Contemplating Sanctuary:
Design strategies for contemporary contemplation spaces with cleansing water as a wetland treatment park and urban sanctuary

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Abstract

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This design thesis explores contemplative design strategies that engender spiritual communion with place. Sensuous experience of cleansing and temporal water creates a restorative environment. Synthesizing design principles with Japanese and Puget Sound case studies, this research speculates on the relationship of water gardens to aid as portals to contemplation and the sacred in an urban ecological wastewater treatment park.

Designers can frame and shape perception of natural phenomena that can assist in emotional, psychological, and spiritual renewal. Gardens and assisting architecture offer place and timing to settle into stillness, silence, and solitude. Path, threshold, and enclosure of water offers ways of sculpting a sensory experience that focuses attention in the present and summons tranquility and reflection

This ecological wastewater treatment park in SoDo district Seattle is an urban pilgrimage to a wetland forest reserve. Water, soundscapes, and earthworks sculpt a sanctuary for listening, observation, and storytelling with the transformation of the tidal landscape over time.

Keywords: Contemplation. Restorative. Soundscape. Water.

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Much gratitude to my family for helping me arrive to this fortunate position of being able to study and share my thoughts through university.

Much gratitude to my cohort, faculty, and friends for helping me journey through graduate school.

Acknowledgments :

I want to thank everyone who contributed to this thesis process through much needed conversations and co-imagination. I acknowledge this work was explored on the ancestral lands of the Coastal Salish people.

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Chapter 7

Sanctuary and Site Design

Preface

This thesis was written during the early onset of the COVID-19 pandemic in Spring 2020. While designing and writing I was immersed in the silence, stillness, and solitude of the backyard of my rental home in North Seattle. It was a surprising but helpful experience to sit within the project outside of the social life of studio, where I fundamentally enjoy sharing moments with my cohort. Even prior to the self-quarantine measures I had begun writing at home. Unbroken trains of thought, allowed for a sense of retreat, despite missing being in a room with friends, colleagues, and interesting conversations. This is not to discount the atmosphere of the collaborative studio but to value a private space and time to breath into ideas that take some time to settle into. I am thankful for the outdoor garden spaces of my house where I can sit and speak aloud as I wrote, without worrying about distracting anyone else or being insecure about being overheard speaking on a loose topic. As spring erupted around the neighborhood and I could witness the seasonal change from of the backyard of cherry trees. I actively aligned my schedule to be outdoors at key times of day. The meditation time was appreciable as the Green Lake neighborhood become an observation campus of what green spaces were contemplative. Observation of plant, animal, and materials allowed time to sit and observing Spring. The expectations of what a meditation practice might produce is beside the point because the experience of the observation practice itself will yield its own insights. Those insights of settled minds need space to breath, settle, and flow with being distracted by something else at some other time. Mediation allows us to come back to where we actually are in our life.

At the end of this thesis project the Black Lives Matter movement and protests mobilized in Seattle and nationwide after the murder of George Floyd in Minneapolis, which I mostly experienced over the internet and social media but was moved by silent marches. Modern contemplation places should extend into social justice and community healing spheres. Case studies offer spatial models and ideology for contemplation centers, but those lessons must also adapt their potential for a multiplicity of contemporary cultural, social, and environmental issues and visitors.

This thesis is intended to serve as a goal post and road map for future practice and opportunities. The seeds begun here are intended to blossom over time, and as such, this document should be applicable for:

- Cultural exchange applications to Japan for students and scholars
- Design applications to garden + landscape design groups
- Independent research fellowships about gardens and health for students and scholars

This thesis was a design process oriented project that sought to learn about contemplation spaces historically as well as materially. In particular a perspective emerged about the quality of natural scenery are essential to meditative and contemplative activities. With influence from Japanese design and the Pacific Northwest wet season climate this design process observed moments of water in the bioregional landscape for their acoustic and material presence. Observation of these sensuous moments in case studies combined with literature about restorative experiences revealed the relationship between meditation, sensory design, natural soundscapes, and water presence for contemplation gardens.

The contemplative design strategies that are synthesized from readings, observations, and conversations focus on the experiential elements. Additionally the materials focus on water acoustics resulted in a design of an ecological water treatment park. Conceptually the site design seeks to connect a contemplative experience of water transformation. Water gardens frame water elevations flowing over time, creating dynamic wetland gardens that change seasonally. Architectural design sculpts quiet and reflective spaces to bring attention to subtle moments of naturally-inspired water flow.

"Given the dominance of so-called "professionalism", that privilege the technical, productive, material, and intellectual over the experiential, receptive, immaterial, and emotional, [this] tendency [is] complicit with the dominant values of contemporary culture. Opposition can also be explained by the risks, misunderstandings and difficulties associated with engaging the sensitive matters of spirituality and religion."

- Barrie, Bermudez, Tabb. Architecture, Culture, and Spirituality. p 3

Because the Japanese garden is the microcosm of numerous spirits of the natural world, good design comes not from clarity of a concept, but from its profundity, which one cannot understand at a glance but can discover from every angle.

- Seiko Goto, Gateway to the Human Spirit. p 197

The wilderness as a temple is only a beginning. One should not dwell in the specialness of the extraordinary experience nor hope to leave the political quag behind to enter a perpetual state of heightened insight. The best purpose of such studies and hikes is to be able to come back to the lowlands and see all the land about us, agricultural, suburban, urban, as part of the same territory - never totally ruined, never completely unnatural. It can be restored, and humans could live in considerable numbers on much of it. Great Brown Bear is walking with us, Salmon swimming upstream with us, as we stroll a city street.

- Gary Snyder, Practice of the Wild. p 197.

How can we design contemporary contemplation centers (for intergenerational ecological resilience)?

How can water treatment infrastructure become meditation gardens on a long scale of time?

How can architecture as an instrument amplify the therapeutic sense of water at a human scale?

Critical Stance - Path, Portal, Language

I am curious about contemporary garden-making and its relationship to contemplation spaces. We have tremendous work to do individually and collectively to shift individual values towards regenerative economies and adapt to the climate crisis. This thesis process started by thinking about how the ecological crisis will lead to a potential collapse of the very ecosystems that support restoration and retreat, a threat to spiritual infrastructure with nature. My sense is that we require places that allow for reflection on the accumulating stress, anxiety, and depression that has only begun to enter the public consciousness. As a form of mindfulness therapy and of climate therapy, I believe the Japanese Buddhist philosophical and garden-making traditions offer potential for landscape design in our transformational era of spiritual and social need.

As the societal pressures of decarbonization, urbanization, and climate extinction escalate, novel gardens and landscapes will emerge to adapt. They will be productive and performative, camouflaging as community infrastructure with natural aesthetics. [1] Simultaneously as decentralized, bioregional, and distributed infrastructures are invented, the potential for places of communion with nature will grow more rare, valuable, and sacred. The modern industrialized metropolis itself is a highly energetic system, operating with speeds and spectrums of noise, light, air, and media pollution. This pollution illuminates that environmental justice issues intersect access and quality of nature spaces. [2] While land reclamation and green infrastructure may be engineered it can provide opportunities to cultivate spaces for ethics, spirituality, and healing. [3] A long-view of time is critical for imagining places of intergenerational resiliency and communal caring about people and lace. [4] Central to that regeneration work, landscape design and garden-making aspire to provide hope, refuge, reflection, joy, sincerity, honesty, clarity, care, bravery and a suite of emotional connections to place.

Sacred landscapes have always been sites of critical cultural exchange points between ecological endurance and spiritual healing. [5] The potential of a contemporary contemplative place is not to retreat from modern dilemmas, imperatives, and contradictions but to retreat from the cultures, patterns, and technologies that commandeer our transcendental attention. Thus the potential of contemplative landscapes are to serve as essential places for evolving ethics beyond exploitation, disposal, and individualism, and host serendipitous, mystical, and forward-thinking experience with natural adaption. [6]

Increasingly apparent is how environmental design ripples into emotionally, psychologically, and spiritual well-being and belonging in place. [7] The therapeutic, restorative, and transformative design of the built environment can be part of a systematic strategy of public health, stress management, and spiritual infrastructure. [8,9,10] While social life acutely impacts our well-being, natural environments passively restore. We grow alongside the gardens, as they symbolically and meaningfully engage our psyche. [11] Because contemplative places allow us to "get away" from everyday experience and situations, they are a dedicated primer space to enhance mindfulness practice and spiritual reflection. Architectural scholar Thomas Barrie describes, the design of architecture should not seek to "change someone's mind" but merely "broaden" what is possible. [12] Art philosopher Ken Wilber talks about the capacity of place to move us to contemplation only if we are open to being moved. [113] Zen priest angel Kyodo wIlliams talks about the radical potential to transform society starts with the transformational practice of the self. [14]

Landscape is animate, alive, and speaking with us. [15] We understand the language first without words before translating the knowledge into architecture. [16] If we consider language not just as social communication but as a mode of consciousness, then contemplative environments provide access

to a language potentially revelatory for one's individual spiritual journey. [17] Knowledge is encoded from place-based experiences of the landscape. The illusionary division of "built environment" and "natural environment" conceals the inseparable ways that material ecologies, natural cycles, and cultural values can replicate experiences of the natural world. A post-humanist ontology sees the humanity as inseparable within the communal habitats, of plants, animals, microorganisms, water, soil, atoms, and beyond [18] A multi-sensory embodied design approach therefore invites more careful attention to how the environment communicates. [19] Public space around natural processes should support constructive activities of observation, listening, and story-telling for the collective future. [20]

Historically places of retreat are set apart from the urban landscape. These "nature retreats" and mature parks are not simply magical but are materially sensuous. Compositions of aroma, texture, soundscape, age, memory, and moods emit from a living web. These places summon curiosity, awe, and splendor for pilgrims and residents. Contemplative places of nature occupy a combined consciousness, simultaneously environmental and cultural. [21] Places that facilitate contemplation then allow for immersion and embrace in the special, maturing, and sensuous archetypes of the landscape. Here is a place to pay attention to other living beings and receive a moment of clarity. So then are these material places in-compatible with the contemporary globalizing, secular, and post-industrial Western city? How does modern urbanism and the design professions help shape the material spaces that facilitate sensory experiences of place. The process of "getting away" takes time. This inspires landscape-based design questions of modern pilgrimage, temples, and rituals with the matter of nature.

- How can the design of an embodied experience help facilitate a contemplative and transcendental experience?
- How can places offer emotional refuge through interdependence with natural phenomenon and transience.
- How can those places help us think about the investment in ecology and the non-human species as being a critical direct investment to human survival.

Personally, when I reflect on my experience of "being in nature" I think of the difference in urban and non-urban effects. Among regional mountain-forest landscapes I appreciate the residual multi-day effects of calm emotions, sharp mental focus, and body relaxation. Among urban wild parks I appreciate a kind of mental reset and temporary contentment but rarely residual serendipity, compassion, and calm like remote landscapes. Rather my life in urban experiences is tempered by logistics, over + understimulation and social temperament. An aura of urban stress and presence of social inequities augments any contemplative atmosphere of public green spaces. Yet the city is an energetic place with its own life-giving potential. Urban design can seek to balance the types of places and kinds of experiences present in urban environments.

Natural environments may not be intrinsically loaded with sacred potential, but they do define space and time for individual reflection and meditation. As a conduit for processing life, contemplation gardens are critical to spiritual development. They become the setting, the apparatus, and memory rooms for conscious transformation over time. Contemplative spaces are portals for awareness. The metaphorical spiritual journey is about going and becoming more than arrival and destination. Path and place situate spatial and subjective meaning with each of our spiritual journeys.

As people begin to transform their community landscapes to be more productive, resilient, and ecological we must also imagine how they become equally more meaningful, resonant, and sacred. Through gesturing to contemplation as an experience, I imagine that critical eco-tech infrastructures can also perform as portals for spiritual life and communion, assisting ecosystem endurance in the transition of climate change. They should help people to not only process personal emotions but also project collective awareness. Drawing inspiration from the expressive, interpretive, and naturalistic art of Japanese garden-making and the curious, ephemeral, and elemental experiments of American environmental art, I wonder how landscape design can support the journey of the individual?

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Observations from Japanese case studies became the central heart of the project. Support in research literature revealed the spiritual potential of the built environment to be in the an experiential quality of restorative nature. An intersection of architects and landscape architects discussing "contemplative landscapes", "transcending architecture", and "the sacred" provided a fertile avenue for continued exploration. By focusing on how the quality of the landscape and gardens relates to the contemplative experience I began to explore landscape design history and trajectories relating to water.

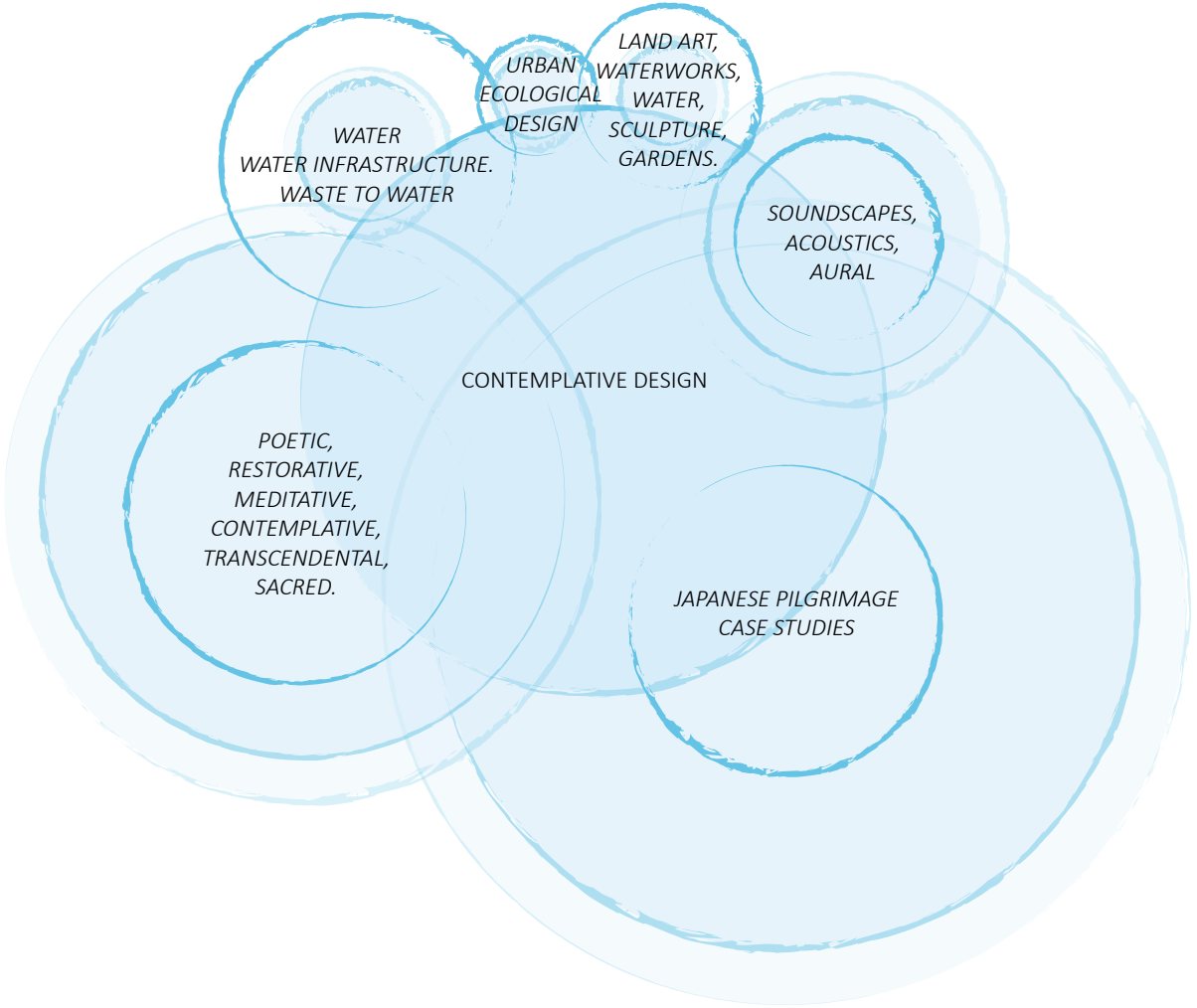


Figure 2.I Thesis research areas

PHENOMENOLOGICAL
Attention to ecological phenomena

RESTORATIVE
Attention Restoration with nature

THERAPEUTIC
Attending to physical, psychological, emotional needs

MEDITATIVE
Attention on non-thinking experience

CONTEMPLATIVE
Attention on opened experience

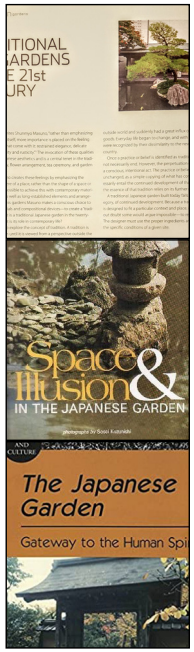
TRANSCENDENT
Attention between the self and the whole

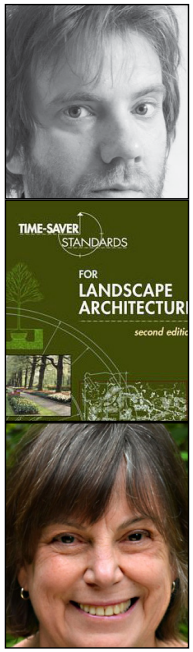
SACRED
Ritualized relationship with landscape

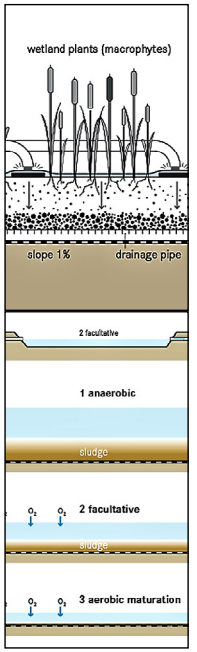
Figure 2.2 Research literature attention. A spectrum of attention to the built environment escalates in connection and meaning

Within the literature the common denominator of the contemplative experience is attention. Specifically: Attention and what we are attending to. The capacity of a space to hold attention is a critical aspect for contemplation and the efficacy of natural environments on restoration. A spectrum of how attention is directed outward and then inward connects from the phenomenological to the sacred. These voices explore the value of the built environment and architectural design to support the places where people can experience spiritual connection.

The research motivated a site design to apply the theoretical frameworks, with aspiration to design a temple and water garden retreat center. Further research into the history of the Japanese garden gave a background on themes and techniques. Sensory design and soundscapes became a material to attune the built environment to the restorative experience. A brief history of the evolution of land art into environmental and ecological art informed landscape design thinking about water processes. Briefly researched ecological wastewater treatment methods helped to frame how the water gardens form could function as a treatment landscape.







JAPANESE GARDEN DESIGN

- *Typologies*
- *Themes*
- *Techniques*

SOUNDSCAPES AND WATER

- *Environmental Acoustics*
- *Mitigate unwanted noise*
- *Mask unwanted noise*
- *Make wanted sounds*
- *Fountain design*

ECOLOGICAL/ ENVIRONMENTAL/ LAND ART

- *Materials recompose*
- *Frame deeper timescales*
- *Reveal environmental awareness*

WASTEWATER TREATMENT

- *Municipal Wastewater treatment*
- *Wet Weather CSO Treatment*
- *Ecological water treatment systems*

Figure 2.3 Research literature materials. Research supports how sensory design can help shape contemplative spaces

Attention

- concentrated focus and care to the present moment. -

Restorative

- a recharging of the mental, emotional, spiritual energy expended through life -

Meditation

- an observational practice of seeing the extents of what is happening, a "non-thinking"-

Contemplation

- a joining of observation and (non)thoughts around an opened space and a dedicated time-

Transcendent

- a transporting beyond the sense of the individual into a unison -

Sacred

- a moment of transformational space and growth. A metaphysical place, mobile in ourselves, summoned with loved ones in life, and meaningful.

Environmental psychologists Rachel and Stephan Kaplans' Attention Restoration Theory (ART) proposes that directed attention can be restored through exposure to natural environments [1] Attention is extinguished by continual and taxing stimulus. Environments aid by allowing attention to recharge itself in observation. While meditation is the role of the individual, restoration is the role of the environment. Kaplan compares similar outcomes of Asian meditation traditions and ART. Two mandates are proposed for restorative experience between the individual and the environment; 1-To avoid tiring thought patterns. 2-To avoid unnecessary mental energy. [2] Contemplative retreats provide a personal experience of mindfulness that individuals can practice on return in the everyday.

States of Attention

1 Clearer head, or concentration -

Clearing the mind and cloudy thoughts via meditation or meditative activities.

2 Mental fatigue recovery -

Post focused attention, this phase allows for directed attention to recover.

3 Soft fascination, or interest

Engage in a low-stimulation activity that fosters quiet.

4 Reflection and restoration

Restoration leads to reflection of self.

General Environments for Restoration

1 Being Away

Sense of separation from the usual

2 Fascination

Hard Fascination, attention held by highly stimulating activity

Soft Fascination, attention held by less stimulating activity

3 Extent

Quality of the environment facilitates familiarity, immersion, comfort

4 Compatibility

Quality of congruence with the environment. Individual chooses to be there and is intrinsically motivated and resonates

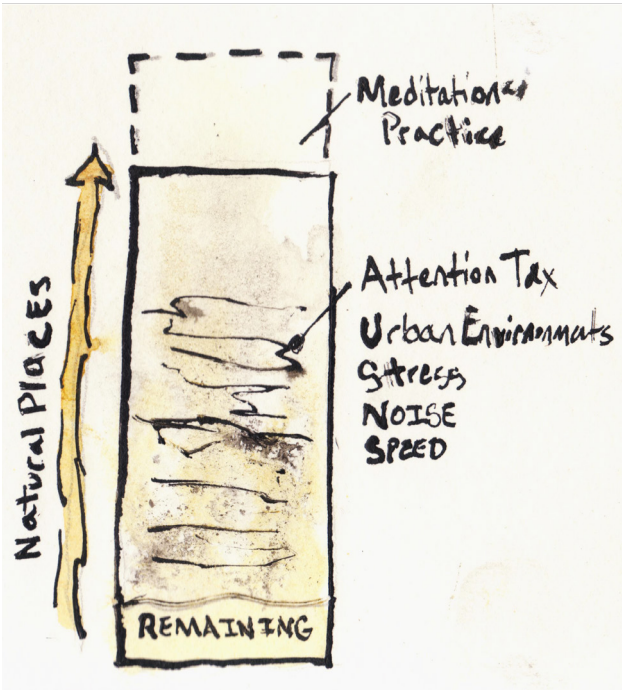


Figure 2.4 Attention Restoration Theory diagram. Time investment in a natural environment is an essential element of recharging attention reservoirs. Contemplative spaces look to landscape design of natural environments to reduce defensive stimulus and

"In what way, does a designed environment support meditation? For me it concerns attending, that is attending as a verb related to the noun attention. We attend to forces external or internal, or both. If we agree that a landscape can aid or retard attending, perhaps then we can then examine how certain garden forms have done so in the past to suggest how we might do so in the present, or even the future." - Marc Treib [3]

Contemplative spaces are a concentrated resting point that melds mind, body, space, landscape, time, and meaning. Concentration focuses on reflection, memory, and attention between the individual and the outer field. Contemplative gardens reveal layers of time and living relationships of the landscape. They are special moments away from everyday uses and expectations of space, time, and place. Moreover, contemplative gardens host the meditative and restorative activities necessary for mental and spiritual health. Moments of meditation can bridge and invite fresh thought and perspecties leading to a transformational change of mind. This moment is what American Zen garden landscape architect Martin Mosko calls "Big Mind". [4] The integration of architectural and landscape design can create restorative environments that facilities transformational personal experiences. [5]

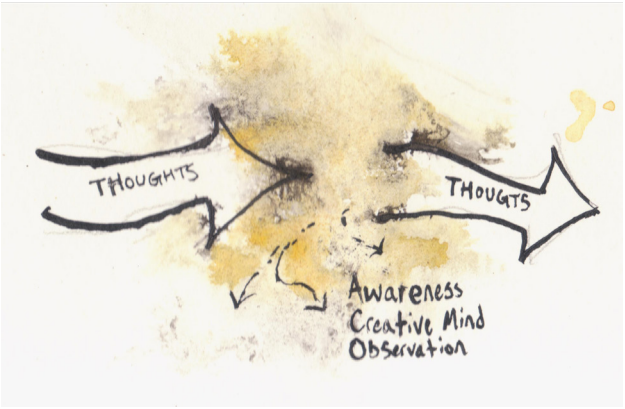


Figure 2.5 Meditation diagram. Meditation helps us to observes our thought patterns and reframe how we behave. In the gap of meditation is more awareness, creativity, and observation.

"A garden is a place where appearances draw attention to themselves, but that doesn't mean they necessarily get noticed, no matter how much they may radiate or beckon the eye. Where appearances recede into the depths of space and time even as they come forward to stake their claim in the phenomenal realm, they make special demands on our powers of observation. This is bad news for gardens, for nothing is less cultivated these days in Western societies than the art of seeing. It is fair to say that there exists in our era a tragic discrepancy between the staggering richness of the visible world and the extreme poverty of our capacity to perceive it. Thus even though there are plenty of gardens in the world, we live in an essentially gardenless era." [6]

Developing a garden for reflection and contemplation requires attention to material composition and conversations between nature and culture. [7] Landscape architects, artists, gardeners, craftspersons, makers, and poets engage in the garden-making traditions. These sites offer potential for summoning beauty for the mind to meditate on.

Retreat centers are effective for contemplation by creating a compatible social atmosphere within restorative environments. Spiritual belief systems help the individual reframe the meaning of life challenges while immersed in the natural beauty of gardens and landscape. Retreats differ between first time and repeat visitors, with visitors defining beauty and spirituality as key experiences. [8] Compared to the modern built environment, natural retreats and environments provide for "soft fascination" and reflective experiences. [9] Landscape design of restorative and contemplative environments may be most effective with awe-inspiring open spaces at a landscape scale with clear layers of order. [10] As attention is directed into the sensuous and naturalistic garden, the scale of scenery and depth of projection into that space impacts the contemplative potential of the design. [11]

Monasteries serve as residency centers dedicated to introspection, contemplation, and observation of the divine. [12] Architecture that emulates and heightens the experiential qualities of monasteries and religious spaces can provide models for bringing the contemplative into contemporary life. [13] The design of architecture as expressions of natural wonder can elevate spaces into restorative environments with transcendental potential. [14] Monasteries integrate mediation and mindfulness practices to support "soft fascination" and passive attention restoration. As part of the architectural experience monasteries orient around courtyard gardens that provide space for mindful practices and moments of beauty. Japanese courtyard gardens have traditionally served as religious meditation aids and are gaining modern appreciation as therapeutic and healthcare gardens. [15] Proximity to surrounding woodland brings therapeutic and restorative experience of "forest bathing" into the retreat experience. [16]

Figure 2.6 Retreat to Art Biotope Water Garden. The garden serves as a meditative aid for mindful movement. Resident artists and visitors come to pay close attention to the reflection of woodland in this constructed garden.

Figure 2.7 Retreat to Temple #31 Chikurinji. Ascension across pathway towards another ascend.

Figure 2.8 Saiho-ji moss temple. Shallow ponds surround the island sanctum with carefully placed stones punctuating the space in between.

