

Native Spaces | Native Actions | Native Traditions

an Outdoor Education Campus for the Seattle Public Schools

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| introduction |

An environment-based education movement – at all levels of education – will help students realize that school isn't supposed to be a polite form of incarceration, but a portal to the wider world.

-Richard Louv¹

Progressive education is bringing students back in contact with nature, and the result has been higher test scores, fewer behavioral problems, and a greater respect for the environment. In Seattle, this move is embraced by Mercer Slough and IslandWood, two outdoor education campuses that provide specific programs to students each year. While this is a step in the right direction, there is more that can be done to assure Seattle Middle School students reap the benefits of education embedded in nature.

This thesis proposes the implementation of an outdoor education campus within Seattle City Limits that students attend on a weekly basis to engage in a curriculum of science and local history. On a fourteen acre site in West Seattle, on the banks of the highly polluted Duwamish Waterway, the campus will engage the students in dialogue about human effects on the natural environment.

Drawing from the rich 1600 year history of Duwamish settlement on the site, this thesis proposes the unifying elements of Native spaces, Native traditions, and Native actions to bring a cohesive design approach to the campus. While appropriate for a campus built on this historic site, the design also seeks to address the concerns of memory faced by Native Americans in Seattle today. The outdoor education campus will teach students important lessons in community and environmental stewardship while providing a way for tribes of the area to perpetuate their legacy and tradition through the next generation.

| problem statement |

Seattle has seen the benefits of bringing students back to nature, and it is fortunate to have several outdoor education campuses in its midst. From Bellevue to Bainbridge Island, students currently have the opportunity to partake in annual outdoor education days at Mercer Slough or IslandWood.

Mercer Slough is located in Bellevue, Washington. In this 320 acre natural environment, students are introduced to ecosystems ranging from wetlands to wildlife habitats to a blueberry farm. The Mercer Slough Environmental Education Center is a collaboration between the City of Bellevue Parks Department and the Pacific Science Center (figure 1). This small campus, designed by Seattle firm Jones & Jones, contains a visitor's center, community room, and two classrooms for student exploration. Students typically make an annual trip to the slough, where a day of outdoor educational programming is planned. Developed by the Pacific Science Center, this program may include a morning hike through the expansive site followed by afternoon science exercises within the classroom space. Students complete experiments and worksheets to draw



figure 1: Mercer Slough Outdoor Education Center | Bellevue, Wash

connections between what they experienced outdoors in the morning and a standard science curriculum for their age level.

IslandWood, an environmental education campus located on Bainbridge Island, Washington, offers a 4 day residential School Overnight Program for students in grades four through six (figure 2). During this immersive environmental experience, students stay in dorms on campus and complete a program specifically geared toward science, technology, and the arts. Designed by the Seattle-based firm Mithun, the campus provides spaces for both indoor and outdoor learning and exploration, eating, sleeping, and gathering. Views to the outside, natural elements brought in as interior decor, and porosity between inside and out enhance the benefits of learning in nature regardless of where on campus a student may be.

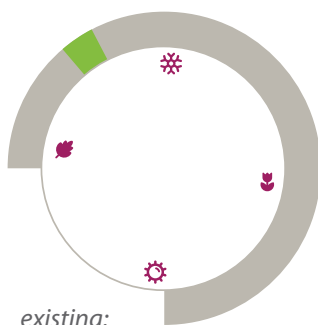
While each of these campuses provides a much needed opportunity for students to interact with the environment, these interactions are limited to once-yearly special visits. In order to more fully experience the academic and personal benefits nature afford students, a more standard schedule of outdoor education



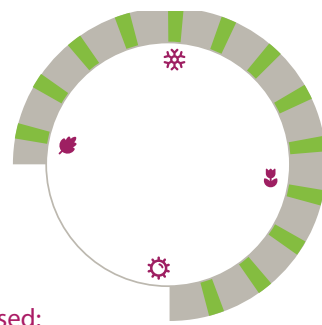
figure 2: IslandWood | Bainbridge Island, Wash

must be implemented. This thesis proposes the City of Seattle and the Seattle Public Schools collaborate to envision and implement a series of outdoor environmental education campuses within the city limits that are easily accessible for middle school students (figure 3). With centrally located campuses, the block scheduling of science and local history will take place at the outdoor education campus, with students attending the new campus instead of their standard middle school for one 3 hour session per week.

While it will eventually be necessary to have a series of these campuses in order to accommodate both travel distances and the number of students that will be using them, the pilot campus



existing:
annual environmental
education
- Mercer Slough
- IslandWood



proposed:
weekly outdoor environmental education
for middle school students in grades 6-8
as part of the standard Seattle Public
Schools curriculum

figure 3: problem statement and resolution

should be placed in a location where it will have the largest positive impact. One way to measure this is through the State of Washington standardized eighth grade testing in science. The two middle schools with the lowest rates of proficiency are Denny International and Aki Kurose, both at the southernmost boundary of the Seattle Public Schools district. With 40% proficiency and 31% respectively, the students at these middle schools have the most room to learn in an outdoor education environment. When one layers on top of this statistic the wealth distribution of schools south of I-90, the benefits a new campus could bring are amplified. With 62%-73% of students receiving free and reduced lunch rates at Denny International, Aki Kurose, and Mercer Middle Schools, a new campus would benefit students of lower income families.² Finally, when accounting for accessibility to a nearby outdoor education campus, this intervention will also support students from Madison Middle School, creating a reasonable range of access for these four middle schools (figure 4).

With the pilot middle schools chosen, a site must be found that is centrally located to these schools geographically, while still embodying natural features and history that can inspire a specific focus of study for the campus curriculum.

Aki Kurose:

31% proficiency on
8th grade state science test
73% free or reduced lunch
561 students (190/grade)

Denny Intl:

40% proficiency on
8th grade state science test
62% free or reduced lunch
704 students (230/grade)

Mercer:

72% free or reduced lunch
736 students (245/grade)

Madison:

906 students (300/grade)

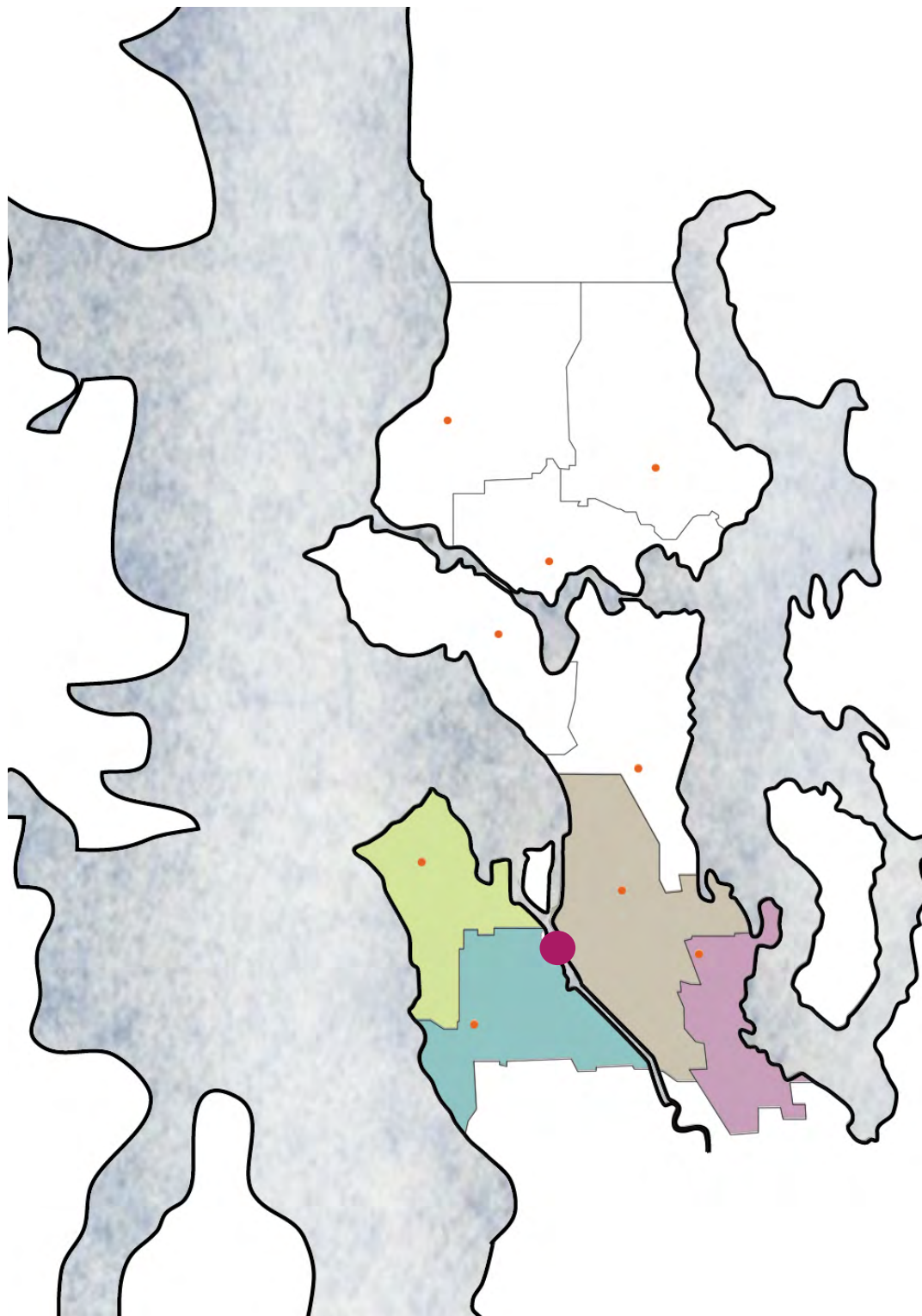


figure 4: Seattle Public Schools 2010 report



| site |

Too often we think that the site exists merely to enhance a building, but we can learn from the ancient Greeks or any of the villages of the Mediterranean that a site can be made more beautiful by the buildings placed on it.³

- Arthur Erickson, Architect

Selected as a location central to Denny International, Madison, Mercer, and Aki Kurose Middle schools, the site proposed for the Duwamish Campus for Outdoor Education is located on the west bank of the Duwamish River in West Seattle. Currently, the site encompasses Terminal-107: fourteen acres of land used as park space and public water access by the Port of Seattle (figure 5). In addition to being one of the last remaining public green spaces on this portion of the Duwamish Waterway, the rich history of the site gives a recognizable identity and theme for the outdoor education campus (figure 6).

The shoreline of the Duwamish River to the west of Kellogg Island was once the site of two Duwamish settlements: Ha-Ah-poos and Tohl-ahl-too.⁴ These settlements had been inhabited by tribal

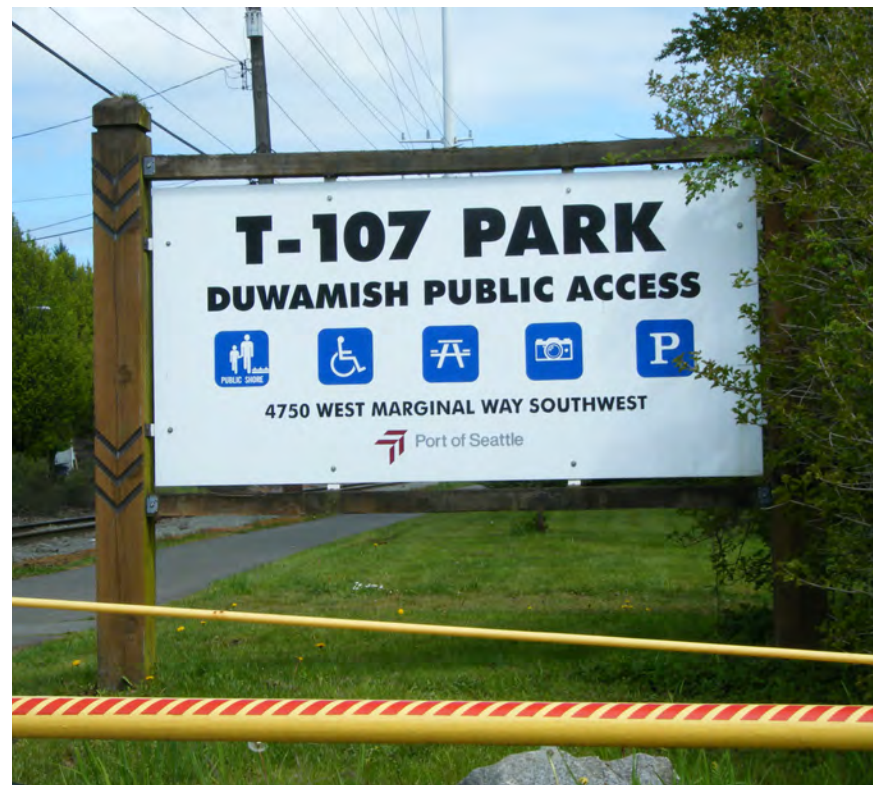


figure 5: current entry to Terminal107 Park | Seattle, Wash

members for at least 1400 years when the Point Elliott treaty was signed on January 22, 1855. This treaty laid out the agreement for the purchase of all land west of the Cascades, east of Puget Sound, and north of what is now Tacoma for \$150,000.⁵ As part of this treaty, the lands of these villages became a part of the Washington Territory, while tribes were promised reservation land and fishing rights. The tribes had to be off the land by January of 1856, and just four years later, the site of the former villages was purchased from the US Government by John Pike.

The fertile land on the riverbanks was farmed for several years, and the produce grown here was often locally sold at Pike Place Market.⁶ In 1895, Eugene Semple proposed a plan to connect and improve the waterways in and surrounding the City of Seattle. One portion of the plan, which also included the creation of the Ship Canal from Lake Washington to Lake Union and filling the tide flats south of downtown to create more buildable land, proposed the straightening and dredging of the Duwamish River. Plans were set in motion in 1909 when the City Engineer of Seattle formed a commission to sell bonds to help finance improvements to the Duwamish River.⁷ The project had multiple visions: a deeper, wider, straighter river would promote larger ships using the canal,

the reclaimed land could be used for industry now reachable by water, and the new waterway would alleviate the common problem of flooding in the area. In 1913, dredging began on the Duwamish River, and by 1920, twenty million cubic yards of mud and sand were moved to create the new 50 foot deep, four mile long Duwamish Waterway.⁸ Within this route, only 2% of the original shoreline remains, and the only natural bend remaining in the river is that which flows around Kellogg Island, directly across from the current site of T-107.⁹

Industry sprang up along the new Duwamish Waterway banks, most notably the Boeing Plant that built B-17's during World War II. From 1929 through the early 1980s, the west shore of the Duwamish at Mile 2 was inhabited by former Seaboard Lumber Mill.¹⁰ In 1998, the City of Seattle in association with the Seattle Parks and Recreation Department collaborated on an Intertidal Habitat Restoration Project on the site, completed in 2000. The project included demolishing the structures both on the shore, and those that protruded into the Duwamish that were once associated with the lumber mill. Contaminated soils were removed or covered, and a 1.8 acre intertidal bay was excavated to promote habitat restoration. The resulting park, dedicated in

