Wetland Wasteland

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A thesis
submitted in partial fulfillment of the
requirements for the degree of:

Master of Architecture

University of Washington
2012

Jim Nicholls, Chair
Dan Stettler

Program Authorized to Offer Degree:
Department of Architecture

ACKNOWLEDGEMENTS

To Mom, you live on with every step I take.

To Jessica and Dad, for your unconditional love and support.

To Erin, for your generosity and feedback.

To my advisors, Jim and Dan, for your guidance, especially in those unsure moments.

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PREFACE

This document has been organized into chapters around a quotation by James Corner and the title of the thesis itself. The organization is intended to add poetic power to the narrative of this thesis--but do not be descieved by its style. The straightforward elements are all included in this more interwoven narrative: project concept, site history and current context analysis, program description and rationale, project description and conceptual meaning of the architecture, and conclusion. The introduction and concept are in the first chapter. The site history is divided into the next two and a half chapters, with the architectural foundations and the program weaving into the fourth chapter. The project description and analysis of its meaning are in chapter 5 and part of chapter 6. And the conclusion begins in chapter 6, but its roots reach back through the whole document.

I wrote the document in a poetic prose style because I believed that the project called for this treatment. The use of the literary devices of foils, call and response, paradox, and metaphor began even before the architecture started to take form. They were part of how I read the site and so it was natural to write in a similar way.

1

1 THE MAGNIFICENT PARADOX

"Immense and Immediate. Efficient and Wasteful. Brutal and Spectacular. The American Landscape, like the culture it embodies, is a magnificent paradox. For all of its clarity, beauty, and precision, there is an odd confusion lurking across the land, a terrifying and sweet errancy of measure that is at once ominous and promising."[1]

-- James Corner, *Taking Measures Across the American Landscape*

Underneath part of the University of Washington lies an old landfill. It settles where Union Bay, an inlet of Lake Washington, used to be. Below the landfill, the deepest peat deposit in the state of Washington, shifts and subsides under the heavy loads of 40 years of Seattle's waste. All of this sits restlessly on a thick layer of dense clay, ground and carved by the glaciers that shaped the modern landforms known collectively as the Pacific Northwest.

1. Landfill, 1955.
They dumped trash directly onto the marsh

2. Layers of the site.
Clay, peat, landfill, patchwork surface

3. Production landscape
The Lake Washington Shipping Canal being dredged out of the Montlake Isthmus, 1914

4. Recreation landscape
Children canoeing in one of the earlier human-built canyons before the shipping canal formalized the channel

2

Wetland Wasteland begins and ends with this story that has formed the landscape. The architecture is a means to process the landscape. Two elements compose the architecture: the incinerator and the baths. The incinerator processes current trash, diverting what would become future wastelands into the resources of heat, energy, distilled water, and open space. The baths are a recreational outlet for the resources the incinerator produces. They sit out on the restless land, one bath floating above and one sunk into the land. As the land shifts, the baths act as tools to register the land's movements. The incinerator and the baths together form a didactic experience. This experience is built out of foils that make connections to the past, present, and future. The presence of one foil enriches the other. They both work together to frame a whole picture.

1. *Production and Recreation.* There are two conflicting ideas of landscape at work on the site now. The first is the idea of a landscape that performs and/or produces, as in a canal connecting bodies of water, as in a logging forest, as in a landfill. The other is the idea that a landscape is a romantic scene for repose or recreation, as in a hot spring, as in a bird blind, as in a meadow path.[2] In its history and its current state, the land and water in and around this site embody both ideas. These ideas, however, have always been separate. Their separation has made it harder to see and appreciate the paradox that their simultaneous existences create.

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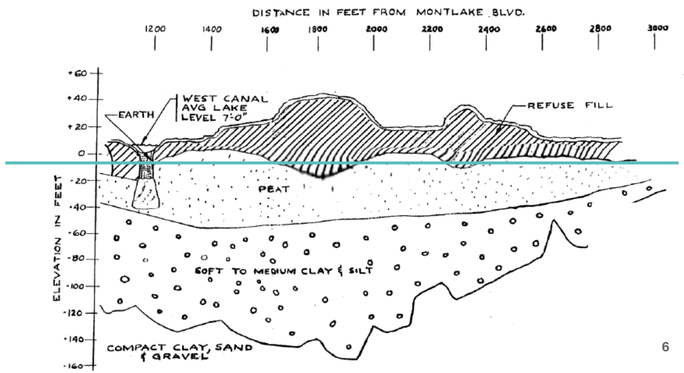
5. Water and land
The soft underground layers transform the surface topography. Here the land has shifted away from the storm drain, leaving pools of water.



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2. *Water and Land.* Water and land are continually shifting on the site. Human built[3] and natural forces have brought water and land into an unusual relationship on this site. Typically, land is thought of as solid, water as fluid. On this site, because of its history, the land has become fluid and the water has become the solid, consistent element. The datum line of the water's surface—like the bubble in a carpenter's level—is a naturally available calibration tool. The architecture uses the water in the baths as the constant that registers the movements of the shifting land.

6. The datum in a moving landscape
A section drawn by an engineer as the landfill was closing has been altered to more accurately show how the peat layer interacted with the landfill above it. The green line shows the surface of water holding level as the land moves around it.

7

3. *Fluctuation and stability.* What do we do when we cannot trust the land beneath our feet? If it is a production landscape, we engineer stability. If it is a recreation landscape, we leave the land to flux. Construction on the site over the past 40 years has attempted to stabilize the land with dikes or find stability by anchoring below the shifting layers with pilings. But everything will fluctuate over time. The softer it is, the faster it moves, but a deeper look at the site history reveals that even the hardest things out there move.

These foils are also paradoxes. They are elements that seem inconsistent yet somehow simultaneously true. The story of the foiled paradoxes is what makes this site so powerful and so rich. Today, the stories are concealed by a patchwork surface brought together under the umbrella of the university—athletic facilities, parking lots, and an outdoor ecology classroom. However, the patchwork has been put together in a largely uncoordinated way, creating awkward spatial and programmatic transitions. This varied and disjointed surface acts as a rug concealing the story of paradox that has been swept underneath. *Wetland Wasteland* is about looking underneath the rug and connecting that story to what the place is today and what it can become in the future.

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7. Footing on soft land
A landfill operator attempted to walk on the peat in 1955

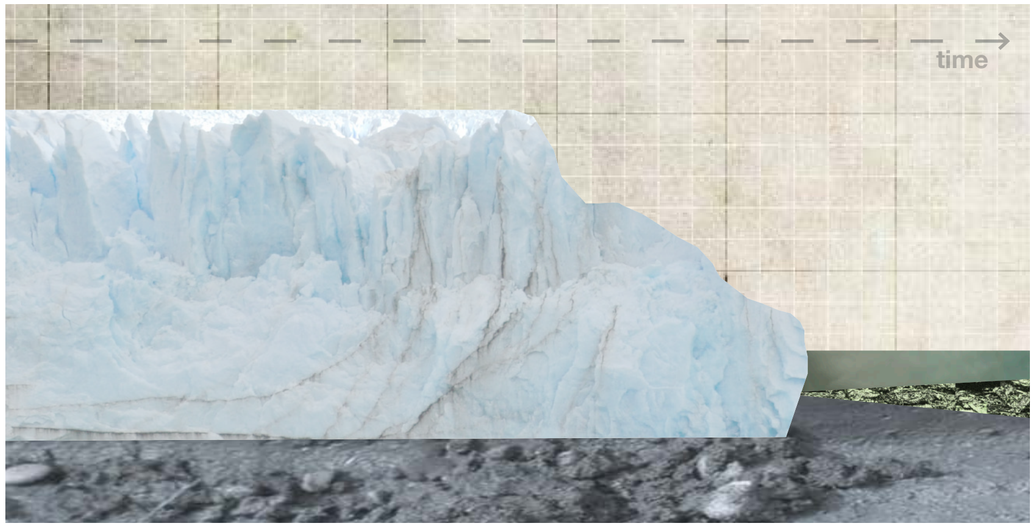
8. The site and its context today
The Burke-Gilman Trail, a former railroad, is a meandering marker of the old natural shoreline of the bay. The current urban fabric still conforms to its path.

2 FORMING THE LAND: WETLAND

"Nature apparently grew tired before she finished Seattle. She made a wonderful harbor, produced an empire of timber-hung pictures on the horizon, spread three lakes on the hills, and then left the town site to itself like a tousled, unmade bed"[1]

---Welford Beaton, Seattle Chamber of Commerce official in 1914

Land is never a static form.[2] It is instead the expression of current and past processes.[3] The earliest process that demands attention for this story is that of continental glaciation. Liquid water chilled by global cooling trends fell from the sky as snow. It collected over thousands of years, the older snow turning to ice under pressure. The massive ice formations started forming in Canada, and as they grew they advanced south. The Fraser Glaciation was the most recent "northern ice" to advance down into western Washington. Its final phase, the Vashon Phase, passed over Seattle on its way south about 15,000 years ago. The ice stood 3,000 feet tall as it carved and ground the earth below its heavy mass. When it receded, 1,500 years later, "it carved the massive ice-rounded low hills" that make up Seattle's topography today. The bowls that now hold all of the lakes and the Puget Sound "are the spectacular products of this glacial energy."[4]



9. Site History Diagram
The glacier towered over the land and when it receded, the peat and water began to collect

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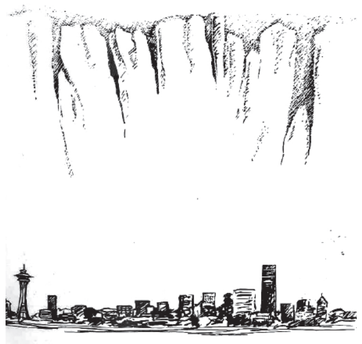

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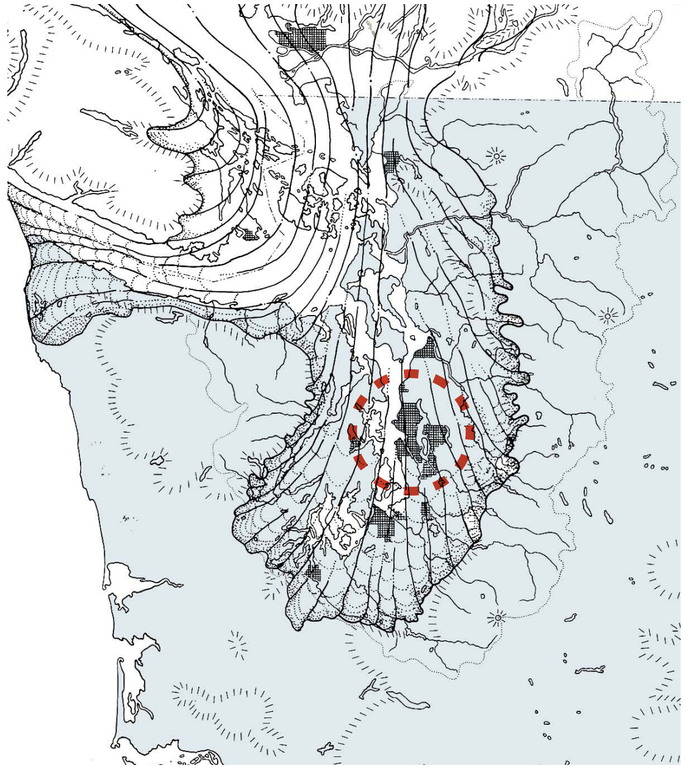

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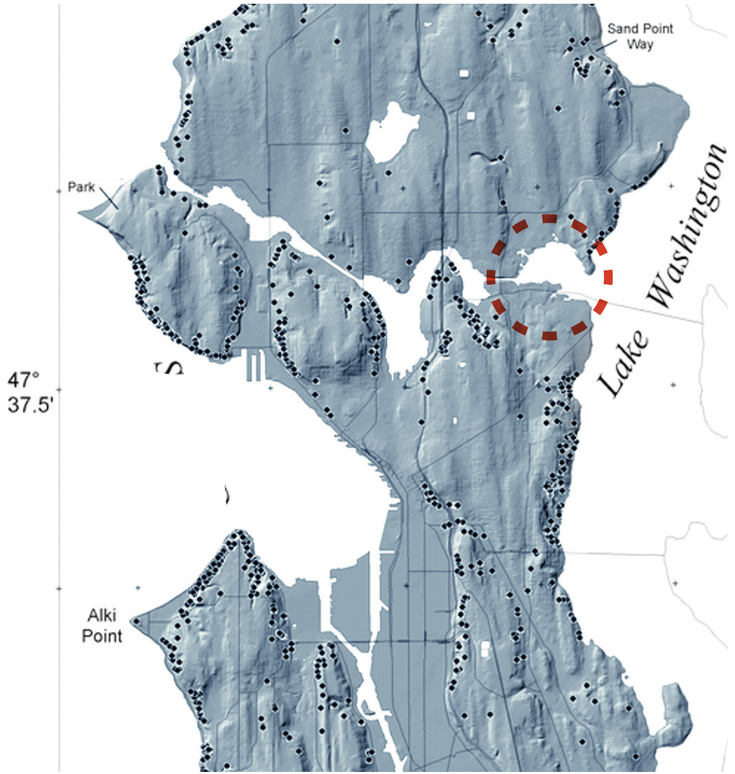

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10. A wall of ice 3,000 feet above Seattle

11. Glacial flow
The lines of flow show the greatest southern extent of the Vashon Phase. The mountains retained the ice as it carved the Puget Sound.

