

Phenomena and Form at the Water's Edge:

A Scenario For Boston

by

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Eugene, Oregon
1992

SUBMITTED TO THE DEPARTMENT OF ARCHITECTURE
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OF MASTER OF SCIENCE IN ARCHITECTURE STUDIES
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JUL 14 1994

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Submitted to the Department of Architecture
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Degree of Master of Science in Architecture Studies

ABSTRACT

Hypothesis

Phenomenology of Water and Design

Water is an important element in our environment and thus is important in urban, architectural, and landscape design. It also has an inseparable relationship with human beings in our visual, acoustic, olfactory, and tactile environments. This thesis explores the potential for using the qualities of water as an expressive element in design to create poetic spaces. These explorations include a derivation of a language of form from the phenomenology of water:

- The physical nature of water
- The metaphysical nature of water
- Experiencing water with the five senses

The Water's Edge: The In-Between Zone

The waterfront is the edge that separates land and water. Historically, cities around the world have increased their footprints by infilling the water for more land. In some cases, the water has disappeared at the end of the process. This one-sided expansion at the edge has caused cities to overlook the value of waterfront. This thesis proposes that we should look at the edge from the other side—the water.

The study of the edge conditions between land and water includes the following areas:-

- Duality of the edge
- Types of edge conditions
- Threshold at the edge

Reclaiming The Water's Edge For People

In America, the water's edge is often used for industrial development. When the wharf era had

passed away, the edge is often left with warehouses and factories. Both harbors and riverfronts have often suffered from the same problem of neglect and lack of development. Cities need to reclaim their water's edge as a great asset.

Waterfront development should address the question of people's access to the water. Well-developed open spaces should become places where people can experience the power of water.

Design Concept: A Contemporary Museum of Arts and a Water Garden

In the design explorations, set out in this thesis, *a new scenario for Boston is created—an urban courtyard that stages the drama of water—a place for people to experience the water's edge and to touch water.*

The site that has been selected is special because it is between the Charles River and the Boston Harbor, acting like a threshold between the two zones. Nevertheless, many attributes of the site apply to other waterfronts since the site is an infilled industrial left-over area with traces of history and thus public memory offering references and meaning for design.

Conclusions

The design tested the hypothesis and demonstrated how one can derive form from the phenomenology of water through an integrated design of architecture and the urban landscape. A variation of treatment of the water's edge where it meets the city, buildings, program, and the people is shown. Through the design of thresholds and the movement pattern in penetrating different spatial zones, visitors of the project can perceive the impact of the drama of water.

Thesis Supervisor: Mr. Michael Dennis

Title: Professor of Architecture

ACKNOWLEDGEMENTS

It is a pleasure to have the opportunity to thank the people who have made the research and the writing of this thesis such a fruitful and memorable experience. My supervisor, Professor Michael Dennis, and other members of my thesis committee: Professor Julian Beinart, Professor Shun Kanda, and Mr. Antonio Di Mambro, have all offered me invaluable guidance and advice from the inception of this project to its completion. They have generously shared with me their time and expertise, often beyond what the duty of a thesis advisor calls for. In addition to them, I must also thank Professor Bill Porter, Professor Ellen Dunham Jones, Professor Ellen Whitmore at the GSD, architect Steven Holl and my colleague Jack Debartolo 3 for their inspirational comments on the thesis.

I must also thank Carla Morelli, Peter Brigham at Wallace Floyd Associates, the Metropolitan District Commision fo the help in obtaining the site information.

Various fellowships and grants have provided me with the financial resources for the thesis. The AIA Scholarship for Advanced Research and the RTKL Intern / Travel Fellowship funded my trip to Europe, where I took many of the photographs found here. The RTKL grant in addition allowed me to work as an intern in the RTKL offices in Baltimore and Los Angeles in the summer of 1993.

I want to thank my friends and classmates who have helped me at various stages of this project. To Li Pei, who took and processed the photographs of the models as seen in the thesis. To Zachary Lee, for volunteering to do the humdrum work of photocopying and scanning in the last week before the thesis was due. To Agnes, Sin Yan, and my friends in church, all of whom have left their imprints on the thesis in one way or another, for their constant support, encouragement, and prayers. Their reminder that I could do all things through God, had inspired me at times when I was tired and discouraged especially when I had to rebuild one of the models after it was crushed before any documentation.

Finally, I must express my heartfelt gratitude to my family and my friend Samuel. My sister has always been there for me, sharing my joys and pains. My parents have not only shouldered the expenses of graduate school in the past two years, but have also been my unfailing supporters. I would not have been able to accomplish what I had without them. My dedication of this thesis to them is but a token of my appreciation for what they have done for me.

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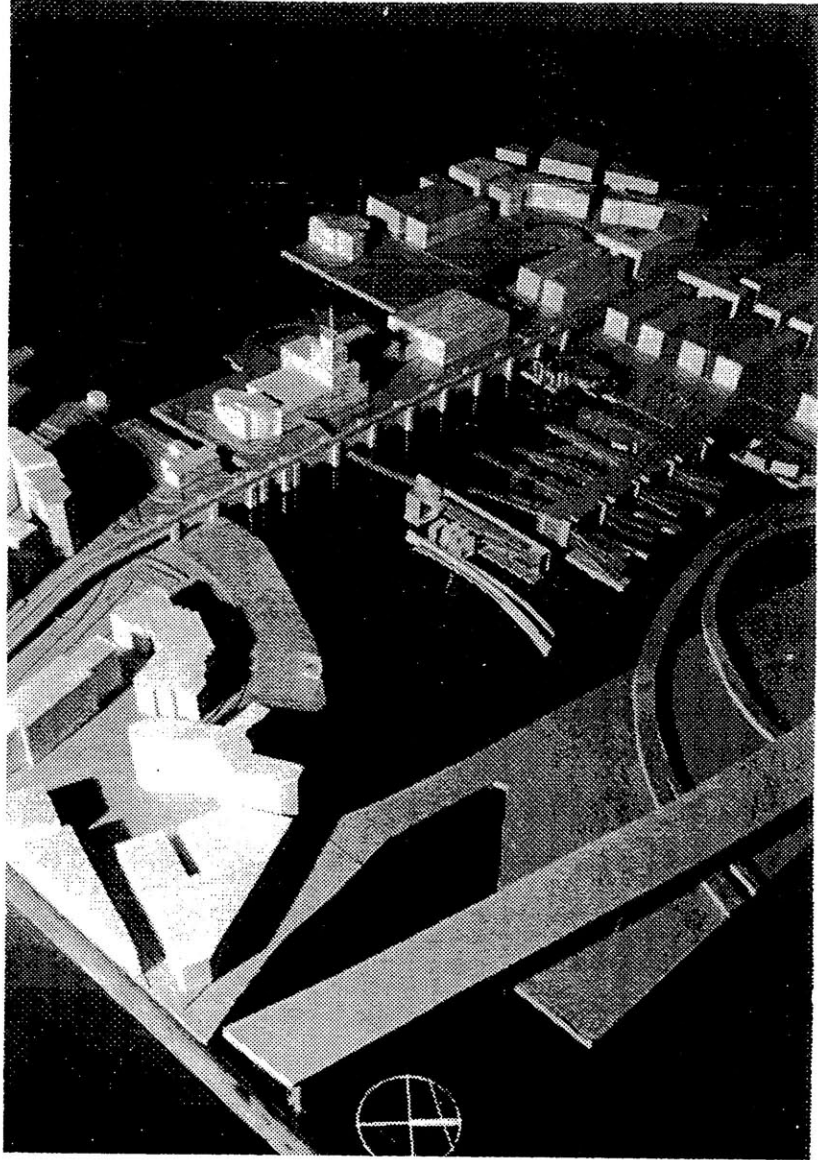
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INTRODUCTION

Water is the most interesting object in a landscape, and the happiest circumstance in a retired recess; captivates the eye at a distance, invites approach, and is delightful when near; it refreshes an open exposure; it animates a shade; cheers the dreariness of a waste, and enriches the most crowded view ... It may spread in a clam expanse, to soothe the tranquillity of a peaceful scene; or hurrying along a devious course, add splendor to a gay, and extravagance to a romantic situation.

Thomas Whately, 1770

Water and man are inseparable. Water is one of the two most important components in the world because water and land make up the earth on which we build our world. Water covers 70% of the earth's surface and constitutes the major part of the human body. Moreover, water is an essential amenity. Man relies on water as a working medium in transportation, power generation and as an industrial agent. Above all, water gives pleasure to people. Bodies of water "add excitement as well as serenity, definition as well as a sense of space to the cityscape, to say nothing of cool breezes, recreation, and reflection at night."¹

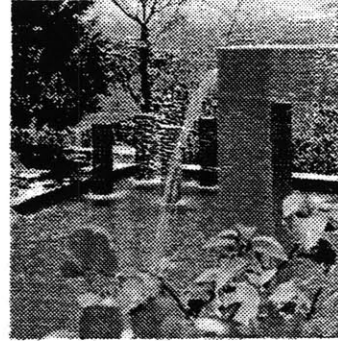
"The relations existing between architecture and water may assume various forms, occasionally mutually raising their value,

1. Aerial view of design in context.

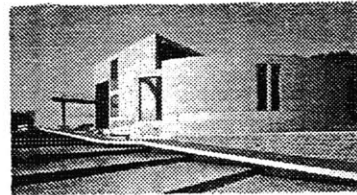
2. Fountain, Luis Barragon

3. Museum of Literature, Himeji. Tadao Ando, 1989-90 (Y. Takase)

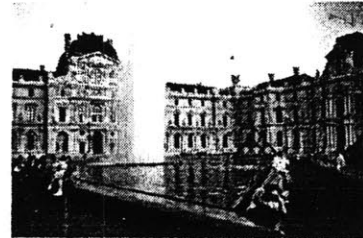
4,6. Forecourt, Louvre. I. M. Pei.



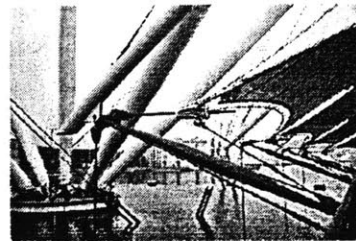
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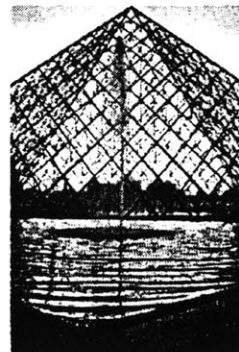
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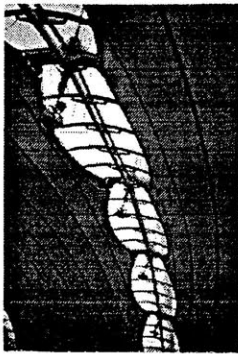
5, 8-9,11. Port of Genoa, Renzo Piano.

7. Pool outside the Chapel at Ronchamp, Paris.

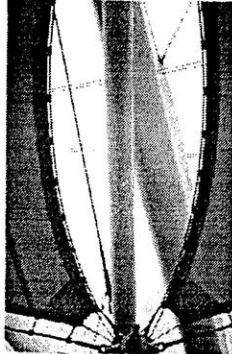
10. Canary Wharf, London

12. Pool at Museum of Literature, Tadao Ando. (Y. Takasa)

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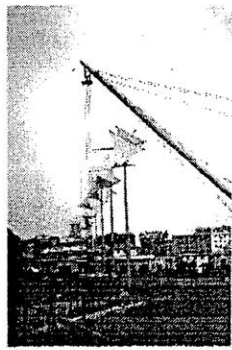
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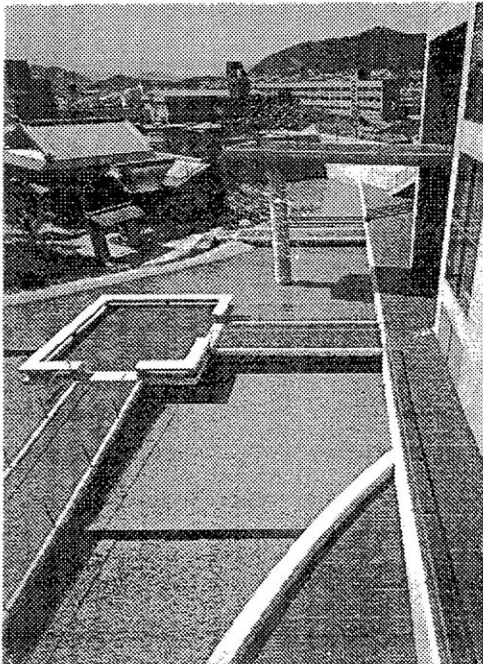
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sometimes however opposing each other dialectically. But it is always the water that assumes a precise typological value in the sense of determining and valorizing the organization and quality of the spaces in question. In addition, water plays in many architectonic examples a poetic role, embodying those values "beyond" the actual architectonic facts: integrated into architecture as in Wright's "Fallingwater" and in dramatic opposition as in Libera's Villa Malaparte, or as "Ariadne's Thread" in order to better understand Scarpa's architecture, water accompanies — as it has done through the ages — all significant changes within contemporary architecture." ¹

Paolo Fumagalli

Water is of interest to disciplines of contemporary architecture. Architects who use water frequently in their designs include Tadao Ando and Luis Barragon. Among famous projects are the cemetery by Carlo Scarpa, the reflective pools at the Louvre, the waterwall in the East Wing of the National Gallery of Art by I. M. Pei, as well as the Falling Water and the Raul Bailleres House by Frank Lloyd Wright. All of these projects involve water as a major design element.

Through looking at precedents and in actual designs, the ways in which the spirit of water can enliven urban, architectural and landscape designs will be explored.

Notes:

Wof Von Eckardt. "Reclaiming waterfronts." Urban Open Spaces



THE WATER'S EDGE: THE IN-BETWEEN ZONE

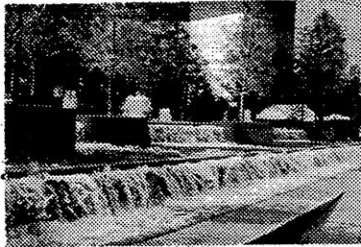
HYPOTHESIS



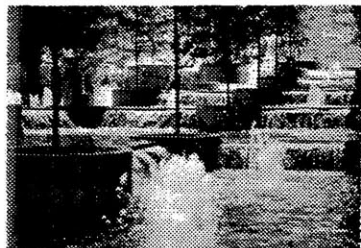
RECLAIMING THE WATER'S EDGE FOR PEOPLE

PHENOMENOLOGY OF WATER AND DESIGN

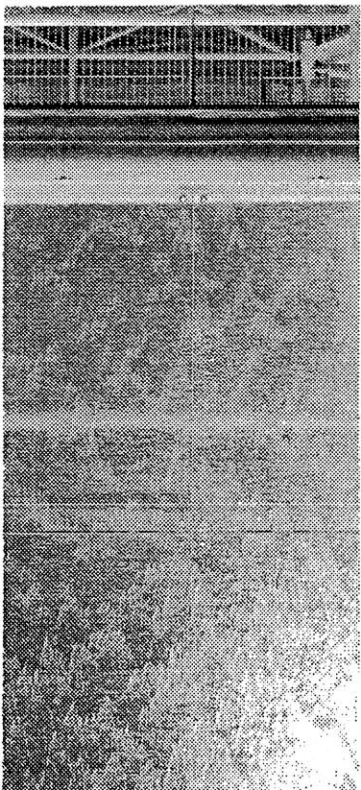
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"Sensuous, dynamic, and often unpredictable in form, water adds drama and mystery to architecture."

Translucent, malleable, seemingly immaterial, yet with form and color, water is the most chimerical of architectural materials, promising shapes, creating voids, extracting context, and imprisoning imagery in a shimmering formations, assuming the shape of its container, water seduces the senses as it skips down stones, cascades from concrete walls, and murmurs a gentle invitation to splash, touch, and dive through its mirrored surface. In the solid implacable world of stone and concrete, water is the playful, unpredictable, and powerful source of much of architecture's poignancy." ¹

Definition of Phenomenon

1. An occurrence or fact directly perceptible by the senses.
2. Philos. That which appears real to the senses, regardless of whether its underlying existence is proved or its nature understood.
3. Physics. An observable event. ²

Hypothesis

My thesis explores the potential for using the qualities of water as an expressive element in contemporary design to create poetic spaces. These explorations include deriving a language of form from the phenomenology³ of water in three respects: the physical nature of water, the metaphysical nature of water, and how water interacts with other elements in design.

1, 3-5. Fountain Place, Dallas

2. Children playing with soap. (Allen)

6. Waterwall, British Pavillion, Seville. Nicholas Grimshaw

7. Reflection
8. Refraction
9. Interference Museum of Science exhibits

10. Rocks at the water's edge.

The Physical Nature of Water

The Three Physical States: Solid, Liquid, and Gas

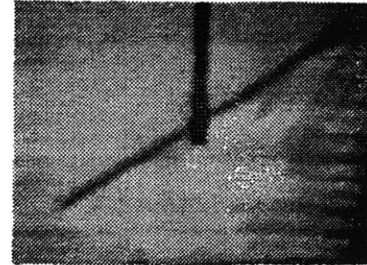
Water exists in three natural states: solid, liquid, and gas in different temperature and pressure. We can find all three states in our urban environments: in the form of liquid water from the droplet form to the depths of the ocean; ice on streets and on our buildings in the winter; and steam coming out from steamliners or from ventilation shafts along subway lines.

