BlueCross BlueShield of Tennessee
Cameron Hill Sustainable Case Study

Perched on a magnificent site atop Cameron Hill, the new headquarters for Blue Cross Blue Shield of Tennessee (BCBST) offers stunning views of downtown Chattanooga and the Tennessee River. The project is intended to last for generations, and vision, creativity, and dedication were required to create a development that will remain environmentally responsible far into the future.

BCBST undertook the new development with sustainability and innovation goals in mind. In the process of providing a workplace that promoted employee well being, BCBST discovered that their plans aligned perfectly with the U.S. Green Building Council's LEED (Leadership in Energy and Environmental Design) standards. The organization pursued LEED certification and is poised to attain a Gold certification.

The $299 million project consolidates BCBST employees from 10 facilities throughout the Chattanooga area and represents sound financial stewardship. Estimates indicate that the not-for-profit corporation will gain at least a 10-percent reduction in overall facilities costs thanks to the move. Moreover, collaboration and productivity is greatly enhanced by team members working together at the same location. Administration also saw the campus as a way to provide amenities to its employees through the addition of a wellness center /full fitness facility, healthy food service, a training center, and a pharmacy and clinic.

The Heartbeat of the Campus

Knowing that its employees are the life blood of the organization, BCBST very thoughtfully planned the space for the 4,500 people who would occupy it. Companywide surveys in the very early stages of the project helped management understand the features and amenities that employees found important. A comfortable work environment that included access to daylight and views, and the flexibility for individual thermal control were prime issues. As a health care organization, BCBST was also committed to providing a high level of indoor air quality.

Many of the features that the organization planned to implement to accommodate employee preferences and provide a better working environment were inherently sustainable. BCBST brought a green building services consultant into the process to assess how these measures dovetailed with LEED requirements. The project was already on track to receive a LEED Silver certification and, with some additional strategies, might attain Gold.

Highlights of the BCBST campus include:

- Daylight and views for all employees.
- Reduced energy consumption by over 20 percent compared to a standard building.
- Improved indoor air quality for employees with outdoor air ventilation rates 30 percent higher than code requirements.
- Reduce global warming impacts and ozone depletion through the use of advanced refrigerants.
- An annual savings of over 20 million gallons of water.
- Decreased storm water runoff by 15 percent.
- Opportunities for employees to improve health and reduce stress at the Wellness Center.

The design team searched for efficiencies in every aspect of the project – from the structure and curtain wall to energy and daylight. Systems and methods are integrated, so single strategies are leveraged to provide multiple advantages.

Seeing Differently

Studies have shown that people's physical well being improves when they have access to nature. BCBST was determined to offer views to nature in as many employee spaces as was possible, which posed a challenge for 950,000 square feet of office and amenity space distributed over five buildings. The designers crafted an innovative solution that reinvented the traditional office floor plan.

Typically, office floor plates of this size are designed with four rows of columns placed along the exterior walls. At BCBST, only three rows of columns support the structure. The designers placed two column rows 15 feet in from the exterior walls and one row of columns down the center. They then cantilevered the floor off the columns. By splitting the core in this manner and positioning elevators, break rooms and common area at the far ends, BCBST offices have an expansive sense of openness and create views unobstructed by columns. The strategy is so successful that BCBST employees enjoy views from 90 percent of the occupied spaces in the office buildings.

Let the Sun Shine In

Providing daylight for employees was another driving force behind the space configuration. Outside the building, solar louvers serve as light shelves to bounce natural light deep into the interior spaces.

The height of office workstation panels impacts daylight infiltration, so the interior designers worked to balance low heights with the need for privacy. The team created physical mock-ups of workstations so employees could try out options and offer feedback online. Because employees generally found the 42-inch height too low, the designers crafted a hybrid solution. Workstation walls parallel to window walls have lower panels, and higher panels are installed on the spine wall perpendicular to the window walls. Where the higher 54-inch panels are used, the top 12 inches are made of frosted glass to allow light to permeate the space while still offering privacy. For private

offices, the designers fitted the doors with wide floor-to-ceiling sidelight glass panels on both sides and glass transoms above to ensure the offices did not block out natural light. Bringing ample daylight into the offices has positive physiological effects on building occupants, and reduces energy consumption required for artificial lighting and related cooling.

Comfort, Control and Fewer Carbon Emissions

Employees and management at BCBST benefit from an under-floor air distribution system that provides higher indoor air quality, individual temperature control and reduced energy consumption.

Higher Air Quality

The raised floor system supplies air at the breathing zone, which is cleaner because it has not had a chance to mix with particulates throughout the office. Keenly interested in the welfare of its employees, BCBST went even further and specified ventilation rates 30 percent higher than required by code.

Many traditional building products are manufactured with volatile organic chemicals (VOCs) that emit gas pollutants into the interior environment for years after construction. BCBST materials have low-VOC levels to reduce these emissions, helping to safeguard occupant health.