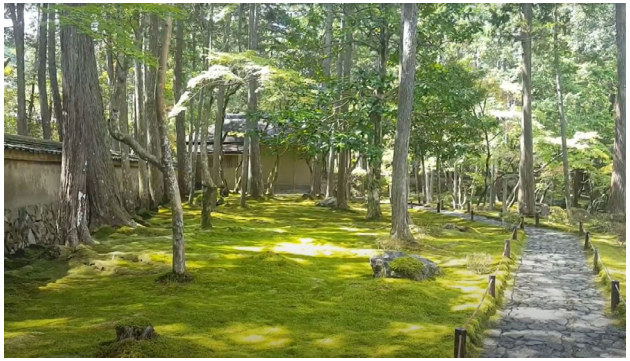


Figure 2.9 Saiho-ji moss temple. Circular path meanders through moss surfaces and maple / pine canopy. The design of the garden was gradually created by the head priest during the 13th century. Walls enclose the garden, containing attention within.

Crafted as religious and philosophical aids, traditional contemplative gardens offer imagination for engaging public landscapes for regeneration. While Western traditional gardens have represented paradise, the pictureesque, and order through geometry, Eastern traditional gardens offer places of impermenence, seasonal beauty, and naturalistic scenery in compact spaces. [17] While traditional western monotheism constructs sacred spaces to house connection to the divine, traditional Japanese Shintoism respects the animism, with forest as sacred and timber shrines as the altars to the spirits. [18] Japan has a tradition of landscape design intended to reveal the seasonality of nature. Garden compositions are designed to hold a void space, "ma", that invites attention in the interpretative relationships among the elements. This fascination to the garden relationships extends the amount of time spent in place and elongates a calming experience. [19] Time is an essential dimension to Japanese social situations, architecture, and garden design. [20] Gardens are designed with a set of contemplative principles and design techniques that can be adapted to other climates and resonate with other cultures, rather than being simply an aesthetic style. [21] Foundational values of harmony, gentleness, and peace mix with the individual creative spirit. Conversations with nature guide the practical garden making techniques of asymmetry, balance, borrowed scenery, enclosure, hide and reveal, blank space, and layering. [22] Through material composition Japanese Zen gardens are "not simply a reflection of nature, but rather the freedom of mind expressed as nature in the garden". [23]

Traditional garden typologies include Stroll Garden variations, kare-sanui - the Dry Rock Garden, roji - the Tea House Garden, and Tsubo-Niwa - Courtyard Gardens. [24] Stroll gardens facilitate meditative movement with path, views, and choreography mediating the journey to a resting spot. Stroll gardens compress the expansive wild landscape into viewable curated gardens. Japanese gardens traditions were shaped by geography and climate to become compact, semi-urban iterations. Thresholds mark a place of special reverence. Walls enclose dedicated grounds. Movement and rest

allow for attention to the body. Walking focuses mindfulness on the bodily sensuousness of the landscape. Sitting encourages observation and experiencing the landscape over time, rather than across space. Courtyard gardens rely on choreography and building enclosures to frame interior void space, inviting contemplation and curiosity from a rested position. Zen and contemplative gardens are thematic expressions and metaphors of life; growth and decay, birth and death, impermanence yet flow, transformation and cycles, interdependence and union, presence and void. Water is a material as well as a motif employed to summon a contemplative experience. [25] Zen garden traditions, especially the dry garden typology, recall water in the landscape in a variety of interpretative scales and forms. [26] Study and practice of the fusion of Japanese gardens reveals design themes that can propel contemporary garden-making expressions. [27]

Figure 2.10 Ryoan-ji pond. Crossing around the front pond the visitor travels deeper into the temple complex. The expansive reflection pond is framed by lush canopy paths.

Figure 2.11 Ryoan-ji dry garden. From veranda seating visitors gaze into the enclosed courtyard rock and sand garden framed by boiled-oil clay walls and reaching everygreen canopy.

Chapter 2 - Attention Meditation Contemplation, Garden endnotes

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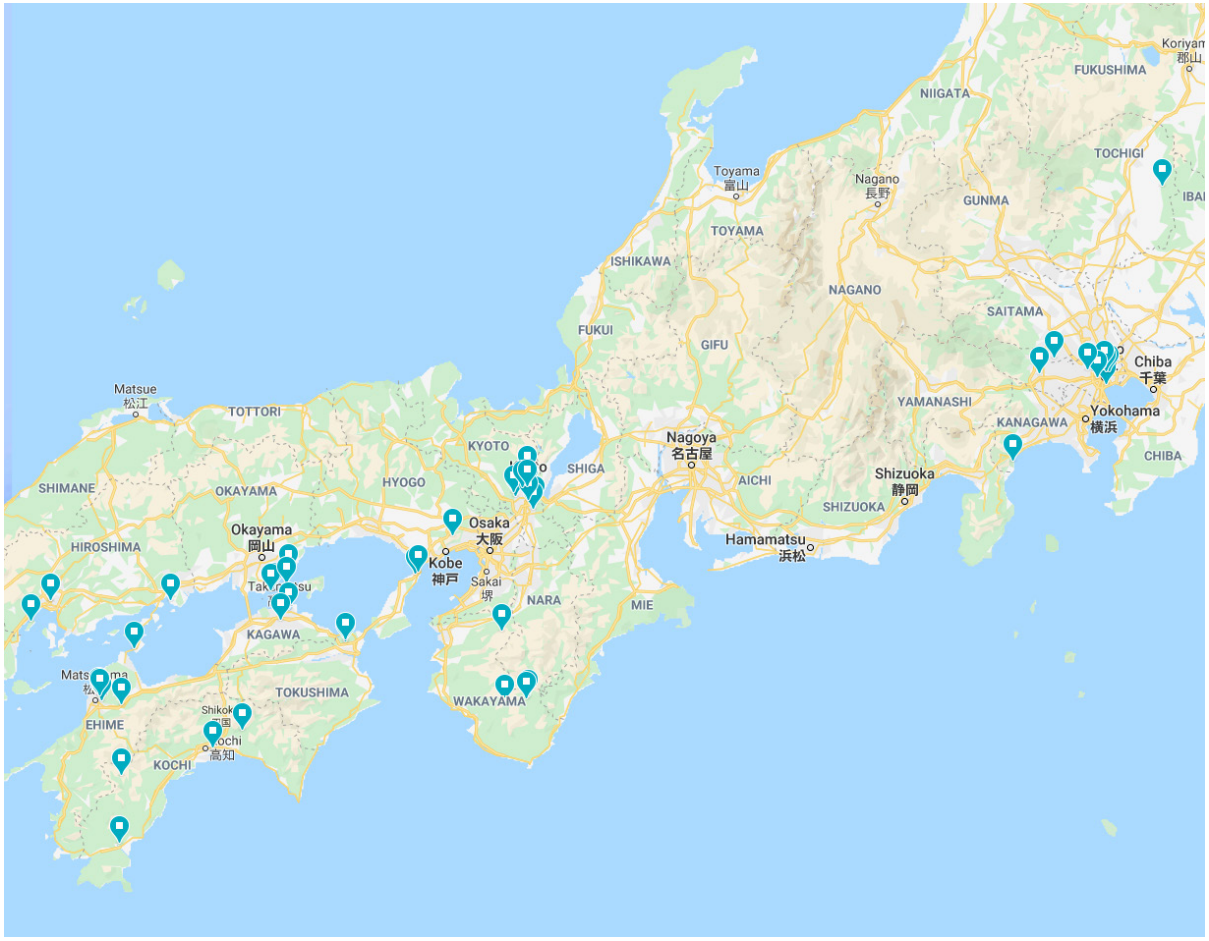
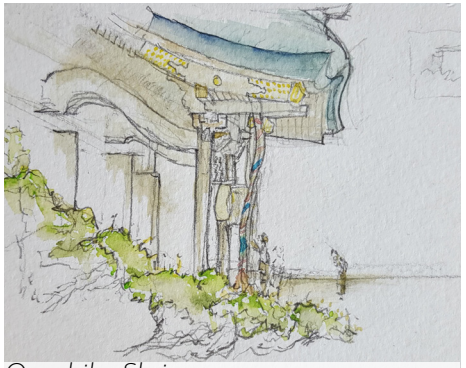


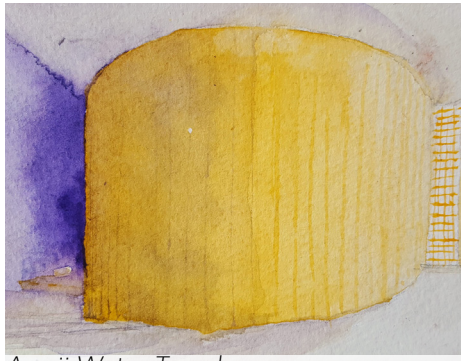
Figure 3.1 Japanese case study map. This map illustrates the location of case studies across Shikoku, Wakayama, Kansai, and Kanto prefectures.
Figure 3.2 (Opposite) Japanese case study perspectives. Sketches capturing contemplative moments of places.

In Fall 2019 I was fortunate to take a traveling fellowship to Japan to visit modern and contemporary places of contemplation, through the UW Department of Architecture Kiyoshi Seike Endowed Fellowship. (Figure 3.1) The trip demonstrated the magic of Japanese landscape design. My methodology of observation, meditation, filming, audio recording, watercolor painting, sketching and journaling allowed for immersing my attention into the environmental character and atmospheres of the places. My personal experience can inform a future methodology of researching spaces with empirical and subjective tools with specific questions. Gardens could be compared and contrasted for preferences, trends, and techniques.

List of sites

Awaji Water Temple
Oasahiko Shrine
Konsenji Temple #3
Dainichiji Temple #4
Jizoji Temple #5
Shikoku Mura
Isamu Noguchi Garden Museum
Nanmenzanyashimaji Temple # 84
Teshima Art Museum
Inujima Art Museum
Chikurinji Temple #31
Kochi Makino Botanical Gardens
Sairinji Temple #48
Jodoji Temple #49
Ryoan-ji Temple
Entsuji Temple
Saihoji Moss Temple
Enoura Observatory
La Collina Omihachiman
Sayama Community Center
Sayama Forest Chapel
Art Biotop Water Garden
Kumano Hongu Taisha, Oyunohara
Koyasan Rengejoin Temple


Oasahiko Shrine


Awaji Water Temple


Teshima Art Museum


Inujima Art Museum

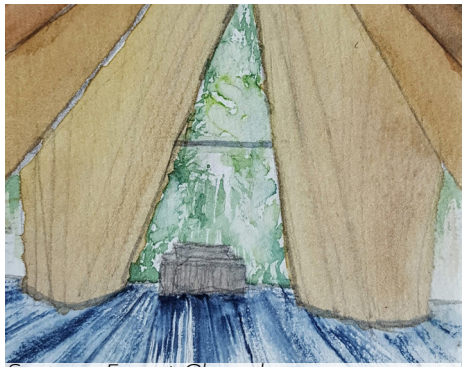

Kochi Makino Botanical Gardens


Ryoan-ji

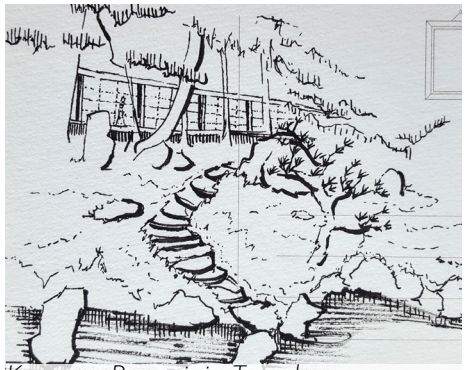

Saihoji Moss Temple


Art Biotop Water Garden


Sayama Community Center


Sayama Forest Chapel


Kumano Hongu Taisha, Oyunohara


Koyasan Rengejoin Temple

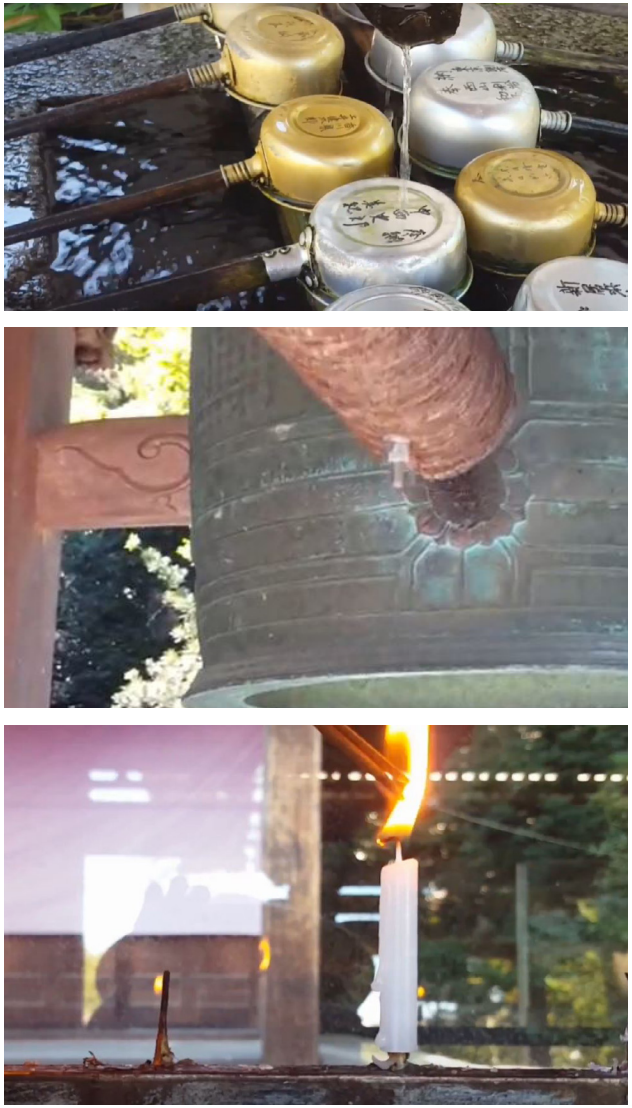


Figure 3.3 Shingon Temple Arrival Rituals. Symbolic gesture of cleansing, announcement, and spiritual light and life.

My travels revolved around the 88 Temple Trail in Shikoku and Kumano Kodo in Wakayama, both pilgrimage trails of the Shingon Buddhist sect. The center of Shingon practice and the mausoleum of Kobo Daishi is Koyasan sited deep in mountains. Traditionally the 88 Temple Trail begins and ends from Koyasan. This sect fuses connections between the mind, body, and world is a way to observe the truth of the Buddha. In Asian and Eastern traditions religious experiences are mediated by rituals including sound meditations. This tradition emphasizes chanting mantras as a form of meditation. The experience of attending a Shingon temple and a Shinto shrine is a series of rituals mediated by sound and senses. Pilgrimage on foot with jingling bells and walking stick reminds you of the contemplative journey. Pilgrimage brings you to the base of a mountainside, stream, or other revered natural landscapes on the periphery of towns. Crossing over a threshold and through gate you arrive within an enclosed complex. Water cleanses the mouth and hands. You announce your arrival with a belltower. Lighting a candle represents your life light burning, you ignite three incense sticks for your past, present, and future. Ascending the pathway to the temples you recite mantras on the exterior porch of the Shingon temple or ring a rope-bell and clap at Shinto shrines. You present your wish to the spirit of the place in a moment of silence. You descend to a rest spot or the clerk hall. From this courtyard rest spots I would draw, paint, mediate, and observe. The soundscape of this experience happens in a rhythmic complex, you hear the arrival and performance of new pilgrims cycling through. These spaces become alive with ritual performance of the visitors.

Following the trip and during this thesis process I began to reflect on those places and my personal experience that was captivating and insightful. In this way I am continuing to develop an autobiographical approach to design. I allowed myself to continue mindful observation of place as a source of design inspiration in the Puget Sound area. The trip reinforced an idea that create a restorative refuges are places that allows time to connect with the momentary, seasonal, and communal qualities.

Key Observations:

"Gardening the senses". Architecture is seeking to frame nature. This can be clearly felt in traditional buildings that open up to adjacent gardens and in the layout of temple complexes. [Ryoan-ji, Kochi Makino Botanical Gardens, among others] Contemporary Japanese architecture continues this tradition by heightening the sense of a natural phenomena. Design priority was given to expression of living landscape and moving materials.

Pilgrimage and Japanese temples are intrinsically landscape based experiences. Architecture honors the proximity to sacred nature. It is not about select interiors to a holy house but paying respect to the divinity already present and alive [Shikoku 88 temple trail, Kumano Kodo]

Architecture is an multi-sensory instrument. Materials, form, and engineering can simply amplify a natural phenomena for pleasure and wonder. [Art Biotope Water Garden, Inujima Art Museum, Teshima Art Museum, among others]

Timing, repetition, and rhythm are necessary to settle into one spot and observe the life there. Rest stops allow for spending time as a visitor on the grounds. [Shikoku 88 temple trail,]

The ritual atmosphere of the place impacts the mood. The respectfulness of people to other's experience make the mood [Koyasan Okunoin, Teshima Art Museum]

Natural soundscapes are part of garden-making and ecological design. Soundscapes shape a sense of retreat, tranquility, and therapeutic memory of familiar places. [Shikoku 88 temple trail,]

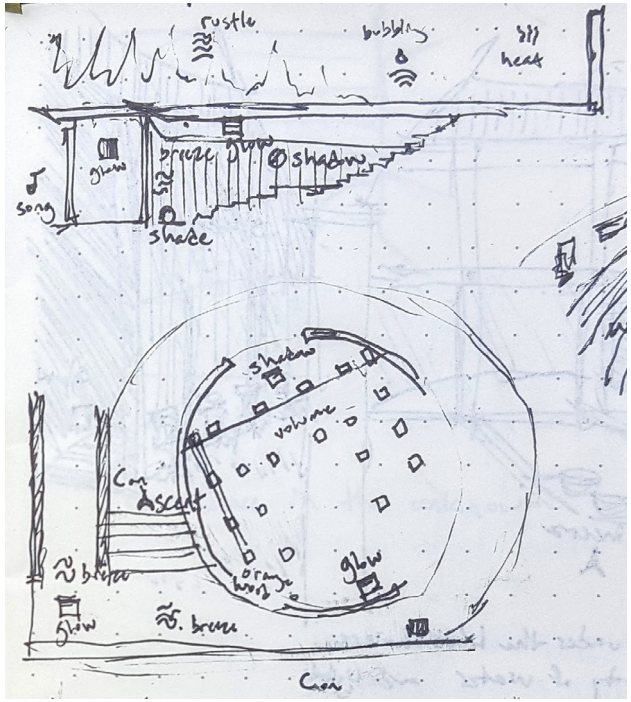


Figure 3.4 Awaji Water Temple sketch. Annotations of moving materials that animated the architecture

Figure 3.5 Teshima Art Museum sketch. Silence, echoes of surface water, nature coming in and going out, no cameras.

Figure 3.6 Contemplative gardens and land art share similar connections. The first being a special scale of time and space. The second being pilgrimage to special grounds.

"In they're meditative clarity the works of land art and Japanese meditation gardens of Zen, despite their very different cultural backgrounds are quite similar. Endeavoring to achieve expressive simplicity is still today a central concern for many outstanding artists and Landscape Architects and characterizes their work" [1]

From the 1970's onward remotely located land art projects provided retreat locations of contemplation for pilgrims of art and landscape.[2] Projects aesthetically evolved the static materiality of modernist sculptures and landscape design. Designing landscape as the sculptural medium was used to reveal a natural process of climate. Aesthetics challenged sensibilities of representational art, static landscape design, and "natural" places. Land Art embraced forms of site-specific dialogues with the site ecology. These projects from the 1970's are predominantly located in the rural lands of the American Southwest, and Midwest regions. In reality these projects exist on former indigenous tribal land after Euro-American colonial settlement and establishment of the reservation system. Predominantly white male artists, with New York City art foundation funding, traveled to these rural locations for artistic freedom and rebellion from urban gallery art. Out of their conceptual land art works came directions for modern landscape design to reclaim derelict urban industrial sites for contemplation of contemporary issues. Exploring conceptual narratives fueled the early movement which transitioned into more ephemeral Environmental Art and functional Ecological Art.

The remoteness of land art projects complements their sense of retreat and physical separation from the attention and velocity of urban life. Without pilgrimage the only way to "see" them was in static representations in galleries, in print, or on the internet. The way Land Art is represented is by a privileged view. Photography represented land art in one sense because the work was vast in scale and the projects were so remote.

Particular perspectives capture the scale and ephemeral quality of the artwork melding into the composition of the landscape. This is similar to observing the Zen garden from a vantage point that sets the garden scene within a wider field and conversation. Similarly land art and Zen gardens abstractly reference the archetypes and characteristics of their locality and microclimate. Their sensuous characteristics adds to the ritual experience of being in a special retreat which are qualities that representational media do not provide. Remote shrines, temples, and monasteries locate on the periphery of revered nature where the source of spirit resides. In contemporary America this may be exclusively outside of the city rather than on the edges of developments.

The minimalist material palette reinforces the garden relationships. Raw earthen forms reveal dynamic and temporal relationships. Artwork ages and weathers on a landscape scale of time. Observing the artwork, one sees the scenery. The layers of time are textured onto the landscape and the enduring transformation of nature is perceived. Land art performs similarly to Zen gardens as the material relationships become more characteristic and beautiful with age without implying direct messages about their forms. Interpretation of composition allows for the viewer to participate in the beauty. Embodied experience of land art engages a particular phenomenological sense of the earth. [3] Sculpted landscapes engage a shifting scale between viewer and artwork in a kind of live choreography. In the meditation garden we look into the space from a rested position to clear the mind over time. In the stroll garden, walking and rest choreographs attention to the rhythms of place over time. Could we begin to think about earthworks and land art in a similar fashion? The vast scale of landscape facilitates contemplation and appreciation of a deeper sense of time. Walking across vast sculptures offers time for introspection, retreat, and bound experience. The potential to observe from multiple vantage points offers views into the contemplative space but one never physically reaches their destination. Just like the Zen gardens these projects are portals in which to observe nature and better understand our relationships as part of nature.

Figure 3.7 Teshima Art Museum. The shell building is a framing device for the forest and sky

Figure 3.8 Art Biotope Water Garden. Irregular ponds reflect transplanted woodland trees in an elevated field

Figure 3.9 Shikoku Mura fountain. Sculpting movement around water flow

Figure 3.10 Morris Untitled Pit #30 The berms descend as the horizon extends

Figure 3.11 Morris Untitled Pit #30 Wetland. The sculpture resist yet nurtures emerging wetland habitat

"What marks art off from all other organized human activity, is that it does not seek control through explanation, that it offers the freedom to experience and question." [4]

For artists like Robert Smithson the intention was not to capture the pristine beauty of nature but to reveal the depleted realness caused by humans over time and natural entropy [5] In his writing Smithson held a nuanced opinion about the role of landscape artist to engage the spiritual dimension of practice. "Spiritualism widens the split between man and nature. The farmer's, miner's, or artist's treatment of the land depends on how aware he is of himself as nature." [6] Smithson died before he began the next phase of his practice, to reclaim post-industrial degraded sites for regenerative earth and water systems .[7] His following conceptual work "Twisting Tails" in Utah would have developed a four-tiered detention pond system in a form mining quarry. [8] Robert Morris created this untitled earthwork in 1979 from the remains of a 3.7 acre former quarry gravel pit in Kent, near Seattle as part of a project known as "Earthworks: Land Reclamation as Sculpture". (Figure 3.9) Organized by the King County Arts Commission the project invited seven artists to propose artworks for degraded sites in the local area. Herbert Bayer's design of the storm-water detention earthworks outside of metropolitan Seattle in Kent was part of the initial seven projects. Morris was invited to implement his proposal as a first demonstration. [9] Herbert Bayer's Mill Creek Canyon Earthwork later followed. These first wave and celebrated "earthwork" artists aimed to make post-industrial derelict sites to "land reclamation". Their focal point was reimagining how artworks in and of land material would offer a different scale and experience of art. Yet these artists stop short of ecological function. The Spiral Jetty in Salt Lake is affixing minerals and is only periodically accessible during drought conditions. The Morris Untitled pit #30 in Kent, Washington, continues to be preserved in its original form despites the forces over time that evolve the pit as a wetland habitat.(Figure 3.10)

Contemporary landscape architects George Hargraves, Michael Van Vakenburgh, Kathryn Gustafson among others have engaged with sculpting land art for increased ecological function. [10] These designers engage with the dynamic flow of water into the site during heavy inundation periods, altering the park dramatically and accepting natural process as part of the sculpting of the park. American and European professional design have continued to weave the material of water into the narrative and experience of public spaces and integrated buildings. [11] [12]

Environmental and ecologic artists and designers, particularly women, from the 1990's onward have engaged with land as sculptural form for ecological performance and social engagement. Lucy Lippard in Overlay details how feminine conceptual art has and continues to embrace a generative exploration of nature. Land art evolved into environmental and ecological art by partnering with nature's capabilities to function amongst environmental degradation and polluted water quality. Michael Singer Studio incorporates contemplative garden into water recycling spaces that often provide wildlife habitat and reflection. [13] Nancy Holt Up and Under 1997 sculpts berms and aligns views with near and far natural elements. [14] Agnes Denes sculpted a spiral forest sanctuary form in Finland on a former mining site. [15] Viet NGO - Devil's Lake Wastewater Treatment 1990 is a 58 acre snake form effigy that treats municipal wastewater in North Dakota. [16] Patricia Johanson - Ellis Creek Water Treatment Facility near San Francisco California combines floral forms with wastewater ponds. (Figure 3.11) [17] Jackie Brookner - Veden Taika (The Magic of Water) 2010 is the addition of habitat islands into wastewater treatment ponds in Finland. [18] Locally Waterworks Gardens by artist Lorna Jordan and landscape architecture firm Jones & Jones, creates a reflection pond stormwater treatment park near the Black River, Renton, Washington. [19] Brightwater Park is a wastewater treatment facility with restoration woodland mounds and surrounding stormwater infiltration ponds by Hargraves and Associates.[20] As water infrastructure projects embrace complexity and adaptive management of natural systems, land art can learn from those waterways and guide people within those processes.

Figure 3.12 Patricia Johanson - Ellis Creek Water Treatment Facility [1]

Figure 3.13 Lorna Jordan Waterworks Garden. Path sails among red alder and willow wetland ponds.

