drawing through 4 seasons
Drawing Through 4 Seasons

Grace Lee

Thesis submitted to the faculty of the Virginia Polytechnic Institute and State University in partial fulfillment of the requirements for the degree of Masters of Architecture

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aquatic center: alexandria: virginia

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like the wind...
like the sun...
like the waves...
like the shadows...

like the seasons create different images...

How could the seasons create different images in architecture?
This thesis is concerned with architecture and its changes through four seasons.

It is about drawing new images of a building in different seasons. Like trees change their leaves in seasons and like people change their clothes in seasons, this project is about architecture changing its architectural elements in four seasons. It all began with an imagination of how a building would respond differently in each of the four seasons.

The project, located at the waterfront of Old Town, Alexandria, Virginia, is an Aquatic Center with swimming pools, changing areas, saunas, fitness area, and massage areas. The Aquatic Center creates different images to its visitors through surrounding natures and their changes, architectural elements and their movements, visitors and their activities.

The goal was to provide people unique and different experiences every time they visit.
dedication

I dedicate this book to my parents.
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**Contents**
Late one September of 2008, I was sitting by the waterfront of Old Town, Alexandria, trying to study how the Potomac River met the edge of land. For a long period of time, I stared at low waves blankly, then I tried to document what I was seeing in words and sketches. It was difficult. And I was getting tired. Just being tired of drawing the same image over and over. I took out my camera and started taking a series of snapshots. I was ready to head out.

It was not until I got back school getting ready for my pin-up that I looked at those photos closely. I started viewing small differences in each photo due to natural occurrences happening at each moment I took a picture. The water carried by the wind, shadows cast by the sun, splashes created by the water hitting the rock... those were all aspects of light, reflection and shadow that made each of my images unique.

I wanted to design a building that carried this idea.

Like trees change their leaves in seasons, like we change our clothes in seasons, I wanted to design a building that changes in seasons.

People naturally respond to nature - often times, not really appreciating seasonal changes. I wanted to communicate the changes of seasons through architecture. Like my images that I took in September, I wanted to design a place that creates different and unique experiences in to its surroundings and for its visitors every time. I imagined those changes may be made from nature, surroundings, architectural elements, visitors and their activities.

This was my beginning.
These images were taken while walking down King Street, Alexandria, Virginia from the King Street Metro Station to the waterfront. I began walking down from near the Masonic Temple to my site, which is located at the end of King Street. During my journey, I was trying to document the street’s movement of people, cars, commercial activities, and other occurrences.

King Street seemed to have a continuous movement day and night. Visitors, residents, and workers continuously walk up and down the street. The street is full of cars and bikes that drive in either directions. Even a free running trolley continuously commutes on King Street every ten minutes. There were lots of parked vehicles on either side of the street from the Metro Station down to the last intersection. A small open space was my final destination, located at the end of King Street. I was able to view the Potomac River, but my vision was limited due to the surroundings.
Old Town Aquatic Center is located at the end of King Street, where a small open space with a private boat club and its parking space currently exist. Throughout my years studying in Washington Alexandria Washington Center, I always wondered along about the end of King Street. Driving to school Route Seven, the Masonic Temple became my landmark of Old Town. The Temple, placed on a hilltop west of King Street, greets traffic as people enter the commercial strip of Old Town.

Beginning of my thesis year, I wondered... King Street in Old Town begins with Masonic Temple and ends with...

Imagining King Street being the spine of Old Town. I thought it had a strong head - the Masonic Temple - but a weak tail, a small space. Once people reached the end of the street, they often went through the Torpedo Factory to reach the waterfront. I wanted to keep the movement along King Street.
There were few challenges with the site as I further studied:

Because of its design, once people reach the last intersection of King Street, they often walk through a walkway inside the Torpedo Factory instead of walking straight down to the Potomac River. Through my building and urban design, I wanted to bring those people straight down to end of King Street. I wanted people to be able to reach the Potomac River once they reach at the end of street.

