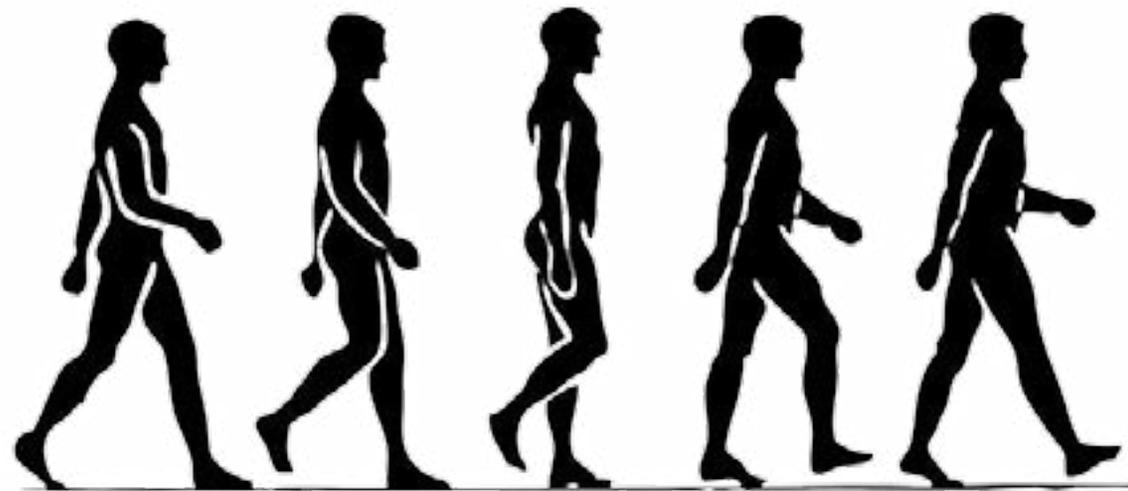


The Human Senses: Designing Beyond Intuition

By
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Thesis
NDSU
Landscape Architecture 572
Advisor: Kathleen Pepple



The Human Senses: Designing Beyond Intuition

A Design Thesis Submitted to the
Department of Architecture and Landscape Architecture
of North Dakota State University

By

April Lipatan

In Partial Fulfillment of the Requirements
for the Degree of
Bachelor of Landscape Architecture


Primary Thesis Advisor


Thesis Committee Chair

May 2013
Fargo, North Dakota

Statement of Intent

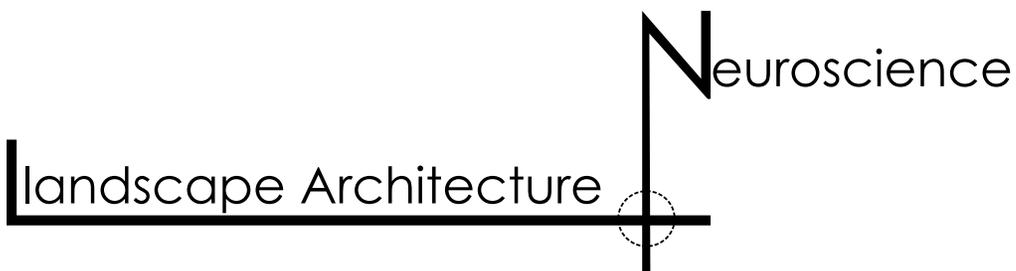
Abstract

This thesis project will explore how multi-sensory experiences can be merged with landscape architecture as a supplement to communicate the meaning of place. The problem of landscape architects not fully understanding the senses and their processes needs to be addressed in order to create designs that are beyond our intuition. Landscape architects can better communicate the experiences humans have with built environments by better understanding how the senses work as communication tools. The problem is the lack of knowledge on the senses in this field. Landscape architects have the capacity to integrate humans into spatial elements creating meaningful places, and producing distinctive memorable designs which harbor extraordinary experiences. This thesis will reveal how the senses can communicate our world around us through a comprehensive understanding. Through the assistance of Juhani Pallasmaa's outlook on architecture, art, and the senses, this study hopes to connect how multi-sensory experiences could be a key medium for artistically yet successfully communicating concepts and meanings in landscape architecture. This project approaches the gap, understanding the process of the senses, in landscape architecture by combining theory, psychology, and relative research from studies and synthesizing the information into a successful strategy to design communication. Case studies on human senses will explore the processes and reactions in established psychological studies to express how the senses work as communicative tools. The research will then explain how to utilize the selected measures and apply each to Freeway Park in Seattle, Washington. The measures will help in determining their capabilities to create a sensual design in Freeway Park. By artfully applying multi-sensory experiences to the field of landscape architecture, designers can integrate the mind, body, and soul into the senses to create an optimal experience. The importance of this study is to ultimately bring attention to application of multi-sensory experiences in landscape architecture and provoke further exploration of the senses in this field to merge with the related sciences. This thesis will push the limits of what it means to design with the senses.

Problem Statement

There is a **lack of understanding** on the extent of which you can **utilize sensory** design elements. Landscape architecture has been **dominated mainly by the visual medium**. If we dive deeper into the **science of the senses** and their processes, we are opened up to the different dimensions of the senses and to **new design strategies** that can engage humans into the built environment. Utilizing smell, sound, and touch can create and **form spatial perception** just as effectively, if not, more intensely than the sense of vision. Merging the related fields and landscape architecture is paramount to this style of designing.

Philosophy - My philosophy is important in my design as it acts to unify elements within the concept. Eastern philosophies have held an influence on many of my designs. Bringing people into an awareness of their space is what I can offer for others to help bring them back to themselves and into the realization of the space you are in.



The Project Typology

Claim

Merging the field of landscape architecture and the relating sciences is paramount when designing with the senses. This integrates the users into the landscapes at an optimal level.

Supporting Premise

Understanding the related fields that pertain to the human senses assists greatly when designing with the human senses. If we can integrate the user of a space through the engagement of the senses, the user will ultimately have the strongest connection and memory of that space.

Theoretical Premise

The theory of designing with the senses is already a strategy of designing in landscape architecture. Healing landscapes and schools already integrate the use of human senses.

Project Justification

Designing with the senses is not a new concept in the field of landscape architecture. However, merging the science of the human senses and landscape architecture is something that has not been as heavily explored.

Narrative

In this thesis I will explore what it means to design with the senses by pushing the limits of sensory design. This idea of design with the senses is not a new one, however, merging the fields of landscape architecture and the relating scientific fields is a concept that has not had much research. This strategy of designing is important for landscape architecture because this includes the research that explains why experiencing natural elements is healthy for humans.

User/Client Description

Users of site are surrounding business men and women coming through the site. The design will be geared towards these users and all other users to help them come out of their daily hustle and bustle.

Major areas to note:

The Seattle Center and the Seattle Waterfront are major nearby landmarks that are popular for spaces like Pike's Place Market and the Space Needle.

First Hill is the reason for why Freeway Park is such an important amenity. It helps to connect the Downtown District to residents of First Hill.

The Downtown District holds many of the jobs from which the users come from.

Engaging the people who are stuck in the everyday grind of the big city life is key to creating such a memorable and strong connection to space.



Major Project Elements

40

Integrating the science of the human senses



Working with and preserving Halprin's original concept



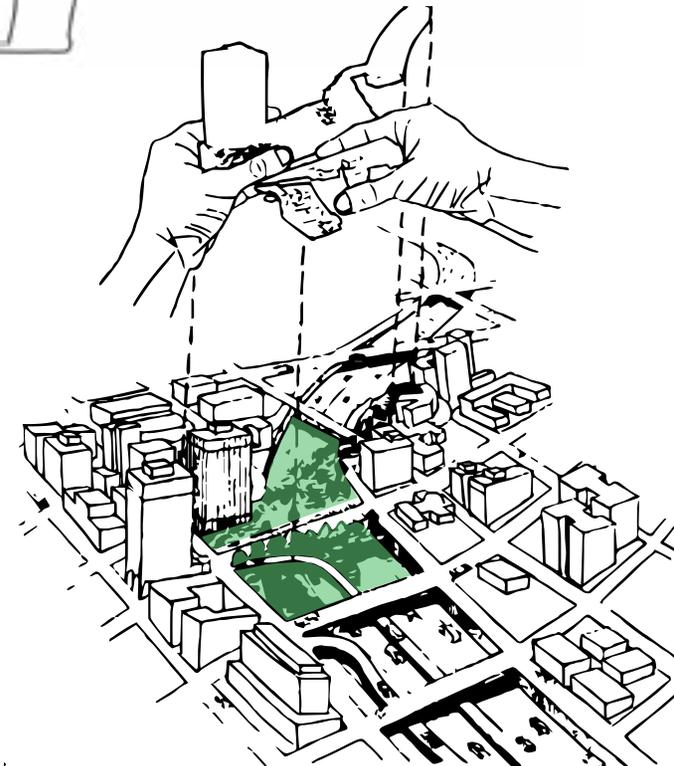
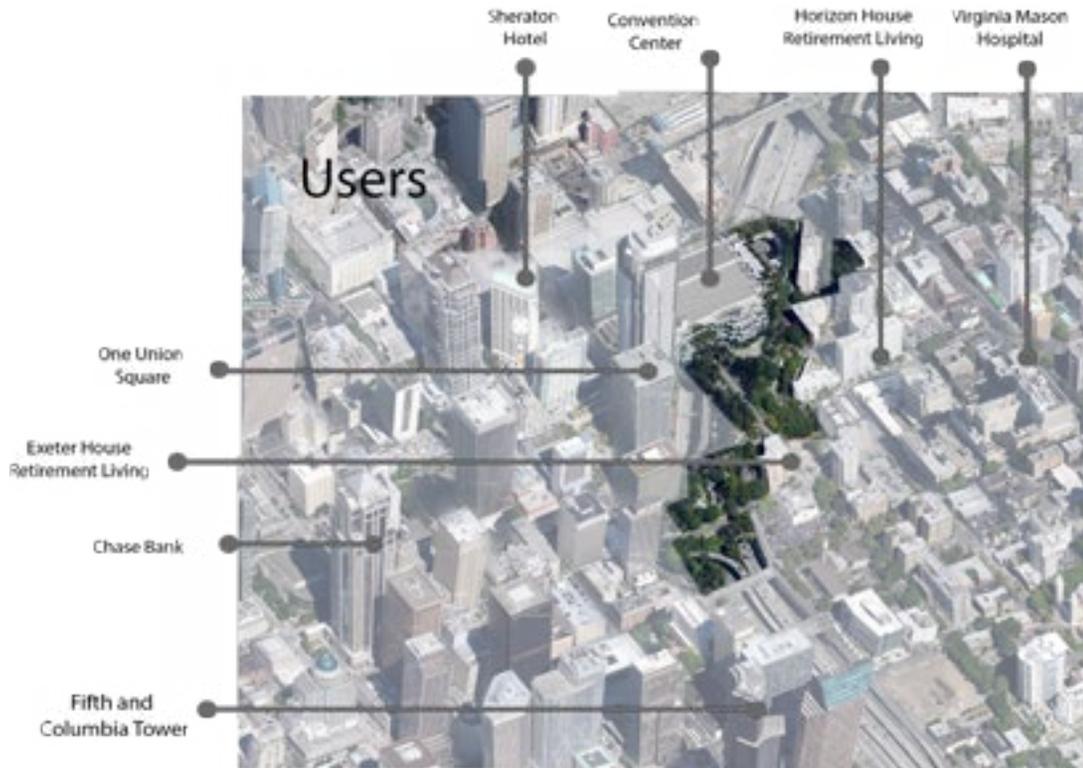
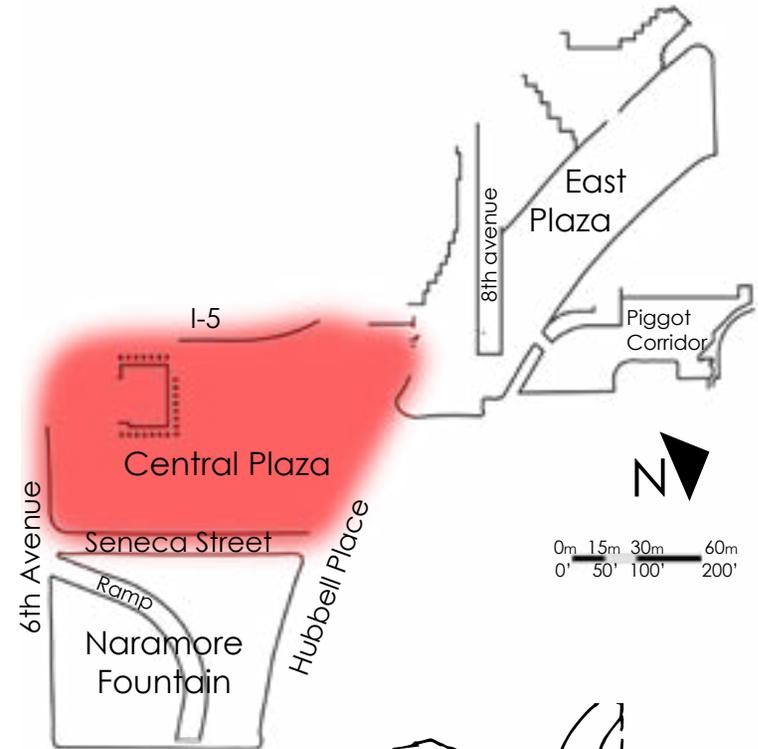
User safety perception



