In Search of Water: Aqua Exhibition Center in Erie Basin, Red Hook, Brooklyn, New York

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Seoul, Korea, February 1997

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ABSTRACT

The main purpose of this thesis is to provide a solution to the underutilized and abandoned drydock and defamiliarized water in New York Shipyard within the Brooklyn Waterfront caused by a rapid change in maritime technology.

After the new introduction of modern maritime technology - from labor intensive break-bulk shipment to containerization-, there has been a significant declination in the Brooklyn Waterfront. Although the modern technology increases the efficiency of whole industry in the region, it simultaneously requires partial or total transformation of existing conditions. The cause of this kind of transformation can be political, social, and/or mainly economical. However, the architectural reason for its lack of resolution is the motivation for this thesis project.

The sidewalk and main circulation that connect to the nesting programs with waterscape will provide more dynamic sensory experiences into the Erie Basin and the Shipyard. Recreation, exhibition and education facilities will ameliorate the Basin environment with a newborn Waterfront Aqua Exhibition Center. Not merely is the Basin regenerated and expanded but the method of saving valuable and core elements in the existing conditions and adding new layers to heighten the quality of the site as a whole is instrumentalized.

Thesis Supervisor: j. Meejin Yoon
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CHAPTER ONE: SITE SELECTION

A Shift on the Mean Street
- NBC’s ‘Third Watch’ films in tough New York neighborhoods to get that rush of authenticity

New York – This must be hell
That is what it looks like in Red Hook, amid the abandoned industrial buildings and brick warehouses: the dumping ground for old mattresses, rusted oil drums, a stripped and burned Mercedes-Benz and whatever useless trash that has been tossed vicariously out a car window. It is Brooklyn’s junkyard district, a place God has forsaken, where the Manhattan chic wouldn’t be caught dead. Nothing grows here, except maybe a few weeds. Children don’t play here. No one comes to this place, except, as the locals call them, ‘the less desirables,’ and the audacious production crew and cast of ‘Third Watch.’

by Janice Rhoshalle Littlejohn
1.1 Central Idea for Site Selection

Public Waterfront

This plan envisions a 21st century waterfront where adjacent communities have access to a lively mix of waterside activities; where natural habitats are restored and well cared for; where a working harbor is active with industry and waterborne commerce; and where new plan development generates jobs, revenues and housing for New Yorkers. The citywide plan recommends more than 100 sites for new or improved waterside public spaces to provide access for adjacent underserved communities; create linkages to extend the existing network; promote tourism and provide visual relief in densely developed areas; and encourage use of the water as a recreational resource.

Excerpted from New York City’s Comprehensive Waterfront Plan issued in August 1992

Until 1960’s the New York Shipyard in Erie Basin, Red Hook, Brooklyn, New York had been the center of one of the most active industrial areas in the city because of a big advantage of deep-water access. More than 40% of lands and buildings, however, have been abandoned in spite of a spectacular view of the statue of Liberty, lower Manhattan, New Jersey side Harbor, Staten Island because of a rapid and significant change in maritime technology – from labor-intensive break-bulk shipment to containerization. These are not the only elements, which were abandoned a long time ago. Water has been abandoned since 1960’s as well. As a consequence, the Shipyard has become one of the most problematic and traumatized sites in the city in terms of underutilization and major crime scene. Thus, I hope if I activate this defamiliarized water once again, the whole site can possibly regain glorious days.
1.2 Transformation of Site: Brooklyn Waterfront
1.3 Primary Site Conditions

1.3.1 Brooklyn Waterfront

Disconnection between industrial district and neighborhoods
As a result of historical development patterns, industrial uses predominate along Newtown Creek and the Gowanus Canal, and south along East River and Upper Bay through the Sunset Park area. Originally part of New York’s thriving port, these areas once housed one of the largest concentrations of maritime and industrial activity in the world. Deep, near-shore waters and protected harbors, combined with the availability of a large labor pool, offered an ideal setting for 19th and early 20th century industrialization which relied on water and rail for goods shipment. As a result, the waterfront developed with cargo handling piers and ferry terminals—backed by upland industries, warehouses and the residential communities where many of the workers lived. These uses afforded few opportunities for open space and public access to the waterfront. Thus, there has been a huge disconnection between industrial district and its neighbor districts. This disconnection was amplified after many of industrial areas were abandoned because of the rapid change of maritime technology.