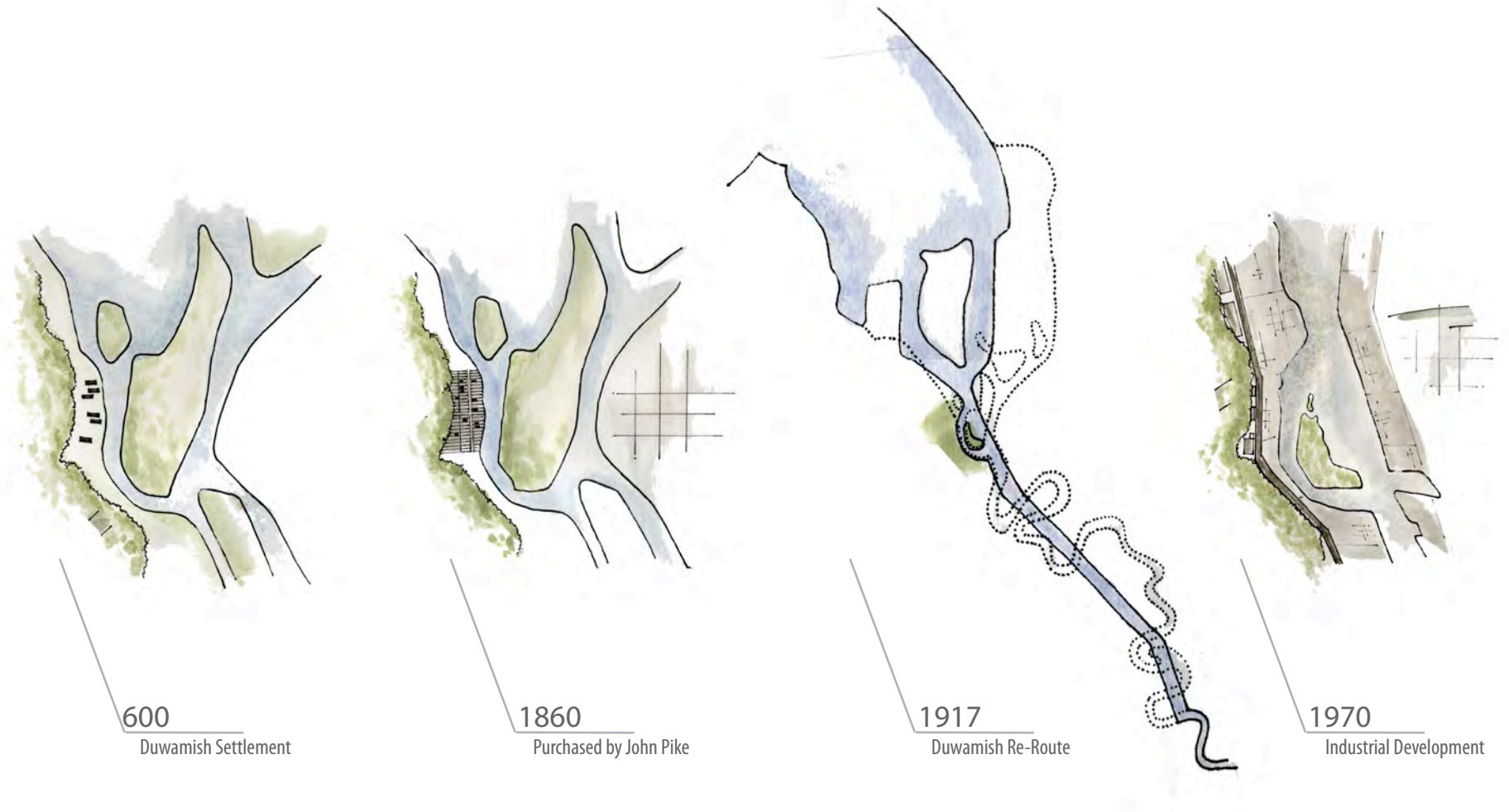


figure 6: timeline of site history

spring, 2001, was named Herring's House Park, after the Duwamish Tribe settlement, Tohl-ahl-too, that existed on the site until 1900.¹¹

Directly south of Herring's House Park, Port of Seattle owned Terminal 107 was slated to be the home of a marine terminal. During demolition of existing structures on site in 1977, archeological discoveries of the village that once stood on the site



figure 7: Duwamish Campus site in relation to EPA superfund site

halted demolition.¹² The Port of Seattle decided to re-envision the land as a park which included public access to the waterfront.

With industrial uses both north and south of the site, the site is currently zoned for industrial use (IG2 U/85). The entire width of the site is a riparian corridor, and much of the site is a wildlife corridor, a shoreline habitat, and a liquefaction area. The site does have an Urban Village overlay, suggesting that more public and pedestrian uses will be encouraged for redevelopment of the space. Currently, zoning prohibits the implementation of a primary or secondary school in IG2 zones, but I propose as part of the Urban Village overlay to rezone the site to allow the community aspects of the outdoor education campus to remain open to all on evenings, weekends, during the summer, and for special events. This would increase pedestrian circulation in the area, and would provide a more rich and diverse set of opportunities for both the students and community. As community centers, child care centers, community clubs, craft work, sports or recreation facilities, and vocational and fine arts schools are already permitted under the current zoning, redefining the site zoning to allow an outdoor education campus is an appropriate change to make.

Today, the Duwamish is the most densely inhabited river corridor in Puget Sound.¹³ Years of abuse to the waterway and its banks

have led the EPA to list the Lower Duwamish River a Federal Superfund site in 2001 (figure 7).¹⁴ At the time of writing, “the river remains so polluted the state Department of Health has warning signs posted in eight languages.”¹⁵ Despite the warnings, a recent survey by Public Health of Seattle and King County reveals many residents in the area are still consuming self-caught seafood from the river for either cultural or economic reasons. The ecological unhealthiness of the river and the effect this has on citizens and the environment has spurred several grassroots task forces to tackle the challenges of rehabilitating the river and supporting the EPA’s superfund efforts. Key elements of the future vision for the Duwamish River that would be specifically enhanced by the inclusion of a new environmental education campus on the riverbank include:

increasing living wage jobs through the impending cleanup work via partnerships with local businesses, schools, governments, and training programs;

remove toxic chemicals from the Duwamish River and ensure a risk-free place to fish and play;

reducing ongoing sources of pollution through source control, including green infrastructure, natural drainage and ‘green streets;’

create and steward thriving wildlife habitat restoration sites;

enhance healthy recreation and eco-tourism opportunities;
plan with communities for sustainable, thriving, vibrant riverfront neighborhoods”¹⁶

Along with the list of goals, the Duwamish River Cleanup Coalition published the Duwamish Valley Vision Map to show the possibilities for the region in future years (figure 8). Per this map, T-107 will be connected across West Marginal Way SW and the existing train track by a green street, activating the connection between the site for the new outdoor education campus and the Duwamish Tribe longhouse and lands across the street.¹⁷

Beyond the rich history and continuation of Native inhabitation at the site, the environmental, artistic, and cultural surroundings make the location ideal for an outdoor education campus. The site is less than one-third of a mile away from the current location of Pathfinder K-8, a Seattle option school focusing on encouraging Native American teaching into everyday education. This proximity will allow the two schools to collaborate when needed and students to benefit from both the academic and environmental settings of each school. Directly across the street from the site is the Duwamish Longhouse and Cultural Center. This proximity

allows the Duwamish Campus for Outdoor Education to share infrastructure with the longhouse, providing a community campus to support larger events than either venue could host independently. The north end of the site boasts a restored wetland where students can see an ecosystem functioning and recovering. The Duwamish River to the east of the school is a fantastic teaching tool for both ecology and history, but is also an excellent resource for outdoor adventures and physical education. By incorporating a kayak dock and storage into the design of the new outdoor education campus, students can take the short 750 foot trip across the Duwamish to the uninhabited Kellogg Island for a science or cultural lesson, or continue paddling for a unique physical education component (figure 9).

While the physical surroundings make this site ideal for an educational campus for the Seattle Public Schools, existing improvements to the site, made by the City and Port of Seattle can still be used for public enjoyment while enhancing the educational experience of students. Terminal-107 is currently the home of two art installations: a replica of the hull of a north pacific halibut schooner is erected at the south end of the site, with informational exhibits recording the history of the place below (figure 46).¹⁸ Branching from this landmark is a short path in the southeast portion of the site with a series of interpretive signs telling the story of a silver salmon in the Duwamish River. The story, which focuses on the upriver journey of the fish to spawn, was passed down through generations in one Native American family's memory. The story is etched in both English and a native Salish



figure 8: excerpt from Duwamish River Cleanup Coalition map showing proposed site for the Duwamish Campus for Outdoor Education



| | |
|--------------------------|-----------------------|
| Cooper Elementary Campus | 1850' away (1/3 mile) |
| Duwamish Tribe Longhouse | 400' away |
| Restored Wetlands | 500' away |
| Kellogg Island | 750' away by water |

figure 9: proximity of additional learning opportunities



figure 10: existing on-site art



| theoretical framework |

If you start with the young, while their minds and spirits are evolving, they will be healthier, stronger, fuller human beings.¹⁹

- Dagmar Thorpe, Sac and Fox Tribe

In America, Native culture was forcibly suppressed using methods of assimilation, and the memories of traditions are fading as those who carry the knowledge pass on. Their beliefs and teachings must be saved, and its relevance to communities today must be made clear. This thesis will show how an educational campus founded on the ideas of Native spaces, Native actions, and Native traditions will challenge the conventional expectations of what a school must be and result in spaces that support a curriculum of exploratory learning embedded in community and environment.

It should be no surprise that the after years of being forced off their lands into narrow confines of Euro-centric schools, and forbidden from partaking in the events and ceremonies that had once been the foundation of their culture, a majority of Native Americans today feel their history is being forgotten. Without a strong presence in America's written records and narratives, and

struggling in a world where progress too often trumps tradition, Tribes realized that the younger generations were not learning the songs, languages, dances, and teachings of their ancestors. The memory of the Native People was disappearing with the loss of the elders who carry the knowledge.

William Demmert, member of the Tlingit Tribe and co-founder of the National Indian Education Association, insists that the reasons why Indian Nations are at risk include poor academic achievement, the loss of language and culture, and a constant pressure on the natural resources we have left. While it is essential that Native American students understand the history, culture, and traditions from which they come, all students can benefit from embodying the beliefs and actions traditionally seen as "Native." The effect that Native space, Native actions, and Native traditions may have on students of today can inspire an educational approach appropriate for students of all backgrounds at the Duwamish Campus for Outdoor Education. It is my intent to incorporate the attitudes and functional purposes embedded in Native architecture without recreating a historicizing form that bears little relevance to the

needs and functions of the school today. A new campus is not an exercise in slapping a longhouse facade on a cookie cutter school building; it is a new vision for an academic setting that encourages sustainable Native ideals to thrive.

This section will reference approaches taken in both historic and contemporary design of Native spaces, current trends in site-based educational models, and building technologies that can improve the health of the environment for future generations. The lessons learned from these examples will help inform a culturally and environmentally sensitive solution to the design of the Duwamish Campus for Outdoor Education.

Native Space: forms + functions

There is often uncertainty about the values or degree of Indianess to be expressed...One group may want to develop contemporary buildings from pre-contact types in order to bypass the culture of oppressors; another group will want buildings that show Native ability to adopt Western technology and to adapt to new situations.²⁰

- Carol Krinsky, Art Historian

Before the introduction of European influences and teachings, Native Americans inhabited the lands around Puget Sound in harmony with the environment. As Carol Krinsky, an art historian who focuses on Native architecture notes, "Native American cultures had for centuries been developing buildings as a response to climate, means of subsistence, available materials and resources, belief systems, and other elements common to all of humanity."²¹ For tribes in the Pacific Northwest, this meant constructing built works that were climactically appropriate, functional, and had a minimum impact on their site and surroundings. These principles can be carried through to architecture of the Duwamish Campus for Outdoor Education to create a contemporary interpretation of Salish function and culture.



figure 12: Salish house

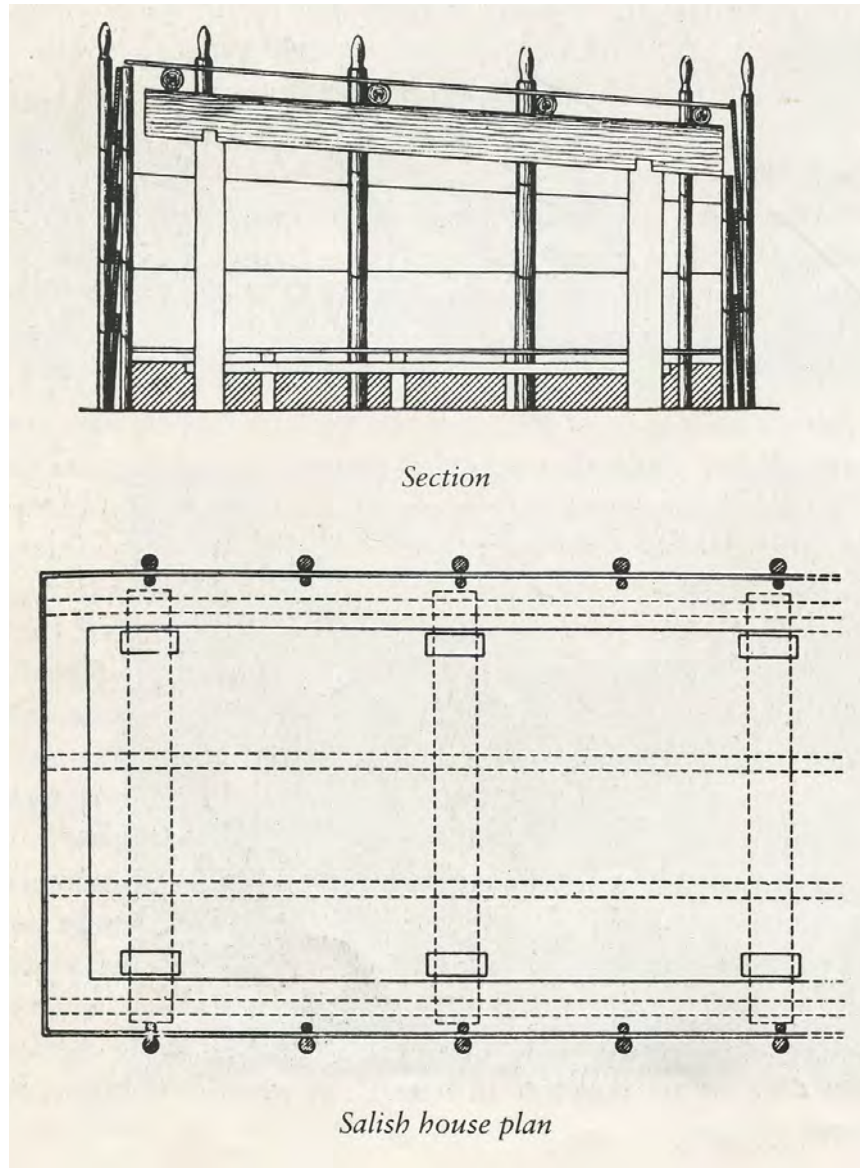


figure 13: Salish house structure

The construction type historically preferred by the Salish tribes of the Seattle area was that of large, multifunctional buildings created from cedar planks (figure 12). The basic structure of these forms came from a post-and-beam bay system that could easily be expanded as the need for more interior space arose (figure 13).²² The choice of red cedar was multifold. First, it is relatively light in weight, which made the massive logs used in the post and beam structure more manageable. Next, cedar split beautifully, allowing builders to cleanly and efficiently split the logs into planks that were needed for the walls and roof of the structure. Additionally, red cedar is naturally permeated with oils that make it an incredibly durable material, even withstanding the intense wet seasons of Puget Sound.²³

One unique aspect of traditional Salish home design, outlined by anthropologist Fraz Boas, is the separation of structure from wall. The heavy timber logs that form the post-and-beam structure of the space are in place to hold up the roof of the building, while the exterior wall is essentially a curtain wall, in place only for privacy and separation from the elements (figure 14). The exterior walls of Salish homes were constructed by placing pairs of small posts around the perimeter of the building, then slatting and tying