Figure 3.14 Enoura observatory. Architectural framing of solar alignments

Figure 3.15 Kumano Kudo stabilization. Reinforcement against future landslides

As land art frames space and time, it reveals the dynamic qualities of the biogregion. Noting the intended design similarities between Zen gardens and Land Art projects, we see how thematically relate. They offer a place for personal reflection while providing a reading of a natural environment. While artists in the land art movement engaged environmental form through land reclamation projects, they were not designing for ecological function or regeneration. Exploration of post-industrial and environmentally degraded sites were the foundation of the artworks. In their reclamation artworks could offer experiences of contemplation about site, a still important focus for contemporary landscape architecture in the anthropocene. Influenced by these early works landscape architects and designers have evolved earthworks, land art, and environmental art by revealing the overlooked ecologic potential of urban industrial and post-industrial public spaces. The land art movement influenced Modern landscape architecture aesthetics, yet has not culturally embraced the ritual aspects that accompany prehistoric land art and contemplative gardens. In Buddhist gardens, monks tend to the orderly maintenance of the purity of the garden, as part of their meditative practice. Native American effigy mounds and modern effigy earthworks are performance spaces for ritual connection between self and the animus of the landscape. [21]Modern western public parks are considered for their recreational and leisurely value rather than sacred, ceremonial, or mystic places. Compared to the ritual activity of pilgrimage sites, parks and modern landscapes lack a co-creation and participatory ritual process. Additionally Lippard points out that contemporary art best looks to the past for formal and emotive models but to the future for social needs. “Both art and religion were once inseparable aspects of collective life… we now “take refuge in art” rather than finding in it an “expression of life”. [22] In the creation of modern contemplation gardens, especially of water systems, we might explore how ancient and evolving American and Western cultures did and can integrate history, ecological function, and cultural performance. [23]

Figure 3.14 Entsuji Temple Garden. Zen rock garden flowing across moss ground and borrowed scenery of building columns, cedars, and mountain

Chapter 3 - Meditation Gardens and Environmental Art

endnotes

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Contemplative Design Framework

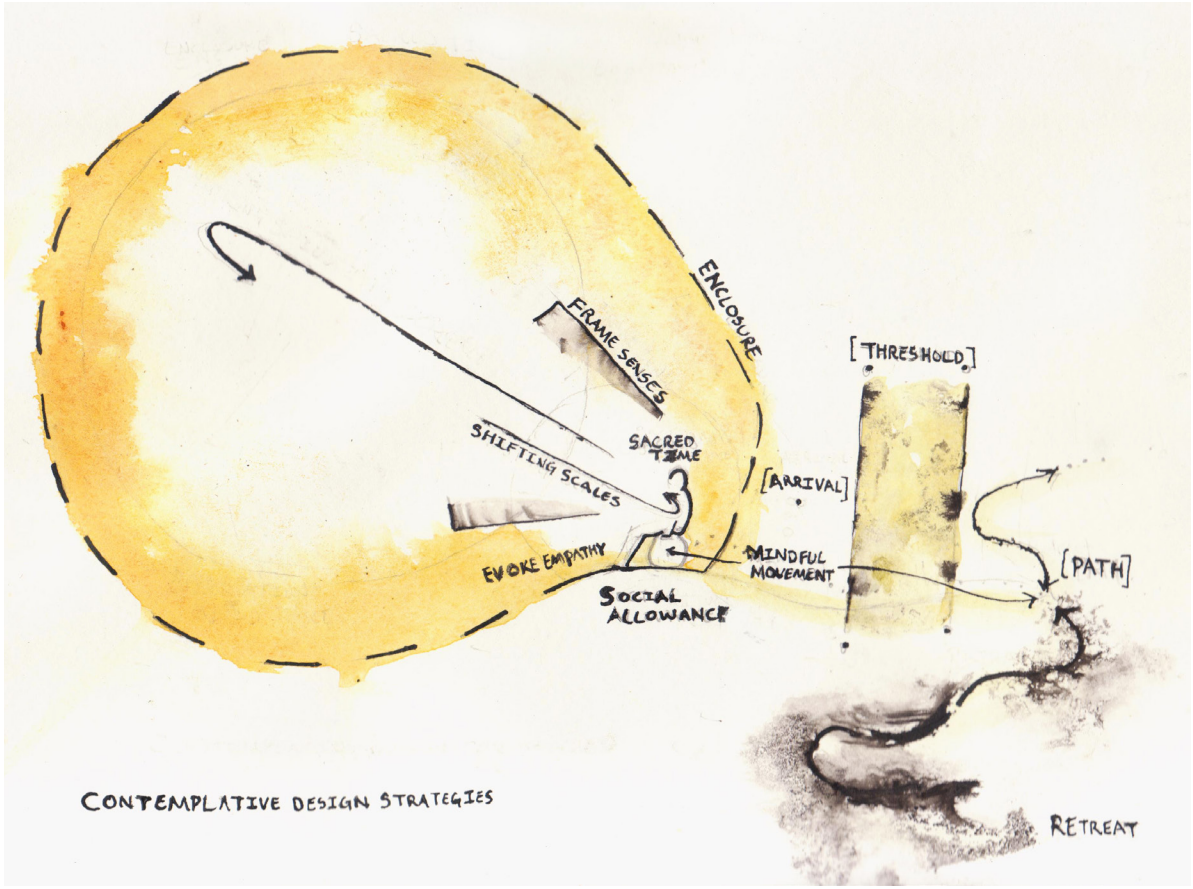

Figure 4.1 Contemplative Design Framework diagram. This diagram summarizes a set of experiential elements and spatial strategies to design a place for contemplation

My methodology included synthesizing existing research on the contemplative with adjacent writing on meditative, transcendental, and sacred landscapes. Combing my personal observations with the research I developed a contemplative design framework of spatial strategies and experiential elements. These contemplative design strategies offer a framework for approaching the design of a place for contemplation. The framework focuses on ways design creates a choreography of experience. "Slow spots" or rest points along the choreography provide opportunities for meditation in the landscape. Contemplative spaces are located away from attention draining environments. Instead, casting attention out into a void space invites an intimate experience of place. Intimacy and familiarity with landscapes encourages a relationship between emotion, memory, and place. These experiences can have a lasting impression and be remembered when visiting other landscapes.

Retreat : a sense of being away

Rebecca Krinke describes a "sense of separation" as being essential to the choreography of the contemplative experience. Places of contemplation differ from the everyday experience and invite more awareness of worlds beyond the everyday. A.T. Mann describes the primal role gardens serve as the liminal place for people between cultural experience and nature. Locating the contemplative space helps to create a formal and ritual sequence away from the everyday. Singer ponders how ecological infrastructure itself can serve as the special "get-away" space. The journey to the specially located contemplative slow spot is an extrinsically self-motivated discovery and accomplishment. This is part of the pilgrimage experience and what Kaplan describes as "compatibility". Sacred landscapes are retreat areas of special and revered natural wonders. Temples, shrines, and sacred grounds reside remotely at the source or flow of a natural energy, like a mountain, river, or cave. Barrie describes how landscape archetypes influence the form of sacred architecture that seek to bring the experience of the landscape archetype into ritual retreats.

Figure 4.2 Retreat. Spaces separate the special from the everyday. Thresholds create the sense of being away somewhere else in the contemplative space

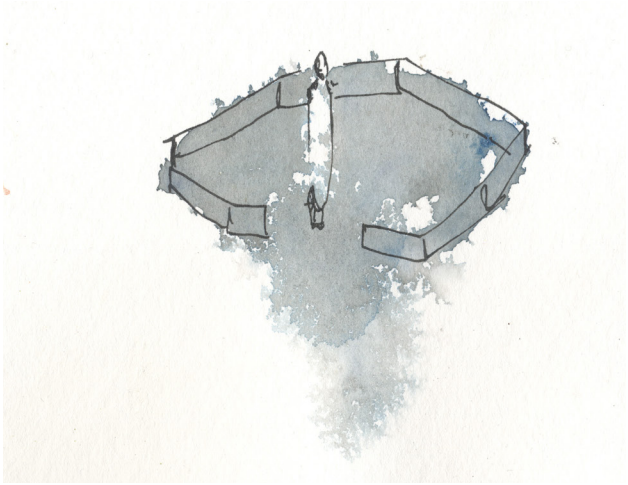

Figure 4.3 Enclosure. Defines and reinforces cleared space for contemplation

Bound Enclosure : security, definition, and immersion

Krinke argues that the typology of an enclosed garden provides a sense of security, privacy, and protection. A dedicated enclosed space certainly gives the potential for the individual to reach intimate, soft, and deep emotions away from social expectations. Olszewska finds that landscapes that span into naturalistic void spaces are preferred to confined or self referential courtyards. Japanese garden techniques of borrowed scenery allow for enclosed courtyards to extend attention beyond to living landscape elements. Bound spaces delineate a special place from otherwise everyday spaces. Singer describes how our post-modern spaces lack a definition that erodes potential for a reserved spot for well-being. Barrie compares religious enclosures of the cloister Monastery, Zen garden temple, Courtyard plaza mosques. These historic models bring attention inward to the individual. Through space, form, proportion, material, and choreography the designer can create drama in arriving at the special space.

Musko, Barrie, Hermann reinforce that thresholds define the poetry of the space. Entry, arrival, departure, and exits are critical markers to a sense of reaching the special enclosed space. The enclosure may be physical walls or ecologies that define a threshold from everyday sensory environments, social expectations, and time awareness. Landform, path, and scenery define the experience of enclosures in traditional monasteries and temples were the spaces focus on an interior void space to contemplate.

Frame Senses : focus *attention to the senses*

By augmenting the sensory environment and phenomena the designer works to amplify the senses. Reducing overstimulation and understimulation, brings focus onto intended focal elements, like flower scents, rain on surface water, reverb concrete chambers. Architecture, instruments, and bodily movement shapes the experience of material ecologies. Sambuichi and Nakamura describe their intention for architecture to heighten people's awareness of the landscape and its living materials, ultimately blending in as an expression of landscape ecology . Singer, like other environmental and land artists, position their artwork to frame attention to the surrounding world and nature as a process more than the static art object itself. Designing for particular senses at the human scale creates opportunities to make memories within the space.

Figure 4.4 Senses. Sensory elements provide the texture and memorable experience of place

Figure 4.5 Scale. Scale brings attention outward from the individual into the microcosm or macrocosm

Shift Scales : *contrasting the big and small*

By setting relationships between the immediate and the wider infinite, there is opportunity to shift the sense of the person being part of a larger world. Masuno expands on Zen garden traditions of miniaturizing regional wild landscapes into compact naturalistic garden scenes at the human scale. The imagination fusing climatic events, surrounding environments, and natural change together. Scales start a dialogue between garden and environment, microcosm and macrocosm. Krinke supposes that the sense of untouched nature, "wilderness", activates a contemplative landscape and reflection, in essence because there is a non-human focus. Treib, Beardsley, Hermann, and Bermudez argue the success of finite defined space is their capacity to frame attention onward into the infinite, immaterial, and transcendental scales. Singer reminds us that contemplative spaces are multilayered, concealing and revealing which invites questions. Sambuichi talks about how architectural framing of moving materiality is an expression of the landscape climate that brings awareness into the landscape scale.

Mindful Movement : rhythm of motion and rest

Bringing awareness to how the body is feeling is a central objective of meditation. Pilgrimage encompasses mindful movement as one sets out intentions for their journey. Walking is a method of meditation and awareness. Walking a loop creates a sequence of arrival, journey, and return. Punctuated along the journey can be rest spots for seated meditation. Rest spots invite spending time in one location to survey the area, shifting attention from the body into the landscape. Japanese stroll gardens capture the drama of moving between thematic areas. Masuno describes how pathways hide and reveal glimpses of the stroll garden while meditation gardens are constructed with privileged views from a seated spot. Barrie elaborates on "path as place, place as path, and path as path" where the physical path can be a metaphor for the spiritual journey.

Figure 4.6 Mindful movement and rest bring attention back to the body and the sensory environment.

Evoke Empathy : *resonate with life of place*

Figure 4.7 Evoke empathy allows for awe, fascination, and curiosity to bring attention outward into another being

The power of therapeutic gardens is that the vegetation and composition can "take you somewhere". Ulrich, Parsons, Kaplan, and Krinke offer that plant life is significant to bringing your attention out of your thought patterns and into the fascination of gardens. This emotional movement can be uplifting in the present and be recalled in the memory. Krinke and Olszewska suggest that the composition of vegetation to remind of bioregional archetypes are potent. Exploring bioregional archetypes, like waterfall, grove, clearing, meadow, etc, could connect restoration ecology with contemplative and therapeutic landscapes. Singer emphasizes we are looking "into" the landscape rather than "at" the landscape. Musko and Masuno both suggest that the meditation garden should start a contemplative dialogue but not finish it. The viewer completes the space with their level of intrigue, participation, and wonder. Musko describes the contemplative design strategy of aligning the poetry of the space with an intended emotion the space could invite (awe, calm, curiosity).

Phenomena, weather, and climate conjure an atmosphere that communicates on an emotional level. Garden, art, and place frames the process of growth and decay over time. Kaplan describes how immersion in natural retreat allows for reconnecting with your sense of self and self-care. Additionally the concept of forest bathing encourages mindfulness with mature ecosystems. Singer aspires for contemplative spaces to give people a sense of something recognizable about being human. Attention and participation with seasonal color, texture, and growth can help people relate with "where they are" on an emotional level.

Social Allowance : inward attention is allowed

Inward attention is allowed through rituals (such as a chanting, meditation, silence) or through consideration. In religious and formal settings there are social expectations not to interrupt or distract from the ritual events. Ritual silence can be a powerful experience of place. Architectural acoustics can create a reverberating space that amplifies and discourages movement, conversation, and distraction. The experience of listening to the ceremony, ritual, or song of a space without human language allows for a soft focus and a personal sense of time. Krinke points out that group dynamics naturally incentivize people to interact, so contemplative spaces can be design to encourage individually-scaled entries, path, and rest stops for personal observation. With digital technology social allowance would include electronic device free zones that could accidentally interrupt the restorative experience.

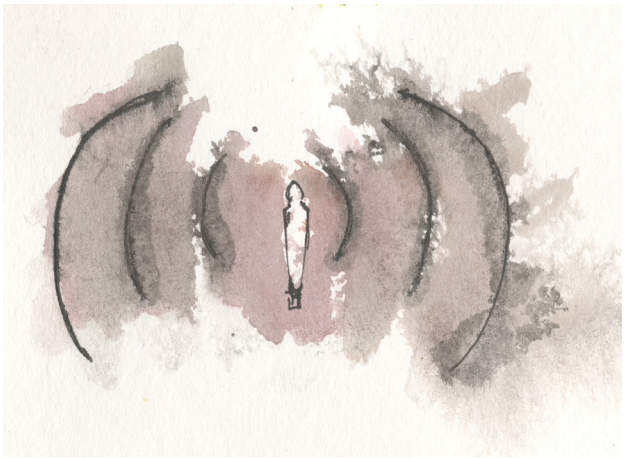

Figure 4.8 Social allowance provides the space and time for a personal experience uninterrupted by distractions

Ritual Exchange : marking event of our experience

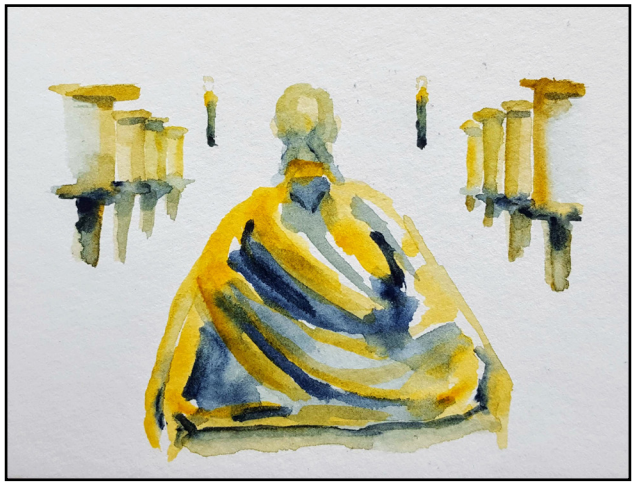

Figure 4.9 Rituals allow people agency in how they spend their time and attend to themselves

Rituals allow people to clear and claim a space for an intended use. In secular culture of public parks common rituals may be recreation, leisure, that align with a time of day. Krinke describes how architectural choreography creates a ritual of removing the visitor from everyday activity and perception to enter into the contemplative center. Pilgrimage is a ritual journey and mentally focuses the individual of connection to the present and place. Restricting access and inhabitation of a space mentally and physically can create ritual spaces across different times of the day. Balancing reward and frustration in secular spaces. Krinke also describes the benefits of ritual participation through reflective writing. Through co-creation and participation the person can create a meaningful personal experience within the space, creating associations of sanctuary. Singer approaches secular urban infrastructure projects as opportunities to educate and encourage positive change with human-nature interactions. Barrie illuminates the power of words, concepts, and the media of architecture to fuse with personal intentions to produce a space that nurtures personal growth and mediation in sacred spaces.

Sacred Time : time boundaries meld away

Time is a critical dimension of the contemplative experience. A slow, steady, calm environment allows us to lose our sense of time in a meditative state of mind. The choreography of immersion combines place and identity for a moment. Continual time investment in places reveal fresh nuances, changes, and seasonal signals. Places that charm us invite us to revisit and appreciate of a relationship of self and place. The contemplative can be a momentary experience for a visitor but becomes more appreciable the time a resident spends in relationship with that place. The scale of time is texture and age layers of nature. Textures communicate a maturity beyond the human sense of time. The ephemeral yet immaterial composition captivates. Time in contemplative settings are special because they are different from everyday expectations of time. Slowing down and settling is needed to unpack nature, self, and place. Observation spots eroding distinctions between observer and observed. This brings more awareness and appreciation between the "outside" environment and the "inside" person.

Singer, Lippard, and Beardsley describe how gardens, sculpture, and architecture can be designed to frame time, as growth and decay. One strategy of Japanese gardens is to create a longer span of time in one spot through interests and depth in planting, form, and meaning. The fullness of the garden relationships holds attention and increase the amount time spent in one spot. Considering that attention and meditation takes time to slow down and reconnect with ourselves a place should be inviting and facilitate a lengthy stay with resting spots. Rest areas, pause points, and rhythmic choreography all allow for the individual to invest time in one place through different experiences. These places to observe ourselves and the environment can be considered "slow spots". These slow spots position a place for continual observation of natural change over time.

Figure 4.10 Sacred Time allows people to grow into themselves and appreciate that growth over time

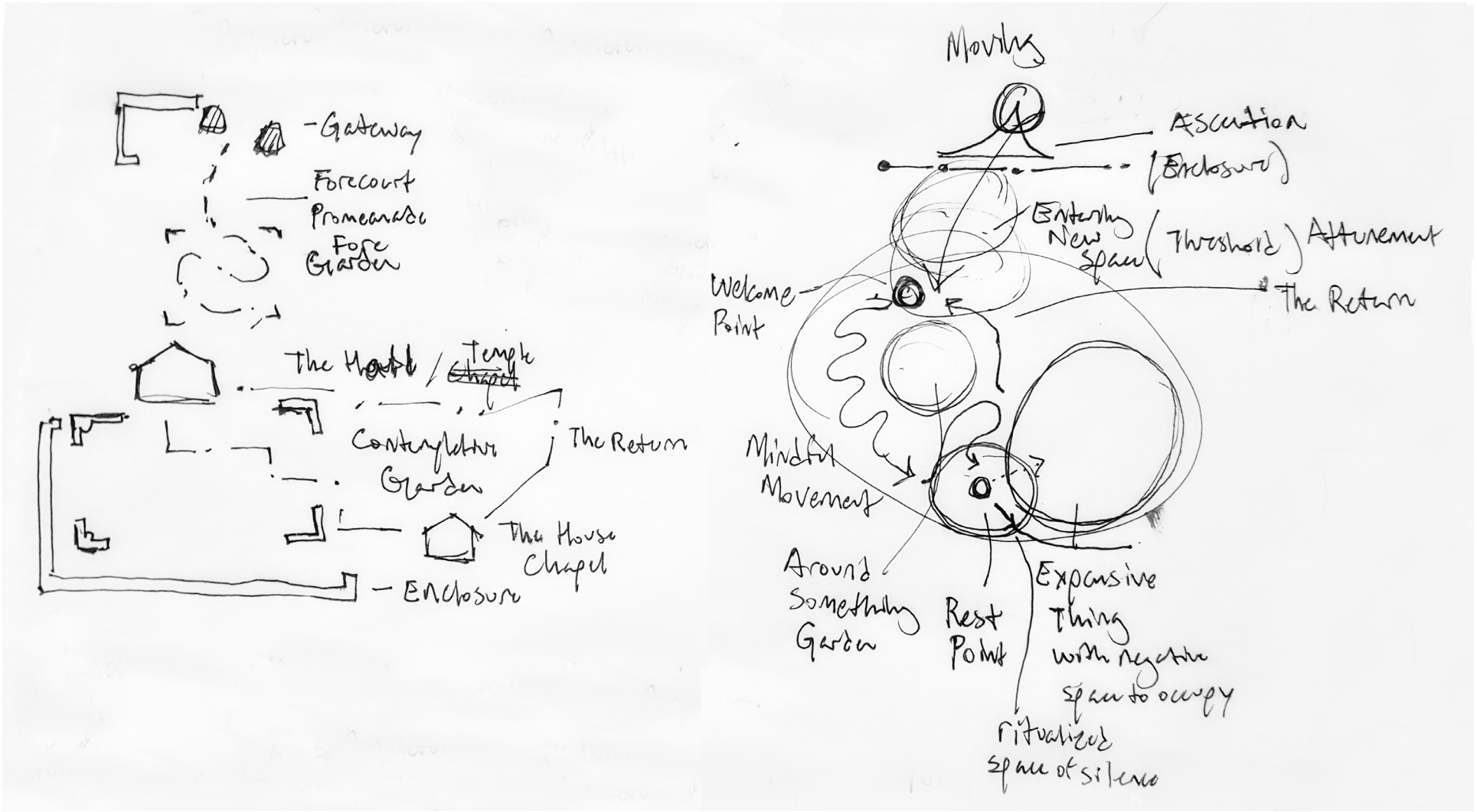

Figure 4.11 Spatial Strategies. Diagramming the spatial journey and experience of Japanese temple landscape design. Choreography of path, threshold, arrival create the journey to the rested contemplative void space.

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[14] "By "transcendent" they mean considerations associated not only with the sacred or metaphysical, but ones also facilitate human health and well-being, caring for the environment, and other beings, and nurturing interpersonal connection and community" Barrie, Thomas, and Bermudez, Julio. Architecture, Culture, and Spirituality. Taylor and Francis, 2016. pp 4

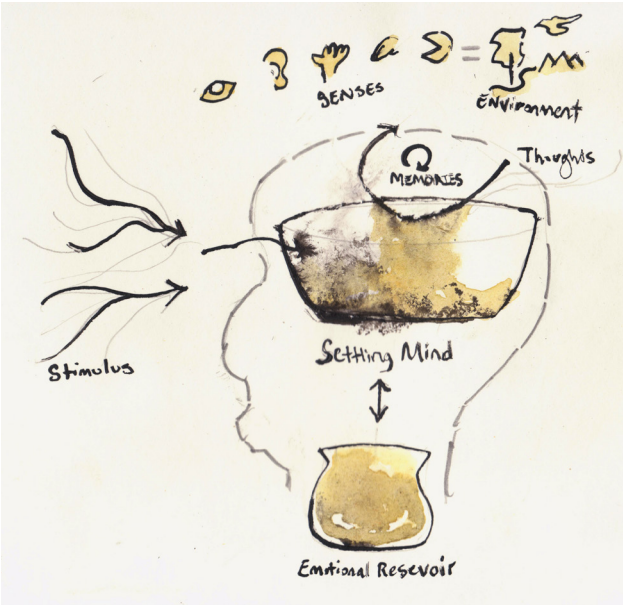


Figure 5.1 Sensory Materials. The material ecologies of place design shapes the stimulus of the senses. Heightened sensory elements become attention focusing elements to help settle the mind. The clear mind and sensory experience help affix a memory of place with an emotional significance.

As designers and makers, we primarily work with material assemblies and impressions. Attention, meditation, and contemplation live at the intersection of how materials, space, and ecologies meld. Careful curiosity into multi-sensory materials can guide the making of a design and elicit a meditative atmosphere. Flowing water can take infinite forms with differing sound signatures. Fountain design and alluvial morphology offer insights into how water can be designed for particular soundscapes and visual presence. Moreover we can begin to think of the scales of water sculptures and buildings constructed like fountains for sound signatures.

Materiality in modernist and traditional architectural design is primarily focused on assigning material to premeditated form, in the structural and finished textures of a space. These kinds of materials are "static" or "unmoving". They are still aging in place, but within the architectural microclimate. Contemporary architects sensitive to landscape materials talk about "moving" or "living" materials as inspiration and determination of buildings. [1] Those materials combine senses, memory, and place, shaping our intuition of places. [2] Those materials become the life and animation of space, as buildings become instruments to amplify their presence. Architecture becomes an expression of the landscape when it reveals how we sense the material beauty of place.

Water itself is life, sacred, and we have a primal connection to it. It is a therapeutic and space shaping material that reaches our senses and we see its live presence in the landscape. Water is also a metaphor for the flow, settling, and clarity of the mind, emotions, and spirit. Giving name to the infinite permutations of water flow and the sound expression can provide materiality for particular atmospheres. Sound is an energetic language that expresses a point in time and a sense of place. Soundscapes as a material shapes our sense of space and the mood of the atmosphere. Soundscapes of white noise and fluid rhythm are background Sound in voice, story, song, create long-lasting memories of meaningful life experiences. Landscapes rich in ecological health communicate intimacy, tranquility, and resonance at an emotional level that connects our memories with place.

Sound markers invite and authorize ritual. Sound becomes meaningful by marking the phases of an event and the changing of the seasons. Whispers commemorate winter dormancy. Rustling canopy announces of fresh spring leaves. Insects chirp the summer horizon. Crunching unfolds over fall. Memories are formed through the sounds of the ecological seasons. Rich sensory experiences of place are characterized by soundscapes. Living landscape contains their own presence of "silence". [3]

Soundscapes are a sensual dimension of spiritual and mental health. The therapeutic and clarifying effect of natural soundscapes plays a critical role in meditation and restoration by becoming background rhythms. Sound dimension of space has an impact on learning, memory, and behavior. Sounds of the nature, body, breathing, and inner voice become familiar elements that can more swiftly enable one to reenter a meditative state of being. Construction of natural soundscapes becomes part of the materiality of the garden. [4] The addition of water into the garden invites more animal and playful life to follow. Animal and plant life grow the composition of the soundscape. This life invites moods, memories, and meditative moments.

The way we design the ecologic quality of gardens will have an effect on the restorative potential of the place. The therapeutic and clarifying effect of soundscapes should drive an outside-in design approach, starting with site realities as "borrowed scenery" using soundscape action tools to sculpt an inner sanctum. [5] Natural soundscapes and the fullness of natural features are a critical sensory component of a more focused, calm, and clear consciousness. [6] The mind is allowed to wander, listening in soft fascination to the moving sonic materials without directed mental energy. [7] Tranquil spaces can "take" us "somewhere" for a brief but attention resetting moment that can lead to reflection.[8] Contemplation gardens serve as vestibules, instruments, and portals for accessing a moment of sacred time through the naturalistic soundscape and memories it holds.

