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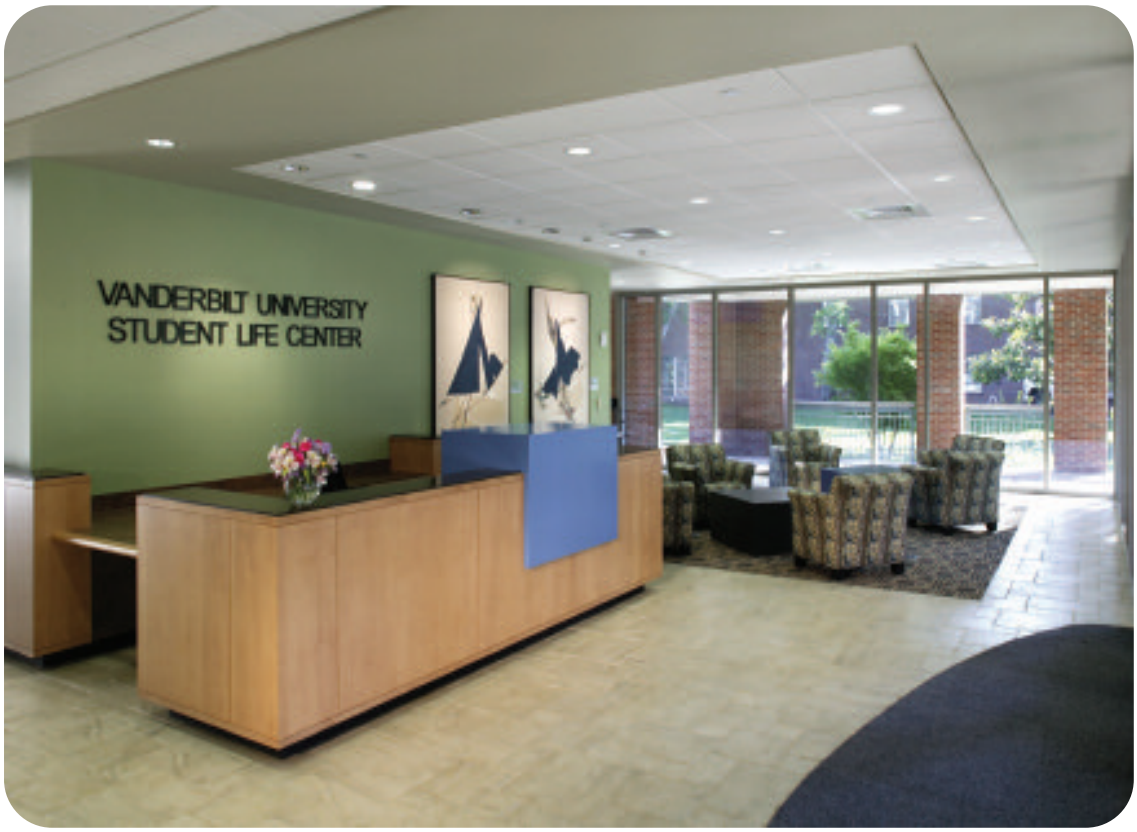
Energy Conservation Key on Vanderbilt University Project



Student Life Center Vanderbilt University Project photo

See full article in the Project Profile on page 6.

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Project Feature

Energy Conservation Key on Vanderbilt University Project

By Orion Building Corporation

Energy conservation and sustainability were key goals for the project team on the $9.5 million Student Life Center for Vanderbilt University. Orion Building Corporation, based in Nashville, served as construction manager on the project and worked with the university over a five-year period to develop budgets and timelines for the project.

The 62,000-square-foot facility, completed in February 2005, includes a 19,000 square-foot parking garage, 26,000 square feet of public meeting space, 15,000 square feet of office space, an 8,000 square foot ballroom, and supporting catering facilities.

Vanderbilt brought Orion on board in 1998 to provide preliminary budgets. At that time, the university's program for the facility was very fluid, and concept drawings had not been developed. There were a lot of different departments and users that were being considered for space in the proposed facility. To meet almost weekly requirements for new budgets based on a changing program, Orion developed a spreadsheet matrix to be able to quickly respond to the needed cost information.