Standing in the small green space at the end of King Street often seems like you are in private property owned by the adjacent existing boat club. A brick walkway that runs through the middle of the space from boat club’s parking lot to their club adds to that feeling. Reconsidering the boat club and its parking lot was my next challenge.

I started working with re-designing edge of existing shoreline. I wanted to extend King Street to the Potomac River so people could enjoy ending their journey of King Street with water. I also worked on moving the boat club as it was blocking the northern view of the site. By dedicating a space within the Aquatic Center, I was able to remove the existing boat club and have an open northern side to the street. I pictured this open northern side for boat parking, either for boat club members or rented to others. Through my designs, I wanted to make my site a new landmark in Waterfront, Alexandria.

This goal resulted a trolley rotating system where current the King Street ends, providing continuous movement along the street. I also moved the current water-taxi stop to the intersection of King Street and Aquatic Center’s entrance, so people could have a view of the Masonic Temple, one of Old Town’s landmarks as they enter the town.
early studies & concepts
Waterfront Park is at the east end of King Street. The park has a nice open view towards Maryland and Washington, D.C., but its lack of shade results in little occupation through most of the year. Visitors of the waterfront often meander along the northern side of King Street due to its commercial buildings, street performances, and attractive shoreline. My goal was to bring more people to Waterfront Park with different activities that go along with my building program throughout the four seasons.

Through activities in and outside the Old Town Aquatic Center, I imagined Waterfront Park drawing its own images in four seasons.

I wanted an Aquatic Center with swimming pools during summer and ice-skating rinks during winter. By providing concerts and occasional markets, I pictured both the center and Waterfront Park to be full with visitors and their activities even during other seasons.
When designing, I wanted an easily reachable building not only to local residents but also to town visitors.

By blocking the street for pedestrians from the last intersection of King Street, I wanted to create a safe walkway reachable to my site for local residents. I imagined this newly blocked space creating its own seasonal images by being used as occasional street markets, performances or public seating. Knowing local residents would be arriving from all directions, I tried to keep my building open to all axes.

Through my studies, most of Old Town visitors arrived either by their own vehicles or walking from King Street Metro Station. Street parked vehicles not only took over either sides of King Street, but they also started to intrude near by residential zones of Old Town as well. I wanted to complete a public transportation system that runs along King Street to encourage both town visitors and workers to use their own vehicles less. Currently, a free Old Town Trolley runs along King Street from the King Street Metro Station down to the Torpedo Factory. The Old Town Trolley will be the only vehicle that would be able to enter the blocked zone from the last intersection; however, instead of stopping at a trolley stop, I introduced a trolley rotating system. People would be able to get on and off from the trolley as it rotates 360 degrees to journey back up to the Metro Station.

To extend King Street, I also designed a Water Taxi stop. The Potomac River Water Taxi was mostly used by city visitors, but as it is getting more stops along the river, there is a high potential of it being highly used in near future. By adding the taxi stop, I pictured King Street extending beyond its physical end, connecting to Washington, D.C. and Maryland.

My new image of King Street is busy with workers, residents and visitors entering and exiting through a complete public transportation system.
March, April, May
- growing
- thunderstorms
- new beginning
- flowers blossom
- Easter
- snow melting
- spring floods
- stream runoffs
- increase in air & ground temperatures
- cherry blossoms
- magnolias
- cherries
- quince
- monsoon
- cyclones
- rainfalls
- allergies
- lifecycles
- Valentine's day

June, July, August
- longest days of the year
- festivals
- night events
- ocean
- beach
- vacation
- Fourth of July
- fireworks
- swimming
- tanning
- rain
- floods

List of local activities in four seasons.

