



CHAPTER 9: ISLANDWOOD

INTRODUCTION

“IslandWood was created to be an experiential place, designed so that each of its structures become a ‘textbook’, something the kids can operate. There, they can learn which direction is north, which direction is south; they can learn how the wind moves and how the sun moves; and they learn how to be better stewards of the environment.”

— *Dave Goldberg*

A LIGHT IN THE FOREST

“Children are the hands by which we take hold of heaven.”

Henry Ward Beecher

At IslandWood – “A School in the Woods” – much of the learning happens beneath the trees, the towering Douglas firs and Western red cedars, surrounded by sword ferns, moss-covered logs and boulders, leaves littering the forest floor – the sound of birdsong across a meadow, wind moving through the alders, the smell of water and the earth.

Located across Puget Sound from Seattle, this private, non-profit center gives area school kids the chance to experience the natural world. Outdoors, they explore science, math, writing, technology, culture and the arts through the study of plants, wildlife or stream ecology. Inside, they interact with buildings that serve as a showcase of sustainable design and construction.

IslandWood’s most valuable lessons are those of transformation, discovery and surprise – what founder Debbi Brainerd originally envisioned as “a magical place for learning”.

ISLANDWOOD

Bainbridge Island, Washington

Every week during the school year, approximately one hundred students, ages 9 to 12, spend four days and three nights at IslandWood with their teachers, exploring a nearly complete watershed of forest and wetlands. Once, the project's site was the center of a thriving logging operation, adjacent to the largest lumber mill in the world. A century later, this wooded setting provides immediate access to the natural and cultural history of Puget Sound.

IslandWood is a living laboratory for learning. In the midst of spectacular natural surroundings, it is the built environment that also teaches here. The classrooms are the shelters, bird blinds and other outdoor structures scattered throughout the site. Dorms feature fireplaces made of Pacific Northwest stone. Rooftops have solar panels. Building designs demonstrate the dynamics of air, temperature, light and water.

Completed in September 2002, IslandWood became Washington State's first LEED® Gold project. Now, after more than five years of operation, it is regarded as an international model for youth-based environmental education. The outdoor learning center now attracts 4,000 schoolchildren annually from more than 60 schools and another 4,000 adult visitors and volunteers for hosted conferences and community events.

DESIGN OVERVIEW

Mithun recommended the new campus pursue LEED certification for its main structures—through strategies to maximize energy efficiency, minimize building footprints, keep materials out of the waste stream, use materials efficiently, and emphasize recycled content. The client and project team agreed that IslandWood's overarching design intent should include the following:

- Protection of the entire property through environmentally-intelligent design
- Best practices in environmental education for a state-of-the-art facility
- Buildings that function as interactive learning tools
- Connections to nature

SOLAR MEADOWS: An important feature of Island-Wood, solar meadows were carved out of the dense forest to allow direct sunlight into the buildings and maximize solar gain for the PV arrays atop the Learning Studios (classrooms). The Living Machine™ (right) serves as an on-site biological wastewater treatment plant and interactive aquatic science classroom.





FRIENDSHIP CIRCLE: A place to relive their experiences, to share their discoveries: school kids look forward to gathering at the Friendship Circle, a constructed forest amphitheater, on their final day at the center.

Sustainable land use planning began early with Brainerd and the design team working together to determine the best placement of buildings. Mithun identified potential locations through the use of aerial photographs, site visits and map overlays to highlight logged areas, steep slopes, suitable soils, and experiential features. In the final site layout, the center's structures are clustered on less than six acres of the 255-acre property – limiting development of the main campus to an area where the tree farm had last harvested in 1977.

IslandWood is an educational setting. Yet it is also a place where the buildings are designed to teach history, natural history and the principles of sustainability. Sculpture, found art, paintings, photographs and botanical prints can be found everywhere. Throughout the campus are handcrafted railings, furniture and fixtures built of wood harvested from the building sites. Classroom floors are laid with a variety of sustainable materials so students can learn about alternatives to wood; bathrooms have tiles made of recycled glass.