Site Information

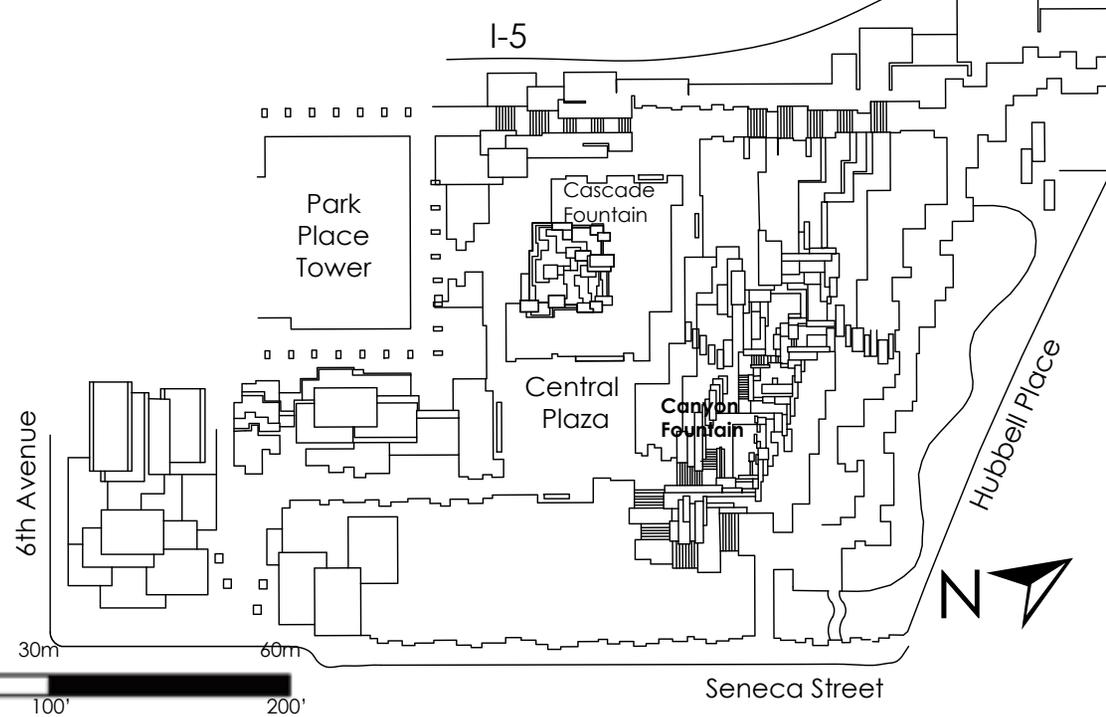
Understanding the human senses is the primary focus of the project. I chose a Lawrence Halprin site because he too works with small scale human behavioral interactions with space. I will try to expand and push the limits of what it means to design with the senses in his design.

There is already a need for the regeneration of the park for public safety reasons. So, how can safety and monotony be addressed in design through the science of the senses? Instead of demolishing parts of the park that have hiding spaces, why not use design strategies to open a space and make it more public.



Site Information

Problems on the site include public safety and maintenance of the fountains. The large elevations in the fountains create perfect intimate hiding spaces for those who need to hide. Just like in any large urban city center, there are many users who could utilize this potential of a space. The non use of the fountains leave the site feeling unused and abandoned which contributes to the unsafe perception. Users quickly walk through the space with no reason to stop.



Opportunities on the site include open public surroundings to draw on in the solution to creating a more public perception. The on site Park Place building is a Leed certified building with a green roof and houses the Environmental Protection Agency for the Pacific Northwest. This makes for a great opportunity to start connections to a sustainable future for an all concrete park. A child daycare is on the first floor of Park Place Building. If the children can be drawn out into the plaza, the perception of public safety could be enhanced.



Project Emphasis

The emphasis of the project looks at creating stronger connections and memories of a site by utilizing the science of the human senses. The results of the design will aim to create a safer public space and alter the current space in a fashion that will positively engage users into the site and out of their everyday busy minds. The design will strive to reconnect users to the site by disengaging their minds to take a break and engage into the present space.

Areas of Focus

Safety

Public Space vs Private Space
Integrating new users, children
Attracting more users

Senses

Reinventing the identity of Central Plaza

User Integration

Integrating the user at every level
User interaction at access points
User interaction stimulating the senses
Integrating the children as users

Plan for Proceeding

- Week 1 Understanding my intent for my thesis
- Week 2 Work on statement of intent
- Week 3 Complete statement of intent
- Week 4 Understanding thesis proposal
- Week 5 Work on thesis proposal
- Week 6 Work on thesis proposal
- Week 7 Complete thesis proposal
- Week 8 Understand thesis program
- Week 9 Work on thesis research of the senses
- Week 10 Work on thesis research of the site
- Week 11 Work on putting it all together
- Week 12 Have preliminary thesis program due
- Week 13 Review by advisors
- Week 14 Editing after review
- Week 15 Editing after review
- Week 16 Editing after review

Research Direction

Research is conducted on the science and processes of the human senses. The research will then be applied to show how these related fields can be integrated into landscape architecture.

Design Methodology

The senses are quantifiable through research and studying of the relating fields in psychology. The research for each sense was found through archived databases and online data bases. Understanding, analyzing, and applying the research will happen throughout the paper.

Documentation of Design Process

The research begins with the above topics of research. A site visit was mandatory in taking inventory and then analyzing the information. Creating diagrammatic drawings which are in agreement with site analysis for the site was needed to lead to concepts and ideas. A masterplan was then executed to detail out the functions of the spaces which came from the diagrams. Details, perspectives, and sections are then created to create understandings of the design.

Research Results and Goals

Learning Space

As humans first learn space, they touch, bump, and crawl through things as their bodies measure its dimensions in relation to space. Little receptors called proprioceptors cover the humans skin in order to help measure it in space. In this research, we learn how children first learn space and do small tasks such as transitioning from a crib to a bed. A suggestion made by the author is that, as parents, you should allow your kids to roll around in the bed from end to end with their eyes closed so their bodies can measure that space. This is the reason adults do not fall out of bed at night. How can humans relearn spaces or understand a design through a haptic experience? This research helps to move forward with these questions.



W. Ross Macdonald School for the Blind

Haptic Process Applied to Design

This project was useful in displaying how movement and materials help navigate users beyond the visual cues. Research on this case study dive into how a school designed for the visually impaired can navigate users. The design utilizes the scent of woods, textures of materials, and the acoustic qualities of materials to help students find their way. Something as simple as how your footsteps sound when you come into a space can help build on the experience and integrate users on a sensory level.

Research Results and Goals



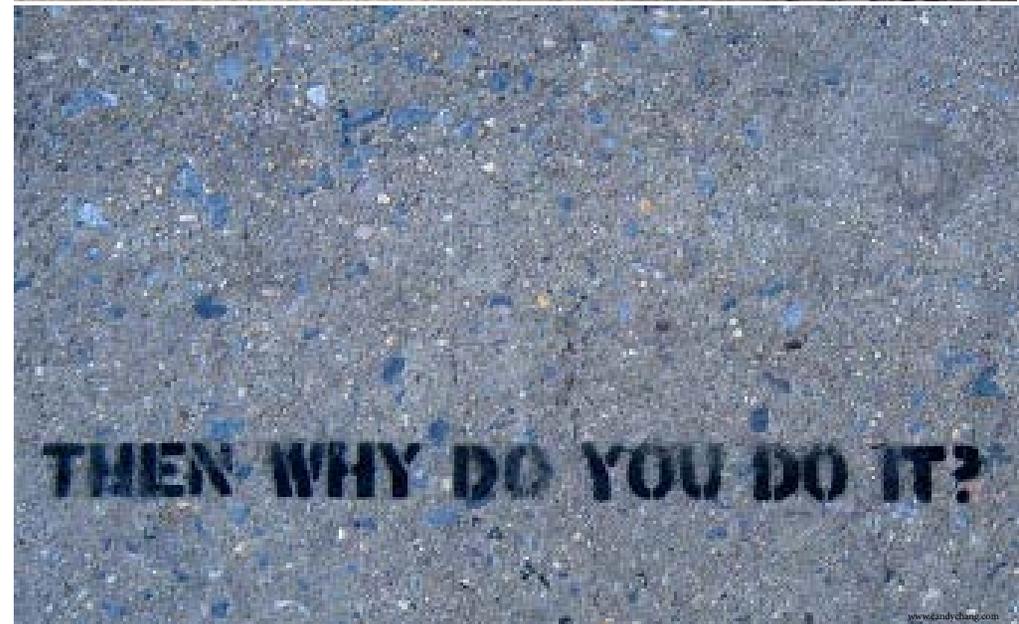
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<http://weurbanist.com/2012/01/25/feeling-the-earth-move-urban-sidewalk-liquid-intervention/>



www.candychang.com



www.candychang.com

Case Studies

In these two landscape installations the artists intentions are one in the same. In Candy Chang's Sidewalk Psychiatry (above) she strives to bring the user out of their busy minds and ask them herself what really matters in life. In the artist Faum's installation, (right) he takes the ground and creates an imbalance by shoving a pocket of water under the normal pavers of the street. He also successfully brings users into an awareness of the present space they are in and creates a out of the ordinary moment to come in to.

Research Results and Goals

Vision

Fractals patterns are mathematical patterns in nature and other subjects that repeat at every level. For example, a tree branches in two or three directions from the trunk and repeats this pattern until the very ends of its branches. This research helps to explain the recent research that explored window views being healthy for people. The human eye prefers to look at fractal patterns. Fractal patterns have shown to actually reduce stress physiologically. How can fractals be incorporated into design? This research can help push what forms we create when designing.

