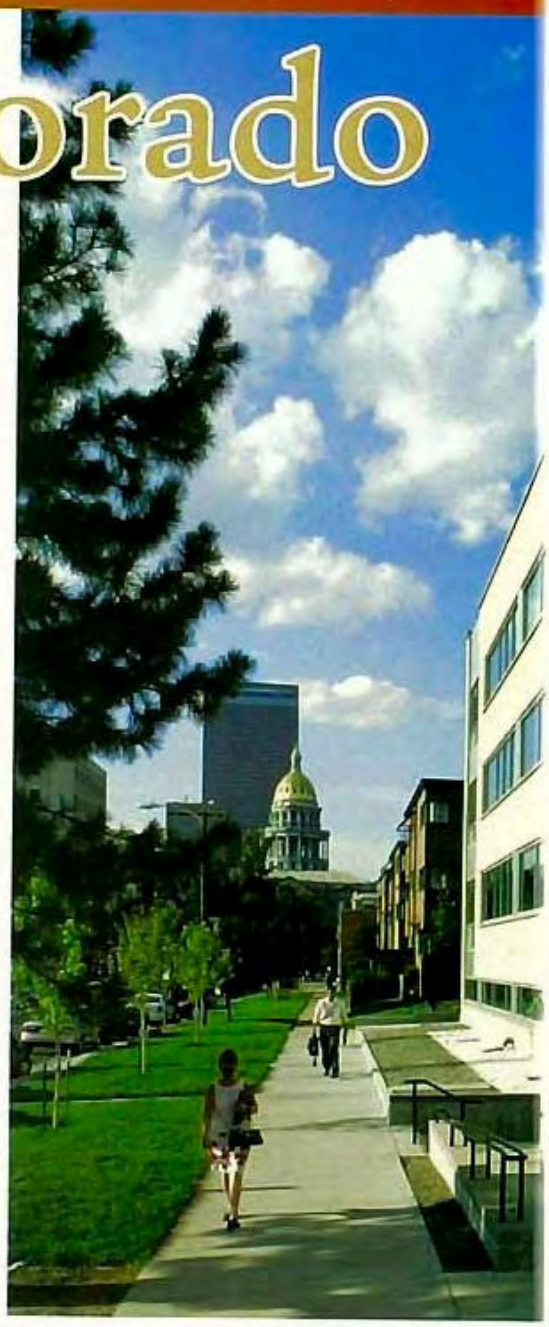
LEED In Colorado

State builds its first LEED certified building; EPA erecting showplace Region 8 headquarters in LoDo

By Carol Carder

In 1998 the U.S. Green Building Council introduced the Leadership in Energy and Environmental Design (LEED) Green Building Rating System® to establish a common standard of measurement and to recognize environmental leadership in the building industry. LEED standards are available or under development for new construction, existing building operations, commercial interior projects, core and shell projects, homes, and neighborhood development. Many entities, such as the General Services Administration, cities such as Albuquerque and some universities have mandated their buildings attain LEED certification.



David Owen Tryba Architects designed the state of Colorado's first LEED certified building, a 40,000-square-foot, $4-million addition to the Colorado Department of Labor and Employment at 12th Avenue and Sherman Street in Denver. Hadji & Associates of Denver provided the mechanical and electrical engineering. Hyder Construction Inc. of Denver completed the addition in December 2004.

"We used a lot of common sense to produce a high-quality design while keeping to a strict budget," says Collin Kemberlin, design architect for David Owen Tryba Architects of Denver. "It's relatively easy to integrate a basic level of sustainable technology and still track the budget when you start early with the premise that this will be a LEED certified building."

"We were able to build this LEED certified building for $100 a square foot, quite an accomplishment compared to other LEED buildings out there," says Lance Shepherd, project manager for the state.

The additional cost over standard construction was approximately 1 percent to 2 percent. Conversations with the state and contractor early in the design phase enabled this project to meet LEED while maintaining budget. In that way the architects were able to specify many off-the-shelf materials such as low flush toilets, materials with recycled content, locally obtained materials, and so forth.

