City Projects Case Study

Northgate Civic Center
Seattle Parks and Recreation
Seattle Public Library

Photo courtesy of Miller|Hull

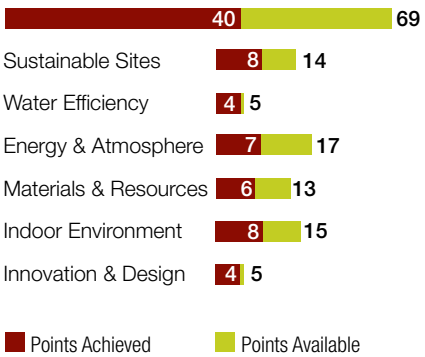
Square Feet: 10,000 library, 20,000 community center

Location: Northgate neighborhood

Construction Cost: $295/sq. ft. library; $228/sq. ft. community center

Completed: July 2006

LEED Facts - NC Gold



Benefits

- 46% reduction in energy use – $34,500 in annual savings
- 77% reduction in potable water use - $2,500 in annual savings
- 94% construction waste diverted from landfills through recycling
- 30% decrease in the rate of stormwater runoff
- 19.5% decrease in impervious surface area

Project Overview

Northgate Library, Community Center and Park anchors the redevelopment of Northgate, a suburban-style commercial area in Seattle. It combines three programs and funding sources into one integrated development, and converts a fully paved site into a multi-use pedestrian campus with close connections to transit and adjacencies to green space. The community center contains a gymnasium, activity rooms, child care, multi-purpose room, kitchen and staff offices. The smaller library is devoted to books, seating and support spaces.

The community center was designed to take advantage of natural systems, featuring natural ventilation and natural light. An underground detention vault retains stormwater from the site along with cleaned stormwater from adjacent 5th Avenue, releasing it gradually into the watershed.

The community center has 12 full-time employees and an average of 90 visitors daily, each staying an average of three hours. The library has five full-time employees and an average of 500 visitors daily, each staying an

Photos courtesy of Miller|Hull

The Public Art Program of the Mayor's Office of Arts & Cultural Affairs integrates artworks and the ideas of artists into a variety of public settings.

Northgate Community Center

Title: *The Eddy*
Artist: Nikki McClure
Completed: 2006
Commissioned: 1999 Community Centers Levy 1% for Art Funds.

The Eddy creates a place of rest on a busy site. The artwork photo above references the Thornton Creek watershed and the streams of people using the community center.

Northgate Branch Library

Title: *Circulation*
Artist: Dana Lynn Louis
Completed: 2006
Commissioned: Libraries for All Bond 1% for Art Funds.

The *Circulation* artwork, pictured to the left, refers to the collection, digestion and dissemination of knowledge that occurs daily at the library, and the relationship between visitors and the interior and exterior environments.

Public art images courtesy of Seattle Public Library

average of half an hour. Total equivalent full-time occupancy for both buildings (transient and non-transient) is 78 people.

Sustainable Sites

The library and community center, combined with open space, help to provide a civic identity for Northgate, a center of development in the 60s and 70s near the northern limits of the city of Seattle. It is one of six urban centers designated in Seattle's Comprehensive Plan. The commercial core has been dominated for decades by a large shopping mall and surrounded by strip malls. Northgate is destined for transformation from a mall-centered, automobile dependent area surrounded by single family homes into a pedestrian-friendly, transit-oriented urban area with dense commercial and mixed-use development, convenient services and a variety of housing choices.

At the same time, the community has made a commitment to sustainable development, rallying around the recovery of Thornton Creek, whose upper watershed has been largely developed and covered over. For more than a decade, redevelopment was deadlocked by conflicting visions about creek recovery, transportation, and mall redevelopment. During this time, there was virtually no housing or commercial construction. Progress was also hampered by an outdated regulatory environment until 2003, when the city achieved a compromise transportation plan that emphasized transit, bikes and pedestrians. The city also updated regulations, encouraged sustainable design and implemented the library and community center collocation.

The large parking area south of the mall and across the street from the project is redeveloping in two parts, with a future light rail station and transit center on one side and on the other, mixed-use with 450 housing units, along with underground parking and cinema. The desire to restore Thornton Creek will be resolved with a planted water quality swale fed by clean stormwater that would have flowed in buried pipe under existing conditions.