To ensure that contaminants are not being brought into the space, BCBST expanded on a green cleaning program it implemented at a former facility to encompass all buildings on the Cameron Hill campus. A Green Seal-certified janitorial service uses approved products without harsh chemicals to prevent allergic reactions, protect air quality and reduce impacts on local watersheds. BCBST is also employing integrated pest management to diminish the use of hazardous pesticides and herbicides throughout the campus. By using an ecologically sensitive approach to controlling pests, weeds and plant disease, the organization helps to keep the indoor and exterior environments cleaner for people and habitat.

Flexibility

The under-floor air distribution system also allows employees to alter the temperature and airflow in their own areas to suit personal comfort levels. The ability to heat and cool individual areas helps to create a more pleasant workspace. In addition, the under-floor system opened the opportunity to maximize ceiling heights, which lends volume to the space.

The system offers more control to BCBST management as well, as the space beneath the floor contains the power distribution system, telephone and data capabilities. When departments shift to new locations or new employees come on board, the modular space is quickly and easily reconfigured and ready with controllable air vents, power cables and information technology interface. This saves money, time and materials.

Savings and Environmental Protection

The significant increase in outdoor air entering the mechanical system could require greater energy for conditioning, but the low pressure distribution of the under-floor air distribution system and efficient mechanical equipment keep energy use low.

Climate change is an important issue, and BCBST took steps to minimize its building effects on the environment. Although the building curtain walls are mostly transparent to provide views, the team used low-emissivity, one-inch thick insulated glazing units. The units bring in natural light but prevent solar heat gain, which reduces the electric load for this cooling-dominated building.

Efficient cooling towers, water-cooled chillers and variable speed fans work to provide air conditioning without the use of ozone-depleting chemicals. High-efficiency pumps and motors on the HVAC system reduce carbon impacts by conserving energy. Through integrated energy-saving features, BCBST saves approximately $265,000 annually in electric costs over a project built to code standards.

Pleasing Products

Construction materials have a variety of environmental impacts. The manufacturing of new materials often requires mining, use of natural resources, use of toxic chemicals in the production process, and reliance on fossil fuels for manufacturing and transportation. The design of BCBST helped reduce the amount of new materials needed in several ways.

The unusual cantilevered design that helps to maximize views resulted in a 25 percent reduction in columns, which saved a great deal of construction concrete. The under-floor air distribution system required less duct work than a typical space, so less sheet metal was needed. Because the system and the moveable interior workstation panels allow for easy space reconfiguration, fewer building materials will be needed for future layout changes. Modular carpet tile throughout the offices also makes it easy to replace damaged and worn areas without replacing the entire carpet, which keeps a significant amount of materials out of the landfill.

Water-based and low-VOC materials, paints and finishes are used throughout the space. In addition to making the space healthier, these products require less harmful chemicals during manufacturing. BCBST's design team also maximized the amount of interior building products made in America to support the national economy and lower fuel emissions associated with transportation.

Building construction materials also contained an average of 20 percent recycled content to keep new materials' production to a minimum. Concrete on site contains post-industrial fly ash and the buildings' reinforcing steel contains over 90 percent recycled and regionally manufactured steel. In all, 20 percent of the construction materials were derived from local and regional sources within 500 miles of the city, which supports the local economy and minimizes transportation costs.

Natural Affinity

BCBST recognizes that land and water are important resources. The organization took advantage of the surrounding landscape, both as an employee amenity and a way to lessen water runoff into the Tennessee River. In addition, the water-saving features on campus significantly lowered water consumption.

Smart Circulation

Ultra low-flow plumbing fixtures, a water efficient irrigation system and landscaping that demands very little irrigation resulted in a striking 32 percent reduction in water use. In terms of volume, this means that the BCBST facility saves 20 million gallons of water annually over standard irrigation approaches.

Ground Forces

Previously, a dilapidated apartment complex sat on the spot where the new BCBST complex is located. Reusing a previously developed site is a sustainable strategy as it leverages pre-existing infrastructure and preserves land for habitat and ecology. More than half of the 57-acre site will be left as undisturbed native forest.

Between the buildings, BCBST's design team created four courtyards. Each one offers a different experience, creating diversity for habitat and aesthetic options for employees. A vegetable garden in one courtyard emphasizes the importance of proactive health care by promoting a healthy diet.

The great lawn, which connects people to Fourth Street access, is a quiet space with a dry streambed. This streambed collects storm water that drains from the roofs of several office buildings. A retention pond at the end of the great lawn holds the runoff to prevent it from flowing directly into the city's storm water system and local watersheds. The pond also serves as an attractive courtyard feature.

A third courtyard offers more vegetated space and is commonly referred to as "the forest." Here, employees enjoy shade, pathways and seating. A second pond creates a place of tranquility.