1. The two extreme of Brooklyn’s waterfront typify its enormous diversity. At one end, Newtown Creek is heavily industrial-replete with oil tanks and waste facilities—and, at the other end, Jamaica Bay’s creeks, wetlands and barrier beaches form an intact ecosystem that is one of the city’s most valuable natural resources.

2. In recent decades, changes in the structure of the city’s economy and transportation technology have resulted in the underutilization and abandonment of piers and wharves along the Brooklyn waterfront, and decline of maritime-related and manufacturing industries. Brooklyn lost two-thirds of its manufacturing jobs in the last 35 years. Major factors in the maritime decline were the rapid growth in containerized shipping and the shift of most of the port operations to the New Jersey side of the harbor. The change in maritime technology from labor-intensive break-bulk shipment to containerization required fewer but larger port facilities with modern containership piers, warehousing and distribution facilities. The Port Authority developed extensive facilities on the New Jersey side of harbor, which had sufficient land for these port facilities and superior access to the Nation’s rail lines and interstate highways. As a result, most port cargo activity shifted to New Jersey, and goods movement within the Brooklyn waterfront shifted from barges, ships and rail to trucks.
The region encompasses most of Brooklyn's Industrial waterfront. Until 1960's, it had been the center of one of the most active industrial areas in the city. The city-owned Brooklyn Army Terminal in Sunset Park and Brooklyn Navy Yard are centers of small-scale industry.
SITE SELECTION

Transportation
To achieve public access goals for Brooklyn, the district studies identify opportunities to connect residents to their waterfronts, particularly in those areas that presently have little, if any, waterfront open space. Along the industrial waterfront from Newtown Creek to Sunset Park, where public open space is extremely limited, the plan identifies several important opportunities to create new waterfront open space. The wealth of public waterfront parks concentrated in the south can be linked together to increase their use and accessibility.

1.3.2 East River / Upper Bay

Lack of open and public spaces

These areas will remain primarily an industrial waterfront. It is an important source of economic activity and employment, offering opportunities for growth. Manufacturing zoning will be maintained in these areas and on most other waterfront blocks where current conditions favor continued industrial use. The industrial uses that predominate along the waterfront have largely precluded public access and recreation activities for the many thousands of people living nearby.

To increase public access – one of major goals of this project – a sizable recreational development is planned for the central portion of these areas. The plan also identifies opportunities for waterfront access and recreation in Red Hook and Sunset Park, as well as Greenpoint and Williamsburg where vacant and underutilized waterfront parcels offer potential for non-industrial redevelopment with publicly accessible open spaces.
1.3.3 Red Hook

History of Red Hook

Red Hook emerged as a major shipping center in the 1800s when Erie Basin became one of New York's most active shipping and warehousing terminals. It served as a major shipping facility during World War II and the Korean War, handling a variety of commodities and merchandise from South America and the Far East. Population in the adjoining neighborhood increased with the construction in 1939 of the Red Hook Houses, one of the city's first low-income housing complexes. In the late 1950s, the Port Authority purchased the Basin, breakwaters and various surrounding properties.

Considerable Parkland—none along the waterfront

The Red Hook subarea extends from Hamilton Avenue and the Red Hook Containerport to Gowanus Creek along the shores of Buttermilk Channel, Upper New York Bay, Gowanus Bay and Gowanus Canal. Maritime uses are clustered at the Red Hook Maritime Terminal and the Erie Basin/Gowanus Bay areas; the remainder of the peninsular contains a mix of industrial and residential uses and vacant land. Although there is considerable parkland within the peninsular, there is none along the waterfront.
Concentrations of Vacant Land

South of the Marine Terminal and Atlantic Basin, there are scattered manufacturing and warehousing activities and concentrations of vacant land. The wedge-shape area between Wolcott and Van Brunt streets has approximately 40 acres of vacant land and buildings zoned for industrial uses on the waterfront, and residential uses inland. The recently renovated Pier 41 houses small industries, a catering hall and an excursion boat. Of particular significance are the Beard Street warehouses and vacant property at the foot of Van Brunt Street. The warehouses include 21 attached Civil War-era buildings located on seven acres of land. Sold by the Port Authority in 1992, the warehouses are partially tenanted with industrial uses and are under renovation. Certain points in this area offer spectacular views of the Manhattan skyline and the Statue of Liberty.

