

GROUNDS

Due to the high water table regulated by the Sammamish Slough, the Center building sits atop hundreds of rammed aggregate geopiers, anchoring the building and minimizing the potential for an earthquake-caused disaster. A restored wetland adjacent to the parking lot receives inflow from the chain of bioswales, continuously recharging the subsurface water table. The wetland provides numerous ecosystem services sequestering carbon and filtering surface water before it reenters the water table. Together, these features host an abundance of plant and animal life.

Finally, two electric vehicle charging stations are available to all EV owners around the clock.

21 ACRES
growing eating living



Center for Local Food and Sustainable Living



GUIDE TO SUSTAINABLE FEATURES

LEED-ING THE WAY

When 21 Acres received the news from the U.S. Green Building Council that its Center for Local Food and Sustainable Living achieved LEED Platinum certification in November 2013, it marked the end of a decade-long process involving hundreds of people working to design, plan, and construct an ideal building lasting for the next 100 years.



The USGBC continues to be a critical voice for how green buildings contribute to resilient communities and their Leadership in Energy and Environmental Design (LEED) rating system provides a toolkit and a blueprint for building and maintaining sustainable buildings. This Sustainable Features Guide describes some of the strategies 21 Acres used to earn LEED credits.



VENTILATION

The health and comfort of a building's occupants are the most important design objectives, so access to fresh air is a paramount concern. The Center's ventilation follows the form and organization of naturally occurring systems driven by exterior wind or internal warm air circulation. Air movement inside changes seasonally and is affected by occupant-generated heat in winter (stored in the building walls) and simple window operation in summer.



Fresh air enters two large duct openings where ultra-quiet, energy efficient fans draw in outside air through filters and deliver it to the interior. The ducts penetrate an earthen berm that warms the air in winter and cools it in summer. Once air enters the building, it passes through an efficient heat exchange system using fluid from a ground source heat pump as the exchange media.

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2/2015

LEED Facts	
For LEED BD+C New Construction (v2.2)	
Certification awarded Nov 2013	
Platinum	54
Sustainable sites	12/14
Water efficiency	5/5
Energy & atmosphere	17/17
Material & resources	5/13
Indoor environmental quality	10/15
Innovation	5/5

WATER

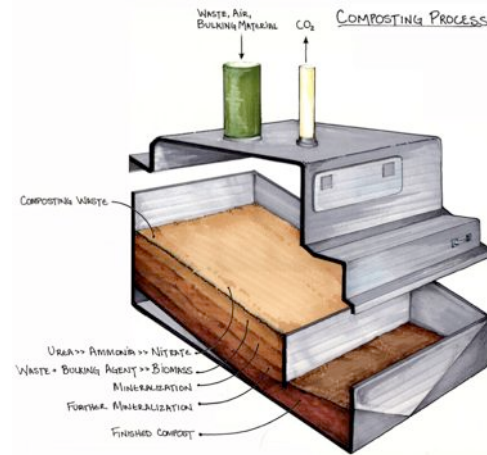
Like most commercial buildings, potable water enters from a municipal water main. Unlike most commercial buildings however, all wastewater is treated on-site. Kitchen and bathroom graywater flows through biodigesting tanks and then into sand-based biofilters. Together these systems operate as living organisms, breathing air, consuming organic material, and producing essentially pure water and innocuous gasses.



Gray water flows through biodigesting tanks before entering biofilters.

Stormwater is also handled on-site. The parking area surface consists of permeable pavers allowing runoff to seep into bioswales where it slowly moves to connecting rain gardens. Rainwater not captured by the building's green roof also drains toward the bio-swales before seeping back into the soil.

Composting toilets on the second floor use gravity to separate liquids from solids. The wastes slide down an inclined platform toward the bottom



Cutaway of composting toilet tank.

of the composting chamber. Liquids collect underneath the platform and get pumped outside into a storage tank. Over time, the waste is converted into biosolids or compost. The composting toilets together with waterless urinals and low flow fixtures reduce water use 85% over conventional fixtures.

ENERGY

A 25.6 kW rooftop photovoltaic (PV) solar array offsets approximately 10-15% of the facility's electric consumption. The building is equipped with computerized circuit breakers that measure electrical consumption at the breaker panel. An energy monitoring system is available and can display electricity production and consumption. A public touch screen kiosk provides information about the effectiveness

of the energy-saving features.

The entire building is heated using a radiant floor system with heat extracted from the earthen berm by a heat pump system. Fluid in the system absorbs heat in the ground as it passes through underground tubing. When the fluid returns to the building, the heat gets transferred and redistributed throughout the building, via tubes in the interior concrete floors.



A horizontal closed loop heat sink.

Windows allow ample daylight to enter the building, even on the darkest of winter days and occupancy sensors keep highly efficient light fixture use to a minimum. A gearless traction elevator uses approximately 70% less energy than a hydraulic elevator. Together, these measures reduce energy use approximately 30% over a conventional building.

BUILDING ENVELOPE

The building's systems were carefully designed and integrated to reduce

the demand for energy, while keeping the building's occupants comfortable. The insulated concrete forms used in wall construction result in an average of 44% less energy needed to heat the building and 32% less energy to cool in summer than conventional construction methods.

An example of low impact development, multiple living or vegetated roofs serve as the roofing material over surfaces not covered by PV panels. With growing media and plants taking the place of asphalt shingle or PVC, the plant and soil matrix reduces the heat island effect, reduces storm water runoff, absorbs carbon dioxide, reduces summer air conditioning costs and winter heat demand.



Sedum plantings for green roof.

Compared to conventional construction, the design team placed an unusually strong emphasis on sourcing local and recycled content in the building materials and finishes. These are most evident in the kitchen and bathroom areas.