

Cornell's Fernow Hall Undergoes Green Makeover

By Jenny Ivy Byrne

Cornell University in Ithaca, N.Y., has a rich history dating back to its opening in 1865. The university has 10 historic properties that are listed on the National Register of Historic Places. The campus has a regal atmosphere, with turn-of-the-century architecture incorporated throughout its 250 buildings.

In 2010, the school launched a comprehensive sustainability initiative as part of its 2010-2015 Cornell University Strategic Plan. The plan includes strategies on how to make buildings more efficient and how to conserve water, as well as a recycling program, land management strategies, transportation initiatives and a commitment to shrink its carbon footprint.

The efforts have been paying off. Cornell has been able to decrease greenhouse gas emissions by 32 percent. One major way the school has been working to reduce energy use is through lake source cooling, taking water out of the nearby Cayuga Lake and pumping it into a heat exchanger on shore. The system has helped the campus reduce air-conditioning electricity by 86 percent and has reduced overall electrical use by 10 percent.

The university also approaches new construction and current facility maintenance with sustainability in mind. Cornell has eight LEED Gold and one LEED Platinum buildings. All plans for the school's future construction and renovations will follow the LEED rating system as set by the U.S. Green Building Council (USGBC). In 2008, the school's board of trustees voted that all building projects exceeding \$5 million must achieve at least a LEED Silver rating and achieve 30 percent energy savings.

One of the school's latest sustainable projects is Fernow Hall, the main building for the Department of Natural Resources. Last year, the USGBC certified a renovation and addition to the building as LEED Gold. As a steward for environmental sustainability, the department wanted to give Fernow Hall a green makeover, creating a space that could incorporate education while representing the department's mission.

The most essential goals for the project were preservation, restoration and innovation, according to John di Domenico, AIA, LEED AP, partner-in-charge at di Domenico + Partners of New York. The firm designed the renovation and addition for Fernow Hall and will be working toward LEED Gold for Rice Hall, another university building that is going through its own renovations.

Built between 1912 and 1914, Fernow Hall, one of Cornell's buildings on the National Historic Register, sits atop a prominent hillside. Updates to the building throughout the years partitioned

open spaces, which resulted in dark internal corridors and enclosures. The goal of the restoration, which would open up those dark spaces, was to preserve the building's character while bringing the facility into the 21st century.

"The main goal [of the project] was to meet the programmatic needs and to design the spaces in a way that, when you're within them, there was this constant reminder that the department of natural resources is all about teaching and learning about the environment," di Domenico said.

The biggest transformation of Fernow Hall that visually incorporates modern design with historic architecture was a 1,700-square-foot addition that houses new classroom space.

"We didn't want to extend the footprint of this historic building, so we rolled the landscape up onto a green roof and tucked the new classroom beneath it. Then, we rolled the landscape down adjacent to the historic building so that office spaces that were on the lower level of this building now have a large open space. Just by manipulating the landscape, we accommodated their program needs without impacting the view to the historic property," di Domenico said.

The green roof, which contains self-sustaining plants, is an extension of the classroom, allowing for a hands-on learning experience. The façade of the addition is a glazed curtainwall on the north side that is fritted in a certain portion, meaning there are small dots in the windows so that students wouldn't be distracted by the outside view.

There is also a rain garden outside, which helps with stormwater management. During a storm, rainwater flows from the rooftop of Fernow Hall and is directed into the gutter system where it travels from the roof to the ground through downspouts. Stormwater is then directed into the rain garden where it will temporarily collect up to 6 inches deep to help irrigate the garden, which also collects stormwater runoff from the adjacent walkways.

"The rain garden wasn't large enough for us to achieve a [LEED] point, but we implemented it because it's a sustainable move, and it's also a place where the department could have an extension of their classroom. Green for us doesn't just mean LEED criteria, but also what it says about the department and the users that are occupying the building," said Ricky Liu, AIA, LEED AP, the project's architect.

The addition was only part of Fernow Hall's conversion to sustainability. The interior also needed a lot of work to incorporate energy-efficient elements. Renovation measures included reducing the size of the HVAC system. The department wanted natural ventilation through



A 1,700-square-foot addition to Fernow Hall at Cornell University in Ithaca, N.Y., incorporated a green roof and rain garden onto the property.



Fernow Hall's new addition involved a classroom that was integrated with the surrounding landscape.

operable windows, and this could decrease the reliance on energy-driven mechanical equipment. Other sustainable efforts included modifying the exterior walls with more efficient insulation. Additionally, many materials, such as marble and wood, were reused throughout the project to keep the character of the old building.

Designers also integrated photovoltaic cells into existing skylights. A digital dashboard powered by the cells gives real-time energy usage data.

"When you're below these skylights in these break rooms or classrooms, you can look up and see the skylight and also see that it's generating a percentage of energy for the building," Liu said.

Because it's a historic building, the design for the new Fernow Hall had to consider how to preserve certain elements while updating the building appropriately. During the 1.5-year design process, strategic efforts helped to save an original staircase that had once been vital for the building. When the staircase was in use, it was a place where students could interact with other students and faculty. The stairs had been enclosed due to fire safety reasons, but were opened

up once again after renovation.

"It was a shame that the stairs were enclosed because they were historically an important part of teaching and learning," di Domenico said. "Students went up and down the stairs with the faculty, and they met and conversed, so this circulation path was critical. One of the main design moves was to open that staircase up to once again make it a vital vertical path within the building."

When the renovation was completed and the new addition was ready for occupancy, school officials and di Domenico offered students, faculty and staff a chance to review the design process during a seminar. di Domenico, is a professor at the New York Institute of Technology's School of Architecture and Design, and he wanted the project to be a learning experience.

"We always start [a project] by saying that we want the design to be a learning process, and there was a lot of interest generated in this process," di Domenico said. "We engaged a lot of conversation about cost, benefits and residual effects. It became a learning process for the students and faculty involved."

Photo Credit: di Domenico + Partners

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