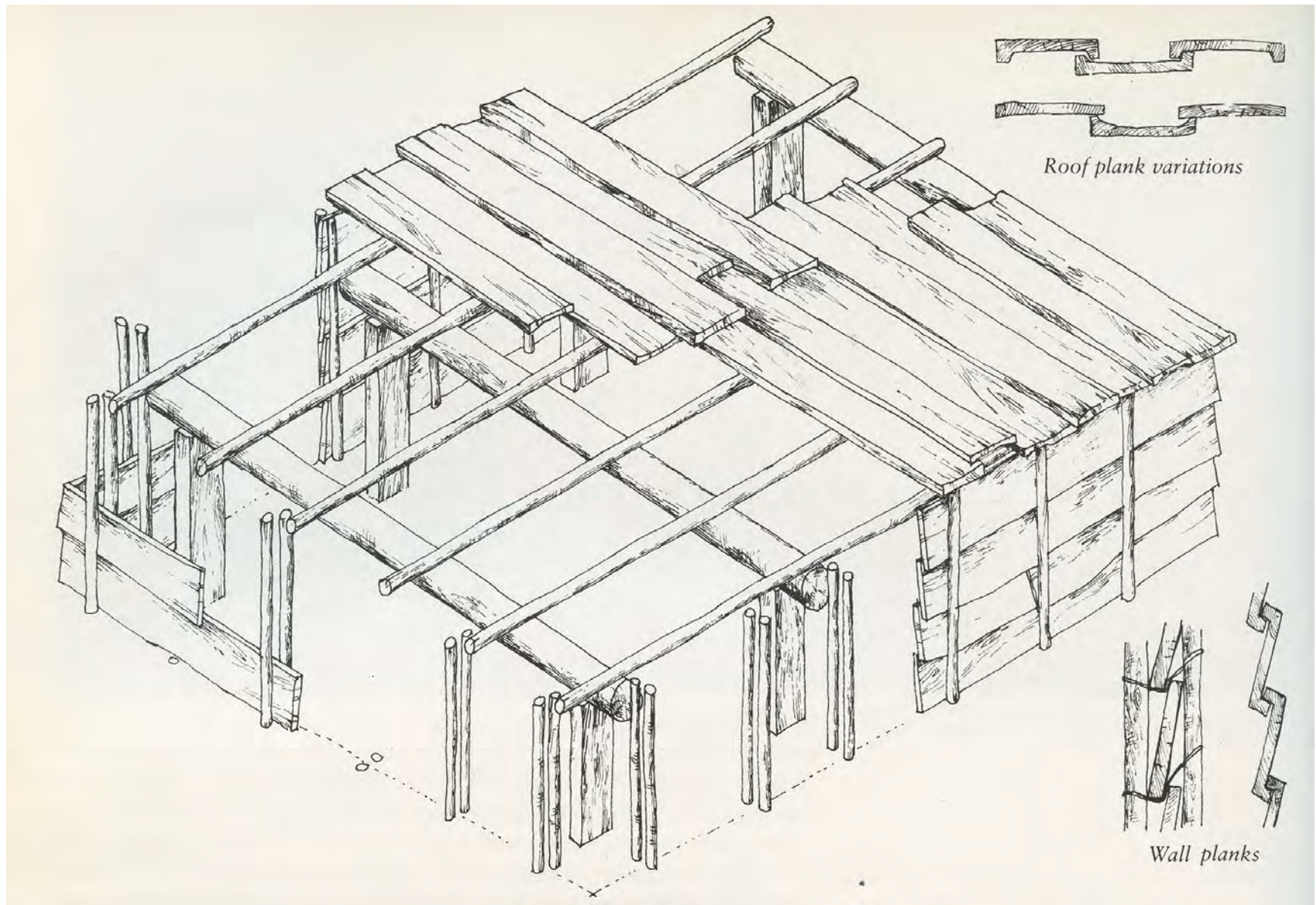


figure 14: Salish house tectonic diagram

cedar planks between these boards to create a shingled and water resistant outer wall.

The benefits of this wall system were multifold. Maneuvers as simple as lifting the lowest planks in a longhouse exterior wall off the ground by a few inches made the interior spaces more habitable for several reasons. First, this kept the lower planks from sitting in water and rotting. More importantly, this provided the means for convectional ventilation and cooling within the space of the longhouse. Air would be pulled in from the outside through this floor-level space, while hot air and smoke from the fire would be vented through a central hole in the roof of the structure (figure 15).²⁴ This early implementation of passive cooling and

ventilation remains a relevant ideal to include passive systems in the Duwamish Campus for Outdoor Education.

In addition to ventilation, the easily dismantled outer walls of Salish homes also allowed for flexibility of the living quarters. For one, the end walls of the longhouse could be quickly removed and more bays could be added to an existing home to allow for expanding family or space needs. In addition, this system gave the Salish the flexibility of seasonal living quarters. When summer came, families would remove the wall planks from between the hold-posts and transport them via canoe to the site of a summer fishing camp, where the post-and-beam structure of a second home was already in place (figure 16).²⁵ This Native refinement



figure 15: Salish house interior

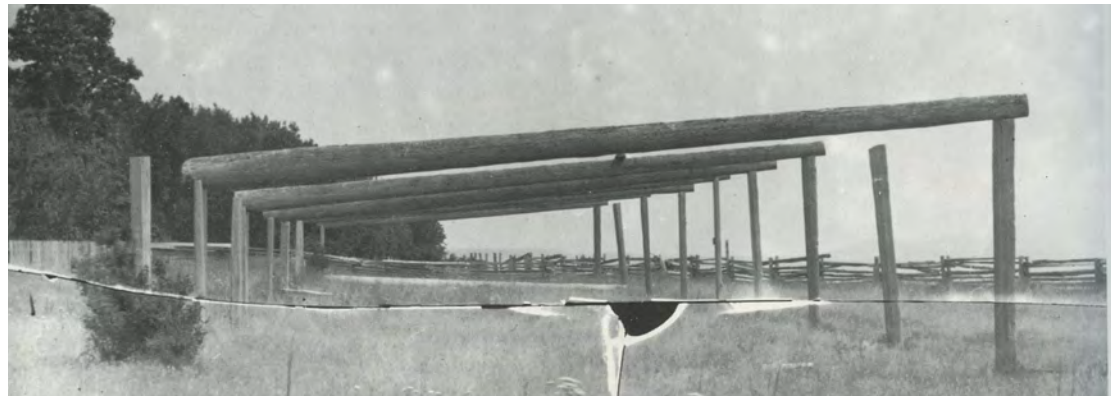


figure 16: Salish house structure

of a building type so centered on flexibility and change is an ideal model for the Duwamish Campus. Native spaces were forever changing to meet the changing needs of not only the individual, family, and community, but also the broader needs of nature. This adaptability results in a built form that is as flexible as the community around it.²⁶ In a current application, as the population of Seattle rises but school budgets remain tight, providing an educational space that allows for not only future expansion, but adaptability of both interior and exterior spaces that can be redefined to test and implement new ways of learning is essential. Spaces must be relatable and appropriately scaled for an individual child, a class or clan, the school as a whole, and the broader community.

While much can be learned from traditional Salish design, when considering the outdoor education campus, it is also important to note the trends present in contemporary Native architecture. Starting in the mid-1960s, there was a nation-wide resurgence and discussion of the importance of Native American culture. Spurred by the push for Native self-determination that did not become official until 1975, many tribes began constructing museums, cultural centers, and schools to show the next generation the importance of Native teaching and to ensure their histories would not be forgotten.²⁷ Measures to preserve this memory vary from

tribe to tribe. As Chief Delvis Heath of Oregon stated, “We could see that the old ways were disappearing, the old language was disappearing, and that pretty soon none of our young people would know where they came from, or who they were. That’s when we decided to build a museum.”²⁸ The Duwamish tribe of Seattle built a tribal museum and longhouse as a teaching tool for both the tribe and community (figure 17). The Seabird Island Indian Band of British Columbia envisioned and implemented a K-12 school to teach the First Nations ideals and culture to their younger generations (Figure 18). With a sudden market



figure 17: Duwamish Longhouse | Seattle, Wash



figure 18: Seabird Island School | Agassiz, British Columbia



figure 19: Native Decoration

for providing spaces for these cultures to be strengthened, the question of how one might depict culture in design became a discussion within the architecture community.

In 1990, Carol Herselle Krinsky set off across America to study the contemporary Native building typology, and she catalogued and analyzed numerous structures built by various tribes and architects. Her analysis found that the ways in which architects wove culture into built form took three distinct aesthetic forms: those which incorporate ornament, those which embrace modified continuity, and those which incorporate symbolic forms. Through analysis and understanding of why these structures were designed the way they were, it is possible to understand the successes and flaws of using these approaches to create a design that speaks to Native culture.

According to Krinsky's synopsis, buildings that incorporate ornament are structures formed to meet the contemporary needs of the people, and then a layer of imagery with Native themes is applied as decoration (figure 19).²⁹ This is a cost-efficient way to show pride and ownership over a space but often comes across as

a superficial attempt to represent a complex culture.

Buildings of modified continuity are essentially recreations of past building forms. In the Pacific Northwest, this is a popular approach to contemporary Native design, since the ubiquitous form of the longhouse can function for a Tribe in many ways. By clumping program into a long, low, rectangular block, adding heavy timber structure, and cladding the exterior in wood, the form of a longhouse appears. One must ask if building in this recreation of aesthetic style is what brings value to the Tribal structure, or if it



figure 20: turtle building

is the idea of a flexible community space, regardless of form and material, that will result in success.

Krinsky's third category of Native buildings, the symbolic buildings are subcategorized into the "diagram" and the "zoomorph." Typical diagrammatic architecture includes a circle, which can represent the circle of life, medicine wheel, cosmos, or any of a number of important cultural articles. The diagram is open to interpretation: its meaning can be interpreted in whatever way is most appropriate to the viewer. Zoomorphic shapes are forms



figure 21: eagle zoomorph

usually drawn directly from Native narrative. In these examples, buildings take the loose form of birds, serpents, or turtles, and are a significantly more literal translation of culturally chosen symbols to built form (figures 20, 21).³⁰ Either of these approaches is often apparent at the start of a project and intended by the architect, but experience notes that the users of the space often draw their own imagery from the forms of the building beyond what the architect had originally planned.

Within Krinsky's overview of contemporary Native architecture, the reference to Native buildings, actions, or traditions often came across as extremely literal or outwardly superficial. The general forms of built works may appear to be "Native," but the functions of these spaces remain rooted in the Eurocentric culture of the time. For the Duwamish Campus, a more appropriate approach to a design concept is not to replicate the form of Native buildings and symbols, but to reinterpret historic Native space, actions, and traditions into built form. The functions, meanings, and benefits gained from exploring Native culture is more applicable to the needs of students today than the superficial reinterpretation of historic aesthetic forms.

With so many examples of superficial Native space, it was important to consider a successful interpretation of Native space into contemporary built form. On a site donated by the University of British Columbia, at the edge of a sandstone cliff overlooking Vancouver Harbor, Arthur Erickson was asked to conceive a building to display and archive artifacts of the First Nations.³¹ After viewing the collection the new museum was required to house, Erickson proposed a structure of unadorned concrete and glass, a space that subtly embodied a range of cultural references without a sense of mimicry or modified continuity.³²

Per Erickson, the idea of the museum is to enter through the closed forest way, then "burst" into a spanning view of the large art pieces and environment beyond. The scale of each space was directly related to the scale of the art it held, and to what was visible beyond the museum walls.³³ By using this approach, Erickson gives the feeling of intimacy even in the largest spaces. For example, as a visitor enters the Great Hall, the floor slopes down as the ceiling steps up, giving clearance for even the tallest totems. Though it is clear from the 30 foot structures on display that the space is massive, the openness, proportion, and light create a space in which the visitor does not feel lost. Magnificent



figure 22: Great Hall Interior at the Museum of Anthropology



figure 23: dappled light of small gallery space

views to the water and mountains beyond are the backdrop to the great hall, composed of a series of seven simple concrete post and beam structures of increasing scale. The concrete forms act to guide the visitor, permit the infiltration of light via skylight, and set up a rhythm and scale that speaks directly to the totemic elements displayed both inside the Great Hall and in the environment beyond (figure 22).³⁴

As the visitor moves from the Great Hall into the smaller galleries, the change in venue is dramatic. Lower ceiling and diffused light from the trees just beyond the windows create an intimate space for the display of smaller art pieces and artifacts (figure 23).

A strong believer that site dictates design, Erickson recognized the importance of respecting the layered history of the site even when designing a museum specifically geared toward inhabitants of a certain era. During World War II, three massive concrete gun emplacements were erected on the cliff the museum would now inhabit. Rather than shying away from these permanent artifacts, they have been incorporated into the design of the museum: one even serves as a pedestal for Native sculpture (figure 24).³⁵

This play of interior and exterior, the balance of intimacy and vista, and the visual explanation of past and present intertwine the building with site and visitor. Erickson understands the importance of specificity in design. From specificity of site, to user, to technology to craft, Erickson sees this new regionalism as the way in which globalization will keep indigenous people from becoming a homogenized global culture (figure 25). Erickson's awareness of the threat of cultural homogenization, even at the time of the Museum of Anthropology's design in 1972, is even more relevant in the global world of today.



figure 24: Concrete gun emplacement in gallery



figure 25: Museum of Anthropology Great Hall Exterior



Native Actions: integration in site + community

It is difficult to change the views of adults, so we have to change the views of children. This would mean a new mode of education for Indian – and non-Indian – people.³⁶

- Clifford Trafzer, Wyandot Tribe

Native Actions are not about focusing only on the past, but are about the integration of the Duwamish Campus for Outdoor Education in today's site and community (figure 26). By marking the campus's presence in West Seattle, and through inviting the community to become part of the campus, these ideals will both enhance student learning and create a vibrant community center in the off-season. With an architectural response that focuses on integration of the community into the site, Native culture will live on not only in lessons taught to students at the Duwamish Campus, but at larger events to the community as well.

It is clear through contemporary writings of Native Americans that the best way to create memory of Native culture today is through the youth. The question now is not if Native cultures, traditions, stories, and languages must be preserved, but how. As David



figure 26: view of downtown Seattle from Duwamish Campus site

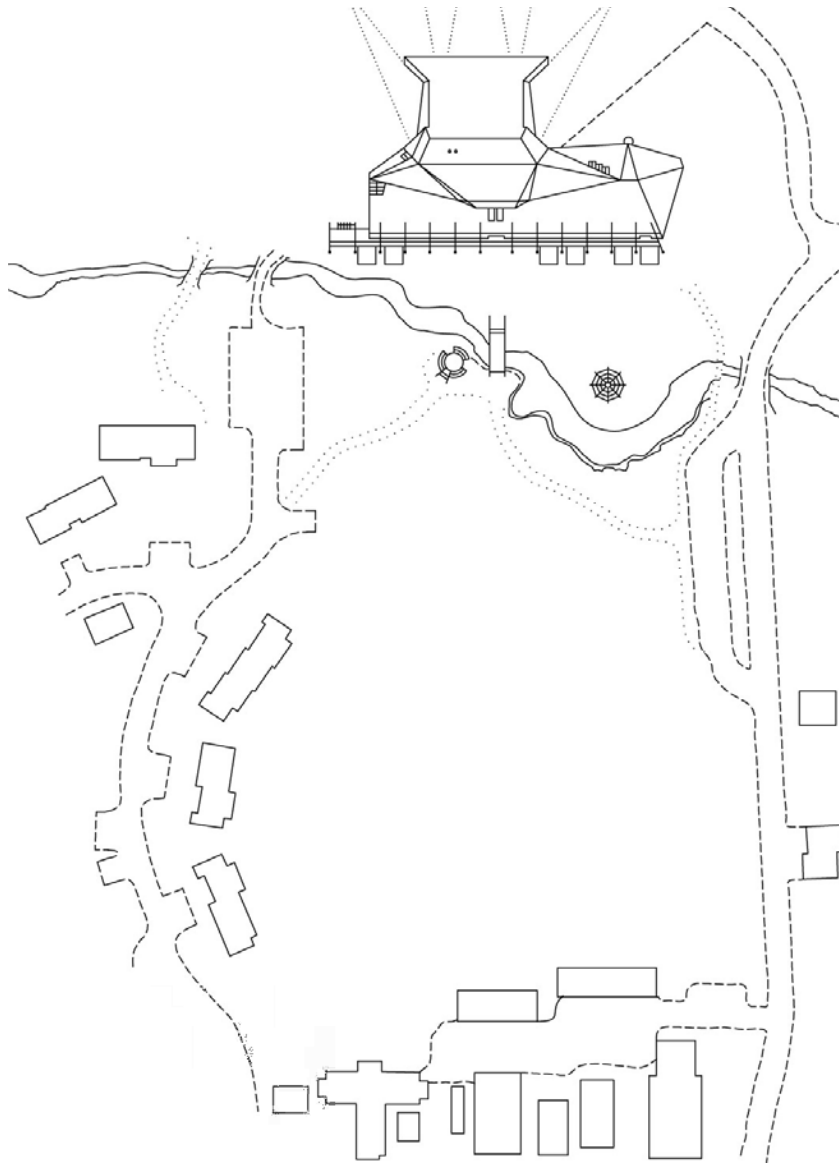


figure 27: Seabird Island School site plan

Lucero, a member of California's Luiseno tribe, states, "Our culture was dying out, and a group of us are trying to hold it together and bring it back to life. It's happening – young people are starting to learn the language, the songs and dances."³⁷ In a culture so deeply rooted in the tradition of memory, Lucero points out that it is reliant upon the people - the next generations - to keep the culture alive. In short, there is no better way to impart this knowledge to the next generation than through the schools. Projecting this belief into an architectural response, the Seabird Island Band of Agassiz, British Columbia approached John and Patricia Patkau to design a new school for the youth of their tribe.

