

Greenwood Elementary School



Greenwood Elementary School's New Addition

FLOOR SPACE: 64,076 ft²
BUDGET: \$ 10.5 million (\$163.87 per ft² construction costs)
BUILDING POPULATION: 295 (K-5)
CONSTRUCTION DATES: Completed August 2002
OWNER: Seattle School District No. 1
ARCHITECT: BLRB Architects, p.s.
GENERAL CONTRACTOR: Wick Constructors
PROJECT MANAGER: Heery International
STRUCTURAL ENGINEERS: PCSA, Inc.
MECHANICAL & ELECTRICAL ENGINEERS: Tres West Engineers, Inc.
CIVIL ENGINEERS: RoseWater Engineering, Inc.
LANDSCAPE ARCHITECTS: Osborne Pacific Group, Inc.

PROJECT NOTES

SITE AND WATER

Adaptive Reuse. The existing school site was reused. Only the earlier addition was replaced.

Preservation of Wooded Areas. Existing natural areas were left intact to support habitat and outdoor learning.

Minimize Re-grading of Site. Demolition materials were used as fill to reduce the need for grade changes.

Stormwater Management: Stormwater infiltration system strategies included pervious paving for pedestrian walks and reduced parking surfaces through an alternative transportation plan.

Outdoor Water Conservation: Drought-resistant, native landscaping eliminates the need for a permanent irrigation system.

Indoor Water Conservation: Low-flow, water conserving plumbing fixtures and waterless urinals reduce water use by 33%.

ENERGY AND ATMOSPHERE

Maximize Use of Daylight. Daylight was introduced into all occupied spaces.

HVAC Upgrades: An energy efficient 4-pipe fan coil system and computerized energy management system boost the efficiency of the mechanical systems.

Envelope Upgrades: The building envelope was upgraded to meet or exceed requirements of the State Energy Code.

Commissioning: A formal systems commissioning process carried out at completion of construction.

MATERIALS AND RESOURCES

Certified Wood: FSC-certified forest products were used for building structure. [[selected areas? Everywhere?]]

Recycled Content and Local Building Materials: Structural steel, concrete, GWB, carpet, masonry, roofing, and cabinetry all contain recycled content. Several materials were locally manufactured.

Recycling: Construction waste was recycled, and a number of materials were salvaged for reuse elsewhere. The design includes space for collection and storage of occupant recyclables.

INDOOR ENVIRONMENTAL QUALITY

Low VOC Materials: The project used low volatile organic compound (VOC) building materials for adhesives, sealants, and paints.

Fresh Air: Operable windows in all classrooms coupled with 20 cfm of per occupant via the mechanical system ensures plenty of fresh air for students and teachers. Carbon dioxide sensors in placed in high occupancy spaces alert the system to inadequate ventilation conditions.

IAQ Plan: The team developed and implemented an indoor air quality (IAQ) plan for both construction and occupancy.

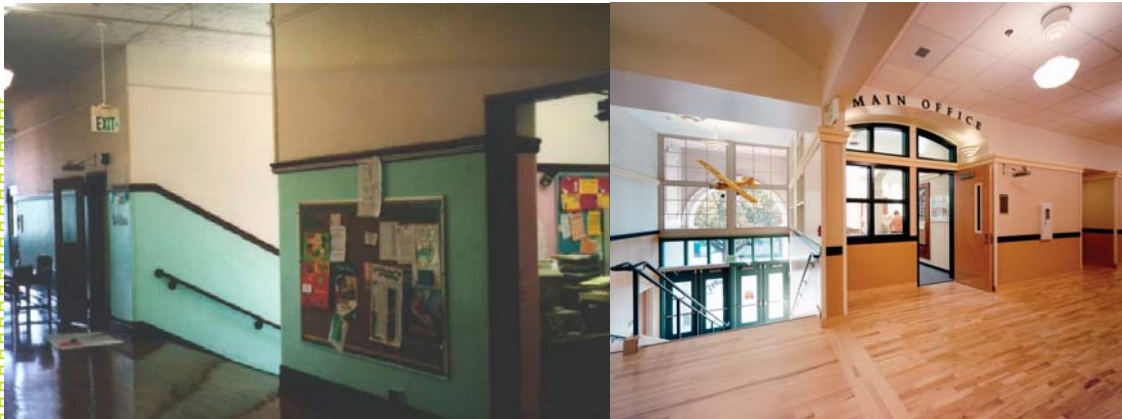
INNOVATION

- **Environmental Education Program:** The Environmental Education program uses sustainable features of the building and site as educational features.

At the onset of the planning process, the Seattle School District was unsure whether to renovate the existing school or to demolish it and build a new facility. The design team facilitated several design charrettes with the community to develop a program that reflected the Greenwood Community's values. Based on this feedback, the 1909 building was renovated, the 1921 building was demolished, and new additions were added to meet current needs.

BLRB Architects' aim was to provide a physical environment that supports a variety of teaching techniques and learning styles, promotes parent and community involvement, and restores the rich historical heritage of the original structure. The architect was further challenged to incorporate principles of energy efficiency and environmental sustainability, thus creating a model "green" school for the Seattle School District. The District wanted the building itself to serve as a teaching tool with its sustainable features furthering the educational mission of the school. BLRB's design of Greenwood Elementary is grounded in the belief of architecture's potential to educate and stimulate through its physical form. To further encourage the school to be a model of sustainability within its community, an environmental education program was established. Educational features throughout the facility include instructional alcoves, interpretive signage, an outdoor classroom, student gardens, exposed building structure and systems, and student monitoring of building systems and energy consumption.

"It's a great building to work in, the atmosphere, the ambiance," said Greenwood Principal Robert Radford. According to the Washington Environmental Council, the new standards have lowered utility costs by 30 percent, raised standardized test scores by 20 percent, and increased student attendance and employee retention rates.



The before and after pictures above show how much more warm, well-lit and inviting the administration entrance is.

In addition to a state-of-the-art building envelope and climate control system, the plan for the new Greenwood Elementary included photovoltaic panels artfully concealed in order to protect the building's historic character. These began producing electricity in the fall of 2002, making Greenwood Elementary the first Seattle Green Power project to come on line.

Electricity Generation: 1120 watts peak capacity
Solar Equipment: (8) BP Solar 140 watt multi-crystalline modules; AEI GC1000 120VAC inverter
Cost: \$6,330



Acknowledgements: Thanks to Kathleen Bjorkheim at BLRB for providing information and photos for this case study; project architect was Lee Fenton. Prepared by O'Brien & Company. Green power project picture and description from Seattle City Light website. Quotes from Seattle PI, Monday, February 7, 2005, "New Greenwood school is green -- and a nice place to work, learn Advocates point to wise energy use, recycling" By Kyle Arnold.