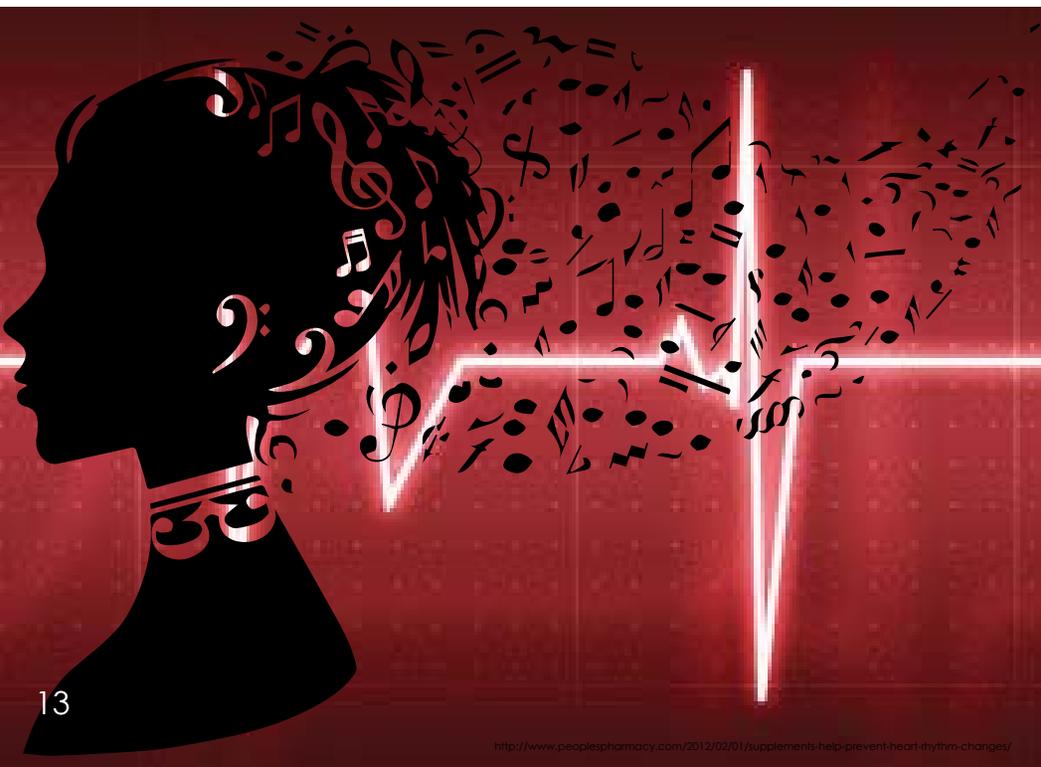


Photo by April Lipatan

Research Results and Goals

Sound

Research on the sense of sound assisted in how sounds can be incorporated with design. Humans have biological preferences to sound due to evolution. In general the preference is to natural sounds. Studies have shown that music with certain rhythms and beats help to physiologically calm. Knowing that certain sounds can affect behavior can create quite an atmosphere when in conjunction with other sensual elements. The ventriloquist effect is the illusion of a sound coming from different source and yet our bodies process this information as though it is coming from the false source. This effect explains how our bodies can out together information to create an experience.



Research Results and Goals

Case Studies

Artist Jim Greene utilizes sound as his medium to create social interaction in dense urban areas. In the Sound Walk (right) he places foreign sounds that do not belong in urban city centers. The sounds such as yodeling, cows mooing, and a man screaming, work to stop passerbys on the sidewalk and share this unique experience. People will stop and ask each other "Did you hear that?" or even just laugh and smile at each other. He also has other installations such as a water fountain that makes a toilet flushing sound when you drink, a whoopi cushion exhibit, and a laughing escalator. All of these cases are great examples for incorporating sound into the land.



phot by April Lipatan



http://en.wikipedia.org/wiki/File:Tanfran_Torget_escalator



<http://archives.frederatorblogs.com/monsters/2006/04/28/water-you-talking-about/>



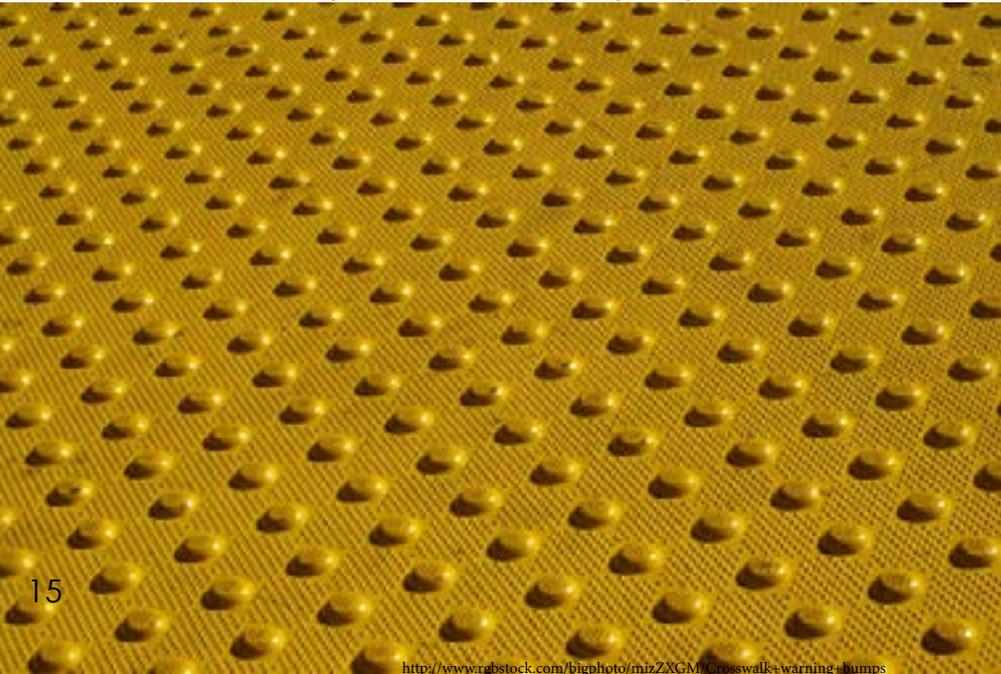
Vince Grzegorek

Research Results and Goals

Historical context of the thesis

My project can learn from artists and environmental installations that have already been explored by implementing similar ideas. Some landscape architecture strategies that have already been in practice include designing healing gardens and landscapes which take into consideration the disabled and utilize sensory elements. I would like to push the senses forward in the design field by creating entire designs based on the science of the senses. Research shows that the more senses stimulated at the time of experience, the stronger the connection and memory of that space.

Bumps for the visually impaired



Healing Gardens



Research Results and Goals

Goals

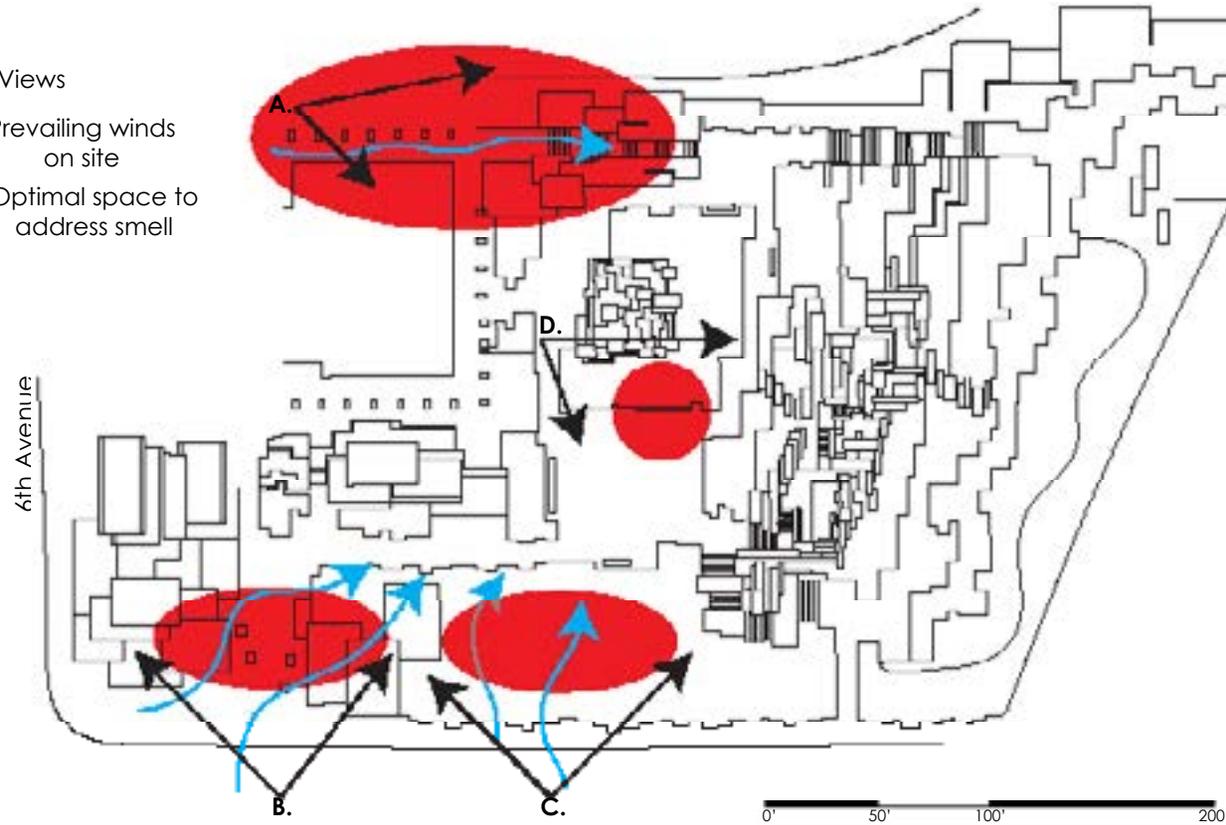
1. Research on the science of the senses
2. Case studies focusing on senses
3. Inventory Analysis of Freeway Park
4. Application of the science of the senses into design at Freeway Park

Main goals for this project were to research each sense as intensely as possible in the amount of time allotted. After the science of the senses were completed the aim was to find case studies where related professions had implemented designs utilizing all or some of the senses as mediums or focused on a sense as the main goal of the design. After studying the goals of those designs and installations, applying this all to a design effectively was the focus. Integrating the science of the senses into landscape architecture at the site of Freeway Park was then next goal. I wanted to express that the senses can logically be applied to many design concepts to help communicate meaning better and integrate users on a different level.

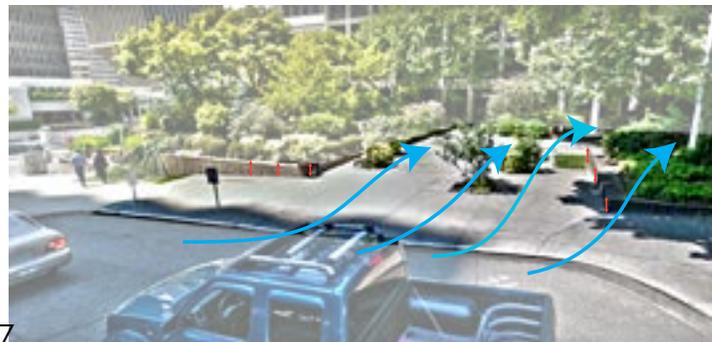
Site Inventory | Smell/Taste

Understanding the prevailing winds on the site is important for detecting and designing for smells. The center of the site has a lack of smell and the edges bring smells into the site from the surroundings. Traffic has an influence on the way wind travels and the smells they bring. Preserving a space to introduce smell into the site would be best at the center of the site. The central space will work in drawing people into the site and act as a gathering space for people to come and rest. How can smell be used in creating an identity for a space? This is my aim with the sense of smell at Central Plaza.