When faced with the task of designing a new building for their students, the mission of the tribe was straightforward: a focus on Native education teaching self-reliance, collaboration, and respect for the community and for the environment. The tribe stressed the importance of community and parent involvement at the school, and they insisted that the architecture respond to these needs.

John Patkau's early career began in the office of Arthur Erickson,

and he shared Erickson's belief that architecture specific to a time, place, and people can counterbalance the increased homogenization of other aspects of culture.³⁸ To this extent, the inspiration for the form of the Seabird Island School comes from the site that accepts it. The school is placed at the north edge of the village center, opening to and becoming one with the larger community to the south (figure 27).³⁹ Large masses of the program, such as the gymnasium, are placed on the north of the building and protected from the elements with a large folding roof (figure 28). The classrooms are aligned along a southern spine, and each learning space opens directly onto the "village green," inviting interaction and taking advantage of the warm southern sun. A massive "porch roof" overhangs the exterior boardwalk that connects the classrooms, referencing Salish architecture of the past, but designed for the present as an abstract totemic form (figure 29).⁴⁰

The program and spatial division of the school draws elements from both Eurocentric school expectations as well as incorporating Native touches. Separate wings are designed for the elementary and middle school, but both use a shared gymnasium and open

library space. The boundaries of the library are not clearly defined, and the fluid space serves as circulation, library, and space for students to gather and socialize. Each classroom opens directly to the outdoors, permitting teachers to take advantage of teaching gardens and salmon drying racks to teach not only current theories of botany and health, but to further native traditions as well.⁴¹ This direct connection to the exterior also allows the home economics room, complete with kitchen facilities, to serve as a community preparation space for events on the village green.⁴²

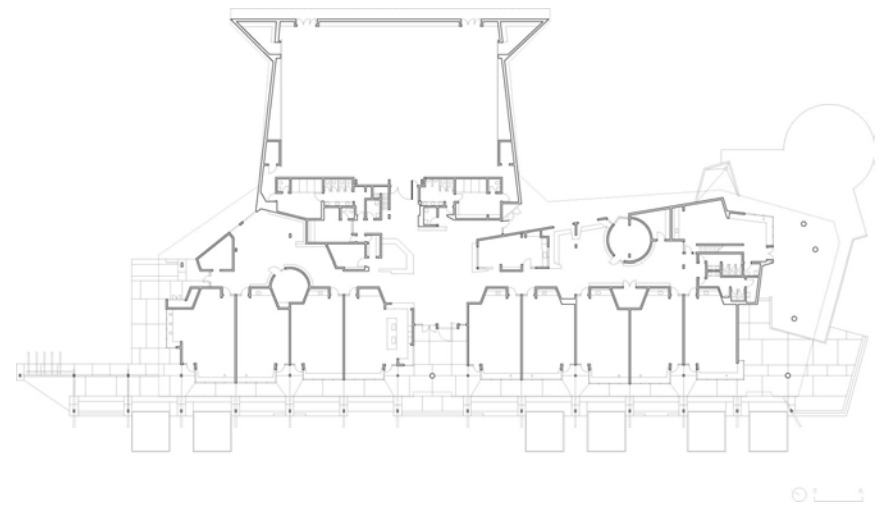


figure 28: Seabird Island School floor plan



figure 29: Seabird Island School south facade

Since the school opened in 1989, much has changed on the site and surroundings. The Seabird Island Community quickly saw the need for more educational space, and a full campus sprung up around the school. As they chose not to expand upon the existing building, an additional school was built several hundred feet away, then a trade school was built less than 200 feet south of the school's front doors, effectively cutting the school off from the community green. Playground equipment was added at the south and east sides of the building, and chain link fences were installed all around (figures 30, 31). While the building took into account many of the immediate needs of the Seabird Island Community, spaces for play and expansion seemed to have been overlooked. From this, it imperative that the campus for the Duwamish Outdoor Education Center has a plan for addition and adaptation well into the future.



figure 30: Seabird Island School fencing



figure 31: Seabird Island School playground



figure 32: forest school | UK

Native Traditions: environment as educator

The destruction of Native People and the destruction of the environment are essentially the same. It denies the spirit of Native People – and denies the spirit of the land, which can benefit American Society as a whole.”⁴³

- Dagmar Thorpe, Sac and Fox Tribe

Pressures of standardized state testing and school rankings have caused the school to revert to “tried and true” models of education rather than envisioning progressive methods of teaching. While students and staff may embark on annual field trips to outdoor education centers, the typical day is still spent seated at desks, in a classroom, learning through repetition. And though accepted as the standard for American education, can it be argued this is the best solution? Becoming increasingly popular in Europe, and making an appearance in America as close to home as Vashon Island, the movement for a new style of education - education centered around environment and community - is resulting in astounding student success (figure 32). This model of outdoor education is not a novel concept in our region, in fact, it is the way every child learned two hundred years ago. In Native communities, children were taught by their elders, their community, and the

world around them, and this model resulted in a culture of respect for the land and for others. Historically, the youth were encouraged to learn from the world around them, and in turn, become aware of what impact they have on that environment. While it is imperative students learn the essentials of writing, science, and math necessary for success in today’s society, the best and most lasting way to teach these lessons is from experience, not rote memorization from a book, computer, or chalkboard.

Tribal member and parent John Foley states, “Indian students have a difficult time in schools where individualism is valued over cooperation, where students have to raise their hands quickly with the answers and work independently without sharing. Those are the values that get rewarded in the school system, and many Indians aren’t comfortable with that.”⁴⁴

The school environment to which Foley is referring is not one that existed in America before the European influence. Native children



figure 33: Waldkindergarten | Germany

learned from their families, the elders in the community, the oral traditions of the tribe, and from the environment around them.⁴⁵ Tribal member Dagmar Thorpe insists that the best way of Native teaching is to “look at the whole process, the total dimension of what life is about, and educate our children to that process.”⁴⁶ It is not enough to allocate specific hours of the day to either reading, or mathematics, or social studies in the non-collaborative Eurocentric format that has been broadly accepted across the American public education system. A return to a holistic education approach - one based around nature, exploration, collaboration, and self-reliance - is not only a return to Native actions, but is a movement that is proving successful in practice in other parts of the world.

Waldkindergärten, a type of school gaining popularity in Germany and Denmark, are envisioned as learning environments where educators look beyond the confines of a classroom to “envision a dramatically different style of education that emphasizes direct experience, self-directed inquiry, teamwork, and self-reliance.”⁴⁷ Similar to the holistic education practices encouraged by many Native Americans, these schools are looking at education in a new way. The most notable factor of the Waldkindergärten system is the absence of a built structure in the education process

(figures 33,34). Parents are responsible for dressing their children appropriately for the weather, and students are outside for the duration of the day. Natural items such as sticks, acorns, and leaves become playthings, science lessons, or tokens to teach mathematical concepts.⁴⁸ Rather than specific schedules and lesson plans, students are encouraged to ask questions about their environment, and teachers use the how, the what, and the why of pupil observations to teach educational concepts.⁴⁹

The positive effects that an outdoor-based education has on students are evident in many ways. In his book *Last Child in the Woods*, Richard Louv directly outlines the negative environmental, social, psychological, and spiritual effects that have resulted from the new generation's disconnect from nature. Louv documents precedence of how close interaction with nature enhances the senses, creativity, mental and physical health, and an understanding of and stewardship for the environment. There is ample anecdotal evidence and an increasing number of substantiated claims that interaction with nature lessens the symptoms of Attention Deficit/Hyperactivity Disorder, one of the most prevalent mental disorders in children.⁵⁰ For students that have experienced the immersion in nature provided by Waldkindergärten, a PhD



figure 34: Waldkindergarten | Germany

thesis at the University of Heidelberg recorded that teachers who worked with these students in later years had almost exclusively positive reports on the children's preparedness and education. Per this report, "in six defined categories, from 'cognitive tasks' and 'social behavior,' to 'creativity' and 'physical ability,' graduates of Waldkindergärten clearly outperformed their peers."⁵¹ These studies suggest that a return to nature, specifically as a means of education, gives students a benefit in their academic endeavors and beyond. The success of these programs is apparent from their increase in popularity: More than three percent of Germany's early education centers are run in the Waldkindergärten method, and in Denmark, the proportion is as high as eight percent.⁵² In our own region, Cedar Song, the first school in America to embrace the Waldkindergärten method, opened on Vashon Island in 2007, and is still extremely popular today.

While the Waldkindergärten system is based on precedence that is acutely familiar to the Natives of the Pacific Northwest and has been an officially recognized education method since 1993, it has only been widely accepted as a program for children from infancy to six years of age. Only recently have a few progressive schools tackled the challenge of keeping the benefits of the

Waldkindergärten system in an education structure for students up to 12 years of age.

One way of incorporating these benefits is essentially a continuation of the Waldkindergärten concept, called Waldschulen: forest schools located in nature. At the Waldschulen located in Germany, students are encouraged to participate in events designed by faculty and staff and additionally provide their own direction for exploration and education. The school has no age separation; therefore, children can learn from their peers on topics that interest them.⁵³ The school boasts a holistic approach to primary education and an environment where "cognitive, emotional, and motor learning takes place simultaneously."⁵⁴

A concept touting similar educational benefits - but less reliant on vast tracts of land - is being incorporated into public school education in Copenhagen's urban schools. "Spot a Lot," an urban outdoor school in Copenhagen, has developed a way of learning in which students descend on an empty lot in the city center for one day a week and make the site an urban laboratory (figure 35). The sites are measured and recorded, groups of students each make

proposals for what they could do within the confines of their own plot, and the designs are then implemented. While the early ideas from students ranged from ski slopes to a mosque, the plots were eventually developed by 15 student groups into personal spaces for sitting, planting, and observing.⁵⁵

The basis for education embraced by both Waldschulen and “Spot a Lot” centers around the hands-on immersion in education through environment: a direct reinterpretation of Native actions. The program and architectural response of the Duwamish Campus for Outdoor Education will be a direct reflection of these educational ideals, academically proven both historically and in our current context.

The basis of the immersive outdoor education program proposed in this thesis for the is reliant upon students learning directly from the environment around them, and considering the current condition of the Duwamish River, it is essential that the natural environment be enhanced by this new intervention. While designers today tout current “green” building principles as meeting many of these characteristics as well, it is not enough

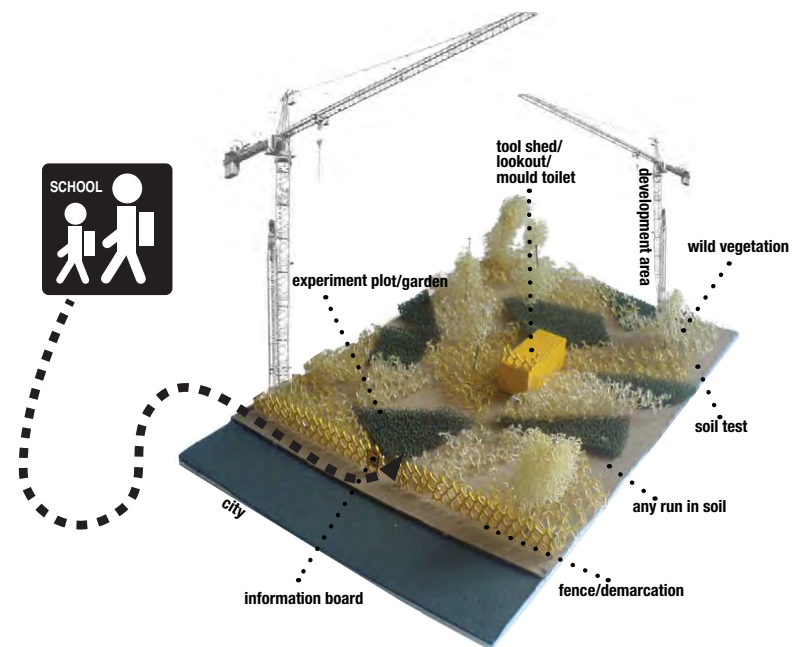


figure 35: Spot-a-Lot program diagram | Copenhagen



figure 36: warning sign posted at Duwamish Campus site

for the campus to be a “less bad” imposition on the land. The site proposed for the new outdoor education campus is an EPA superfund site, and decades of mistreatment cannot be reversed with the simple “cut and cover” remediation that recently took place on the site (figure 18).

Both the built structures required for the Duwamish Campus as well as the curriculum taught within must focus on leaving the site in a better environmental state than it was found. Some tactics to consider when designing the campus include stormwater reintroduction and managing runoff; material selection for both site and building that are local, appropriate, and non-harmful to site or students; passive systems for ventilation, heating, and cooling, integrated sustainable systems; and appropriate native and remediative landscaping. Living machines, like those integrated into schools across the globe and even as close as IslandWood on Bainbridge Island, serve to teach students about ecology, environment, and the direct effects humans have on the environment (figure 37). While living machines are specifically designed to treat wastewater from a specific built facility, with an fourteen-acre site, the remediation processes achieved by the system could be expanded to initiate and test an infrastructure

that could be expanded the extent of the Duwamish (figure 38). As a lab and testing ground, the Duwamish Campus will serve as a hub not only for knowledge exchange on campus, but as a positive vision for the future of the Duwamish.

In this way, the Duwamish waterway as a whole serves as the education campus for students of the Seattle Public Schools. While built forms are in place to facilitate certain functions, it is through the greater environment that lessons are learned. One successful precedent of how environment can act as educator has been



figure 37: living machine - IslandWood | Seattle, Wash

envisioned and constructed just five hours from Seattle, at the Nk'Mip Desert Cultural Center in Osoyoos, British Columbia.

Completed in 2006, the Nk'Mip Desert Cultural Center was envisioned by Hotson Bakker Boniface Haden architects + urbanistes to meet the needs of the Osoyoos Indian Band. On a 1,600 acre site adjacent to the Great Basin Desert in Osoyoos, British Columbia, Canada, HBBH created a vision for an interpretive center to educate the public about both tribal heritage and the unique environment.

