestic hot water and a large portion of the heating load during cold weather.

A building management system (BMS) will monitor and control the operation of major mechanical and electrical systems and equipment. Weather stations located on the roof will transmit data to the BMS to enable optimal functioning of the buoyancy-driven ventilation system. Carbon dioxide sensors and thermostats in the classrooms will be monitored by the BMS, which will adjust ventilation as needed. The BMS will also adjust lighting levels based on occupancy and daylight availability to reduce energy consumption. Start-up and ongoing commissioning is planned to verify and maintain performance.

The building is expected to use less than one-third of the energy used by comparable existing buildings.

With multiple energy conserving strategies, the building is expected to use 71 percent less energy than the regional average for higher education buildings, per the Commercial Buildings Energy Consumption Survey. This impressive achievement will place the project well ahead of ambitious energy targets such as the 2030 Challenge; the center will meet the Challenge's 2015 reduction target ahead of schedule when it opens in fall 2012.

Surrounding the building, drought-resistant vegetation and shade trees will conserve irrigation water and create a welcoming gathering place. Constructed site features called runnels will aid stormwater management and quality by allowing rainwater collected on the rooftop to infiltrate onsite through narrow channels.

Low-flow plumbing fixtures including 1.28 gallon per flush toilets and 1/8 gallon per flush urinals reduce indoor water use to 48 percent below the calculated LEED baseline. This equates to roughly 117,000 gallons of potable water savings annually.

Exterior view of the Mediated Learning Center. Image: Ratcliff.

Sustainable materials are used throughout the project. Redwood benches on the building grounds will be milled from trees harvested from overcrowded groves on campus. Interior materials including carpet tile, floor tile, batt insulation, acoustical panels, and countertops will contain recycled and regional content. The project team will use several third-party certification programs to guide materials selection and ensure that the desired environmental benefits are present in purchased materials, including the Forest Stewardship Council and Greenguard for Children & Schools.

LESSONS LEARNED

The project's innovative building systems will require operations and maintenance procedures that differ from typical campus protocol. When pioneering a new technology on campus, De Anza College recommends engaging operations staff in the design phase so that they may evaluate future operational requirements, provide input into systems design, and prepare for changes to standard procedure.

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.