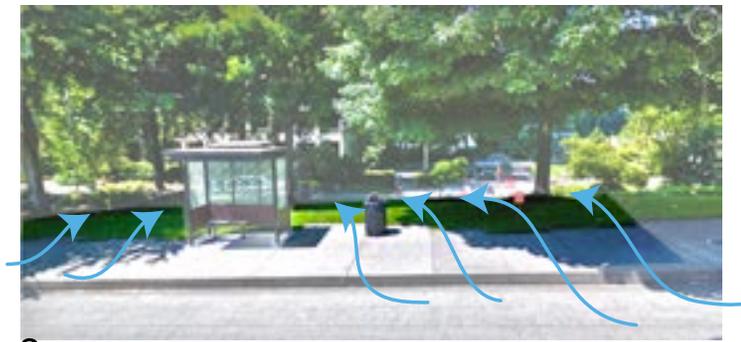
- Views
- Prevailing winds on site
- Optimal space to address smell



A. -High speed traffic from I-5 on ramp



B. -Low height of planters
-Wide open entrance from sidewalk



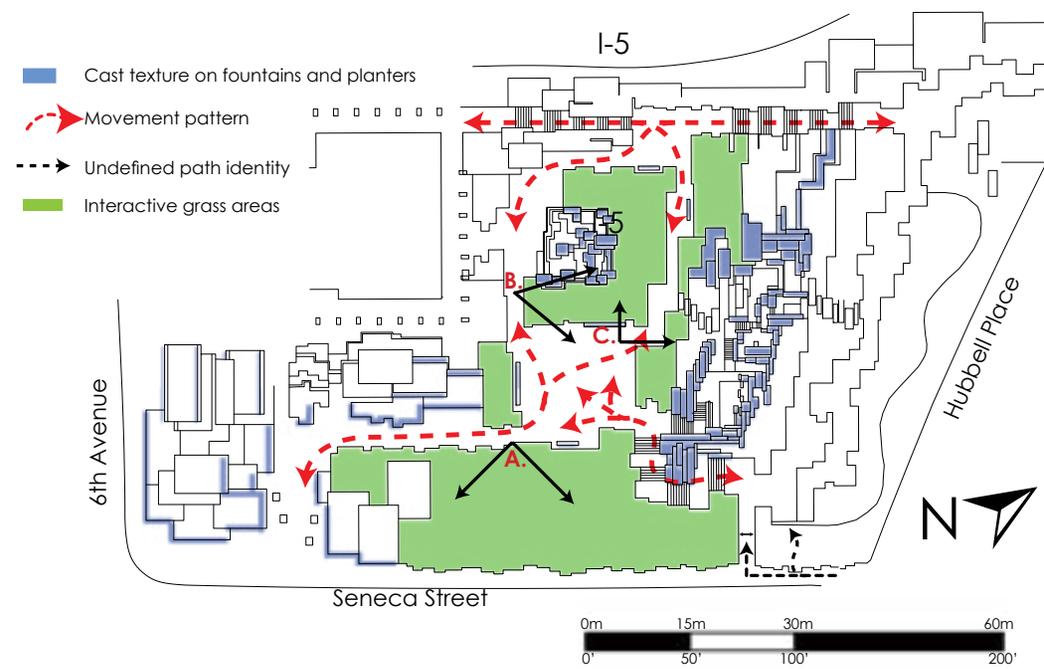
C. -15' difference over 60'



D. -Void of sense of smell

Site Inventory | Movement/Haptic

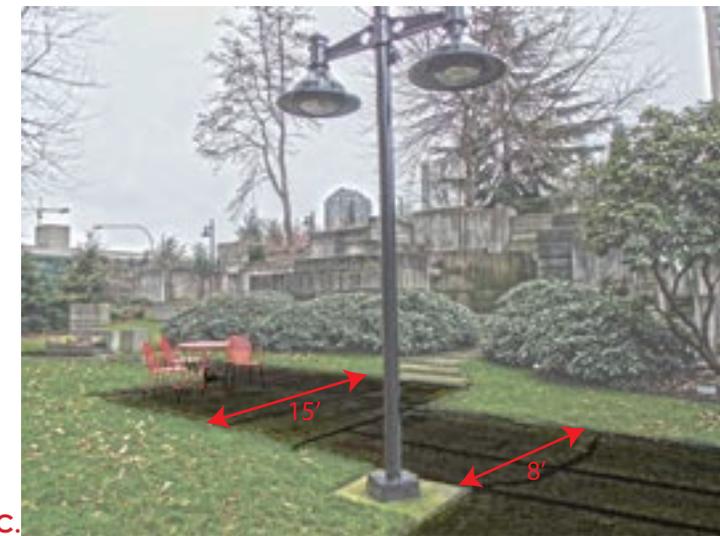
The material chosen for Freeway park is all made of cast concrete. There are items such as drinking fountains, garbage cans, benches, and planters which are all made out of cast concrete. This creates a visual lack of diversity in haptic textures and visual textures on site. The paths which users can choose narrow which creates an opportunity to implement a positive distraction and engage users into the plaza. No matter which path the user chooses, at some point it narrows, and this will make for an interaction that users will have to participate in. This interaction should involve the sense of movement. But, how can the sense of movement be used to create such a distraction? This is the goal I wanted to achieve when focusing on the sense of movement.



A. Lack of vegetation and 15 foot drop creates an opportunity for a large movement interaction.



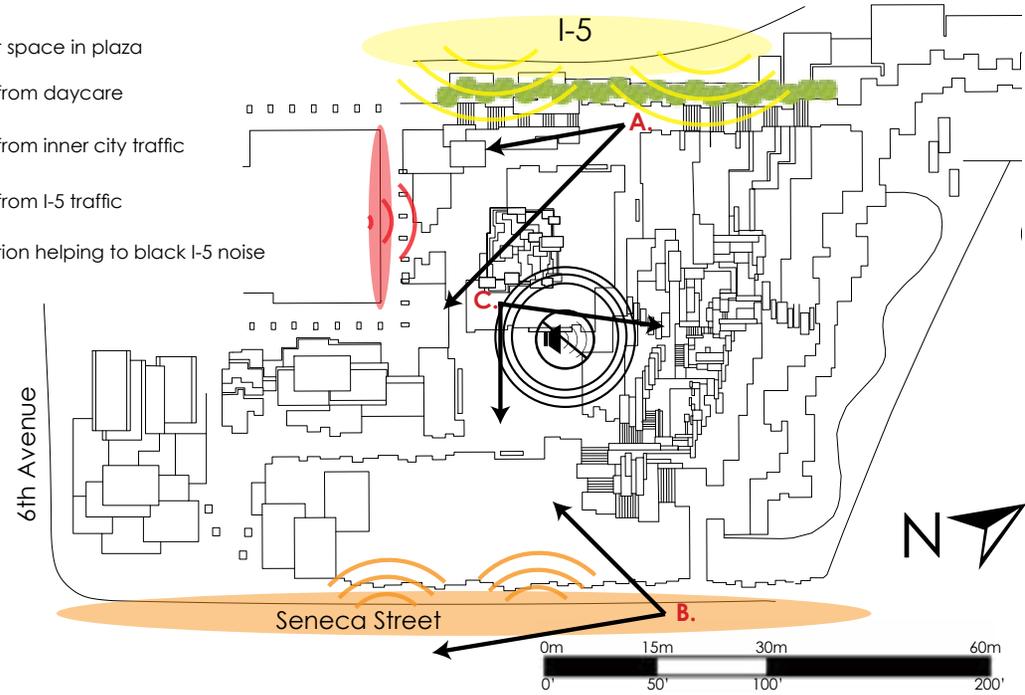
B. -Texture of concrete is consistent throughout plaza.



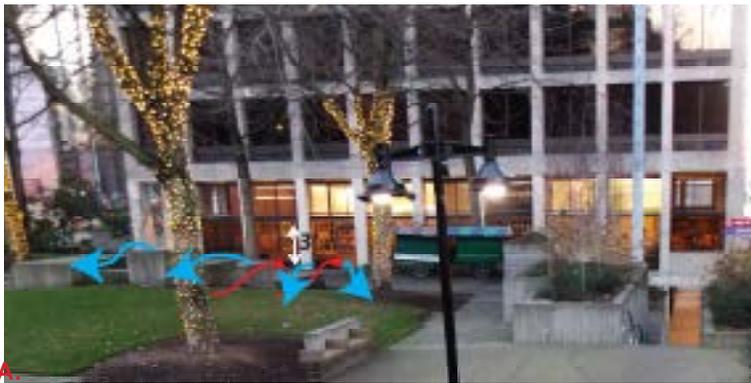
C. -Opportunity to create a distraction in the path due to small width of path on both main paths through Central Plaza.

Site Inventory | Sound

-  Quietest space in plaza
-  Sounds from daycare
-  Sounds from inner city traffic
-  Sounds from I-5 traffic
-  Vegetation helping to block I-5 noise



The Sound on the site consists of mainly mechanical sounds. Central Plaza is surrounded on all four edges by Freeways and inner city traffic. The edges are loud due to the traffic and in turn creates a seemingly quiet center. In observing sound on the site I had discovered a sound that I found I would like to incorporate into the plaza, kids. There is a daycare at the first floor of Park Place Building. The sounds of children playing and screaming can bring new users and a closer sense of public safety into the space.



19 -Sounds of children spill into the plaza.

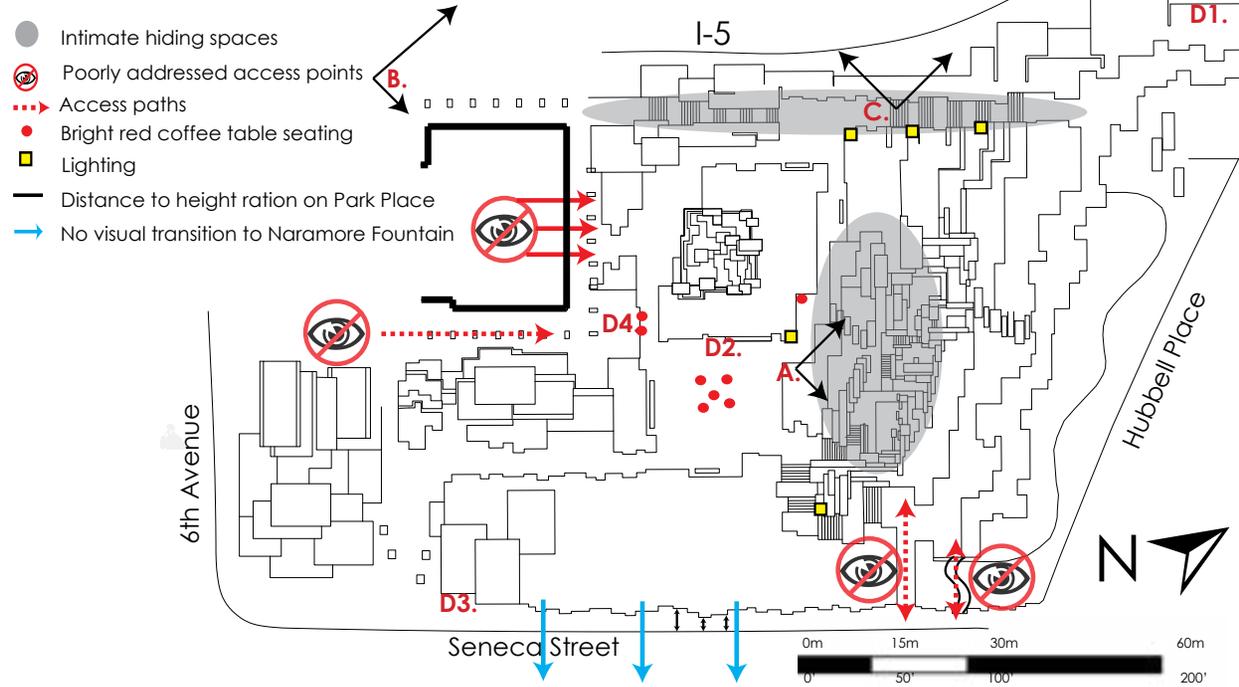


B. -Slower inner city traffic brings vehicular sounds to Central Plaza since the road is directly adjacent to 2 on ramps, freeway road, and inner city roads.



C. -The rush of the traffic sounds creates a comparatively quiet center within the plaza. Sounds can be brought into this space.

Site Inventory | Vision



A. -The major contributing factor to unsafe feel are the hidden spaces within the main fountain and stairways.

The non diverse materials again creates a monotony in the site. Factors leading to the unsafe feel are vagrants hiding in the fountain and small intimate spaces which are perfect for those who need to hide. Also, additions such as chain-link on top of the design create an unsafe or hazardous perception. The access points to the Plaza are not addressed to their full potential and could help the Plaza to become a more public space. How can vision stimulate the senses and engage users into the plaza? This is what I will aim to do as a design goal.