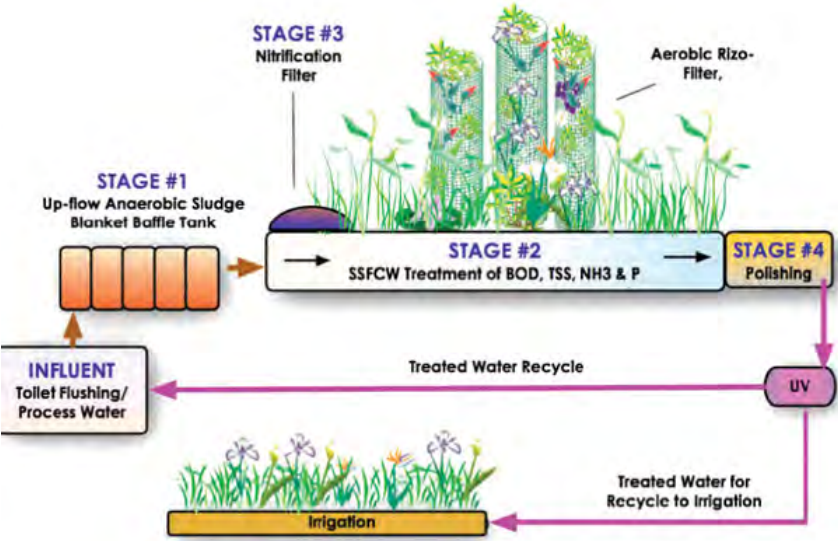


figure 38: living machine diagram



figure 39: Nk'Mip Desert Cultural Center rammed earth wall | Osoyoos, BC

Architecturally, the most notable feature of the Nk'Mip Desert Cultural Center is its striking 80 meter long rammed earth wall, the largest in North America (figure 39). Culturally, the Okanagan see this element as a tribute to their tribal traditions of semi-underground winter dwellings. Functioning much as subterranean architecture would, the insulated rammed earth wall provides enough thermal mass to keep the center cool during the day, and releases excess heat to warm the space at night. This element, combined with radiant heating and cooling, lowers the energy usage of the building, and helps the Osoyoos band remain true to their principles of environmental stewardship. Other environmental features of the building include the use of bluestained pine (a local material that exists in excess due to an infestation of pine beetles in the area,) a habitable green roof, and native plantings as landscape.⁵⁶

The program and displays of the Nk'Mip Desert Cultural Center were designed with the intent that the desert environment would be the teaching element. Of the 35,505 square feet of programmed and constructed space, only 12,000 square feet is enclosed and conditioned. Interior spaces are limited to a theater, black box

gallery, restrooms, offices/admin, and gift shop (figure 40). The majority of the learning spaces, while framed and suggested by built form, are not enclosed, conditioned, or even roofed (figure 41).⁵⁷ The mission of the center is to teach visitors about the desert through interaction with the desert, and interior spaces are only used for support. The approach of programming both interior and exterior space for relevant uses and functions is a direct reflection of Native traditions of expanding learning beyond the confines of built walls. The space itself has five levels of enclosure, apparent to the visitor as they explore the space. The first is zero enclosure. Paths wind through the desert on 22 hectares of land, punctuated at intervals with informative plaques. In these spaces, the natural environment is the experience, marked as part of the cultural center only by the incorporation of a gravel path. Next are spaces of implied enclosure. Built onto a hillside, retaining walls help contain the topography of the site, and these walls work with the building enclosure walls to create implied spaces. Though not covered or conditioned in any way, these “outdoor rooms” form inhabitable spaces that, although often a continuation of the desert landscape, are clearly defined. Next are spaces that are covered, though not conditioned (figure 43). By providing shade and vertical enclosure, spaces are defined. Next

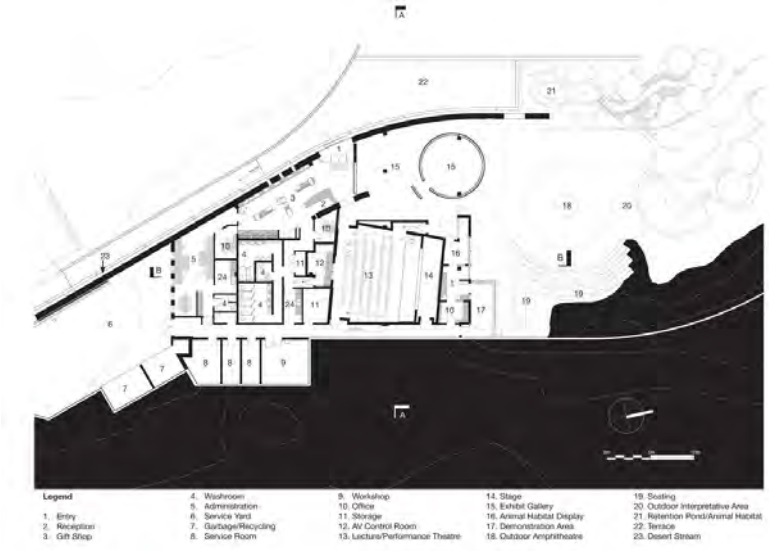


figure 40: Nk'Mip Desert Cultural Center interior plan

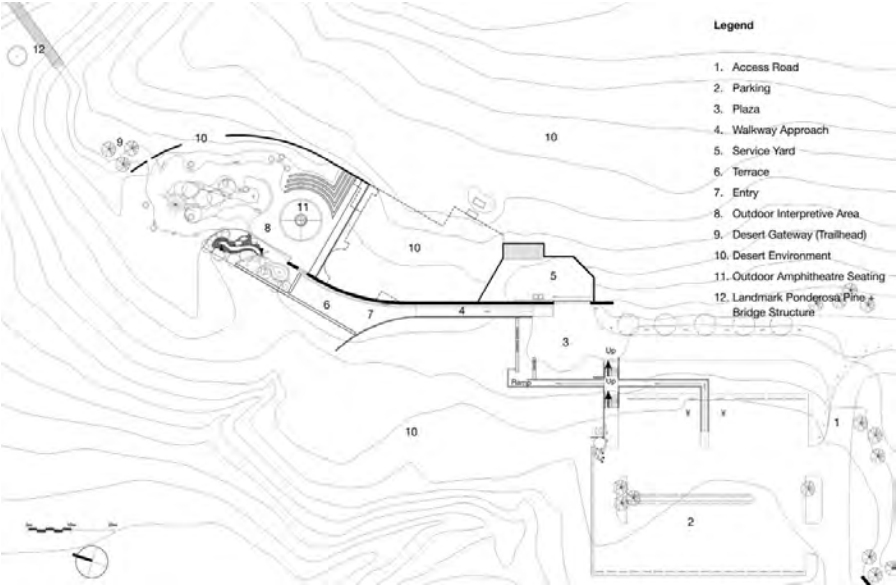


figure 41: Nk'Mip Desert Cultural Center site plan



figure 42: continuation of material from interior to exterior

are spaces that while interior and conditioned, provide views and visual connections to the outside. Continuous use of material and specific natural lighting cause the boundary between inside and out to blur through panes of clear glass (figure 42). Finally, the most enclosed spaces are fully interior spaces with no view to the outside. Due to programmatic needs and specific design, these spaces, including the auditorium and recreation of a lodge, cause the user's focus to be turned inward toward the specific display or teaching element enclosed.

conclusions

The design for the Duwamish Campus for Outdoor Education must interpret what is relevant from historic and recent precedent this while meeting the needs of students today. The Native goals of promoting culture through education and promoting education through environment will ultimately pair with site-specific design to influence the built form of the Duwamish Campus.

The incorporation of facilities, such as the home economics room at Patkau's Seabird Island School, that are specifically designed and located to function for both the school and community are an integral way to bring the community into education. The

accessibility to unprogrammed outdoor space for students and teachers at any time brings an element of the Waldkindergärten system to a traditionally structured school. The Nk'Mip Desert Cultural Center takes the idea of education from environment even further by realizing that neither structured nor unstructured learning spaces are required to be indoors. The implied spaces created by walls, enclosures, and landscaping give visitors a sense of place and security without confinement, a concept that should be incorporated in the new campus for outdoor education.

Like Erickson's design for the Museum of Anthropology, the new Duwamish Campus should recognize all aspects of the site's vast and varied history. While the Duwamish village that existed on the site for 1400 years before European influence may have been the longest tenant of the land, it certainly did not have the longest lasting effect. From the straightening of the waterway to the industrial pollution that still haunts the site to the recent "restoration" that involved a cut and cap remediation and replanting of a "natural landscape," the history of the site, in all its iterations, will have a direct impact on the campus, goals, and architecture of the Duwamish Campus for Outdoor Education.



figure 43: Nk'Mip Desert Cultural Center outdoor learning area



| program |

Architecture can provide a supportive enclosure facilitating individual and group activity. Its siting, whether secretive or prominent, expresses community values...Its materials and colors, its external form and interior spaces may reinforce tradition or revise tradition to suit modern needs and expectations.⁵⁸

- Carol Krinsky, Art Historian

The goals of the Duwamish Campus for Outdoor Education are three-fold. Centered on the concepts of Native spaces, Native actions, and Native traditions, the campus will integrate students into the site, the environment, and the community to encourage behavior of future global citizens.

Inspired by Native spaces, the campus will interpret historic design and ideals of the Pacific Northwest Tribes into the architecture and programming of the space. To be clear, this does not dictate the physical form of buildings on the campus to be reliant upon a historicizing recreation of Native built forms to make its point understood. Native spaces are not about a specific form or recognizable shape, but are about linear or central organization as

need dictates; spaces that are expandable, flexible, and adaptable; and spaces that can be naturally tempered and ventilated. Long before these strategies of integrated systems, sustainable building types, and living building systems were trendy in contemporary architecture, Native Tribes of Seattle were incorporating these strategies into their own built works by necessity.

Inspired by Native actions, the Duwamish Campus will not be designed to accommodate contemporary American practices of teaching, but instead facilitate Native methods that center around community involvement, exploration, collaboration, and learning from the environment. Native traditions are not about the applique of artwork, but are about students learning from the community, the community learning from students, and the importance of language, art, music, and craft. The close analysis of existing infrastructure for Native teaching, from schools to museums to cultural centers, will dictate not only the program the Duwamish Campus will need to thrive on its new site, but will also question the aesthetic and functional conventions typically placed on school structures and built forms.

Finally, inspired by Native traditions, the design of the campus must acknowledge and respect both the history and future of its site. Students attending the Duwamish Campus must be aware that the land on which they tread has a history beyond its time as a Duwamish settlement, beyond its time as farmland owned by John Pike of the now-famous Pike Place Market, beyond the influence of industry, and beyond its current status as a highly polluted and superficially remediated EPA superfund site. Each inhabitation of the land has made its mark, and it is imperative that the Duwamish Campus for Outdoor Education predetermines the legacy it will leave. Native actions are not only about remembering the past, but are about becoming stewards to the environment and creating spaces that are accessible to all. Embracing the Native belief that this land belongs not to us, but to our children's children, the new campus for outdoor education will extend beyond its walls as an environmental beacon, and the building and site will help to restore the Duwamish to a healthy, natural state.

The form that results from these parameters is also defined by them; it must balance the needs of the students, the needs of the community, and the needs of the environment. By creating built form that will speak to Native culture, encourage innovative

and exploratory education founded upon Native principles, and facilitate the environmental restoration and betterment of the Duwamish River, the Duwamish Campus for Outdoor Education will serve as a school of the future while respecting and learning from traditions of the past.

Traditionally, children in the Pacific Northwest learned from the community and the environment, not from a series of textbooks and state issued tests. Education in America needs an overhaul, but it is not going to happen by implementing more testing. The Native ideals expressed by the mission statement of Seabird Island School states, "We believe that education is a preparation for total living. It should provide knowledge and skills in reading, writing, listening, critical thinking, problem solving and mediation."⁵⁹ These are not lessons that must be taught in a confined space with a series of desks facing a chalkboard. These are lesson that can be learned from the history, the environment, and the stories surrounding Seattle and the Duwamish.

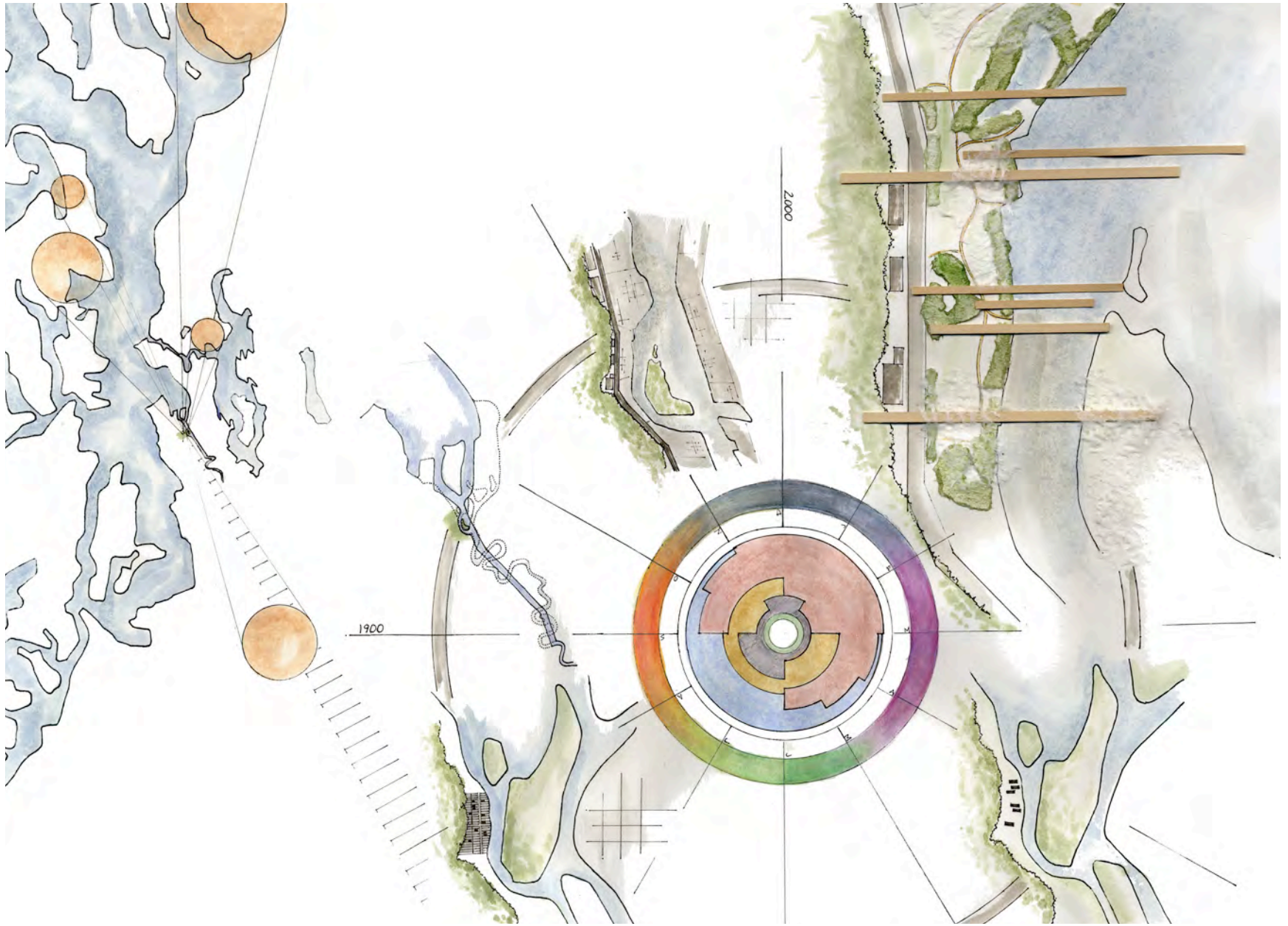
By weaving the concepts of Native spaces, Native actions, and Native traditions through the design of spaces on the campus, the

benefits of these ideals can bring a cohesive feel to the campus. Specific influences on design include the flexibility of Salish Homes integrated into the campus master plan. The possibility for expansion, both within individual learning spaces as well as built additions to the school as a whole should be considered from schematic design. At the same time, while it is ideal to embrace the ideals of Pacific Northwest Native American design (flexibility, passive systems, etc.) this does not mean the resulting form will be a longhouse, be called a longhouse, or be reference to a longhouse in the sense that it is a long, low, horizontal building wrapped in wood.

Climatic concerns, views, and access are primary concern when placing these elements on to the site. If used, multi-story spaces should be placed on the north of the site with a single level or outdoor spaces further south, in order to not block solar access or views, and be linked with the public park that will remain on site. In addition, if inhabited spaces must be indoors, the connection to outdoors is of paramount importance culturally, as well to take advantage of solar opportunities, ventilation, and incredible views.

