

Operations Control Center Seattle Public Utilities

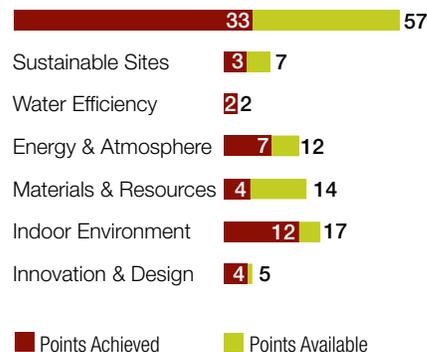


Photo by William Wright Photography

Square Feet: 27,863, 2 stories
Site: 5.4 acres
Location: SODO neighborhood
Construction Cost: \$143/square foot
Completed: September 2007

LEED Facts - CI Gold

Anticipates Being Achieved



Benefits

- 100% power from green power
- 32% less indoor water use
- 30% more ventilation
- 40% of furnishings reused
- 71% of construction waste diverted from landfill

Project Overview

Seattle Public Utilities' (SPU) Operations Control Center (OCC) is an adaptive reuse project that supports the utility's mission and strategic priorities for the next century. In addition to housing overall field operations management staff, it serves as a base for water and sewer field operations in south Seattle and as a backup emergency operations center for the city.

The 36-year-old structural concrete building was modernized to meet current seismic standards and fire codes, and all building systems were updated to be more energy

efficient. The facility features advances in communications technology and responds to increased security demands.

Three operational functions in the SPU OCC are staffed 24 hours a day by at least three staff members, and those include the SCADA control room, the Operations Response Center, and the First Response Crew. There is a full time staff of approximately 100 and approximately 150 crew members who operate out of the facility. Personnel based in other facilities may use the building to attend meetings or training sessions on any day.



Photo left by NEllen Regier, middle by Ted Jonsson and right by William Wright Photography

Art at the Operations Control Center

The SPU Public Arts Program uses visual art experiences to reinforce and illuminate its mission for ratepayers and employees alike. SPU partners with the Office of Arts & Cultural Affairs' Public Art Program to administer SPU's Arts Program to incorporate art that enhances SPU projects, facilities and properties and/or that helps educate the viewer about SPU's work.

Title: *Chimera*

Artist: Ted Jonsson

Completed: 1975

Commissioned: Seattle Water Department construction funds (now Seattle Public Utilities)

The artwork shown in photo above uses water as the primary sculptural element and features two curved, stainless steel pipes, which begin at either end of a pool of water and meet at the pool's center, curving upward in an "S" shape. Mirroring one another, the two pipes create the symmetrical form of a figure eight. The sculptural form is extended by the shape of water that is projected out of each pipe as it splashes toward the sides of the pool.

Additional public artworks are showcased at the Operations and Control Center and appear in some of the building photography included in this case study. For more information on these artworks, please contact the Office of Arts & Cultural Affairs.

Sustainable Sites

The OCC is in a two-story concrete structure built in 1971 and located in an industrial zone about two miles south of downtown Seattle. The renovation project is restricted to the interior of the building, and does not include the existing landscaped forecourt and mature plantings or the exterior of the building.

The facility is adjacent to a warehouse, also belonging to SPU, and across the street from a gated operations yard dedicated to parking as well as equipment and parts storage. The building is located to the west of the raised roadway of Interstate 5 and to the north of the Sound Transit light rail line as it emerges from the west portal of the Beacon Hill tunnel.

The OCC is about four blocks from the SODO Link Light Rail station and bus connections. No new parking was added for the project, and bicycle storage, showers and changing rooms are inside.

The heart of the project is a key public function that communities all over Seattle depend upon. The citywide SCADA (Supervisory Control and Data Acquisition) system for monitoring and controlling SPU's water system has undergone a conversion from analog to digital technology. Changes include reorganization of space to improve work group adjacencies and the integration of new technologies, including remote monitoring and communications systems.