B. Sidewalk discontinues and access to Central Plaza is made unclear.



C. Unsightly chain-link fence around original design says that this space was or is unsafe.



D. -Bright red addition to the park has started to create some sensual identity.

Site Inventory | Original Design

Lawrence Halprin has commonalities among many of his most famous designs. Three areas that I understood to be problems which contribute to why the safety and maintenance are typical issues with his sites are: scale, design philosophy, and location. These sites are all located in dense urban city centers. There is large diversity of people that come to city centers including the poor and homeless. These people often look for places to sleep and hide or conduct other activities. Halprin's design philosophy gives way to these small hiding places. He often design small intimate spaces for individual interactions to occur and these spaces become too intimate in a large city setting. The scale of the design creates maintenance issues because the sites are often too large and need more maintaining than the city is willing to pay for. How can a new sensual design reinvent a space that has unraveled over the years?



Photo by Lucy via www.landscapevoics.com



Skyline Park, downtown Denver Colorado

Photo by April Lipatan



Heritage Park, downtown Fort Worth, Texas

Photo by National Register for Historic Places

Site Inventory | Original Design

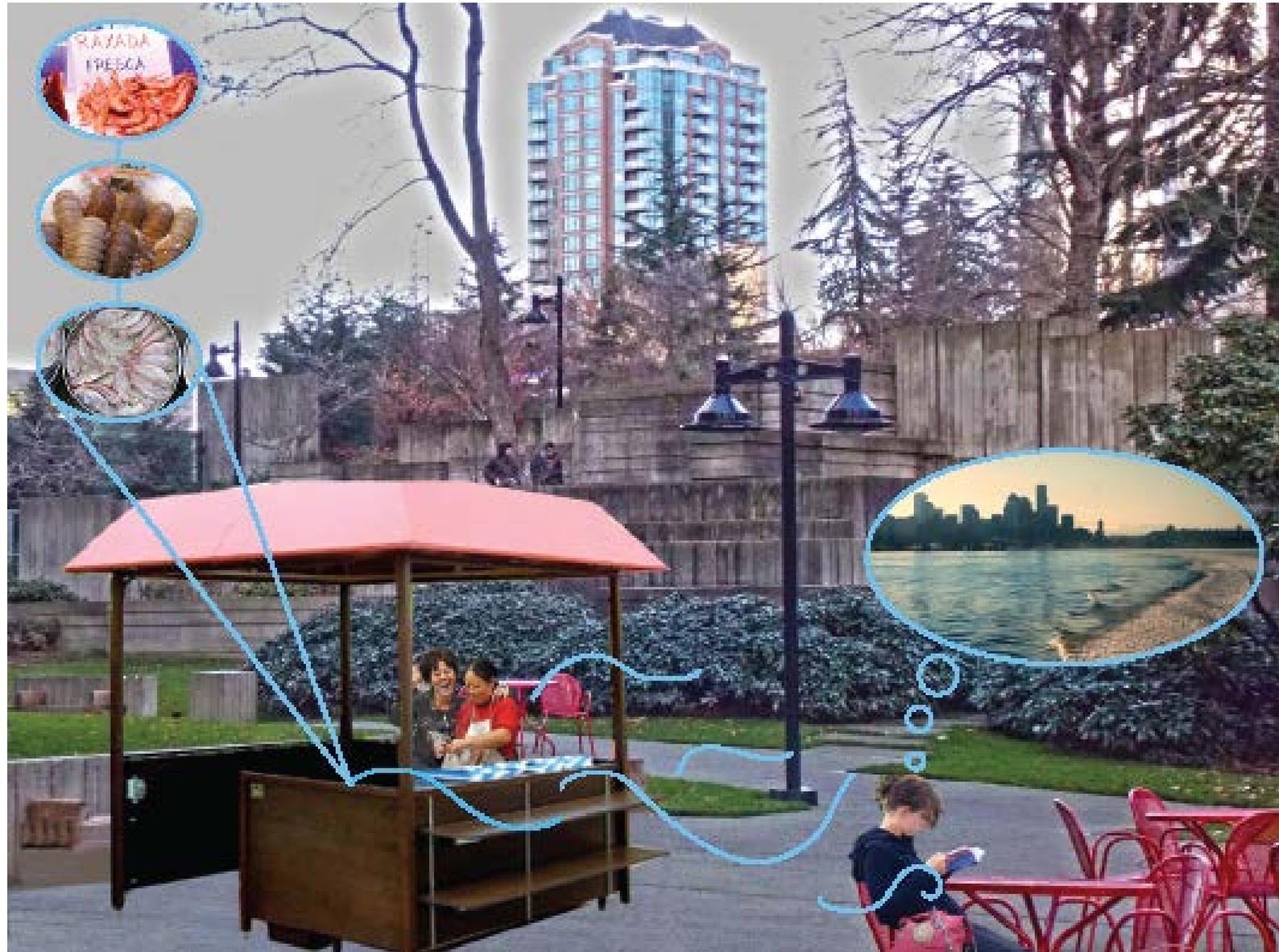


Halprin is also known for incorporating the local environment into the design. In this case he considered the local geology of basalt rock and their rigid formations. He considered the surrounding forests, creeks, and waterfalls which were all inspirations from the local mountain ranges. Freeway Park is in the process of becoming landmarked and so to stay consistent and to help preserve some of his original design I chose to incorporate the nearby Puget Sound into my design concepts.



Conceptual Work | Smell

To address the sense of smell and the lack of, I wanted to bring a coffee hut into the site to spread the aroma of coffee. Users can now identify the space they are in with a smell. Seattle has 128 Starbucks per 100,000 residents and that is only naming one company's coffee shops. So to embrace what Seattle loves most a coffee shop seems to fit. There is also a book cart on site which sells old library books for one dollar. What a great way to enjoy a book than with coffee. The idea behind bringing a scent to the site was that the human brain only needs 8 molecules of a substance to recall a memory. To create that strong connection to the site, I chose to utilize the sense of smell.



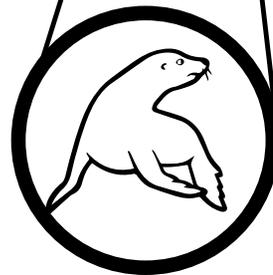
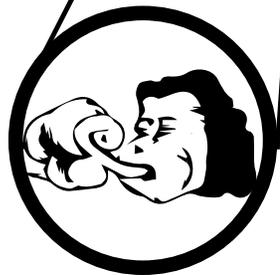
Conceptual Work | Movement

How can movement engage the user into the Plaza by bringing them out of their busy minds and into the present awareness of the present space? Forcing a user to interact with the entire body brings the human mind into an awareness of that space. If a user must force their body to take a certain direction or move a particular way, then they must actively be thinking about that moment. Utilizing the narrow paths to engage the user is what I played around with during the conceptual stage of design.



Conceptual Work | Sound

In playing with design ideas for sound, I chose to draw on the children's daycare at the first floor of Park Place Building. How could children be incorporated into the plaza utilizing sound? In this concept I chose the idea of playful sounds which incorporated drawing on the surrounding local environments, in this case, The Puget Sound. Sounds such as seals and ocean waves could be triggered by sensors as children moved from Park Place Building into Park Plaza. These sounds could bring smiles to the faces of the people watching this experience and also continue the reminiscent of the Puget Sound.



Conceptual Work | Vision

In addressing the access points of the site I chose the most dominant sense, vision. Vision is your first wayfind cue when searching for a place. How could vision provide a positive visual cue of Central Plaza while utilizing the senses? Pavers can help to identify what space your in and begin to create a sense of identity. Maybe playing with the path to actually engage the user at this point along the sidewalk would become the most integrative solution. People would again have to think about moving due to a visual distraction in the path and think about where they are.



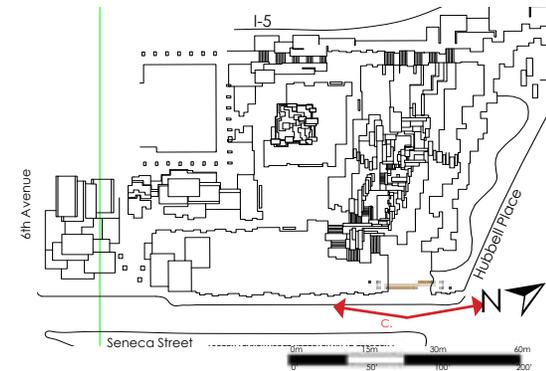
Final Design Work | Masterplan



Final Design Work | Access Points

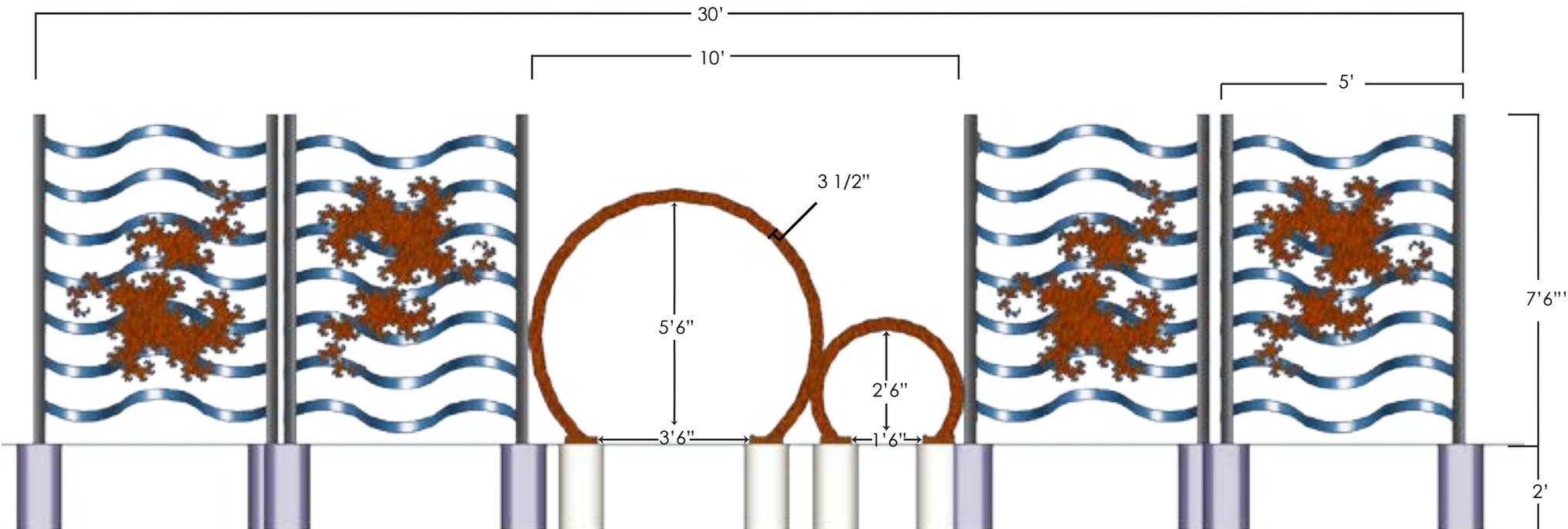
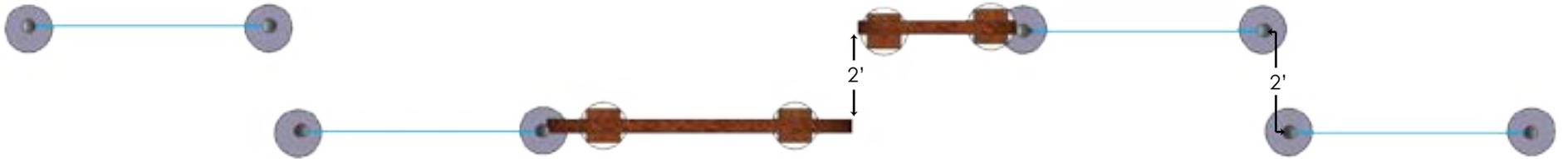


A large vertical gate that punctuates the access points has been placed to visually address the fact that this is the way to Central Plaza. Other elements that make this a multi sensory experience is the incorporation of movement. As you move through the gate you must bow or bend down slightly. This creates that engagement of the users mind into that awareness of the present space. I included the age group of children due to the vicinity of the daycare in Park Place Building.