Buoyancy

One of the characteristics of water is that it supports things of lower density to float on it. Ships, floating barges, floating docks, are all inhabitable spaces on water.

Reflection, Refraction, And Interference

When a water wave travels and hits an obstacle or an edge, it reacts to the medium in different ways. It may create a reflection in which the wave bounces back with a different wavelength. This is called reflection. If there is an opening in the edge, the wave will go through and travel in a refracted course. The phenomenon of refraction depends on the size of the threshold in the edge. Interference appears when two traveling waves meet, producing a new wave whose wavelength equals the addition of the two original waveforms.



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11. Ice on the Charles River.

12. Fountain in Texas

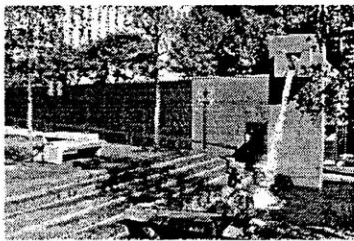
13, 15. Fountain Place in Dallas.

14. Fountain in front of the Pantheon, Rome.

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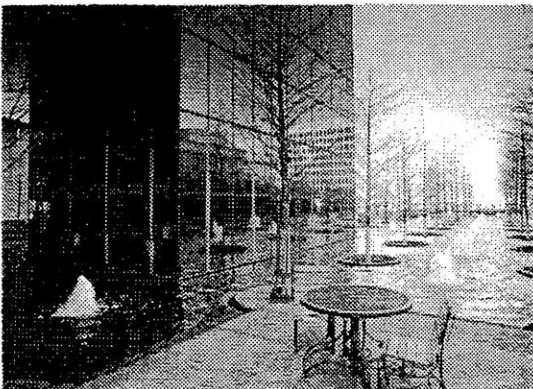
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The Changing Phenomena of Water

Change In Season:

Change In Physical States

Water changes its physical state in accordance with seasonal climatic changes, and thus helps to transform the character of a place. For example, a frozen river in the winter creates a rather different atmosphere from the one it creates when it is flowing in the summer. The perception of a building can also be different when snow covers its site.

Change In Time:

Tidal Change In Water Level

In accordance with the movement of the moon and the resulting magnetic fields, there is the phenomenon of the tide. The water's edge becomes animated when the water level rises and recedes to a different level. If the edge has a sloped section, as in a beach, the phenomenon becomes more apparent since the walkable surface area diminishes when the water's edge moves up the land.

Change In Temperature:

Cooling And Heating Effect

Designers can take advantage of the cooling and heating effect of water. In cities with an arid climate, such as Dallas, large-scale urban designs employ water extensively at building edges to bring down the temperature.

16. Water takes the different shapes of its vessels. Museum of Science exhibit.

17. Rushing water. Lok Fu Park, Hong Kong. (Higuchi)

18. Contained water. Thomas Cole, The Tiltan's Goblet 1833. (MOMA, New York).

19. Lok Fu Park, Hong Kong. (Higuchi)

Change In Form: Fluidity And Containment

Since water flows, it has no distinct form of its own until a vessel contains it. It then takes the form of the vessel. The design of pools can thus take many shapes in plan and in section.

Change In Motion: Movement And Static

Water can rush downwards, as a waterfall, shoot upwards as in a fountain, and flow sideways as in a river in different speeds. It can also become as calm as a mirror in an undisturbed pool.

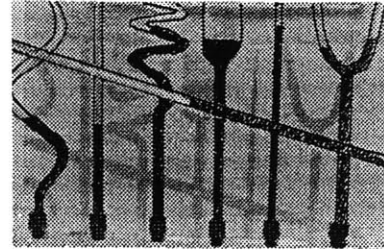
The Metaphysical Nature of Water

Metaphorical And Symbolic Meaning

As an element full of symbolism, people of different cultures have loaded water with content and meaning throughout the ages.

Ceremonial Delight

Water is magic. Water adds a sense of celebration and uplifts the spirit by virtue of its flowing character. Historically, fountains contribute to the making of public plazas. Almost typically, one would find a fountain in European piazzas to mark the space and give a sense of ceremony. It provides a reason for people to gather together, and these places are usually landmarks. In Geneva, a water shoot in the middle of the lake



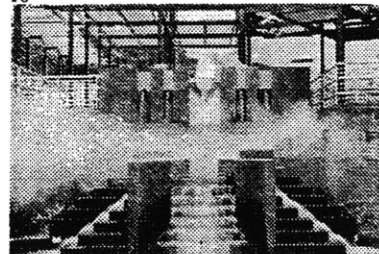
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20. Concrete Fountain in the plaza of Reston, Virginia. James Rossart. Provides incidental play fro children in warm and cold weathers.

21. Waterfall at Yosemite.

22. Baptism in Triplett Creek (Marion Post Wolcott)

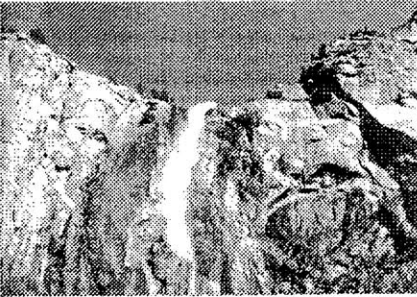
23. Reflection of building in Canary Wharf, London.

24. Ceremonial pool reinforcing axis. Paris.

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also marks a special place for people to visit frequently.

Contemplation

The quiet, static character of water also accompanies a sense of contemplation. It soothes the mind. Japanese landscape designs often employ water in a Zen way of thinking. It offers a sense of meditation.

Rejuvenation of Energy and Life

Water as a drinking source nourishes the body. Water also provides a water medium to cushion the human fetus in the mother's womb. It thus symbolizes energy and life.

Cleansing And Purification

The ritual of cleansing with water, especially in public, forms a very important part of Eastern cultures.

Sacredness

During a Christian baptism, a person goes through a transformation of life when he or she enters and breaks into the plane of the water in the baptismal pool, and emerges from the water surface as a spiritually new-born person.

25. Sea rhythms. San Francisco Bay. (Laurence Nelson)

26. Emergence from water. Williams Square, Los Colinas, Texas. Robert Glen.

27. Reflective pool in front of the Washington Monument linking vistas and joining the sky. Washington D. C.

28. Fountain as an acoustic screen.

Experiencing Water With the Five Senses

In the application of water in design, an understanding of the interaction of water with other elements is mandatory. These elements appeal to the five senses of human to experience the drama of water in our visual, acoustic, olfactory, tactile, and cognitive environments.

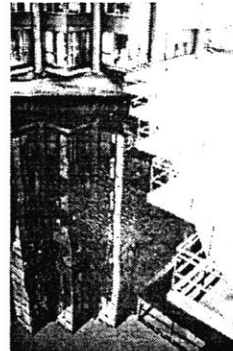
The Phenomenal Lens⁴: Water And Light

One of the most prominent features of water is the play of light and shadow, or even color, as water captures the light. As light reflects off water, it creates a unique shadow of ripples. In the MIT chapel by Saarinen, a pool of water on the outside edge of the building miraculously animates the building in the interior through windows. This acts as an example of using water and its reflection to complete the penetration of spaces.⁶

Water can also act as a mirror — a plane that takes an object from a real space to a virtual space. Reflecting pools applies this principle to enhance the monumental quality of the building or to reinforce the axis to establish a visual continuity.

Water Music: Water and Sound

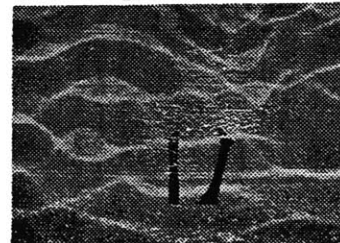
The sound of water is one of the first few stimuli to our acoustic sense as an infant. The continuous sound of water in public spaces can enliven the space. It can also act as an acoustic screen from background noises. It becomes part of an experiential sequence when one progresses



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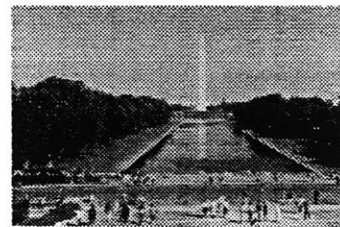
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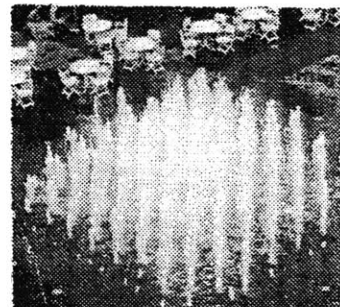
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29. Touching the edge. Fountain Place, Dallas

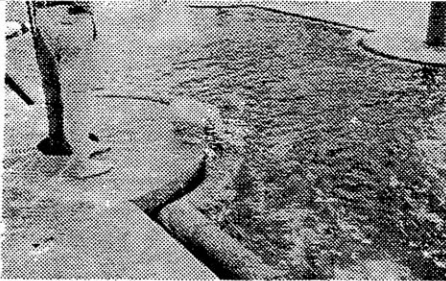
30. Touching the lake. Geneva, Switzerland.

31,32. Four Continents Bridge, Japan. Site Architects.

33. Playground, New York City. Behrend. (Taylor)

34. Water shoot in the lake as a landmark. Geneva.

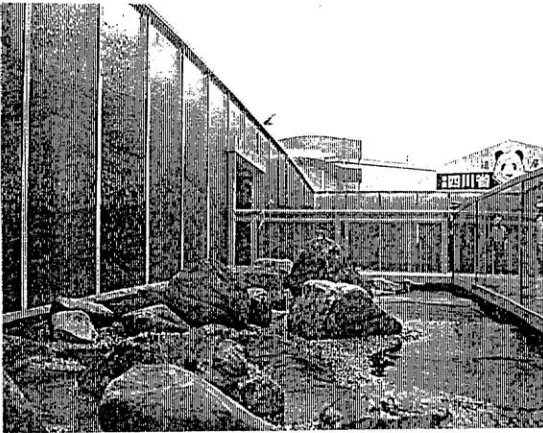
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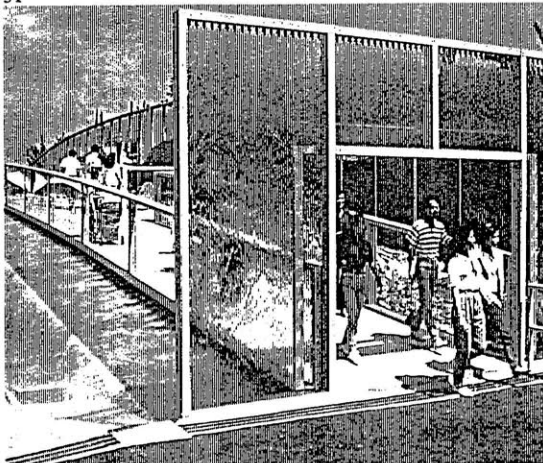
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to the space. After establishing a distant visual connection, one can then hear the sound of water in increasing intensity through the progression.

Water and Smell

The olfactory sense of water gives an identity to waterfronts. One can often smell the harbor when approaching the city.

Touching Water: Water And Materials

The very fact that one will get wet is a powerful experience. Some fountain and water garden designs push the limits to provide an option for people to enjoy water by getting wet.

In addition, materials share a close relationship with water. As in a waterwall, glass allows people to see water flow in a controlled but transparent way. It allows light to penetrate into the interior space through the refraction by water. Stone, sand, and gravel submit to nature's process. Water erodes, polishes, and deposits these materials onto the shore.

The Three-Dimensional Knit: Water-Sky-Land

Water, sky and land are the three main components of the earth. When one views the city from the water, the land divides the sky and from the water. However, when viewed from the city, the water and the sky merge into one at the horizon line. From the sky, water and land share an adjoining line. Water, land, and sky knit with one another in three dimensions. This is part of a

35. Kinetic water sculptures. Georges Pompidou Center Phatte & Tinguely. (Higuchi)

36. Water, the sky, and the city. (Daidalos)

37. The roof and the waterwall. British Pavillion, Seville. N i c h o l a s Grimshaw.

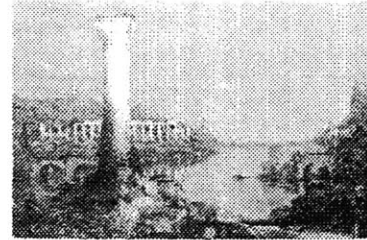
38. Water sculpture. David von Schlegell

39. floating stones in the pond in the botoanical park in Hamburg.

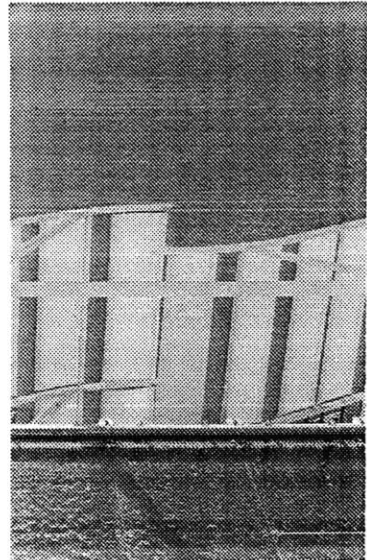
public memory that most of us share when we depart from the city and return in a ferry trip.

Notes:

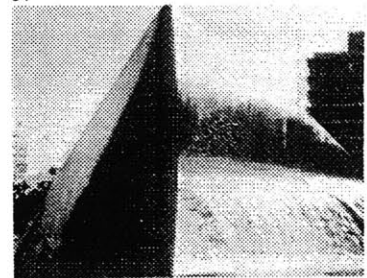
- 1 Victoria Geibel, "The Allure of Water," Metropolis 7/8, 1987 p.44
- 2 Webster's II New Riverside University Dictionary
- 3 Definition of Phenomenology: The study of human awareness in which considerations of objective reality and purely subjective response are temporarily left out of account. (Webster's II New Riverside University Dictionary)
- 4 Steven Holl, lecture in Boston Architectural Center, 1994.



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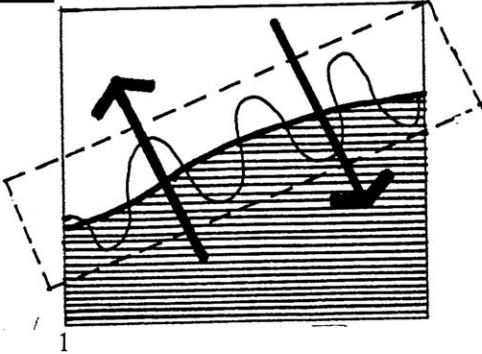
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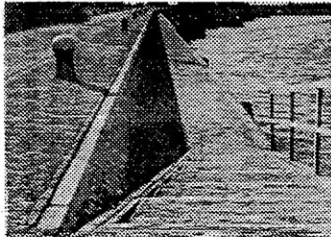
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THE WATER'S EDGE: THE IN-BETWEEN ZONE

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The waterfront is the edge that divides land and water. Historically, cities around the world have increased their footprints by infilling the water for more land. In some cases, the water disappears at the end of the process. This one-sided expansion at the edge causes cities to overlook the value of waterfront. I propose that we should look at the edge from the other side of the edge—the water.

The study of the edge condition between land and water includes four aspects: the two-sidedness of the edge, types of edge conditions, the threshold at the edge, and crossing the edge.

Duality of the Edge

There are two sides to an edge. Webster's II New Riverside University Dictionary defines edge as: "a dividing line or point of transition, the line of intersection of two surfaces of a solid." The water's edge is a dividing line between two zones: land and water, water and sky and the two sides of land as a river or harbor dissects a city. It can also act as a point of transition for two spaces, a line of exchange, a line or a plane of intersection that separates and joins two elements.

Types of Edge Conditions

Besides being an in-between zone, an edge can in fact act as a zone with its own identity.

- | | | | |
|--|---|---|---|
| 1. Land-water exchange at the edge. The in-between zone. | 2. The in-between zone of the edge. (G. Cullen) | 3. Duality at the edge. (G. Cullen) | 4. The overlapping edge. (G. Cullen) |
| 5. A separating edge. (G. Cullen) | 6. Sidney Opera House on the skyline.. | 7. South Street Seaport and the view of the city. | 9. The edge joining the land and the sky. Iseo. (G. Cullen) |
| | | 8. The skyline of New York. (T. Weinstein) | |

The following are the types of edge conditions that I explored:

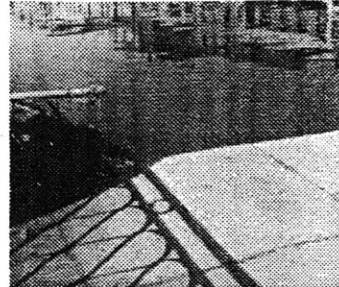
A Distinct Line Of Separation

The waterfront acts as a city's boundary, There are cities surrounded by water— islands, cities with inner harbors or dissected by a river, and lastly, cities with water on one edge—coastal cities, etc. Harborfront, riverfront, seafont, lakefront, canal edge, all have different boundaries.