12. Seattle's modern topography
When the glacier receded north, it carved the hills and valleys.

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The glaciers receded because the planet was warming. Great rains melted the glaciers, and the "milky meltwater" poured down the hills in channels and collected as lakes in the basins. Around 10,000 years ago, when humans walked into the region for the first time, the melt and rain that was filling up the waterways reached equilibrium with the hydrologic cycle.[5] This meant that the waters stopped rising and the modern shorelines had been formed, or rather, the shorelines before the industrial era.

On the hills of the modern neighborhoods of Ravenna and Laurelhurst, three channels were formed by flowing water: Ravenna Creek, Yesler Creek, and Kincaid Creek. They all emptied into Union Bay. The bay was an inlet of Lake Washington and the northern part of it was a gentle gradient of cattail marsh into which the creeks emptied.[6] At the southwest end of the bay sat the Montlake Isthmus, a narrow bluff separating Union Bay from Lake Union. This was a well known crossing point for Native Americans moving north-south through the area. When white people moved into this part of Seattle they saw this land bridge as an impediment.

As early as the 1850s, Seattle's officials discussed the idea of dredging a canal to connect Lake Washington to Lake Union and out to the Puget Sound.[7] An engineered waterway would allow commerce to flow from the region out to the greater global market. It would allow humans to harvest and sell natural resources much more efficiently. It would be "brutal and spectacular"[8], transforming the landscape as dramatically as the glaciers did.

The transformations reached this magnitude early in the twentieth century. As

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13. Montlake Isthmus log run, ca. 1900

14. 1885
Union Bay, Lake Union, and the portage trail on Montlake Isthmus

15. 1894
After the Great Seattle Fire in 1889, Yesler moved his mill to Union Bay. Montlake Isthmus now has a narrow log run connecting Union Bay to Lake Union.

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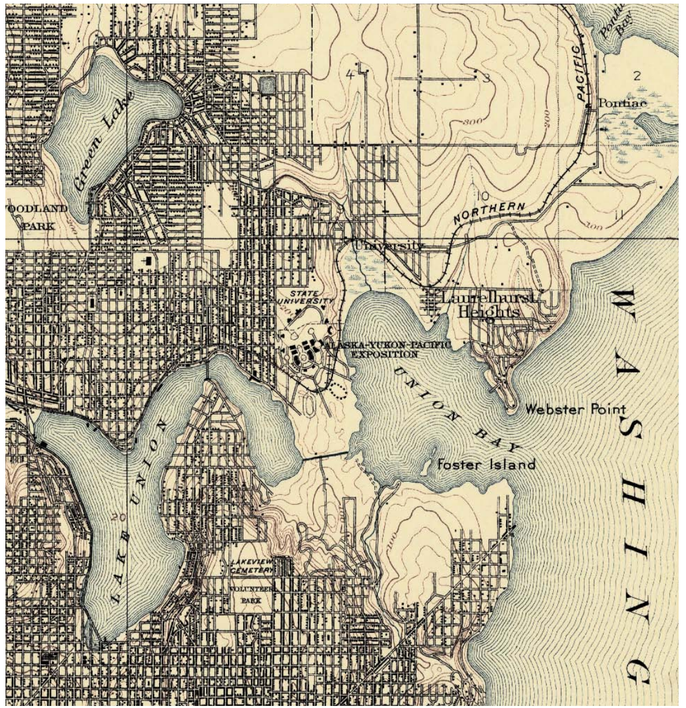

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16. Union Bay, ca. 1900
Yesler's Mill and the rail line leading out to it are across the bay.

17. 1909
The city and the university are growing around the bay, but the isthmus remains uninhabited, awaiting a major human-built alteration.

the world's major political powers began forming nation-states and dividing up the world's resources, Seattle's politicians and engineers carved Seattle into what Thomas P. Hughes describes as an "eco-technological" environment, "systems in which the natural and human-built overlap and interact."[9] The immense projects were expressions of a culture looking to perfect what they thought to be a flawed natural world. "By late 1914, with the start of World War I in Europe, dredges and steam shovels were slinging dirt and mud along almost every major river and lake in urban Puget Sound. In the span of almost five years, engineers rerouted the plumbing of an entire drainage basin. It was as if someone pulled a plug and a giant sink emptied."[10]

On either side of the Montlake Isthmus, the Army Corps of Engineers installed temporary dams to hold back Lake Union and Lake Washington while they dredged a canal through the isthmus. Over a period of five years, steam shovels removed four million cubic yards of earth from Montlake Isthmus.[11] After ten millenia, the topography changed in a matter of minutes. At 2:00pm on Saturday, August 26th, 1916 the Army Corps of Engineers breached the Lake Union dam, flooding the canal. On Monday they breached the Lake Washington dam. Lake Washington was almost ten feet higher than Lake Union so over the next three months Lake Washington drained until it reached Lake Union's elevation. This exposed thousands of acres of new land. It left houseboats and docks awkwardly teetering on dry land. It also turned a natural lake with naturally regulated drainage into an engineered and closely monitored industrial waterway. "The construction of the Lake Washington Ship Canal was the most important human factor to impact the lake and its shore lands."[12]

18 and 19. 2:00 pm August 26, 1916
Breaching the temporary dams was a public event.

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20

20. Union Bay 1917 overlayed on 1909
The shore of the bay moved south, exposing 610 acres of new land. The rail line snaking around the bay is now the Burke-Gilman Trail.

3 FORMING THE LAND: WASTELAND

"Engineers and landscape architects [of the early twentieth century] shared one critical assumption: a sense that nature altered was nature perfected and society harmonized."[1]

---Matthew Klingle, *Emerald City*

Much of the new land around the shores of Lake Washington was soft and mucky, barely land at all. In Union Bay, the cattail marsh just migrated to the south, shrinking the bay by 610 acres.[2] The bay was naturally shallow. Lowering the lake just made it smaller and shallower.

Prior to the canal, Union Bay had depths ranging from five to ten feet. The floor of the bay was much deeper when the Vashon Glacier first receded. Over thousands of years, the floor rose as organic matter collected. There was an abundance of matter collecting because the bay was the outlet for three separate creeks. Their nutrient flows provided a rich environment for plant life. Plants living on the surface of the water died and sunk to the floor of the bay. As more layers of dead organic matter collected, the bottom layers compressed and their decay process slowed to almost a halt. Several thousand years of accumulation has created a deposit of soft, fibrous peat up to 100 feet thick in the middle of the bay, the deepest deposit in the state of Washington.

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21. Vegetation on the bay's surface, 2012

22

22. Landfill, marsh, bay, and Laurelhurst, 1961

This was the first process of waste accumulation in Union Bay. The second one was human-built. After the canal lowered the lake by almost ten feet in the fall of 1916, the new open land it generated began naturalizing as new marshland. It was soft because it was the top layers of the peat, now exposed and able to decay more rapidly. The University of Washington owned the new land and did not have a plan for how to use most of it.

Their first response was to develop a landscape of recreation. They constructed the stadium to the southwest of the new marsh in 1920 on solid ground and fill from dredging the canal. Not long after, they put in a few other smaller athletic fields directly to the north of the stadium, where there was still existing natural land.[3] This firmly established a landscape of recreation along the bay that still exists today.

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Yet, the marsh sat untouched by humans for ten years. Its location relative to the city growing around it would have made it an excellent place to build. The new land was just east of the main part of the university, near the new canal and the lake, and downhill from the growing residential neighborhoods that surrounded the bay. But the land was just too soft to build on.

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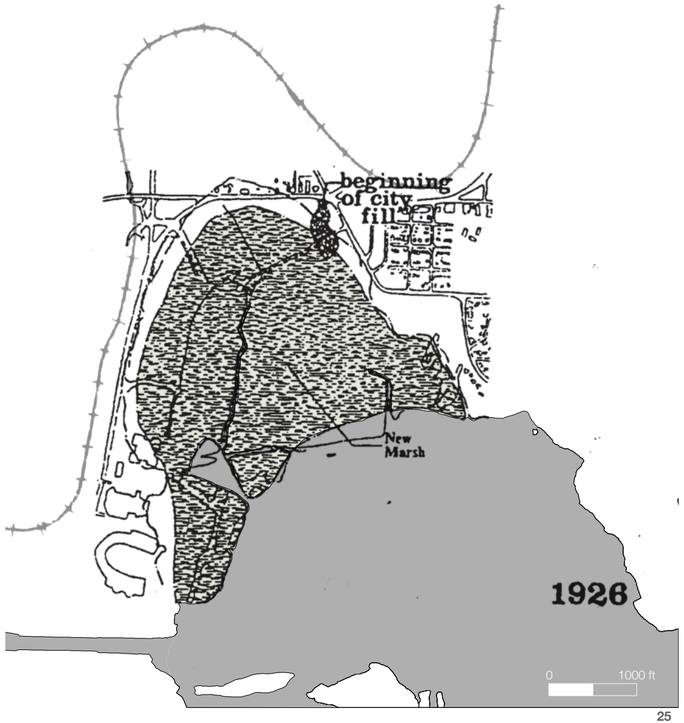
23. Husky Stadium, November 27, 1920
The old stadium felt as if it were set into the land and completely open to the bay.

24. The marsh and the city, 1927
Looking southwest, this aerial captured the newly exposed marsh and the ten year old canal

In 1926 the university leased a few acres on the northeast portion of the new land to the city of Seattle. The city cleared away the vegetation and opened a small landfill operation. At that time there were a few dozen very small garbage dumps across the city where anybody could come at any point and dump their waste.[4] City officials thought it would make more sense to consolidate and centralize citizen's waste disposal operations. The new landfill became known as the Montlake Dump or the Montlake Landfill.[5]

The natural phenomena that formed the site worked at relatively large scales of time, with movements that would have appeared very slow to us. The Vashon Glacier moved about two feet per day, taking 6,000 years to travel from the U.S.-Canada border down to Olympia. The peat accumulated about an inch of thickness every 15 years. It took more than 13,000 years for the peat to reach its present day depths. In contrast, the Army Corps of Engineers removed the material for the canal and drained the lake in less than six years! Once the city developed the infrastructure for consolidated waste management, the Montlake Landfill grew rapidly. It accumulated around one-third of the material that the peat deposit holds, but it took the landfill 40 years, or 0.003 times as long as the peat.



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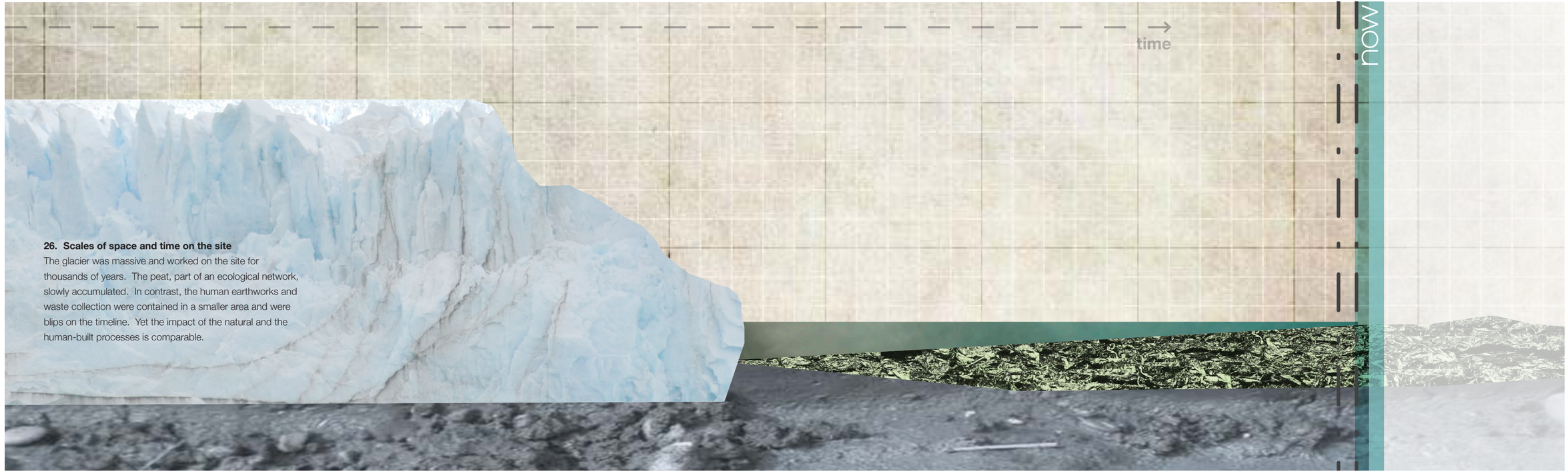
25. The Montlake Landfill, 1926
The new landfill was a small lima bean in the northeast corner of the marsh.



26. Scales of space and time on the site
The glacier was massive and worked on the site for thousands of years. The peat, part of an ecological network, slowly accumulated. In contrast, the human earthworks and waste collection were contained in a smaller area and were blips on the timeline. Yet the impact of the natural and the human-built processes is comparable.