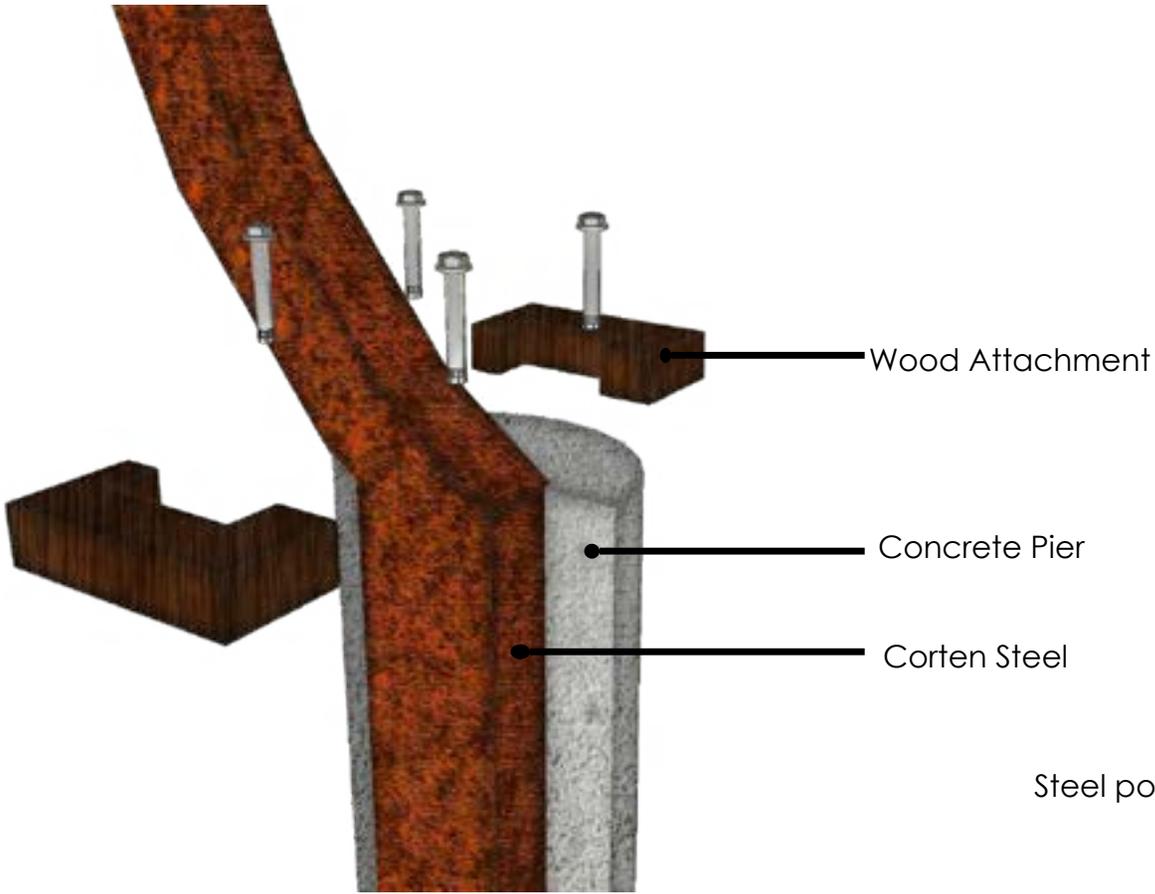
Final Design Work | Access points

The design of the gate plays on depth of vision by being spaced two feet apart from each other piece. The materials used in the gate are corten steel as the fractal design and entrance rings, stainless steel for the waves, and stainless steel posts.

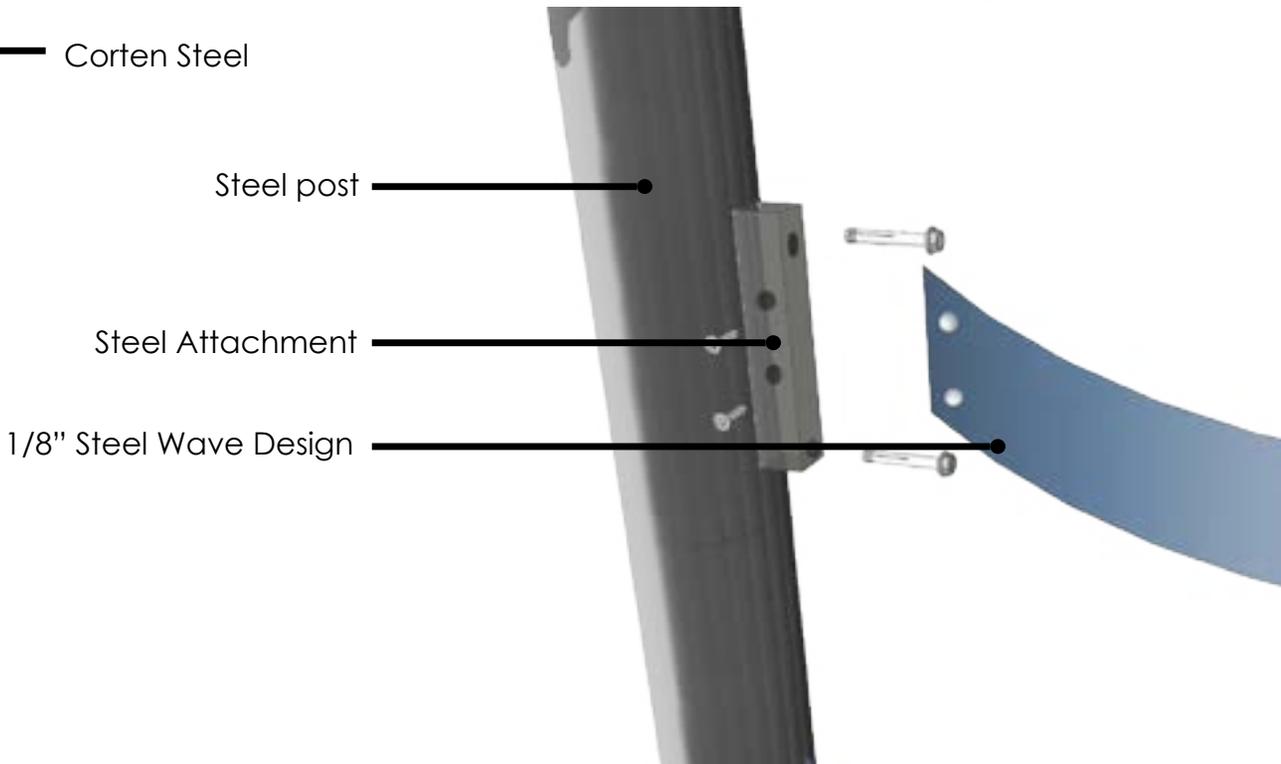


Final Design Work | Access points

Attachment detail on entrance rings



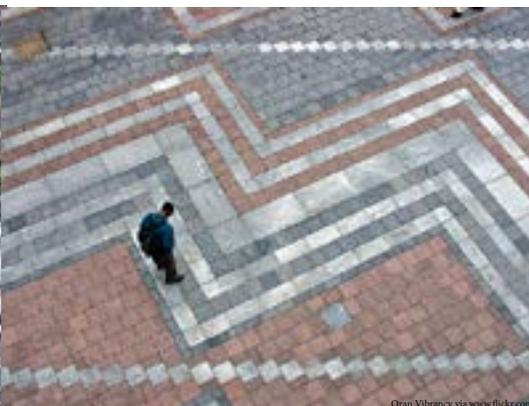
Attachment Detail on gate waves



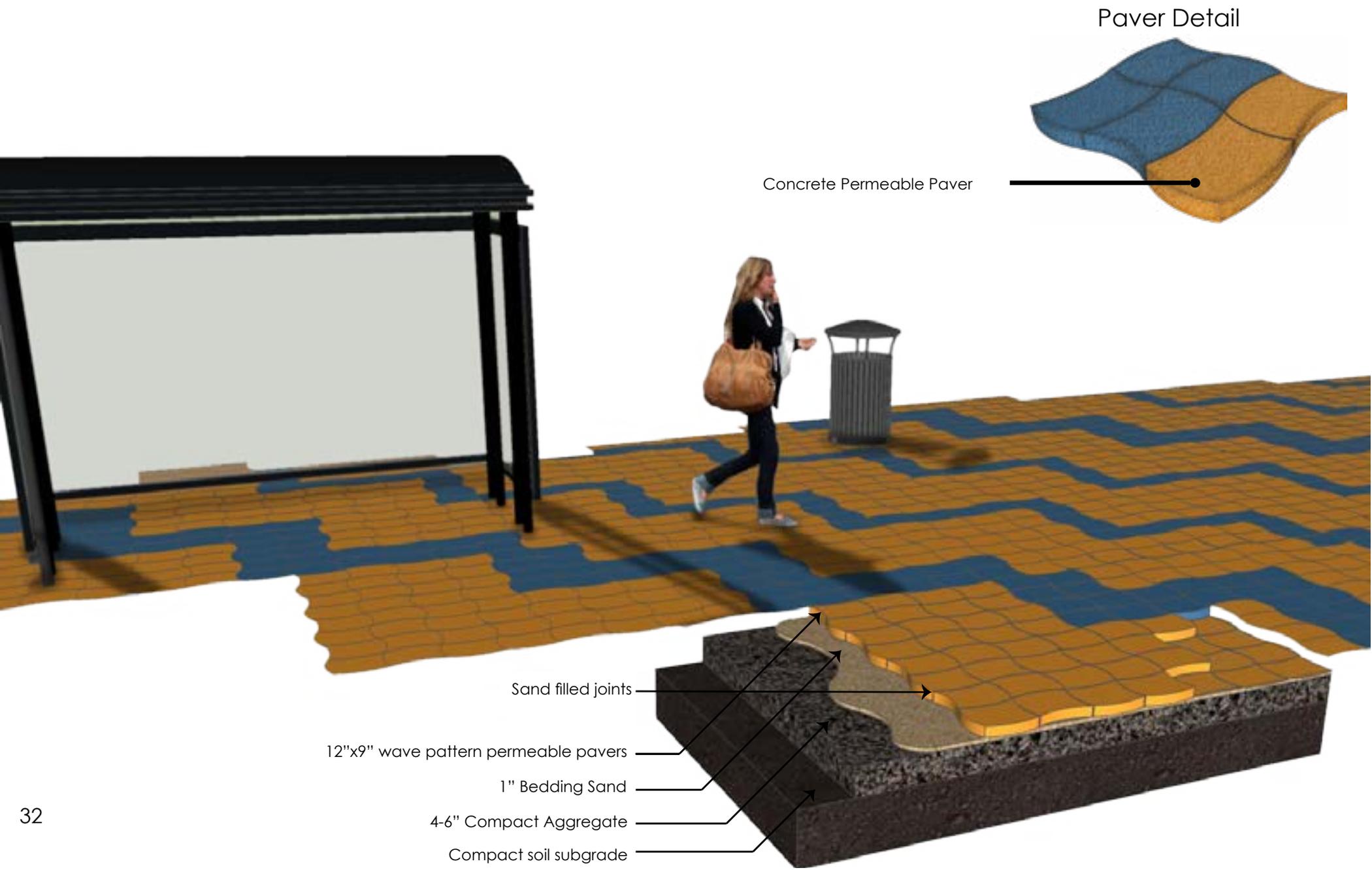
Final Design Work | Access points



Another positive visual cue includes a unique paver pattern. This paver pattern is reminiscent of waves and plays off of the nearby Westlake Shopping Center pavers seen below. The pavers are a beginning of a possible sustainable area and make connections to the Environmental Protection Agency in Park Place Building. The entire park uses cast concrete as its main medium. Implementing permeable pavers is a great way to begin in helping control the area's runoff.