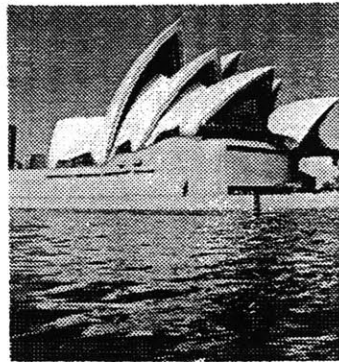
The water's edge is a dividing line to separate the viewer from the city or the dense built form from the openness of the water. The skyline then becomes every city's urban identity. The containment of a large body of water allows people to look at a city or a building from a distance. Driving along the expressway by the East River in Manhattan, one perceives a contrast between the openness of the river and the density of high-rises. These simultaneous views of different characters change constantly along the edge of the city.

An Adjoining Line

The horizon line joins the sky and water. In addition, the body of water on the surface of earth links the continents while the edge separates land from water. Therefore, a port city has a dialectic identity of being individual and being a part of a collective system.



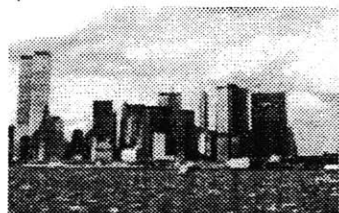
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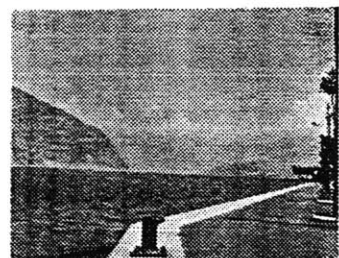
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10. Exchange at the city's edge. (C. Rowe)

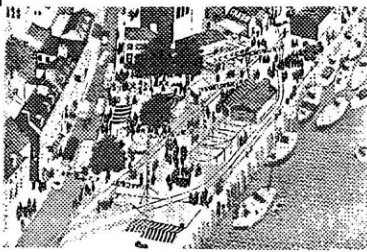
11. Entering and exiting the edge. Venice (George Roldger)

12. The inhabited edge. Hamburg.

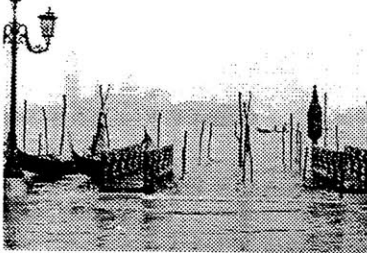
13. The inhabited edge. Piazza San Marco. Venice

14. The edge between the outside and the inside, overlooking the water. South Street Seatport, New York.

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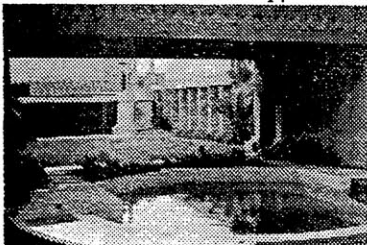
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A Line Of Exchange

The water's frontier is the threshold where goods and people from different parts of the world enter and exit. It is a line or an interface of exchange.

An Inhabited Edge

One can interpret the dimensions of the water's edge and thus in a large scale the edge can be inhabited. Buildings by the edge of canals are often built up to the edge and let the base of the building open up as arcades or so. Activities like eating can happen at the edge.

The Changing Edge

Sometimes, the edge condition can be a blurred separation or an ambiguous zone since the edge changes constantly. The beach exemplifies this idea and the process of urban infill for land made cities creates a changing shoreline.

Threshold At The Edge

The Concept of Threshold

Threshold: An entrance or doorway. A place or point of beginning: OUTSET. The intensity below which a mental or physical stimulus cannot be perceived and can produce no response.¹

Threshold is a point where one passes from one zone to another, mostly without prior knowledge of zone two when one is in zone one.

15. Water transcending inside-and outside space.. Hollyhock House, Frank Lloyd Wright.

16-18. Piazza San Marco. Venice.

19. Dual inhabitancy. Williams Plaza. Los Colinas, Texas. Robert Glen

20. Floating lilies. Hamburg park.

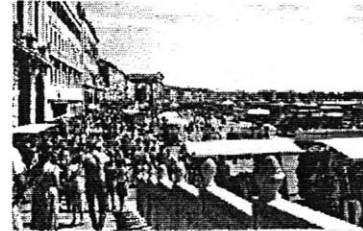
21. Floating /halfway-submerged walk. Hamburg park.

I would like to propose that this point between the two zones can happen in space, both in plan, in section, or three dimensional; in time, and in different scales if I take the idea metaphorically. It can be as small as a doorway, or as large as a gateway into a city.

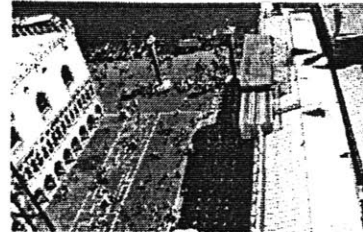
It can become a zone of its own in a city's scale. For example, Piazza San Marco being the threshold of urban life before one enters the Grand Canal. At a different scale, the two columns at the entry of the Piazza also act as a threshold that separates the waterfront from the smaller piazza. These two columns frame the view from the piazza into the vast open canal.

Duality of Inhabitation: Threshold of Water Between Submergence, Emergence, and Floating

In studying the different kinds of thresholds, the penetration, and the condition before and after penetration, the cover of a National Geographic magazine illustrates the point by a picture of a frog halfway submerged in water. The frog inhabits the threshold between land and water. It penetrates the two zones simultaneously. A frog can submerge in water and inhabit the underground world. It can also float and swim in water, letting its body occupy half water and half sky; or both water and sky. It can also emerge from the water's surface, and move to the land. Lastly, when it dries itself on land, it has completely emerged from the water to the land. We can apply



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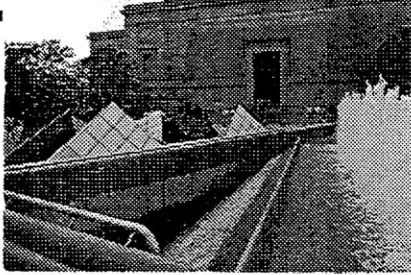
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22. Skylights in Courtyard,
National Gallery of Art.
I. M. Pei. (Leare)

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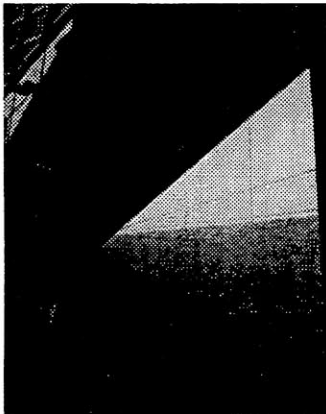
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23-25. Waterwall in subterranean
cafe. National Gallery of
Art.

this analogy of conditions to architecture: a building or space that is located right on the edge, or below the plane (in section), or an island city that appears to be floating on water..... It is all about penetrating the threshold in section (a plane) and in plan (a line).

Intersection In Three Dimensions: Threshold In Section

A vertical flow of energy of water can intersect the ground plane through a threshold in section. Francisco Javier Biurrun has designed a project called *A Monument to Water*, in the Plaza of Coronation, Estella, Navarra, Spain. He transformed an urban parking lot into a pedestrian space, with a monument to water on the site.² Biurrun's theme is energy, and the linkage of the well is an analogy to the excavation of the historic site and ruins. The point of relevance lies in the fact that a well becomes a threshold for the vertical shoot of water, in the z-dimension, that intersects the horizontal plane in the x-y dimension.

Threshold Between The Outside And The Inside

At the building scale, the zone between the outside and the inside calls for attention to create drama in the transition. The threshold between the two zones is the episode of the sequence of movement. In the National Gallery of Art, East Wing, Pei uses water to bring light from the plaza level to the subterranean cafe level. The

26. Threshold looking from the inside to the outside. Museum of Literature. Himeji. Tadao Ando. (Y. Takase)

27. Corssing the edge. Braendesgrard Haven. (Allen)

28. Rialto Bridge. Venice.

29. Crossing. Museum Wharf. Tower Bridge, London.

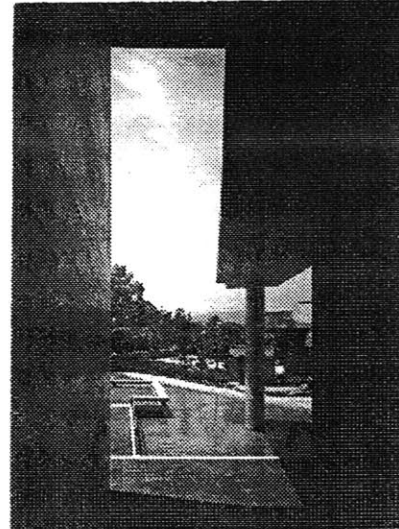
waterwall becomes a central focus in the space. It transcends the inside to the outside through water and light. The Gas Company Building in Los Angeles employs strips of water to extend the outside to the inside at the threshold — the lobby. Tiny bars of water shoot under a piece of glass in the interior, continuing the other half in the outdoor courtyard.

Crossing the edge

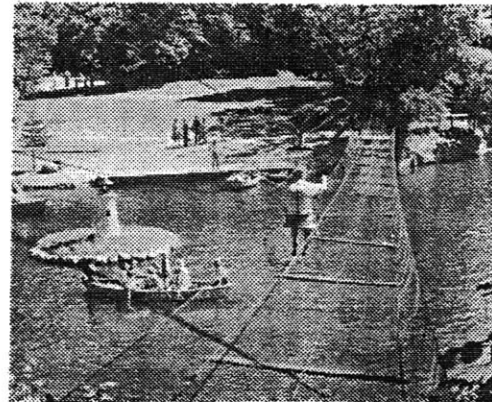
Urban Crossings

Urban crossings like bridges link two parts of the city, generating a dialogue while they cross the water's edge twice at a right angle. They also act as a threshold for water and boats to pass underneath. They spatially divide an outer part of water and claim the inner part. Often they also become iconographic landmarks that are part of a sequence to the city center. Since they span over the water, they have a relationship with the sky, the land, and the water, with a spatial weave of different layers in the x-, y-, z-axes. (x-axis: land to water to land, y-axis: water to crossing to water, z-axis: water to crossing to sky)

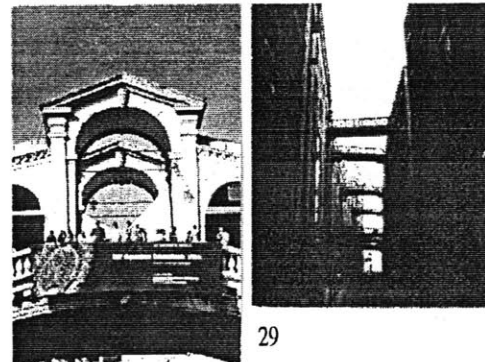
Ponte Vecchio and Rialto Bridge are both built up and inhabited on either sides. This creates a sense of compression and subsequent release when the view opens up in the middle of the river. Other bridges take the form of a simple line that merges with the openness of the river they span.



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30. Duality of an edge. M. of Literature. Ando. (Y. Takase)

31, 32. Building edges by the canal. Venice.

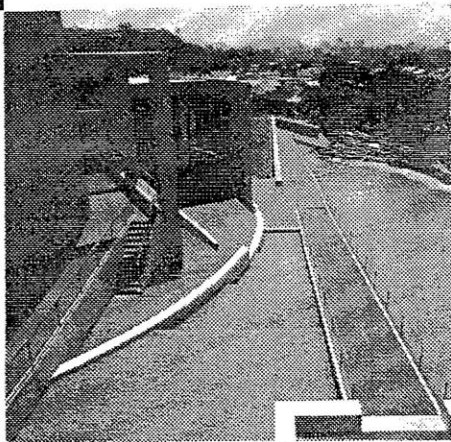
33. Tower Bridge, London

34. Water as the in-between zone.

35. A bridge and an edge of a plaza. Venice.

36, 37. Buildings and canal edges. Venice.

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In conclusion, my investigation is based on looking at the critical moments at the water's edge and how that edge is constituted and penetrated. It relates to the study of movement pattern and the entry sequence through the threshold.

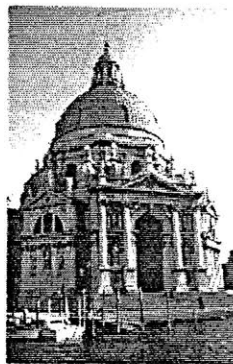
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¹ Webster's II New Riverside University Dictionary

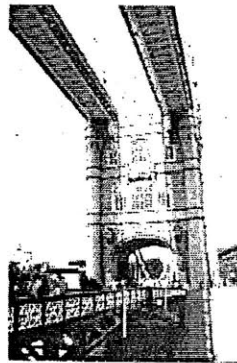
² Sites 25 pp. 140-143



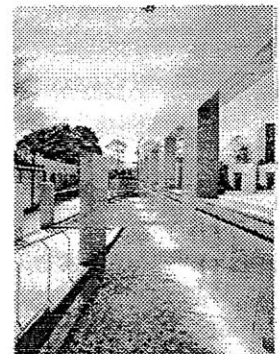
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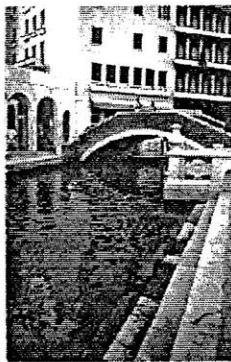
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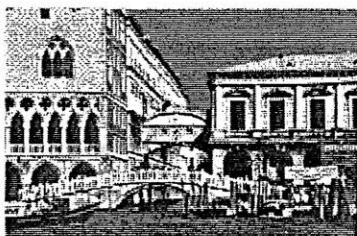
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38. Threshold and crossing. Venice.

39. Crossing by the edge. Venice.

40. Threshold of the bridge. Amsterdam.

41. Ponte Vecchio. Florence.

42. Rambling River - the Charles in a typical pattern at Maple Swamp. (Laurence Lowry)

44. Urban crossing.

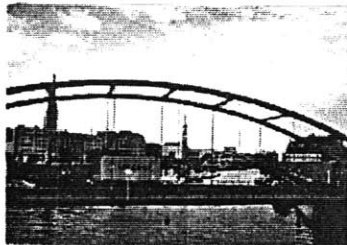
45. Urban landmark: water shoot in lake. Hamburg.



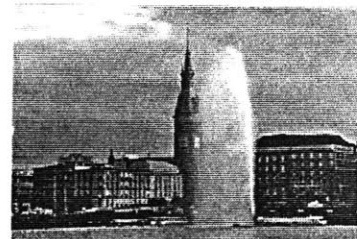
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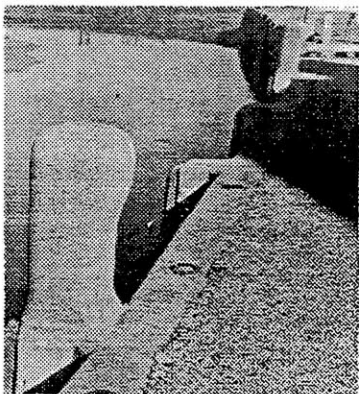
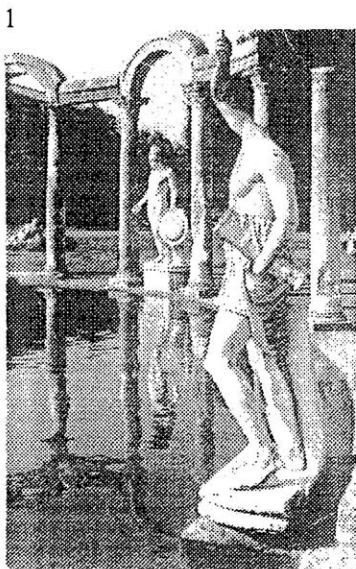
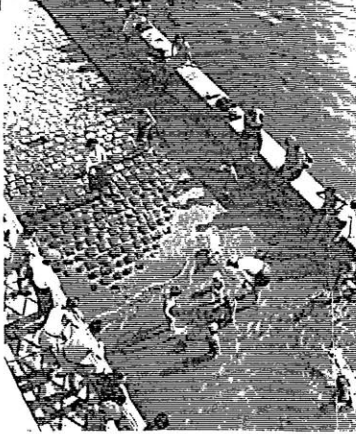
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RECLAIMING THE WATER'S EDGE FOR PEOPLE

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Water As A Form Giver of Cities

Human beings have coexisted with the forces of nature for centuries during which time the relationship between water and cities has evolved. Although floods still occur, cities still make ties to their water edges since people have an inherent fondness of water.