East of the warehouses, the privately owned, eight-acre former Revere Sugar Refinery has refinery structures and equipment covering 70 percent of the land. New York Shipyards occupies most of the waterfront area between the vacant refinery and Columbia Street. The Red Hook Recycling Center is in this vicinity. Erie Basin encompasses over 30 acres of waterfront open space and buildings, with a protected harbor of over 80 acres and a minimum water depth of 25 feet. Immediately east of Erie Basin stands the long-vacant, 13 acres New York State Grain Terminal and oil storage tanks.
Red Hook Today

In 1989, the Port Authority solicited proposals for Erie Basin and five adjacent sites, including the Beard Street Warehouses and the Grain Terminal. Subsequently, it sold the Beard Street Warehouses and Erie Basin property. Erie Basin is now used for a Maritime Support Service Center. The owner has leased the upland pier sheds to the NYC Police Department for an evidence vehicle impoundment facility. As part of the approval process for the Police Department lease, the Coffey Street Pier is rehabilitated for public recreation, and a half-mile-long combined walkway and bikeway were constructed along the waterfront on Columbia Street and the southern arm of Erie Basin. The Grain Terminal site remains under the Port Authority's jurisdiction. The Department of Sanitation is seeking to acquire it for use as a materials recovery facility.

In 1991, there were 176 industrial firms and approximately 3,000 industrial jobs in the larger Red Hook industrial area. The number of industrial jobs per acre, five, is low. Manufacturing comprised about half of these industrial jobs. Trucking and warehousing and special trade contractors are the area's largest industries. There are also single major employers in the chemicals and allied products, transportation equipment, and water transportation industries.
Red Hook Industrial Area Employment

<table>
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<th>Establishment</th>
<th>Employment</th>
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<tr>
<td>Total Industrial*</td>
<td>176</td>
</tr>
<tr>
<td>Construction</td>
<td>42</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>30</td>
</tr>
<tr>
<td>TCPU</td>
<td>36</td>
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<tr>
<td>Wholesale Trade</td>
<td>48</td>
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<tr>
<td>Total Non-Industrial</td>
<td>60</td>
</tr>
<tr>
<td>Grand Total</td>
<td>236</td>
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* does not include most municipal and utility employment. Total industrial employment includes fuel dealers and repair services and may therefore exceed the sum of sectors.


In 1989, 38 percent of the land area in Red Hook was in industrial use, 23 percent was vacant, 13 percent was open space and other uses, and 17 percent was residential. Approximately ten acres of vacant land are located on small lots scattered among inland residential and industrial uses. Red Hook also has several private solid waste transfer stations.

Three-fourth of Red Hook's 4,019 housing units are in public housing. The Red Hook Houses range in height from six to thirteen stories. Other housing tends to be low-rise, one- and two-family structures and rowhouses. Between 1970 and 1990, Red Hook lost 504 housing units, although recent investment is evidenced by building façade improvements along Van Brunt Street, scattered building rehabilitation, a new supermarket, and small industrial developments on the waterfront.

Local retailing and services are concentrated along Van Brunt Street. In 1989, there were 43 ground floor commercial businesses and 15 vacant storefronts on Van Brunt Street. The buildings along Van Brunt Street are three- and four-stories high, and built to the streetline.

Figure 11- aerial view of Red Hook

Community and business groups are actively working toward revitalization of the street by seeking funding for façade and street improvements, signs and security systems. The South Brooklyn Local Development Corporation established a Red Hook office in 1990 and has initiated job referral and internship programs. It recently received a grant from the New York State Urban Development Corporation to undertake commercial revitalization of Van Brunt Street and study the establishment of a Business Improvement District.
SITE SELECTION