"When we came on board, the state said they desired a LEED certified building, but it wasn't a requirement," says Bill Moon, AIA, principal at David Owen Tryba. At that time no money was set aside to apply for the certification. Later the governor's Office of Energy Management and Conservation gave the project a $25,000 grant for LEED certification.

Left: Construction under way on the 40,000-square-foot, $4-million addition to the Colorado Department of Labor and Employment building in Denver.

Above & above right: The completed Department of Labor and Employment building addition is just two blocks from the State Capitol.

Jack Wolpert, E-Cube Inc., Boulder, provided the commissioning to assure quality was met according to the LEED criteria. He explains that the owner registers the building with the LEED program during construction, then applies for the certification with the documentation after construction is completed. Documentation includes receipts for recycling materials, vendor's purchase tickets for building materials with recycled content, etc.

"We owe much to Hyder Construction, and our architects did a fantastic job," Shepherd says.

"Documentation was a big piece of the puzzle," says Jason Horsford, Hyder project manager. "We had to start with square one in explaining the material options to each subcontractor. Then we had to educate everyone on construction waste recycling, such as stacking the cardboard boxes next to the dumpster so we could haul them to recycling."

Points are awarded for each category and its subcategories. Main categories are sustainable site, water efficiency, energy and atmosphere, indoor environmental quality, materials and resources, and innovation in design process. Having a LEED accredited professional on the team also earns a point. The more points, the higher the LEED certification level. Basic certification is 26 to 32 points; silver 33 to 38 points, gold 39 to 51 points, and platinum 52 to 69 points.

Reclaiming an existing building in an urban area by adding on to it rather than building new in another location earns a point. Another point is earned by recycling almost 52 percent of the abandoned on-site parking garage that was demolished to make room for the addition. Other features include infrared controls on faucets, white reflective roofing, daylighting with glass blocks and a skylit atrium, low volatile organic compound paints and adhesives, and comprehensive energy modeling.

The architects also designed the renovation of the 1956 Department of Labor building, but the state didn't seek certification for LEED EB (existing building). The upgrade and addition will achieve 20-percent to 30-percent water savings and 15-percent to 20-percent energy savings in comparison to a standard building of comparable size, according to Kemberlin.

"The state will be following many of the LEED criteria in future building projects, but may not apply for certification," says Shepherd. "It wouldn't be fiscally responsible to go back and make changes after construction."

Two state-owned buildings at the State Capitol Complex – the Judicial Building and State Services Building – are undergoing environmental retrofits under a performance contract with Chevron Energy Solutions of Denver. These two buildings will be LEED EB certified upon completion. Upgrades are also occurring in the other 14 state buildings in the Capitol Complex. The $14-million cost of changing out toilets, sinks, lights, HVAC controls, boilers, chillers, and so forth will be paid from the anticipated $900,000 a year savings in utility bills for the 1.8 million square feet of state buildings, according to Shepherd.

EPA Region 8 Headquarters

In lower downtown Denver (LoDo) on the former U.S. Postal Service Terminal Annex site adjacent to Union Station, the Denver office of Opus Northwest Construction LLC is building a 292,000-square-foot office building for the General Services Administration (GSA) that will house the new Environmental Protection Agency Region 8 headquarters. In addition, retail tenants will occupy approximately 15,000 square feet facing 16th and Wynkoop streets. In addition to the basic sustainable building components, this design-build structure will have the bells and whistles to qualify for LEED® Silver certification.

"While Opus is required to achieve LEED® Silver certification, we are going for Gold!" says Marshall Burton, vice president of real estate development.

GSA selected the Opus team in August 2004 to design, construct and own this magnificent mixed-use project in the historic LoDo neighborhood. Core members of the Opus team, in addition to Opus, include Zimmer Gunsul Frasca Partnership (design architect based in Portland, Ore.), Syska Hennessy Group Inc. (design mechanical engineer from Los Angeles) and Hinman Consulting Engineers Inc. (security consultant based in San Francisco).

Nine levels are above grade with two levels of below-grade parking exclusively serving the EPA. Construction began in April 2005 and is scheduled to conclude in time for November 2006 occupancy.