The need for transportation and the development of harbors led to the formation of the waterfront in port cities. The river's natural course similarly shaped cities with riverfronts. Cities with extensive canal systems, like San Antonio and Hamburg, also have their particular forms. Cities that orient to their plan to their water edges include Chicago, Washington, DC, Sylvania, etc. Amsterdam and Venice are unique cases. There are also small American beach towns like Venice, Santa Monica and San Diego on the California coastline.

After The Working Waterfront

Industrial development often occurred at the water's edge. When the wharf era passed by, the edges of port cities have often been left with warehouses and factories. Both harbors and riverfronts have suffered from the same problem of neglect and lack of development. Cities need to realize that the water's edge is in fact a great asset. By reestablishing the connection to the water's

1. People at the water's edge. The ground is animated by the water that came in at high tide. (RVC)

2. Hadrian Villa. (Wlyson)

3. The pier edge. (G.Cullen)

4. Luis Barragon House. (RVC)

5. Entry at the British Pavillion, Seville. (Nicholas Grimshaw)

6. Entry at the Museum of Literature, Himeji. Tadao Ando. (Y. Takase)

edge from the center, or reclaiming a lost asset, a port city may gain back its lost identity.

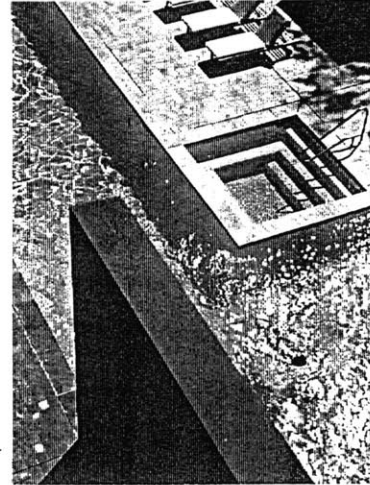
Between Public Memory and Future Promises

Some cities have started to develop their riverfronts into parks and their harbors into commercial developments. In Tokyo, although the river has basically dried up, the districts developed along the river still flourish in the absence of the water. The flow of people now substitutes the flow of water.¹

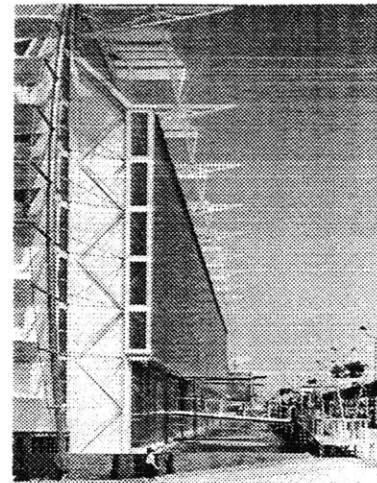
Building Form and Public Space on the Edge

A city should conserve some of its water's edge for developing active open spaces and protecting it from inaccessible privatization. View corridors should lead to the water where the public can easily gain access to the edge from the city.

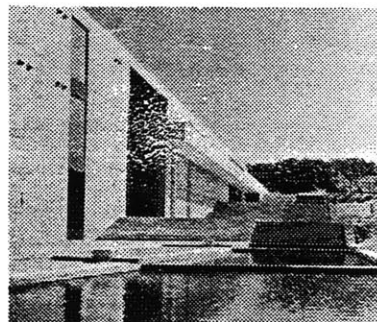
In cities such as Boston, development has begun on the wharves and has proved to be successful. However, buildings constructed on wharves such as Rowe's Wharf, tend to take up the whole footprint of the wharf, leaving only a pedestrian pathway to each side. In the design explorations, set out in this thesis, *a new scenario for Boston is created — an urban courtyard that stages the drama of water—a place for people to experience the water's edge, and to touch water.*



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7. Water as the phenomenal lens.

8.. A padding pool in Amsterdam. (Allen)

11. Waterfront restaurant in Rotterdam.

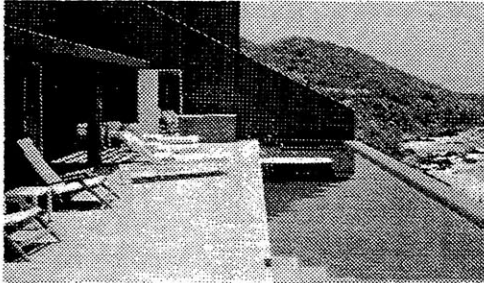
9. Water park (RVC)

12. Ferry Terminal, Amsterdam, Hamburg. 10, 13.

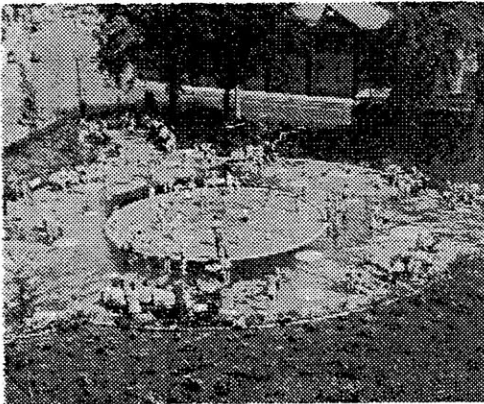
14. Music Hall by the canal. Amsterdam.

15. Baltimore Inner Harbor, including Aquarium and park.

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Summary of Hypothesis

I believe that designs that relate to water should strive to heighten the experience for human encounter with water and the passage of the edge through the threshold. One should draw themes from the phenomenon of water, the dialectic relationship between land and water, the dividing line of the horizon, and the critical moment of submergence and emergence. One can design spaces that are analogous to the dual habitat of a frog, which can either live under water or on land. The dual and simultaneous occurrence at the edge holds great interest for design.

NOTES:

1 Shun Kanda, colloquium at M.I.T., 1993.



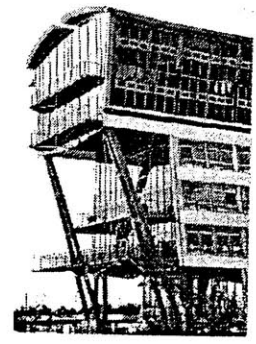
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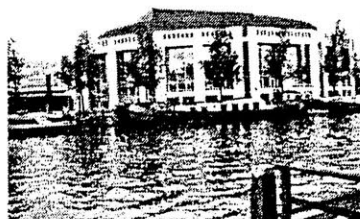
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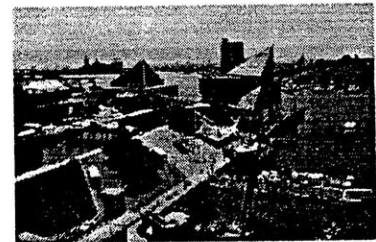
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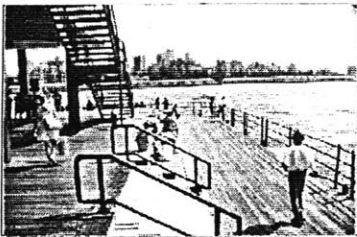


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INVESTIGATION

PRECEDENTS



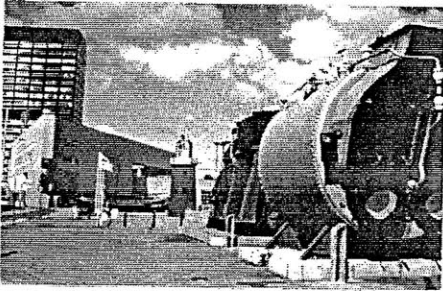
SYNTHESIS

1. Facing the Water's Edge. (Allen)
2. The deck at South Street Seaport.
3. Lake front in Geneva. The stepped section and the spatial layering.

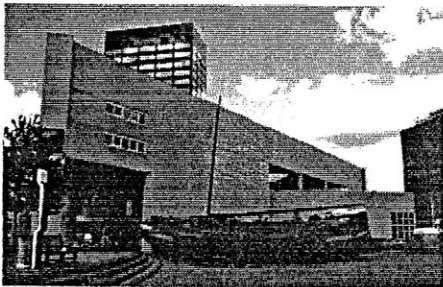
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PRECEDENTS

I have selected the following examples to show how water, in the architectural, landscape, and urban design environment, takes on a distinct role in the projects. In each case, the presence of water is so vital that if one takes the water away, the project loses its impact. Some projects also show sensitivity in the setting of buildings in their landscape.

Rotterdam

The Linearity Of The Waterfront And The Sequence To The Center

The linear characteristic of waterfronts sometimes implies that there are two endpoints which are mostly terminated in a poor and undefined way. Attempts to bridge the line with the city fabric can activate the edge by providing multiple points of entry.

The largest port in the world, Rotterdam is a city that was almost completely rebuilt after the World War II. It thus has a coherent architectural style. The intention to establish a relationship with the water starts to show in the sequence from downtown to the waterfront. The Marine Museum and its form constitute the first gateway from the city. Subsequently, interesting contemporary building forms and programs like a performing arts theater, the Rotterdam Waterstad, and a small marine factory line the main street in a sequence that ends at the harbor. The buildings form a continuous fabric on one side and break into a series of interesting buildings on

4-7. Sequence from downtown to the waterfront. Rotterdam.

8. Waterfront art

9. Cable-stayed bridge in Rotterdam.

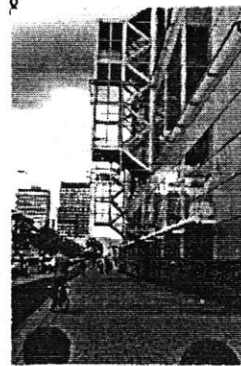
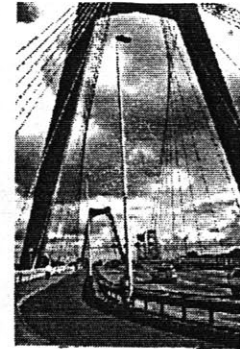
10 - 17, 19. Sequence in Waterfront, Rotterdam.

18 Old warehouse district in the harbor, Rotterdam

20. Autonomous form in the harbor. Rotterdam

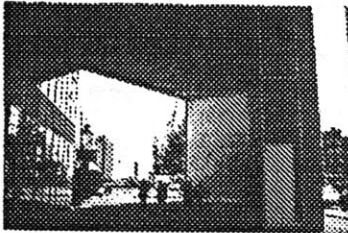
the other where a canal comes in. The street ends with an apartment building and a hotel which together mark the end as a second gateway.

This is then aligned with a small steel bridge that echoes the gateway a small distance away. It shows sensitivity towards the city scale and the harbor scale and the transition between the two happens on the waterfront. Many works of public art celebrating the themes of water are located across the length of the waterfront whose entire landscape treatment invites people to come to the edge. The linear edge ends with a beautiful red cable-stayed bridge which is widely used by both pedestrians and vehicles. At the other far end, the working harbor, people are also drawn to the edge by a park system and a university nearby. Rotterdam is an example of an integrated design at all scales.



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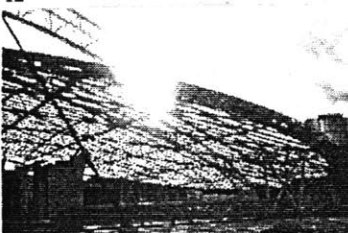
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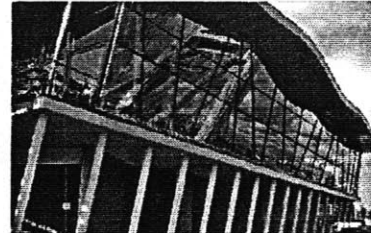
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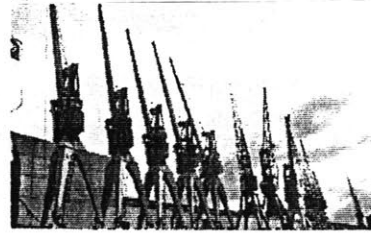
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21. The enclosure of water by the three monuments.

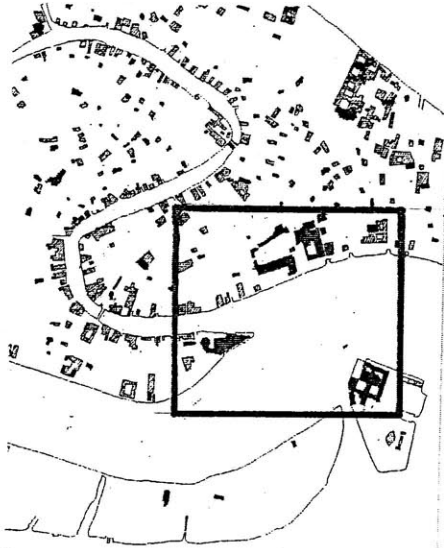
22. Dogana da Mar and San Giorgio Maggiore at the tip of their site to command the space around them.

23. Aerial view of the enclosed water.

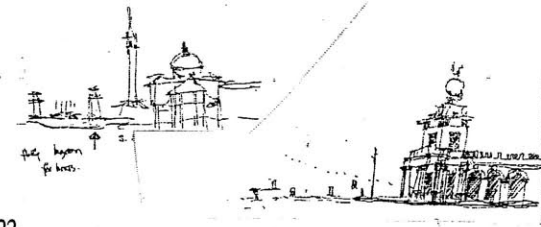
25, 29. Dogana da Mar and Giudecca.

26. Doge's Palace. Venice. 1857 showing the traffic at the canals.

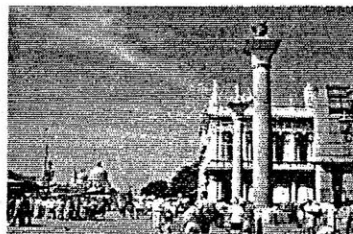
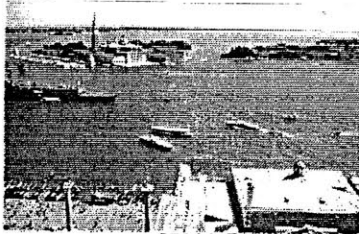
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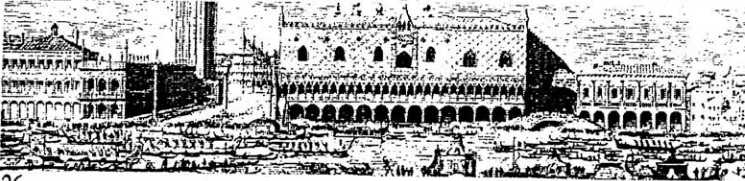
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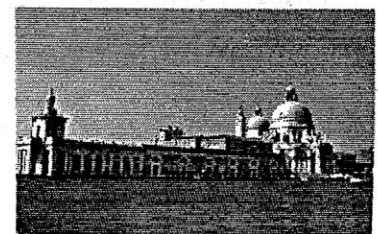
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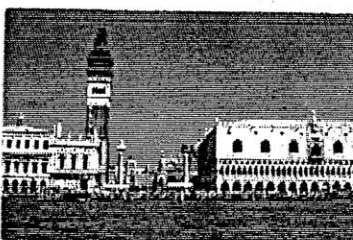


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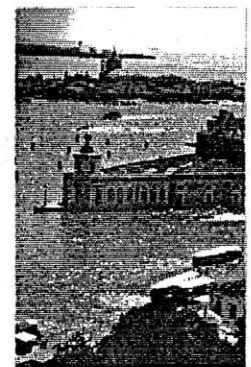
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Venice

Enclosing Water in the Making of Urban Space

Although Venice is a unique case, we can still extract some of its relationships with water as principles.

With the Grand Canal acting as the artery of the city, Piazza San Marco acts as the landmark and the major plaza oriented along the water.

At the city's scale, the Grand Canal is a primary component in the making of the space enclosed by the monuments St. Mark's Cathedral, Dogana da Mar at the tip of Giudecca, and San Giorgio Maggiore.

At the next scale down, Piazza San Marco, the primary political and religious center, acts as the threshold of the canal from which people enter Venice. The piazza is oriented to greet the entry from the water's edge.

24, 28. The columns take the thrust of the river into the plaza.