As they were used before European Influence, consider how materials of today can be used responsibly and in totality. As we can learn from the Salish, "Except that it could not be consumed, cedar was to northwest coast craftsmen almost what the buffalo was to Plains Indians. Its inner bark was woven into mats, cloth, rope, and ritual costumes, and its outer bark shingled the roofs of their houses. Its wood – composed of thin-walled cells with large spaces between the cells – offered naturally insulating walls. Not surprisingly, most Northwest Coast Tribes also believed the tree was endowed with spiritual power."⁶⁰

With global views influencing the built forms taken by the three cores; both visual and physical site connection must be made between the three cores to unite the campus as a whole. By keeping the main circulation path along the bank of the Duwamish, just as it would have been when the tribe inhabited the site, students and the public are reminded of the industry that surrounds this island of green. The campus is not insular: it is on the edge, looking beyond, and projecting to its surroundings.



| design |

We describe this as a search for “found potential; - those aspects of site, climate, building context, program, or local culture, for example, that will facilitate the development of an architectural order which is evocative of circumstance.”⁶¹

- John Patkau, Architect

The design proposal for the Duwamish Campus for Outdoor Education consists of three site-specific nodes with a cohesive site strategy. When determining the forms these nodes will take, the importance of visual connection to the larger environment is a driving factor. Traditionally, Salish longhouses were built directly adjacent to water, so by opening a view corridor from the existing Duwamish Longhouse to the river was of utmost importance. Secondly, a view corridor was cleared from the main building to the view of Mount Rainier, framed (from the site) by industrial concrete plants. This reminder of the human impact on the natural environment serves as a lesson to both students and community alike. Finally, the skyline of Seattle can be seen from the site, and this view references pathfinder as one part of the broader community of Seattle (figure 44).

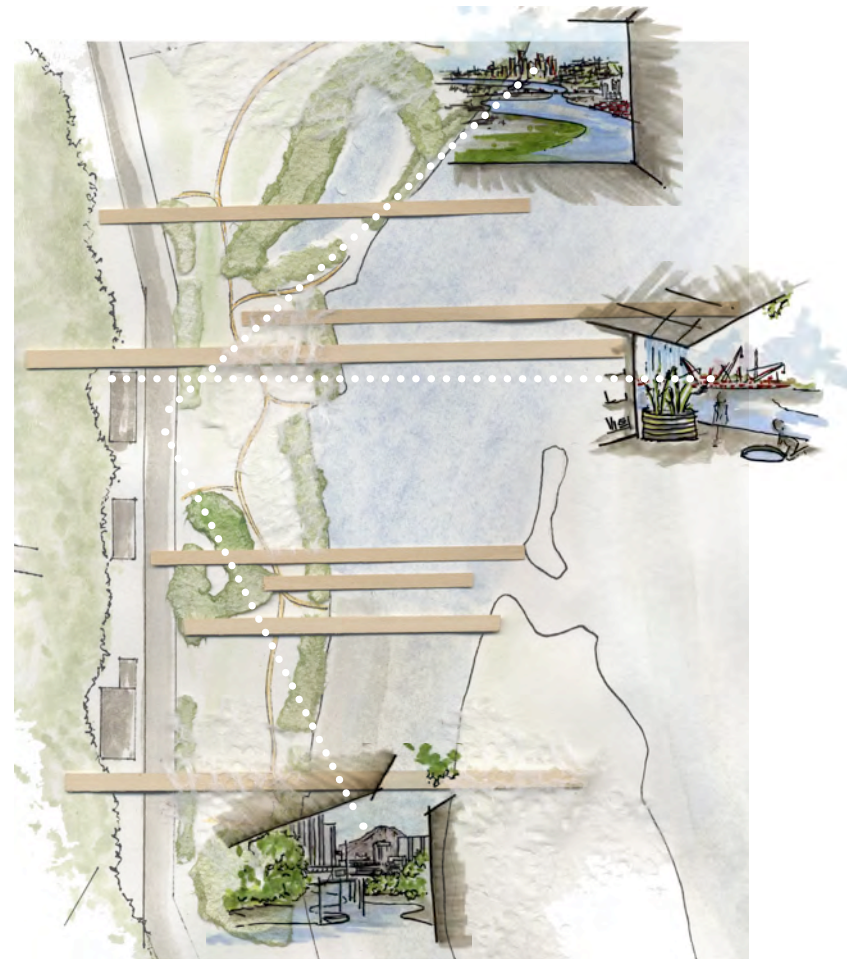


figure 44: sight lines from Duwamish Campus



figure 45: site diagram with locations of learning nodes

The Duwamish Campus for Outdoor Education houses three distinct nodes for education: the earth node, the sky node, and the water node (figure 45). Each morning, a group of 150 students arrives on campus at the start of the school day. Most students arrive via Seattle School busses, which drop off students at the Greyhound lot directly north of the Duwamish Campus entry. Others arrive via parent drop-off in the parking lot at the north end of the site, or via the metro transit stop that connects to the site via a bike and pedestrian path (figure 46). Upon arriving on campus, the students are divided into learning clusters, each occupying one of the three campus nodes.

earth node

Located in the portion of the site near where the Duwamish village once sat, the earth node centers around the forms and functions of native space (figure 47). This structure is flexible, expandable, and adaptable, using local materials and passive ventilation for interior spaces. Situated directly across from Kellogg Island, the only remaining (1/2) island and bend from the original path of the Duwamish, the earth node will be the site of water remediation both from the campus and from the Duwamish, helping to restore the river to a healthy and thriving waterway.



figure 46: site plan and access to Duwamish Campus



figure 47: earth node location on the Duwamish Campus for Outdoor Education

As evidenced by the success of immersive outdoor education programs, classrooms of the traditional structure are not required for an effective educational campus. In some cases, learning spaces need not be enclosed, conditioned, or even reliant upon built structure to facilitate learning.

The earth node consists of four open air learning spaces, each with a specific focus. The southern-most space is a wet lab where students can test water directly from the Duwamish river to understand the pollutants and ecosystem challenges the contemporary river faces. Separated by the living machine yet connected via a long boardwalk, the next space is a sunken gathering space. Inspired by the form of a Salish longhouse, the roof wraps down and forms a back and side wall, protecting the space from winter winds. Next is a flexible area with a large pivoting wall that allows the space to be closed to the west or open all the way through. Finally, a classroom space anchors the north end of the earth node, where built-in fixtures provide the necessary storage for learning tools and materials.



figure 48: earth node floor plan

The earth node program and curriculum centers around the remediation of both site and waterway. While each learning space has a distinct identity, they work together to support the State of Washington standard curriculum points of questioning and investigating, systems: input, output, boundaries, and flow, cycles in the earth systems, from cells to organisms, and the flow of energy through ecosystems.

Drawing on Native space principles of geothermal tempering and passive ventilation systems, the earth node spaces are sunk

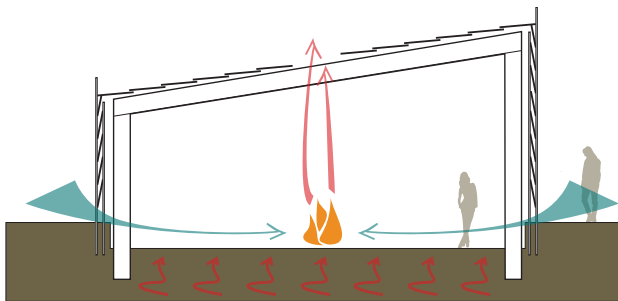


figure 49: Native precedent: environment as mediator

into the ground with walls lifted slightly from the floor to allow for natural ventilation (figure 49). Gabion retaining walls hold back the land while providing a defined path for drainage. To heighten the awareness of earth, students enter the node and ramp down, eventually coming to a finish floor height nearly three feet below the surrounding landscape (figures 50, 51). In the wet lab at the opposite end of the building, retaining walls bring the living machine up to a similar height, so the interaction with the environment is literally at the fingertips of students (figures 52, 53).

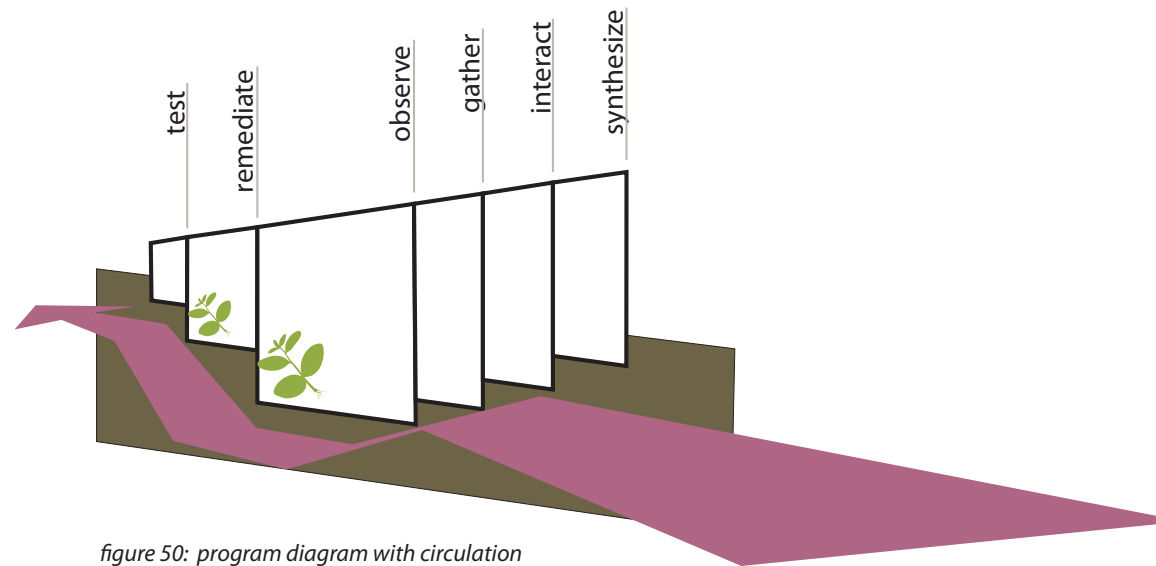


figure 50: program diagram with circulation



figure 51: earth node entry



figure 52: campus section through earth node



Each week, students experience a different campus node, thus covering the extent of the planned curriculum over the course of the semester. On a campus so fully tied to nature, the curriculum and lesson plans change with the seasons. The following excerpt describes what a typical day may bring for an eighth grade student on the Duwamish Campus for Outdoor Education.

9/25/11 – earth node

Today, I was assigned to the earth node at the Duwamish Campus. First thing in the morning, it was pretty cold outside, but all 50 of us piled into the gathering space for an early morning lesson. It seemed a lot warmer under the wrapped roof, and my friend said it was because we were partly underground, and the earth was keeping us warm. The teacher said we would be learning about the living machine today, and about how we were going to be part of making the Duwamish River clean again. From all the boats and barges floating past while the teacher was talking, I didn't really see how a few plants could clean up the water, but boy, was I wrong!

After the teacher told us how the river had gotten so dirty in the first place, (they straightened a whole river just to make shipping easier!?) we were off to the wet lab. It was all the way down at the other end of the building, and we had to walk past all of the living machine before we got there. It just seemed like a bunch of plants in tiered planters, but I was about to find out how cool it was. First, we sloshed down to the edge of the river and scooped up beakers full of water. Then, we added chemicals into the water to see what types of pollutants were present. We found all sorts of things from oil to pesticides to even a dirty boot!

After we tested the water, we followed its path through the different phases of the living machine. From the up flow anaerobic sludge to the aerobic rizo-filter, each step of the journey helps to purify and cleanse the water. After the water seeped in the artificial wetland for a few days, it was ready to go back into the river!

With all the bad stuff we've learned about the Duwamish river, from shipping to industry, it's good to know that we're helping just a little to make it healthy again.



figure 53: earth node wet lab and living machine



figure 54: water node location on the Duwamish Campus for Outdoor Education



figure 55: water node floor plan

At lunchtime, students take their packed lunches to the cafeteria space on the ground floor of the sky node, and mingle with their peers to recap the morning. The afternoon classes arrive on campus via school bus, and the morning group takes those busses back to their respective schools to resume afternoon courses as normal. The afternoon groups are then divided into the learning nodes, and a block lesson of science and history curriculum begins.

water node

The water core is conceived on the ideals of the natural environment acting as the classroom for students. A pier structure perched between the Herring House restored wetland and the Duwamish Waterway, from this vantage point, the curriculum centers on the

impact humans have had on the environment, both for better and worse. A series of learning spaces supports the State of Washington science curriculum including - inquiry: questioning and investigating, evidence of change and inheritance, variation, and adaptation. The central portion of the node encompasses three learning spaces. Two are outdoor spaces where benches and tables unfold from prefabricated straw bale walls to provide seating and work space. The third is an enclosed rental shop where students learn water safety and the public can rent water-sports equipment for use on the weekends and during the summer. The east end of the water node is a floating dock brings students to the level of the Duwamish river, allowing study of the water as well as a direct link for physical activity. The west end of the node boasts a sunken classroom for direct interaction between students and nature.

With spaces that directly engage two distinct water-based environments, students will explore the importance of water in Seattle's history, and how industry and nature can be balanced into a successful whole. The structure for this core reflects the Salish traditions of expandable and deconstructable spaces. Just as a longhouse could be continuously added onto as more space is needed, additional interior spaces can be added to the open pier structure as needs arise in the future. Through using rapidly renewable materials such as Lamboo (laminated bamboo) structure, compressed strawboard fill, and prefabricated straw

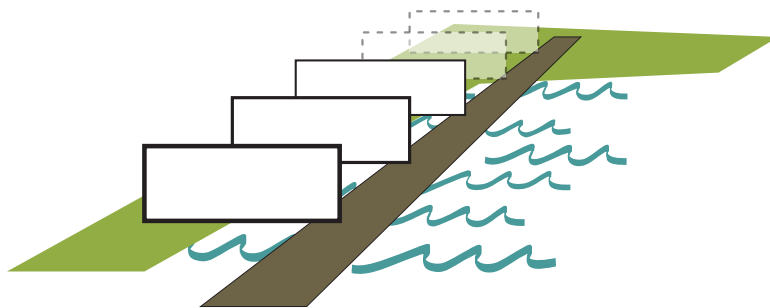


figure 56: Native precedent: expandable/deconstructable spaces

bale walls, the concept of how human actions can affect the environment is apparent in both building and site. With the entire node supported by piers, constructed with prefabricated roofing sections and walls, and secured by mechanical fasteners, the structure could be removed with very little lasting effect on the environment. From a learning center that could be dismantled in less time than it took to erect to a restored wetland abutting the polluted Duwamish River, the water node is an expression of human impact on the environment.

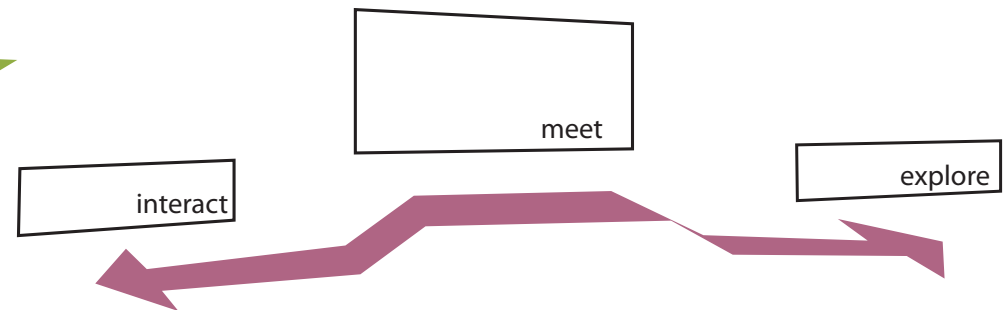


figure 57: program diagram with circulation



figure 58: water node entry





figure 59: campus section through water node

From observing wetland plants and creatures to taking a canoe expedition to nearby Kellogg Island, the water node at the Duwamish Campus for Outdoor Education serves as a launching point for all water studies. The following is an excerpt from what an eight-grade student might experience in her afternoon on the Duwamish Campus.

4/18/12 - Water node

Today, we were back at the water node, but it's finally warm enough to go out in the canoes! When we arrived on campus, we first went to the learning space to talk about the adaptations different organisms would take depending on their environment either in the wetland or the river. Next, we were supposed to use the sunken classroom space to record the organisms we found in the wetland. I saw ducks and turtles, and the teacher showed us how even by looking at a sample of water in a jar, we could already see different critters floating around!

After we recorded the plants and animals we saw in the wetland, it was time to canoe! We carried the canoes from the boathouse down to the floating dock and climbed in. It took us a while to get paddling

in the right direction - we're lucky the path to Kellogg Island doesn't pass through the shipping channel with the big boats!

