

seattle's
new

central library

*a lesson in
sustainability*



Designed by renowned architect Rem Koolhaas before the City of Seattle adopted its sustainable building policy, the Central Library will not only meet that policy, but is expected to achieve a LEED™ certification.

—Photo by Ian Edelstein
City Design, Print and Copy

Under the leadership of Seattle City Librarian Deborah Jacobs, the new Central Library has been “future-proofed” to ensure that it is embraced by Seattle, and in turn serves the city for a very long time.

The March 2004 issue of dpdINFO featured a new series of green home remodeling guides published by Seattle Public Utilities. This month we focus on Seattle’s new Central Library, a building with much to teach about sustainability.

Perhaps no institution, other than a university, is as associated with learning as a library. But Seattle’s new Central Library is not just a place that houses teaching materials; the structure itself teaches sustainability by incorporating environmentally friendly design concepts into a building that also feels good.

Some interesting sustainable design strategies used in the library include the high-performance curtainwall system, daylighting, rainwater harvesting and minimal use of materials, like using the structure as the finish. Seattle Public Library (SPL) is developing an education program that will teach visitors about the sustainable design features incorporated into the building. The education program includes signage, an information kiosk, tours, and a page on SPL’s website at www.spl.org. Information developed for children and teens describes the strategies that create healthy indoor environments while conserving resources.

Function Over Form Ensures Long-Term Usability

Under the leadership of Seattle City Librarian Deborah Jacobs, the new Central Library has been “future-proofed” to ensure that it is embraced by Seattle, and in turn serves the city for a very long time. Renowned architect Rem Koolhaas, of the Office for Metropolitan Architecture, was selected to design the project because of his innovative approach to place function before form.

For example, the books—located along a four-story “Books Spiral”—are organized along a continuous ramp according to the Dewey Decimal system. The gentle slope provides barrier-free, universal access. Because they aren’t spread out on multiple floors, books can be located readily and added easily, providing the library with room to grow the size of the book collection from nearly 1 million to 1.45 million volumes.

As seen in other libraries, expansion of collections often encroaches on public spaces, yet another reason the old library needed to be replaced. The new Central Library has more public spaces, including the lobby, the Betty Jane Narver Reading Room, and the Faye G. Allen Children’s Center, which is more than seven times the size of the previous children’s area.

The library uses a well-organized strategy, called a Wayfinding Program, to help visitors navigate. Elements include large-sized supergraphics serving as signage, directing patrons to needed services and steering them through the Dewey Decimal system. Important elements are color-coded throughout the building to improve usability. For example, stairs and escalators of the vertical circulation system are painted chartreuse.

Energy Efficiency Exceeds Code Requirements

The Central Library is expected to perform 10 percent more efficiently than required by the Seattle Energy Code, a code already considered rigorous by national standards. This is accomplished with a variety of features, beginning with the façade—a glass and aluminum curtainwall constructed with a high-performance glazing system. Half of the glazing is a triple-layer of glass with an expanded aluminum metal mesh sandwiched between the two outer panes. This metal mesh serves as a

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shading device, keeping the sun off the interior glass, and thus reducing heat buildup from sunlight and modulating the light entering the interior spaces. Air between glass layers provides insulation and the two inner layers of glass contain krypton to increase thermal performance. The glass also has a "Low-E" (low-emissivity) coating—a state-of-the-art system invented by the architect that underwent extensive research and development before its use was approved. The northern half of the building has double-glazed clear glass.

The glazing system takes advantage of natural daylight, decreasing the need for artificial light, while also reducing glare. The large amount of daylight available from 360 degrees is softened, creating sharp, crisp light that is not too bright. In effect, the entire building becomes a "light-catcher." The arrangement of spaces and glass also allows views that connect visitors to the urban neighborhood beyond the library's walls. For example, someone standing inside the lobby adjacent to Fourth Avenue can see out to the Fountain of Wisdom, originally designed by George Tsutakawa for the opening of the 1960 library, and the Henry Moore sculpture across Fourth Avenue, a visual relationship that did not exist in the old library.

The Central Library uses a unique type of air distribution system, called displacement ventilation, on floors 3, 5 and 10. Displacement ventilation is introduced at floor level and improves energy efficiency by utilizing lower fan speeds and less extreme heating and cooling air temperatures. This strategy works well in Seattle's temperate climate where buildings can often take advantage of "free cooling." The system also provides more fresh air to the space people occupy, creating a healthier indoor environment. Computer controls monitor the system to increase energy-efficiency, and heating and cooling can take place in independent zones, matching actual use to needs.

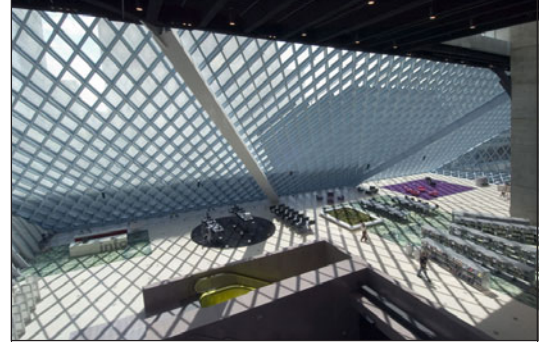
Potable Water Needs Dramatically Reduced

Rainwater is collected in a 40,000 gallon tank to meet landscape irrigation needs, eliminating use of potable water. This system increased the size of the required stormwater detention tank by about 50 percent to accommodate the storage needs. Plants were carefully selected for their low-maintenance and low-water needs. The system provides double-duty use out of a single system that was already required by code (the detention portion) and helps to prevent combined sewer overflows, which can negatively impact water quality in Puget Sound. Potable water is further reduced with the use of waterless urinals and spring-loaded automatic faucet shut-off devices in the lavatories.

Space Serves Multiple Functions

Serving multiple functions with individual features is a hallmark of sustainable design. The library makes innovative use of materials and systems with features serving double or triple duty. For example, the structural steel also serves as backup steel for the curtainwall and as an interior finish. In the core of the building, the structural concrete is painted or sealed and serves as the finish. Some spaces have lighting shielded with polycarbonate lexan panels that serve triple duty as a light diffuser, ceiling and return air plenum. Fire insulation on steel beams is painted black, and the roof insulation is covered with fabric like a quilt. Other areas have a more highly finished look. This is a part of the aesthetic variation desired by the architect, and considered part of his "trademark."

SUSTAINABLE BUILDING



The Central Library's arrangement of spaces and glass allows views that connect visitors to the urban neighborhood beyond the library's walls. Its window glazing system takes advantage of natural daylight, decreasing the need for artificial light, while also reducing glare. In effect, the entire building becomes a "light-catcher."

—Photo by Pragnesh Parikh, OMA/LMN

History of the Library

The new Central Library, which opened on May 23, 2004, is the third Seattle library building constructed at the same site.

The first building, a Carnegie library completed in 1906, lasted 54 years before being replaced in 1960. The second library lasted only 40 years before the collections outgrew the building.

In 1998 Seattle voters approved the "Libraries for All" bond, a \$196.4 million capital campaign to replace the Central Library, build five new branch libraries, and renovate 22 of the existing branch libraries.

For more information on the Seattle Central Library visit www.spl.org.

Sustainable Building Info

Another Central Library case study is available on the City of Seattle's Sustainable Building website at www.seattle.gov/sustainablebuilding/cityprojects.htm. Information on LEED™ certification is available at www.usgbc.org.

To explore DPD's role in sustainable building, visit www.seattle.gov/dpd/sustainability or contact:

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