

GRAND PRIZE

University of Colorado
Boulder

GREEN FACILITY



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Living and Learning Sustainably

Colorado research university aims for LEED Platinum with a green dorm

Williams Village North, the newest residence hall at the University of Colorado Boulder, isn't just a place to sleep and study – it's a learning community built around a commitment to sustainability.

Completed in August at a cost of about \$46.5 million, the 500-bed structure boasts conference and faculty offices, classrooms, a community kitchen, laundry facilities, recreation and common rooms, and space for a future coffee shop. Drought-resistant plants native to Colorado provide 100% of the vegetation on the site.

The project is on track to become the university's first LEED Platinum building. It will join the campus's one Silver and seven Gold buildings, along with several others awaiting certification.

CU's standard for new construction is LEED Gold, but when the building committee realized that Williams Village North was within reach of LEED's highest certification level, the design-build team created a customized plan called the "Roadmap to LEED Platinum" with a list of sustainability upgrades and associated cost/payback analysis.

"From the beginning, our vision for this new residence hall was to create a living learning laboratory to blend

PHOTO ABOVE: Williams Village North, the newest dorm at University of Colorado Boulder, is set to become the university's first LEED Platinum building when it receives its certification. The residence hall houses 500 students, plus apartments for the hall director and a member of the faculty.

sustainability with student housing and academics," says Heidi Roge, project manager for the university's Housing and Dining Services department.

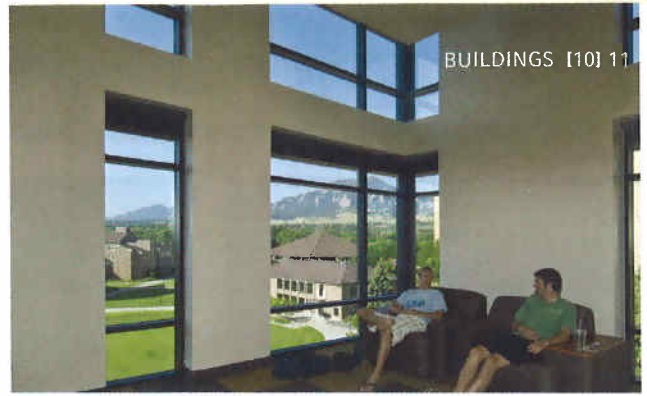
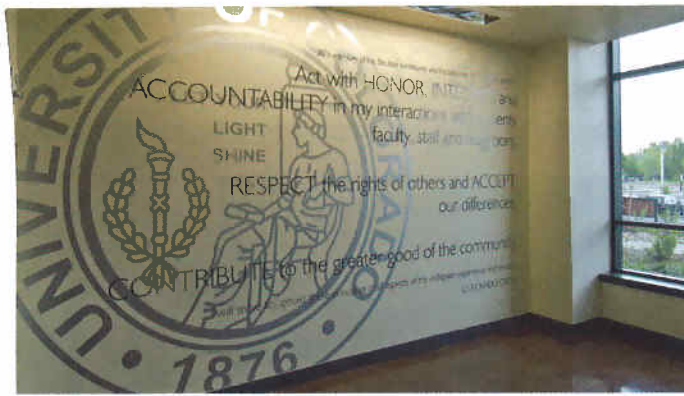
Williams Village's cutting-edge greywater system is currently in its pilot phase, so it uses domestic water in place of greywater. Pending final approval from the city, the system will collect runoff from sinks and showers, treat it, and reuse it in the facility's toilets. Adding to the water savings, the building uses integral diversion systems in the downspouts to irrigate landscape beds with redirected rainwater, and low-flow plumbing fixtures are used wherever possible.

The six-story dorm also maintains a sharp focus on energy conservation. PV panels and a solar thermal heating system offset 12.5% of the building's energy consumption with renewable energy and preheat domestic hot water for all 140 showers. The dorm also uses an energy recovery heat exchanger to preheat makeup air from building exhaust.

Common areas at Williams Village include a community kitchen, laundry room, recreation room, great room, and space for future retail. The housing department plans to observe the use of the spaces and poll students about their needs in order to use the spaces for services students need most, explains Heidi Roge, project manager for the Housing and Dining Services Department.



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PHOTOS ABOVE AND LEFT: The hall serves as a “living learning community” for its residents, boasting five classrooms, 10 academic offices, and an office for the hall director. The building itself provides additional sustainable living lessons, such as maximizing daylighting with glazing tuned to the orientation of each face of the structure.

Phantom load switches in every room control power for color-coded outlets, allowing students to turn off power to every outlet in the room at once except for dedicated outlets reserved for items like alarm clocks and mini refrigerators.

“The cost of the phantom load switch upgrade was over \$40,000,” Roge says. “Certainly this upgrade will result in tangible energy savings, but the decision to incorporate the phantom load switches was based on the university’s desire to provide teaching tools for its residents.”

Windows in students’ rooms are equipped with sensors that turn off the HVAC system when a window is open, a feature that’s estimated to save about \$54,000 per year. Vacancy sensors turn off the lighting automatically when no one is present. The windows themselves also help create opportunities for savings, with tuned glazing based on the windows’ location and building orientation. All of the student room windows in the north courtyard are 1 foot wider (or 25% larger) than the ones on the rest of the building, and window glass was chosen based on which way each window faced.

“All of the windows on the east, south, and west elevations utilized Low-E 240 glass, which blocks heat in the summer, reduces glare, and encourages the use of natural daylight inside the building,” Roge explains. “All of the north-facing windows utilized Low-E 366 glass, which blocks glare but is more transparent, since these rooms never receive direct sunlight.”

The building is fitted with a suite of meters and an automated monitoring system that allows administrators to monitor, display, and track consumption of electricity, water, chilled water, and steam at the heating and cooling plant.

An additional submetering system shows real-time

consumption data on a large LCD screen in the lobby, a function that will help determine the winner of building and campus energy use competitions planned for the fall.

The screen translates the data into illustrations of students’ environmental impact by showing usage in terms of equivalent carbon dioxide emissions, forest acres and number of trees required to absorb emissions, driven miles, and gallons of gas. ■

The building utilizes low-flow plumbing fixtures and a grey-water system (which is in its pilot phase) to conserve water. CU-Boulder is working closely with the city and county to solve the system’s water use and water rights issues.



PROJECT TEAM (partial list)

- OWNER** (Award Submitter): University of Colorado Boulder
- CONTRACTOR:** The Whiting-Turner Contracting Company
- ARCHITECT:** Aller-Lingle-Massey Architects P.C.
- ASSOCIATE ARCHITECT:** Mackey Mitchell Architects
- LANDSCAPE ARCHITECT:** BHA Design
- CIVIL ENGINEER:** Drexel Barrell and Company
- M/E/P:** BCER Engineering