Brooklyn Atand Industrial $jIMixed Use FMResidential/GoasCre Retail and Services

Red Hook Marine Terminal

Beard Street Warehouses

Red Hook General Land Use

Atlantic Basin

Gowanus Creek

Gowanus Bay

Red Hook Recreation Area

Henry Street Basin

New York Shipyard

Revere Sugar

Coffey Park

Red Hook General Land Use

Industrial

Mixed Use

Residential

Retail and Services

Open space/Recreation

Vacant Land/Buildings
The industrial businesses that exist in Red Hook rely on trucking as the primary way to move goods and freight into and out of the area. Heavy truck traffic has had a serious impact on the residential population and most likely contributed to infrastructure failures and the collapse of some of the older buildings in the area. The geological substrata of this coastal floodplain region contain a dense organic layer of red clay that exacerbates the longitudinal transmission of surface vibrations. For years efforts have been underway to reevaluate the existing Truck Route network with an eye toward minimizing its direct impact on the residential community while optimizing its intended industrial usage. The existence of truck-based solid waste transfer stations, that provide little by way of economic development of the community, has contributed to the problem of truck traffic in a major way.

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Bus Route
Blue Designated Truck Route

Red Hook Existing Transportation/Public Access
Historic Former Revere Sugar Refinery

William Beard developed the Eire Basin from lowlands property in 1743. The present shoreline is artificial, with bulkhead lines established during major construction episodes from 1840 to 1880. The sugar unloading system on the north side, built in the 1930's and abandoned in the late 1970's, is adjacent to oldest and the best preserved pier shed in the basin. This site is a unique example of what Reyner Banham, author of Concrete Atlantis, calls the connections between North American industrial building and modernist architecture.
1.3.4 New York Shipyard Co.

Site Description

- 19 acres of prime industrial waterfront property
- M-3 zone (for heavy industrial uses), 14 acres upland, 5 acres underwater
- Easy access to Brooklyn-Queens Expressway, tunnel, bridges, and public transportation

One block comprising the New York Shipyard Co. Some of the original building remain in usable condition consisting of
- over 100,000 sq.ft. of warehouse space
- over 64,800 sq.ft. of drydock space
- over 10,000 feet of pier/dockage spaces
on the Erie Basin of New York Harbor

Ideal for any type of Industrial Commercial development
- deep water access
- low taxes
- situated in the Southwest Brooklyn Economic Development Zone
SITE SELECTION

Beard Street

Van Dyke Street

Parking lot

New York Shipyard

Dockage in Sugar Refinery

Erie Basin

Revere Sugar Refinery

New York Shipyard

Grain Terminal
CHAPTER TWO: CONCEPTS
Water, Light and Drydock
2.1 Water

"Take thought, when you are speaking of water, that you first recount your experiences, and only afterwards your reflections."
- Leonardo da Vinci

Water is by nature formless and passive, and only shows its particular qualities constitute its significance in the context of nature and teach us to handle water correctly.

Water is never more beautiful than when it is still. Motionless, a small pond or a vast ocean instills a sense of peace of mind.
Water is neither inexhaustible nor invulnerable. But the intensity with which it is used today tends to ignore these facts, as we increasingly exploit and pollute this gift of nature that is so essential for life. If we do not want to have to dig for our own water in future, we must think co-operatively, decentralize, and establish autonomous systems for water use at a local level.
2.2 Light

Inside of MIT Chapel

Lobby 7, MIT

Massachusetts Avenue, MIT

2.3 Materials

The gentlest light from the nature accentuates mysticism.

Sunlight is desirable when water action and excitement are to be maximized. The brilliance of sunlight shows as sparkle on reflective surfaces, illuminates each curvacious bubble and penetrates clear water to show pool bottoms or make moving wave shadows.
Experiencing water in nature, and surprises derived from conducting experiments in a water studio, finally led to the water features placed between people and their surroundings.

Figure 14 - waterfall
CHAPTER THREE: DESIGN PROPOSITIONS

Solution to the underutilized and abandoned drydock and defamiliarized water
Schematic drawings by Meejin Yoon
3.1 General Considerations: Urban scale

3.1.1 Red Hook

Since New York Shipyard is a very crucial ‘hardware’ within the Erie Basin, its value should be carefully considered. At the same time, in order to support design proposition of this project, regeneration of urban scale condition also should be considered.

Expanded regulation of Truck Traffic via aggressive enforcement and traffic calming measures. Further study if the Red Hook Truck Routes is required to formulate a project to minimize the impact of truck traffic on the residents and optimize the flow of traffic for the businesses.

