Anythink Brighton Library

Project Type: Public Library
Owner: Rangeview Library District (RLD)
Certification: LEED-NC 2.2 Gold
Construction Cost: $4.2 million
Building Size: 20,000 sf
Number of Floors: 1
Completion: September 2009

Project Team:

Architect:	Humphries Poli Architects
Owner's Rep:	Wember, Inc.
Mechanical:	M-E Engineers
Electrical:	M-E Engineers
Contractor:	Fransen Pittman General Contractors
Sustainability/ Energy Consultant:	Ambient Energy
Renewable Energy Credits:	Carbon Solutions Group
Commissioning Agent:	M-E Engineers

client and team commitment creates a sustainable library

high performance goals

- Achieve net-zero energy or greater.
- Obtain LEED certification.
- Develop carbon neutral facilities district wide.
- Establish a community resource where people dream, learn, innovate, and play.

project description

In 2006, the voters in Adams County approved a $31 MM mill levy increase for the Rangeview Library District (RLD). This approval enabled an aggressive capital improvement plan that included the construction of four new libraries and the renovation of three others. The RLD developed a comprehensive strategic plan that addressed everything from operations, services, and programs to facilities and finances. The facilities initiative encouraged responsible and sustainable practices to develop 'beautiful and inspiring environments.' With LEED certification as a goal, the RLD made decisions based on the lifespan of the library, rather than short-term initial costs. The Anythink Brighton Library, a part of the Brighton Cultural Center, is the second of these capital projects to open and is actually the first "carbon-positive" library in the country.

sustainability process

The aggressive goal to build four libraries in two years enabled the project team to develop overall strategies for the facilities while also considering the unique program for each project individually.

One of the first tasks was to conduct a sustainable design charrette, to set sustainability and overall goals for the new facilities. Then, a more focused, building specific charrette was held. The sustainability consultant benchmarked the energy use of similar libraries, assessed climate appropriate energy and renewable energy strategies, and researched utility rates and incentives. The results of this process enabled the project team to identify design strategies for the project and set an energy use goal that would compare favorably to similar libraries in the region.

To aid the project team in assessing energy efficient building strategies during conceptual design, the sustainability consultant provided an analysis of the aspect ratios, optimal window to wall ratios, and façade shading. Using simple 'block models' to quickly analyze alternate concepts, this analysis supported the project team in making early decisions on appropriate shading strategies, window openings, glazing performance characteristics, building envelope performance, and mechanical systems. Based on these initial studies, the project team further refined several energy and daylight strategies for a more complete energy analysis model. Results from this model enabled the team to consider specific efficiency strategies individually in order to select those most appropriate for the project. A final model of the base and design energy case then verified the interaction of the selected daylight and energy strategies that supported the project goals.

An analysis of first costs, Xcel energy estimated incentives and payback period verified that the selected design strategies were providing the right mix of efficiency and value to the RLD.

achieving net zero energy

For the library to move beyond efficiency and actually produce more energy than it uses, two key factors fell in place.

First, the Governor's Energy Office (GEO) was integral in identifying and supporting a matching grant funded by the Colorado Department of Local Affairs (DOLA). The RLD and their owner's representative sought this grant from DOLA and were awarded $300,000 in matching funds to install a 108 kW photovoltaic system on the library's roof. Second, as a gift from the general contractor, renewable energy credits valid through 2012 were purchased. These credits count towards the facility's energy use and support renewable energy development around the world.

The library is now producing more energy than it uses. This allows the building to be referred to as a net zero energy building. Further, this energy in renewable and non carbon based. As a result, instead of using carbon emitted entirely from off site power sources, the library is actually helping to offset carbon emissions by putting 'clean' energy back into the power grid.

high performance design features

- 108kW photovoltaic system.
- Geothermal loop located underneath the parking lot connected to ground source heat pumps provided radiant heating and cooling.
- Tubular Daylighting Devices.
- High performance glazing and exterior shading.
- Daylight sensors and dimming ballasts .
- Underfloor air delivery.
- Renewable energy credits until 2012.

design strategies create savings

- **$30,000+ per year** projected energy savings.
- **58.6 kBtu/sf/year** - projected energy performance. Compares favorably to benchmarked libraries at 50-90 kBtu/sf/year.
- **32%** energy savings from efficiency strategies
- **68%** energy savings with the addition of photovoltaics.
- **16%** more carbon is offset than the building uses meaning that 167,620 fewer lbs. of CO2 will be emitted into the atmosphere.
- Architecture 2030 compliant for carbon reduction.