Firstenburg Community Center

Vancouver, Washington

The LEED Gold Certified Firstenburg Community Center creates an enduring model of civic architecture and a source of pride for the city of Vancouver. With thousands of visitors daily, the Center provides an unequaled opportunity to demonstrate to the public the benefits and beauty of successful green design.

opsis architecture

The Firstenburg Community Center is a multi-use facility that combines recreational and community spaces with other public services. It embodies the character of the community, provides convenient access to services and brings together a diverse mix of users.

The recreation program includes swim and warm water leisure/therapy pools, a two-court gymnasium, fitness space, aerobics dance studios and multi-purpose activity spaces. The community spaces incorporate child watch, a teen lounge and game room, a senior lounge and resource room, and meeting rooms. The multi-use community rooms, which together seat up to 350, address the lack of meeting and gathering spaces in east Vancouver and provide a venue for City Council meetings, social dances, performances, neighborhood fairs and community forums.

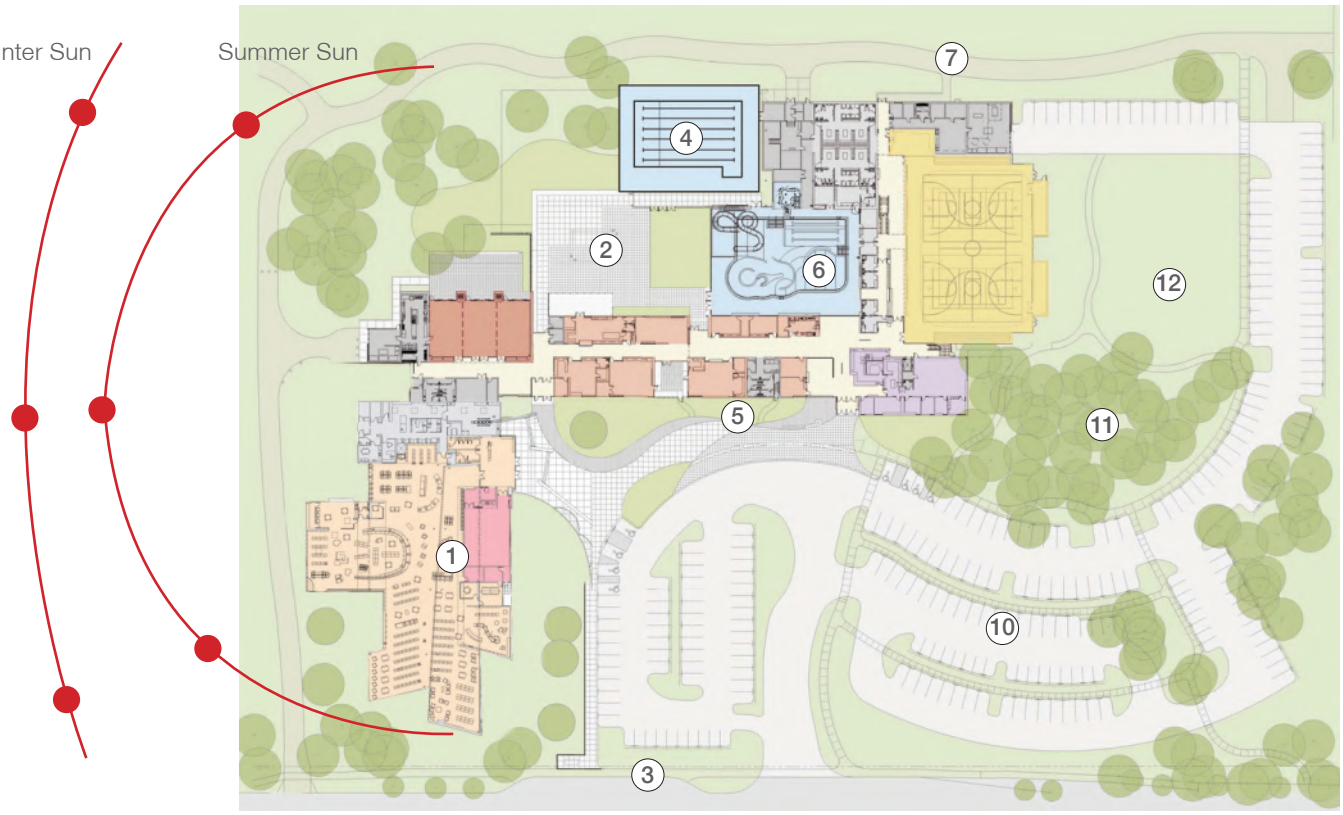
The building and site were carefully designed to seamlessly integrate a now complete city branch library (also designed by Opsis), a future lap pool, and a future arts and crafts wing, which will reinforce the civic identity of this facility. Families have the opportunity to visit the site together, using library and community center resources to enjoy a wide range of recreation and learning activities.