Pursue the development of affordable housing, new and in-fill housing units, to stabilize residential population, provide additional homeownership opportunities to current residents and utilize existing residentially-zoned properties for residential development.

Identify potential resources for expanded visitor and senior transportation, recreation and educational programming needs.

Target Sanitation surveillance efforts to enforce against illegal dumping in the area, especially chronic dump out locations in industrial areas at night.

Identify potential resources for expanded employment programs, such as Jobs Creation and Jobs development efforts must focus on promoting stronger local linkages between residents and businesses.

Perform a community-wide health assessment of the neighborhood residents, followed up with targeted health care services and programs.

Provide additional resources for the Red Hook/Gowanus Chamber of Commerce to promote and support ongoing organizing within the business community, specifically to facilitate local business-community and regional business linkages.

Explore feasibility of instituting commuter ferry service from Red Hook and various points in Brooklyn (such as Fulton Ferry, Atlantic Avenue, Sunset Park and Bay Ridge) to Lower Manhattan.

Perform a comprehensive landmarking survey of the area and pursue the designations of the additional Clay Retort and Fire Brick Warehouses previously submitted to the Landmarks Preservation Commission for consideration.
Promote expansion of small business assistance programs that target minority, women and locally-owned businesses.

Remain previous conditions to memorialize history of site- shipbuilding, drydock and warehouses- and use them as design elements.

3.1.2 Erie Basin

Establish understanding of exterior context from within building. Where possible, building should allow broad views of the ocean and city outside of the building. When this is not possible (generally where overhead conditions are covered by the earth), they should at least provide clues to the exterior conditions through openings.

Establish major penetrations of unique character that establish visual connections or screenings to different kinds of major domains within and outside of the building. At the same time, it should be evident that they are part of the same architectural system.

Establish hierarchy of building entrances that is legible from a distance. Ideally, the main entrance to the site should be exposed from the city. Where this is not possible (because several historic vacant warehouses are blocking), the main entrance should at least be marked in a way that it is clearly legible from an urban distance. Secondary entrances should be delineated with similar architectural qualities, but at a smaller scale.

Use architecture to help indicate building orientation by registering natural light within the building. The design should also prevent sun glare into the interior spaces by using reflected light rather than direct light.

Use architecture to help indicate building orientation by registering natural or purified water within the building. The design should also prevent flood into the site by using several water control systems.

While the overall building should be simple and efficient, selective spaces should be composed differently to emphasize the unique qualities of programs.

Expose the building section at the perimeter to reveal the interior organization from an urban distance. Where building is sufficiently complex, this should occur on the interior as well.
3.2 General Considerations: Architectural scale

Based on general consideration of urban scale and problematic issues of site, the following considerations are all general criteria for the success of architectural scale. While for the most part, these are not specific enough for the designer to translate directly into architecture, these should be considered throughout the design process.

Spatial Perception

Visually expose circulation and its hierarchy as much as possible.

Establish different textures to delineate different programs and spaces.

Establish simple but believable structural rhythms.

Establish different degrees of transparency to delineate different kinds of spatial qualities.

Establish a logical system of material use in order to help believable structures. The materials should also be weather resistant because of site's geographical location.

Visual Access

Establish as many inter-modal views as possible. While this is important for efficient navigation between spaces, it is also important for establishing the visitor's sense of security, which leads to better decision-making.

Establish one prominent volume as a collector space for water and pedestrian circulation to and from individual volumes. In specific, the water-related exhibition should be the most architecturally significant in the project, being prominent both from within the building as well as from exterior.

Establish connections between different spaces that are as direct and visually clear as possible.

Establish different volumetric rhythms to denote different programmatic spaces.

Figure 15- shipbuilding and drydock
Public access and Landscapes

Easy access to the site and building should be provided.

To increase public access – one of major goals for this project – a sizable recreational development should be planned with publicly accessible open spaces.

Land as a part of waterscape to enliven spectacular views of Lower Manhattan, Statue of Liberty and Atlantic Ocean

Waterscapes

Due to the heaviness of water volume, stable water control systems should function efficiently.
Due to the quality of ocean water, water purification systems should be established.
Huge scale of water should be designated to more intimate human scale.
Water as a driven force to activate a solid land and give flexibility with movement, sound and tranquility.