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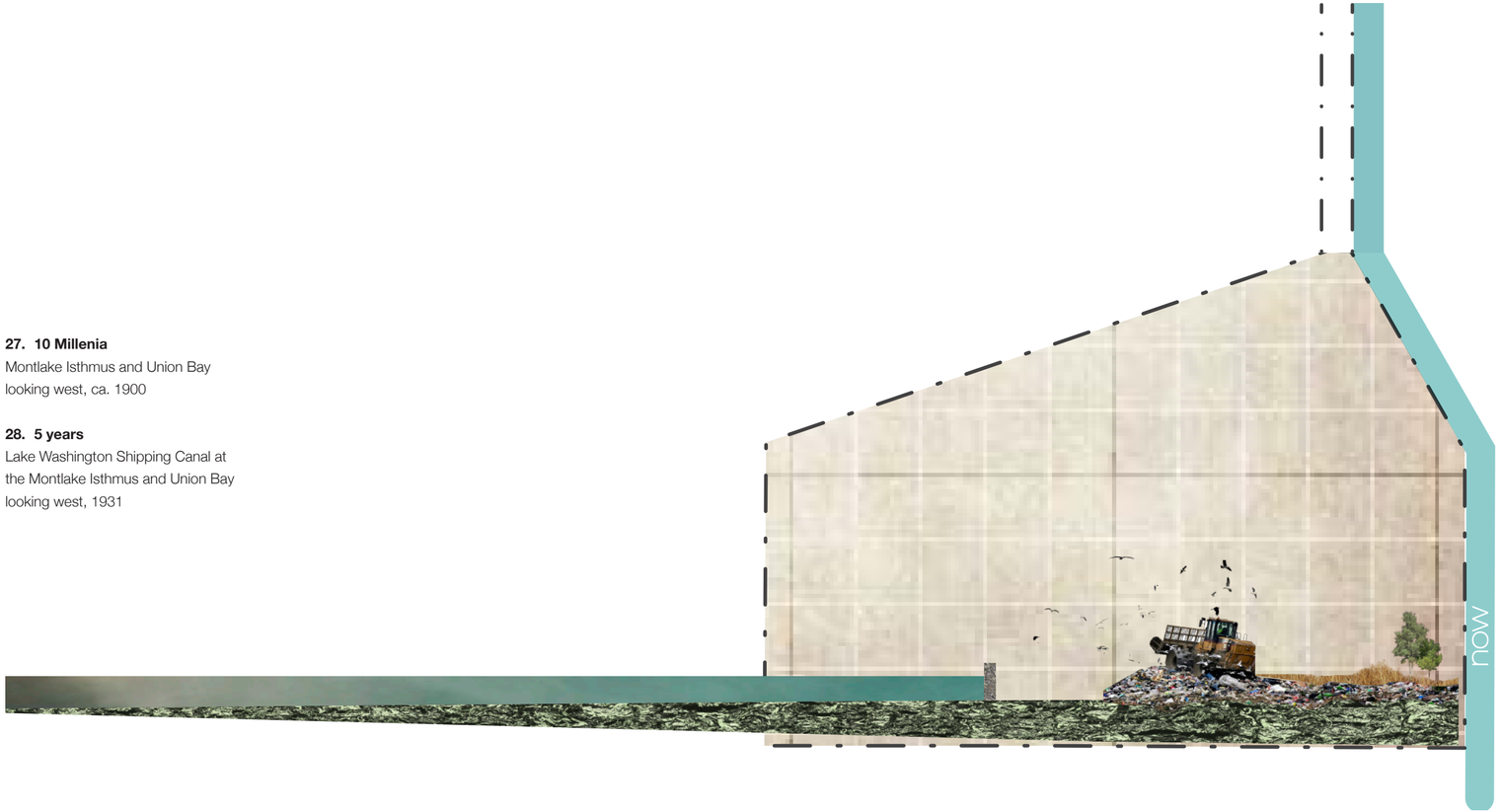
27. 10 Millenia
Montlake Isthmus and Union Bay
looking west, ca. 1900

28. 5 years
Lake Washington Shipping Canal at
the Montlake Isthmus and Union Bay
looking west, 1931



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In the twelve year period between 1926 and 1938, the landfill grew to be ten times its original size. Throughout this period and into the early 1950s, the city was burning trash at the Montlake Dump alongside their filling operations, which is still how industrialized societies deal with their waste today: fire or fill; burn or bury. Engineers have developed technologies that clean or isolate the pollutants derived from the disposal process to minimize the impact on the surrounding environments, but the basic methods are ancient. At Montlake, burning the trash was smart because it slowed the rate at which the landfill grew, but the public quickly saw it as a noxious, offensive process, much too close to their homes and businesses.

The adjacencies to the city that made the new land around Union Bay seem valuable right after the canal opened became liabilities when the Montlake Dump gained momentum as the city's main landfill. Municipal garbage trucks took waste away from residences and businesses and delivered them to one, very visible, wide open site in the middle of the city. The dump was expressing James Corner's "magnificent paradox" in a bold way. "Immense and Immediate. Efficient and Wasteful. Brutal and Spectacular. The American Landscape, like the culture it embodies, is a magnificent paradox."[6] The dump's crude methods led to environmental problems, and its adjacencies meant that the operations were always a public performance. Burning the trash out in the open poured foul smelling fumes into the air and open dumping engendered a magnificent problem with sea gulls. This new environment created by consolidating the public's waste then led to the public protesting about how its waste was being disposed. Through letters and meetings, a public forum forced the landfill to adopt new methods known as "sanitary landfilling."[6]

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29. Montlake Landfill growth
1937, 1938, and 1939

30. Open burning, 1951
The smoke rising from the bottom of the image is burning trash at the edge of the landfill that is slowly pushing out into the marsh. Above that, a drainage channel through the marsh has been dug to drain storm water and sewage coming down from the hills to the north. The fields and streets are lined with cars and buses probably from a football game. The paradox was a public performance, occasionally with an enormous audience.

31 (over). Forming the Wasteland, 1956

32 (over). A magnificent bird problem, 1954

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33

The city stopped burning trash. By the mid-1950s, the site was only for dumping. At the end of each day of dumping, the landfill operators covered that day's trash with a layer of clean soil, eliminating the appetizing meals for the seagulls. The main side effect was that sanitary landfilling used up land faster than the old methods. Seattle was also a growing city with growing habits of consumption and a growing disposable economy. In the 1950s products were starting to be designed to be used and thrown away after one use. They were also being sold in disposable packaging. A new layer of paradox surfaced when these disposable rituals originated at the same time as public concern for the environment. The expression of the paradox was the landfill increasing the rate at which it colonized the marsh. And the paradox became a daily poem, the cadence of which was marked by the meter of waste disposal. By the late 1950s the Montlake Dump was receiving 60 percent of Seattle's garbage, bringing 110 truckloads of garbage to the site every day.[7]

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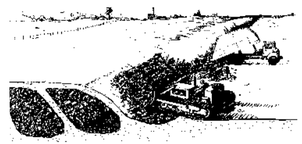

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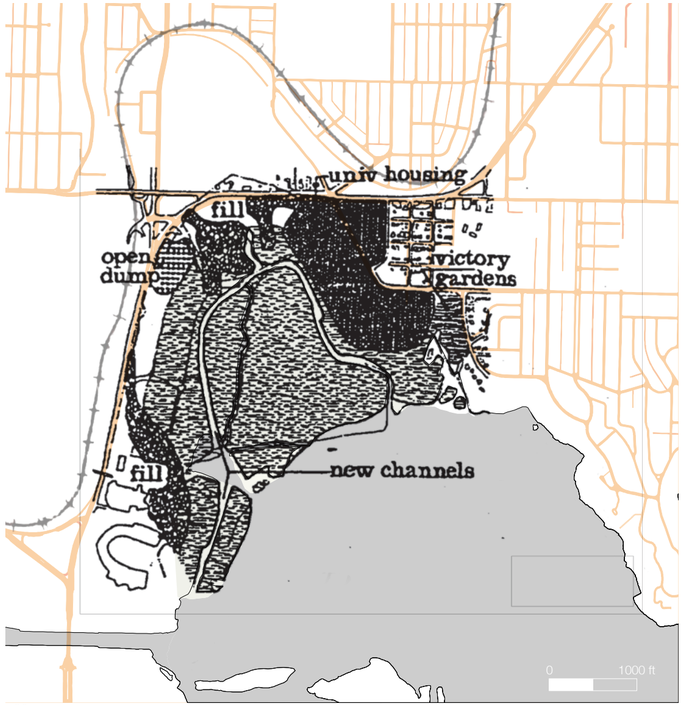
33. Montlake dump bird problem
A happy falconer poses for the camera

34 and 35. Sanitary landfilling, 1955
This new method claimed land much faster and created temporary canyons. People drove right up to the cliff and dumped their waste.



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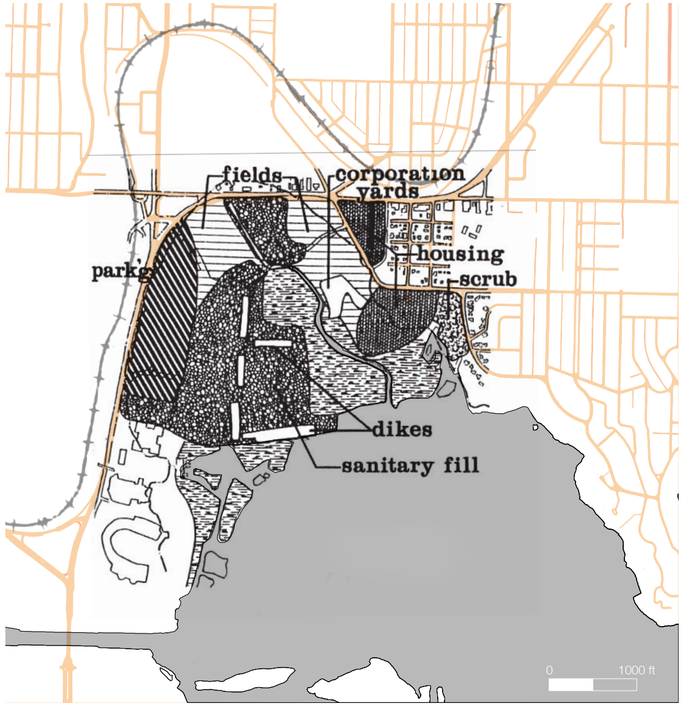
36. Montlake landfill, 1949
The roads around the bay are orange. The "open dump" was for the public to dump on their own, the "fill" was operated by the city.



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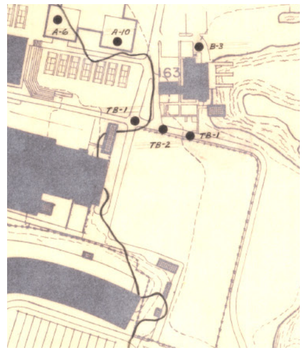
37. Diking: the landfill's next phase, 1962
The active landfill takes up the middle half of the site, but the surrounding patchwork all sits on older landfill.

4 STABILITY AND FLUX



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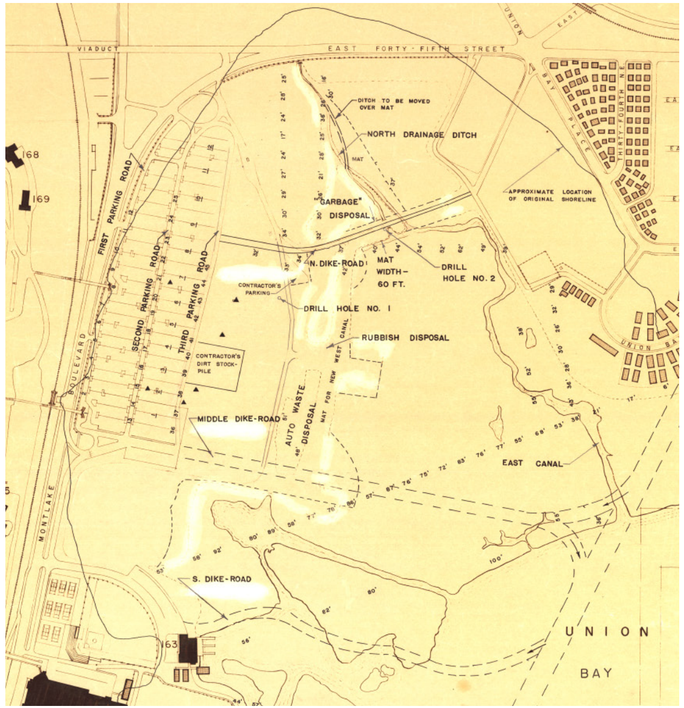
In 1959, University of Washington civil engineering professor Walter Dunn noticed that a wood piling holding up a dock near the old Conibear Shellhouse was shifting and he discovered that the weight of the landfill was pushing the soft underlying layers of peat laterally into the bay. The landfill had become extremely heavy. Between five and thirty feet of trash and soil was sitting on top of the soft peat, the peat on top of the clay, and when the landfill loaded up the peat it compressed it. The soft peat had two directions to move, either down or out. The clay below the peat was too firm to respond to these new forces, so the peat could only move out. This process was causing the piling to move, and actually causing the whole landfill-peat mess to act as one top-heavy shifting sea of natural and human-built waste. The whole mass was moving, and moving quickly. It moved several inches in just a few years. The so-called "sanitary" methods were now polluting the lake.[1]