Visitors to IslandWood also learn first-hand how passive heating and cooling, water efficient features, natural daylighting, and solar technologies reduce the center's electricity and water consumption by half. Guests shower in lodges with solar-heated water. They feel how the buildings' breathe through natural ventilation. They see the way in which the 'butterfly roof' of the Learning Studios taps the sun's energy and diverts rainwater into a cistern. And they understand the workings of the Living Machine, an elaborate natural treatment system that purifies wastewater for irrigation and laundry uses.

The suggestions of schoolchildren had a profound impact on the design of lodges, the trail system and various outdoor field structures.

Kids wanted to sleep out in the woods. They asked for reading lights by each bunk bed, windows so they could look out at trees, and private showers ("no outhouses"). The designers also recognized that children should be able to experience the entire property. The kids' "wish lists" resulted in tree houses, bridges and watchtowers, shelters under the trees, and opportunities to explore the pond, streams and marsh.

INTEGRATED DESIGN PROCESS

The collaborative process to create IslandWood began with Seattle's Paul and Debbi Brainerd, who dreamed of ways to simultaneously address shortfalls in inner-city education and preserve the region's ecosystems. Soon after selling software developer Aldus Corp. (a firm Paul founded in the 1980s), they started the Brainerd Foundation. In 1997 the Brainerds put up \$5 million to purchase a parcel of undeveloped land on Bainbridge Island. Their vision: that urban kids could learn about the natural and cultural history of the Puget Sound region if they could to live in the forest for a short time.

Out of this was born the Puget Sound Environmental Learning Center, with Debbi as its executive director. Inspired by Mithun's work on the REI Seattle flagship store, she selected the firm to lead development of what was soon renamed IslandWood. In November 1998, Mithun's architects began their design process with a rainy overnight campout on the project site to gain a better sense of what students would experience. Brainerd and the designers also met with environmental educators, traveling to more than 25 existing outdoor education facilities across the country – sleeping in bunk beds, learning from naturalists, keeping journals, telling stories.



“Tug on anything at all and you’ll find it connected to everything else in the universe.”

—*John Muir*

Everyone agreed that children would be the project’s true clients. So the design team collaborated with the University of Washington College of Architecture and Urban Planning to arrange a series of design charrettes with 250 fourth-, fifth- and sixth-graders over a period six months. Children built models, answered questions about their favorite outdoor memories, made drawings of ideal spaces – and ultimately provided insights into what would be a safe, fun and engaging educational environment.

Two years of research, focus groups and community meetings involved more than 2,500 people, including biologists, artists, educators, naturalists, cartographers, geologists, trail builders and cultural historians. As project leader, Mithun’s role was vital in translating these ideas into building and site designs. Every design decision had to meet the team’s bottom-line criteria for experience-based learning, sustainability and budget:

“Sometimes the interests of the children and the site were at odds. To overcome the difficulties this presented, the team adopted a detailed decision-making process. For example, as it looked at 15 different kinds of windows, the team tried to both create a woodsy experience and maintain the buildings’ energy performance.”¹

Initial concerns about cost were balanced with the unprecedented opportunity at IslandWood to showcase sustainability visually in all aspects of the campus.

THE SITE

Carved out of the original 1,100-acre tree farm, the IslandWood property encompasses six different ecosystems. The forest consists

BACK TO NATURE: Once the site of a tree farm, and before that an extensive logging operation, the 255-acre campus hosts thousands of Seattle-area schoolchildren and adults annually. Visitors’ first introduction to hands-on learning and sustainably-designed facilities at IslandWood is the Main Center: the Great Hall, Administration Office and Welcome Center, all certified LEED® Gold in 2002.

“An incredible experience for me, as an architect and parent, was having both of my sons participate in the Islandwood experience. My wife and I were chaperones for each of the children, and it was exciting to see the children’s excitement over the entire environment that has been created at Islandwood, and enlightening to see how they actually used some of the learning spaces. Many of the outdoor and indoor circulation spaces became the ‘classrooms’ and confirmed that the quality of these spaces was important for creating an essential link between the indoor experience and being in the woods. The legacy of experiences that Islandwood creates has been the most powerful affirmation of the design process.”