Soundscape Design

"Soundscape" typically refers to the collective sound of an environment, it is a term used by landscape architects and urban designers. [9] "Acoustic" typically refers to the physics of sound on form and material and "Aural" refers to the sound quality of a space, both are most frequently used by architects and interior designers. [10, 11] Soundscape design aims to create harmonious spaces with surrounding context. Urban soundscape design aims to mitigate taxing urban noise, provide tranquil ecological spaces for attention restoration, and create a "silent" sanctuary for contemplation. [12]

"Soundscape" is a concept of listening to the environment and therefore knowing a landscape through its sounds. The term originates with composer Murray Schafer's "Soundscape" concept from his book The Tuning of the World, 1977. Schafer was a Canadian classical composer who moved to a rural farmstead and began to observe the sonic character of the landscape. The rhythms of the seasonal ecology provided rich inspiration for his eco-mimicry compositions. Composed of all the energy sources present in the season of a space, as well as our relative position to perceiving them. Every place has a distinct sonic experience. We could also describe this soundscape as a sonic genius loci - sonic sensory elements of the spirits of that place. In this way we could consider ecological design as synonymous with soundscape design. In rural retreats the soundscape can be remarkably fuller, smoother, and soothing because of the additional scale of terrain, the absence of noise pollution, and abundance of other species. Although in urban environments unintentional assemblies of noise can tax, interrupt, and confine our senses. Attention disengages becomes "on-edge" and defensive to the intensive landscape. Landscape design efforts are being made towards the sense of an urban enclosed that space attracting liveliness or tranquility. [13]

Gunnar Cerwen is a Swedish researcher who has researched Swedish urban centers and Japanese gardens for the value of the soundscape on positive appreciation. He provides a set of landscape architecture design strategies for approaching soundscapes. These tools are conceptual yet practical ways to approach a desirable soundscape. His dissertation developed the Soundscape Action tools which are refined through continued workshops. Through workshops the naming of unique and localized sound features becomes design language for the garden. [14] The strategies are distinguished by the goals of 1) mitigating urban noise sources, 2) "masking" the noise with a competitive sound, and 3) creating desirable sounds. Cerwen illuminates how the materiality of traditional Japanese gardens creates acoustic thresholds that transport the visitor deeper into the garden sensory experience. Traditional techniques of earthen enclosure walls, vegetation masking and absorption, building material, location of gardens, water sound sculptures features, and observation path allow for a heighten sense of desirable restorative sounds. Japanese garden grow biota habitat that enrichs the senses. [15]

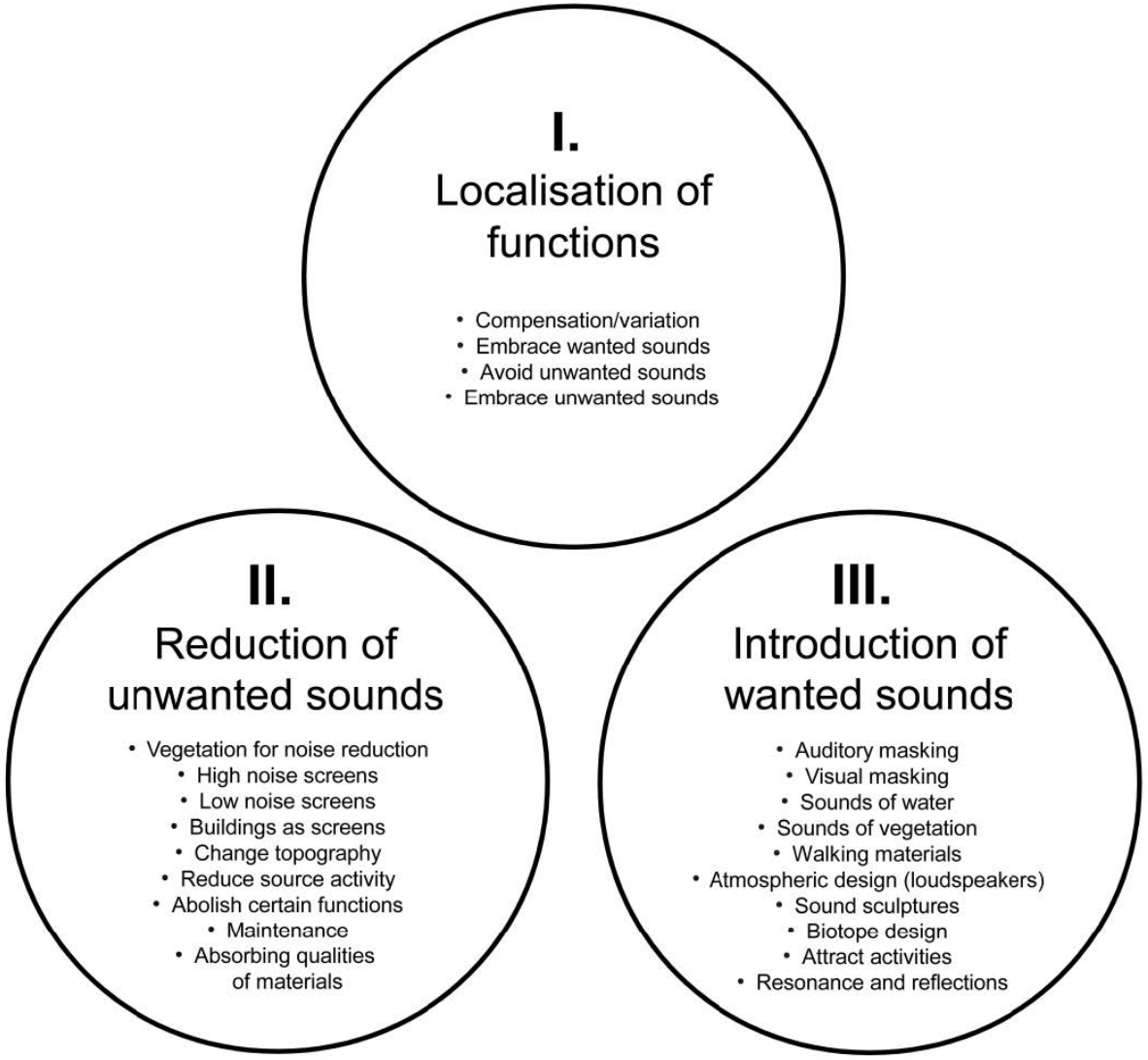


Figure 5.2 Cerwen. A Soundscape Action Tool [1]

Sound Physics and White Noise

Figure 5.3 Little Mashal Falls

Figure 5.4 Licton Spring culvert

White noise helps to create a rhythm and character that becomes a soft object of attention. White noise is the presence of the full frequency spectrum at once. Similar to how light, known as "white light", comprises all the colors in the spectrum, white noise contains the range of frequencies. Typically we do not hear white noise because certain sounds are missing from the environment. White noise can be composed from engineered soundscape recordings. [16] Natural soundscapes also produce a range of frequencies for white noise. Water features produce white noise through the diversity of water movements. Snoqualmie Falls waterfall and Little Mashal Falls waterfall produce an encompassing, surging white noise. Culverts from Licton Springs and Mill Creek Canyon Earthworks park also revealed the unintended white noise of urban water drainage infrastructure. Downspout and catch basins also reveal white noise of passing Seattle wet weather.

Apfel gives principles of sound and acoustics to designers [17] Sound is a dynamic temporal dimension and shapes the perceived character of places. Sound, like water and light, radiates in waves. "Color harmonization is spatial, aural harmonization is temporal". Sound wave forms are crest to valley to crest distance, known as wavelength. The cyclical wavelength interval between crest (beginning) and valley (end) is known as the frequency, measured in Hertz (Hz). In music this interval is also known as the pitch. Sounds can be considered like the movement of water with an object moving up and down vertically. The vertical movement generates waves. Lower frequency = shorter wavelengths. Higher frequency = longer wavelength. Sound is carried through a medium, usually air. Wavelengths are understood to move at 1100 feet per second at 70 deg F. Lower frequency wavelengths travel farther, because they do not expend their energy as quickly over distance. Conversely higher frequency wave lengths travel a shorter distance, expending their energy quickly over distance. In water the movement is 4921.26 feet per second, nearly five times the speed in air. Humans perceive rumbles as low as 20 Hz and squeaks as high as 20,000 Hz. Our greatest speech perception range is 500 - 3000 Hz.

One of the primary goals for a contemplative place is to be able to notice the sounds within it. Urban noise must first be mitigated for a restorative space to emerge. [18] Sound is impacted by distance, medium, and barriers. [19] Earthen berms can be effective barriers. Sound from a point source spreads spherically and decays by 6 dB with each doubling of the distance from the source. But sound in a line source spreads cylindrically and decays by 3 dB per distance doubling, making traffic noise more difficult to diffuse. Barriers are most effective at the noise source or at the listening point. Barriers must be impervious, dense, with enough mass that disturbing sounds cannot bend over them. Building layouts and geometry as well should be designed to prevent trapping unwanted sound. Trees and plants are generally inadequate barriers although woody mass blocks at the listening point and masks with vegetative movement. Observed at the Bloedel Reserve, Weeping Willow pond, being behind a row of three 3′ diameter conifer tree trunks blocked a shallow waterfall sound across the pond as I walked behind them.

Sound travels as wavelengths that bounces off of objects based on its mass and material. Objects larger than the wavelengths reflect the sound, while objects smaller than wavelengths pass the sound around. Sound reflections bounce off at the same angles as the incidence angle, the incoming angle. Soundwaves reflection trajectory corresponds to the geometry of the surface it bounces As demonstrated by a physics class project at the North Carolina State University Wolf Ears, parabolic curves are a concave shape and will reflect sound into a focus point. [20] In Wolf Ears a reciprocal relationship happens with the focus point projecting soft whispers across the lawn into the receiving person's ears. Concave forms of an enclosure would be a design strategy to direct soundwaves to a focused spot. Ritual silence can be created through architectural acoustics that amplify and reverberate soft movement. Observation of Gould Hall Stairs, St. Marks Cathedral, in Seattle and Tomba Emmanuelle in Oslo, and Teshima Art Museum, Japan revealed how architectural acoustics can amplify conversations and movement which influences how people behave in order for others to have a contemplative experience.

Puget Sound Liquid Language

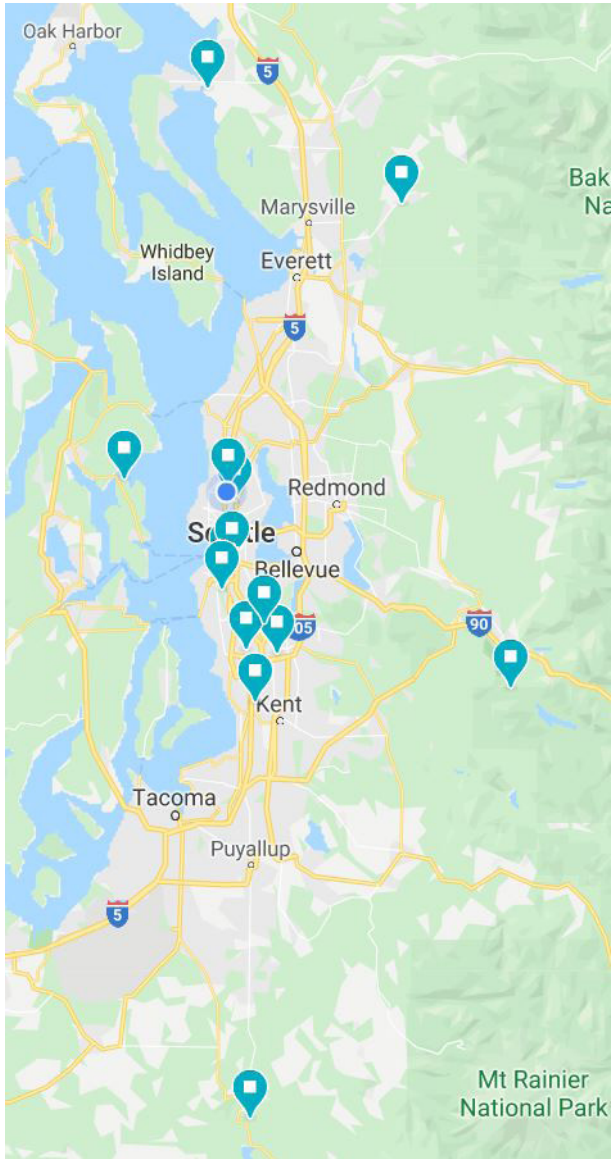


Figure 5.5 Puget Sound Case Studies [2]

Approaching the thesis design process I wanted to explore designing for contemplation and meditation. Which also meant supporting a methodology and process that branches from observation and reflection. Starting with design intentions of engaging a place for spiritual restoration as part of water infrastructure I began to observe water and its effects during the wet season in Puget Sound. This is what I call "Liquid Language". Observing details of water's movement, presence, and atmospheric effect in the landscape oriented my local case study approach. While the term "water" conjures certain imagery, water is always in fluid phases, transitioning and flowing. Some expressions are mist, droplets, creeks, streams, wetlands, falls, clouds, sea, puddles. These expressions are inherently ephemeral and fleeting, hence their beauty and mystique. But we also understand them through the time dimension, as the fluidity of water appears and disappears at varying rates of perception. So i began listening and observing the potential for water to conjure serendipity, curiosity, and wonder. How can the language of place speak to our sense of design?

These case studies display a range of ways water flows through the landscape. They served as places of observation and curiosity. The pacific northwest and the Puget Sound region is characterized by water in numerous phases and scales. Each case study revealed how water is experienced at two simultaneous scales: 1 - The landscape/garden scale illuminated how in the wet season vegetation glows and water horizons shift. 2 - The human/instrument scale illuminated how water marks thresholds of space through their radiant soundscapes. These field visits communicated how local climate can be a source of material design inspiration.

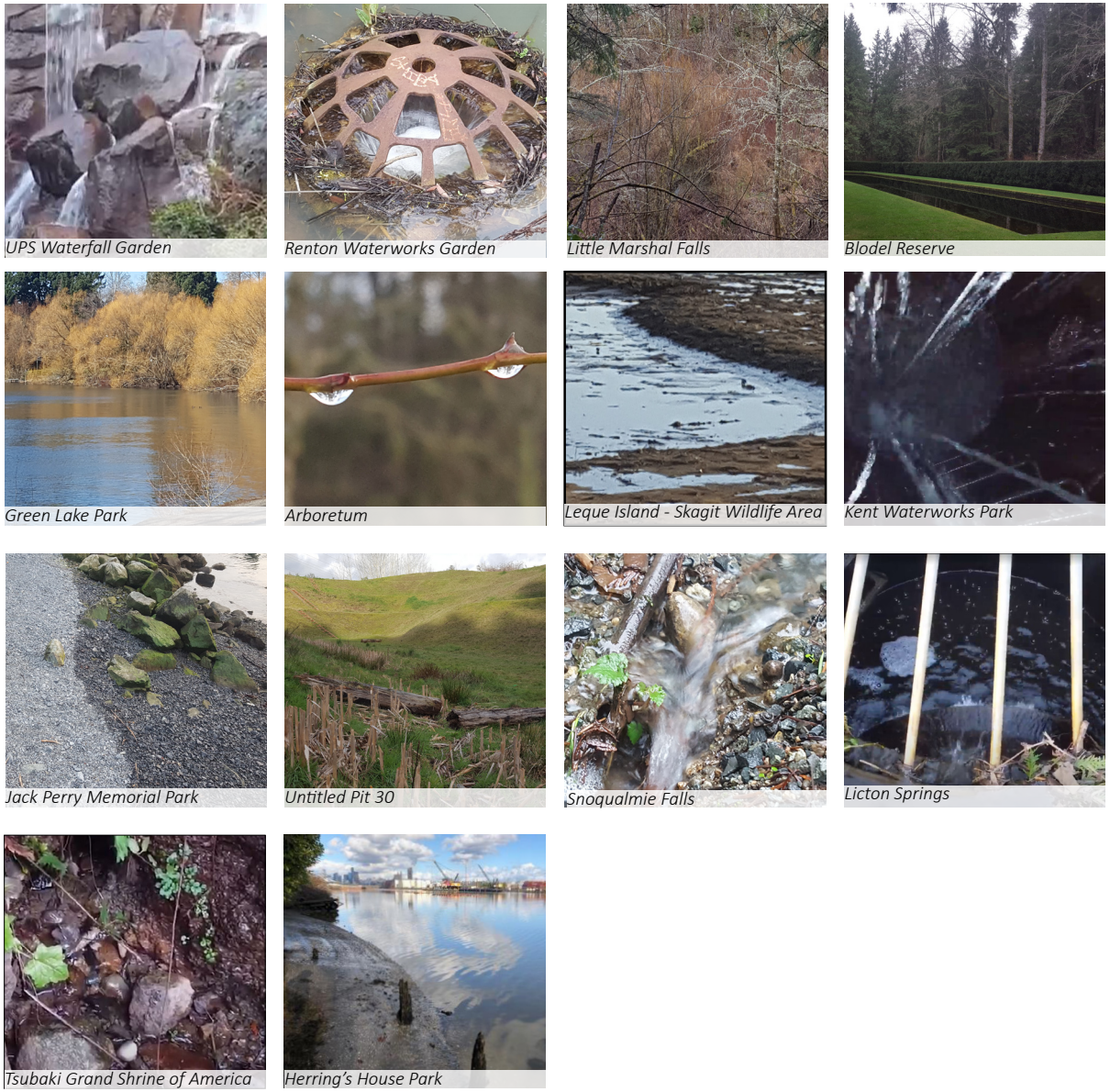


Figure 5.6 Puget Sound Case Studies Images

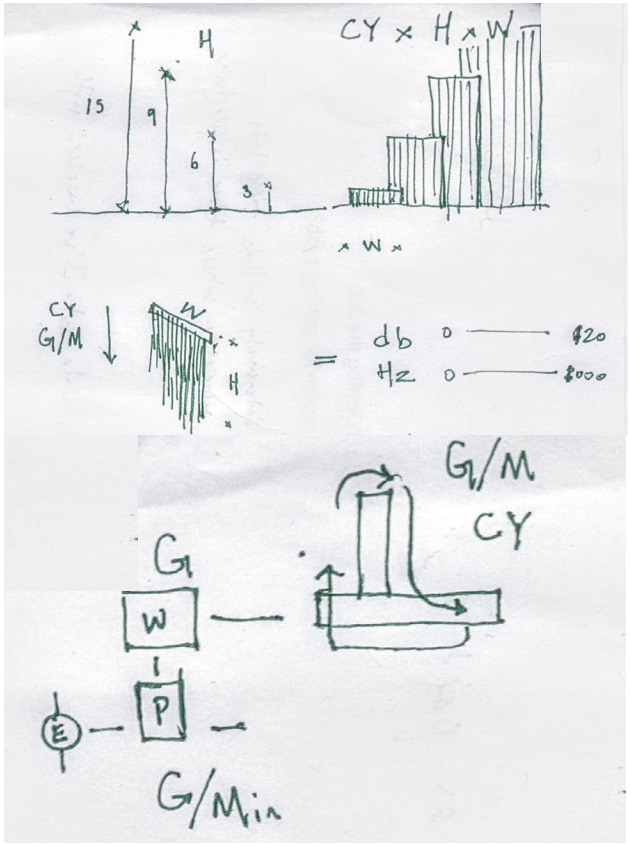


Figure 5.7 Water feature design parameters of volume, flow rate, fall height, flow head result in the water feature. The parameters shift based on the relationship between an pump, active material or weather, passive material.

At the periphery of the project was water feature design for meditative environments. Field observations showed that water features create the intimate soundscapes, therefore how water features are designed may aid in creating a restorative environment. The soundscape and sound art potential of water flow deserves to be further explored. A principal material study can include water, architectural materials, sound quality, and environmental acoustics. The potential for water flow and form studies can inform numerous outcomes: how utilitarian water conveyance can be turned into an acoustic event, building structures as water sculptures, and flow morphology for ecological habitats. [21]

Observation 1 : Flow dynamically creates an auditory and visual presence through its spatial characteristics that are shaped by the structural materials it flows across.
Observation 2 : Flow presence is in relationship with the environmental and architectural acoustics.

Primary takeaways of Ob.1. The form of fluid water is a complex morphic process. Flow "head" determines the shape of fall and flow. The shape of water flowing at the head is in relationship to the flow rate and volume, changing in intensity and shape with increases in flow and volume. While natural flows carried a steady speed their acoustic signatures remained similarly even, part of their merriment. Augmented flows, such as gutters of rain, overflowing catch basins, domestic sink flow, gave an ascending and descending presence because of their variable flow rates. The fall height is an interesting metric to observe in relationship to the shape of head and flow rates, as the fall height also determines the acoustic impact. Parameters for designing a fountain would incorporate volume, flow rates, surface tension, head shape, fall height, and catch basin form. [22]

Primary takeaways of Ob.2 Our architectural environments are always communicating to us in subtle and auditory language. Each space in its materiality and form has a different resonance and laden potential to evoke emotion. The water soundscapes I observed were primarily exterior environments. Because of the removal from industrial and mechanical noise these water soundscapes were more apparent as you crossed through their sonic threshold. In most cases their presence was not particularly amplified or framed in any "designed" sense. However because some were results of civil engineering with concrete culverts and basins, their presence was announced, amplified, and mutated. Each of these moments were most pronounced from a particular listening position relative to the listening chamber. Standing above a churning basin was muted yet spacious. Standing directly above a drop basin with multiple streams unlocked a particular character.

These two observations are in relationship. A playful study of the atmospheric effect of a water feature should be derived in unison with the acoustics of its presentation space, or even created out of the environmental space. Understanding the architecture of the space is essential to imaging the acoustic environment and how sound will behave. [23] Shaping water flow can be directed for particular soundscapes depending on the architectural microenvironment. Additionally because of the complexity of the water flow itself, numerous iterations of one object in one space will happen by playing with the design variables. This interconnected set of variables provides a playground to explore the differing expressions of water during its ascending and descending flow song. Additionally fabrication and experimenting with flow heads that dissect, braid, combine, streams of water fall would discover worlds of water morphology. Further exploration of resonate chambers would be interesting for combing deep and low sounds with fast and light flow sounds.

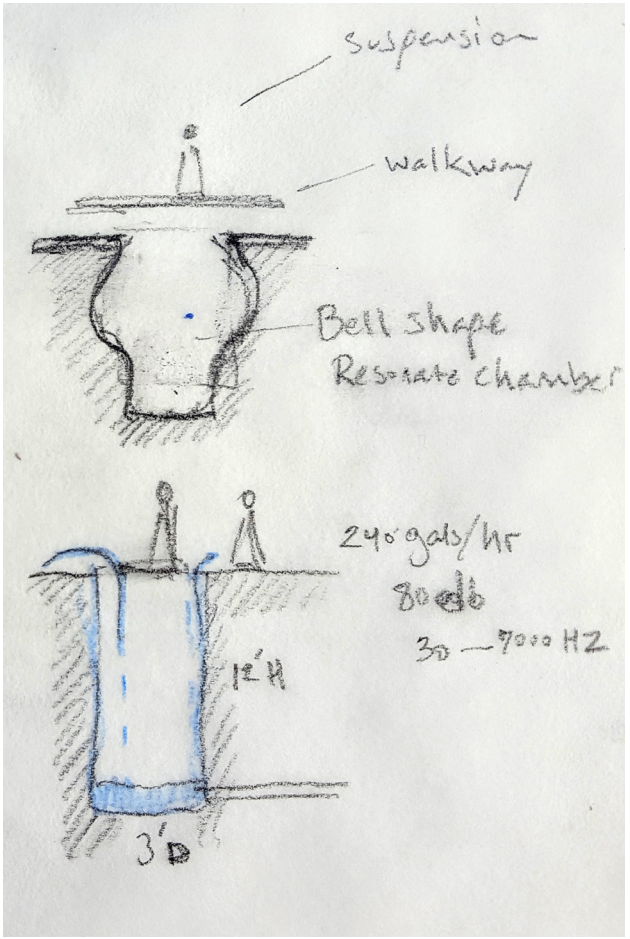
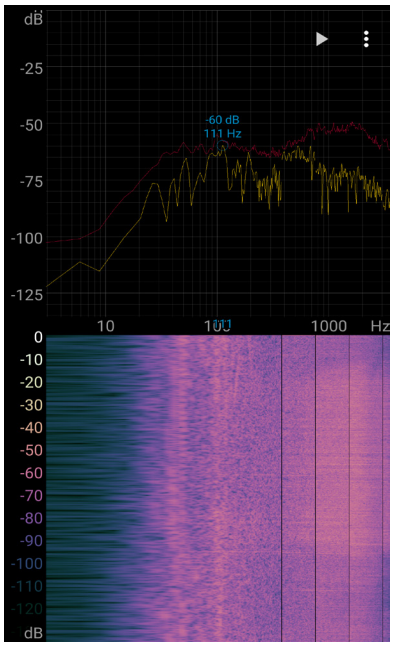


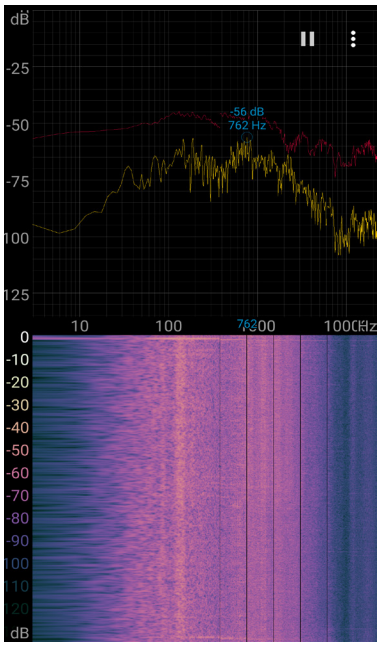
Figure 5.8 Water feature sculpture concept. Structures of water flow can be treated as "instruments" by their form, acoustic chamber, and embodied experience of them.

Snoqualmie Falls Trail



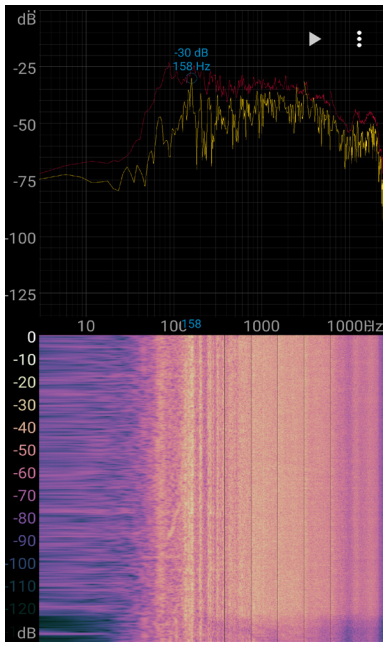
Fall Height :	< 3″
Flow Rate :	0.025 gal/min
Head :	0.5″ diameter
Chamber :	Forest floor
Sound Level :	- 45 dB
Frequency :	800 - 1300 hz
Character :	Soft, quiet, whisper

Sink Faucet



Fall Height :	6″
Flow Rate :	0.5 gal/min
Head :	0.5 ″ diameter
Chamber:	8 x 12 ‘ kitchen
Sound Level :	- 60 dB
Frequency :	100 - 3000 hz
Character :	Trickling, murmer,

Mill Creek Canyon Earthworks Park



Fall Height :	12′
Flow Rate :	20 gal/min
Head :	multi <0.5″ diameter
Chamber:	4′ diameter concrete cylinder
Sound Level :	- 75 dB
Frequency :	80 - 7000 hz
Character :	Roaring, churning

These examples give an indication of the relationship of the water flow and its environment to create a visual and acoustic signature. In my documenting of these raw and wild sources in the landscape I only reached an introductory level of exploration. My methods were literature research into water feature design and filming and audio spectrum recording of water flows in the landscape. Recordings were taken with a Samsung S6 smartphone using the Spectoid app for frequency spectrums and Sound Meter app for dB levels. Video recordings were taken with a Samsung S6 smartphone.

Further material studies could delve deeper into the relationship between water form and sound frequencies for meditative soundscapes. Observationally each soundscape created distinct frequencies ranges. Motor noise (traffic, airplanes, power tools) hovered around 100hz, and at higher db masking levels. Soft water flows touch on mid-ranges around 1000hz -/+, at softer background levels. Water flows within enclosed non-absorptive chambers captured a range of frequencies between 100 - 10000 -/+, with tremendous intensity of sound when directing over the linear source.

Figure 5.9 Field recordings range

Home scale water fountains with gutters allowed observing how wet weather creates sound sculptures. Catch basins were placed under downspouts and heard from inside adjacent windows. During rain events I could observe sound effects of droplets on a small pool of water. The airation of impact causes soft "trickling" sounds. Further material studies could isolate forms for a trickling sound sculpture as part of the architecture.