Critical system monitoring and emergency operations are accommodated inside the core of the building, which has been renovated and updated for increased electrical and data cabling as well as accessibility requirements.

Within the constraints of a tenant-improvement project with emergency preparedness and security functions, the OCC reinforces high standards for sustainable design for city projects and for the larger community, including water and energy conservation and interior environmental quality.

Water Efficiency

Since the OCC is an important base for water system field crews who sometimes work around the clock, locker, shower and kitchen facilities are very important and heavily used. Water conservation is a value promoted by Seattle Public Utilities as part of its public outreach and education programs, and special effort was made to reflect this value in the OCC project. Measures include low-flow faucets and flow restrictors throughout the facility.

Based on occupancy and the use of low-flow fixtures, the facility is expected to achieve a 32 percent reduction in total water use over standard performance measures as outlined in the Energy Performance Act of 1992. In all, the facility is expected to save 60,824 gallons of water annually, enough to serve a similar building.



Photo left, middle and right by William Wright Photography

Energy & Atmosphere

Because of the existing building shell and the complex security needs, comprehensive natural ventilation would be impractical. However, the design team was able to dramatically increase energy efficiency and energy security by taking out an oversized boiler and replacing it with a high-efficiency natural gas-fueled unit that is capable of running on oil in an emergency.

The combination of heating, ventilation and air conditioning upgrades, new windows, increased insulation and ENERGY STAR appliances is expected to result in energy savings of 15 percent over a project built to the standards of ASHRAE (American Society of Heating, Refrigerating and Air Conditioning Engineers) Standard 90.1-2001. Lighting power density is reduced approximately 15 percent below the same ASHRAE standard.

The automatic air handling system is upsized to accommodate a greater square footage of outside air for cooling and ventilation. This system, combined with the capability of expanded hours of operation, makes it possible to efficiently cool the building during non-working hours in the summer months. The system can be programmed to allow flushing and pre-cooling, delaying the need for air conditioning on summer days.

The microprocessor-based controls for the HVAC system provide trend information on energy use to allow monitoring over the life of the facility.

High-efficiency light fixtures include T5 lamps and T8 lamps and compact fluorescents. Over 90 percent of occupants can adjust lighting level to suit individual task needs. To take advantage of natural light, daylight responsive controls are installed in all regularly occupied spaces within 15 feet of windows and under skylights.

ENERGY STAR-rated appliances are used in the kitchen and office equipment throughout the facility is also ENERGY STAR compliant.

In addition to these measures, Seattle Public Utilities has engaged in a two-year renewable energy contract with Seattle City Light. OCC purchases shares in new green renewable energy for 100 percent of energy use or 415,392 kilowatt hours per year, which offsets non-renewable energy used at the site.

Materials & Resources

SPU's promotion of resource conservation is supported through the remodel of the existing OCC building. By staying in place and reusing an existing facility, SPU has avoided the substantial resource depletion and waste generation that building a new facility would entail.

In addition, construction demolition and packaging debris was salvaged or recycled, with 71 percent of the total diverted from landfills. Efforts were made to reuse furniture from the old facility as well as from other SPU facilities. Recycled content constitutes approximately 10 percent of all materials used in the project.

The new office furniture system was selected to match the systems used in other SPU facilities, to ensure interchangeability and greater flexibility for reuse in the future.

A full recycling program for the building includes paper, cardboard, glass, plastics, batteries and metals.

Indoor Environment

Design strategies for the OCC include the removal of existing dropped ceilings as well as a large number of non-structural walls, especially at the perimeter. In addition to bringing more daylight deeper into the building, this overall approach creates an open office plan for much of the department staff, with anticipated benefits of communication and collaborative work.

To provide high indoor air quality, outdoor air ventilation rates to all occupied spaces at the OCC are 30 percent above minimum rates required under the city building code. A CO² monitoring system will be installed to ensure that the HVAC system maintains minimum ventilation requirements.

Carpet systems were chosen according to the Carpet and Rug Institute's Green Label Plus product requirements. Paints, adhesives and finishes were selected for low levels of volatile organic compounds. Greenguard® Indoor Air Quality Certified furniture was used.