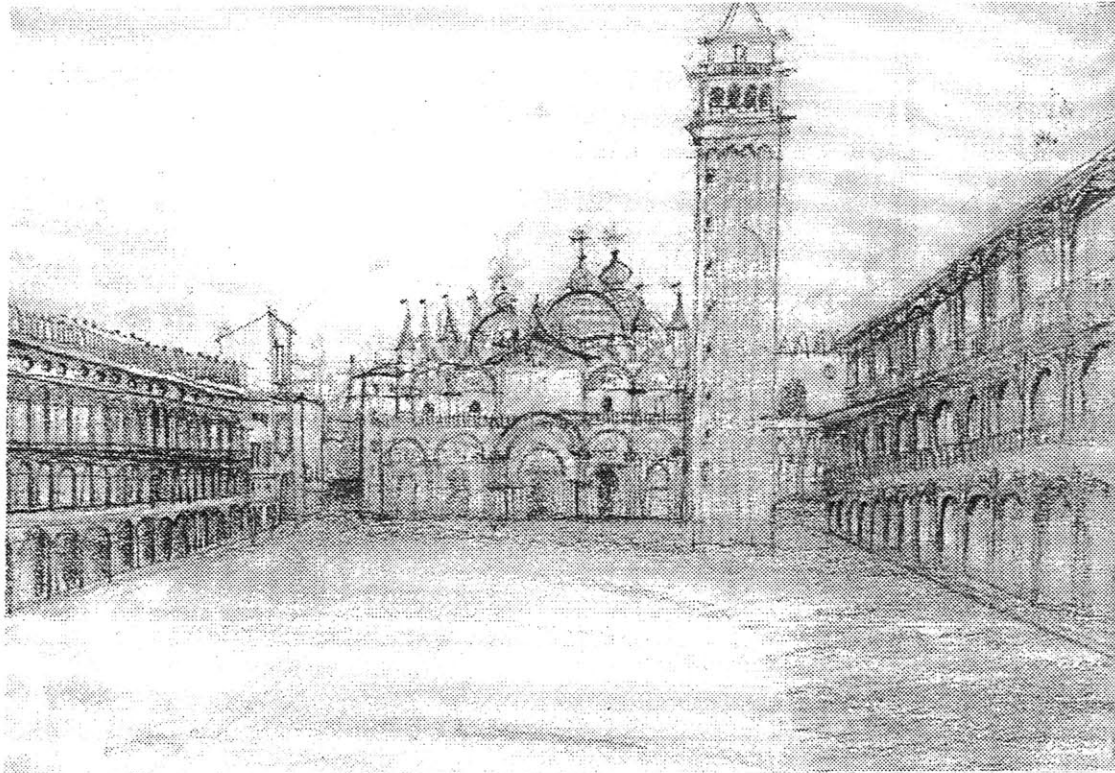
27. San Giorgio Maggiore.

30. Piazza San Marco and St. Mark's Cathedral. Sketch

31. The flooded Piazza San Marco at high tide. (Egbert Koesak)

32. Piazza near the hospital, showing the edge of water.

33-37. Details of Venice.



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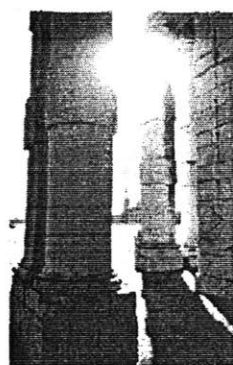
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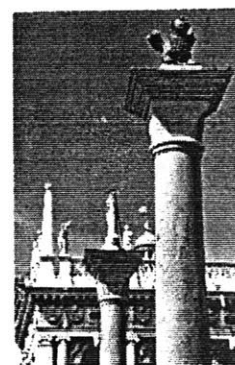
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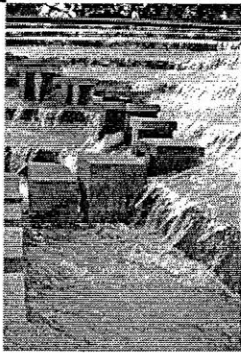
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38-46. The Water Garden,
Fort Worth, Texas.
Philip Johnson

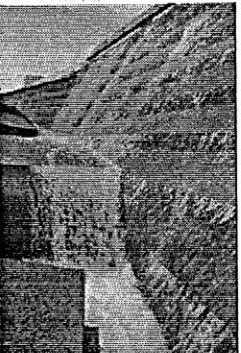
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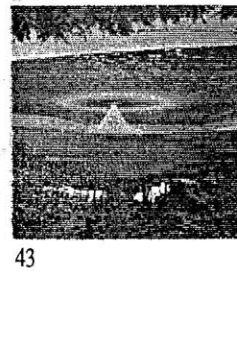
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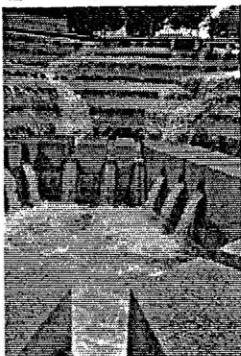
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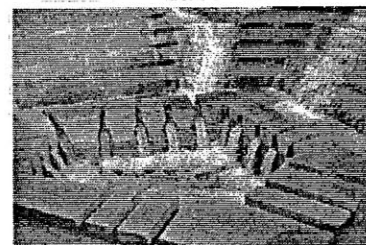
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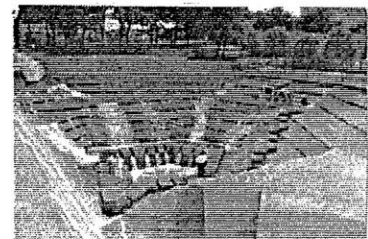
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The Water Gardens, Fort Worth, TX, Philip Johnson

The Kinetics Of Water in the Making of an Urban Waterfall

As a four-block urban renewal project, the Water Garden is truly a monumental urban waterfall. It has three pools of water that bear different characters: a roaring waterfall, a celebratory fountain, and a contemplative pool.

The experience of the waterfall is truly stunning. The immense body of water rushes down the spiral steps that descend to the bottom more than thirty feet below ground. This power is contrasted by the droplets that make up a quiet sheet of water that hangs down the wall like a roll of silk. A visitor can touch the water in the trough in a roughly three-foot high wall that leads one down into the pit. There exists, nonetheless, a certain invisible threshold in the spiral that one passes and feels the roaring water seemingly falling onto you.

After the roaring experience one moves on to a sequence leading to the contemplative pool after passing through a celebratory fountain. Overall, the garden explores water's mobile and static states and their meaning.

47, 48. The Falling Water.
Frank Lloyd Wright.
(Paolo Fumagali)

Falling Water And Raul Bailleres House, Frank Lloyd Wright

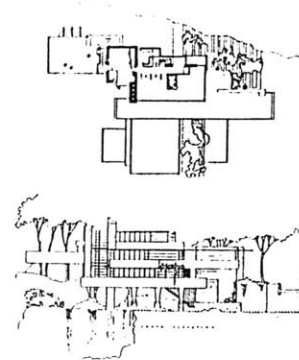
The Changing Context: Water In Its Natural Setting

Victoria Geibel points out that Falling water, as its name suggests, was Wright's most fully realized built architectural homage to water. On the other hand, Professor Kathryn Smith of the Southern California Institute of Architecture argues that many other schemes followed that revealed the architect's ongoing refinement of water's myriad effects, both practical and fantastic. In Wright's 1952 plan for the Raul Bailleres House in Acapulco, which unfortunately was never built, he succeeded in creating an architectural composition where building and water weave in and out of one another, being inseparable partners in a sarabande of forms. Wright also used the approach to the house, intended for a cliff-side site overlooking Acapulco Bay, to announce the intended union.

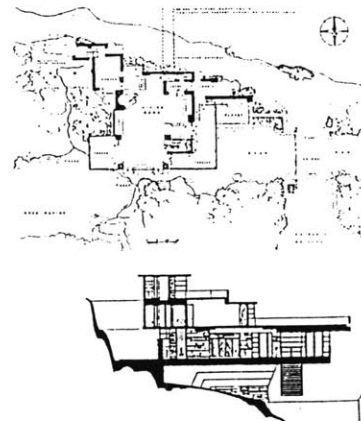
*The institute will relate forever to the ocean. There is nothing to block the view between the institute and the horizon, provided for by planning the institute on the edge of a mesa. The feeling was that the institute should be away from the mainstream for the purpose of contemplation."*⁴

In Falling Water, as Prof. Smith explains, the drive to the house "led through luxurious planting to a fountain that spilled water down several tiers of falls, continuing as a stream, weaving and intersecting with the drive." Wright planned bridges to periodically cross the stream "where water again forms a pool, narrows as it approaches the house, where it branches off in several directions. Architecturally, it merges in the house as a

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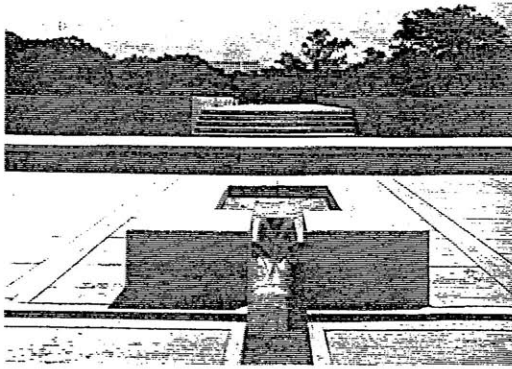
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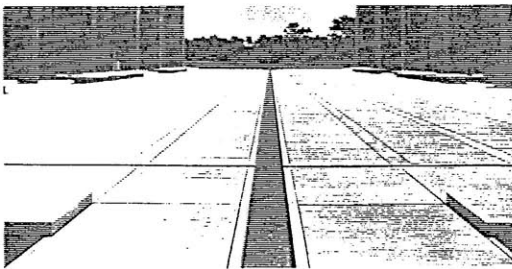
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49-51. Track of water drops from the forecourt to the fountain at the end of the axis. Louis Kahn.

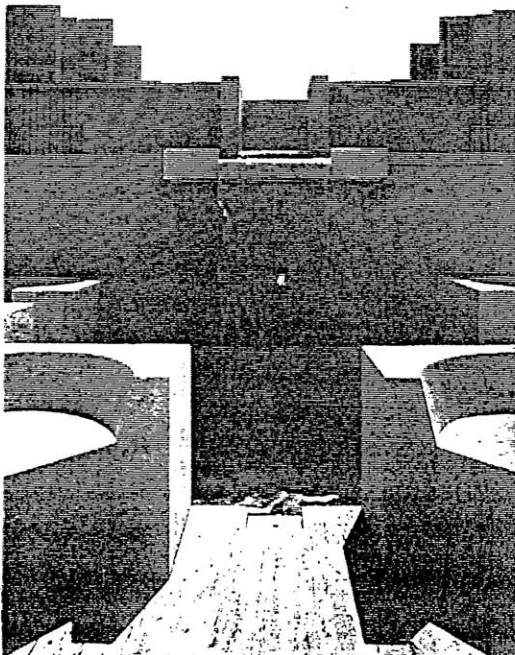
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cooling system and as a swimming pool, which reaches the edge to cascade down to the bay. At the center of the house, Wright created a fireplace mass that would double as an air-cooling system for the tropical climate. Water was brought in and up the shaft to drop as spray on the rocks.”²

Salk Institute, La Jolla, California, Louis Kahn (1964-66)

Water And Site Relationships: Transcending A Building From A Local Site To A Larger Context

“Think in terms of light, air, the sounds that you hear, water, the green world, the animal world.”³

“Louis Kahn was a master in manipulating water in architecture for reasons both practical and metaphysical.” In the Salk Institute, Kahn tried to communicate “the sense of man” through the meeting of materials, the organization of the plan, and the presence of water. He wanted to create an institute that would sit “at the juncture of the land, sea, and sky.”

On the east-west axis the two concrete laboratory buildings face onto a concrete courtyard marked only by a line of water imbedded at grade. Originating in a small enclosure at the eastern end of the courtyard, the water feeds through the two sides of the elevated square enclosure, and comes together in two gentle arches that fold together like bird’s wings, before dropping into the shallow, still pool. Once inside the pool, the water moves calmly westward through the narrow channel into an-

52-54. Time's I & II,
Nakagyo, Kyoto,
Tadao Ando.
(Ando)

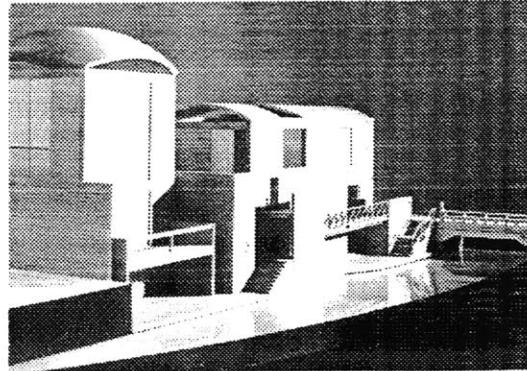
other larger enclosure, perpendicular to the channel, that marks a drop in elevation. Only momentarily captive within this pool enclosure, the water then tumbles down through an opening on the pool's western end, falling down into one, and then into another separate pool. When seen from the eastern end of the courtyard, the water appears to drop off the courtyard, over the cliff, and into the ocean. Reflecting on the institute's visual power, Dr. Salk expressed the following words:

*"The institute will relate forever to the ocean. There is nothing to block the view between the institute and the horizon, provided for by planning the institute on the edge of a mesa. The feeling was that the institute should be away from the mainstream for the purpose of contemplation."*⁵

Time's I & II, Nakagyo, Kyoto, Tadao Ando (1983-84, 1986-)

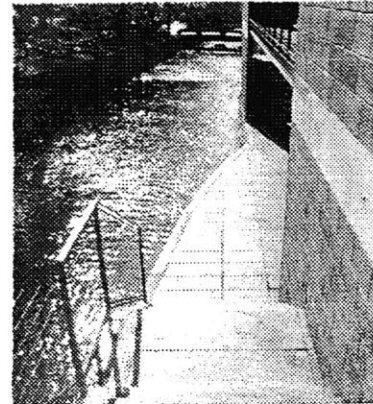
Interplay of River and Building

The relationship of people to the river remains the theme of the Time's I Project, and Ando attempted to draw the landscape into the building. "The building relates to the river in various ways, creating complex spaces. The first level is nearly at water level. The small plaza at this level is in the shape of a sixth of a circle and is continuous with the river. The stairway descending to this plaza gives the observer a foretaste of the interplay of the river with the building." It becomes the dividing line that separates the building with the river and yet that is

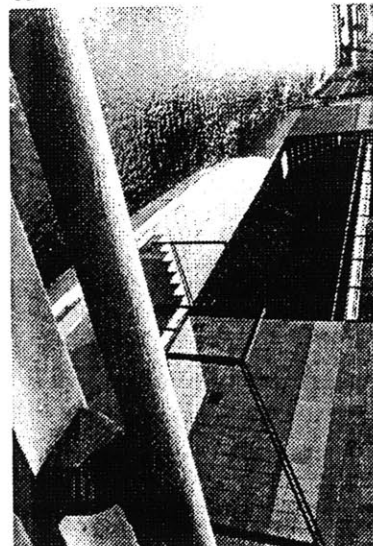


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*"Building
and
Water
were to
weave in
and out
of one
another,*



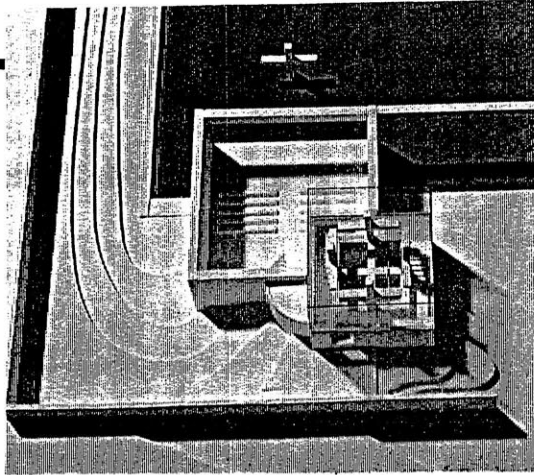
*being
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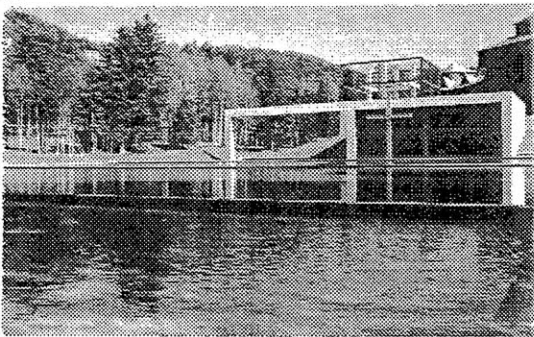
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55-58. Chapel on the Water,
Tomamu, Hokkaido.
Tadao Ando.
Transcendence of space.

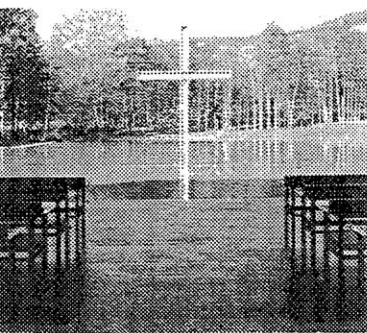
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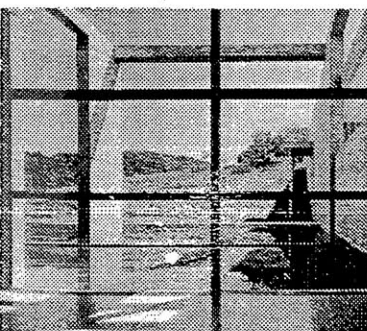
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the line that one can penetrate and transverse. "In walking between the spatially distinct shops, one can come suddenly upon a view of the sky or new vistas of the river. Places open to the river and places open to the sky are scattered throughout the building."

In the Time's II Project, Ando extended the plaza along the river. The three-level volume of the building is dropped at the plaza level to the water's edge. The section shows the building submerged below the plane of the street level down to the water.

Chapel on the Water, Tomamu, Hokkaido, Tadao Ando (1985-88)

Transcendence From Concrete To The Dematerialized Spiritual Realm.

