

Ohlone College Newark Center for Health Sciences and Technology

Sustainable Design Features

Background

From the outset, Ohlone College President Douglas Treadway conceived of the Newark Center for Health Sciences and Technology as a “green” campus that would not only benefit the environment but also serve as a showcase for sustainable design. “Given that the Center’s curriculum includes such subjects as environmental studies, health and emerging technologies,” Treadway explains, “we envisioned the Newark campus as both a teaching tool and an environmentally responsible facility.”

The U.S. Green Building Council’s LEED (Leadership in Energy and Environmental Design) program provides the nationally accepted certification standard for measuring a facility’s environmental sustainability. LEED certifications begin at basic; the highest certification level is Platinum. “We initially targeted basic Certification,” says Treadway, “but now we’re on target for Platinum.”

Following are major features of the Newark Center’s sustainable design:

Solar Power

The Newark Center features the largest solar power collection system in the Silicon Valley, a 600kW solar collection system covering 38,000 ft² of roof space with the most efficient photovoltaic panels available. Used for heating and other utilities, the solar system will provide roughly 30% of campus electrical power needs, resulting in annual energy savings equal to:

- 40,900 barrels of oil
- 19 million pounds of coal
- 236 million cubic feet of natural gas

This is equivalent to:

- Removing 900 cars per day from the road
- Planting 1,400 acres of trees
- Power for 500 homes per day

In terms of air quality, this translates to eliminating:

- 7,000 lbs NO_x per year (smog)
- 6,000 lbs SO₂ per year (acid rain)
- 9 million lbs. CO₂ per year (global warming)

Geothermal Heating and Cooling

To save energy for cooling, the design employs an innovative use of geothermal resources. Whereas many passive geothermal systems are used solely for geothermal heat, the Newark Center’s design employs stable subterranean temperatures to cool warm interior air on hot days and warm cold air on cooler days. The system works as follows.

- Interior air is sent to a geothermal system collection point
- The air then travels through 26 miles of subterranean piping and four acres of heat exchange coils. The temperature of the piped air is either heated or cooled, by the comparatively stable subterranean temperature
- After passing through the system, the thermally adjusted air is reintroduced into interior circulation

Enthalpy Wheels

Another of the project’s energy conservation features is the use of twin enthalpy wheels, also known as rotary air-to-air heat exchangers. Located in the main lobby and visible through a transparent enclosure, these surprisingly compact devices capture wind-contained heat and humidity on cold days, effectively capturing energy that would otherwise be lost. This warmer, pre-heated air is circulated throughout the Center, reducing the amount of energy required for heating, compared to traditional HVAC systems, to keep the facility thermally comfortable.

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The facility also employs significant amounts of natural ventilation and high-performance mechanical systems.

Lighting

In order to maximize energy conservation, lighting efficiency was achieved by:

- Designing the Center shell to maximize daylight contribution to interior spaces, thereby reducing the amount of electric lighting needed
- High-performance glass is used to transmit high levels of daylight while minimizing glare and heat gain/loss
- Energy-efficient lighting (with full-spectrum lamps) is utilized throughout the Center and equipped with occupancy sensors where appropriate

Water Conservation

Water conservation plays an important part of the campus eco-friendly design. Water conservation and related features include:

- Drought-tolerant, water-efficient landscaping, combined with a storm water garden and bioswale for runoff collection and filtering, reduces water usage for irrigation by 20% to 30%.
- Unused water is discharged into protected Bay wetlands
- Campus landscape represents the largest “Bay-Friendly Landscaping” installation in the San Francisco Bay region
- Water-conserving fixtures are used throughout the Center

Costs & Payback

- Capital cost additions for the Center’s sustainable design and construction represented a 3% to 5% premium over cost estimates for an equivalent, yet non-sustainable, campus.
- Energy savings projected at more than \$400,000 annually
- The energy strategies result in a 60% reduction in costs for energy operations

For additional information regarding the project’s sustainable design, please contact Karen Cribbins-Kuklin at the architecture firm of Perkins+Will, designer of the Ohlone College Newark Center. (415-856-3079, karen.kuklin@perkinswill.com)

Building Processes & Materials

- Recycled denim is used exclusively for building insulation
- 60% to 99% of the Center’s furniture is recyclable
- All paints and finishes are low-emission rated
- A high percentage of construction materials were locally sourced
- Construction materials with high recycled content levels were specified wherever feasible
- Forest Stewardship Council Certified hardwoods were used where possible
- The construction phase featured an Indoor Air Quality Monitoring program to keep potential contaminants and pollutants from entering the facility
- A major construction waste management program was put into effect

Brownsite Reclamation

Previously used for farmland, much of the 80-acre campus site was heavily polluted by herbicide use. In response:

- Much of the affected soil was dug up and set aside for future treatment with herbicide consuming bugs prior to re-use.
- 50 acres not slated for campus expansion are proposed to be imbedded with pollution-eating bacteria. The result will be that this area will be clean of all hazardous waste and returned to its natural condition as open space within approximately eight to 10 years.