

Green Building Features

Northwest Center for Engineering, Science and Technology

OUR COMMITMENT

Portland State University is committed to responsible development in building design and construction. Leadership in Energy & Environmental Design (LEED) is a voluntary building rating system for commercial buildings developed by the U.S. Green Building Council (USGBC) to provide a national consensus in what constitutes a “green” building and to provide market incentives to build green. PSU has received a **LEED Gold** rating for the new Northwest Center for Engineering, Science and Technology (NWCEST). The project team diligently pursued an integrated design process to make the NWCEST as sustainable as possible within program requirements. Along with providing a pleasant environment for students, faculty and retail tenants, the NWCEST is a model for energy and resource efficient design.

INDOOR AIR QUALITY

- Implemented an Indoor Air Quality plan to prevent indoor air quality problems during construction due to air contaminants
- Reduction in the quantity of odorous, potentially irritating and/or harmful indoor air contaminants by specifying low-emitting:
 - Adhesives and sealants
 - Paints and coatings
 - CRI green label carpet
 - Formaldehyde-free case and formwork, where possible
- Walk-off mats at entrances to reduce indoor air pollutants
- Separately vented janitorial closets and copier rooms
- Safer, environmentally responsible janitorial services and a six-month free green cleaning supply program for retail tenants

ENERGY EFFICIENCY

Designed to use 45% less energy than Oregon Code through:

- Geothermal heating and cooling system
- Variable volume supply and exhaust systems
- High-efficiency building envelope
- High-efficiency lighting, daylighting and occupancy sensors
- Natural ventilation strategies
- Demand controlled ventilation

WATER EFFICIENCY

Designed the building to use nearly 40% less water:

- Dual flush toilets and waterless urinals on floors two through five
- Rainwater harvesting and reuse for toilet flushing on first floor
- Low-flow fixtures throughout the building
- Water efficient landscaping and the use of native plantings, as well as no permanent irrigation



RESOURCE EFFICIENCY

- Recycled or salvaged over 90% of waste during demolition and new construction
- Specified materials with high recycled content, including:
 - High fly-ash concrete foundation
 - Steel insulation
 - Resilient tile flooring and carpeting
 - Interior paint is 100% recycled latex
- Specified locally manufactured materials, including concrete, brick, structural steel and doors
- Preference given to local and regionally extracted materials
- Interior recycling and sorting facilities

ENVIRONMENTAL RESPONSIBILITY

- Transit-supportive project: Portland streetcar and several bus stops within ¼ mile of building
- Bicycle parking available in bike-storage room, and on-site bike lockers for use by retail employees and/or customers
- Alternative fuel Flexcar car-sharing vehicle located across street from main entrance
- Rainwater harvesting reduces the burden on the city drinking water & stormwater systems
- Additional catch-basin design and stormwater recovery that exceeds City of Portland requirements for removing Total Suspended Solids (TSS) and Total Phosphorous (TP)
- Environmentally-appropriate landscaping, including native and drought-tolerant species



WHAT IS A GREEN BUILDING?

- Considering true costs of building and site impacts on local, regional and global environment through lifecycle costing and assessment.
- Using natural resources efficiently, maximizing the use of local materials, and eliminating waste.
- Reducing building ecological footprints and allowing ecosystems to function more naturally.
- Optimizing climatic conditions with site orientation and design.
- Using energy-efficiency systems and materials.
- Integrating natural daylight and ventilation and improving indoor air quality.
- Planning for future flexibility, expansion and building demolition.
- Reducing, reusing, and recycling materials in all phases of construction and deconstruction.
- Minimizing use of mined rare metals and persistent synthetic compounds.
- Conserving and reusing water, treating storm runoff on-site.
- Encouraging transit, bicycle, and pedestrian-oriented project.
- Including advanced telecommunications technology, allowing greater electronic access, and reducing need to travel.
- Improving acoustics and reducing noise levels.

SUSTAINABILITY AT PORTLAND STATE UNIVERSITY

As a public institution, Portland State University has a responsibility for public service and stewardship. This responsibility extends to the students we teach, the community we serve and the land we inhabit. PSU's commitment to sustainability is demonstrated by the green features in this building, but certainly not limited to them. Sustainability is also important for aspects of campus you can't see and is active in community sustainability projects. In addition, PSU offers academic programs related to sustainability. To learn more about sustainability at PSU please visit www.sustain.pdx.edu.

Contacts

MASEEH COLLEGE OF ENGINEERING AND COMPUTER SCIENCE • www.cecs.pdx.edu
1900 SW Fourth Avenue, Suite 315
Portland, Oregon 97201

Dresden Skees-Gregory, Sustainability Coordinator
503-725-8945

David E. Ervin, Professor, Environmental Studies and Coordinator of Academic Sustainability Programs
503-725-3935

ARCHITECT - Zimmer Gunsul Frasca Partnership

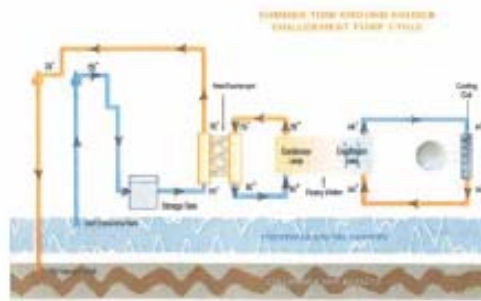
CONTRACTOR - Lease Crutcher Lewis

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HIGHLIGHTED FEATURES

Ground Source Heat Pump/Chiller

The heart of the ground source heat pump/chiller system are its 400 and 200 ton Trane rotary chillers, which use well water as either a heat source in the winter or a cooling source in the summer. There are 2 extraction wells that feed the system, each



with a submersible well pump that pumps up to 1000 gpm to a large concrete storage tank. Water is pumped from the storage tank up to the mechanical penthouse through a series of heat exchangers, then back to an injection well that transfers the heated or cooled water back to another aquifer. The chillers use compressed refrigerant to create both a hot condenser cycle and a cold evaporative cycle. In the summer the chiller sends cold evaporative water to cooling coils in



the air handling units, providing cooling for the building. The system takes the chiller's hot condenser water and "rejects" it to the well via the heat exchangers.

In the winter the chiller sends hot condenser water to the air handler's heating coils while rejecting cold evaporative water to the well via the heat exchangers. This highly efficient system returns untreated well water to another nearby aquifer, thereby minimizing the amount of wasted well water.

Rainwater Harvesting System

The rainwater harvesting system for this project uses Oregon's average 38" of annual rainfall to supplement the building's overall water demand. The system captures rain from approximately 1/2 of the rooftop area and diverts a portion through the rainwater harvesting system located in the hydrology lab on the 2nd floor. The water is stored in a 1000 gallon storage tank, filtered through carbon, and undergoes UV sterilization before being pumped to toilets and urinals on the 1st floor. In addition to conserving drinking water and reducing rainwater runoff, this system also contributes to the university's engineering curriculum. Students will use the rainwater harvesting system to study water usage rates, savings, filtration methods, and other aspects in an effort to advance this technology.