The chapel is built right on a pond's edge on top of a small hill. An L-shaped wall partially wraps around the building. The building projects into the pond and immerses in the water. It also steps down in section and turns into planes of concrete that go under the water and creates a series of descending planes of water, quiet and yet the motion happens at the line where the different planes of water is exchanged. Moreover, through the open structural frame at the end of the building, next to the outdoor worship space, people view a cross standing on the plane of the water, metaphorically analogous to Jesus walking on water, and transcending the building into a dematerialized realm with spiritual presence.

59, 61. Entry through penetration. Temple of water. Tadao Ando.

60. Plan and sections.

Temple of Water, Tadao Ando

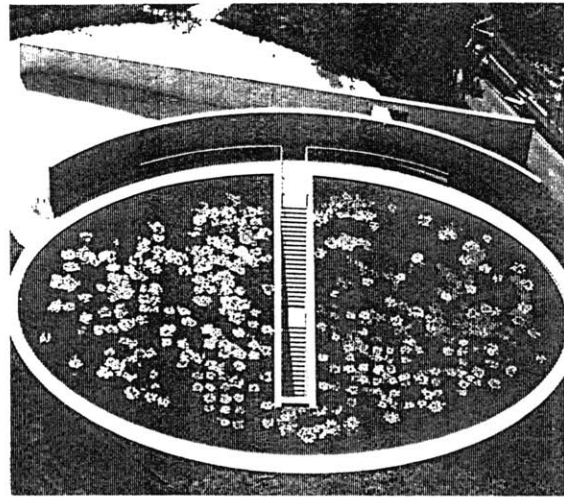
Penetration of the Water's Edge

The simple geometry of the building heightens one experience: the experience of being led through the plane of water. The dish-like section of the building is penetrated by a stair which takes people to the temple below. The atmosphere completely changes as the blue-light-filled space evokes one's sense of holiness.

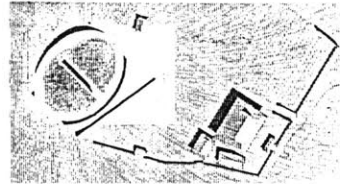
As an extension of a nearby temple, Ando reinvents the use of the lily pond as the entry plane rather than using a landscape element that traditionally accompanies temple landscape.

Notes:

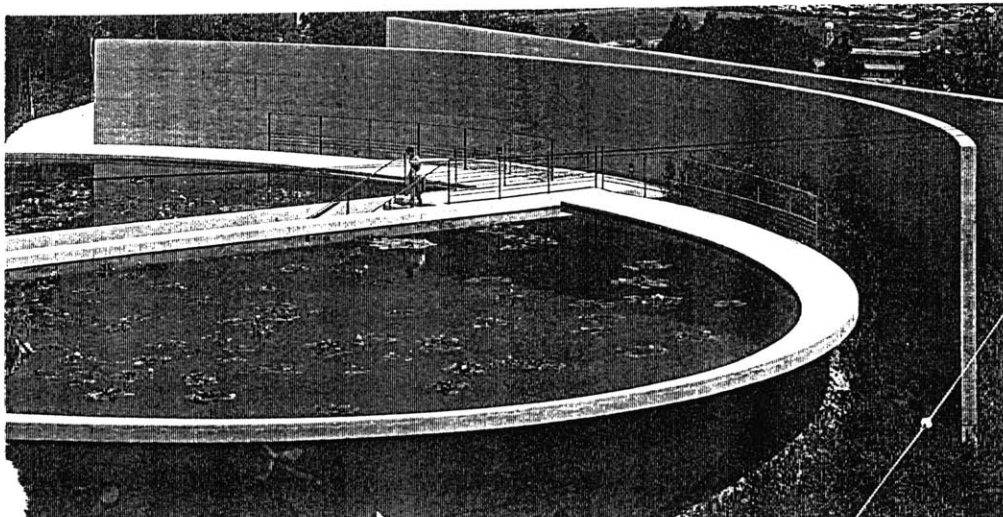
- 1 Victoria Geibel, "The Allure of Water," *Metropolis* 7/8, 1987 p.43
- 2 *Metropolis* 7/8 1987, p.43
- 3 *What Will Be Has Always Been: The Words of Louis I. Kahn*, edited by Richard Saul Wurman.
- 4,5 Geibel, p.44



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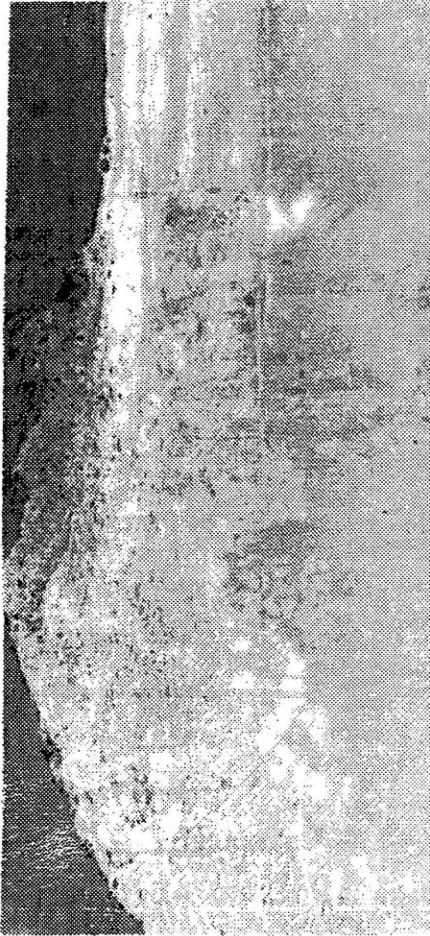
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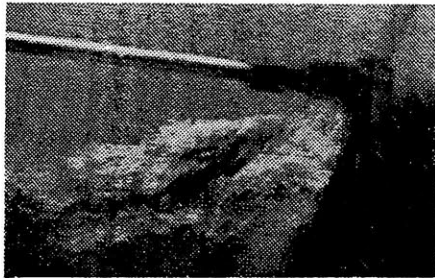
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1. Photograph of a section of a wave.
2. Wave Generator, Museum of Science.
3. Beach. (Brooks Vaughn, National Park Service)

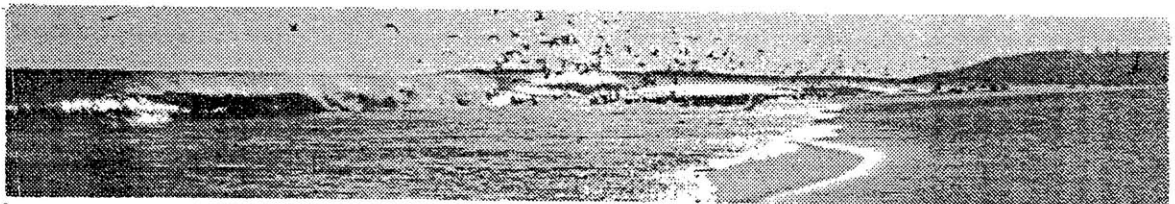
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SYNTHESIS

THE CONCEPT

Through the process of synthesis in a real site, I hope to illustrate my ideas about water and design and put my hypothesis to a test. The successive reclamation of the site calls for the expression of the changing edge. As opposed to infilling water for more land, I make a theoretical proposition to develop the site by taking out some land to reclaim the water.

The main idea lies in creating a stage for water to perform, telling the narrative of its own autobiography and the story of the Charles River. It can serve as a new paradigm for waterfront development: an urban courtyard, giving a new identity and order to the site.

By devoting half of the site to a water garden and using buildings to enclose a claimed zone of water, I can provide enjoyment for people at the riverfront. I have set out to create an integrated architecture and landscape design that offers choices and dramatic experiences for people to meet water at its edge at multiple scales with forms derived from the research already described.

4. View of Beacon Hill and State House across Charles River. (Kanda)

8. Boston Harbor (1950s) (Kanda)

5. Cover of "New Boston" showing waterfront gateway. (Kanda)

9. Quincy Market. Old Boston Harbor. (Kanda)

6. Rowes Wharf.

10. Long Wharf, Aquarium (Kanda)

7. Waterfront along Atlantic Ave. (Kanda)

THE SITE

Boston As A Context

Boston is a port city that grew in size by infilling its edges. The reclamation of the coastline almost tripled the size of the original Shawmut Peninsula.

The Boston Harbor joins the Charles River in the north and the Fort Point Channel in the south. In the past, Boston has had several successful waterfront projects such as the Faneuil Hall urban renewal plan, the transformation of the embankment to the Esplanade, the on-going rehabilitation process of the Fort Point Channel area, Rowes Wharf and the south Boston wharf development, and the future Fan Pier master plan. Therefore Boston offers a set of rich references.



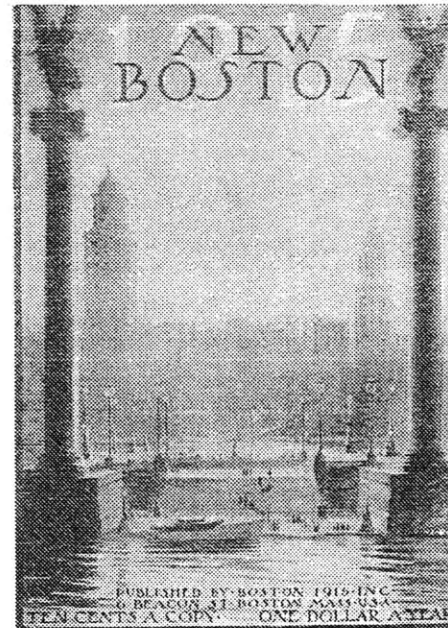
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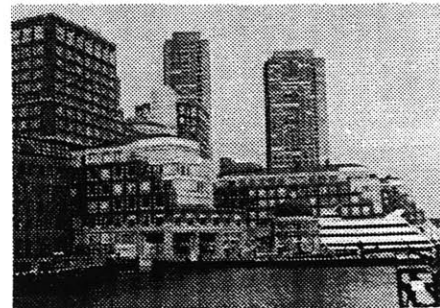
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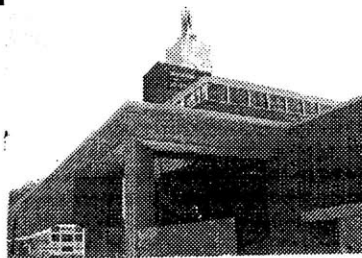
11. Museum of Science.

12. Inlet of water next to the site.

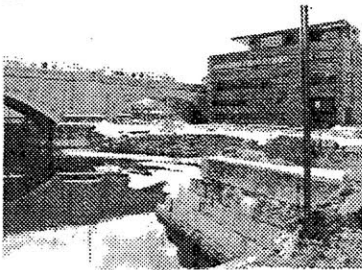
13. Existing site as a suffering from lack of attention.

14. Reflections of light on the viaduct.

15. Existing site as a warehouse district.



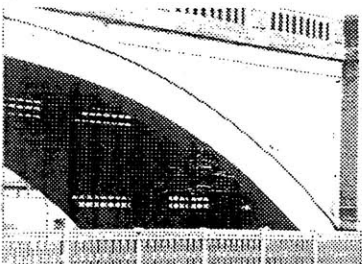
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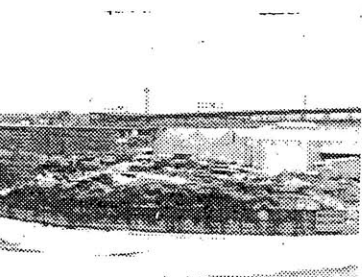
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Generalities Of The Site

Similar to many riverfronts, things left on the edge of this part of the Charles River are among others, highways, warehouses, undeveloped areas like the parking space facing the splendid view of the water and the disappearing natural habitat of marine life.

In my design I try to take advantage of the attributes of the waterfront with its richness in sensory experiences. The design will address the dimension of natural elements such as the water shimmering in sunlight, and its shape and figure, the sky and the wind.

Immediate Context

The site is located between the Museum of Science and Highway 93. The project hopefully gives meaning to the larger context while revitalizing use in the abandoned site. The immediate surroundings have the following elements:

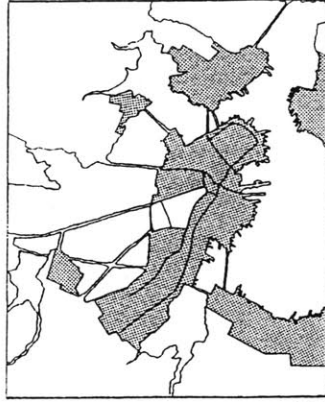
- The Museum of Science on the Craigie Bridge with the subway
- The termination of the Esplanade to the west of the bridge and the shell
- A new Charles River Crossing (Non-River-Tunnel design) of the new Central Artery/Tunnel Project, with new highway bridges and a cable-stayed bridge as a monumental gateway into the city from the north
- The proximity to Charlestown and the distant response to its topography and to the Bunker Hill Monument

16. Urbanization process of Boston. (Kanda)



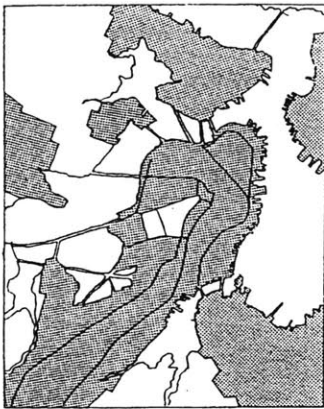
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17. Viaduct and the Museum of Science..

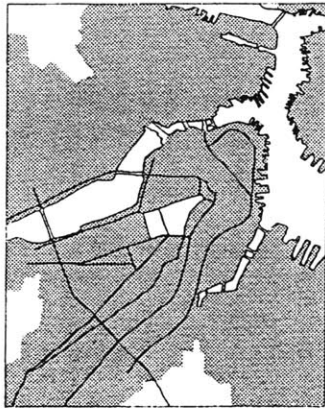


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18. West End in the 80's. (Kanda)



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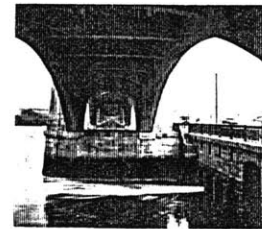
19, 21. Charles River and the Explanade.



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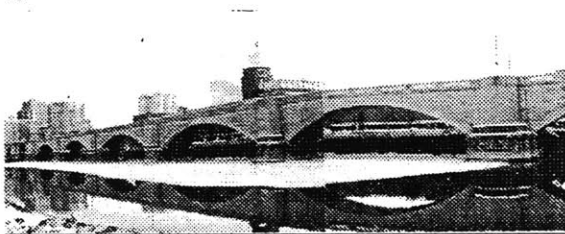


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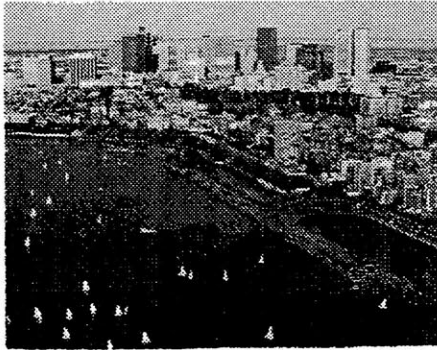
22. Charles River and the Esplanade (Kanda)

23. Rows Wharf. (Kanda)

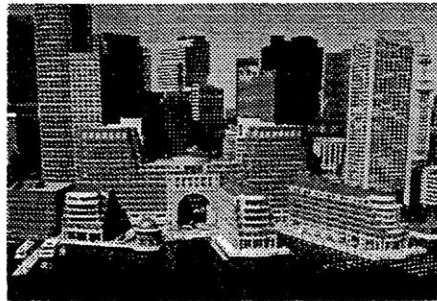
24. Bird's Eye View of the Navy Yard. (Landslides)

25. The wharves, Boston. (Kanda)

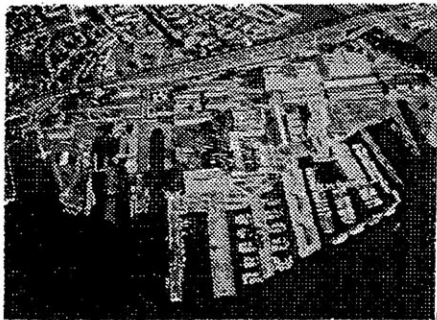
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The Site as the In-Between Zone

Between the River and the Harbor

The site, referred to as the "lost mile," is located between the Charles River and the Boston Harbor. It acts as a threshold into the inner river. In formal terms, the river is one continuous strip while the wharves in the harbors are indented with edges.

Between Cambridge, Boston, and Charlestown

Though administratively belonging to East Cambridge, the site sits between three precincts: East Cambridge in the southwest, Boston in the southeast and Charlestown in the north.