Project Summary

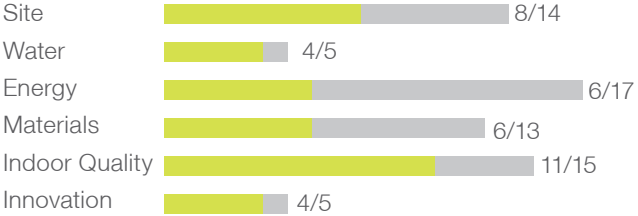
Location: Vancouver, Washington
Gross Sf: 80,982 sf
Building Footprint: 64,003 sf
Cost: $17M
Completed: 2007

Site Features

1 Library, Completed 2010
2 Courtyard with Spray Ground
3 Bus Stop
4 Future Lap Pool
5 Bike Parking
6 Firstenburg Community Center
7 Walking Trail / Service Lane
8 Porous Concrete Paving
9 Established Coniferous Forest
10 Future Parking



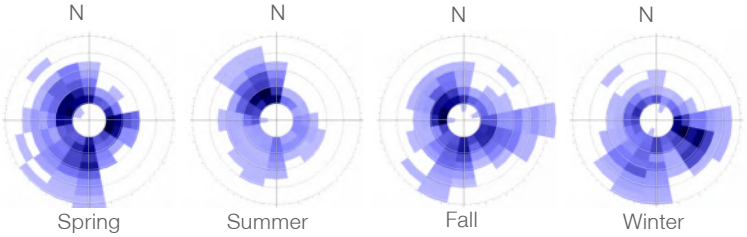
LEED NC v.2.1 Credits Achieved



Total = 39 Credits; Minimum for LEED Gold = 39

Wind

Colored areas indicate wind direction and speed; darker colors indicate higher wind frequency



SITE ECOLOGY AND LAND USE

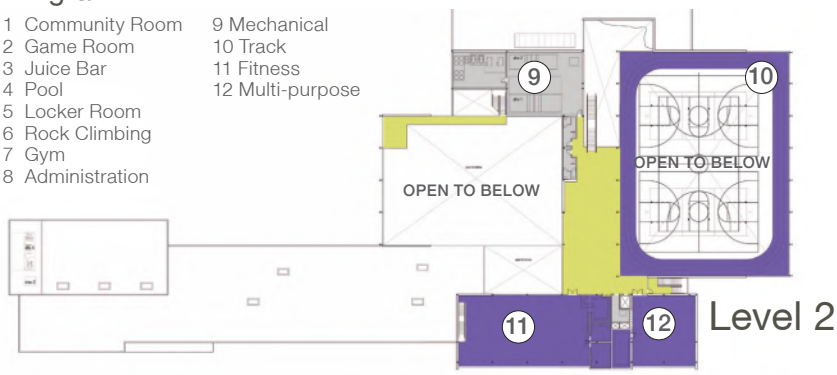
The Firstenburg Community Center is a two level building massed to reduce the development footprint, preserve mature tree stands and enliven the facility by concentrating activity and social spaces. At the start of the design process, an extensive tree survey identified the presence of laminated root rot disease throughout much of the forested site, as well as dense stands of weak trees dangerously susceptible to blow down. The footprint and position of the building are a result of careful analysis of the areas of healthy and significant trees, solar orientation, prevailing wind direction, noise from the adjacent street, and program requirements.

The building takes advantage of the park-like setting with large windows for daylighting and courtyards to allow interior functions to participate with the natural landscape. Native drought-tolerant planting was integrated into the coniferous forest ecology creating habitat for birds and other species.

Use of alternative transportation is encouraged by building a bus stop and shelter, providing ample bike parking and designated carpool parking and creating pedestrian links to an adjacent park and future regional trail. The parking lot's organic shape maximizes the number of significant existing trees retained, while its use of porous concrete and drainage swales means that all of the stormwater is managed on site with no impact on the municipal system.