September, October, November
- Thanksgiving
- harvest
- apples
- peaches
- pears
- various veggies
- Jewish Sukkot
- Chinese moon festival
- autumn in poetry (Melancholy)
- Halloween
- change of colors
- pumpkins
- orange
- red
- yellow
- fruit pickings
- football seasons
- baseball

December, January, February
- snow
- ice
- cold weather
- leave-less trees
- ice skates
- snowdrifts
- hot chocolates
- Christmas
- eggnog
- peppermints
- Christmas
- New Year
- animal migrations
- animal hibernations
- white
- perennial plants
- flowering plum
- ice skating
- snowboarding
- sledding
- ski
- basketball season
- fishing
- snowman & snow fights
- winter blues
- February blues
- holiday depressions
My site experiences four seasons yearly. Although we experience the summer heat and the winter cold more times throughout the year, days of warm spring and cool fall reveal themselves in between hot and cold days.

I started by listing different activities people perform in the four different seasons. Then I narrowed my list down to what could happen on my site. I wanted a building that is active throughout every season with various activities. More than anything, I wanted a program that requires the full usage of the Waterfront Park.

Choosing a site on a waterfront, I wanted a program that fully utilizes the site. I wanted to design an Aquatic Center with a series of swimming pools that uses purified Potomac River water during the summer, which then could be transformed into an ice-skating rink during the winter. With different activities in different seasons, I wanted to create new experiences for people every time they visit the Aquatic Center.
Site model from above

study models
Early Aquatic Center model

Early study models of end of King Street
KING STREET & WATER [OFT]

ENTRANCE LEVEL

1. Water Channel
2. Shallow Water Bed [Under Olympic Pool]
3. Boat Club Entrance
4. Private Boat Club
5. Open Gallery
6. Mechanical Equipment Level Entrance
7. Aquatic Center Entrance/Lobby
8. Water Taxi Information/Office
9. Swimming Pool Information/Office
11. King Street Shops
12. Terraced Swimming Pools
13. Deck
14. Waterfront Restaurant
15. Floating Pool
16. Old Town Trolley Rotating System
1. Water Channel
2. Old Town Trolley Rotating System
3. Banquet / Meeting Hall
4. Bridge
5. Terraced Swimming Pools
6. Balcony Seatings
7. Kitchen
8. Waterfront Restaurant
9. Floating Pool
1/2 SIZE OLYMPIC POOL, FITNESS CLUB, MASSAGE ROOMS [+20FT]

SWIMMING POOLS & FITNESS LEVEL

1. Water Channel
2. Old Town Trolley Rotating System
3. 1/2 Size Olympic Pool
4. Fitness Club
5. Balcony
6. Terraced Swimming Pools
7. Massage Rooms
8. Balcony
9. Floating Pool
1 Water Channel
2 Old Town Trolley Rotating System
3 Fitness Area
4 Terraced Swimming Pools
5 Floating Pool
View A: View of terraced pools from the Potomac River
1. Water Channel
2. Old Town Trolley Rotating System
3. Movable Fabric/Roof Panels
4. Floating Pool
View A: At the end of King Street - trolley rotation system
building elevations
SOUTH VIEW
WATERFRONT PARK ELEVATION
building sections
1 Floating Pool
2 Waterfront Restaurant
3 Wet Wall
4 Massage Rooms
5 Locker Rooms
6 Fitness Club
7 Private Boat Club
1 Old Town Trolley Rotating System
2 Rainwater Collector
3 1/2 Size Olympic Pool
4 Underworld with Shallow Water Bed
5 Fitness Club
6 King Street Shops
7 Massage Rooms
8 Stormwater Storage Cisterns
9 Swimming Pool - 3ft Deep
10 Swimming Pool - 4ft Deep
11 Wet Wall
12 Swimming Pool - 5ft Deep
13 Swimming Pool - 6ft Deep
14 Waterfront Restaurant
15 Floating Pool
16 Stormwater Storage Cistern
17 Floating Pool
SECTION CC
SECTION DD

1 1/2 Size Olympic Pool
2 Underworld with Shallow Water Bed
3 Ramps - Main Circulation
4 Mechanical Equipment/ Storages
5 Fitness Club
6 Locker Rooms
7 Terraced Pools
8 Massage Rooms
9 King Street Shops
swimming pools

There are a six series of swimming pools in the Aquatic Center. There is a ½ size Olympic pool by fitness area for exercisers wishing to do swims, four terraced pools with water overflowing from one to the next, and a floating pool on a barge on the Potomac River. Terraced pools get deeper as one descends. Water in the terraced pools continuously and gently flows down, but swimmers will not be able to swim from one to next.