Structures and Details

Due to the construction of building under the earth, absolutely believable structures should be required.
Tidal condition, weather condition and sea environment should be considered for selection of appropriate materials and structural resolutions.
Ship structure and skin as inspiration of architectural scale structure, surface and materials.
Drydock as an intermediate space to invite water into a land very aggressively.
CHAPTER FOUR: DESIGN EXPLORATION
Water flow diagram
4.1 Experience of Water

Water is far from being just a designer's resource or a material: it begs to have its vital possibilities rediscovered. This starts at the beginning of the planning process for water projects, and involves linking up and integrating elemental themes. Knowledge of water’s particular qualities as a material are needed, and often experiments need to be conducted to give a real idea of the result that will ensue.

In itself water is the fundamental soft element. It is a sculptural medium unsurpassed in its potential to make of its form, transparency, reflectivity, refractivity, color, movement and sound.

In the dark, the presence of water may be sensed by sound or smell. Even when it cannot be seen, its presence is felt. It is not always necessary to light water.

Section initiation diagrams showing how to interlock land into water.
4.2 Invitation of Water

Figure 17: Water is not just a vital element in our lives, it can also be experienced in whole variety of ways. It creates different kinds of atmosphere and moods that appeal to our feelings.
4.2.1 Study models: Interlock water, land, structures, and drydock

Ship structure/skin

Nature teaches us how to make large structures with minimum use of material.
Water is a driving force to interlock every program, space, and structure.
- Water as a circulation, program, and space, and volume

Water also provides flexibility.
Water and pedestrian circulation converge here so this place should be the most dynamic space in this project.
4.2.3 Sketches: water, wind and boat
4.3 Programmatic Assumptions

The following program for the aqua exhibition complex is based on conditions that easily replace or exist in Red Hook, Brooklyn waterfront industrial park.

Chamber of Water
- Exhibition/Education related to water, maritime technology and history of Red Hook

Restaurant
- as Conference hall in needs, maximum capacity 240 people, bar, kitchen, storages

Information/ Checkroom

Administration

Sculpture Garden/ Waterscape
- open to the building during the summer, close to the building during the winter

Book store

Library
- capacity 30 people

Parking
- spaces for 12 buses @ 10' * 60' per bus
- spaces for 106 cars @ 8' * 16' per car
Sunlight is split into its spectrum in a rainbow.
- Force of Water and Light
4.4 In Search of Water

I started with a series of tectonic models that enhance quality of water and light.

4.4.1 1/4" Tectonic scale
: water, light and drydock

The construction of building under the earth requires truly believable structures.

Heavy and Thick Load-bearing walls should be established to satisfy this requirement. But these structures are totally intimidating the whole environment. So to make them human scale is also required.

Invitation of water

Invitation of light

Carving walls out and reflection of water on the wall create dynamic floating images and make heavy walls much lighter in human scale.
Mysterious light travels down from the sky, meets straightforward light through the windows, and creates enjoyable reflection images of water on the wall.

Section on design process
Sky travels down to the earth.

Extension of timber wall provides safety and rest area.

Timber wall maintains the same shape as existing drydock.

White stucco concrete wall accentuates effects of water and light.

Water interlocks all spaces.
Carving walls out and reflection of water and light on the wall create dynamic floating images and make heavy walls much lighter in human scale.

Heavy load bearing walls frame the interior space and allow purified water and natural light to filter through the building.
Joints details; believable structural resolution should be introduced.

Web of water pipes creates various elevations by way of different tidal conditions and effects of light through the opening on the roof.

Mysterious light through the wall is an indication of underground structures and programs.

Water stitches all programs and spaces.
4.4.3 1/4" Tectonic scale
: water, light and materials

Statics analysis - restaurant roof structure

The glass wall façade breaks out of the frame.

Glass façade lets in light, and brings the drydock in and restaurant out.
When people look out of a window, they believe that they own everything in sight.

Instead of using glass as a substance to be looked through, I also want to use it as a substance to look at.
Because of building's geographical location next to the Atlantic ocean, weather-resistant materials are required such as glass, stainless steel and preservated wood.
Cantilever roof and column structure allows non-structural glass wall façade.

Glass wall allows a vital visual connection between restaurant and drydock.