Sustainable Features

The Opus team's approach to the design for the EPA Region 8 Headquarters facility is based on two fundamental and interconnected goals, the first of which is to design a state-of-the-art, environmentally responsive building which reflects the EPA's mission to "protect the public's health and safeguard the natural environment in which we live, learn and work."

The Opus team generated five core sustainable design strategies: 1) load reduction through building form, orientation and materials; 2) use of passive systems wherever possible; 3) management of site water; 4) energy generation, and 5) the creation of safe and healthy environments. These five sustainable strategies help to integrate ecologically appropriate systems for air, cooling, heat, light, and water as part of the building's basic systems.

The form of the building is shaped by a southern "L" and a northern "L," enclosing a central atrium. The southern "L" consists of eight stories with horizontal sunshades to limit warming from summer sun and to reflect winter sun, and approximately 15,000 square feet of photovoltaic panels to harvest Colorado sunshine and store it to power building systems. In like manner, the northern "L" consists of nine stories, vertical sunshades for daylighting, and has been designed to carry the load of up to 12 wind turbines to capture renewable wind energy.

The roof of the facility will house a garden roof system. The city and county of Denver has approved approximately 19,000 square feet of a garden roof system to be used for water quality treatment detention. Through a combination of filtering and biological uptake, a garden roof will meet the water quality detention mandated by the city and county of Denver, as well as reduce the urban heat island effect, absorb carbon dioxide, create wildlife habitat, and provide an amenity for building occupants.

Most of the building incorporates an underfloor air distribution system. This air-flow method minimizes energy consumption, improves indoor air quality and provides the building occupants with more control over the air movement and temperature in their workplace.

The atrium, in combination with typical 45-foot lease depths, helps to maximize day lighting, reduces lighting energy loads and provides planning flexibility for program layout with access to daylight. The atrium will reduce energy requirements

Above: Attractive main lobby of the LEED certified addition. Below: Artist's rendering of the new EPA Region 8 headquarters building in lower downtown Denver.

because it is a partially conditioned space which acts as a thermal buffer for the building as a whole in response to local seasonal site conditions. It creates a central focal point for the public lobby, connects the library, conference and fitness centers, and creates a central informal interaction place for the EPA community.

The interior features rapidly renewable materials such as timber bamboo flooring, timber bamboo wood paneling and timber bamboo veneers. Many interior finishes include recycled materials in acoustical ceiling tiles, ceramic tile and modular carpet. A lightweight concrete with recycled glass forms countertops, and concrete with fly ash is used throughout the building. Both structural steel and ornamental metal framing include recycled steel; reinforcing steel is 99-percent recycled and structural steel is 95-percent recycled. Approximately 10 percent to 20 percent of building components are scheduled to be composed of recycled materials.

Historic and Landmark Features

The Opus Team's second goal is to achieve a building inextricably intertwined with sensitive historic neighborhoods, a building that will strengthen and enhance the neighborhood, yet become a landmark in its own right.

To blend into the historic LoDo neighborhood, traditional red brick will frame the second-, third- and fourth-story windows along Wynkoop Street and the second- and third-story windows along the 16th Street Mall. The ground level along 16th and Wynkoop streets will feature aluminum and glass retail storefronts framed by cast stone columns reflecting the size of neighboring businesses.

The landmark lobby encloses a significant space, with its terminus a building-height atrium. The lobby is extended in two-story volume by a grand stair to the most significant public spaces in the building, the conference center and the environmental information library. An estimated 50,000 to 60,000 people a year will utilize the conference centers. Seating risers will expand the grand stair to provide additional space for exhibits and public and staff gatherings. Light enters the lobby from three sources including the atrium above, the vertical slot marking the main entry and from the conference breakout lobby on the second floor. The lobby will reflect the changing seasons and climate conditions of Denver. The atrium and glass-backed elevators will literally connect the lobby to all the other spaces in the building.

"Construction is on budget and on schedule for a November 2006 completion. A high level of interest continues for the 15,000 square feet of retail and restaurant space available for lease," says Amy Rolle, real estate representative with Opus Northwest. ■