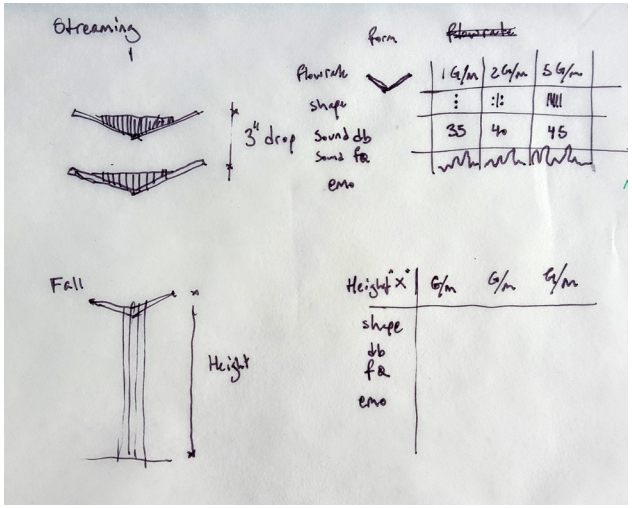
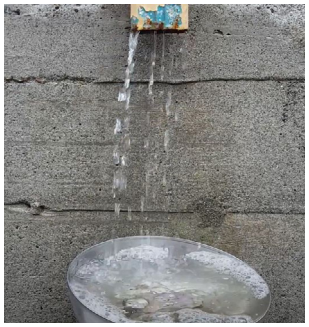
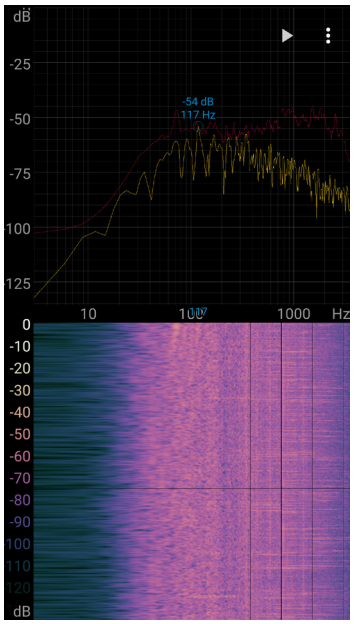
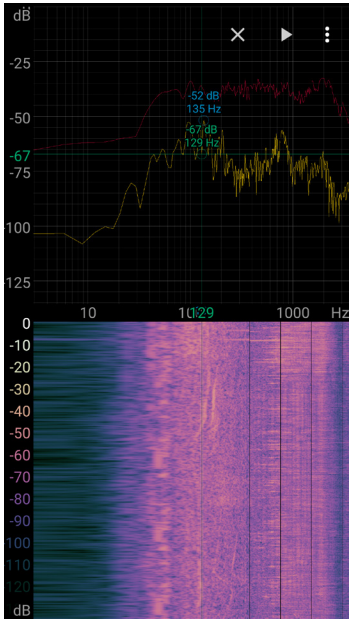
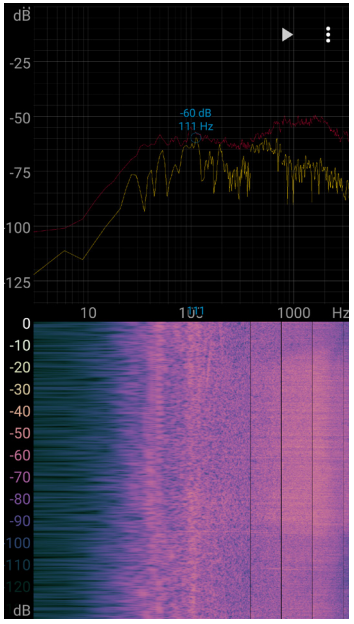


Figure 5.10 (Above) Sound sculpture design matrix concept. Study of how flow rate and form relate to head and sound
Figure 5.11 (Right) Field recordings range gutters









Fall Height :	2"
Flow Rate :	.05 gal/min
Head :	I/8" dia
Chamber:	alumn, gutter
Sound Level :	- 50 dB
Frequency :	50 - 2000
Character :	trickle, pop

Fall Height :	I2"
Flow Rate :	0.3 gal/min
Head :	multi. (6) I/8"
Chamber:	steel bowl
Sound Level :	- 60 dB
Frequency :	80-300, ~I000
Character :	licking, trotting

Fall Height :	I2"
Flow Rate :	0.05 gal/min
Head :	I/8"
Chamber :	plastic bowl
Sound Level :	- 50 dB
Frequency :	800 - 4000
Character :	plop, trickle

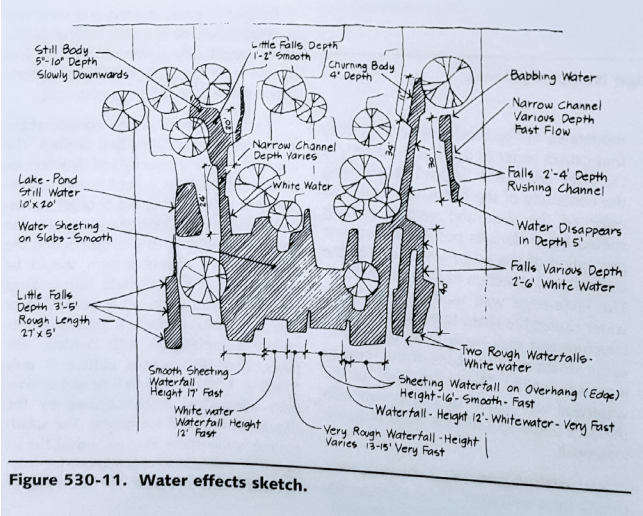


Figure 530-11. Water effects sketch.

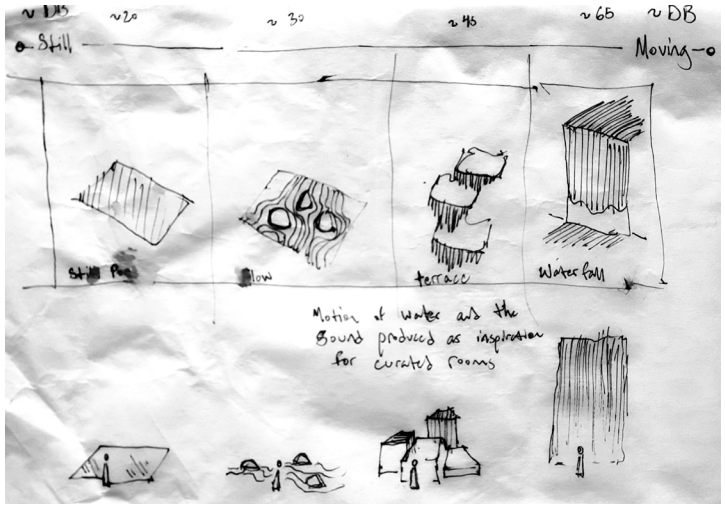


Figure 5.12 (Top) Angela Danadjieva water flow diagram of Ira fountain [3]
Figure 5.13 (Bottom) Sound sculpture spectrum matrix concept.

Material studies are needed to study the relationships between flow and soundscape effects. While basic formal typologies like cascade, fall, stream can give indications of soundscape effect, additional study is needed to anticipate how materials and form can create a desired or wild effect. More craft and observation of water flow could give spontaneity and life to designed water features.

Additionally creative design tools are needed to explore a soundscape water feature. In designing the Ira Fountain in Portland, Oregon, Angela Danadjieva developed an annotative plan of the fountain with water flow and sound effects. Annotations would be a type of design intent and specification to the fountain form in 3-D. [24] A variety of annotation and diagrammatic styles are used to represent the soundscape: illustrated plans, sections, drawings, sequential analysis, texts, slideshows, scores, conceptual frameworks, videos and field recordings. [25]

Using the audio and video field recordings of water soundscapes I composed them into digital audio software (DAW) to become a "soundscape sketch". Audio can easily and quickly be cropped into sound clips and arranged to create an experiential sequence over a site. The recordings could be augmented through effects to craft an ideal sound. I used Audacity to edit and compose 30 second clips of field recordings. I then could use Adobe Premiere to overlay the audio clips onto the perspective graphics in a video format. The sketch creates the audio sense of retreat, movement, threshold, arrival, rest, and departure. The sketch was a form of audio collage but without visuals. It informed the final presentation where I showed the perspectives and played the soundscape clips of each scene.

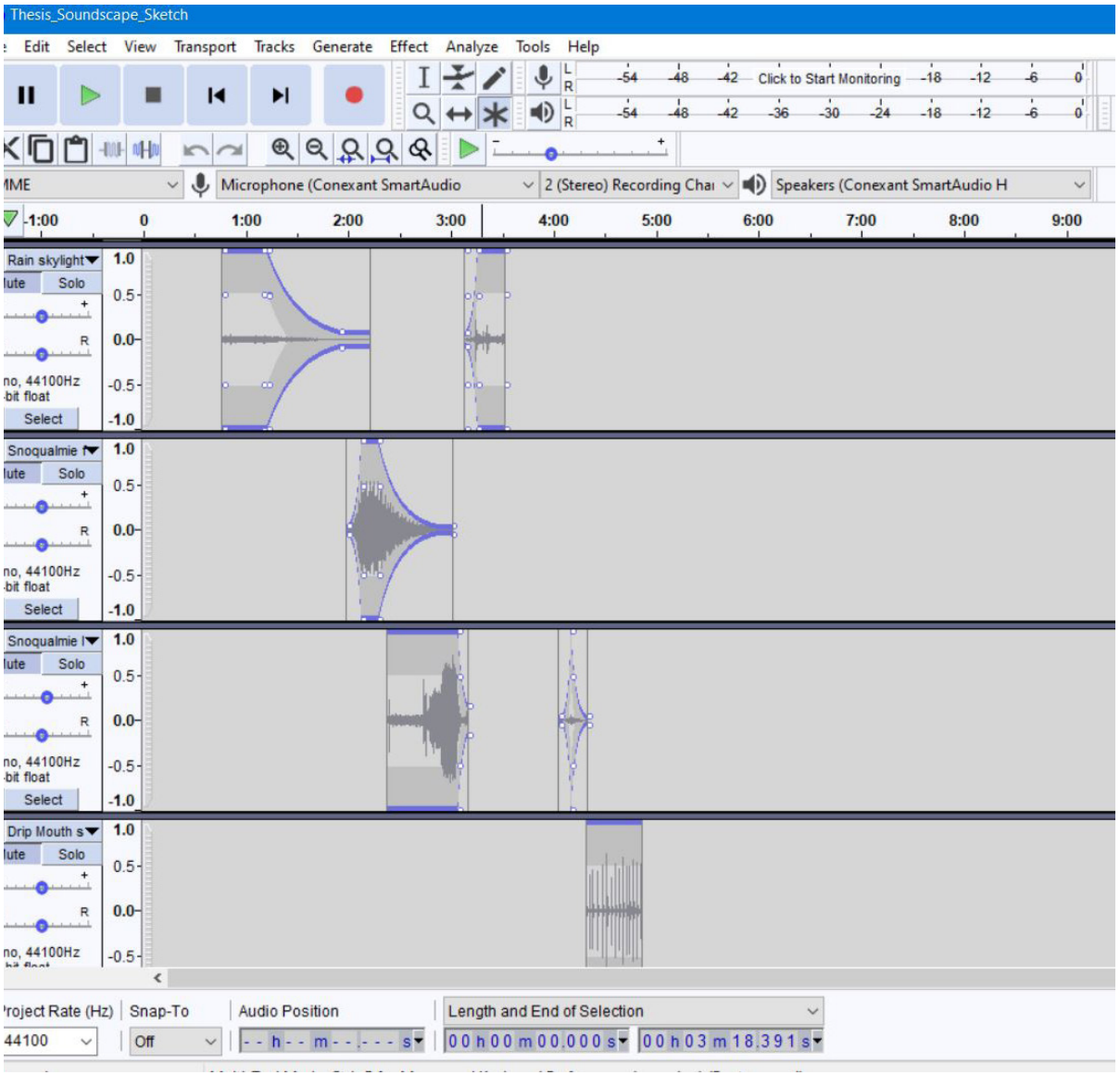


Figure 5.14 Audacity soundscape "sketch"

Chapter 5 - Soundscape Materials endnotes

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Urban Context Map

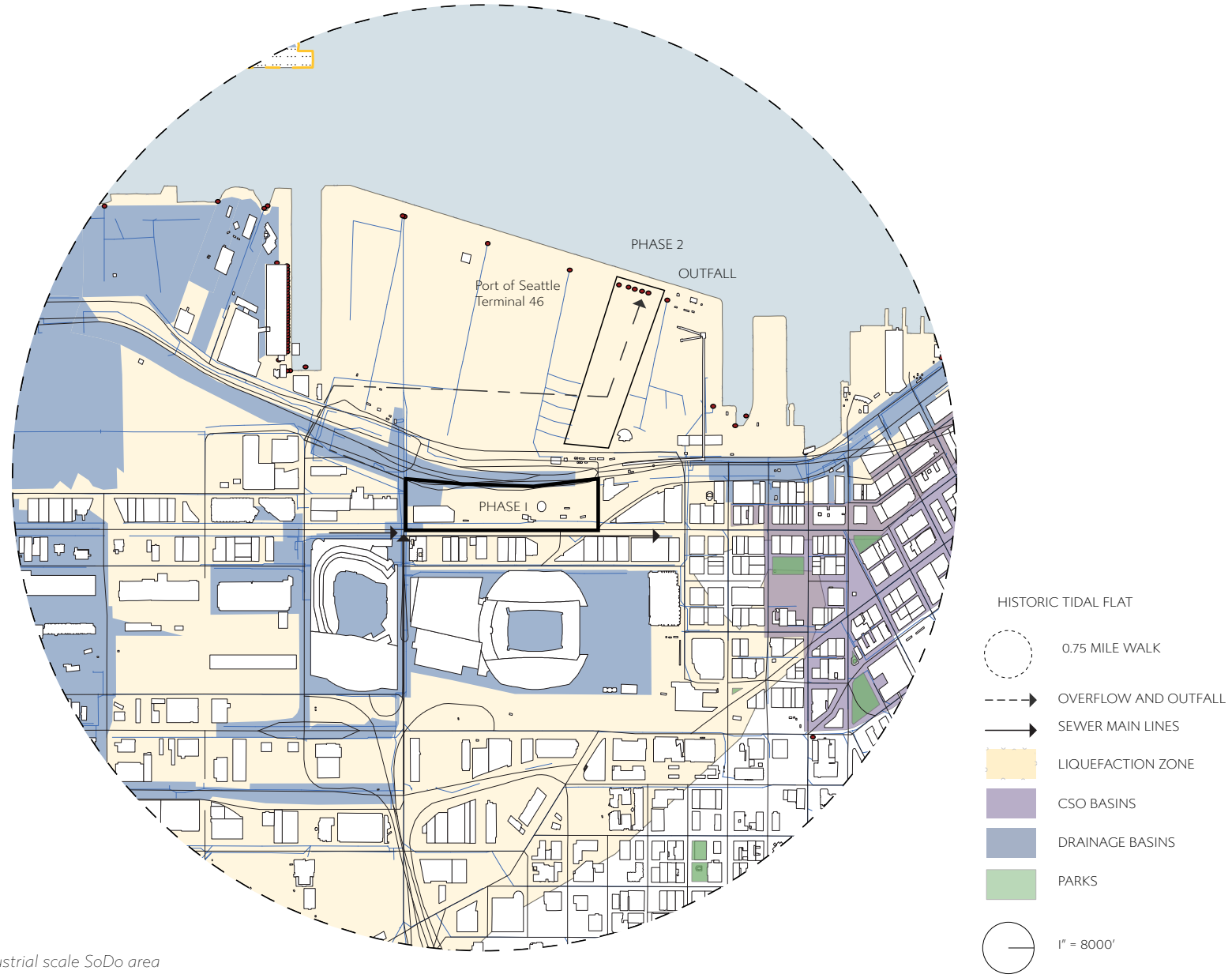

Figure 6.1 Site location within the industrial scale SoDo area

The intention of the design work was to create a conversation bringing the thinking and playing of water for contemplation with the design of water infrastructure.

The design project speculates on the 2017 CSO Art Master Plan by 4Culture and King County Wastewater Treatment Division (KCWTD). KCWTD is planning and constructing additional CSO storage and treatment as part of a coordinated effort to eliminate CSO events to Seattle water bodies. For the Kingdome CSO basin the plan recognizes upgrades to existing conveyance as well as a Wet Weather Treatment Facility and modified outfall site to be planned around 2026 and operational around 2030. [1. Figure 6.2] Within the projected site selection area, I identified the former Viaduct and Alaska Way off ramp site for its potential as a 10 acre wetland landscape park while engaging as a water infrastructure asset. The intended succession of a Phase I Treatment Park and a Phase 2 Outfall Park would bridge public access between the Puget Sound waterfront and the SoDo community.

Water infrastructure in Seattle historically has come with opportunities for parks and green space and will continue to become that way as water resources are strained. [2] The Ceder River Watershed Education Center marks the headwaters of the primary urban water supply. Magnolia Manor, Cal Anderson, Myrtle, Jefferson, Westcrest, and Maple Leaf parks are all incognito drinking water reservoirs covered by open park space with Roosevelt and Volunteer parks remain as uncovered reservoirs. [3] King County water treatment facilities are also embedded or adjacent to public parks. [Figure 6.3] Beyond Seattle, there are numerous precedents and opportunities for contemporary wastewater treatment facilities at district/neighborhood scales to become community parks and green space, like Hassalo on 8th in Portland, Oregon, the Bullitt Center in Seattle, the Omega Center for Sustainable Living in New York.

Figure 6.2 Future WWTF location in SoDo [1]

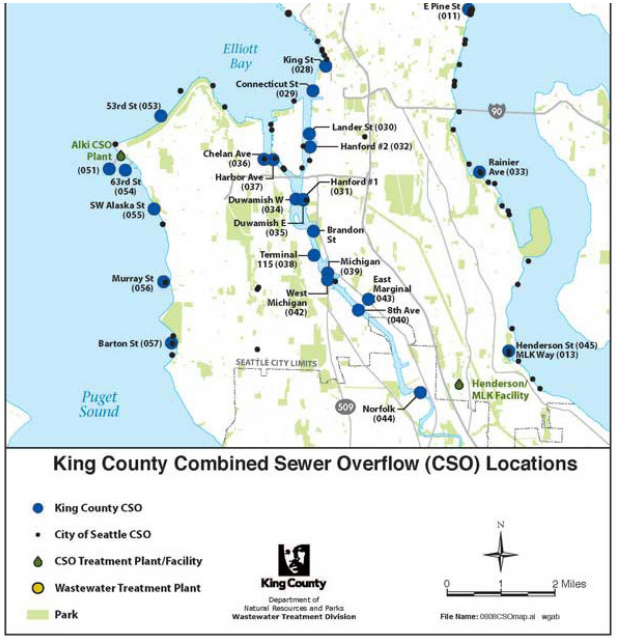

Figure 6.3 CSO locations SoDo. Absence of park space but proximity to outfalls along the SoDo area of the Duwamish River [2]

Figure 6.4 : Sodo Infill. Infill and construction of the SoDo industrial area over tidal flat and marsh area. [3]

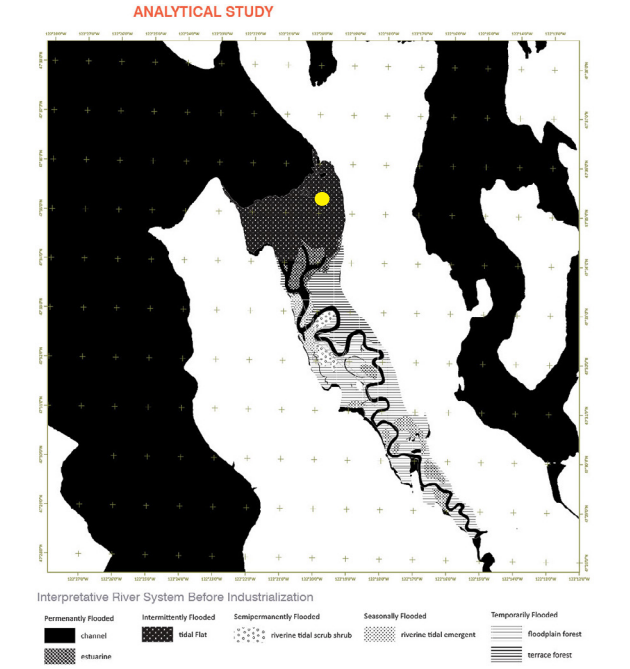

Figure 6.5 : Native Duwamish estuary ecotypes and location of site within tidal flats[4]

Southern Pioneer Square and SoDo neighborhoods lack a spacious natural area between the Duwamish, Elliot Bay and I-5 corridor edges due to its industrial roots. [Figure 6.1] The settler-colonial industrialization of the area in the late 1800's and early 1900's destroyed the tidal flat and lagoon estuary with infill soils from the Denny Regrade which formed Harbor Island and the "South of Downtown" industrial district. [Figure 6.3] The modern day industrial transit hardscape masks the environmental history and the environmental injustices of that area. [Figure 6.4, 6.10] The current site is located in the historic lagoon, just south of the Duwamish village, "Little Crossing Over Place". [4] The village was forcibly converted into "Pioneer Square" and "Seattle" During the Roaring Twenties and the Great Depression the SoDo area was a "Hooverville" "shanty-town" settlement for the impoverished. [Figure 6.5] The midcentury formed concrete automobile infrastructure with the 1953 the Alaska Way viaduct that crossed through the site. [5] The original Kingdome stadium, the CSO basin namesake, was constructed in the 1980s followed by demolition and construction of the current stadiums in the 2000's. Following the Nisqually earthquake of February 2001, the viaduct was understood as a seismic risks and deconstructed in the 2010's, with final demolition by 2019. The Viaduct Replacement Program between the Port of Seattle and the Washington State Department of Transportation reconfigured the SR99 corridor with a tunnel below downtown. The redesigned downtown waterfront park, designed by James Corner Field Operations, seeks to connect waterfront access with salmon habitat, terminates with a shoreline embankment between the Ferry Terminal piers. The Elliot Bay Greenway Trail travels North-South alongside and inbetween the BNSF railway and SR99/Alaska Way corridor. The Port of Seattle is planning on subdividing one third of Terminal 46 to a potential cruise terminal [Figure 6.10, 6] When King County Wastewater Treatment Division constructs a new <120 MGD Wet Weather Treatment Facility for the Kingdome CSO basin they will reconstruct conveyance to an outfall location on the cruise terminal division of Terminal 46 giving opportunity for a phase two park connecting the terminal the treatment park and SoDo.

Following the University of Washington's climate impact group climate change predictions, the site landform is modeled for worst case scenerio 2150 predictions. 5′ for sea level rise, -/+ 2′ earthquake subduction zone, and 3′ for periodic "King Tide" 1% chance flood events. [7. 8. 9.] The landform will create novel micro conditions of an estuary environment as exterior brackish water surrounds the site over generations.

The need for a wet weather treatment facility stems from the combined stormwater sewer system that deals with the negative impacts at the tailwaters. Using SoDo as an example 20th century urban infrastructure was designed to manage water pollution by discharging directly to large water bodies, the Duwamish river and Elliott Bay. The establishment of King County Metro and the Westpoint Wastewater Treatment facility addressed these shortcomings. [10] In the current market there is not enough incentive for private development to retrofit existing buildings to manage water on site. As a result point, historically this resulted in direct pollution of the ecosystem or large scale intensive treatment. In response to imperatives and fines from the EPA via the Clean Water Act, Seattle finds it more cost effective to manage the combined sewer overflow pollution at its outfall source. [11] As urban areas evolve towards more networked and distributed infrastructures we could imagine the water system as a series of micro watersheds and headwater sources. In the transition period tailwater and outfall sites could harvest nutrient resources from combined sewer overflow and blackwater, as the upstream point sources evolve and improve their wastewater production.

Resilient water infrastructure development should scale, following the Living Building Challenge and Living Community Challenge and the success of net-zero buildings that operates internal municipal water supply. [12] We could begin to image how district municipal water infrastructures could become integral to microwatershed villages. [13] They would become the communion portals between urban communities and animate ecology, both fueled by water.

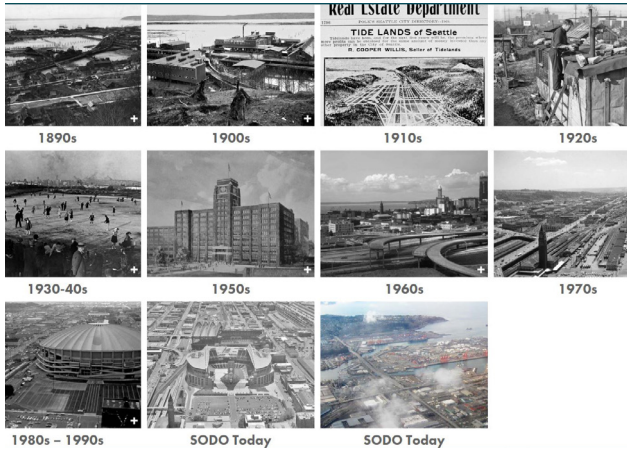

Figure 6.6 : SoDo timeline. Industrial transformation of the SoDo area after infill [5]

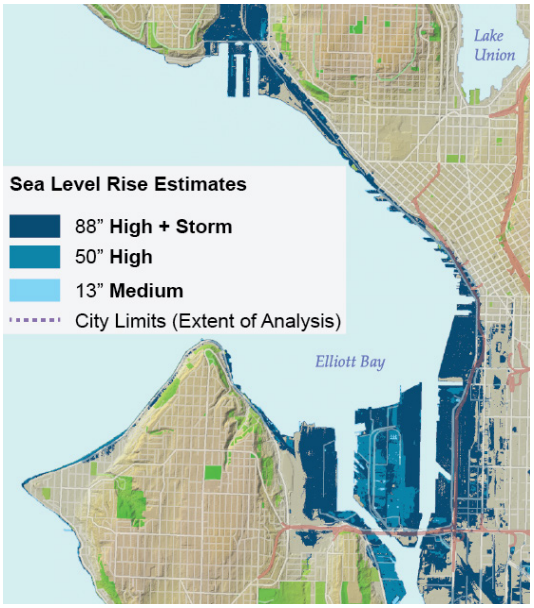

Figure 6.7 : SoDo Sea level rise map. estimates project that the estuary area will experience tidal flows under extreme sea level rise estimates [6]

Figure 6.8 Conventional WWTF use a ballasted sedimentation method that allows for on-demand treatment in compact space [7]

Figure 6.9 Clallam Bay Correction Facility Polishing Pond treats primary and secondary stages through a duckweed polishing pond [8]

The proposed Wet Weather Treatment Facility (WWTF). would treat CSO and Blackwater wastewater. Following the recent Georgetown WWTF, the technology employed was a Ballasted Sedimentation system with discharge to an outfall restoration site. [Figure 6.7] Following the treatment metrics and precedent of the Georgetown WWTF, the SoDo facility could also use the same technology but would be expected to perform at twice the volume at 120 million gallons per day. Conventionally treatment water is directly but invisibly discharged through sewer mains. Instead the treated water could be directed through a wetland landscape, both for a percentage of treatment and to make a park available to the public. Moreover the wetland landscape could be designed as a series ecological wetland treatment zones that would augment the operation of the WWTF.