The central courtyard is a hardscape plaza with trees and landscaping. All ends of the office buildings open to this area, making it the center of activity. Employees can sit at outdoor tables, eat lunch, casually gather with other colleagues or arrange meetings on the plaza. It is equipped with wireless Internet access to offer employees a tool for creativity when they work. Transportation bridges offer a canopy that can provide protection from the elements.

Vegetated "green" roofs were initially planned for all five of the buildings. In order to stay in line with the budget, the extra $1 million cost difference between white reflective roofs that reduced heat island effect and vegetated roofs meant that the green roofs could not be accommodated. As contractor contingency funds became available, however, green roofs on three of the connectors and both flanks of the amenity building were added back into the project. These roofs help retain rainwater, which minimizes the amount of runoff entering the storm water

system. Although the green roofs were not a large enough percent of the project to achieve a LEED point, BCBST administration thought these highly visible features were critical for educational purposes. The effort was rewarded, as the green roofs have generated a great deal of interest and enthusiasm on campus.

Civic Relationship

Sustainability is more than environmental responsibility. It also encompasses connections to one's community and facilitates social interaction.

On campus, a unique space layout brings employees together to create a hub of activity. Instead of placing the elevators in the middle of each building, designers positioned the elevators on the end of each floor toward the center of the radial configuration. This strategy organizes circulation at the campus' core. To increase connectivity, the buildings are connected at the basement level, first floor and fourth floor. Because so many of the site's sustainable features are visible, the campus offers an experiential education for BCBST employees and visitors.

Although the campus is 250 feet above the city, BCBST is a longstanding community member and it was important for the campus to relate to Chattanooga's downtown. Designers did not want the structure to appear as a fortress from the city below. Rather than organize the 950,000 square feet of office and amenity space into a continuous shape that wrapped around the hillside, they arranged five buildings in a radial configuration that connect at the center. This core aligns with Fourth Street and employees can access downtown via Cameron Hill Circle or ride BCBST's new hybrid shuttle throughout the day. BCBST funded the $100,000 increase to purchase the hybrid shuttle versus a conventional vehicle through an incentive program offered by a local philanthropic company for facilities that build and renovate to LEED standards. The BCBST shuttle connects to the city's electric shuttle that runs through the retail center. Visual connections to its surroundings are heightened by the buildings' orientation, which maximizes the amazing views of the city and Tennessee River.

Cameron Hill is an historical site that housed Union cannon emplacements and fortification to defend the city during the American Civil War. BCBST constructed a smaller version of the former Boynton Park that showcases the site's history and is working with the National Parks Service to return two cannons and plaques describing the battles to the hill. Although the park is on private property, the public is welcome on campus and at the park during working hours. Public outreach and education is also enhanced by tours of the new environmentally-friendly facility.

Blueprint for Change

The move offered an opportunity to change aspects of day-to-day operations as well. BCBST put together building guidelines and communication teams will reinforce them. Employees were notified one year in advance that their new campus would be 100 percent tobacco-free, and smoking would not be permitted anywhere on the property. BCBST set a goal to reduce all paperwork by 50 percent before move-in. In addition to shifting to digital files wherever possible, high speed desktop printers, fax machines and copiers were replaced by all-in-one machines that provide all of these functions. Rather

than scatter them throughout the office, BCBST bought fewer machines and placed them in central locations. The shift has provided an incredible savings in ink cartridge replacements and paper as staff think twice before printing something since it's no longer an arm's length away.

The 17,000 square-foot fitness center sends a strong message about health and wellness and bicycle parking is provided on site. The addition of the 6/10 of a mile walking path around the perimeter of the hill also inspires physical activity. BCBST boosts the price of unhealthy foods and beverages to inspire people to pause and consider an alternative selection.

To reduce greenhouse gas emissions that lead to global warming, the organization encourages alternative modes of transportation through the shuttle which connects to the city's transit system. It also offers preferential parking for carpools, motorcycles and electric or hybrid vehicles.

Lessons Learned

To the surprise of the project team and contractor, the city of Chattanooga does not have the ability to recycle construction debris. The contractor developed a full waste management plan, divided and segregated all materials into separate bins, but then found that it had no place to go but to the landfill. The contractor explored the option of helping a local waste hauler develop the resources to recycle the large amounts of construction debris, but local policies prevented the change. In the end, the contractor was only able to get cardboard recycled and sell the palates. Fortunately, BCBST has warehouse storage available and is keeping extra materials such a brick, doors, access flooring, etc. to use for future repairs.

Despite a predominant impression that sustainable building costs more, the creative use of integrated systems and proper materials provided a healthy workplace that minimized environmental impacts at no cost increase to BCBST. According to management, the increase for green measures was only 1 – 2 percent of the project.

What's in Store

BCBST will soon purchase green power for a portion of the energy load at the Cameroon Hill campus. Officials hope to provide more eco-roofs on site as funds become available and are interested in the possibility of adding solar panels in the future.