Program

1 Community Room
2 Game Room
3 Juice Bar
4 Pool
5 Locker Room
6 Rock Climbing
7 Gym
8 Administration
9 Mechanical
10 Track
11 Fitness
12 Multi-purpose

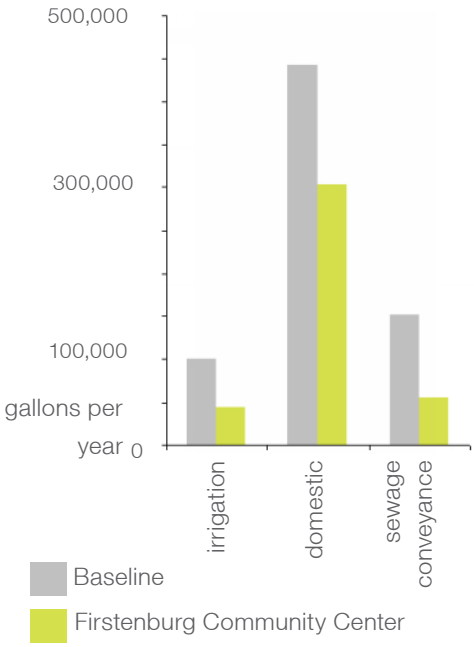


WATER CYCLE

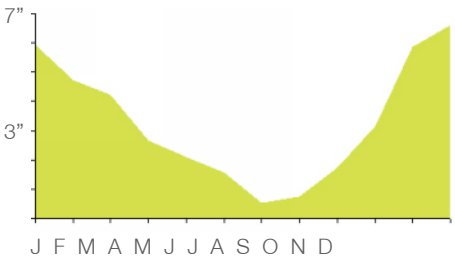
By carefully selecting drought tolerant native plants that can survive the region's dry summers and using high efficiency irrigation technology, water use for irrigation was reduced by over 50%.

Water use inside the building was reduced by 31% over a baseline building, while water use for sewage conveyance was reduced by 63%. This is achieved through the use of waterless urinals and low flow fixtures, as well as by using graywater from the pool's filter backwash system to flush many of the building's toilets. Approximately 60,000 gallons of 'recycled' graywater are used annually.

Water Use Reduction



Monthly Precipitation



Total Annual Precipitation = 39.96 inches

ENERGY FLOWS

Sustainability goals identified at an early design charette highlighted maximization of transparency between spaces, using daylight throughout the entire building, reinforcing opportunities for passive cooling, creating strong connections to the site and providing a welcoming open display of recreation and community spaces. These forces resulted in a long thin building footprint that allows for exceptional daylight and cross ventilation, while creating a large protected south facing courtyard.

Radiant concrete slab floors are heated or chilled to maintain comfortable temperatures throughout the year while using minimal energy. The mass of the concrete in the floor as well as in exposed thermally massive walls effectively stores heat or coolness to decrease the effect of exterior temperature swings. Other passive systems such as automated natural ventilation and solar shading devices that block heat gain from direct sun in the summer, but allow it during the winter work in tandem with the thermal mass and mechanical systems.

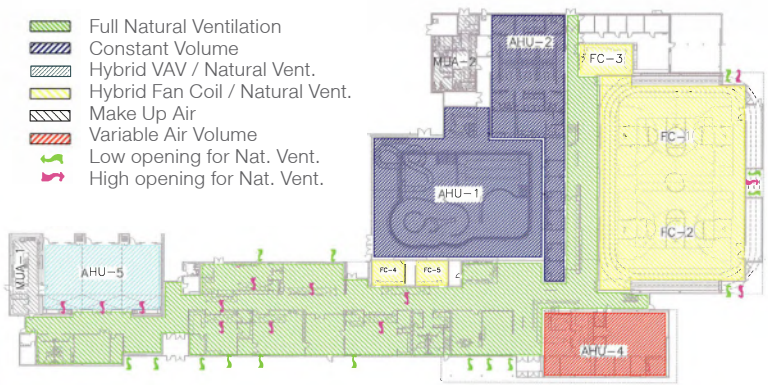
A central heat pump recovers waste heat in the summer and uses it to heat the pool and domestic water, often allowing the 96% efficient boilers to shut down entirely. Daylight sensors integrated with dimmable energy efficient lighting fixtures eliminate the use of artificial lighting whenever possible. In combination, these systems result in energy use that is anticipated to be at least 27% less than traditional building construction.