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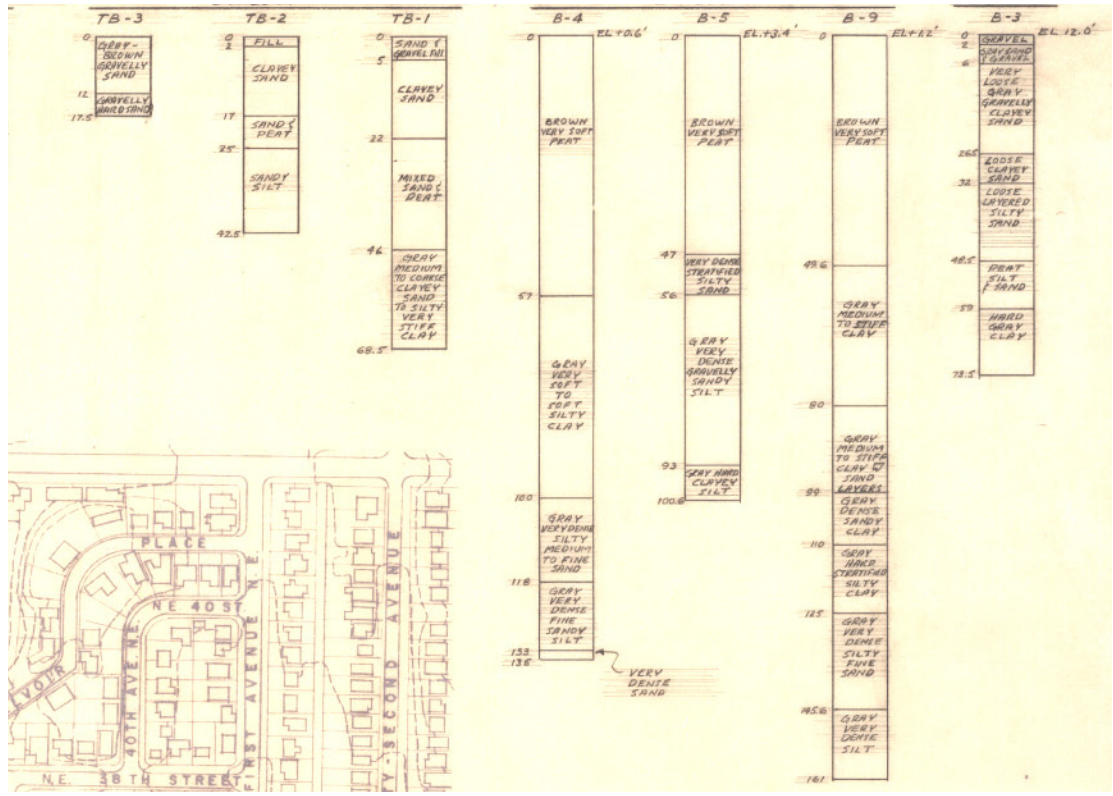
38. Conibear Shellhouse, 1966
The test bore sites are numbered and marked.

39. Peat depths across the site, 1960
An engineer's construction drawings as the UW prepared the landfill for closure.

40. Test Hole Borings, plan and section, 1966

41. The IMA's settlement over time, 1968



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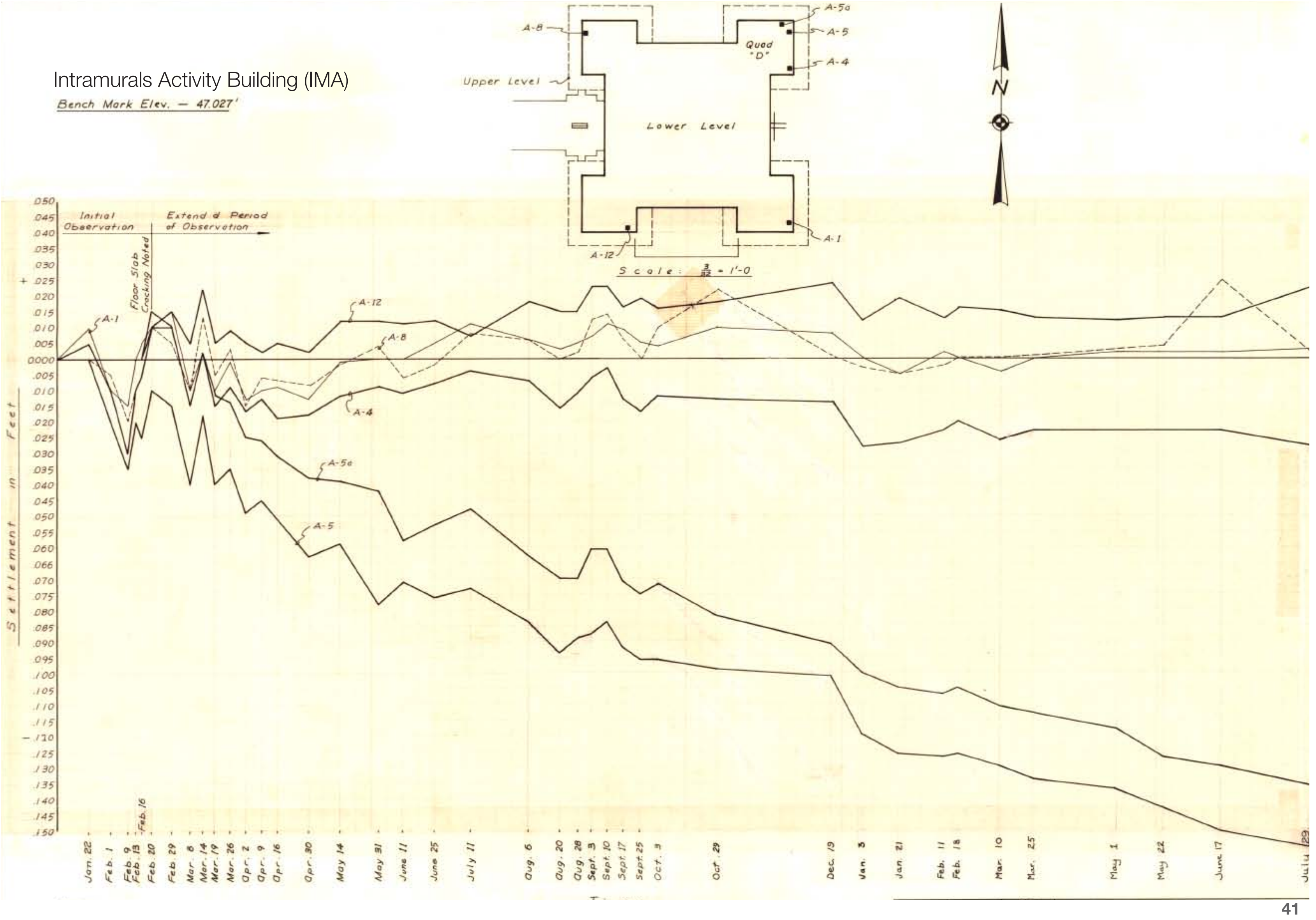

Intramurals Activity Building (IMA)
Bench Mark Elev. — 47.027'
Upper Level
Lower Level
Quad "D"
Initial Observation
Extend of Period of Observation
Settlement in Feet
41

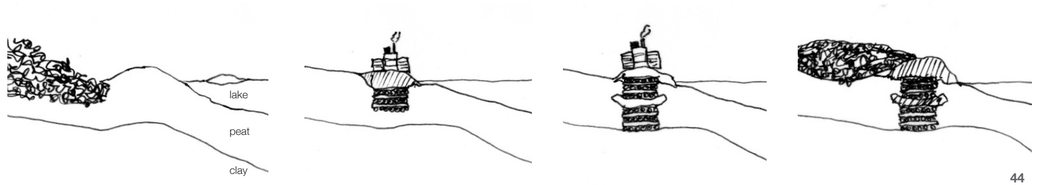
42

To counteract this toxic movement, Walter Dunn designed a system of dikes that would hold the shoreline. They would retain the peat and trash from moving laterally out into the lake. He specified that they would be made out of telephone poles and other scrap timber found on site, stacked up as cribbing, lashed together with cable and/or joined with spikes, and then sunk below the surface to stop the subsurface layers from moving.[2]

The construction process of the dikes began by building the cribbing on the surface along the shore. The landfill operators then covered the cribbing construction with soil and drove over it with a 35-ton tractor until the dike had sunk fully into the ground. Then they built another section the same way and drove over it until it was also buried, repeating this process until the dike no longer sank, signaling that the bottom of the dike was embedded into the clay layer. Farther out toward the center of the site, this may have been as much as 70 or 80 feet below the surface.[3]

The dikes worked perfectly. The shore of the landfill stopped moving and became a massive retaining wall to landfill against. An aerial photograph of the site today shows the shore as a straight line, the product of the buried and hidden structure. This engineered stability gave the landfill an even larger capacity, which was just in time for another one of Seattle's large production landscape projects.

In 1961, construction began on I-5. The State Highway Department designated the Montlake Landfill as the main site to receive the demolition debris. Over the next two years, the site received all of the city fabric that was in the way of I-5 construction. 1.2 million cubic yards of soil and "an unrecorded, but extremely large volume of debris from the freeway project" found a new home in Union Bay.[4] This was the landfill's final and most intensive phase of dumping.



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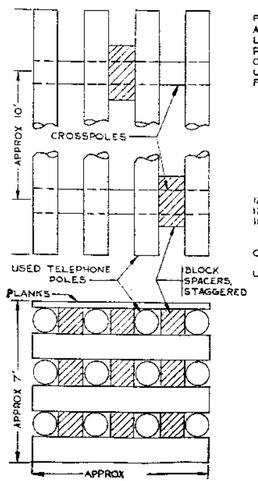


PLACE CULVERT ON LUMBER DIKE ABOUT ONE FOOT BELOW WATER LEVEL.
PLACE PLANKS OR TIMBER OVER TOP AND SIDES OF CULVERT USE WASTE LUMBER AND RUBBLE FOR APPROACHES.

MATERIALS.
12 USED TELEPHONE POLES, 25'-3
12 PIECES PHONE POLE, 7'-10'.
18 BLOCK SPACERS, SQUARE OR ROUND APPROX. SIZE OF TELEPHONE POLES ABOUT 24" LONG.
CABLE AND FASTENERS AND/OR PLANK AND SPIKES.
USED PLANKS OR BOARDS.

Figure 7

Timber Mat Cross-section, 1959

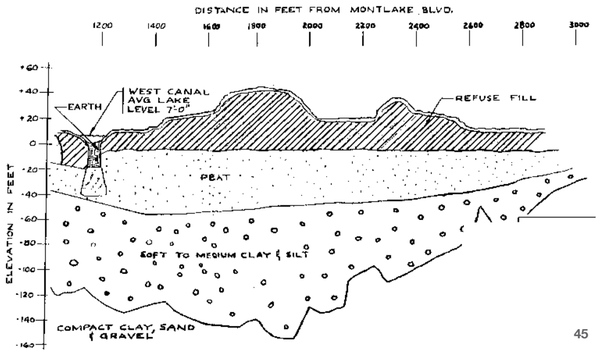
Source
Office of the University Architect
University of Washington
B&G Office Building
Seattle, Washington

43

42. The dikes under construction, 1960

43. Spec sheet for dike construction, 1959

44. Diagram of dike construction process



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In 1965, after almost 40 years of activity and expansion, the landfill had colonized the entire marsh, and it began to close. At this point, the active landfill occupied the central 50 percent of the marsh. Almost all of the surrounding land had gone from being under water to marsh to active landfill--and ultimately capped with two the three feet of rubble and clean soil. By 1971 the surface had been transformed into parking lots, sports fields, or open fields. The parts that did not become parking lot were seeded with clover and grasses. The engineers at the university's Capital Projects Office (CPO) were sweeping the paradox under the rug. Seattle city officials were in the process of acquiring new land outside of city limits to deposit Seattle's trash. They were moving the paradox out of sight, expanding its footprint, which contradictorily makes it quiet and hidden.

45. Section of the site's layers, 1964

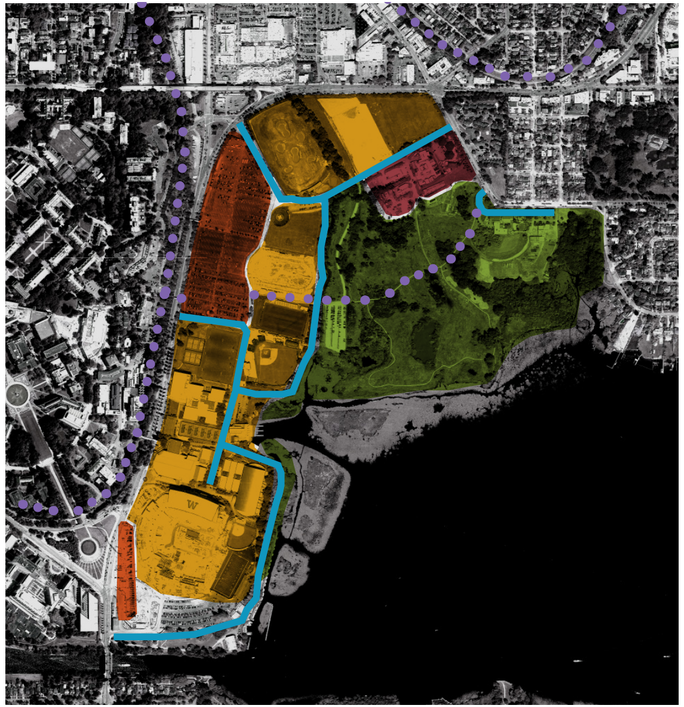
46. Montlake Landfill capped, 1963
The hills of Ravenna, Laurelhurst, and Sandpoint are in the background.