Final Design Work | Access points



Paver Detail

Concrete Permeable Paver

Sand filled joints

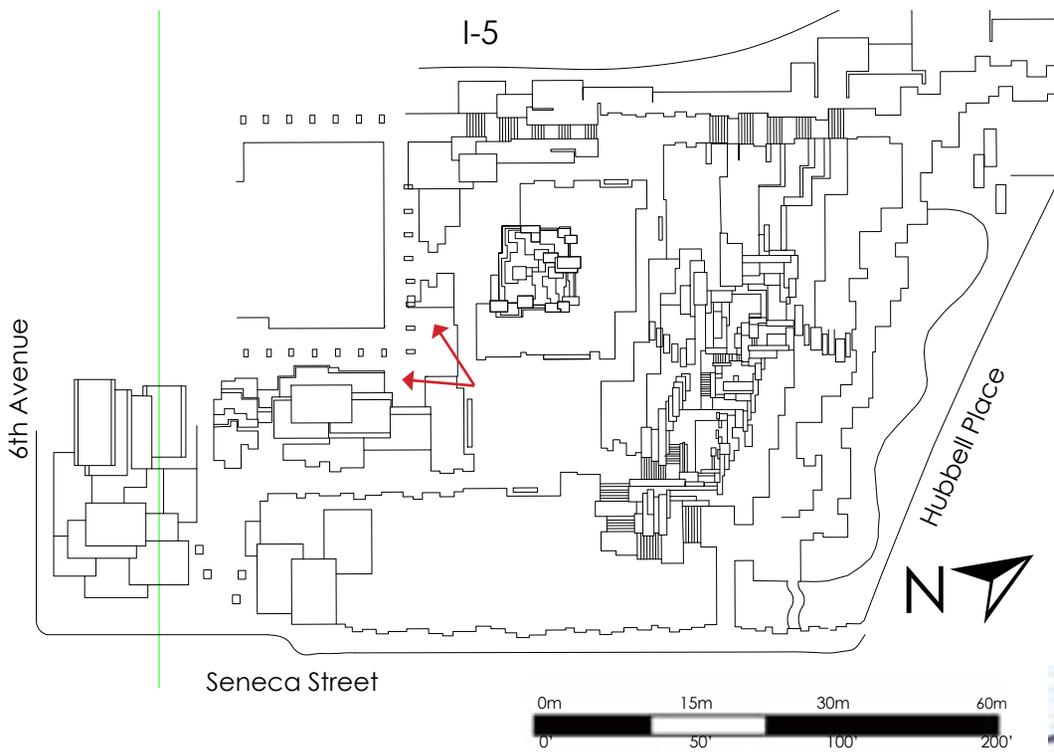
12"x9" wave pattern permeable pavers

1" Bedding Sand

4-6" Compact Aggregate

Compact soil subgrade

Final Design Work | Integrating Park Place Building



The two senses involved in the integration of Park Place Building into the plaza were sound and smell. The prevailing winds come into the site at the East corner of the building. Placing plantings that would take advantage of the wind would be optimal here.



Final Design Work | Integrating Park Place Building

Planting vegetation that can mimic the sounds of waves of the ocean were placed in a playful path for children to interact with. The path is at a narrow three feet wide encouraging children to brush their hands along the noisy grasses. The lavender in lavender plays on the color of the ocean and creates an intense identity with the use of smell.



Final Design Work | Detail

Light Weight Soil Mixture



1/3 Peat

2/3 Fine Sand



Dwarf Miscanthus mimics the sound and look of a wave ripple.

Plantings should be spaced 2' apart.

12"-72" of soil depending on planting of area. Root depth grows up to 15".

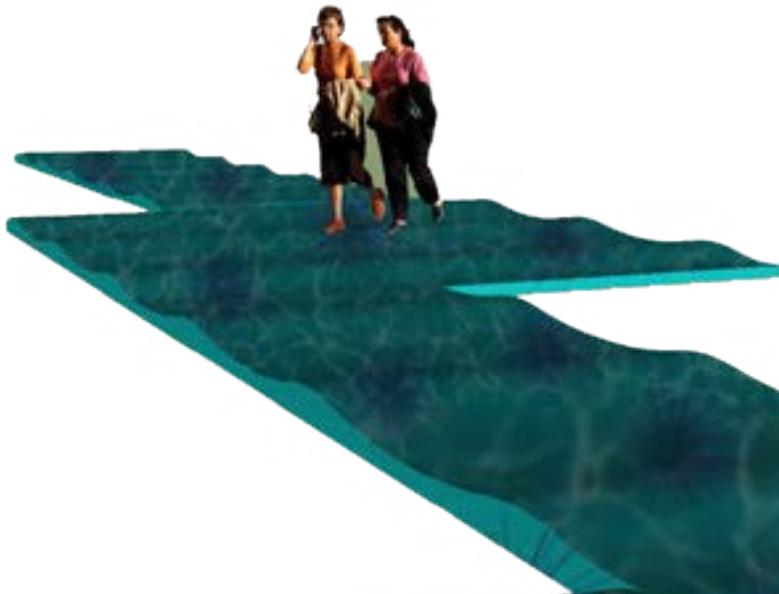
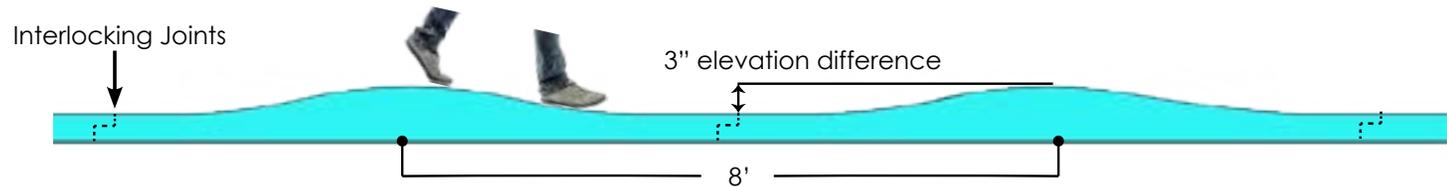
Fertilizer and irrigation system