The wetland treatment zones would perform as a series municipal wastewater treatment ecotypes for water reuse standards. [13] Water treatment zones could be a series of surface and subsurface wetlands,[Figure 6.8, 15,16,17] faculative ponds,[Figure 6.9, 18,19,20] tertiary polishing ponds, and retention ponds that operate in substitution and/or support of the WWTF ballasted sedimentation process. Municipal scale treatment biologic treatment methods could allow wastewater to settle through the water system nourishing the ponds and natural succession of wetland ecosystems. [21,22] Additionally ecologic engineering similar to the "living machine" work of ecologist John Todd could augment the WWTF and treatment park, leading to novel integrated approaches to tidal waterfront water treatment. [23, 24]

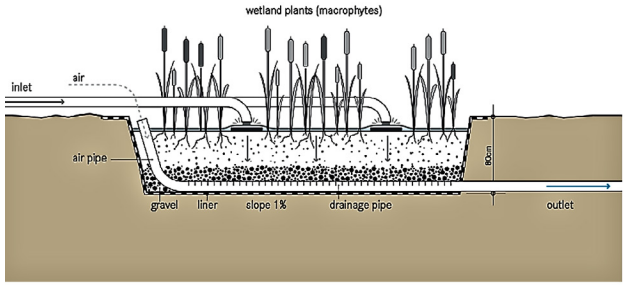

Figure 6.10 Surface Constructed wetland profile for wastewater treatment [9]

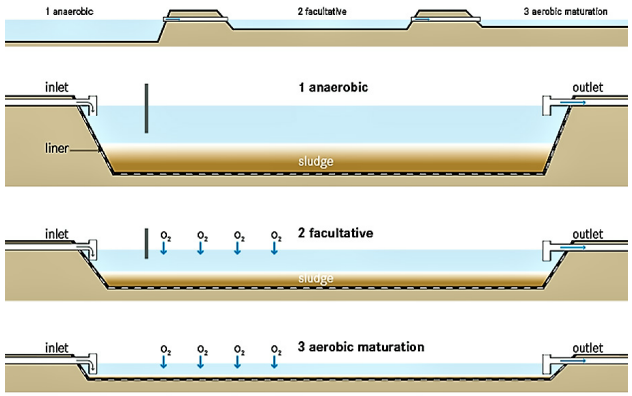

Figure 6.11 Shallow faculative pond profile for wastewater treatment manage oxygen availability for biologic treatment [9]

Figure 6.12 Port of Seattle Proposed Cruise Terminal would provide opportunity for a phase 2 gateway estuary park into SoDo [10]

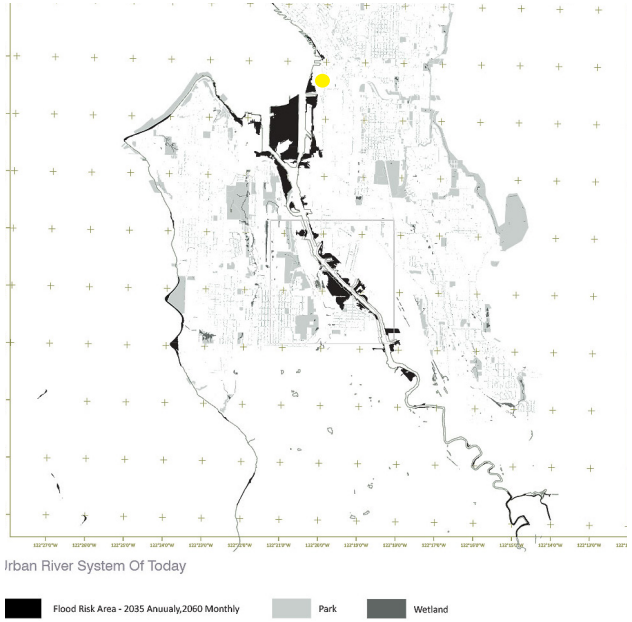

Figure 6.13 Present Duwamish estuary ecotypes. Infill conditions would naturally revert to wetland conditions along the Duwamish River and Elliot Bay [4]

Chapter 6 - Pilgrimage and Site Analysis endnotes

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enclosures are based on 2150 predictions of higher emission scenarios. A minimum of 47 inches height sea level rise impacts +
0.2 (2.4 inch) foot vertical land fall from a subduction earthquake zone will result in at least 4 foot sea level rise. An additional
3.2 foot (38.4 inch) rise with 100 Year Floods or 1% chance per year "Extreme Still Water Level Magnitude"

[8] SPU Climate Change Predictions https://www.seattle.gov/utilities/environment-and-conservation/climate-change-program/
projected-changes/sea-level-rise-map) 5 feet above MHHW. MHHW by the 2170s. Monthly high tide by the 2150s. Annual extreme tide by the 2120s

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Site Hydrology Concepts

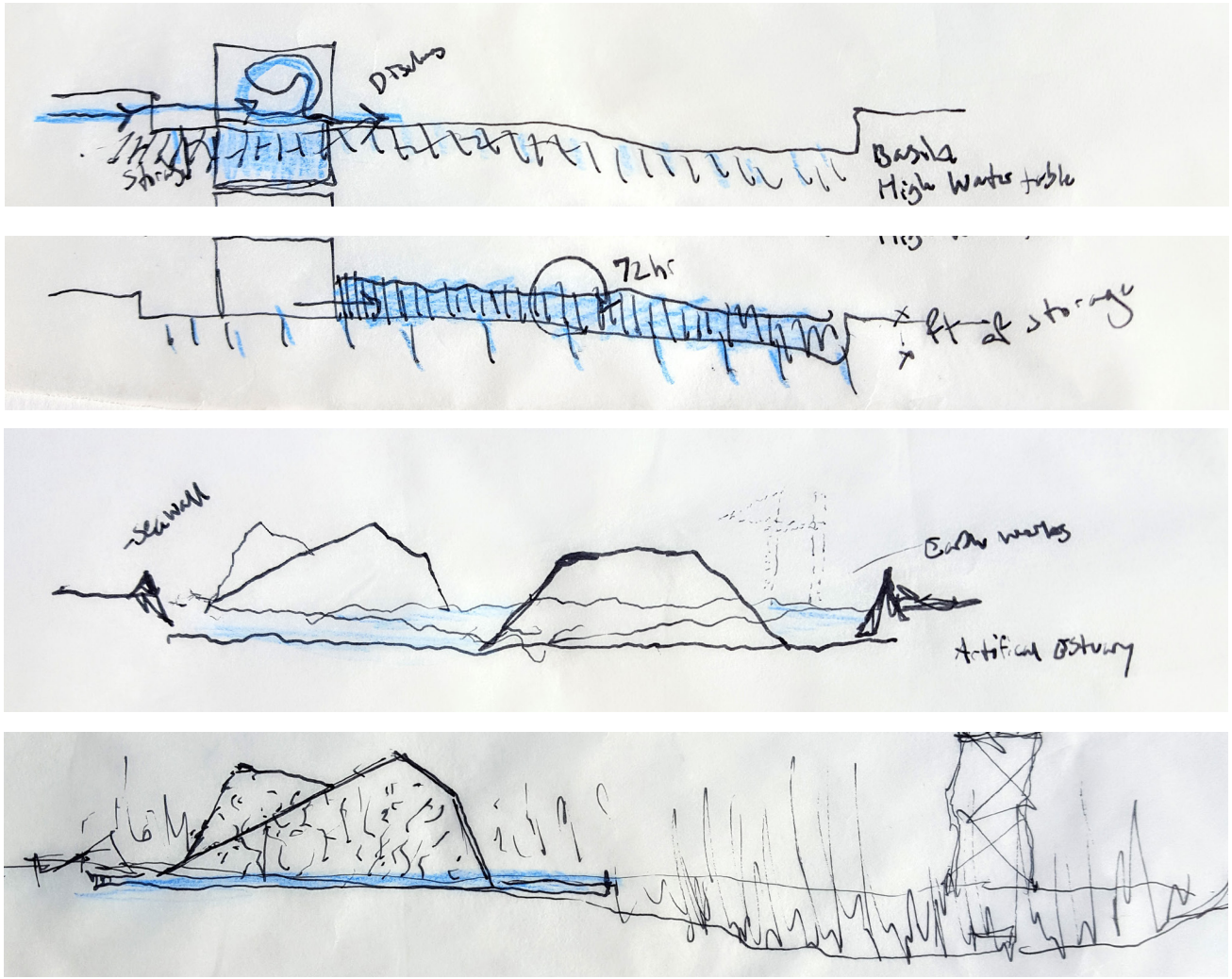


Figure 7.1 Tidal Estuary Concept Site Section Sketch

The site design was a parallel design process to the rest of the thesis research. With the intention of creating a water temple within wastewater treatment I sought to engage how infrastructure can become contemplative space. The result was a wastewater treatment park that embraces the site hydrology as the primary materials.

The park would perform as a wastewater treatment wetland park with water inundating certain treatment zones. The effect would be rising and falling water levels that would mimic an alluvial waterway and create estuary conditions over time. Locating the WWTF and treatment zones to create surrounding water horizons would give the sense of the park being an island inside and out. Concept sections aim for the park to be expressions of tidal flat language with sweeping mounds and reflective water surfaces cascading across site.

A river of wastewater becomes the headwaters for this wetland retreat. The infill topography would be regraded to allow for treatment water to flow to the other side of the site and return for harvest. High groundwater table and sea level rise would eventually create brackish conditions that could create a novel estuary condition with the freshwater wastewater. The WWTF and community center would be elevated above the fluctuating treatment water horizons.

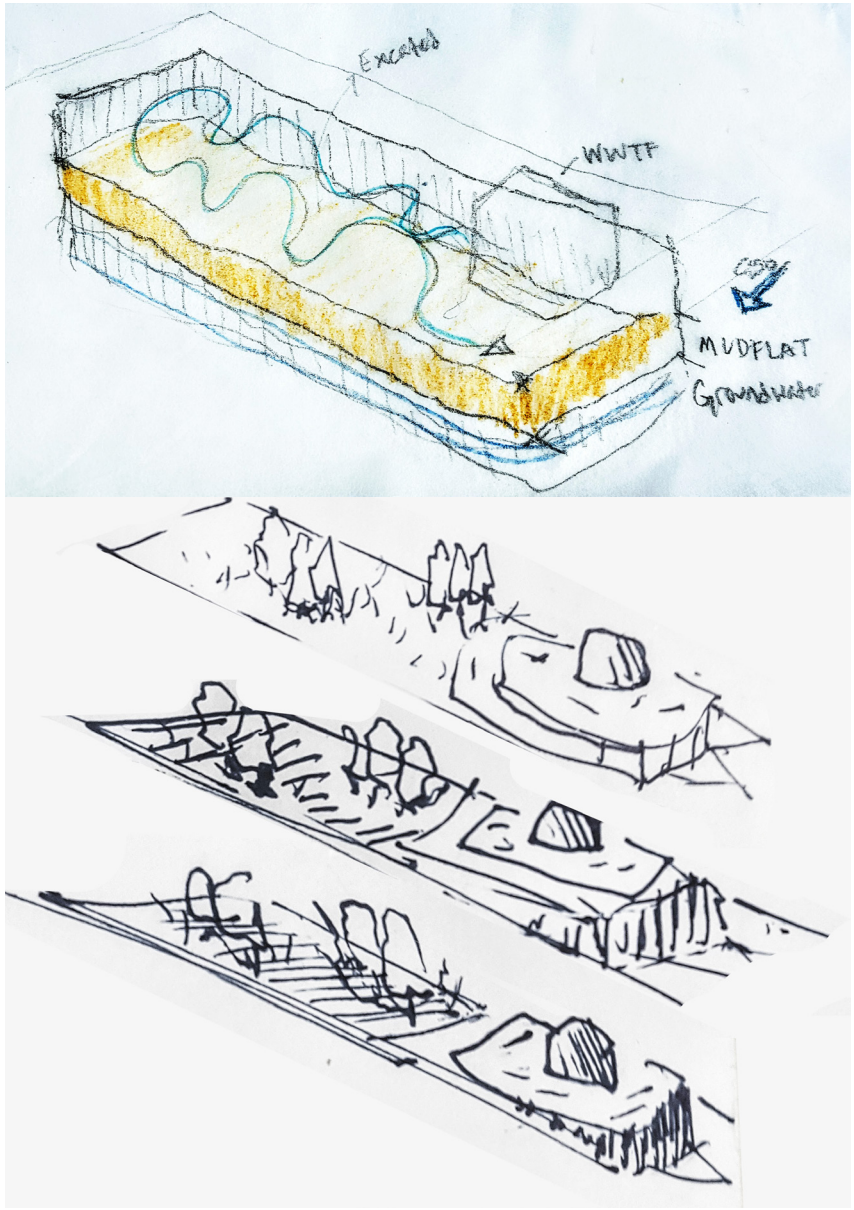
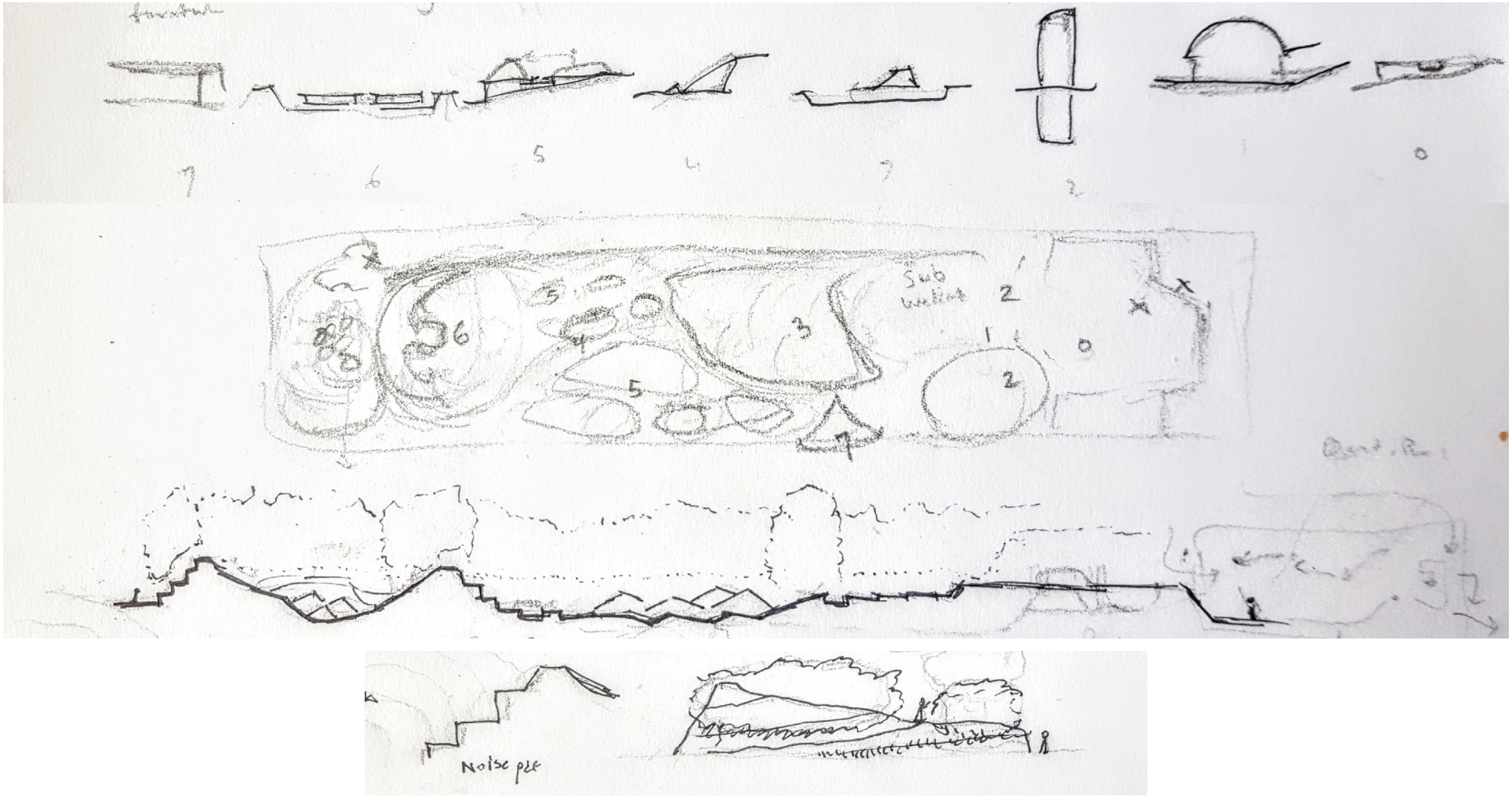


Figure 7.2 Tidal Estuary Concept Axon Sketch

Landform Process

A series of wetland treatment zones would define distinct enclosed spaces. I worked through Hand Sketching to develop concept schematics and moved to mineral clay modeling to understand the landform. A workflow of uploading sketch and modeling images to Rhino allowed for building a digital topography model to explore how water levels would shape the spaces. Rhino geometry could be further explored for water flow design. Photoshop Rendering of the digital model brought character to the identity of each water garden space. .

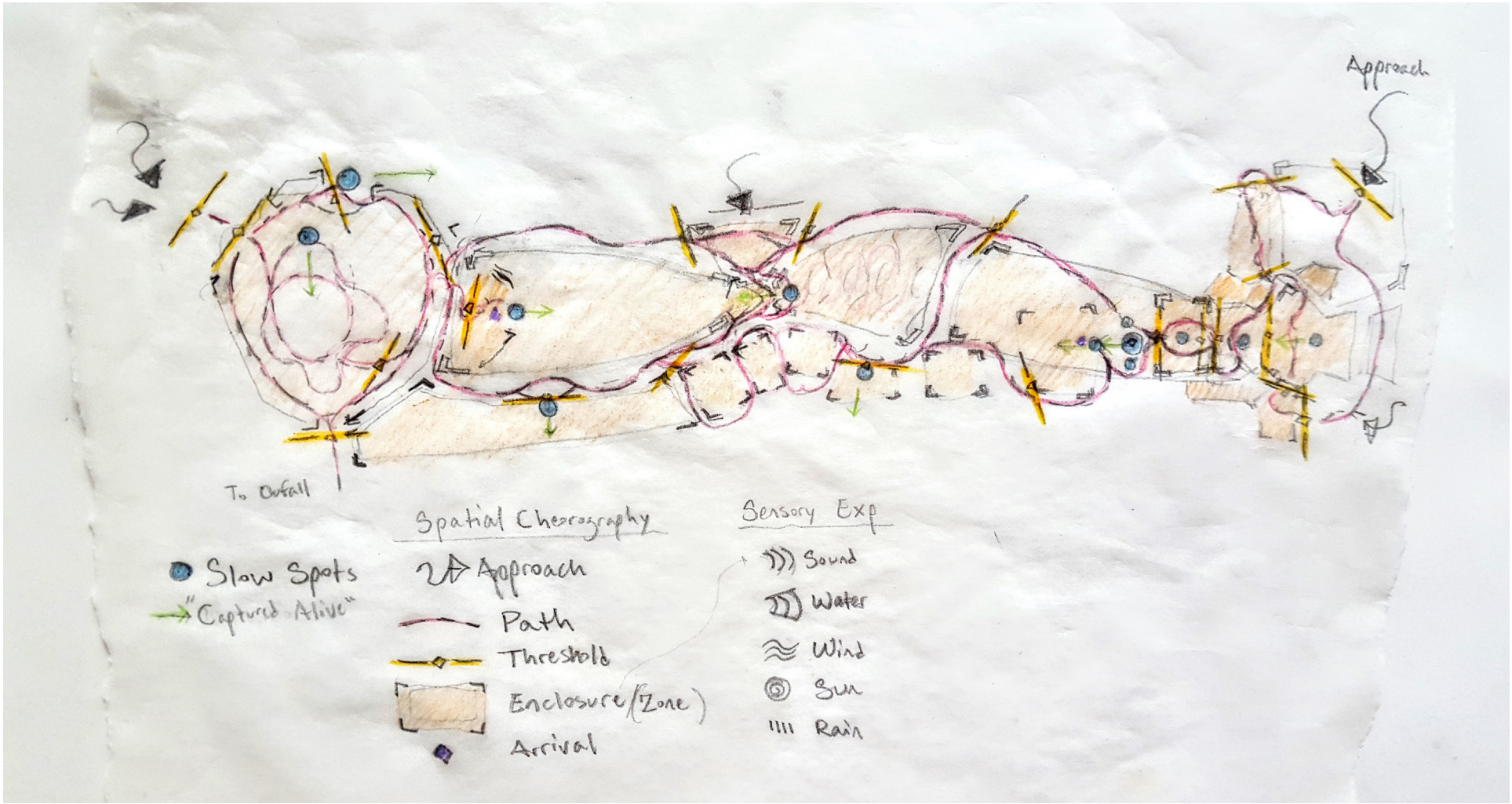
Figure 7.3 Landform Design Process Media



As water garden zones were defined I developed rest moments within the landform to observe the water process landscape. The landforms took profiles that would create an ascend journey into the park while mitigating noise and providing tree planting edges. These rest moments evolved to become the “slow spots” in the park that were places of stillness, silence, and solitude.

Figure 7.4 Landform Design Process Slow Spots

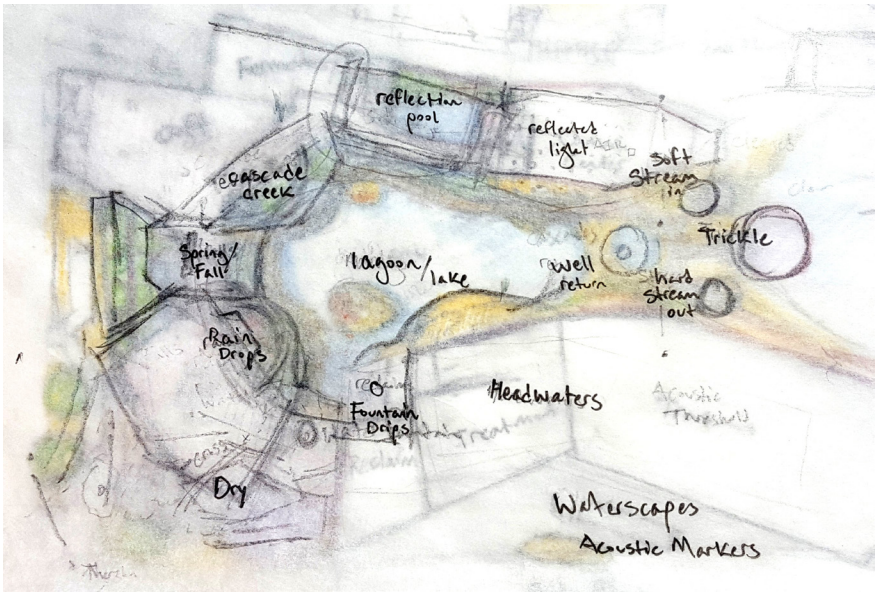
Contemplative Choreography Process



As water garden zones were defined I analyzed the spaces based on the spatial strategies. The process illuminated how the path and thresholds were working together to bring people to the arrival point. The scale of enclosures revealed the expansive and intimate sides of the park. Sensory elements were expected for each zone and could be drawn with intensity levels.

Figure 7.5 Contemplative Choreography Process Sketch

The WWTF and community center complex was intended as a temple design that gravitates around water courtyard gardens with a shrine.. Through iterations of the relationship of massing to water bodies a centrally framed lake came forward. The variety of water garden scales in the complex allows for different experiences of rest. Thematically each garden would be inspired by a phase in the water cycle of the Puget Sound. Elevated 8' above street level the complex rest above the reclaimed water cistern.