46

While the boundary between the old landfill and the lake became locked into a state of stability, the landfill forced the interior of the site into state of flux. The CPO graded the surface mostly flat and level, but the layers below continued to settle and subside. It only took a few years for gentle rolling hills to develop. While this settlement has slowed since the landfill first closed, new forces are constantly altering the delicate equilibrium. Today the site is a shifting sea of trash with a patchwork of uses covering the surface, creating a loosely stitched together rug. A 74-acre "naturalizing"[7] area known as the Union Bay Natural Area (UBNA) is stewarded by the University of Washington Bothanical Gardens (UWBG). The closely managed meadows, wetlands, and young forests function as an outdoor ecology classroom, a small recreational trail system, and home to over 200 species of birds. Birders and birds from all over the Puget Sound flock to UBNA for its rich, diverse ecology. Just below its surface, however, are a network of culverts, monitor wells, and methane vents. These systems are in various conditions of operation and disrepair as the site shifts and the life of the landfill after closure progresses. To the west of UBNA are the UW athletic fields and facilities and a 17-acre commuter parking lot. These rugs of program and the site's adjacencies bring three main users to the site today. The natural area brings birders throughout the year. The gym and the natural area together bring runners and walkers moving around the site for recreation. Both of these users are coming ***to*** the site. A major bike path bisecting the natural area, the residential neighborhoods to the north and east, and the university to the west bring bike and pedestrian commuters ***through*** the site because it provides a shortcut.

47. Patchwork surface, 2012
UBNA is green, UW athletic fields and facilities are yellow, the commuter parking lot and the light rail station under construction are orange, the buildings and grounds lots are red. Roads through the site are blue and the main commuter path through the site and the Burke-Gilman Trail to the west of the site are the purple dotted lines.

48. Existing Users
Birds, birders, walkers and runners go to the site, commuters move through the site



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The topography that supports the footsteps of these users is moving. The land transforms as forces act on it. These forces are economic, cultural, or physical and they generate the surface conditions that form the current context for this project. Physically, there are a number of seasonal ponds in UBNA that are shaping the land now. The weight of the water is pushing down on the unstable layers below and pulling the surrounding topography with them. The ponds are growing, becoming more permanent, and shifting the drainage patterns of the site. There are two spots along the shore that do not have dikes underneath: at the mouth of the University Slough and at the eastern prow of the diked shore. At these spots, the land is eroding as the lake and the ponds press down on the layers below. By 2050 a couple of the ponds will connect with the lake, bringing the lake back into the site.

49. Shoreline and ponds, 2012
The buried dikes are the grey rectangles.

50. Shoreline and ponds, 2025

51. Shoreline and ponds, 2050

52. South Pond, November 2012

50

51

52

53. NCAA track almost complete, 2012
the purple track sits on a concrete slab, which spans across more than 200 pilings

54. The track under construction, 2012
The pile caps are the light squares inside the construction site

53

54

This soft, moving land still makes it hard to build. The university has invested tremendous effort and resources toward finding stability in this land, with the most striking and absurd manifestation of this effort being the NCAA track and field stadium currently under construction. The university is in the process of a more than $300 million renovation of the Husky Stadium. To get more seating, they removed the track from the football stadium and are building a free standing track in between the commuter parking lot and the slough. NCAA tolerances for the distances of tracks is much tighter than the landscape will naturally allow. They cannot just lay a track on top of all of those shifting layers. So they have pile-driven over 200 eighteen-inch steel pipes 120 feet into the ground, tied them all together with grade beams, poured a concrete slab on the structure, and laid a bright purple track on top of it all. It has essentially become a giant table—the steel piles are the legs, the slab is the table top—that could tower above the land if the earth settled or liquefied underneath it.[6] It is a magnificent feat of engineering and construction solely to allow a few students to run around a perfectly flat and measured hard surface as fast as they can. As they race, cormorants perch above them on the field lights looking for prey. Back down on the ground, birders are sitting in the bleachers of the track, not to watch the racers, but to watch the birds above. The birds and birders are using this magnificent feat of engineering for an unintended purpose. They add beauty and meaning to this varied and disconnected surface.

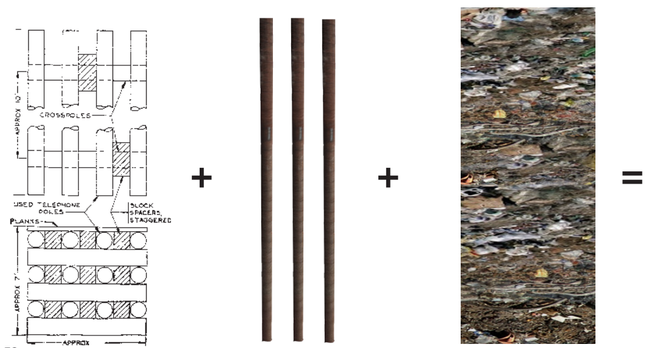
55. 120 ft. piles
An impact hammer drove the steel pipes into the subsurface layers. After this, they were filled with concrete and capped.

55

This investigation of the site's wonderful, perverse history and current conditions leads to an architectural question: how do the structures and spaces supporting the current uses find footing in this soft land? In these three methods of footing are the origins of the architectural language of *Wetland Wasteland*.

Three ways to find footing on soft land.

1.dikes
2.piles
3.the landfill itself



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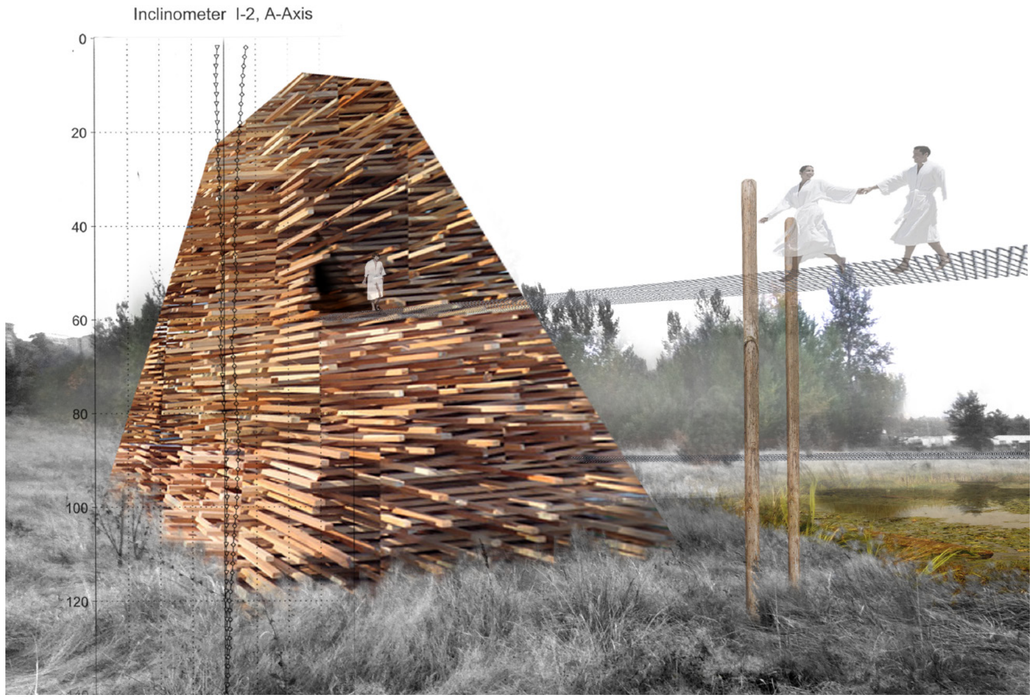
56. Tectonic equation

57. Conceptual sketch
The hot bath as a pyramid of cribbing shifting out in the eastern wild.



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5 WETLAND WASTELAND

"New and evolving features created by man are, to an extent, absorbed by the fluid and yielding nature of our surroundings. What results is a hybrid environment, a utilitarian topography, a sustain artifice. This ***neo-nature*** *has become a picturesque aesthetic, an often cherished rural environment where sentimental attitudes that that inform our visual perception of the landscape become key."*[1]

-- Laura Allen and Mark Smout, *Pamphlet Architecture 28*

The way the site is organized now, there are two characters on the surface that oppose each other. They are foils in this story. One is the city, represented by the impervious roads and parking lots and the athletic facilities mostly on the western side of the site. The grids of the parking spaces, the standardized modules of NCAA sports fields, bleachers, field lights and score boards make this side feel tightly ordered. It is only the undulating topography of the vast parking lot—topography that oddly sheets water away from storm drains—that indicates that something disorderly is happening below. The other character is the wild, or the natural, represented by UBNA. Its meadows, ponds, and patchy small woodlands populate gently rolling topography that opens out to the lake. This space feels held by the city on three sides and wide open to the south, with views to the lake and the surrounding hills. On clear days,

59

58. A landscape of two foils
The site model showing the slough dividing the two site characters.

59. Western order
Its grids, modules, and impervious surfaces.

60

60. Eastern wild
Meadows, wetlands, and young forests stitched with meandering gravel paths

61

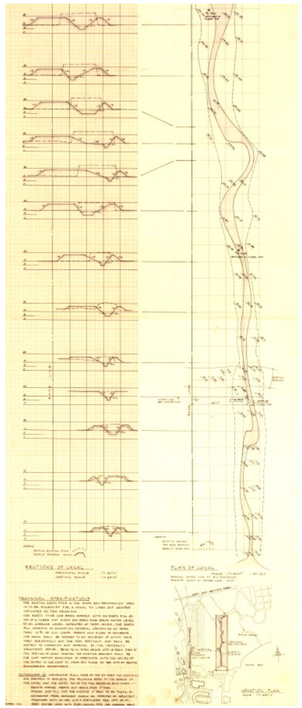
61. Open to the lake, 2012
A rare sunny winter day brings a lot of people to UBNA

62. The slough, plan and sections, 1963
An engineer's construction drawings as the UW prepared the landfill for closure.

63. The slough, 2012

Mount Rainier reveals its snowy yet rugged peak. The views provide the visitor with a feeling of immensity, but UBNA's interior is also a source of excitement, often bustling with the activity of hundreds of birds and water fowl. This space, regardless of its rich history composed of human-built and natural layers, is a unique asset for Seattle.

These two characters, the western order and the eastern wild, are divided by the University Slough. The slough is a human-built water channel cutting north-south through the site down to the lake. It roughly follows the path of the old Ravenna Creek, which long ago became a culvert running underneath a street, its path still a convergence line for water flowing down the hills and out to the lake. The slough carries storm water—really, a diluted cocktail of street chemicals—out to the bay. Once in the bay, the aquatic ecosystem begins a process of digestion. Mimicking the bay's ecosystem, *Wetland Wasteland* proposes to let trash generated in the hills above the bay flow down into the bay once again, but this time, it is digested in an "eco-technological" way.



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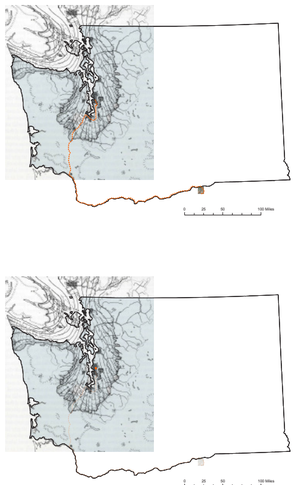

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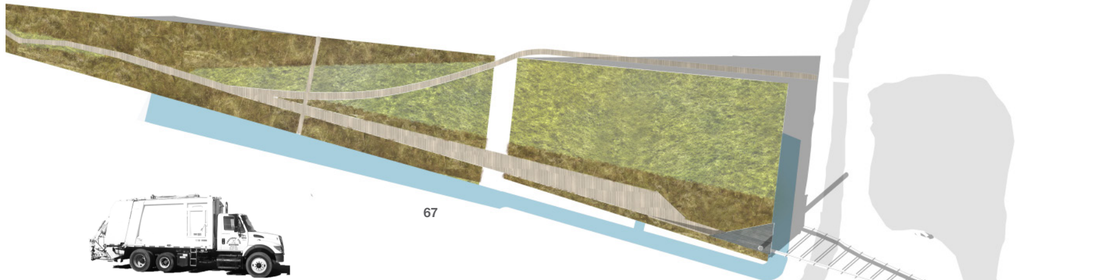
The Montlake Landfill closed more than 40 years ago, but its closure did not mark the end of Seattle's trash problem. It marked the moment when the problem expanded. It did not go away, it just went out of sight. This was a common trend throughout American cities in the 1970s. The post-industrial revolution globalized the economy, pulling industry out of American cities and hauling it overseas. When the physical presence of industry left, the American tolerance for pollution and grit went with it. In America, dumping and burning trash is no longer a public performance. It is part of a hidden paradox that is guarded by high security fences surrounding very isolated sites. Seattle's trash is trucked to a train depot in South Seattle. Several trains per week travel 300 miles to a rural landfill on the Washington-Oregon border.[2]

Wetland Wasteland proposes to recede a portion of the glacier of trash advancing south, bring it back to the bay and melt it into fire and clean water. In this proposal, trucks collect the trash in the areas surrounding Union Bay—the University of Washington, the University Village (an upscale outdoor mall directly north of UBNA), and the residential neighborhoods directly to the northeast and east of the bay. It is a small, localized district, focused around the bowl of Union Bay, that pools its waste and turns it into collective resources. The trash collected amounts to about four truck trips per day[3], a new rhythm on the site expressing the city's consumption, transforming the stigmas of consumption into the pride of resource generation.

65

64. Receding the glacier of trash
In the top map, the orange dotted line follows the train tracks down to the Columbia Ridge Landfill. The bottom map has one orange dot over Union Bay, the proposed smaller footprint for a portion of Seattle's trash.

65. The proposed resource district
The orange network is the existing UW district heating tunnels that the incinerator ties into. The areas of trash collection are light blue.