The site planning and design of the library and community center complex emphasizes pedestrian interconnections and links with street improvements along 5th Avenue Northeast, the arterial that runs between the project and Northgate Mall. The effort involved partnership with the Seattle Department of Transportation, which upgraded 5th Avenue Northeast to project specifications for pedestrian use and stormwater capture.

The one-story, steel-frame structures are highly transparent and modernist in presentation, with full-height windows defined by brises soleils. Sloping greenbelts on the east and south property lines of the site were left undeveloped and restored with native plantings. An open plaza, playground and lawn are integrated with building entrances and site circulation, and the whole is tied with the mall and parking across the street through the driveway and crosswalk.

Photos courtesy of Miller|Hull

Water Efficiency

The system for water harvesting, treatment, and detention is a major feature of the project. A large stormwater vault collects runoff from roofs and paved surfaces on the site, releasing it for natural filtration and diverting it from the storm sewer system. It supplies all irrigation needs and helps to restore natural hydrology by gradually releasing the water into the downstream channel of Thornton Creek.

An 11,780-cubic-foot underground concrete detention vault with a 267,000-gallon capacity, located under the lawn on the project, collects water from the roofs and paved surfaces of the site. It is adequate for a 100-year, 23-hour storm event. From October through April, water is pumped steadily out and released into the storm system at rates set by new city standards, which match those of the same land without any impervious surfaces. From May to September, the releasing pump is reset for use only on site, and the water is collected and drawn down for irrigation.

Through water harvesting, the system yields approximately 300,000 gallons per year diverted from site runoff. Combined with a reduction of impervious surfaces on the site, these measures reduce the rate of stormwater runoff leaving the site by over 30 percent after redevelopment.

In addition to accommodating on-site stormwater, the system is designed to accommodate one acre of natural tributary area offsite, and also to provide storage for runoff from neighboring 5th Avenue Northeast. Although not required by regulations, street and parking runoff is pre-treated, routed through a Votechnics 3000™ manhole chamber to remove 70 percent of total suspended solids.

The storage vault water is also used for irrigating the landscape, entirely eliminating the need for potable water for irrigation. With the exception of irrigated turf, all plants chosen for the site are native to the area, making them well-suited for the efficient drip irrigation system.

A combination of waterless urinals and low-flow fixtures reduces potable water consumption inside the buildings by an estimated 84,453 gallons per year, or 41 percent over baseline fixtures according to the national water efficiency standard (EPA 1992). Together, the rainwater harvesting system and water conserving fixtures will generate $2,500 in annual cost savings. The combination of rainwater harvesting and reuse and efficient low-flow fixtures results in a total reduction in potable water consumption of 77 percent for the project.

Energy & Atmosphere

A number of energy conservation measures particular to each building contribute to overall energy savings for the site. Highly insulated building envelopes include walls and windows, high-efficiency lighting, natural ventilation and a high-efficiency mechanical system. Large roof overhangs minimize heat gain.

Combined measures achieve a reduction in electricity use of 157,688 kilowatt hours per year and 18,783 therms of natural gas, enough power saved to supply about 17 single-family houses. This is about 45 percent beyond the national standard based on ASHRAE 90.1-1999 for the project, and will generate $34,500 in annual energy cost savings.

High-efficiency condensing boilers and hot water heaters are 13 percent more efficient than conventional boilers. Flue gasses are condensed as they escape to recover heat that would otherwise be wasted.

An air-to-heat recovery system captures waste heat from the building's exhaust air and is used in the winter to pre-heat the fresh outside air that serves the community center activity rooms. The community center also has operable windows that provide natural ventilation.

Air conditioning in the library is through high-efficiency direct-expansion rooftop units. An 18-inch air plenum under the library's floor helps to circulate air throughout the building for heating and ventilation. Extra efficiency and comfort is achieved by delivering heated or cooled air, along with fresh air, right to the place where it is needed. Warm air is allowed to collect near the ceiling in the summer, and in the winter warm air is ducted from the ceiling to the floor plenum, where it is used to preheat cool air before it goes through the heating coil. Because the system is low-velocity, less energy is needed to drive the fans. Additionally, a high efficiency split-system is used to condition the telecom rooms. Because the system is low-pressure, less energy is needed to drive fans.