—Richard Franko

of mostly second-growth Western red cedar, along with Douglas fir, big-leaf maple and alder. The watershed includes wetlands as well as a stream, pond, cattail marsh, bog and harbor. The bog is a rare habitat that features a stand of Western hemlock as well as Labrador tea, which thrives in the Arctic, and sundew, a carnivorous plant.

In the nineteenth century, this land was logged extensively to support the Port Blakely Mill, once the largest in the world. After the sawmill had gone out of business in the 1920s, the area was cleared in pockets over five decades as a stockpile for Port Blakely Tree Farms. When island logging became too expensive, the company chose to develop a massive housing project on the site – one of the island’s last undeveloped parcels. That set off local protests until the property was acquired by the Brainerds.

THE PROGRAM

The campus totals 70,000 square feet, with 23 buildings and 16 outdoor structures spread over six acres of the property. IslandWood begins with the Welcome Shelter, just off the main parking area where buses drop off hundreds of students every week. Mithun established two paths into IslandWood, each designed to shape visitors’ first impressions and point toward their experience to come.

The Main Center includes the Great Hall, Administration Office and the Welcome Center. The Great Hall is used to host meetings and conferences and serves as a gathering space for school kids during their stay. Adjoining this building is the Dining Hall, composed of the kitchen, restrooms and laundry operation. To the north is staff housing and the Garden Classroom, which features the greenhouse, a

garden for organic produce and herbs, and composting facilities.

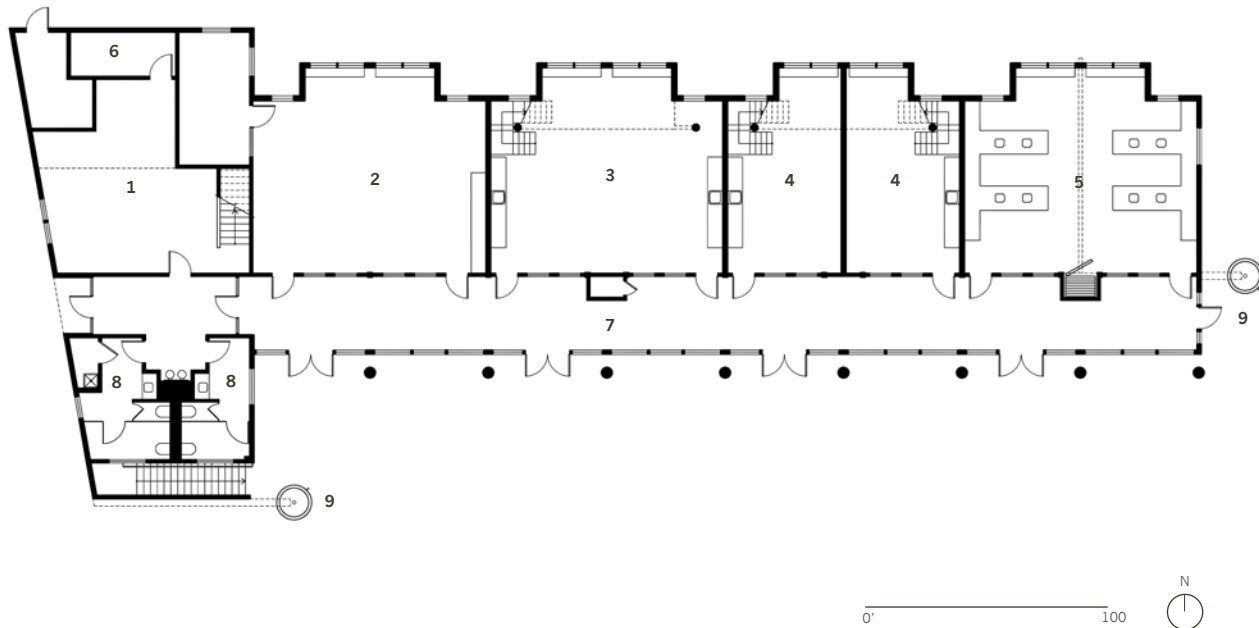
Thirty yards to the east along the main trail is the Learning Studios building, containing seven classroom spaces under one roof. Across the main solar meadow is the “Living Machine”, a tertiary treatment system for wastewater. Immediately south is the Creative Arts Studio, a non-traditional, artistic space nestled into the edge of the woods.