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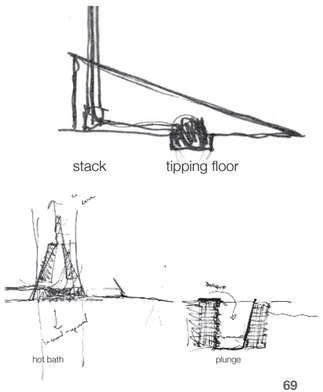
The incinerator processes trash underneath a vegetated, human-built hill along the slough, the edge between the urban and the wild. The trucks haul the trash along the rising hill, through the city side of the site to the edge between the two sides. Before they reach the slough, they turn north drive along the slough for a couple hundred feet, entering the incinerator from the east. This makes the rhythm visible from the city side and the natural side. The trucks deposit their loads of trash on the tipping floor, which sits behind large windows, exposing the incineration process to the users moving through and around the site. A grapple crane picks up the trash and puts it into a hopper that feeds the furnace.

68

66. Trash collection process
Truck to tipping floor to furnace

67. Site plan
Path of the garbage truck is blue

68. Site plan and context



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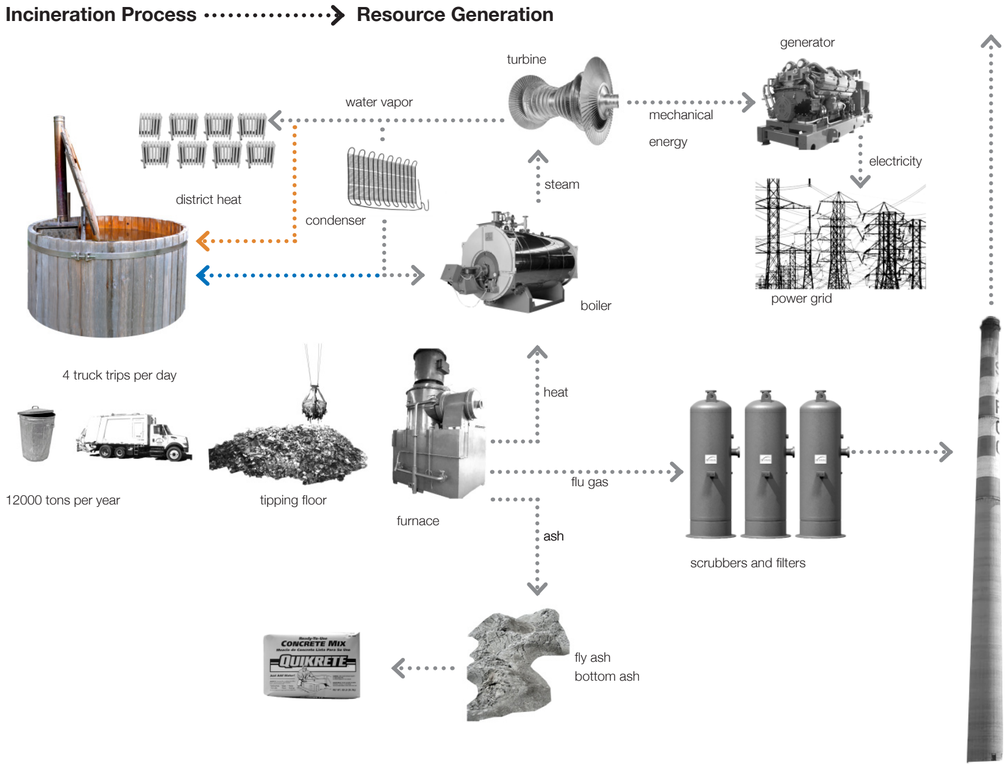
69. Architectural concept sketch
A composition of foils

70. Incineration Process
The resources for the baths are in color

The incineration process produces heat. The process of converting that heat into electricity creates a byproduct of distilled water that is still very warm (over 212°F). Most of that heat connects into and expands the capacity of the university's existing district heating system and most of the distilled water loops back into the turbine's process. However, a small amount of that heat and water makes its way in a pipeline out of the incinerator and into the natural area where it provides the resources for two public baths. One bath is the hot bath, the other is the cooler plunge bath.

The incinerator and the baths are overlapping foils. The incinerator is, architecturally, part of the landscape. It rises out of the land, forming a hill in the shape of a wedge. The surface of the wedge is a large, loosely programmed open space that begins high up on the hill of the university. It is wedged deep into the campus and expands down the hill and out into the bay, connecting the upper campus down to the commuter parking lot, to the athletic facilities, and to the commuter bike path moving across UBNA. It makes a fragmented set of existing points—a commuter bike path that ends at the parking lot, a narrow pedestrian bridge across Montlake Boulevard, and a staircase taking people up into the main part of campus—into a unified gesture that celebrates the connections and destinations. The surface of the wedge is a network composed of three elements. The first are the designated pathways for commuters to move *through* and walkers, runners, birders, and bathers to move *around* the site. The



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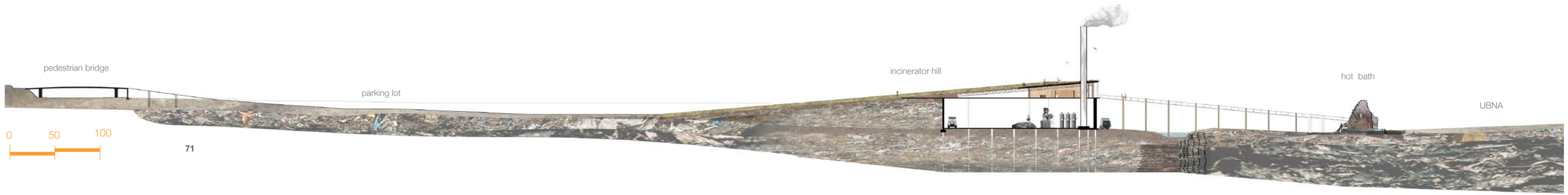
other two elements are lawn and meadow. The lawn provides space for athletics and leisure in a less structured form than the rest of the surrounding athletic facilities. In friendly weather, people populate the lawn with informal activities like sun bathing, kite flying, or bocce ball. Large events occur on the lawn. A concert or outdoor theater with stage at the bottom of the hill and the audience sitting uphill fills the lawn with people on summer evenings. People watch the Fourth of July fireworks over Lake Washington from the top of the hill. The meadows lining the edges of the wedge are vegetated with tall grasses, native shrubs and short trees. They soften the edge between the wedge and the surrounding city and extend the natural area's character across the site and up into campus.

71. Site section



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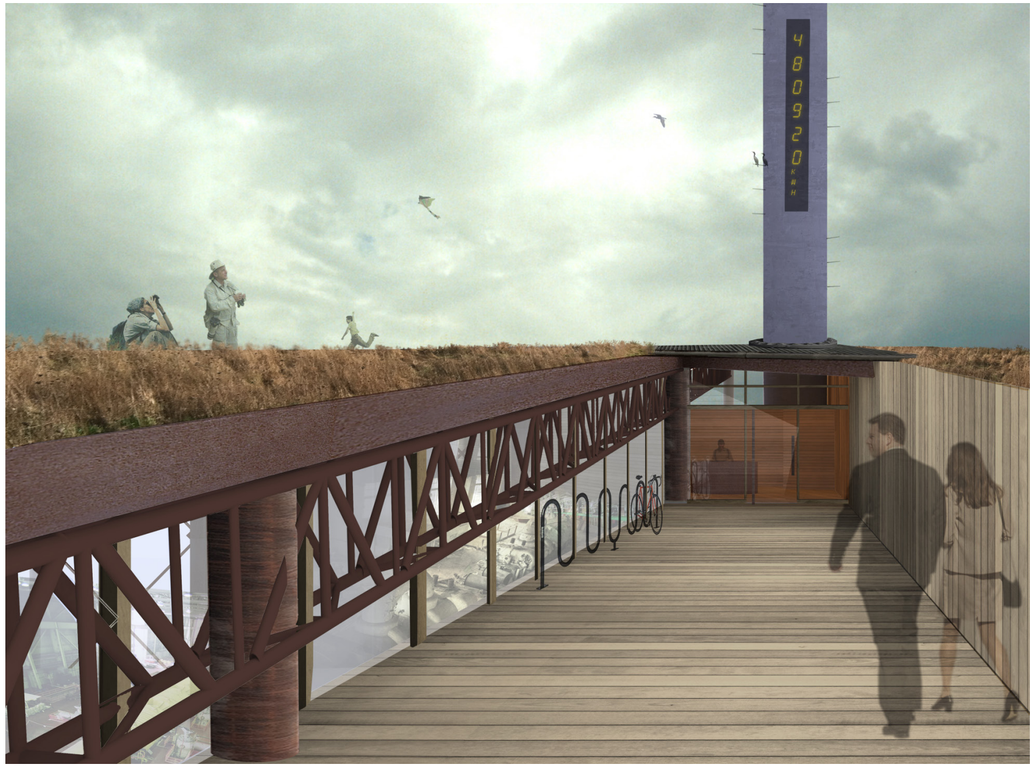
The wedge starts lifting up when it reaches the eastern edge of the parking lot. Over 500 feet it rises to be 50 feet tall before it is sheared off just short of the slough. Most of the hill is supported by the city's trash. For a short period while the project is under construction and the incinerator is not yet running, the district trucks its trash here to fill the hill. The neighboring communities get an opportunity to see, smell, and hear how long it takes them to fill up this hill with their trash. Once the hill is completed, underneath the tallest part of it is a large void supported by steel piles and trusses. This is where the incinerator processes the district's trash. The east facing sheared cliff is mostly transparent, exposing the incineration process within. A 100 ft. tall smoke stack stands at one corner of the hill, shooting through the hill up to the sky, marking the spot where trash turns into atmosphere. This stack is a beacon for everybody around the bay. Three vertical scoreboards line the stack. They display the amount of trash burnt in tons, the amount of heat produced in BTUs, and the amount of electricity generated in kilowatt hours. But this is a college football town so of course, on game days, they display scores.

Marching up along the scoreboards are steel rods welded to the stack. They provide perches for the birds of prey that look out over the bay. With the birds come the birders, across the slough and into the city side of the site, creating the potential for chance interactions between different user groups. A bather starts talking to a birder and learns about the hunting and flight patterns of the cormorant that birder has been observing. The birder learns about how the incineration process feeds the district and the baths.

72. Entrance to the changing rooms



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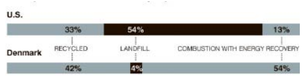

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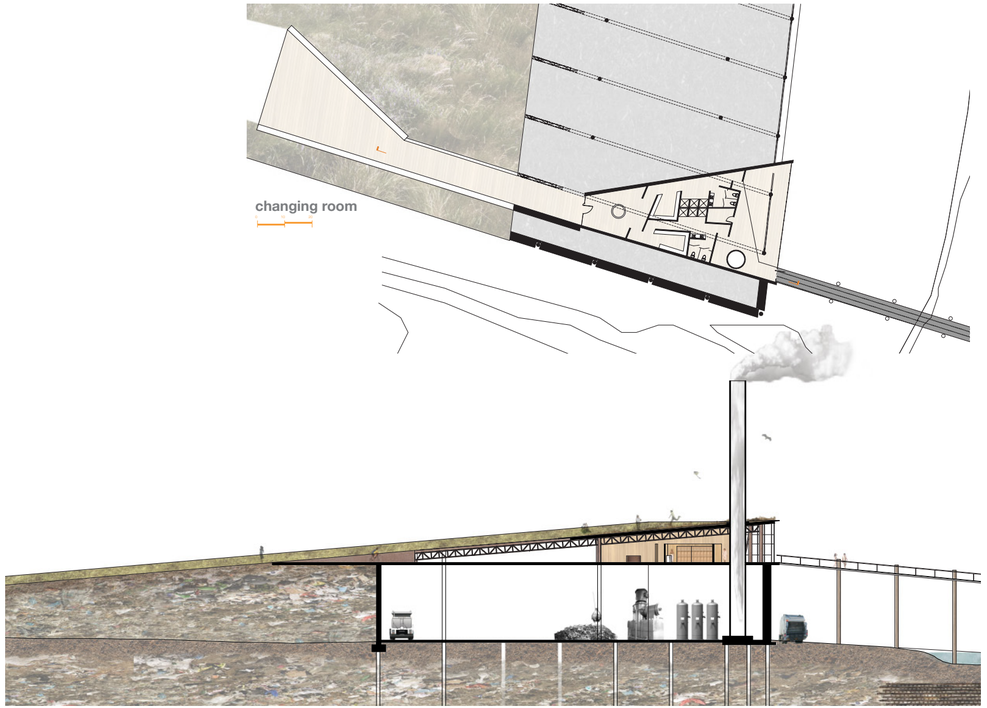
73. BIG, Incinerator Ski Slope, Copenhagen, Denmark

74. Waste management compared

75. Changing rooms, plan and section

The baths are a foil to the incinerator. People are frightened by incinerators because they bring in dirty stuff, burn it, and release more dirty stuff into the atmosphere. This fear is rooted in an outdated understanding of incineration. Denmark is leading the charge toward alleviating these fears by proving how clean trash incineration can be and turning its trash into essential resources for its citizens.[4] While the U.S. landfills 54 percent of its waste and incinerates 13 percent, Denmark incinerates 54 percent and now landfills just 4 percent of its waste. This is really a smart way to deal with our habits of consumption and waste and mixing an incinerator with a public, recreational, or cultural use brings the public into contact with the waste stream. While incinerators are dirty, baths are clean. The baths will attract the public to the incinerator and careful, strategic display of the story of the site history will stir up questions: Why am I bathing this close to an incinerator? How can the dirty incinerator make me feel this cleansed? Why are both of these things right here? On top of the old landfill, where a lake used to lap against gentle marshy shores, baths will bring the layer of the wetland back to the wasteland.