In both buildings, daylight controls reduce total quantity of artificial lighting, dimming electric lights when outside light is adequate. When electric light is needed, the luminaires that were selected use less power while still providing quality light to the space.

Energy-saving measures in the design and construction of the Northgate Library and Community Center made it eligible for partial rebates through the Seattle City Light Energy Smart Services program of $20,150 and Puget Sound Energy Efficiency Services of $19,340 – for a total of $39,490 in energy conservation incentives.

Materials & Resources

The asphalt that covered the site prior to acquisition was broken up and used as fill under the foundations of the buildings. Concrete from the demolished buildings themselves was recycled, used in the new building footings.

Materials in the two buildings, which include exposed steel structure and brick cladding, were selected for extreme durability. Interior and exterior materials were sourced locally, if available, and selected for recycled content where appropriate.

Over 20 percent of the materials were manufactured within 500 miles of Northgate. Concrete from the two demolished buildings was used to build the new building footings. Asphalt from the extensive previous parking lot was also crushed and used as fill under the buildings. Over 10 percent of the materials have recycled content.

Indoor Environment

Building interiors are light and open, taking advantage of views to greenbelts on two sides, to the pedestrian areas on the site and to the buildings themselves. Large roof overhangs and brises soleils shade windows in both buildings, reducing glare and minimizing heat gain, especially in the west-facing community center.

Natural light and access to exterior views reaches 94 percent of the floor area in the community center, including relites into the central corridor and to the gymnasium.

Indoor air is protected by the choices of carefully researched finishes and other potential sources of fumes. All sealants, paints and adhesives were selected for low volatile organic compounds (VOC) content, as certified by Green Seal Standard. Carpet, carpet pads and tiles were certified under the Carpet and Rug Institute's Green Label testing program.

The air filtration in the mechanical system exceeds standard industry practice. Operable windows in the community center allow users to control the fresh air entering the activity rooms.

Innovation Credits

- Exemplary Water Use Reduction
- Educational Display, Tours & Website
- Pesticide Free Park

Lessons Learned

The project has demonstrated the benefits of combining the planning and budgets of multiple agencies (the parks department, city library and transportation department) for creating the civic core of a redeveloping community. Thanks to coordination of the process by key city staff members, the support of the administration and the integration of both buildings into the design for an emerging pedestrian environment, the combined effort resulted in a whole that is much more than the sum of the parts.

Where irrigation is involved, it is possible to reduce overall potable water use substantially through the construction of a large underground vault which stores water for use in the dry season. This vault system also offers the opportunity to restore runoff rate from the site to closely resemble pre-settlement levels.

Goals for sustainability and certification are best addressed at the beginning of the process. The decision to seek a LEED Gold rating for the project was made late in design, after the project was budgeted and designer and owner-partners had made a large number of design decisions based upon construction cost containment and other goals.

Rating & Awards

U.S. Green Building Council LEED® for New Construction Gold Rating

AIA Washington Council Civic Design Merit Award 2007

Brick in Architecture Award Municipal Government Gold Winner 2007

The Team

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To Learn More

City Green Building promotes green building through education, technical assistance and incentives. www.seattle.gov/dpd/greenbuilding

Office of Arts & Cultural Affairs promotes the value of arts and culture in and of communities throughout Seattle. www.seattle.gov/arts

Parks and Recreation provides facilities, parks and urban forests that improve quality of life in Seattle. www.seattle.gov/parks

Seattle Public Library strives to inform, enrich and empower by providing easy access to a vast array of ideas and information. www.spl.org

LEED® is the national benchmark for high performance green buildings developed by the US Green Building Council. www.usgbc.org

Seattle City Light Built Smart Services offers incentives and technical assistance for commercial customers. www.seattle.gov/light

Puget Sound Energy provides services and incentives to help customers save energy and money. www.pse.com

Seattle Public Utilities offers technical assistance on water conservation and natural drainage systems. www.seattle.gov/util

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