IslandWood’s three Sleeping Lodges – the “Mammal’s Den”, the “Bird’s Nest Lodge” and the “Invertebrate Inn” – are located approximately 200 yards southeast of the main meadow and Welcome Center. Each building has its own loft and ‘Great Room,’ focused around a fireplace/stone chimney made of native rock. Designed to accommodate about 120 students and teachers, the overnight lodges feature rooms with two sets of bunk beds, each with its own private toilet-sink-shower arrangement.

A network of pathways and trails leads to remote learning sites around IslandWood: the Tree House, sitting 25 feet up the bole of a Douglas fir, serves as a forest canopy classroom with a birds-eye view over the bog; a suspension footbridge stretches 52 feet above a forested ravine; and nearby, a floating platform effectively becomes a classroom on the pond. Not far from the lodges is the Friendship Circle, a constructed forest amphitheater where school groups meet for their final gatherings, a place to sum up their four days of experiences at the center.

Finally, IslandWood provides housing for University of Washington graduate students while they are earning their Master’s in education or environmental science and teaching graduate-level classes.

SIGHT, TOUCH, SMELL, FEEL, SOUND: Every detail and every space within the Learning Studios is designed to arouse kids' curiosity about nature and sustainable materials. Classroom floors feature cork, bamboo, recycled rubber, and recycled-content concrete, while countertops are made of recycled-content concrete, recycled yogurt container composite, or soybean/sunflower seed bio-composite.



- 1 educational storage
- 2 technology studio
- 3 sustainability studio
- 4 ecosystem science studio
- 5 wetlands studio
- 6 photovoltaic controls
- 7 solar lobby
- 8 composting toilet room
- 9 rainwater cistern

TREE HOUSE: One of several remote site structures across the property, IslandWood's Tree House is a popular destination – high up a Douglas fir and overlooking a thousand-year-old bog.

Located a half mile northwest of the Main Center, the grad complex includes eight cabins (two students per cabin) and a large garden plus the Commons House, which provides a kitchen, living area, study and laundry facilities.

BUILDING MATERIALS

Just as important to IslandWood's character as "buildings that teach" and maintaining a "deep-in-the-woods" feel are its product and material choices: salvaged, sustainably produced, locally harvested.

Design guidelines required that 5 percent of materials come from salvaged sources, that 20 percent contain at least 20 percent recycled content (as per LEED guidelines), and 20 percent be manufactured within 300 miles of the site. More than half of the wood products used in construction are from FSC-certified sources. In addition, all buildings were designed so that structural systems on the inside – including roof trusses and wood shear walls – are exposed, eliminating the need for finish materials. Concrete slabs contain 50 percent fly-ash in the cement to reduce the use of carbon-dioxide-producing Portland cement.

The campus's Welcome Center features recycled-content concrete and reclaimed wood flooring. Overhead is a 92-foot, 120-year-old salvaged wood beam suspended from the ceiling in tandem with a replica of one of the old mill's massive saw blades.

Each classroom within the Learning Studios has a different sustainable floor covering; countertops are made of recycled yogurt containers (from Germany), crushed sunflower shells, recycled

concrete, or recycled soybean-shell bio-composite. Additional building features include recycled plastic toilet partitions, recycled-glass wall tiles, and 100 percent recycled cellulose insulation. Even the walk-off mats are made from recycled tires. Nearby, the straw bale walls of the Creative Arts Studio illustrate use of a natural building material.

The Sleeping Lodges feature recycled wood in their great rooms and lofts, cork flooring as a sound absorber upstairs, and throw rugs in bunkrooms woven from upholstery remnants and discarded clothing. Each of the lodge fireplaces – plus those in the Dining Hall and Main Center – represents a different time period in the geologic history of the Cascade Mountains: igneous, metamorphic or sedimentary.