While the incinerator appears to be part of the landscape, rising from it, the structures supporting the bathing process are pressed into the land from above. There are three of these structures: the changing rooms, the hot bath, and the plunge bath. They all use wood as their primary structure. The two baths, sitting out in the natural area, use the telephone pole and the language of the cribbing dikes to form their tectonics. A gradually descending steel grate pathway, supported by pairs of telephone poles driven into the layers below the surface, connects the three structures. The pathway terminates at the plunge bath with a wood deck that cantilevers past the shoreline, out over the lake.



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The gradual descent begins on the incinerator hill before the bather even steps inside the changing rooms. After an ascent up most of the hill, the bather enters a wood lined canyon that has been pressed into the hill. On the north side of the canyon, where a gap opens because the hill continues to rise as the canyon floor plateaus. This gap provides views down into the incinerator. The bather, still in his street clothes, is exposed to the fact that he is actually walking on the top of a large industrial building. The massive scale of the structure is revealed along this walk and the bather finds himself between the monumental scale of the incinerator hill and the human scale of the wood lined changing rooms.

This scale transition actually already exists on the site in a similar manifestation. The university gym (the Intramural Activities Building (IMA)) is a facility that serves the entire university, all 35,000 students. It contains large open spaces for indoor sports. The locker rooms are vast, 18 ft. tall, long halls with seemingly endless rows of lockers. On one wall in each of the locker rooms is a small wooden door that opens to a dark, cedar lined sauna. This 12 ft. by 12 ft. room, the only sauna on campus, feels crowded when four people are in it. It is an intimate, private space set in a large public volume.

Inside the changing rooms, pressed into the top of the incinerator hill, the experience continues to be framed by foils. After an entry volume, the space is divided into male and female changing rooms, before the volume unifies again as a lounge that looks out over the natural area and the lake. On the southern side of the lounge stands the incinerator smoke stack, a 12 ft. diameter pipe, that passes through the volume on its way up to the sky. The stack signifies the starting point of the pathway out to the baths. The pathway lines up directly with the stack. On the walk back from the baths, the bathers will be confronted with this axis

76. Experiential concept

77. Looking back at the Incinerator

77

as the pathway folds up to become the stack reaching 100 feet into the sky. The volume of the changing rooms is completely lined with tongue and groove cedar boards, each five and a half inches wide. This is a human scale, a module that the human hand is comfortable with. Long traditions of building have proven this. However, the smokestack and the large steel truss overhead holding up the hill are of a much more massive scale. The experience that the bather has of transforming his or her body and mind from city mode to natural-area-bather mode is nested between these two scales, embodying this transformation from the industrial to the natural, the productive landscape to the recreational landscape. But, of course, the reflective bather notices that the productive landscape of the incinerator is also recreational; and the landscape of the baths is also productive. The two foils enrich each other.

The galvanized steel grate pathway carries the bather down to the entrance to the hot bath. Below the grate are three steel pipes that support the grate, but they also contain the hot distilled water that feed the baths. The hot bath is made of two elements: the precisely-built, water tight wooden vessel holding the bath and the seemingly erratically stacked and hastily lashed together telephone pole nest that encloses the space above bath. The vessel is like a cedar hot tub or a wooden boat. Tongue and groove cedar boards are joined tightly together and fully sealed when they expand from the moisture of the bath penetration the pores of the wood. The vessel is prefabricated offsite and brought to the site by barge. A crane lifts the vessel and sets it into place, perfectly level for only a brief moment in time on a spot of graded land near a pond. The telephone pole nest is then built around the vessel. The lead builder loosely follows the drawing set, making sure the spaces, general proportions, and connection to the pathway follow the design. The telephone poles are lashed together with cable and staked

78. Walking out to the baths

79 (over). Hot bath, plan and section

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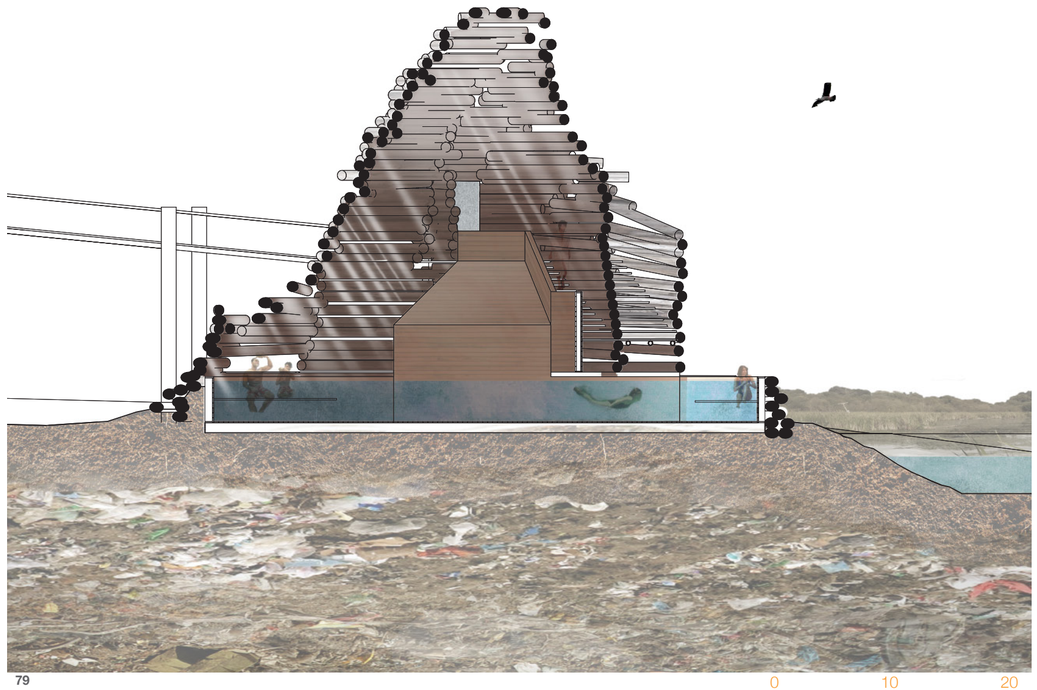

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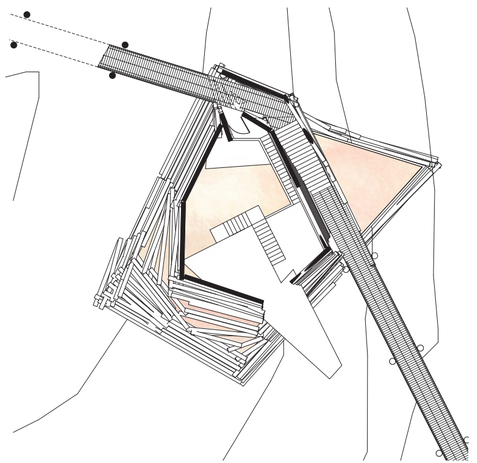

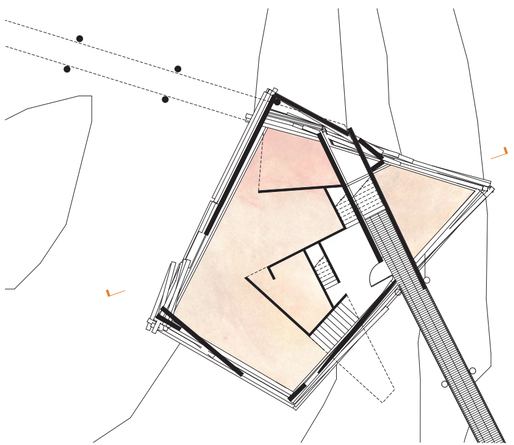

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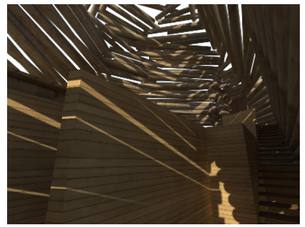

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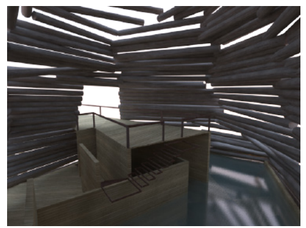

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80. Midwinter light from lower landing

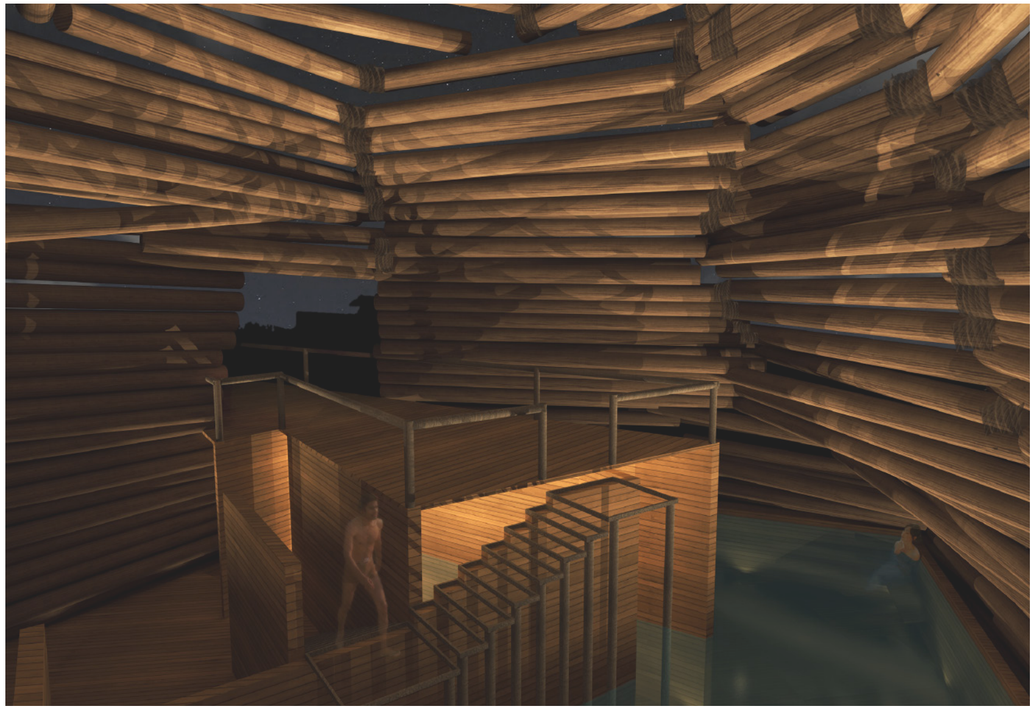
81. Entering the hot bath on an overcast day

82. Entering the hot bath at night
The tightly ordered and precisely constructed water tight vessel contrasts with the seemingly haphazard nest above

together with spikes and bolts. The space between four to six feet from the floor of the bath is a crucial time in the construction. This is the zone where the bathers' line of view is, and the design opens up the nest in a few spots to allow views out to the lake and the natural area.

The bather enters the hot bath up high with a large and heavy galvanized pivot door marking the threshold. The pivot several inches in from the end of the door, rather than a hinge, allows the door to be frameless, and its clean edge to stand juxtaposed against the rugged ends of the telephone poles that very roughly frame the door's opening. Gaps between the door and the poles throw small plumes of steam outside. Beyond the door is a small landing. The whole volume of the bath is visible from this landing. The nest of poles peaks fifteen feet above the bather's head as he pauses on this landing, surveying the bath and the stolen views beyond. A stair to his left takes him down along one wall of the bath to the lower landing. Here is where he can hang his robe before he descends another short stair into the bath. The stair wraps around the back of one of the two smaller spaces in the bath. On some days these spaces are male or female specific. On other days they are just quieter, more intimate rooms to experience.

The water in the hot bath is all one continuous volume with one continuous surface. The spaces are only partially separated by dividing walls. The bather can swim through the larger common space under the pathway that bridges over the bath and out to the exterior part of the bath. Views back to the incinerator and the university are blocked by the bath out here. The bather can only see out to the natural area and the lake, hills, and mountains beyond. This is a wild, open experience.



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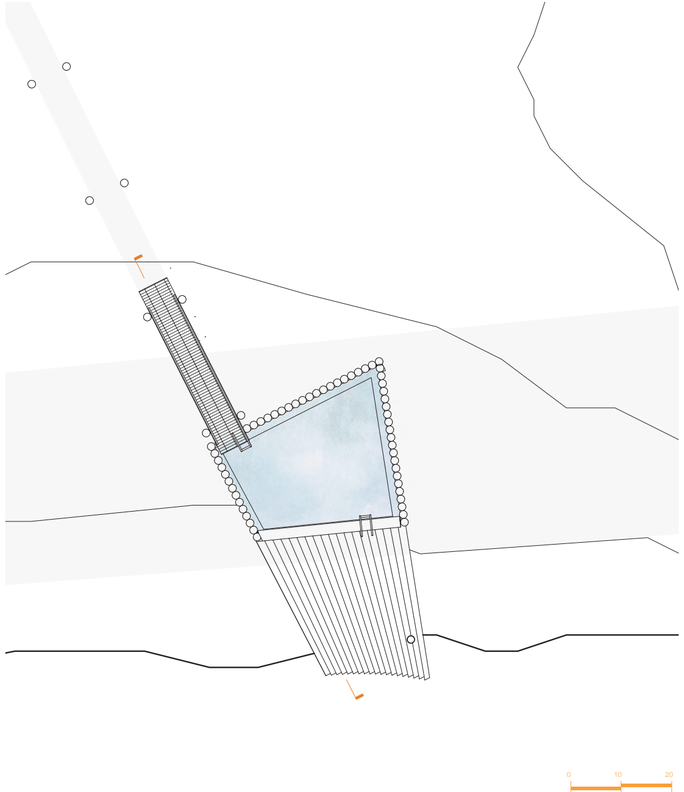
The bathing experience in many cultures throughout history is also one of foils. The bather soaks in the hot bath until he cannot bear the heat any longer and for brief periods, plunges into a cold bath for relief. In *Wetland Wasteland*, the bather climbs the stairs out of the hot bath and rejoins the pathway through the pivot door on the lower landing. The steel pipes are once again below him, supporting his footsteps. The pipe carrying the distilled water is no longer insulated, its heat allowed to dissipate into the environment. He scampers down the gradually descending pathway on the axis of Mount Rainier. Once he crosses the pond the terrain mounds up slightly and it appears as though the steel grate pathway gets buried. The telephone pole supports, however, march along at 25 ft intervals. Immediately before the plunge bath, the earth falls away again and the metal grate path returns, carrying the bather out to the plunge bath. He runs up to the ladder and throws his body into the pool.