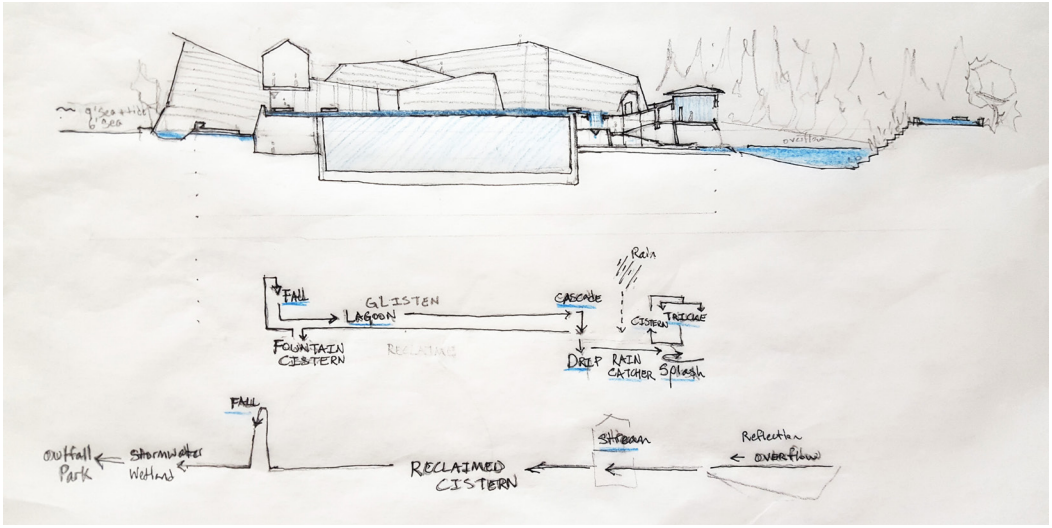
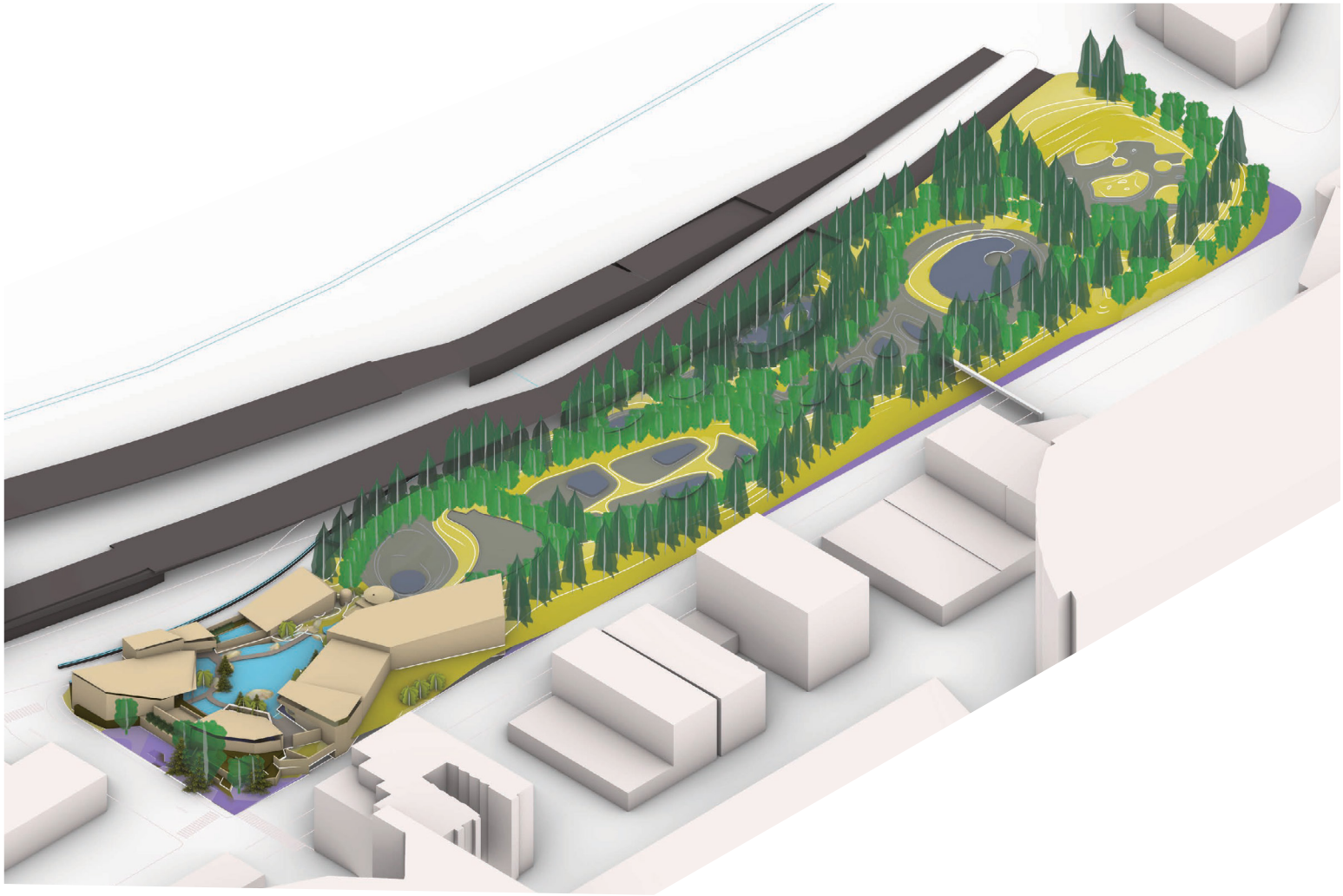
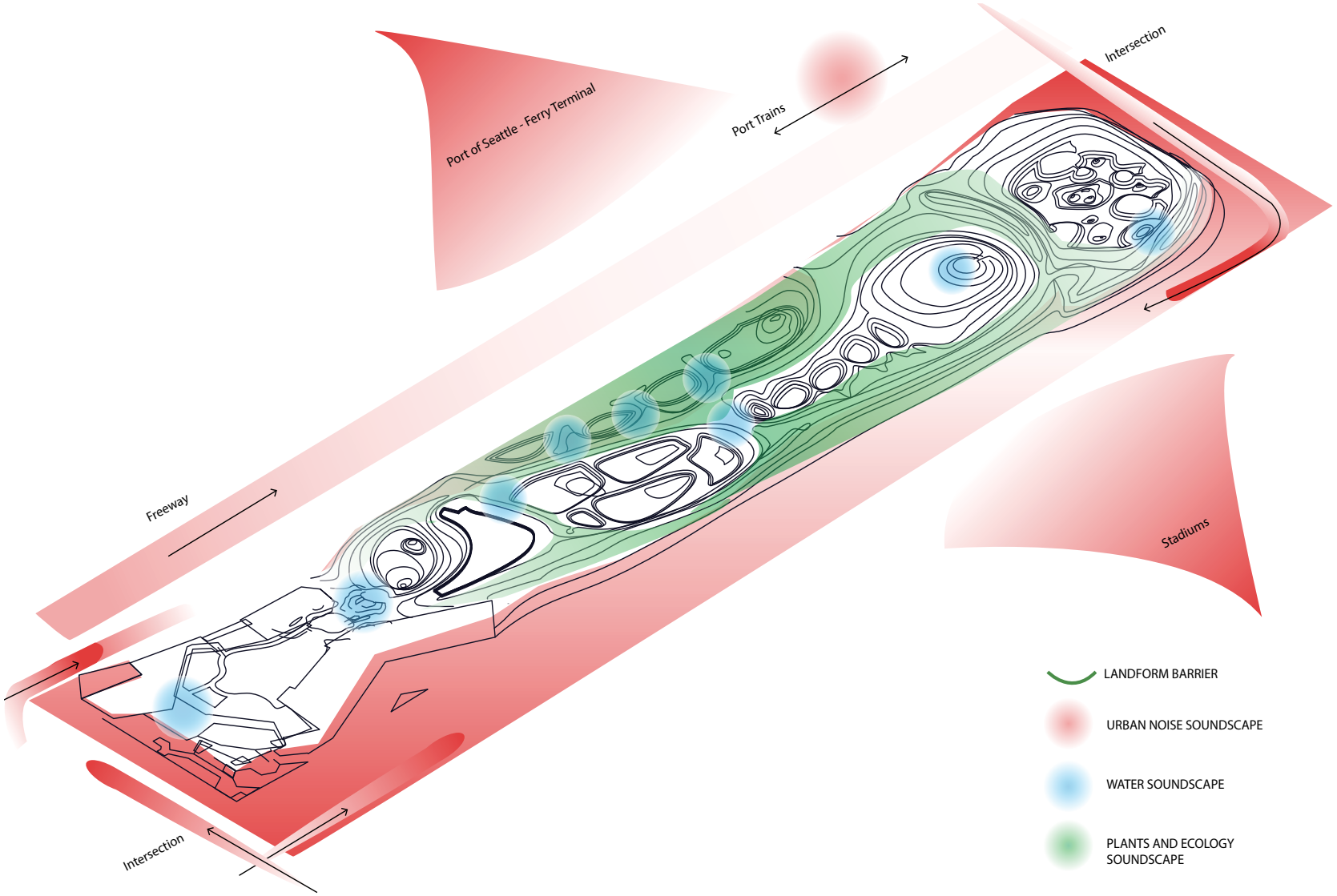


Figure 7.6 Temple Complex Water Gardens Process Sketch
Figure 7.7 Temple Complex Water Gardens Process Section Sketch



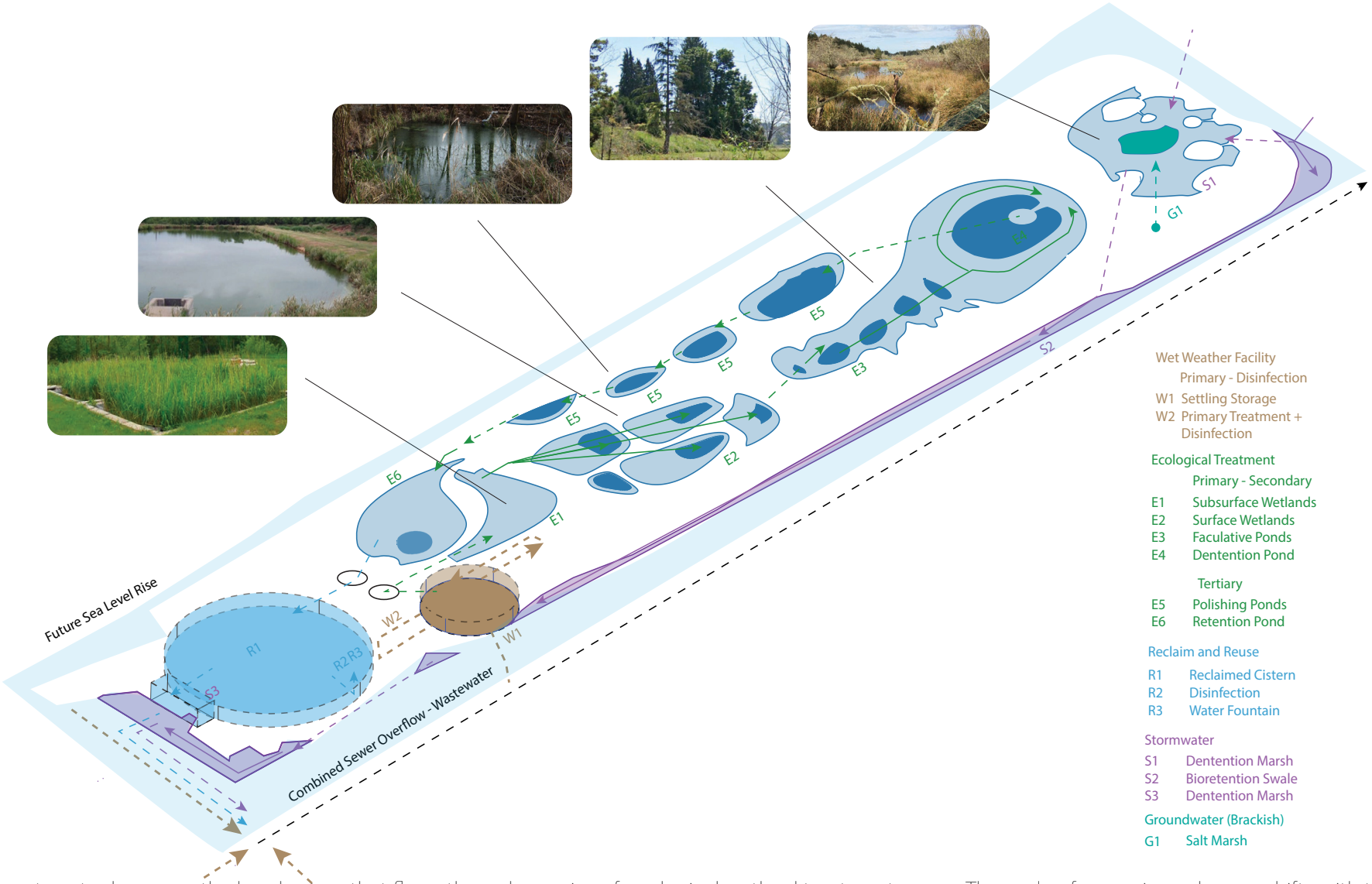
In contrast to the noisy, social, and speedy urban energy, this park is intended as a retreat and sanctuary. Surrounding by traffic on all sides, the site operates as an island. Industrial scale urban spaces make the site feel like a bowl enclosed by highways, stadiums, city skyline and traffic.

Figure 7.8 Urban Context Rendered Site Axon



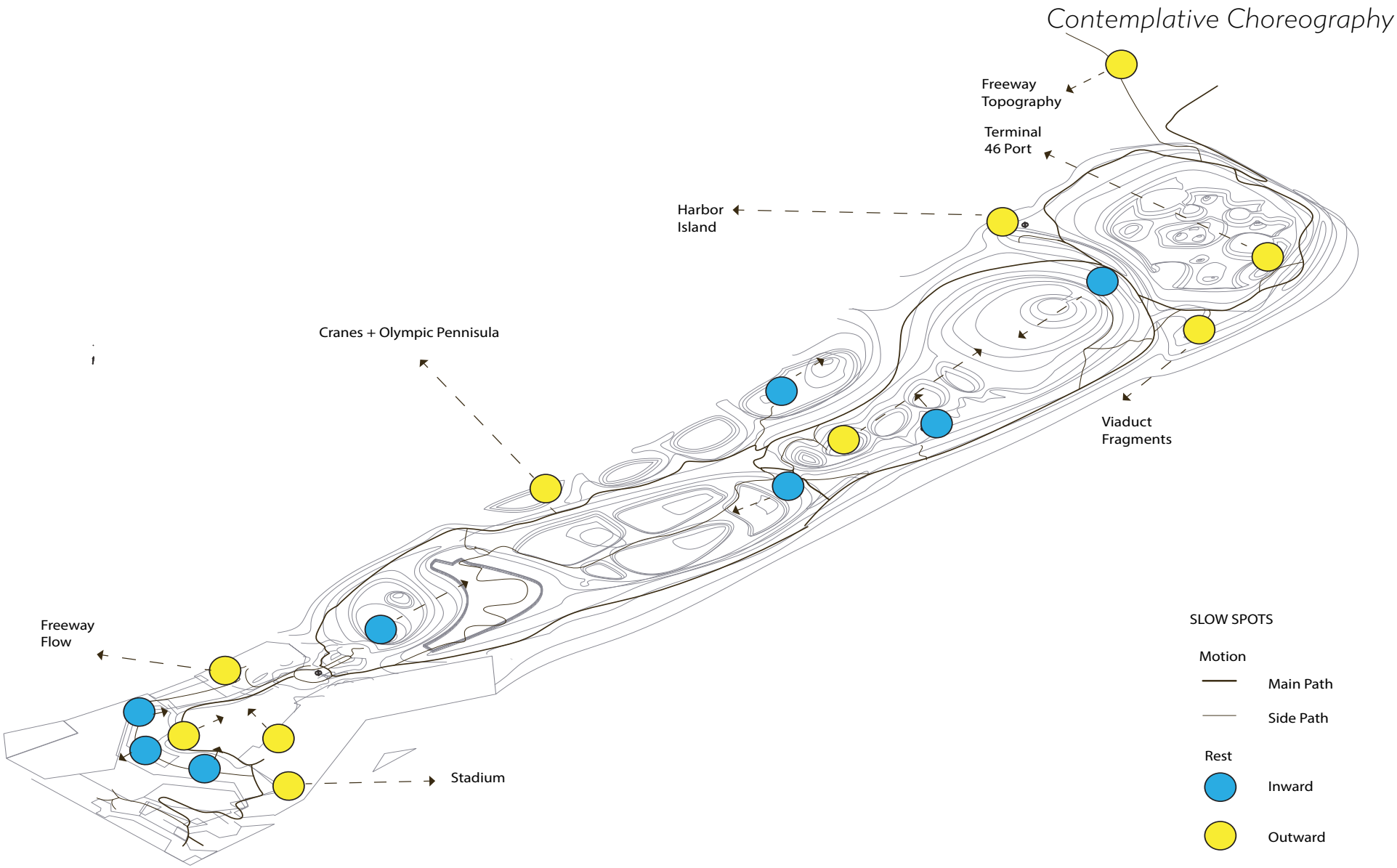
The landform is sculpted to block unwanted urban noise turning it into background white noise. Terraced earthen berms, wind, and enclosing wetland forest create acoustic thresholds. Water transition from zone to zone create a sound mark. The WWTF and community center orient building massing to block intersection acceleration. Pathways on the interior of the zones provide distance from noise source, working to bring attention inward to the mosaic of natural soundscapes.

Figure 7.9 Soundscape Annotated Site Axon



A river of wastewater becomes the headwaters that flows through a series of ecological wetland treatment zones. The scale of space in each zone shifts with the changing water levels throughout the seasons. At full retention the park becomes an elevated path weaving around water horizons and framing sky, forest, water, wind, and wetland. Water treated through the landscape returns back to the community as recycled and drinking water. The facility and park treatment becomes a resilient clean water asset for the district, able to take in CSO in the wet season and district wastewater to, store it, treat it, and resupply local water reuse.

Figure 7.10 Water Ecology Annotated Site Axon



The landform is a looping pathway that weaves you through the story of water being cleansed. Side paths that lead to intimately scaled slow spots for rest while main paths invite a stroll. Each slow spot frames a scene within the park or outward into the urban landscape. Borrowed scenery of the industrial port area projects attention outward into the city landscape while inward zones borrow cityscape elements as part of water garden scenes.

Figure 7.II Contemplative Choreography Annotated Site Axon

The park is cultivated to inoculate a mosaic of wild process and ecologies that can serve as a test center for urban wetlands. Experientially we are going on this journey with the water together. The journey through each zone shows the process of water being cleansed all the way to its renewal and celebration. Each of these moments are a slow spot to settle into stillness, silence, and solitude. The larger spaces offer expansiveness and awe while the smalls spaces support intimacy and reflection The composite of individual moments inward and outward creates the contemplative experience. At the urban level we can contemplate the future of water infrastructure. At the experiential level you can make memories the sense of place.

Figure 7.12 Annotated Rendered Site Plan

Sea spring lagoon is a sunken brackish wetland garden on sculptural mounds. It references the historic Duwamaish "Little Crossing Over Place" location and lagoon. The area is the arrival zone from the northern - Pioneer Square entrance. Brackish groundwater is pumped up into central sunken depression, creating a tidal salt marsh. The ecology of the surround wetland is a marsh wetland to manage stormwater. The sea spring is surrounded by shallow mounds emerging above the wetland. The periphery landform berms enclose the space directs observation west to the cranes, the sunset, and the Olympic mountains.

Figure 7.13 Sea Spring Lagoon Perspective Sketch

Viaduct Point

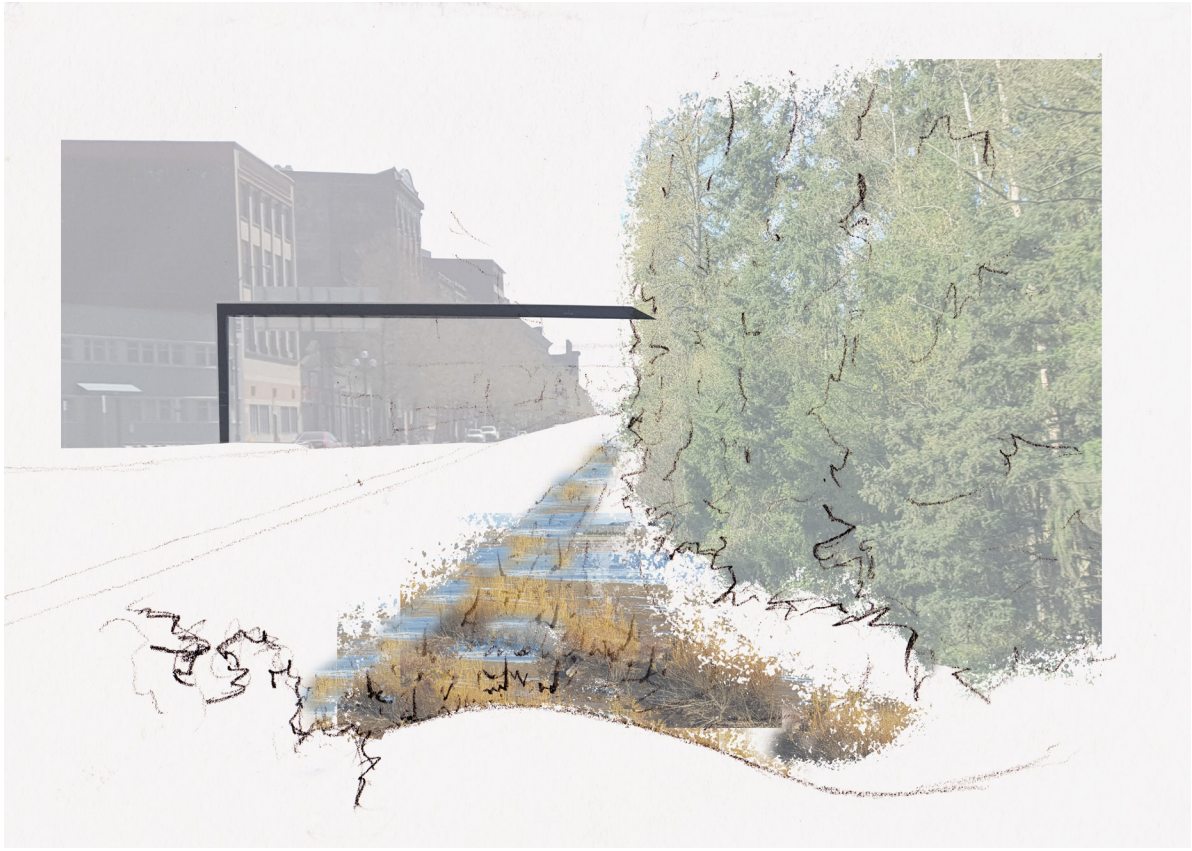


Figure 7.14 Viaduct Point Perspective Sketch

Viaduct Point is an observation mound at the edge of the wetland park and the SoDo district. The overlook peers over the stormwater swale that fills with water creating the sense of an island. A remnant of the Alaska Way Viaduct extends into the park and frames the flow of traffic. Eventually the landform will become part of the future tidal and seascape landscape.

Tidal Stage invites performance, story-telling, and gathering. Resting at the end of the elongated retention pond the stage emerges out of still water. Seating faces southern sunlight and the skipping tide-like pools of the retention area. Large steps are terraced into the berm landform for gathered seating. The surrounding berm and forest encloses and makes the area into an intimate performance space. The stage rests above the overflow for the pond, creating a steady background sound. The wet season inundates the surrounding edges framing an island stage in a ponding scene. The dry season reveals an emergent marsh garden surrounding the edges of the amphitheater.

Figure 7.15 (Above) Tidal Stage Plan Sketch
Figure 7.16 (Top) Tidal Stage Amphitheater Perspective Sketch
Figure 7.17 (Right) Tidal Stage Stage Perspective Sketch

Flying Cranes

Figure 7.18 Flying Cranes Perspective Sketch

Flying Cranes remembers the history of the estuary area. The scene overlooks the historic waterfront tidal flats, the current highway, and the industry of Harbor Island and Duwamish River area. White and orange cranes rising up from the port island are seasonally shrouded by mists. As the highest mound on the site this view peers out at the island that was created from the Denny regrade and infill of SoDo.

Shimmering Flats is a series of shallow ponds that reflects the city skyline. Tidal flats have a shimmering and reflective quality through their play between water revealing land. Wet season water levels shift the scale of this pond space. Low water levels reveal concentric forms during dry periods. Forest canopy encloses the linear northern view. Wetland mound islands punctuate the pond horizon.

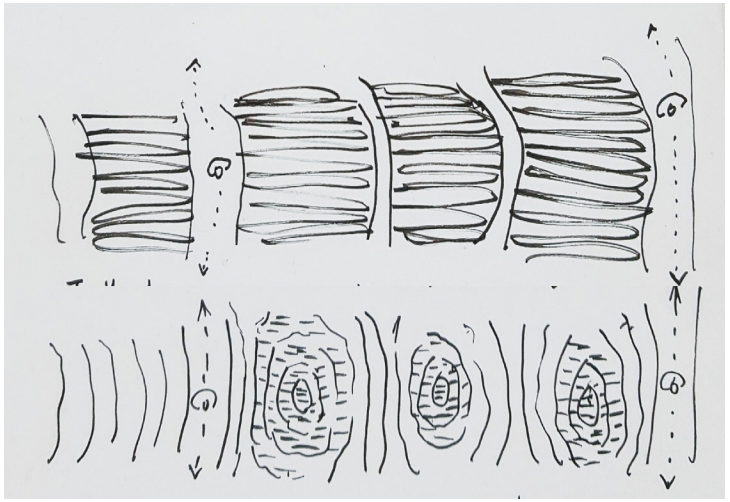
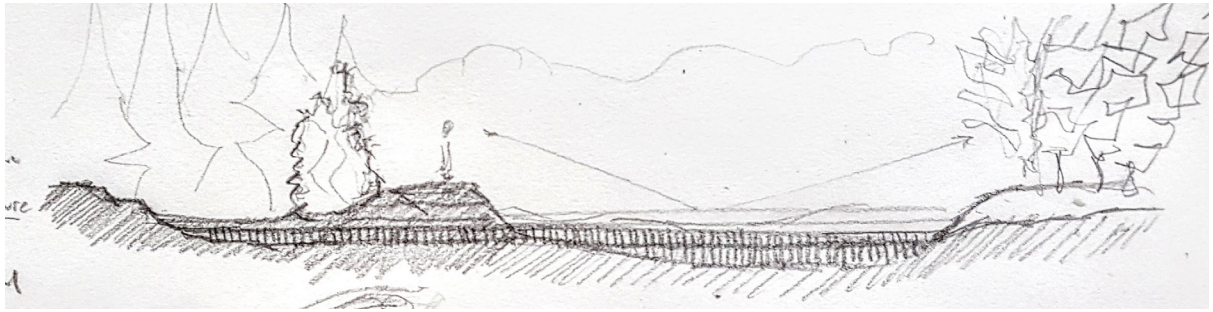


Figure 7.19 (Above) Shimmering Flats Topography Concept Plan Sketch
Figure 7.20 (Top) Shimmering Flats Perspective Sketch Wet
Figure 7.21 (Right) Shimmering Flats Perspective Sketch Dry

Sanctuary Island



Sanctuary Island is a seasonally accessible wildlife pond. A side path breaks into branching paths that reach into the water. There is one distant island for wildlife and one smaller observation island with observation of the wildlife island. The wildlife island is enclosed by wet season willows colorful growth. The path to the observation island can be inaccessible based on water level in the pond. creating a threshold. Vegetation and scale of the observation island creates a intimate space for contemplation.

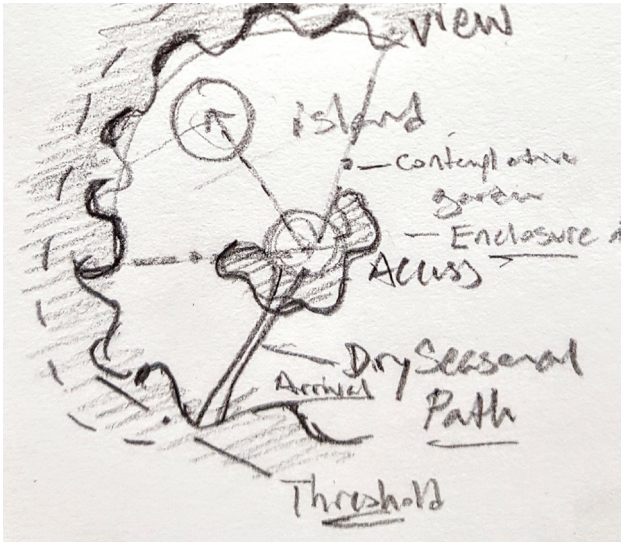
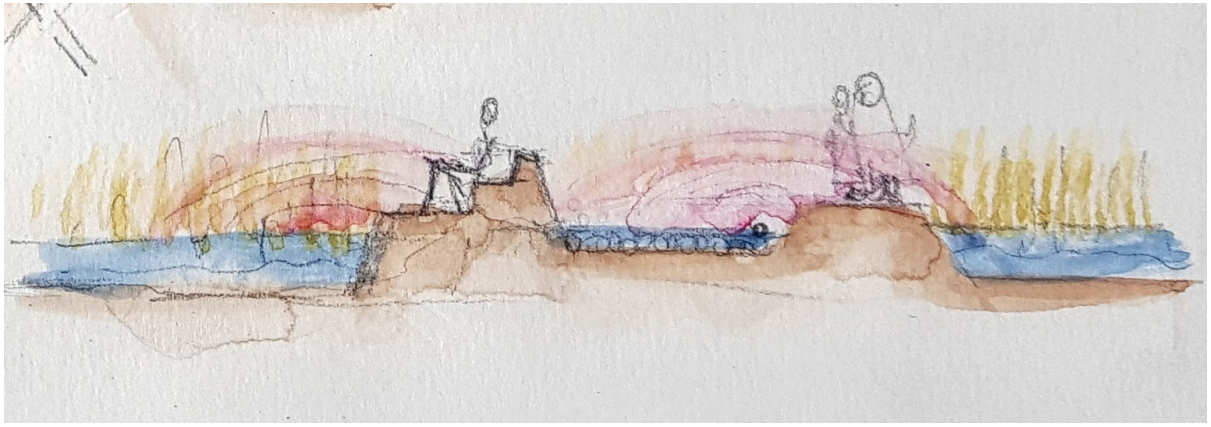


Figure 7.22 (Above) Sanctuary Island Plan Sketch
Figure 7.23 (Top) Sanctuary Island Section Sketch
Figure 7.24 (Left) Sanctuary Island Perspective Collage

Highway Mountains is the final in a series of polishing ponds. The highway monolith frames a view over lanes of freeway and towards the Puget Sound. On a clear dry season day the Olympic mountains emerge beyond the cranes. An earthen berm and shrub plantings frame the pond bringing visual attention to the reflections. Borrowed soundscape and visual scenery focus attention away from traffic and project outward towards the distant horizon.

Figure 7.25 Highway Mountains Perspective Sketch

Skyward Scale



Skyward scales are surface or subsurface wetlands pools. Their form is derived from Chinook Salmon scales. Berm enclosures creates a walkable interior path. In the wet season the scales are a horizon of reflection of the overcast sky. In the dry season the pools could become sunken gathering areas. Water flowing into scales creating a soft flow. Seating next to the scales creates a personal moment of rest enclosed by wetland reeds and rushes.