To ensure interior air quality at move-in time, the heating and ventilation system was run 24 hours a day for a week, with high-efficiency filters prior to occupancy.

Closed-loop hydronic heating is divided into zones that are controlled by temperature sensors. In addition, individual controls allow occupants to manually adjust temperature. Trend logging ability built into the HVAC control system allows the owner to spot deviations from the comfort zone and make adjustments with participation from occupants.

As part of the green housekeeping plan developed in conjunction with the design of the OCC, products used for cleaning, deodorizing and disinfecting every where in the facility are screened by a rigorous rating system. The system, which was developed in collaboration with the Washington Toxics Coalition, is based on very low or zero tolerance for carcinogens and reproductive toxins, neurotoxins, flammability, corrosivity, volatile organic compounds, endocrine modifiers, aerosol containers, eye and skin irritation, eutrophication, biodegradability, fragrances and dyes. Janitorial supplies are screened for other environmental concerns, including recyclability of containers. A training program for janitors working in the building includes instructions for using approved products efficiently and supporting the source separation and recycling program that is in place.

Innovation & Design

A set of pilot green housekeeping policies and procedures have been developed for the building, along with training and instruction materials. In addition, the project is the focus of educational outreach through story boards inside the building, a case study and through publication on the city's website.

- Green Housekeeping Program
- Education Program
- Exemplary Performance in Green Power
- Ultra-violet lighting at HVAC coils to improve indoor air quality

Lessons Learned

The SPU OCC demonstrates that significant gains in overall function, interior environmental quality, and long-term sustainability can be achieved without investing in new building construction. The original building type, a massive 1970s modern structure, presented significant challenges in code compliance and retrofit. However, the environmental advantages of recycling the structure are even more significant.

While removing dropped ceilings and superfluous partitions and exposing structural elements is not a new or unusual design strategy in urban tenant improvement projects, its value in sustainable design is reinforced in this project. The use of paints and wall coverings, with associated maintenance needs and risks to indoor air quality, was minimized. The future waste stream, at the end of these materials' life span was dramatically reduced. Coincident with these benefits, there was a net gain of natural light at most regular workstations. The increased daylight and sense of expanded space dramatically enhances the quality of daily experience for occupants.

Director's offices are enclosed around the core of the building, at a distance from exterior windows. Special efforts were made to provide abundant natural light to the interiors. The closed ceilings are punched through with small interior skylights designed to transmit natural light from the open space below the structural ceiling. In addition to giving the feeling of openness, this feature also admits a small amount of light. However, the actual contribution to light levels is low.

The green housekeeping measures adopted by SPU, with a certification process for product suppliers and education program for janitors, may serve as a model for other organizations and facilities.

Rating & Awards

U.S. Green Building Council LEED® for Commercial Interiors Gold Rating - [Anticipated](#)

The Team

Owner

Seattle Public Utilities
www.seattle.gov/util/services

Architect

Hewitt Architects
www.hewittarchitects.com

Mechanical Engineer

Notkin Engineering
www.notkin.us

Structural Engineer

KPFF
www.kpff.com

Interior Designer

Mercedes Fernandez
www.mercedesign.com

Electrical Engineer

Sparling
www.sparling.com

Lighting Designer

Candela
www.candela.com

General Contractor

Advanced Technology Construction
www.atcbuilder.com

Commissioning Agent

Keithly Barber Associates
www.keithlybarber.com

To Learn More

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

Seattle Public Utilities provides customers with reliable and cost-effective water, sewer, drainage and solid waste services, while protecting public health and balancing social and environmental responsibilities to the community. www.seattle.gov/util/services

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

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

Seattle City Light Green Up Program enables customers to invest in new renewable resources. www.seattle.gov/light/Green/greenPower/greenup.asp

ENERGY STAR® helps citizens and businesses save money and protect the environment through energy efficient products and practices. www.energystar.gov

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