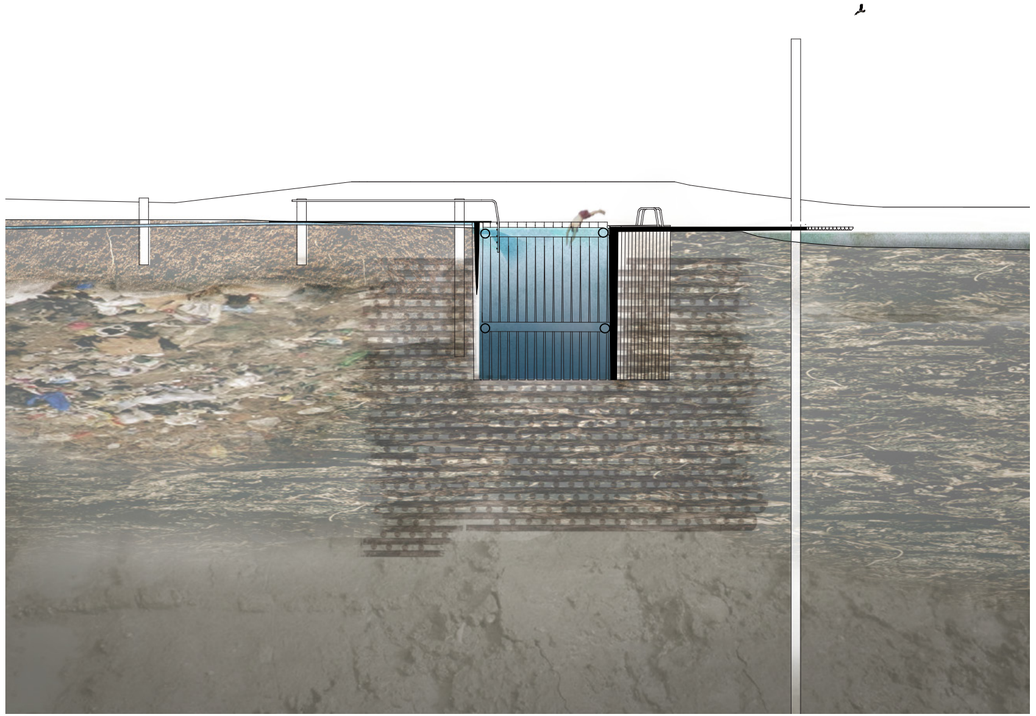
The plunge bath is set directly into the dike that holds the shoreline, holding the landfill and the lake apart. It is constructed by driving telephone poles directly down into the dike in the shape in the plan. Once all of the poles are in place, the material inside the shape is removed and the void filled with distilled water. The pipeline of distilled water flows continually into the plunge bath, keeping the water circulating and clean. After the plunge, the bather might sit on the deck before returning to the hot bath to repeat the rejuvenating cycle.

83. Preparing to plunge

83



84. Plunge bath, plan and section



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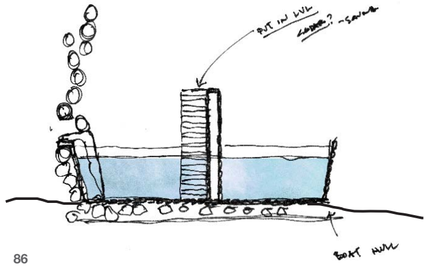
6 A SWEET ERRANCY OF MEASURE

On the south side of the plunge bath is another ladder that leads up to a deck. The back half of the deck rests on the land before it slopes down to the edge of the lake. The front half of the deck cantilevers over the lake, a big diving board daring bathers to plunge into the lake as well. The deck is made of halved telephone poles joined together to form a diaphragm. The flat side of telephone poles face up, making a flat deck. The ends of the poles rest on the tops of the poles driven into the dike, and a massive galvanized steel hinge running the width of the bath connects the deck to the wall of the bath. This hinge plays a critical role in the measurement of the movements of the land around the plunge bath.

The hinge allows the deck to fluctuate with the land that it rests on, while staying connected to the bath, which is anchored into the stable dike. One, single eighteen-inch diameter steel piling stands out near the front of the deck, firmly anchored into the clay below, stable and unmoving. As the deck moves with the land, the piling, like a surveyors stick, registers the deck's movements. Repeat visitors to the deck may notice that while the bath is fixed, the hinging deck is changing.



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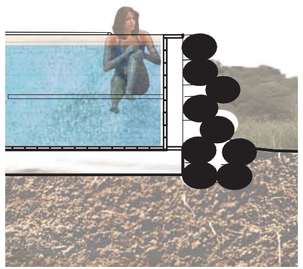

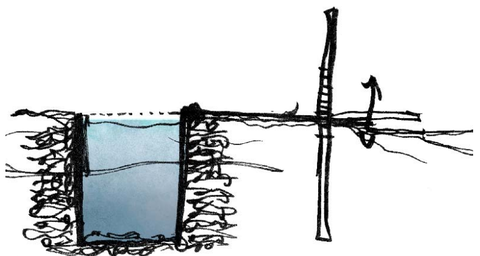

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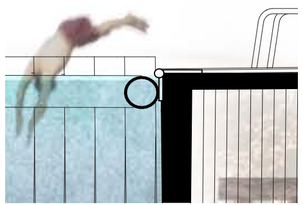
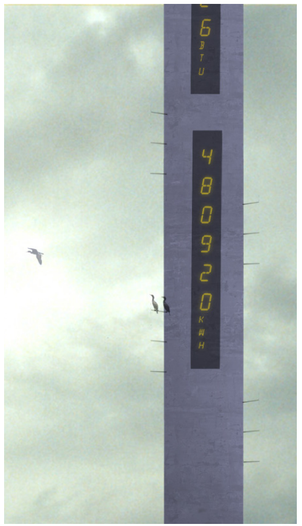


85. Plunge bath measurement
The deck hinges up and down, moving against the stable pile which acts as a surveyor's stick

86. Hot bath measurement
The whole vessel tilts as the land settles. The water in the vessel always stays level.



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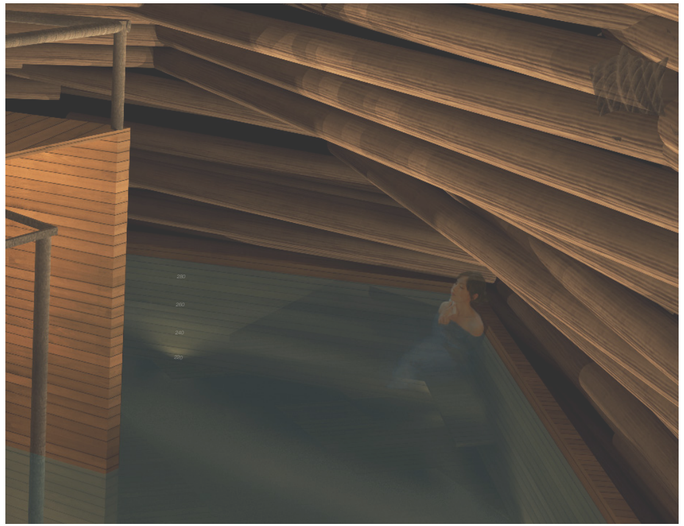
It is usually too cold to be out at the plunge bath for long and the bather returns to the hot bath for warmth. While he is having a rejuvenating experience in the baths, the sea of trash that generated the land around the baths keeps shifting. In the first few years after the construction of the hot bath, the surrounding land will settle because of the new forces pressed upon the it. Within about five years, these forces will equalize with the macro forces generating the larger movements of the site. The baths provide a didactic experience of these fluctuations of the land. As the structures move with the land, the water in the baths will hold its level line. This level line, like the bubble in a carpenter's level, becomes the registration against which movement can be monitored. As the hot bath settles in the land, the lines of the joints between the cedar boards will move. When the bath was newly installed, these lines were set level, parallel to the water line. But before long, they will be at a different angle. Markings on the boards of the elevation in relation to sea level make these changes measurable and repeat bathers will begin to connect their experience in the bath with the story that made the land.

Walking back from the baths, feeling rejuvenated from a cleansing experience in what feels like a natural environment, the bather is confronted with the incinerator. The smoke stack is in his direct line of vision. A scoreboard on the smokestack tallies the amount of trash burnt in tons, the amount of heat produced in BTUs, and the amount of electricity generated in kilowatt hours. The incineration process is behind a façade of glass so he can see workers operating the machinery, and the 2:00 pm garbage truck is making its way along the slough. He is experiencing a fundamental paradox. How can these things be simultaneously true?



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87. Foiled paradoxes
The smokestack, once a symbol of industry's destruction of nature, is a bird habitat and recorder of human-built resource generation

88. Rejuvenation and Calibration
A bather relaxes in the warm water next to the elevation markers of the planks that make up the bath

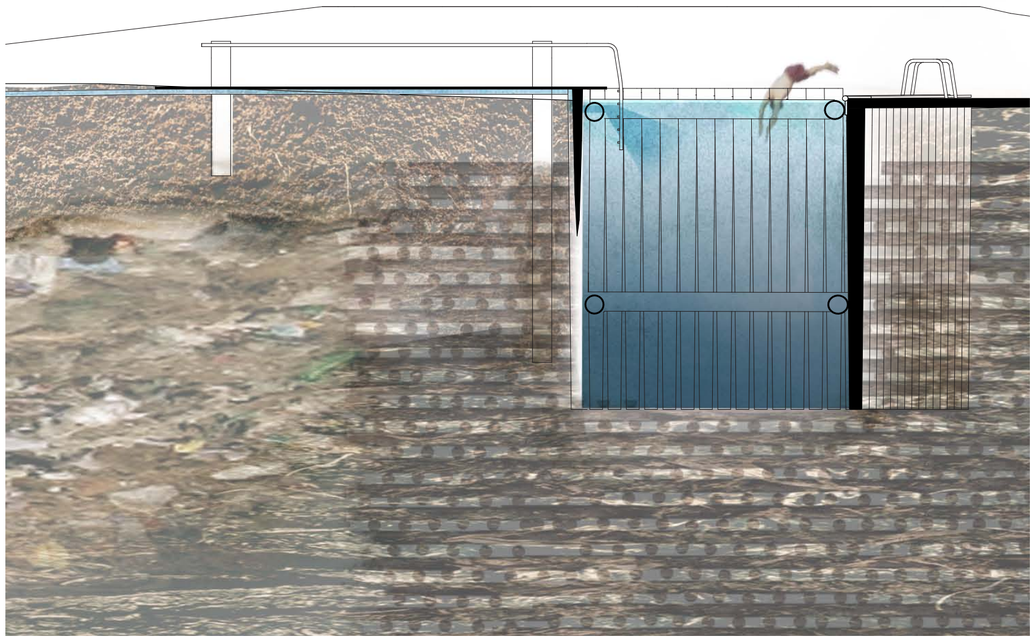
89 (over). Piling, cribbing, and landfill
All part of a naturalizing site

89

They seem absurdly, perversely inconsistent! His mind and body feel cleansed. He just spent time in distilled water among cattails and aspen trees. But the whole time, the trash of a few generations of city dwellers was shifting below him and supporting his footsteps. Current flows of the public's waste were burning behind him, provided him with the hot, cleansing, and private experience.

For the bather, it seems to add up to a whole, but in an "ominous and promising" way. This is a *sweet errancy of measure*, a truth that confounds logic and makes the bather suspend disbelief. Of course, the real reward of the paradox is in asking, how can these things add up to a whole? The two conflicting ideas of landscape, that of production and that of recreation, are integrated in *Wetland Wasteland,* but there are still strong tensions at their edges. That tension, that feeling that things are pulling apart, opens up views of the paradox. The foils highlight the paradox and enrich each other. Cormorants scanning for prey perched on the smokestack, water staying constant as land moves, trash cleansing the body. Is this a landfill or is it a nature preserve? Is this in the city? Or is it in the wild?

The curious bather learns about the stories that shape the land and the water. Large historical photos of the canal construction and the landfill and maps showing ancient glacial movement and shoreline shifts line the walls of the changing room, but they are more than a thin memorial to a hidden or demolished past. Every process that *Wetland Wasteland* introduces to the site and its users and every architectural form and bit of structure is all part of the memorial. It is all part of an effort to inhabit the city and the wild at the same time, to swim in water on top of a sea and feel with all of the senses the magnificent paradox.



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