When we got to the island, there were ducks everywhere. I wanted to see more turtles, but I couldn't find any. The teacher said that was because turtles liked the more hidden spaces in the wetland rather than the big wide river. That makes sense, but it also makes sense that the turtles wouldn't want to live on Kellogg Island because it's dirty. For an island where no one goes, there's trash everywhere! The teacher told us that there is a Duwamish River Cleanup Coalition, but they probably don't come to the island all too often. This summer, when I come back to the Duwamish Campus with my parents to rent a canoe, I'm going to make sure we bring trash bags and help clean up the island! Maybe that way, next year's eighth-graders will get to see turtles here, too.



figure 60: water node sunken classroom



figure 61: sky node location on the Duwamish Campus for Outdoor Education

During the school year, the Duwamish Campus will be consistently busy with five morning and five afternoon sessions per week to accommodate students from Seattle Schools. On the weekends and during the summer, additional programming can be added by the Port of Seattle, Seattle Public Schools, or the Duwamish Nation. One example may be a Pacific Northwest Native Culture Symposium, where experts in Native arts and traditions come together and hold seminars on the song, dance, and history of the area.

sky node

Located directly across the street from the Duwamish Longhouse, the sky node stacks necessary interior program spaces into a building with a small footprint. Housing a cafeteria, auditorium, classroom spaces, a Native archives, and distance learning lab, this building can act as support space for collaborative events between the Duwamish Tribe and the Seattle Schools (figures 62-68). While the largest gatherings would likely take place in the Duwamish Longhouse, spaces of the sky node allow organizers to diversify the offerings of a conference.



figure 62: sky node program diagram

Floor 1:
-lunchroom seating 50

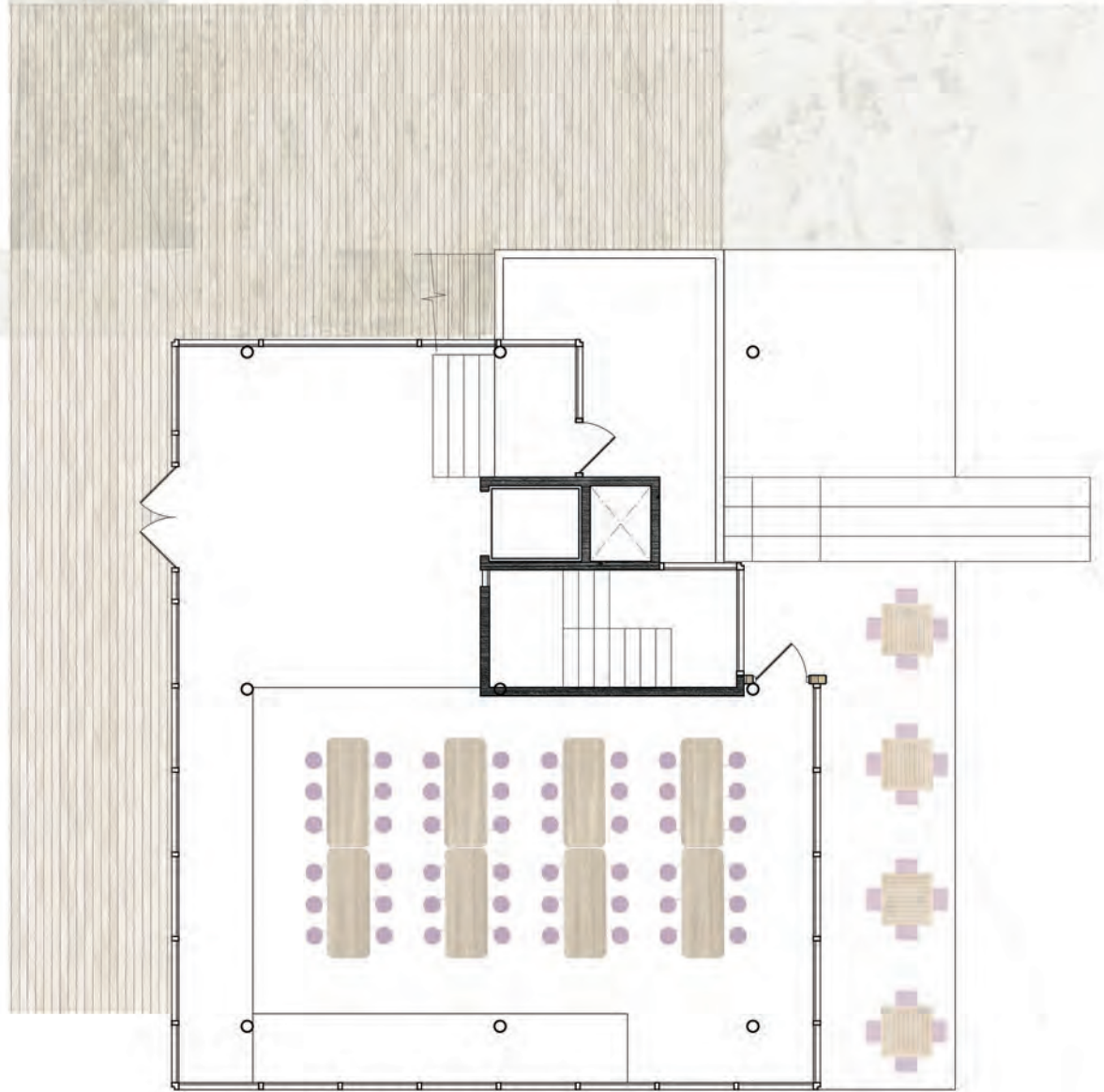
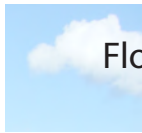


figure 63: sky node lunchroom plan



Floor 2:
-auditorium seating 50

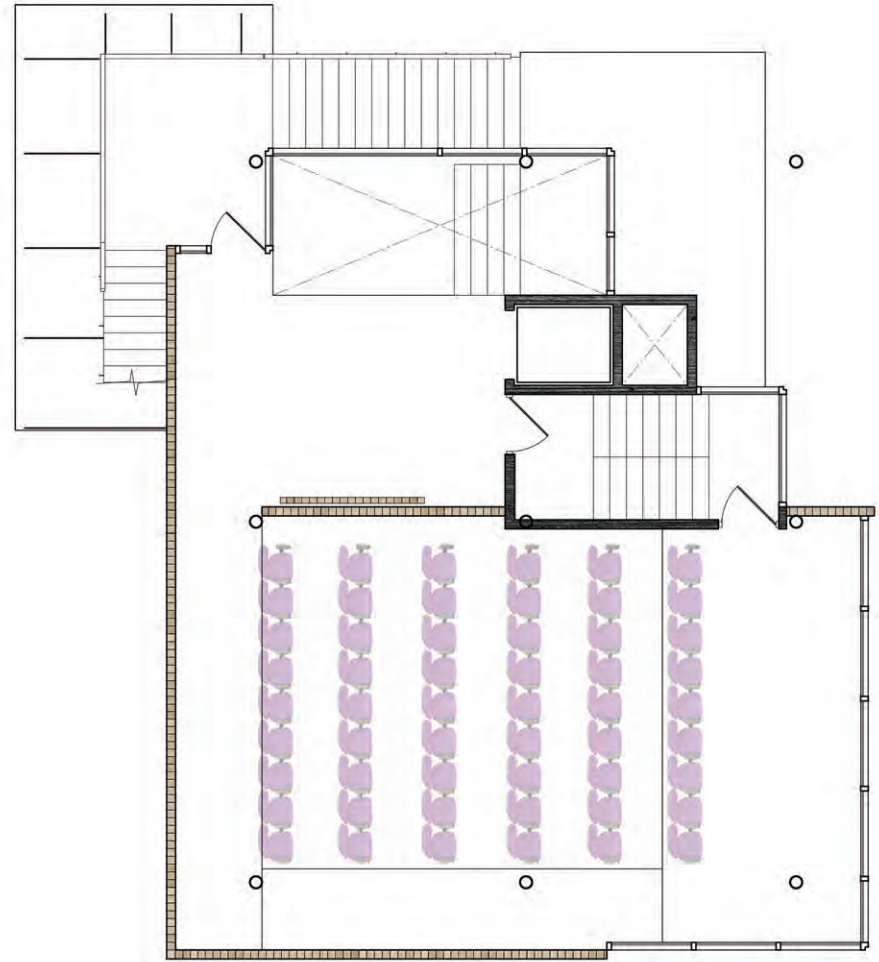
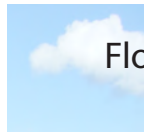


figure 64: sky node auditorium plan



Floor 3:
-formal and informal classrooms

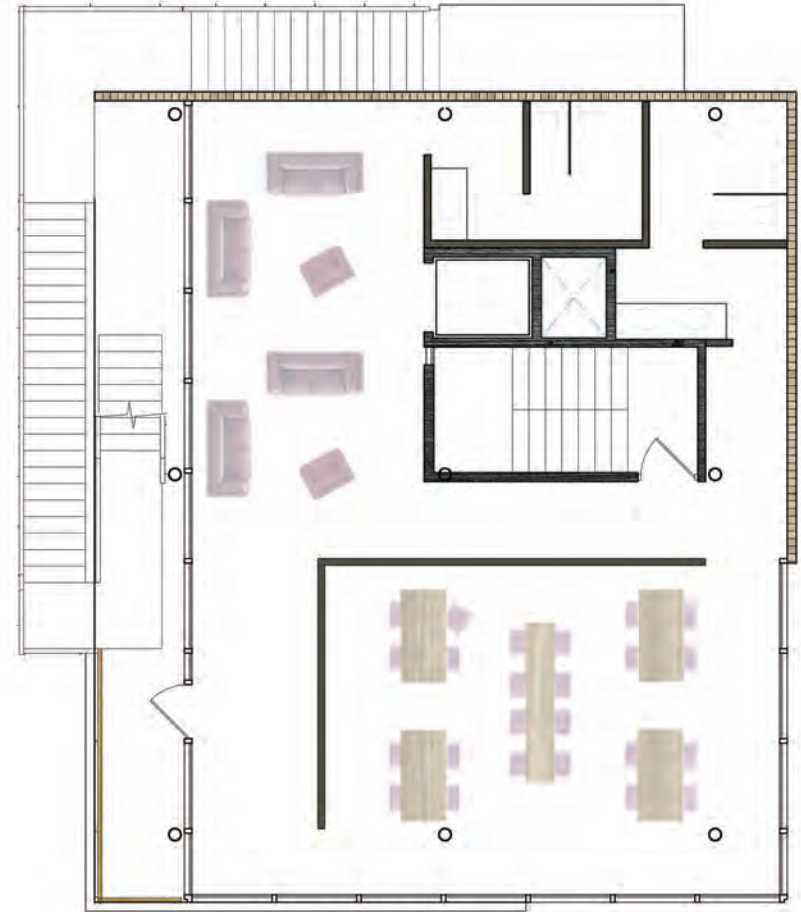


figure 65: sky node classroom plan

Floor 4:
-archives

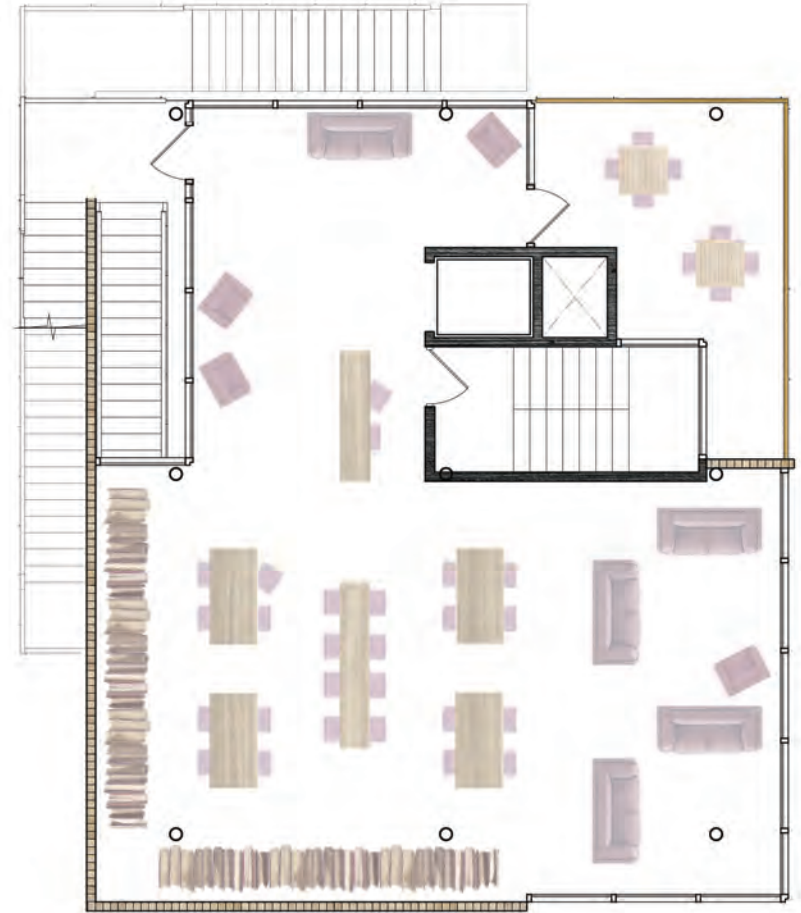
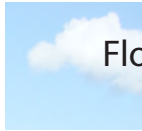