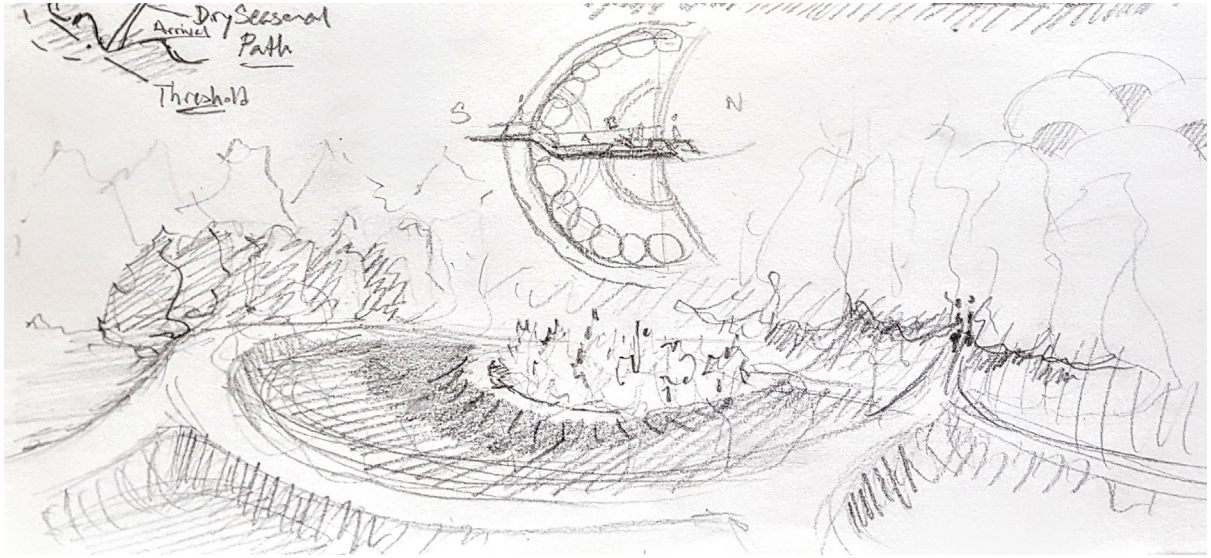
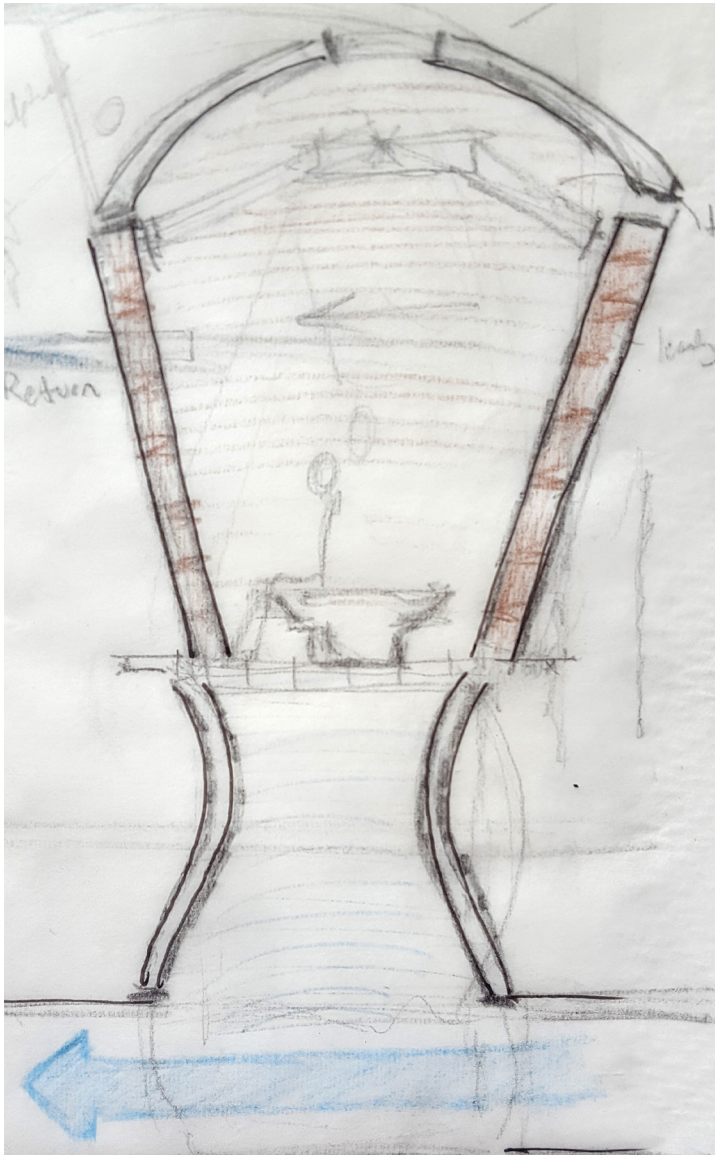


Figure 7.26 (Above) Skyward Scales Perspective Sketch
Figure 7.27 (Top) Skyward Scales Section Sketch
Figure 7.28 (Left) Skyward Scales Perspective Sketch Plan

Settling skyline are observation points along the Shimmering Flats. Western views fuses water, forest, and sky. Berms and forest plantings enclose the sunken space. The intimacy and minimal views place offers refuge by the water edge.

Figure 7.29 (Above) Settling Skyline Perspective Model
Figure 7.30 (Right) Settling Skyline Section Plan Sketch

Stream Ears



Stream Ears are acoustic thresholds between the temple and the park. Ears rest at the confluence waters of the treatment process. The ears listen to the wastewater stream discharging out into the landscape and the reclaimed stream returning after being cleansed. The acoustics of water flow shape the white noise within the rammed earth chamber. The steady stream marks arrival and departure of the journey into the park.

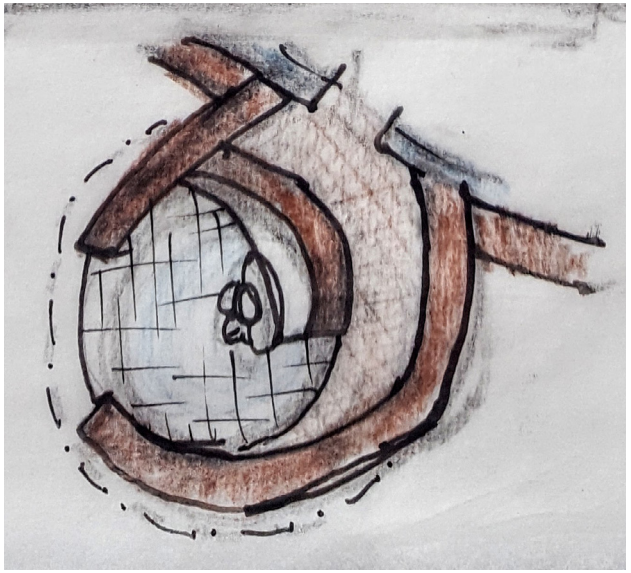


Figure 7.31 Stream Ears Plan Sketch
Figure 7.32 Stream Ears Section Sketch

1 DRY GARDEN
2 WATER FOUNTAIN
3 RAIN GARDEN
4 WATERFALL GARDEN
5 CASCADE CREEK GARDEN
6 LAGOON GARDEN
7 MARSH POND GARDEN
8 GRAVITY WELL
9 STREAM SCULPTURES
10 TRICKLING CHAMBER

Where you live, work, and study becomes a monastery of nature. This temple is a place where research residents and visitors come to observe, learn, and commune. While the park offers restoration at the landscape scale, the center offers meditation at the human scale. This center becomes an incubation center to propagate novel estuary adaptation for changing waterfronts. The arts and science center is an ecological laboratory for the industrial waterfront. A series of courtyard water gardens are miniaturized meditation gardens of the water cycle happening at the larger scale.

1" = 50 '

Figure 7.33 Temple Complex Rendered Plan

The dry garden is a cross-over of stones, sand, and driftwood reminding the visitor of the tidal landscape and the presence of water.

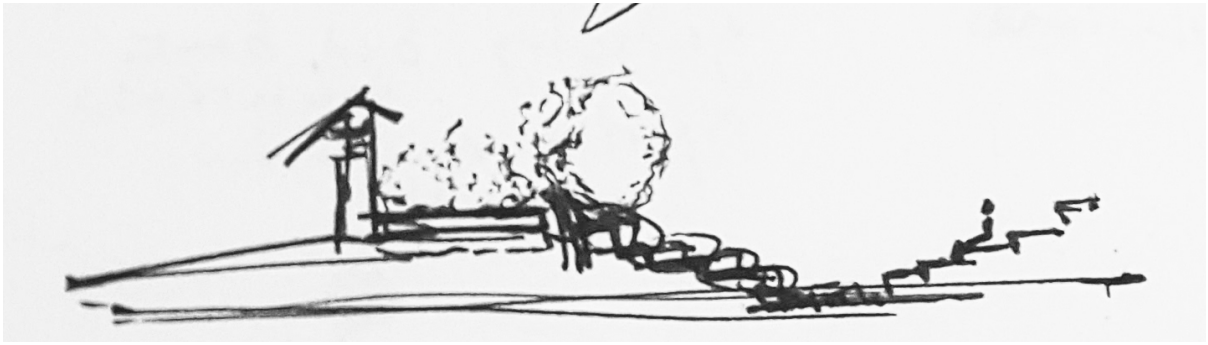
Figure 7.34 Dry Garden Perspective Rendering

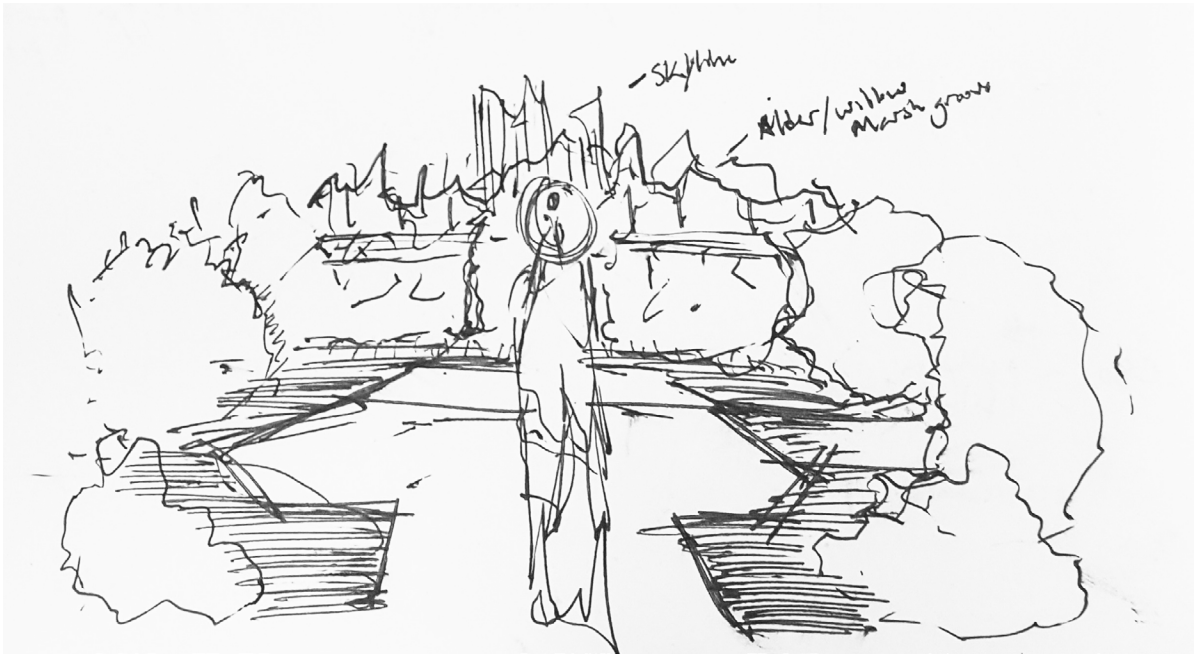
The water fountain invites refreshment with the reclaimed water

Figure 7.35 Water Fountain Perspective Rendering

The central lagoon edges the water out towards the horizon. Wetland mounds punctuate the central pool while building masses frame vegetation beyond.
Figure 7.36 Lagoon Garden Perspective Rendering

The cascading creek garden slips and steps into the center lagoon. The cascading movement mimics the flow across the regraded terrain of downtown Seattle. Water flows across steps for gathering and gazing into the central courtyard providing a rest stop alongside a steady soundscape





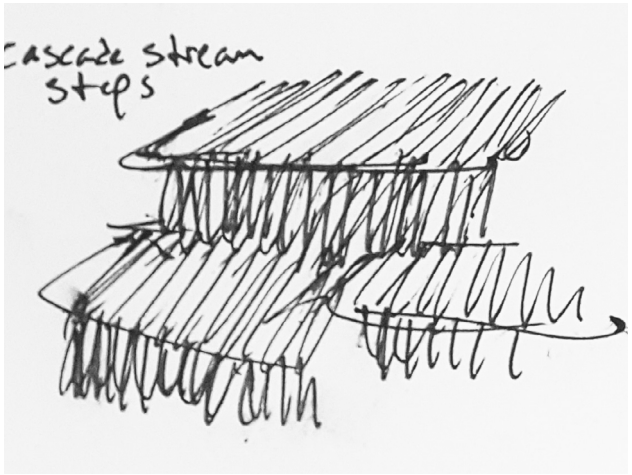


Figure 7.37 (Above) Cascade Steps Water Feature Sketch
Figure 7.38 (Top) Cascade Steps Concept Section Sketch
Figure 7.39 (Right) Cascade Steps Perspective Sketch

The marsh pond reflects stillness and emergence as a side courtyard outside of the community center
Figure 7.40 Marsh Garden Perspective Rendering

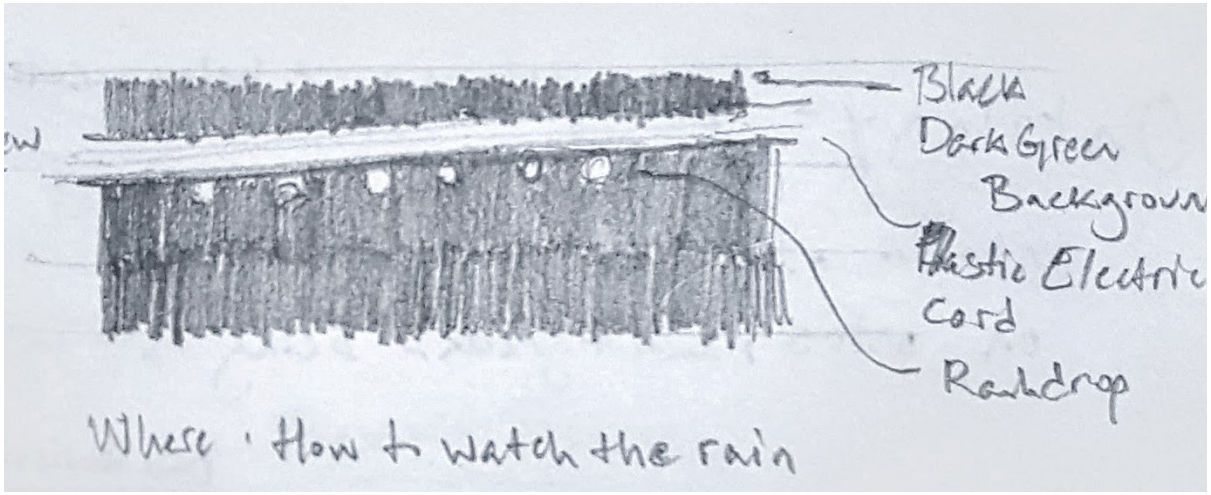
The return well is a fountain that returns the water back into the earth and sky. This return frames the entry into the park through the stream ears stream sculptures that announces departure and arrival or deeper into the shrine chamber.

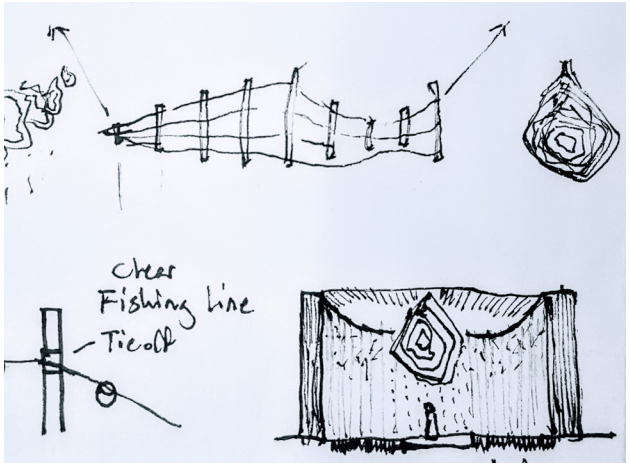
Figure 74| Return Well Perspective Rendering

The trickling chamber observes the confluence of the cleansing landscape. The chamber itself is a fountain with water trickling along the earthen walls with soft reverb. As an observatory the overlook gazes onto the seasonal color of the wetland forest willows and the shifting height of the reflection pond.

Figure 7.42 Trickle Chamber Perspective Rendering

The rain garden frames droplets of water to connect to the rain and dew. An underground chamber shapes acoustic to watch and listen to the rain fall. The rest space peers into a central sky opening. Dim and overcast lighting casts attention on dew droplets collecting along wireframe sculptures. Imagery of a salmon / orca silhouette remind people of why the water is being cleansed.





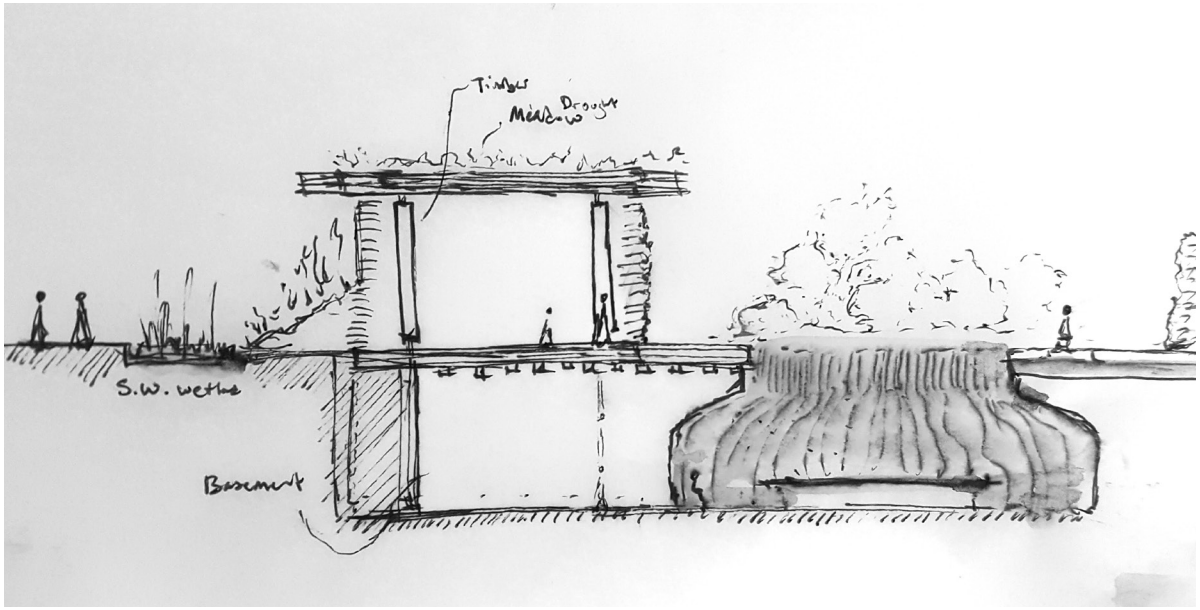


Figure 7.43 Rain Catcher Concept Section Sketch
Figure 7.44 Rain Catcher Water Feature Sketch
Figure 7.45 Rain Catcher Concept Perspective Sketch

Virtual Contemplation.

As contemplative places are a result of their ecologic material composition and technology is advancing society into virtual, digital, and augmented realities, we should envision how the value of restorative gardens extends into virtual life. Studies showing visual tranquility preference is determined in part by soundscapes indicates that virtual contemplative spaces need to be at least engineered with restorative soundscapes in mind. This is already a reality in video games with original instrument soundtracks accompanying the exploration of worlds as well as in films that convey mood through the drama of the soundtrack. If physical access to restorative gardens and landscapes is unavailable than virtual inhabitation should be explored. Environmental electronica and ambiance music combined with digitally modeled landscapes in virtual reality could provide interesting "places". Additionally it would be interesting to compare how someone with an embodied memory of that place would compare someone only experiencing it virtually. Part of the potency of contemplative spaces is that they remind us of something or inspire us towards something. If virtual "gardens" are engineered compositions of soundscapes and visual textures would that have the same effect for someone without a memory of what those materials feel like? Additionally this raises the question about the value landscape designers can bring to virtual spaces that are void of physical materials.

Site Meditation Analysis.

This thesis starting moving along after I was meditating in the Gould Hall rear spiral garden and hearing the bustling waves of buses in a glass and concrete canyon. How are gardens supposed to move us to tranquility if we are mainly focusing on ignoring the cacophony? As "noise" is a value judgment on the mechanical sound of urban areas than how could that noise become part of the "borrowed scenery" of a place and can it become pleasant background noise? Because the noise drones out other softer and more calming sounds, locating contemplative spaces in urban areas requires embodied site visits to perceive areas to avoid the noise and augment it. As design work is increasingly done remotely away from site and in an abstracted digital space, we are missing out on

a level of embodied consciousness of place that would inform how to sculpt a tranquil space with the rhythms and qualities of the local soundscape (including bus routes). As part of site analysis, regular and ongoing observation of what elements are already there should be meditated on before assuming contemplative locations and potential. Times of day and seasons of the year will emerge as more tranquil. This analysis should include users' personal experience and preference as they spend time listening in place.

Soundscape Sketching.

Designers need to play with analysis tools and design media that captures the quality of soundscape and allows for auralizing the design. During this thesis and prior studios I began to incorporate Audacity, Ableton Live, and Adobe Premiere to play the audio and video recordings of natural textures. The recordings communicate for themselves in ways that explanatory words can not touch. During the design process I made a soundscape sketch of the choreography through the site to differing water features. The "sketch" was an audio track from Audacity composed of the soundscape field recordings I took and reassembled to create the sense of retreat, movement, threshold, arrival, rest, and departure. The sketch was a form of audio collage. It informed the final presentation where I showed the perspectives and played the soundscape of each scene. Additionally graphic representations should embrace animations, video, and virtual media. For analytical graphics, sound sources and sound fields locate the experiential to 2-D media. But for emotive graphics, sound sources need to be expressed as they may be experienced. Ways of representing the radiant space of sound in the design process and presentation needs to be explored.

Auralizing Soundscapes.

Further physical material studies could begin to study the relationships between water flow and soundscape effects. While basic formal typologies like cascade, fall, stream can give indications of soundscape effect, trial and error through fabrication would yield the best knowledge and intuition.

Digital modeling that incorporates Computational Fluid Dynamics of water would help define water forms and material structures. Digital auralization simulation of the water forms would give an indication of how the feature would enliven the architectural environment. At a landscape scale modeling water flow forms with parametric topographic modeling could give more precision to restoration projects that require particular ecological water movement, like shallow streams and tidal lagoons. In my research for accessible software to parametrically model any of the above I did not find premade plug-ins but custom community-made grasshopper scripts for Rhino dealing with water flow vectors. RhinoCFD by Cham.co.uk does computational fluid dynamics to observe flow effects with solid objects. CFD is used in civil engineering and auralization is simulated through Grasshopper and Rhino plug-ins, I did not find a digital workflow to simulate water flow in Rhino, much less to parametrically model it, and then auralize it. Given the basic design parameters of a water fountain a parametric script could be written to establish a form for a water sculpture. From there a physical 1:1 model could be fabricated for its sound quality. That sound could then be inserted into auralization simulation software to render how the feature would interact with a modeled architectural space.

Soundscapes for Species.

In the research there is considerable attention paid to the impact of environmental noise on human health. As well as research into the impact of environmental soundscapes on human health. In light of the COVID-19 pandemic quarantine that minimized human activity in parts of cities, animals are comfortable roaming, congregating, and being active. Therefore a future of naturalistic landscape design could study how design decisions impact species health by virtue of the soundscape pollution. Possible considerations could be that certain frequencies and rhythms repel or invite certain species.

Modern monastery.

Religious models deserve reinterpretation for our contemporary secular scientific urbanization time. Combing residency, work, and study creates an opportunity to meditate with one place. Arts and science activites invite observation and creativity. Having fixed community centers in parks establishes dedicated places which can pontentially function as contemplative spaces. Contemplative gardens serve as a public health asset as the practice of gardening is mindful and the spaces are restorative. Because we are increasingly intertwined with digital technology dedicated contemplative space offer the opportunity to "unplug". Stress strains work-life balance. As modern life is primarily lived indoors the design of architecture towards contemplative spaces may grow more mindful appreciation of nature from inside. Limited time resources and access to remote places means that urban retreats are needed for cultivating mindfulness and restorative environments while also bringing attention to the environmental degradation of urban areas. Setting the growth of the community within the regeneration of a landscape would create embodied experiences with the ecological crisis. Ultimately modern contemplation retreats simply seek to provide the setting for personal growth, creativity, and compassion to give back into the world.

Image Citation Notes

Chapter 3 - Meditation Gardens and Environmental Art

[1] Figure 3.1 *Google Maps*
[2] Figure 3.12 *Patricia Johanson Ellis Creek Water Treatment Facility https://www.archinform.net/arch/43747.htm Accessed 6/22/2020*

Chapter 5 - Soundscape Materials

[1] Figure 5.2 *Cerwén, Gunnar (2017). Sound in landscape architecture. Dissertation Alnarp : Sveriges lantbruksuniv., Acta Universitatis Agriculturae Sueciae, 1652-6880 ; 2017:91*
[2] Figure 5.5 *Google Maps. Puget Sound Case Studies [2]*
[3] Figure 5.12 *Harris, C., Dines, Nicholas T, & Brown, Kyle D. (1998). Time-saver standards for landscape architecture : Design and construction data (2nd ed.). New York: McGraw-Hill. Section 530 Pools and Fountains pp 530 Angela Danadjieva*

Chapter 6 - Pilgrimage and Site Analysis

[1] Figure 6.2 *CSO Art Master Plan 2017, 4Culture and King County Wastewater Treatment Division*
[2] Figure 6.3 *King County Wastewater Treatment Division CSO Locations March 2013. PDF File https://www.kingcounty.gov/services/environment/wastewater/cso/library/map.aspx*
[3] Figure 6.4 *Museum of History and Industry Seattle*
[4] Figure 6.5 *Berger Partnership Idea Lab http://www.bergerpartnership.com/idea-lab/inquiring-resilience/*
[5] Figure 6.6 *SoDoSeattle.org https://sodoseattle.org/about/*
[6] Figure 6.7 *Grist Sea Level Rise Estimate. SPU map. https://grist.org/science/climate-forecast-for-seattle-warmer-and-wetter-with-a-chance-of-deluge/*
[7] Figure 6.8 *Georgetown WWTF - Signal Architecture http://signalarch.com/project/gwwts/*
[8] Figure 6.9 *Clallam Bay Correction Facility Polishing Pond http://sustainabilityinprisons.org/blog/2015/09/02/making-the-most-of-a-waste-water-lagoon/*
[9] Figure 6.10 *Tilley et al.2014 Compendium of Sanitation Systems and Technologies*
[9] Figure 6.11 *Tilley et al.2014 Compendium of Sanitation Systems and Technologies*
[10] Figure 6.12 *Port of Seattle. Terminal 46 Cruise Development Terminal. https://www.portseattle.org/projects/new-cruise-terminal Accessed 6/22/2020*
[4] Figure 6.13 *Berger Partnership Idea Lab http://www.bergerpartnership.com/idea-lab/inquiring-resilience/*