Final Design Work | Movement



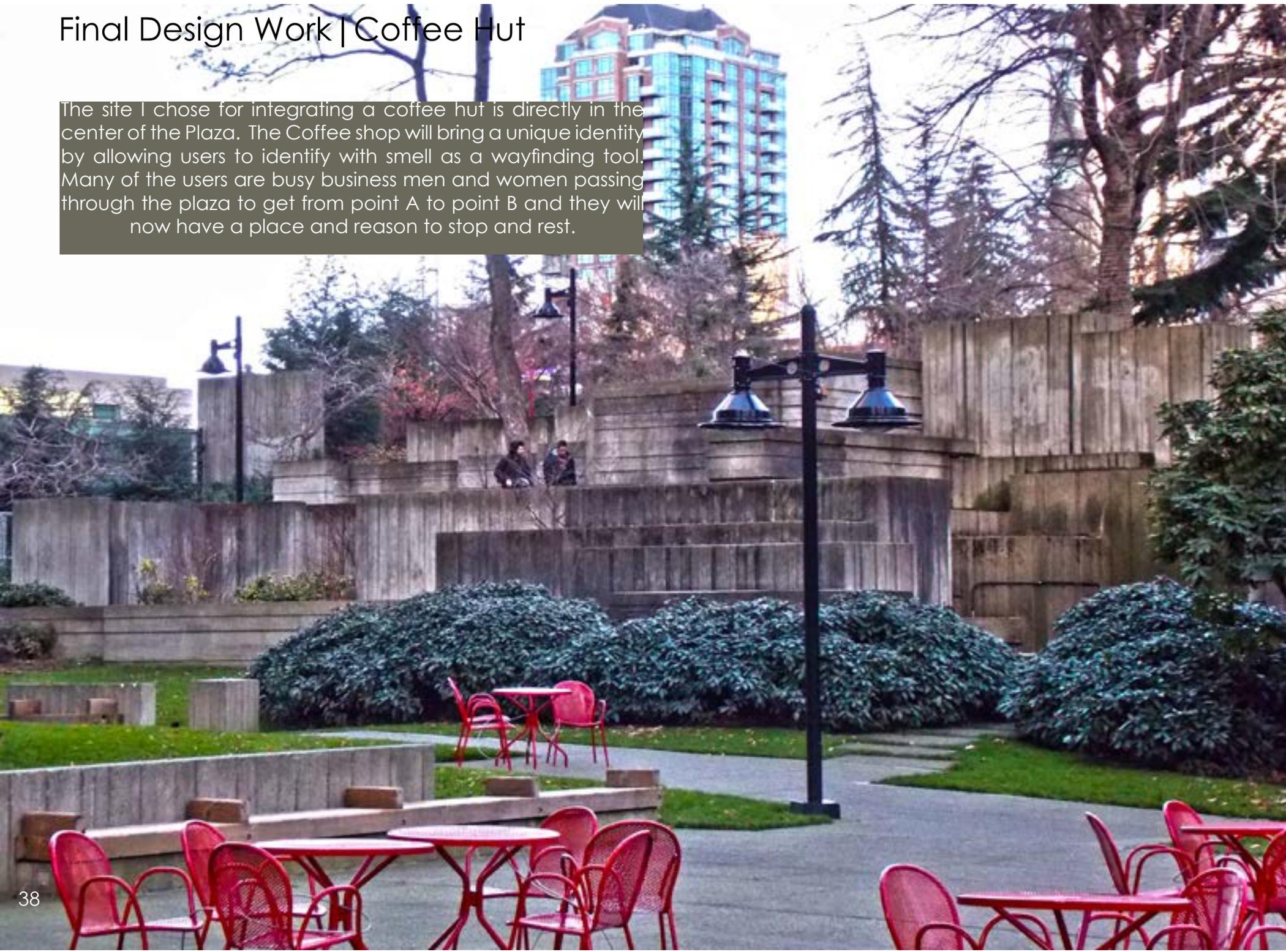
Final Design Work | Movement



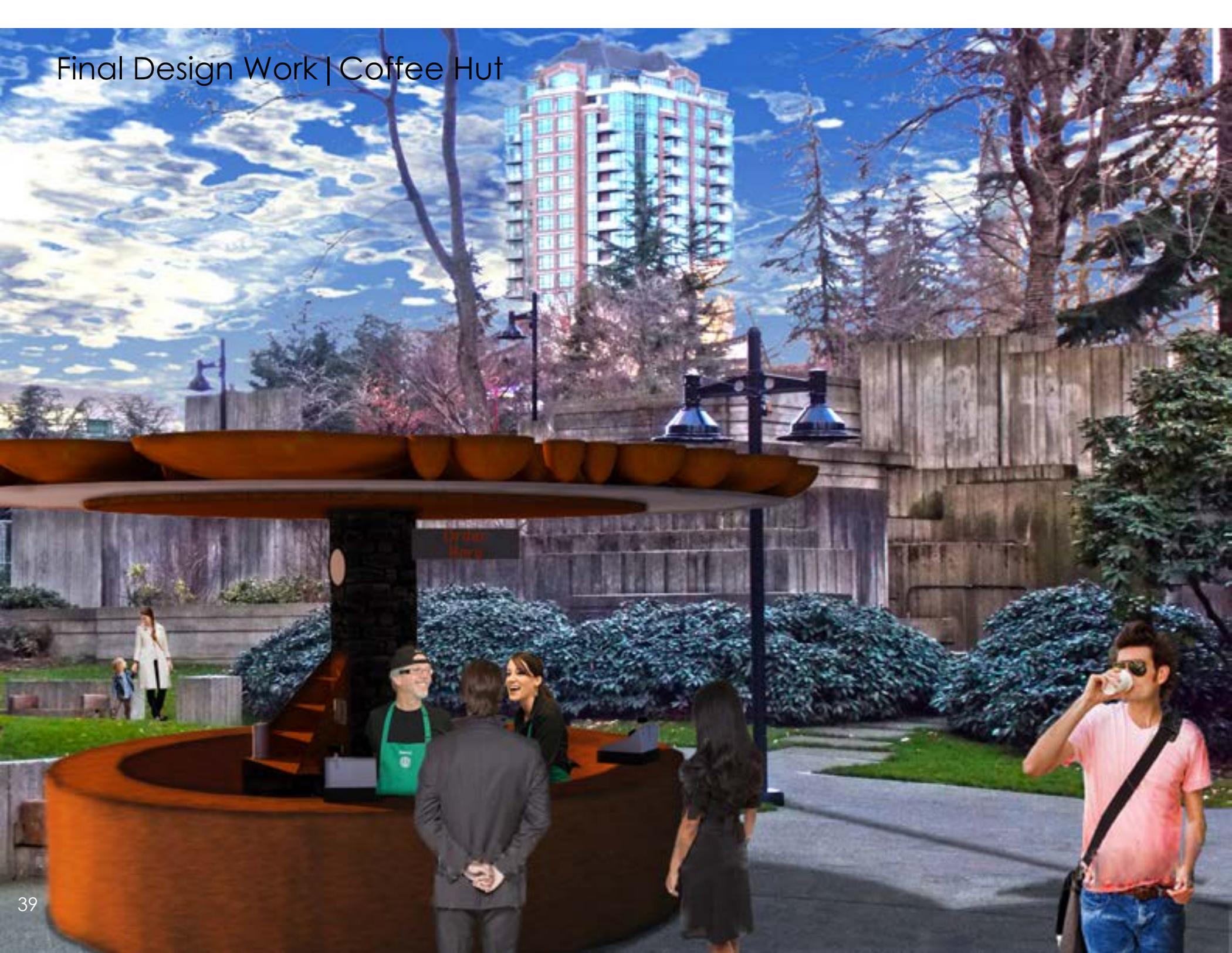
The pathway engages users into the site by creating an imbalanced pathway that mimics ocean waves. The wave crests at three inches over a length of eight feet. The pathway is an artificial and temporary surface which interlocks to install. This changes every four months so that users will not get used to the surroundings. The idea is that the surroundings should always be changing so that monotony never wins. This will all be part of a program that will require the artist to focus on the two topics of movement and Puget Sound. In this design we see creature reminiscent of the Puget Sound and waves of water.

Final Design Work | Coffee Hut

The site I chose for integrating a coffee hut is directly in the center of the Plaza. The Coffee shop will bring a unique identity by allowing users to identify with smell as a wayfinding tool. Many of the users are busy business men and women passing through the plaza to get from point A to point B and they will now have a place and reason to stop and rest.



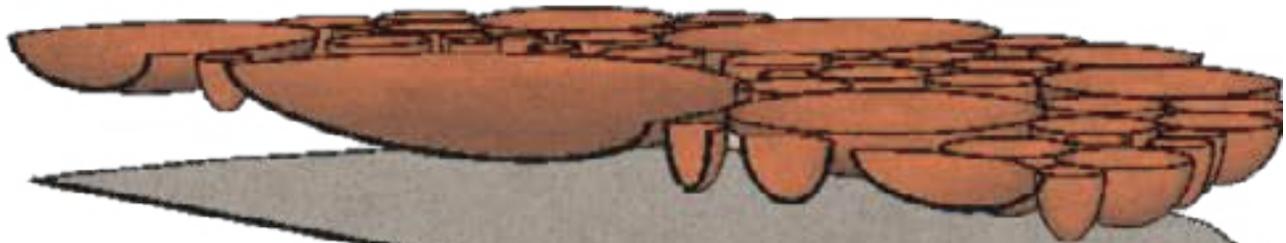
Final Design Work | Coffee Hut



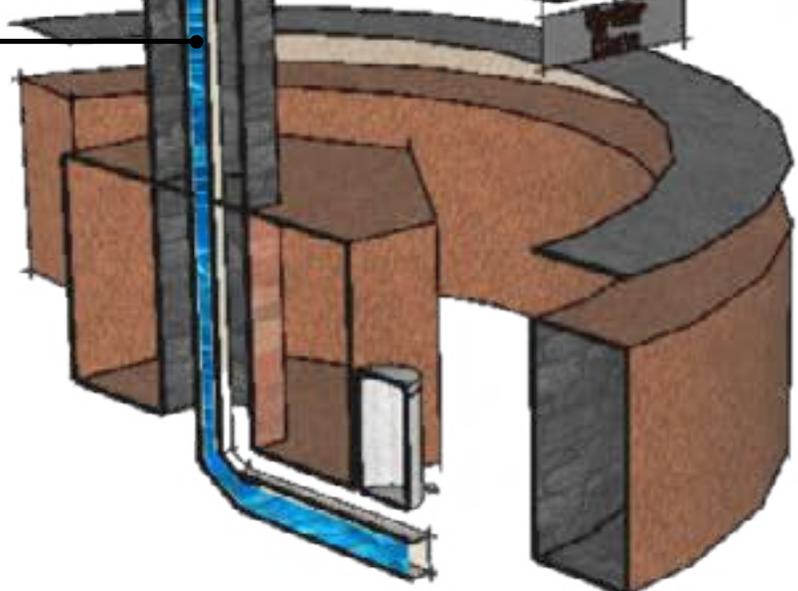
Final Design Work | Coffee Hut



- Weep hole for drainage
- 2"x14mm bolt
- Spacer
- 3/8" acrylic
- Spacer
- Nut

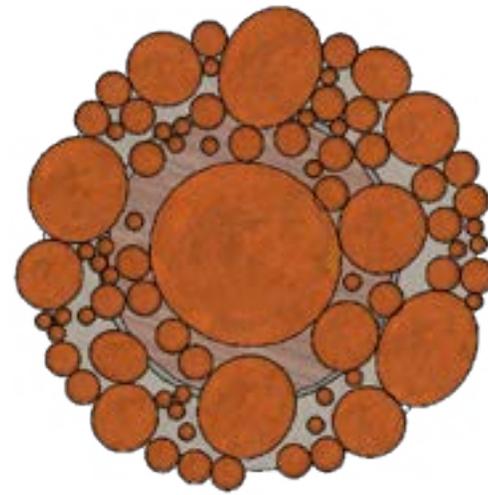


Downspout built into the center column of the kiosk and trenced to the existing infrastructure.



Design Inspiration

Final Design Work | Coffee Hut



Brushed copper/
thin textured metal



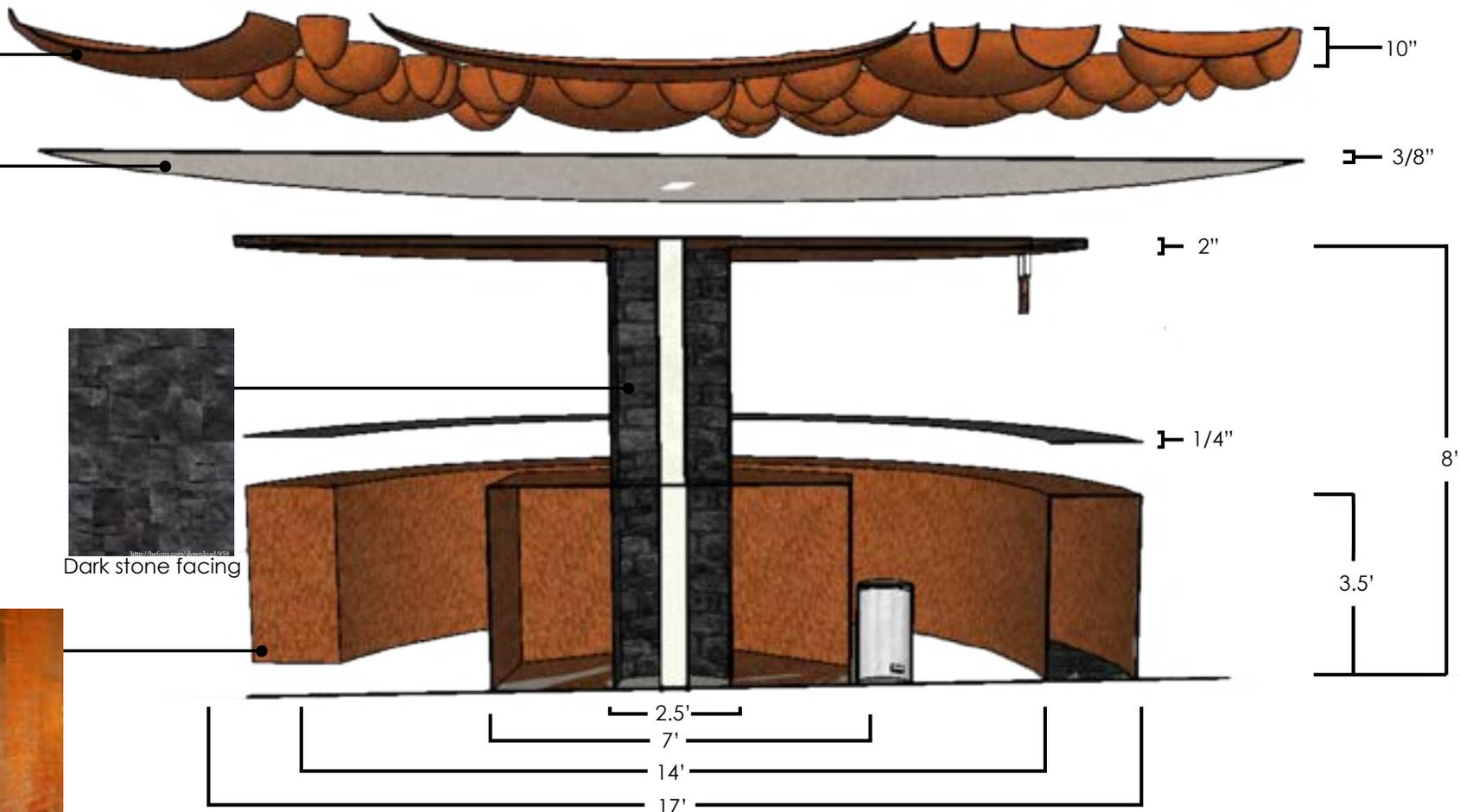
Clear acrylic



Dark stone facing



Corten Steel



Final Design Work | Masterplan



Conclusion | Previous Design Studio Experience

2nd Year Fall

Intro to Landscape Architecture

Entry-level design generation methods involving concept formation, site inventory and analysis, programming, and simple site organization and planning. Problem solving through graphic, computer-generated, and model development; oral and written communication skills.

2nd Year Spring

Parks and Open Spaces

Continued design development in site organization and planning. Design issues in natural resources, land reclamation, construction technology, and rural development. Intermediate problem solving through two- and three-dimensional graphic techniques; continued oral and written communication skills

3rd Year Fall

Site Planning and Design Studio

Visual problem solving and large-scale site planning issues. Two-part focus involving the comprehensive visual inventory and analysis along with the immediate application of site planning and design skills.

3rd Year Spring

Community Planning & Design Studio

Cultural and environmental design issues as they relate to large-scale land planning and site design involved with residential communities. Emphasis within the studio involves site engineering and design detailing.

4th Year Fall

Urban Design Studio

Regional systems inventory, visual survey, analysis techniques, and methodologies for design problem solving through graphic, computer, and modeling development. Focus on urban studies and site planning. Studio.

5th Year Spring

International Design Studio

Comprehensive design studio experience in advanced architectural studies to be conducted in culturally diverse, international locations.

5th Year Fall

Environmental Planning Studio

Environmental systems development and implementation of a complex design problem. Emphasis on landscape architecture design development through graphic, computer, and modeling techniques.

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Personal Identification

“The iguana will bite those who do not dream.”

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