According to Orion Chairman of the Board and CEO Richard Cooper, the estimating team relied on both an in-house cost database and discussions with various subcontractors to develop solid numbers. The preliminary budgeting phase continued for almost two years

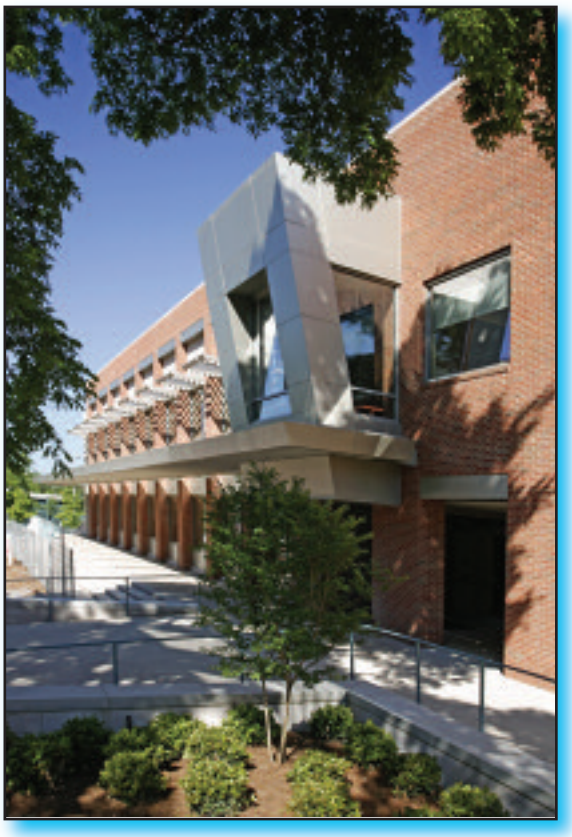
In early 2003, the program was finalized, and a construction budget of approximately $9.5 million was set. Orion then developed a project control schedule to put the construction team on track to meet a March 2005 occupancy date. Schematic, design development and construction documents were all completed according to the schedule. Orion used Timberline estimating software and SureTrak scheduling software to test both the cost and time components at each stage of design. Value engineering and life cycle costs analyses were used during the schematic and design development phases.

"We developed a shopping list for the team to review and then the owner could pick and choose what they felt they wanted to change," Cooper says. One item the university decided to change was the structural system used in the parking garage. Orion provided a list of several options; Vanderbilt selected a hollow core pre-cast concrete because it provided a significant cost savings over steel.

Orion also typically provides its clients life cycle analyses of selected systems—such as the mechanical system or the lighting used—to provide alternative methods for delivering services that might be more cost-effective over the life of the system.

Cooper notes that on the Student Life Center, the project team was somewhat limited in providing alternative options for the mechanical system because of the university's existing underground steam and chilled water facilities, which would form the foundation for whatever mechanical system would be selected. "Because they've got steam and

chilled water sources, the types of systems that you can look at are more limited than in a conventional stand-alone building," he explains.



Energy efficiency was a key objective on the project. The construction team installed energy monitoring and adjusting control systems in the building to decrease energy consumption during non-peak times of building use. A clerestory outfitted with reflective baffles, was included above the 2000 square-foot gathering space to allow for natural daylight to be reflected and diffused to the floor area 35 feet below.

Numerous passive energy-saving exterior elements were integrated into the architecture of the building, including large aluminum composite wrapped fins on the east elevation, sunscreens and a large entry canopy protecting the office windows on the south side and massive masonry wrapped fins on the west elevation. Additionally, the roof was designed to allow 25 percent of the rooftop water to flow into planting beds and grass spaces around the facility to absorb runoff slowly and any non-absorbed water to be cleansed before it entered the stormwater system.

Exterior materials were selected for their durability. Aluminum composite panels, brick and cast stone veneers were used to define the major shapes of the building. Because of the large number of persons using the facility, durability of the interior finishes was also a major concern. Ceramic tile and wood flooring were installed in the public high traffic areas, Replaceable carpet tile was used in the ballrooms, and broadloom carpet was installed in the office spaces.

The project broke ground in November 2003. Cooper says a major challenge was building a project on a campus where classes were ongoing and students lived. "Any time we work in a campus it's always a challenge because you have to be very careful to protect the campus, the environment, and the students and faculty and staff from the construction operations," Cooper says.

Moreover, another contractor was building the Studio Arts Facility virtually adjacent to the Student Life Center. "There were some logistical issues involved in sharing sites and sharing access," says Cooper.

Cooper says that although the project was not designated to be a U.S. Green Building Council LEED-certified project, sustainability and energy efficiency were of paramount importance to Vanderbilt. "Since [Student Life Center] came online, Vanderbilt is proposing to go to LEED certification on all their new construction and to some degree on their renovation construction."

Cooper adds that more and more of Orion's clients seem to be expressing interest in green construction, and as a result, Orion has added staff members who are certified LEED professionals. "We have not constructed a LEED certification project yet—I think they are still fairly few and far between — but we're preparing for it because we know that some of our clients are moving in this direction," he says.

Orion
BUILDING CORPORATION
9025 Overlook Blvd., Ste. 100, Brentwood, TN 37027
(615) 321-4499 • Fax (615) 327-4171