figure 66: sky node archives plan



Floor 5:
-distance learning

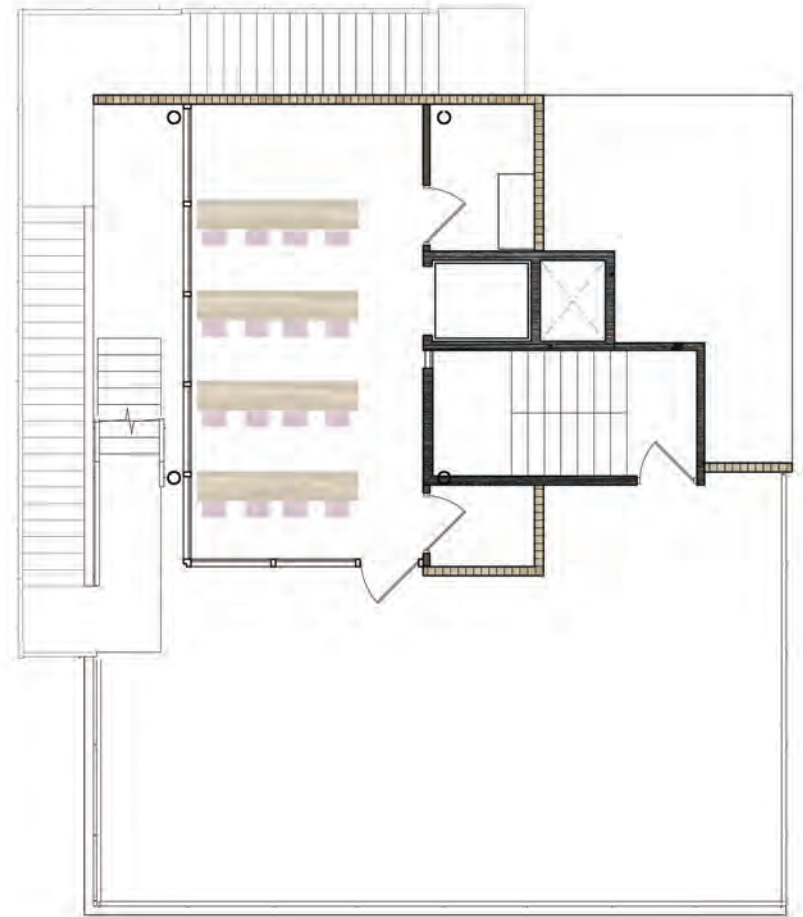


figure 67: sky node distance learning lab plan

Roof:
-space for growing

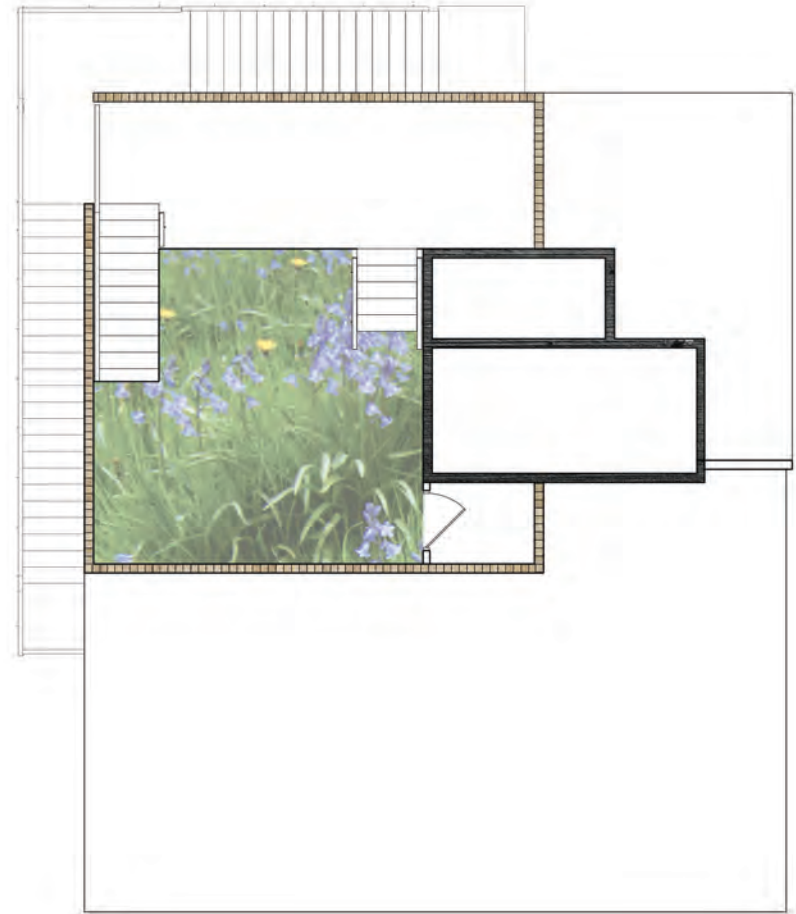


figure 68: sky node roof garden plan

In the sky node, the Native tradition of a linear circulation path with access to individual spaces it is literally turned on end (figure 69). To match the urban fabric along West Marginal Way Southwest, to serve as a beacon of the school's presence, and to take advantage of territorial views to Mount Rainier and the Seattle skyline, program elements for the tower are stacked vertically (figure 70). The circulation is pulled to the exterior of the building, creating the same 300 feet of linear space for interaction evident in the boardwalks of the earth and water nodes (figure 71). Wood cladding wraps the exterior of each floor in a different fashion to provide specific views. The procession through space ends at a roof garden, where students interact with an outdoor growing space with panoramic views (figure 72).

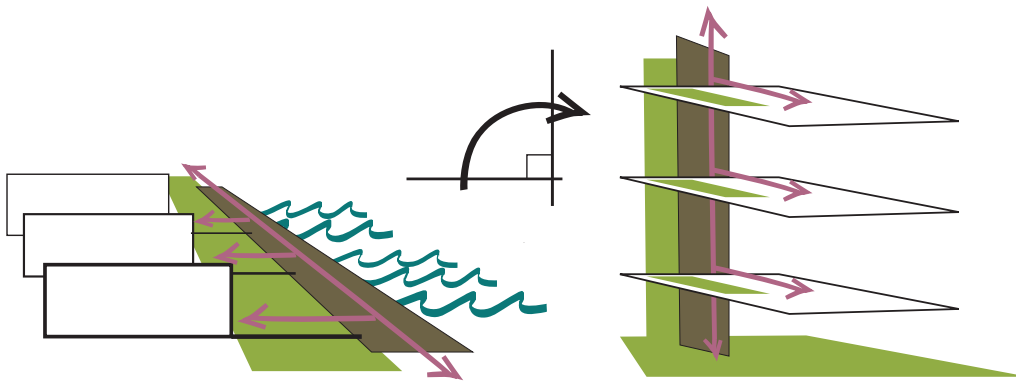


figure 69: Native precedent: community circulation

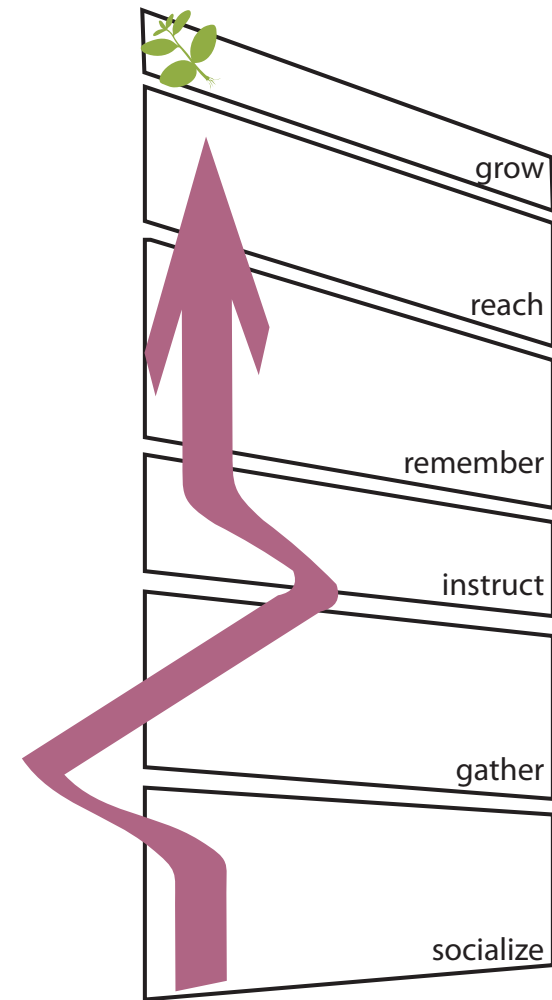


figure 70: program diagram with circulation



figure 71: sky node entry



figure 72: site section through sky node



While each level of the Sky Node supports a specific function, both students and community can benefit from this element of the Duwamish Campus for Outdoor Education. With daytime programs for the students to learn about local history, culture, and science, members of the community could be invited in to teach on their areas of expertise (figure 73). The excerpt below outlines the experience a seventh-grade student might have with a visiting lecturer from Seattle.

1/22/12 Sky Node

Today we were in the Sky Node, and I was pretty happy since it was cold outside. As the only part of the campus with heat, I didn't even have to wear my coat!

A historian from the Burke Museum came to talk to us today about the baskets made by Native Americans in Seattle. We got to look at all the different types of baskets, and we had to guess what they were used for. The ones for gathering berries were pretty easy to pick out - they were still stained red and blue on the inside!

Most of the baskets we looked at were coiled baskets, which is what the Salish Tribes made the most often. He even showed us where certain baskets had been repaired with "Frankenstein mends," so you could tell the new white rice paper that held together old tears from the original basket. When the historian showed us what the cedar root looked like before it was prepared for basket making, you couldn't even tell it was the same material.

The historian from the Burke Museum seemed really excited to come to the Duwamish Campus to talk to us about the baskets. He said that since the museum had so many artifacts, most of them were locked in storage and the public never got to see them. With the new archives, more artifacts could be on display more often.

When the historian said he'd be back next Monday night for an evening lecture for the public, I got really excited that maybe if we came with our parents, we could get extra credit for history class. I think it's a really good idea...



figure 73: interior of archives in sky node

|conclusion|

“Mass culture is becoming so predominant that the local and the particular are becoming less and less evident. This is the ‘McDonald’s theorem’ – the proposition that international capitalism is creating a uniform world culture. Architecture can play an important role in this context, as a counterbalance to the increasing generality of other aspects of culture.”⁶²

- John Patkau, Architect

When architecture is dictated by place, it becomes one with community, site, and environment. It is not an object in the landscape, a tower in the park, or an island unaffected by its surroundings. The pristine is fragile; it warrants respect, reverence, and a gentle touch. Native architecture was not precious - it was functional, yet personal, and it begged to be used, adapted, and customized. It reacted to the environment, it flexed with the seasons, and it literally moved with the Tribe. Historically, Native architecture was place, it encouraged action, and it resulted in tradition.

This thesis began with the concept of making place so tied to the specifics the site it inhabited and community it served that the form of the architecture was secondary to its agenda and functions.

The objective is to bring students back in contact with nature, on a regular basis, and in a meaningful way. With recent advances in technology and instantaneous communication, students are looking past their immediate surroundings to the wider world. While this is an imperative part of learning and exploration, and is addressed in the campus design, it is equally important for students to interact with their immediate site, surroundings, and community to become more responsible global citizens.

Proposing an outdoor education campus for some of the lowest performing schools in the Seattle Public School District gave reason to use this specific site. The concepts of Native spaces, Native actions, and Native traditions stemmed from the idea that our global culture argues for bigger/better/faster without taking a step back to see how these beliefs impact the world around us. Native traditions insist that this is not our planet to abuse, but instead, it belongs to our children’s children. Such a simple concept, but it can result in such a profound effect on an approach to architecture and design.

Rather than employing the latest hi-tech building technologies or the most innovative sculptural forms, this proposal for the Duwamish

Outdoor Education Campus focuses on enhancing the natural features that already exist on site. Rather than installing towering turbines to produce enough power to run high efficiency air handling units, structures are oriented to catch summer breezes for the northwest while blocking cold winter winds from the south. Instead of loading south facades with imbedded photovoltaic technology to harness energy to illuminated LED or CFL fixtures, learning spaces are oriented south and east to take advantage of the morning sun to wake students and prepare them for a day of learning. The campus centers around the environments that exist on this land - for better or worse - positioning nodes on a restored wetland, a polluted waterway, and an urban, industrial thoroughfare. Nature within a city is not always organic, and an educational center that focuses on this specific environment must adapt accordingly.

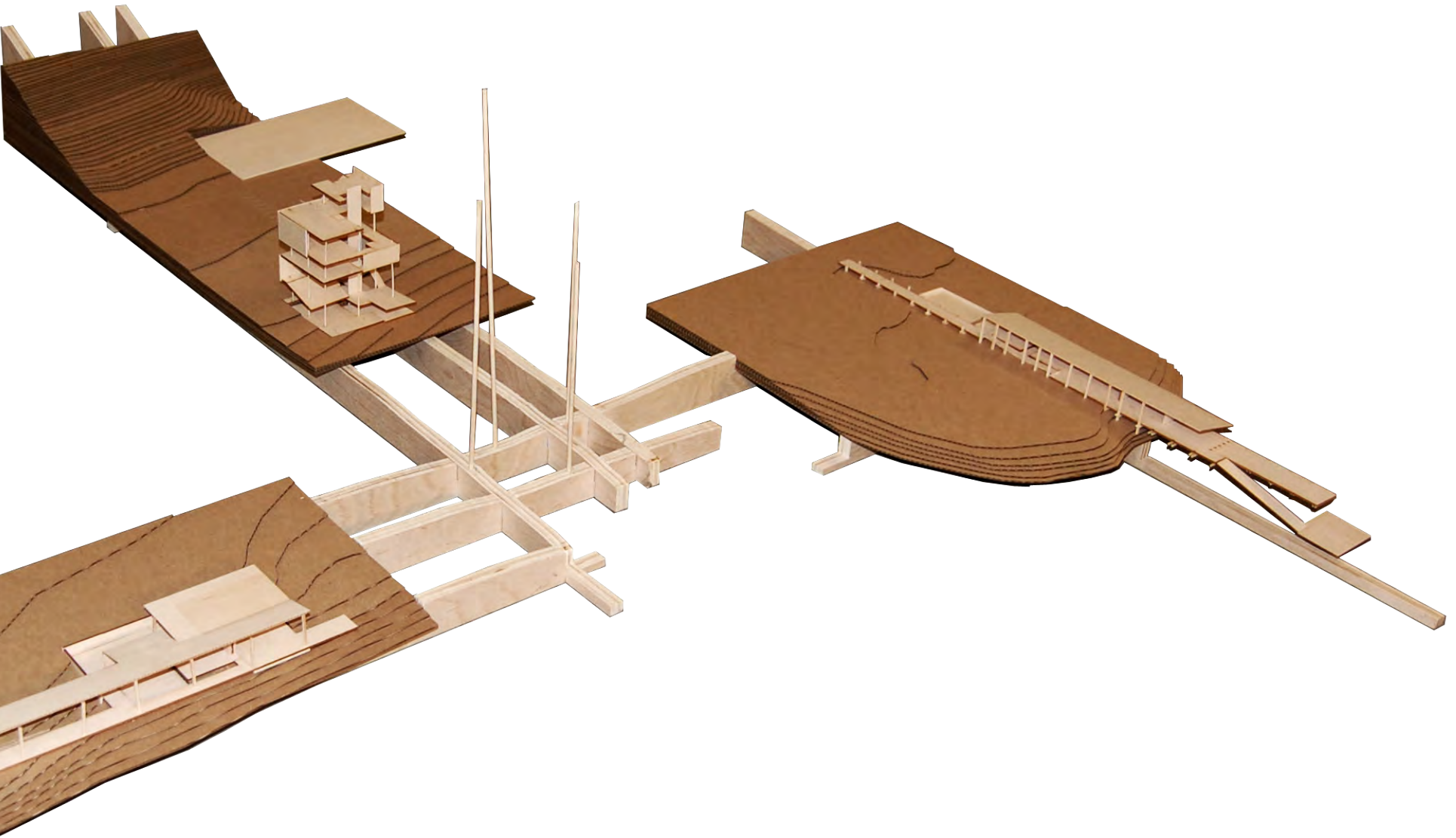
The Duwamish Campus for Outdoor Education faces realities, and it puts forth a proposal for how these realities might be addressed. With more time, the structure of the water node could have been further developed, the specific form and location of the earth node worked and reworked, and the sky node could have taken any number of vertical forms. What would remain in place are the foundations upon which the campus is built. Architecture can allow

students to interact with nature in ways they have not experienced before. From the sunken classroom of the water node to the raised living machine in the earth node, experiential education is brought to children's fingertips. The lessons taught by this campus are not only about natural cycles, but also of how human interaction affects these cycles in good ways or bad. The science curriculum for Washington middle schools expects students to understand Newton's laws. What this campus can teach is that these concepts can move beyond applied physics -- all actions taken by individuals and their environment will also have a reaction. It is imperative the next generation is aware of what that reaction may be.

The design proposed the Duwamish Campus for Outdoor Education allows for this type of curriculum. By not creating a historicizing form, students are not equating the experience of learning here to some sort of historic recreation that is locked in a specific era and time. The campus is of today and tomorrow - perhaps not in architectural trend, but certainly in longevity of program. Like Mercer Slough and IslandWood, formal design is secondary to student experience and interaction. Joining these two successful education centers, the Duwamish Campus for Outdoor Education will bring students back in contact with the environment, and specificity back to built form.



figure 74: campus model



| endnotes |

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figure 2: <http://islandwoodendeavors.blogspot.com/>

figure 5: photo by the author

figure 7: Google Earth

figure 8: Technical Advisory Group. Duwamish River Cleanup Coalition. 2011. 12 May 2011 <<http://www.duwamishcleanup.org/index.html>>.

figure 9: Google Earth

figure 10: photo by the author

figure 11: photo by the author

figure 12: Nabokov, Peter, and Robert Easton. Native American Architecture. (New York: Oxford University Press, 1989.)

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figure 24: photo by the author

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figure 26: photo by the author

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figure 36: photo by the author

figure 37: <http://mithun.com/projects/>

figure 38: <http://www.greenguidespain.com/andalucia/2010/07/its-a-living-miracle/>

figure 39: photo by the author

figure 40: <http://www.archdaily.com/10629/nkmip-desert-cultural-centre-hbbh-architects/>

figure 41: <http://www.archdaily.com/10629/nkmip-desert-cultural-centre-hbbh-architects/>

figure 42: <http://www.archdaily.com/10629/nkmip-desert-cultural-centre-hbbh-architects/>

figure 43: photo by the author

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