ENERGY

Energy is essential as a teaching element within IslandWood's operations. During the design process, MEP consultant KEEN Engineering (now Stantec) conducted sophisticated thermal modeling to determine how campus buildings could be shaped and glazed to minimize heating and avoid air conditioning. Solar meadows were cleared around the buildings to maximize passive solar gain.

The 23-kilowatt photovoltaic array atop the Learning Studios provides half of the building's energy. For classrooms, the design team selected low-energy computers and monitors that consume one-third the power of the most common desktop computers. Additional roof area was included to accommodate the future installation of solar water heaters or more photovoltaic panels. Also, rooftop solar water heaters provide 50 percent of the hot water used in the Dining Hall and three lodges.







BIOPHILIC DESIGN: The principles of biophilia may be found in architecture and interior design throughout IslandWood: “Prospect and Refuge” (top) in the Sleeping Lodges, “Variations on a Theme” (middle) in the doors of the Creative Arts Studio, and “Serendipity” (bottom) in a copper sink within the Learning Studios.

“I told Paul, let’s be proactive; let’s combine our interest in the environment, education and children. Let’s teach kids about the place they live so they understand it and make better decisions in the future.”

—Debbi Brainerd²

The Garden Classroom and greenhouse feature both a micro hydro-generator and a micro wind turbine.

HEATING & COOLING

IslandWood’s buildings were designed to operate primarily as passive spaces – encouraging visitors to think more deeply about their daily lifestyles and impacts on the environment. This means functioning with wider-than-usual temperature “comfort zones” – slightly cooler in winter, slightly warmer in summer – than in traditional buildings. Building walls are insulated to R-19; ceilings are insulated to R-40.

Heat-dependent buildings are oriented along an east-west axis for maximum solar gain in the winter and overhangs on the south side to reduce summer heat gain. Strategically-placed windows trap the sun’s rays inside for heat or allow cooling winds inside for ventilation. Operable awnings shade dining and office spaces. Two of the buildings were designed with butterfly roof sections to enhance natural ventilation. High-efficiency, in-floor hydronic heating supplements the passive design measures in primary buildings.

LIGHTING & DAYLIGHTING

All buildings are well daylit, with high ceilings and large windows offering extensive views outside. Open floor plans, oriented on an east-west axis, were designed to increase the amount of sunlight penetrating to the interior. Operable skylights further optimize daylighting and ventilation. T-5 fluorescent lamps with photocells supplement this light for offices and classrooms.

INDOOR AIR

Every building at IslandWood is naturally ventilated and includes operable, high-performance windows placed to maximize air circulation. Spot ventilation systems in bathrooms, kitchens and the auditorium control moisture and maintain safe indoor air quality. Small photovoltaic panels power building attic fans.

Buildings were also designed to minimize interior finishes. Where required, low-emission stains, paints, sealants and adhesives were used. Formaldehyde-free wood products were used in building interiors. To ensure the best possible IEQ, mechanical and electrical systems were commissioned prior to occupancy, and carbon dioxide sensors continually monitor air in primary spaces.

WATER

Native landscaping, rainwater collection and biological wastewater treatment all combine at IslandWood, not only reducing potable water consumption by 80 percent but also helping students to connect with and understand the hydrologic cycle. Bathrooms include low-flush toilets and waterless urinals, while composting toilets are located in the classroom building, in staff housing and at remote sites.

IslandWood treats all of its wastewater to tertiary standards so that no connection is necessary to the municipal sewage system. Subsurface-flow constructed wetlands are located near the sleeping lodges and graduate student housing. At the center of IslandWood is the Living Machine, housed in a greenhouse for educational purposes. This natural treatment center saves the center an estimated 1,750 gallons of water each day.

DEEP IN THE WOODS: The Learning Studios building (LEED® Gold) is bio-climatically responsive: windows open so interior spaces breathe naturally; skylights and tall north-facing windows provide optimal daylight; photovoltaic panels on the south-facing butterfly roof power 50 percent of lighting and electrical needs; and composting toilets eliminate water use.