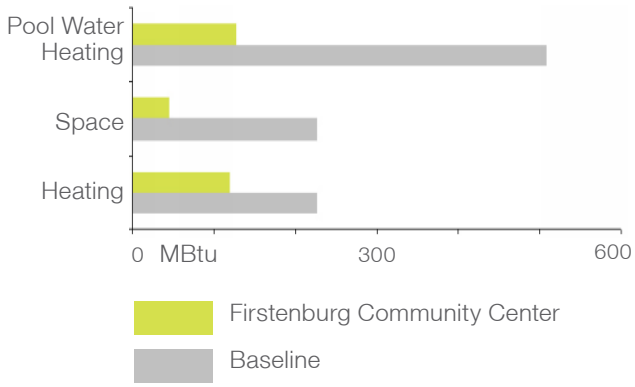
Energy Use

27%
Annual Energy Savings

$66,629
Annual Energy Cost Savings

Mechanical Air Handler Systems





MATERIALS AND CONSTRUCTION

Throughout this heavily-used facility, materials have been selected for their durability, beauty, and sustainability. A strong emphasis is placed on natural, non-toxic enduring materials that will be attractive for decades to come, while also eliminating material use altogether when possible. Douglas fir trees, many of which were diseased, were harvested from the site and milled locally for 12,000 board feet of material used as wall paneling, screens, benches and bleacher seats. Other wood, such as the exterior wood rainscreen system that provides durable protection for the building's waterproofing, was constructed with Forest Stewardship Council certified sustainably harvested wood.

The bamboo community room flooring and acoustical wall paneling made from perforated wheatboard are quick growing 'rapidly renewable' materials. Recycled materials such as the glass wall tiles used in the locker rooms and natatorium make up nearly 30% of all construction materials used. Use of unnecessary materials was eliminated with the use of exposed steel structure, ground face concrete masonry block walls, and concrete floors, and passive heating and cooling eliminates substantial need for ductwork. Material waste was also considered during construction as the contractor was able to recycle 99.4% of all construction waste.

Douglas fir trees were harvested, locally milled and used throughout the Center.

29%
Recycled Materials used for Construction

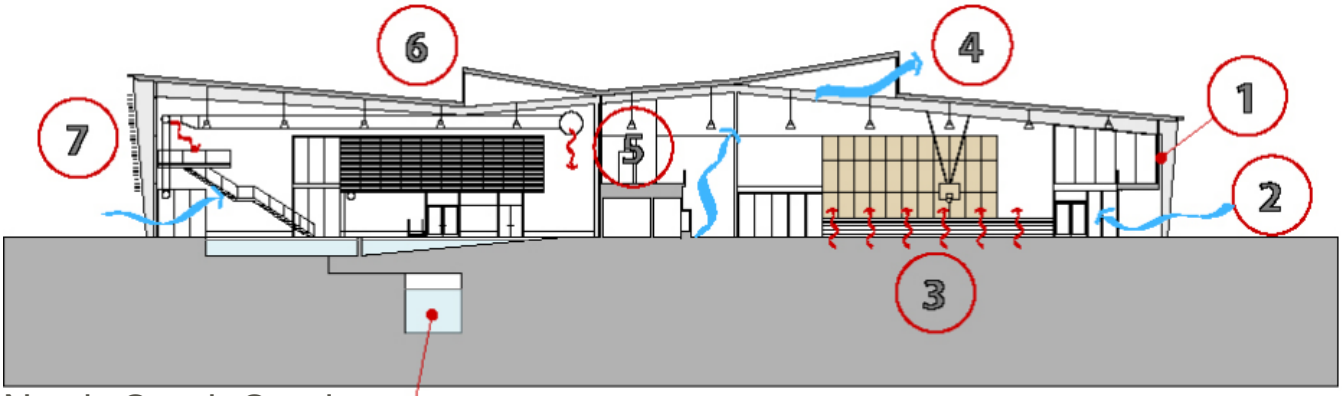
56%
Of Wood Base Building Products are Forest Stewardship Council Certified