The ½ size Olympic pool transforms into an ice rink during the winter with warmer temperature water in terraced pools. People will not be able to jump into the pools, but they will be able to thaw cold hands after ice-skating in warm water. Pools will be closed during Spring and Fall but people will be able to have their feet in water if temperature permits.
View of terraced pools from entrance level
underworld:
1/2 size olympic pool
A forest of columns support the ½ size Olympic pool. These columns are equally spaced to carry the weight of the pool’s slab and its water. Once people walk under the pool, they stand in a shallow water bed, which becomes an introduction of what is above them. By allowing people to freely weave through the columns, people could experience themselves standing between two bodies of water.

Olympic pool floor material is reinforced concrete with glass aggregate. Glass pyramids are inserted when casting to bring in light from above. Through those glass pyramids, people under the pool will be able to see swimmers’ movements as they swim above them.
roof
When designing the Aquatic Center roof, I started thinking of the functions of different spaces within my building. I wanted to keep the swimming pool portion of the building open to the air. I wanted swimmers to have an open view of a summer sky while swimming in summer, and skaters to feel the breeze and snow while ice-skating in winter. The other half where the Fitness Club, Massage Rooms, Boat Club, and Waterfront Restaurant are located is protected with structural steel framed glass panel roof. Fabric panels sit on rails above the entire building. These panels are movable shade panels to prevent the building, including swimming pool area, from gaining too much heat in the hot part of the seasons.
materials

When choosing materials for my building, I began with how much time people would spend in each space. Most people would be barefooted since they would be jumping in and out of swimming pools. So choosing materials comfortable to feet was my priority. Not wanting to introduce too many materials, I kept all areas with water to granite, building interiors to concrete, and decks to wood. Thinking of spaces where people would be with or without shoes was helpful in choosing materials as well.
rainwater
Rainwater from the roof will be collected in two ways.

Water collected from the city site (west side) will be transferred to trees in Waterfront Park and to the Potomac River through a channel, and water collected through the wet wall, between the Aquatic Center and Waterfront Restaurant will be stored and purified to be reused for the swimming pools.
Spring is here after a long winter.
Occasional markets at the Waterfront Park attract people.
Sitting by the edge or by the Olympic Pool with a warm coffee creates a new image of the Waterfront. Iced pools during the winter melt and started flowing from one to the next once again.
Birds singing, flowers blossoming...
Even the sound of waterfalls from the terraced pools again.
People sun bathing in Waterfront Park shows a change in season. Summer has arrived and people create new scenes in the Aquatic Center. People swim from one pool to another, or play in the shade in a forest of columns. Kids run with joy around whole waterfront and park, jumping over the water channel.

Old Town festivals are occasional events with fireworks and good food.
Trees changed their colors to red, orange and yellow.

Fall has arrived.

Swimming pools are closed, but people still sit around the pools with their feet in the water, enjoying scenes. Jazz nights are back!

People gather around the Waterfront Park every Friday night for a jazz party.
Trees are bare but the Aquatic Center is covered with snow. The ½ size Olympic pool transformed itself into an ice-skating rink. Warm water overflows from one to another in the terraced pools for people to warm their hands. The Waterfront Park is full of screams; people are throwing snowballs, making snowmen, and just running around. It is snowing! Winter is here.
thank you

committee, parents, family, friends
bibliography