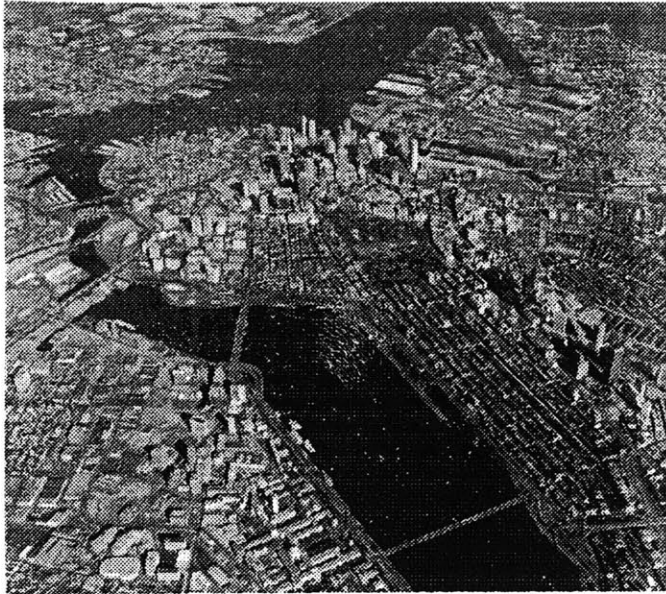
Between the Old Charles River Dam and the New Lock System

The site is next to the Old Charles River Dam on which the Museum of Science sits. Water flows through the viaduct. A dam separates and control two levels of water. It acts as a threshold of the level change, and also divides an inner and outer zone of water. In section, it reads as a separating plane with two lines of water level in front and behind.

Between Recreational and Industrial

While the Charles River is historically recreational, the harbor and the wharves are industrial. As it exists, the site itself is devoted to industrial use. The juxtaposition creates additional interest.

26. Between the harbor and the river. (Kanda)



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27-29. Site attributes including wildlife.



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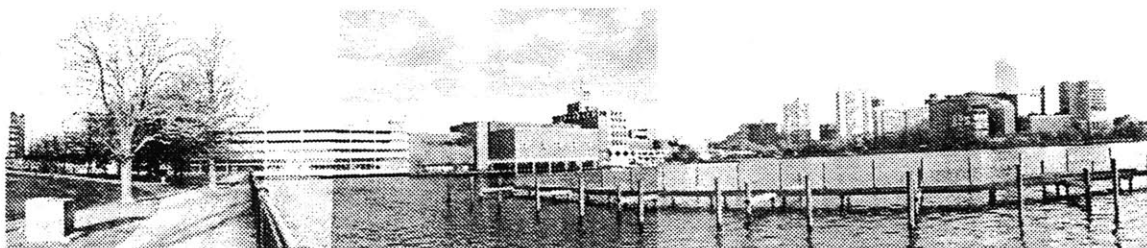
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30. View down from the harbor.

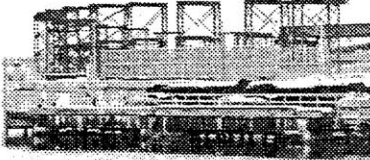
31. View from the Charles River.



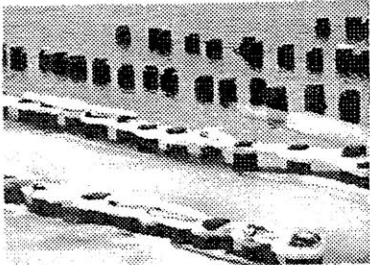
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32-37. Ordered Complexity:
Repeating structures on
the site.

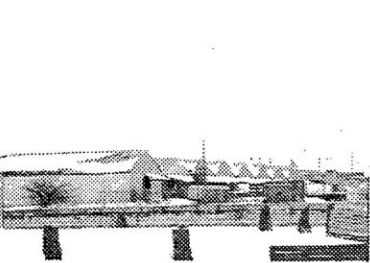
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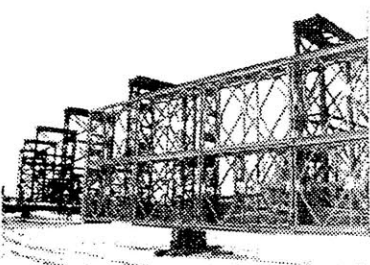
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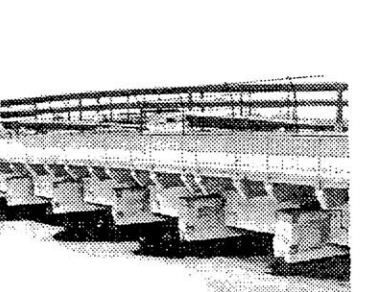
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Ordered Complexity: The Genius Loci of the Site

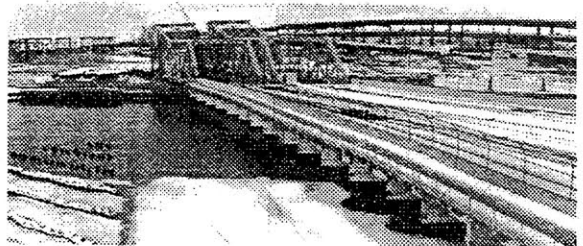
Industrial Ad-hoc Character

Boston Sand and Gravel, historical railroad yards and existing warehouses constitute the elements on the site.

The site is a graphical composition full of objects with repeating elements, like a tracery of lines, grids, coming in all directions, each having an order of its own, coming from a different time, orchestrating into a collage of systems. These objects consist of the rhythmic arches of the viaduct, the open frames of the steel highway piers, the layered decks of the elevated highway, the massive concrete support of the commuter rail, the wooden piers in the water, the ongoing pitches of the warehouses. Autonomous and sometimes monumental, yet full of detail, these objects make up a scene of ordered complexity.

Hearing the Site

Sounds in the site include that of the birds resting on the frozen surface of the water in winter, the sound of the Metro rail at the museum, and an occasional landing of a helicopter in the parking lot.



37

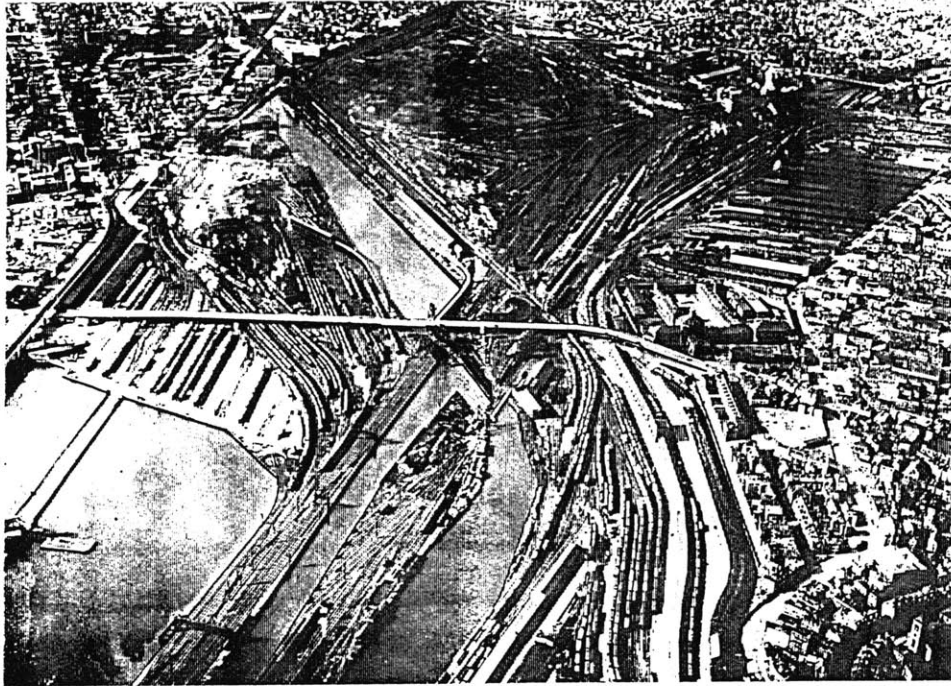
38. East Cambridge railroad track marks. (Maycock)

39-40. Commuter Rail line (Maycock).

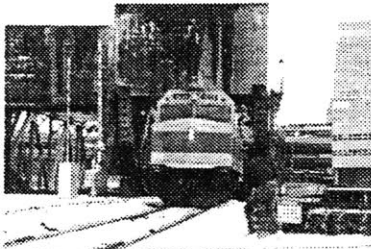
42. Richeisstune Wharf, Lechmere Canal. 1900. (Maycock)

43. Wamen Bridges and Boston and Manni yards, looking toward East Cambridge. 1911. (Maycock)

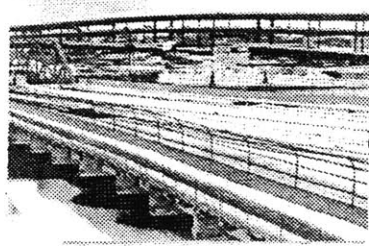
41. Existing site.



38



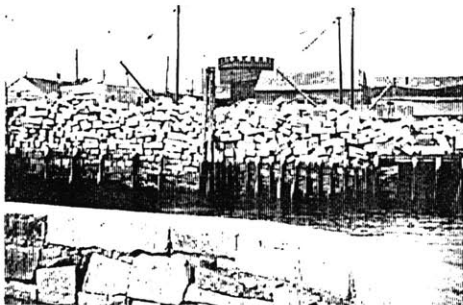
39



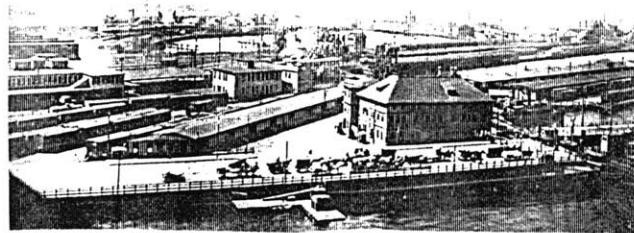
40



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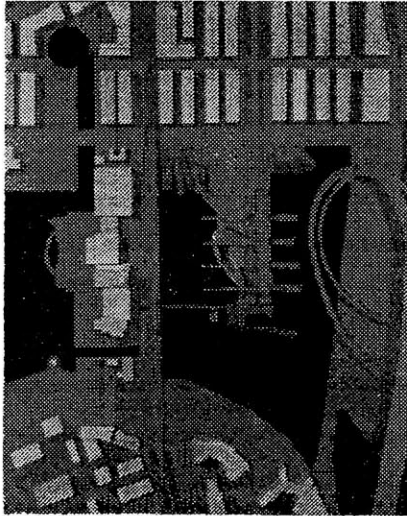
43

44. Context model showing urban design.

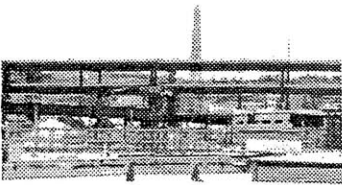
45. View of Bunker Hill monument from the museum and form the site.

46. Museum of Science and the viaduct (to be penetrated.)

47 Visual continuity to and from site.



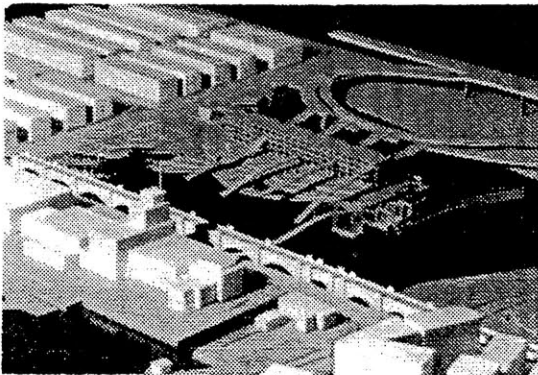
44



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47

URBAN STRATEGIES

My urban strategies include establishing continuities of the the context in the following categories:

Physical Continuity

- Connect the project to the city fabric and centers of activities.
- Connect to existing infrastructure.
- Connect by inventing an urban crossing—a pedestrian bridge—to link the project to the opening in the Museum of Science.

Programmatic Continuity

- Change the whole site into a cultural complex by gathering the two museums with a mixed-use building on the edge to generate activity.
- The buildings thus form the edges of an urban courtyard to enclose the water garden and the inlet of water as a claimed zone.

Historical Continuity

- Connect to the past of the site by expressing the changing shoreline and the seawall.
- Invoke public memory of the railroad yards, the bringing of cargoes into the warehouses, the transportation of logs of wood down the stream of river.

Visual Continuity

- Establish a distant dialogue with the Bunker Hill Monument which can be experienced from crossing the viaduct to the site.

48. Where the city meets the water.

50. Landmarks and places

52. Park / Open Spaces

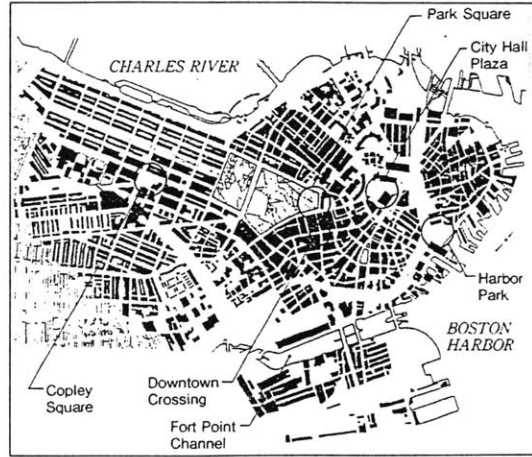
49. Plan of Boston (Kanda)

51. Urban fabric.

53. Access.

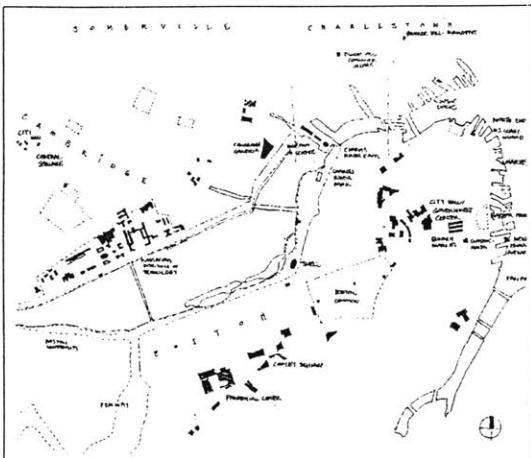


48

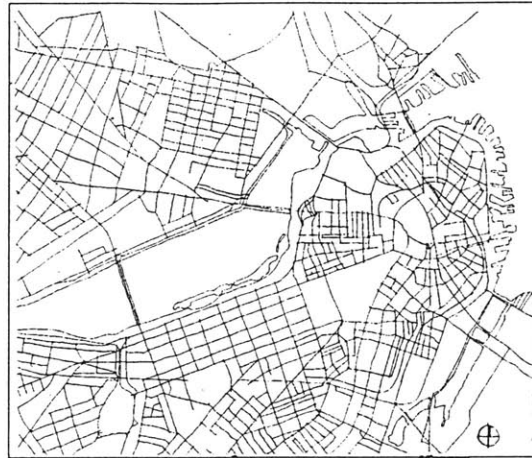


49

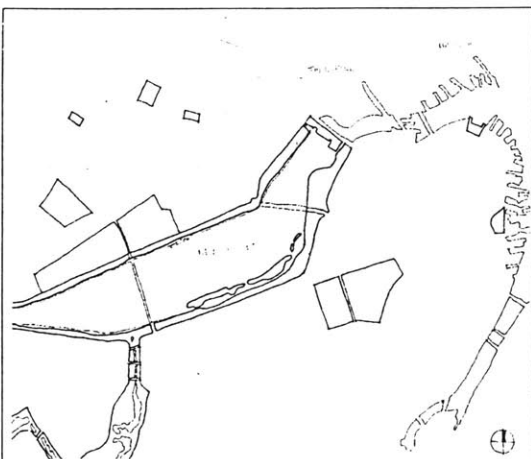
51



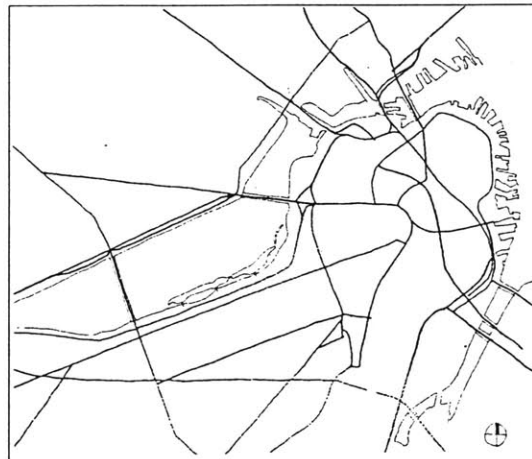
50



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53

54. View from the Museum of Science into the Charles River.

55. The bridge at the Old Charles River Dam.

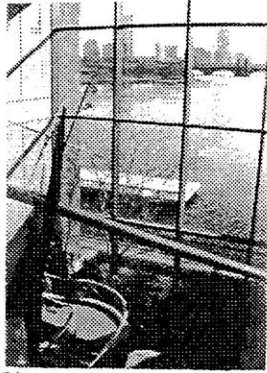
56. View of the Bunker Hill Monument from the Museum of Science.

57. Park at the end of the Esplanade.

59. The transitional zone between in and outside. Piazza Sam Marco.

58. Fountain Place, Dallas. (Higuchi)

52



54

- Provide views towards the harbor and the river from the site.