41%
Regional Materials Manufactured within 500 Miles used for Construction

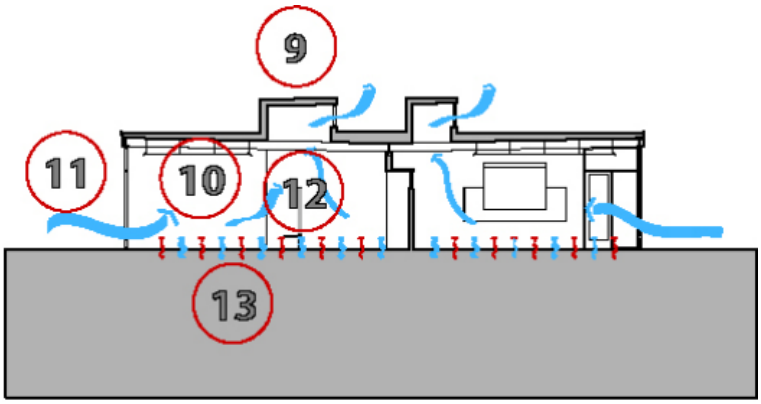
99.4%
Construction Waste was Recycled

Awards

Northwest Pacific Region AIA Merit Award 2008
Portland Chapter AIA Merit Award 2006
Portland Chapter AIA Sustainable Design Award 2006
ASHRAE Technology Award, 2007 First Place
Athletic Business Magazine Facility of Merit Award 2007
Washington Recreation and Park Association Spotlight Award 2007
Vancouver Community Pride Award 2006



North-South Section



East-West Section

Daylight and Ventilation Features

1 North Facing Daylight Glazing
2 North Facing Air Intake
3 Radiant Heated Slab
4 Daylight and Stack Ventilation Monitor
5 Clear Glazing to Natatorium
6 South Facing Daylight Monitor
7 South Facing Wood Sunshade
8 Pool Filter Backwash System Tank
9 Relief Air / Daylight Monitor
10 Indirect Lighting with Daylighting Control
11 Operable Windows and Trickle Vents
12 Screen and Bench of Milled Site Trees
13 Radiant Heated and Chilled Slab

INDOOR QUALITY

Ample daylighting, natural ventilation and non-toxic finishes help Firstenburg Community Center provide a healthy environment for the community's health and recreation activities. The design team used the Portland Daylighting Lab's artificial sky to model a variety of monitor and sunshade configuration possibilities, and a three dimensional model simulating air patterns and space temperatures was created in order to refine the natural ventilation systems. These efforts resulted in east-facing roof monitors with windows operated by sensor-activated actuators to provide deep penetration of daylight into the building and natural stack ventilation as well as north facing monitors at the gymnasium to provide natural stack ventilation and throw daylight deep into the building for balanced, glare-free natural light.

Air quality is further improved by CO2 sensors and low level trickle vents that ensure sufficient ventilation while minimizing energy loads. Composite wood and agrifiber products specified contain no added formaldehyde and construction materials were specified to avoid volatile organic compounds (VOC's). In the natatorium, low level exhaust and ultraviolet secondary water treatment reduce air-borne chlorine contaminants while fabric duct work can be laundered to maintain a clean air distribution system.

Cascade Park Community Library

In 2010, construction was completed on the Opsis Architecture and Johnston Architects designed Cascade Park Community Library directly adjacent to the Firstenburg Community Center. The co-location of the facilities provides numerous efficiencies for systems, from public transportation and parking to utilities, which create a new 'civic center' for the recently annexed portion of Vancouver.

The building focuses views into stands of large existing trees and captures filtered daylight. The dramatic, sloped wood ceiling reading room, stacks, and checkout are open visually to the surrounding children's area, teen area, and meeting rooms. A large community meeting room features a shared but securable entrance for use when the Library is closed. The children's area includes a curving wood parent perch, a family story room and an outdoor courtyard. The building won the 2010 Community Pride Design Award.

DESIGN & CONSTRUCTION TEAM

Opsis Architecture
Arup Engineers, Structural Engineer
Keen Engineering, Mechanical Engineer
Interface Engineering, Electrical Engineer
2020 Engineering, Civil Engineer
JD Walsh & Associates, Landscape Architect
Water Technology, Aquatics Engineer
The Sports Management Group, Programming/Operations
Halliday Associates, Food Facilities
Mark Day & Associates, Technology
Anderson Kriegier, Signage
Berschauer Phillips, Contractor

Photos courtesy of Michael Mathers Photography

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