Water condensation is a major problem during the winter. In order to avoid this problem, air-cooling metal strips are installed along with water cooling/heating pipes nearby glass wall.

Restaurant opens to drydock and provides outdoor eating space, especially during the summer night.
4.4.4 Revisit Urban scale
   : water, drydock and neighbors

Drydock, water and pedestrian flow

Drydock, water and programs

Drydock, water and lands

Drydock, water and water control system
extended public access

primary water control system

water in human scale with extension of public access

secondary water control system

hook shape system
- sense of its own territory
- stable water control
- public access extension
- recreation

recreation
Diagrammatic site model looking northwest

Diagrammatic site model looking east

4.4.5 1/64" Architectural scale
: water, drydock and neighbors

Site plan
Panorama view of Drydock on design process
Revisit Water and Pedestrian Circulation Diagram

Water and pedestrian circulation converge here so this place should be the most dynamic space in this project.

Room of Gretchen

Circulations shift, materials shift and structures shift occur at this space. Room silently invites water from drydock. It also invites light through the light chimney.
Water and pedestrian circulation converge at this space. It is a starting point of circulation of restaurant and waterscapes. At the same time, it is an ending point of circulation of chamber of water.

Carving-wall-out concept is applied here again and new introduction of timber wall structure gives more intimate sense of human scale.
The timber walls are intentionally tilted and not parallel to the floor, so the walls seem to mysteriously float around and over visitors' heads.
From darkness into light

Visitors walk from dark spaces toward the light brought by the light chimney. Light travels down through the light chimney, meets water and materials, and creates a cozy and private sense of amenities in room of Gretchen.
Shifted walls and split-levels give explicitly designated destinations of circulations: to Chamber of Water, restaurant and administration offices.

Ent. to chamber of water
Main circulation to restaurant
Sub-ent. to administration

sketches showing entrance of chamber of water and split circulation

Final Section drawing - main circulation and entrance to chamber of water
Circulation stitches each space.

Circulation also combines upland and underground with landscapes in human scale.

Administration and library separated from main circulation to give sense of privacy and silence.
4.4.8 1/8" Architectural Scale
: Secondary Circulation

The secondary circulation from restaurant to chamber of water and upland that connects to the nested resting areas with waterscape provides more cozy experiences into the site.

Heavy load bearing walls frame the interior space and circulation, and allow purified water and natural light to filter through the building.

*Interior wall as a circulation*
Section: main circulation, chamber of water and preservation lab. Preservation lab, excluded on the design process and transformed to landscape.
Upland and underground combined by circulation. Circulation provides nesting rest areas and light into chamber of water.
CHAPTER FIVE: DESIGN DECISIONS AND CONCLUSIONS
Perspective from main entrance, looking the overall site view
5.1 Design Decisions

: Waterscapes and Landscapes

Waterscapes
Orchestrating visual sequences along water circulation is akin to the art of cinema: foreground and background, close-ups and panoramas, space opening and closing...

Landscapes
Particular attention must be given to the scale and extent of landscaping and planting in spaces of differing size and quality without blocking spectacular views.
The major design concept of landscape is 'the emptiness'. I tried to fill the minimal use of space not to lose communication between upland and underground level and remain the site open. The thing that fills this space in is amenity.

overhead view looking north
5.2 Design Decisions
: Plan and Structures

Plan

Plan - based on urban analysis and interlock diagrams of water and pedestrian flow.
The plan with its somewhat formalistic subdivisions with waterscape reduces the scale and proportions to perceivable dimensions and gives the space amenity and variation despite the strict expression of structure.

The subdivisions in the scheme are not just design elements. The structure and the network of guidelines also define a spatial concept with order and human scale in a huge structure.

The interlocking spaces is made possible by the use of a hierarchically composed modular grid, which allows a consequent structuring of the various building functions.
Water Invitation Diagram based on Tidal Conditions

Diagrams showing various water occupation in the site by different tidal conditions.