- 1 rainwater collection
- 2 winter sun
- 3 summer sun
- 4 photovoltaics 23kW array
- 5 radiant floor heating
- 6 natural ventilation
- 7 composting toilet bins

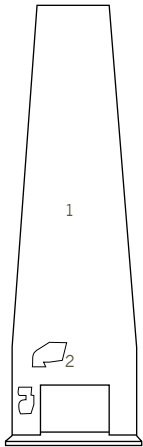
COMMISSIONED ART AT ISLANDWOOD

Bird's Nest Lodge	Eagle's Nest	Don Charles
Dining Hall	Food Waste Weigh Station ("Wade")	Peter Reiquam
Dining Hall	"Nin Pakidadjiwe", oil on linen and wood	Tom Uttech
Dining Hall	Tabletops (from dismantled Bainbridge Island barns)	Alan Vogel
Dining Hall Solar Meadow	Proposed outdoor music sculpture	Patrick Zentz (a Montana farmer)
Dining Hall, Lodges, and Admin Bldg	Railings, table bases (from recycled wood from site), settees, and arm chairs	David Kotz
Great Hall	House Post and carved and painted designs on the adzed posts	Roger Fernandes and Bruce Cook
Great Hall	Cedar bark panels	Subiyay Bruce Miller
Great Hall & Art Studio	Fused Glass Panels	Peter David
Great Hall and Welcome Center – Proposed	Interpretive documentation depicting the process of gathering and creating cattail mats	Yvonne Peterson
Large Conference Room	8 Botanical Prints, b & w photographs	Kari Blassfeldt
Library	"3 Seagulls and Water", b & w photograph	Mary Randlett
Lodges	Ceramic Tiles naming all rooms	Mette Hanson
Lodges	Morse chairs (made of certified Cherry, using the construction technique called mortise and tendon joinery)	Ken Savage
Lodges and Admin Bldg.	Bunk beds, tables and chairs	John Lore, Pickle Ridge Furniture
Lodges and other bldgs.	Adirondack chairs (cedar from salvaged cedar from Olympic Peninsula)	Cecil Ross
Mud Room, Dining Hall; Main Bldgs.	Coat hooks (site-harvested Madrona), benches and door handles (Big Leaf maple and Madrona)	Erik Lindberg
Outside of Dining Hall	Fused Glass Tiles created by children	Diane Bonciolini and Greg Mesmer, Mesolini Glass Studio
Private Dining Room, Dining Hall	"Landscape with Stream", oil on canvas	Galen Hansen
Private Dining Room, Dining Hall	"Frogs" triptych	Roslyn Gayle Powell
Throughout campus area	Outdoor signage	James Bender
Throughout campus area – Proposed	Educational garden spaces	Lorna Jordan
Throughout Center	Fireplace Mantles (of madrona)	James Bender
Welcome Center	Mobius Saw Blade	Buster Simpson
Welcome Center	"Old Logging Gang", b & w photograph	Kinsey

LESSONS IN STONE: Each of the three Sleeping Lodges features a 'geological' fireplace made with native rock – examples of buildings that teach, using art, space and architectural detail to create connections with the natural world.

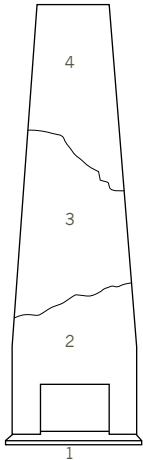
Sedimentary


- 1 Sandstone
- 2 Fossils



Igneous Stone

- 1 Basalt Seats
- 2 Gabbro
- 3 Granite
- 4 Diorite





A WORLD AWAITS: Upon arriving at the Welcome Center, visitors are immersed in IslandWood's history, ecology and art – a preview to the rich variety of outdoor experiences that lay ahead. Suspended overhead is a 92-foot Douglas fir beam, thought to have been milled at Port Blakely in the late 1800s, encircled by the "Mobius Saw Blade".