**Tidal Condition**
- Highest
- Average
- Lowest

**Cross section**

- Highest tidal level (-5' from upland)
- Lowest tidal level (-10' from upland)

- Drydock level (-45' from upland)
Final Model

Overhead view looking northeast

Overhead view looking southwest
Overhead view looking southwest

Overhead view looking west
overhead view looking northeast
5.3 Design Decisions
  : Sections and Details

Drydock and Restaurant

These programs provide water-related exhibition, recreation and more physical/visual experiences of water with touch, taste, reflection, refraction and transparency.
Drydock opens to building during the summer and becomes a main stage for outdoor activities but it is closed during the winter and becomes a serene contemplation sculpture garden.
Chamber of Water

This chamber of water, one of main programs of this project, provides water-related exhibition, education and dynamic sensory experiences of water with sound, movement, form, light, and even taste.
Details: Chamber of Water

Water and Light slightly occupy this chamber through leakages regardless of their sizes, and becomes volume, space and anti-gravity space.
Main Entrance and Circulations

Sufficient Public accesses/circulations to the site and building stitch several layer changes and provide dynamic views and experiences of water and architecture.
Waterscapes

Human beings have a greater understanding for nature than for the art or architecture, and I imagine that waterscapes with well planted greenery can attract people, and while they enjoy the nature such as palms or the refreshing sound of trickling water they might also think about what they do, arts or architecture.
When one is seated here, the masts of the sailing boats are framed like a long dialog between ocean and sky.
Chamber of water and drydock are enhanced by the refreshing sound of trickling water.
5.4 Conclusions and Personal Comments

In general, adherence to the design propositions, a desire for an efficient architectural layout, and common sense led to a design that successfully facilitated use of water. The following are findings and conclusions based on the initial design propositions.

At a building scale, waterscape proved to be a critical element in terms of activation of water by making the spaces more inviting as well as enriching the overall architectural character. It helped significantly at the drydock and upland level to differentiate different kinds of public spaces. Light was found to be a useful element at strategically located places of rest. These spaces would promise to enrich the sensory experiences of water of visitors, thus making them more memorable.

At a community scale, the building successfully establishes itself as a landmark, visible from many different vantage points in the community. As proposed earlier, drydock does seem to make the most sense as the major generator of the architecture, given intimate amenities on the site. The building also successfully knits the site together through water and pedestrian circulation. Whereas pedestrian circulation was originally only available by crossing the thin overpass sidewalks and truck routes, the sidewalks have been widened and truck routes should have been removed and pedestrian circulation now spans the whole site without vehicles.

In addition, the design scheme stitches the site together through materials. Although landscape was partially destroyed by the creation of the building, nature was given back to the site through water and vegetation at various levels allowing the building to visually blend a bit more with exterior conditions. And water is well maintained and contained by paving or greenery in built-up areas.

There are some promising outcomes in this area that would be interesting to explore further. Some of the larger architectural moves such as simplification of circulation might serve to facilitate perception and experience of water. Also to remain some historical warehouses is valuable to memorialize what this site was in terms of ruins.
This thesis project basically grew out of one deep constant interest I have: how architecturally affecting the environments or society can heal our traumatized buildings/cities. Since modernization, so many indiscreet constructions, demolitions and transformations have been occurred here and there. What kind of memories can we expect to save and heal given such a condition? There are no criteria to distinguish what should be preserved or destroyed. Since Erie Basin is also a very crucial ‘hardware’ within a city, its value should be carefully considered. We should not discard our memories so rashly. This is why I have been interested in this site and related program, waterscape, as a prescription.

The overall aim for this project is not only to achieve revitalization of Red Hook area and refamiliarization of defamiliarized water but also to achieve the status of a ‘neighborhood ship’ as part of community... [rather than] remain merely a mass of fragmented individuals. In order to achieve this overall aim, I have been speaking much about the scale and soul of the building and references to human scale and sensory experiences of water to enhance the Brooklyn waterfront environment. Therefore, I have been consciously working with different constellations of materials, colors and forms that together with functions, views, water, light and surroundings, offer a variety of sensory experiences and amenities.

The resulting design exploration is intended to aid designers of these water related buildings, landscapes and especially regeneration projects nearby waterfront by contributing both a process and specific architectural demonstrations.

To be honest, I cannot make a city. This is what I have heard since I started my studies in the States. I truly agree but I still believe that we, together, can make a utopia. And it is my sincere wish that by uncovering some of my design proposals, we will pay a visit to our own utopia.
Placing tectonic models with the plan
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Unless otherwise noted, all images are produced by the author.