Continuity of The Making of Thresholds

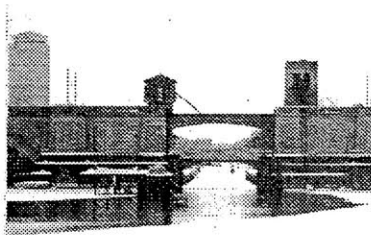
- The site may become a gateway and a new showcase for Boston with the construction of the Central Artery/Tunnel Project and the development proposed by the Metropolitan District Commission. The project can take advantage of this context while creating local thresholds into and out of the project premise.

Continuity of the Esplanade

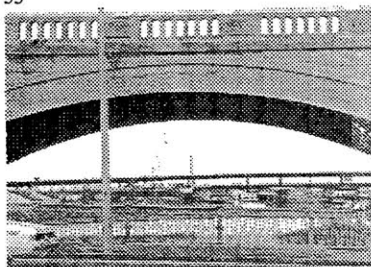
- Continue the existing Esplanade on the Charles River on both sides of the site with active recreation.
- Develop the site as the head of the Esplanade.
- Explore the linearity of the waterfront and its role as a connector of events.

Continuity of the Open Space System

- Connect the Water Garden as part of the open space system, to fill in this missing piece of the development from the Emerald Necklace to the Boston Gardens.



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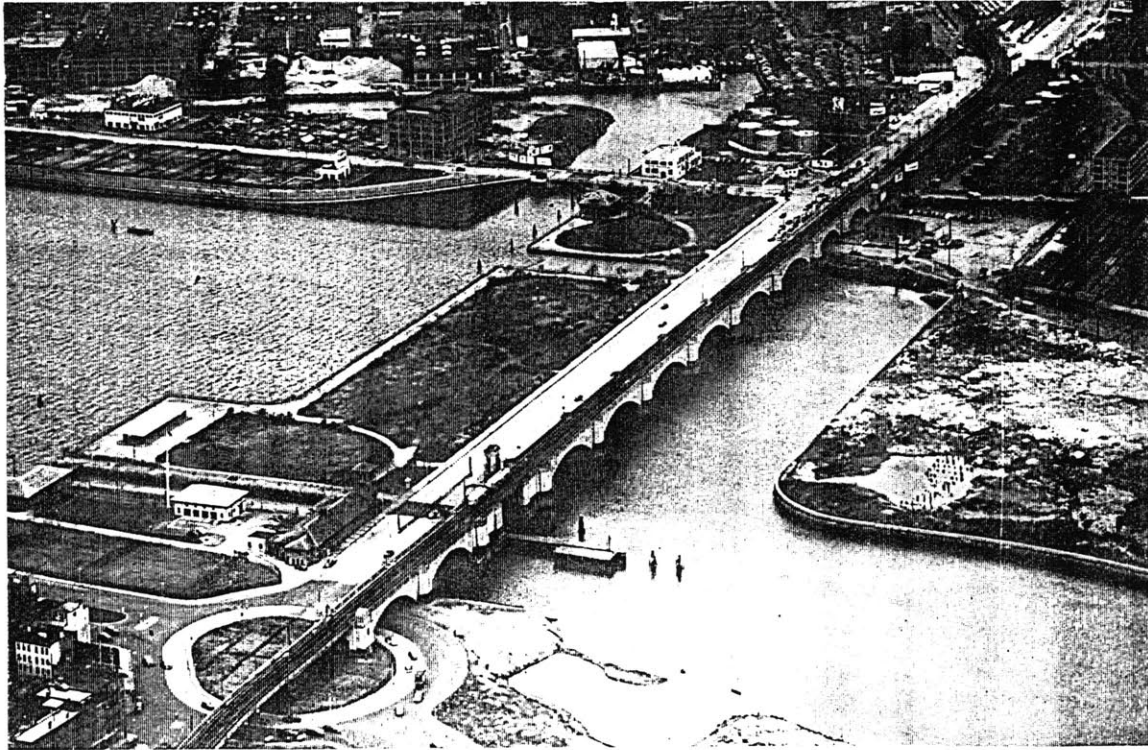


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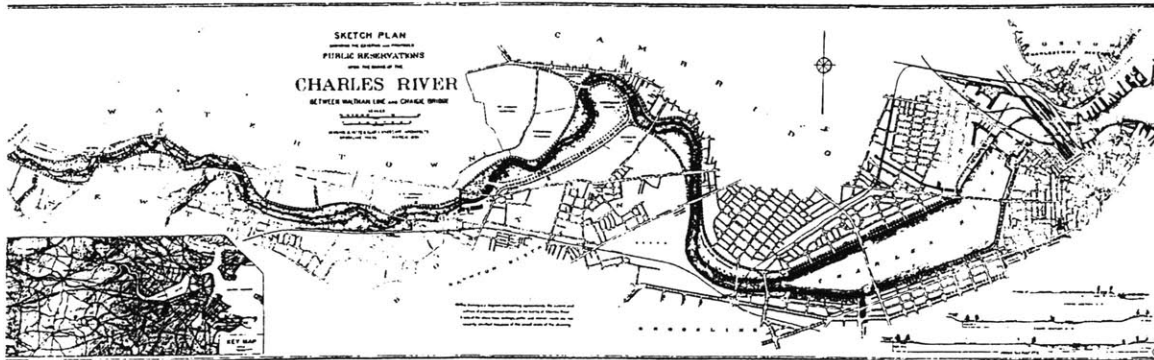
59

60. The site. Lower Basin aerial View c. 1947, showing Victory Gardens along Cambridge Parkway. (Maycock)



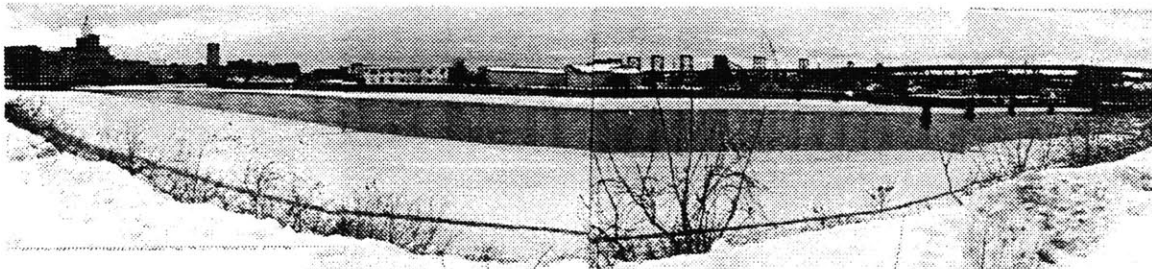
60

61. Sketch plan of reservation upon the banks of the Charles River Olmstead. Olmstead, Jr. 1894.(Kanda)



61

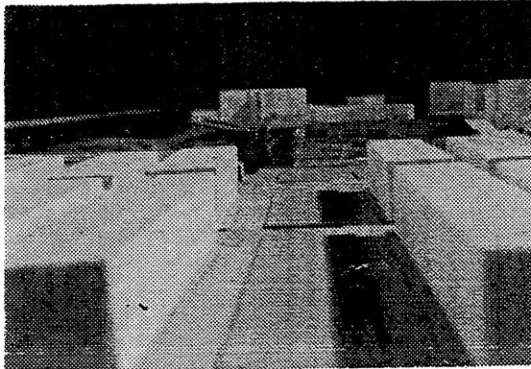
62. View of the site from Boston.



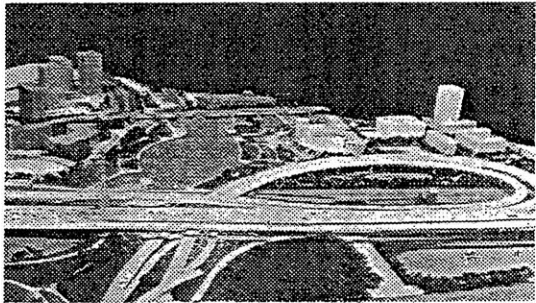
62

63. Perspective view on approaching to the project.

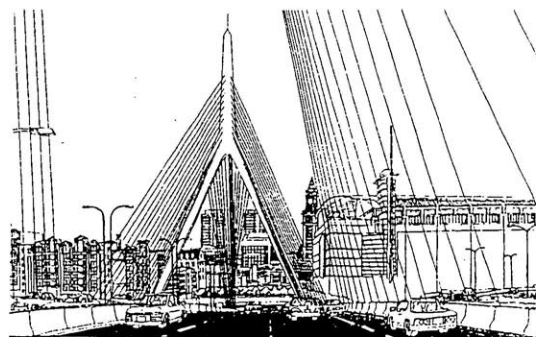
54



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64 - 66. Model and perspectives of the new Charles River Crossing proposed by the MDC

Besides establishing continuities, there are the following strategies:

The Making Of Fabric

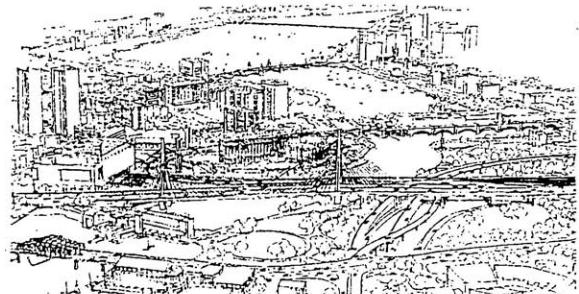
- Using the site to end the axis from the northwest after drafting a new masterplan for the site (by incorporating principles from Mortensen's "A Vision For Boston" for the context.)
- By orienting the short side of buildings to the waterfront, the blocks open up to the water with each street terminating with a view. The double-loaded streets can protect people from the wind while one should feel the relief of openness to the water at the end of the axis.

Designing With Perspectives

Setting the bar building off axis so that the pedestrian and the cars coming from the top of the site will be directed to open up to the water garden and the new museum at the end of the axis.

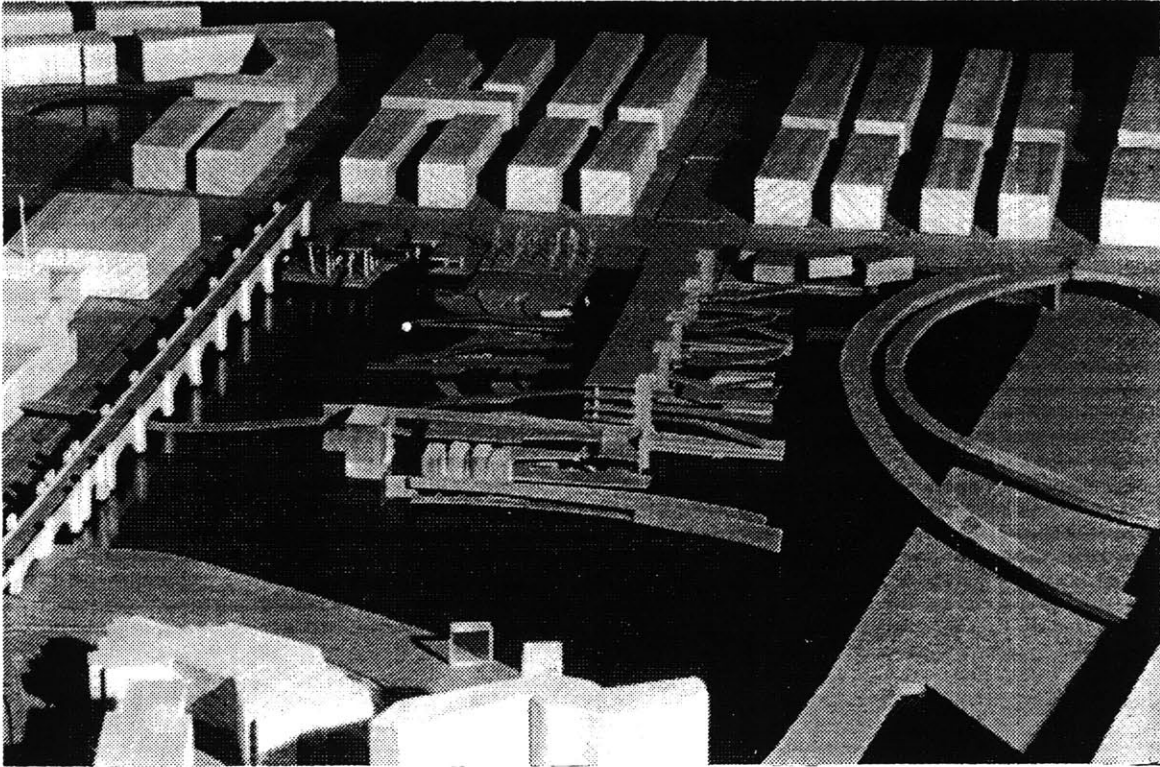
Accommodating the Highway As Part of the Modern Urban Landscape

Rather than turning its back to the highway, the project seeks to accommodate the highway on the side.

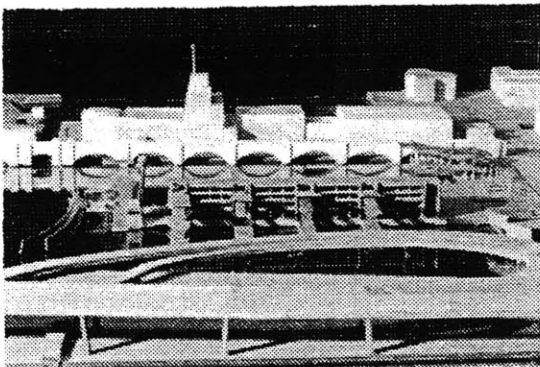


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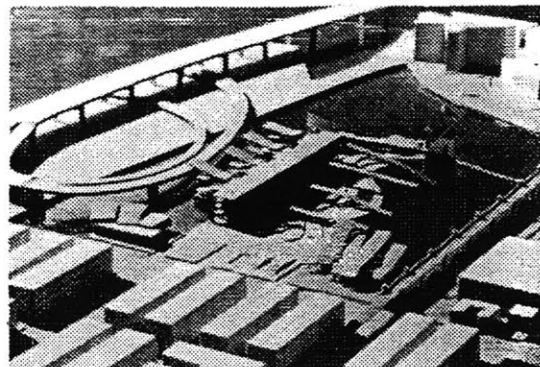
67-69. The site from the city's edge and the water's edge.



67



68



69

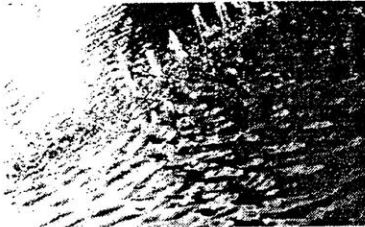
70. Dancing water, Fort Worth, Texas

71. Water sculpture, Church Plaza, Berlin (Higuchi)

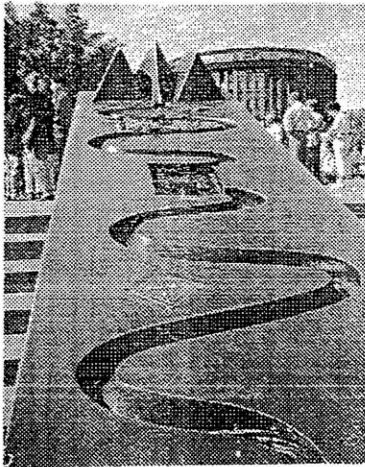
72. Fountain, Lawrence Halprin (Higuchi)

73. Water and structure. Fort Point Channel.

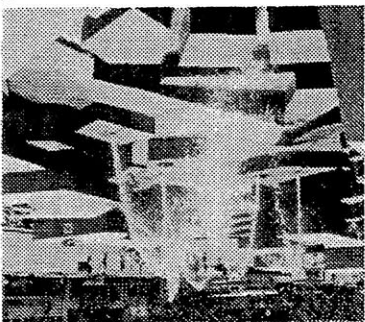
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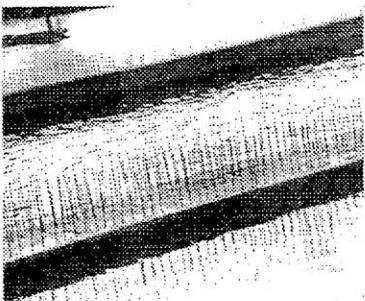
70



71



72



73

ARCHITECTURAL DESIGN

Integration of Architecture and the Modern Landscape

The design tries to knit the building and the landscape together by reflecting the plan of the landscape in three-dimensional form in the building through the walls of the open gallery and the stepped section of the assembly hall.

Crossing the Edge

By designing the movement across the zones through the threshold, crossing the edge may be a dramatic experience through water.

Designing With Water

Manipulating The Nature Of Water

By understanding the nature of water one can express the different forms of water such as:

- ***The Moving Body Of Water***

—the river. This is mainly exhibited in the water garden.

- ***The Contained Body Of Water***

and its vessel. This is expressed in the museum building

- ***The Solid State Of Water***

- ***The Droplet***

Structural Expression Of Building On Water

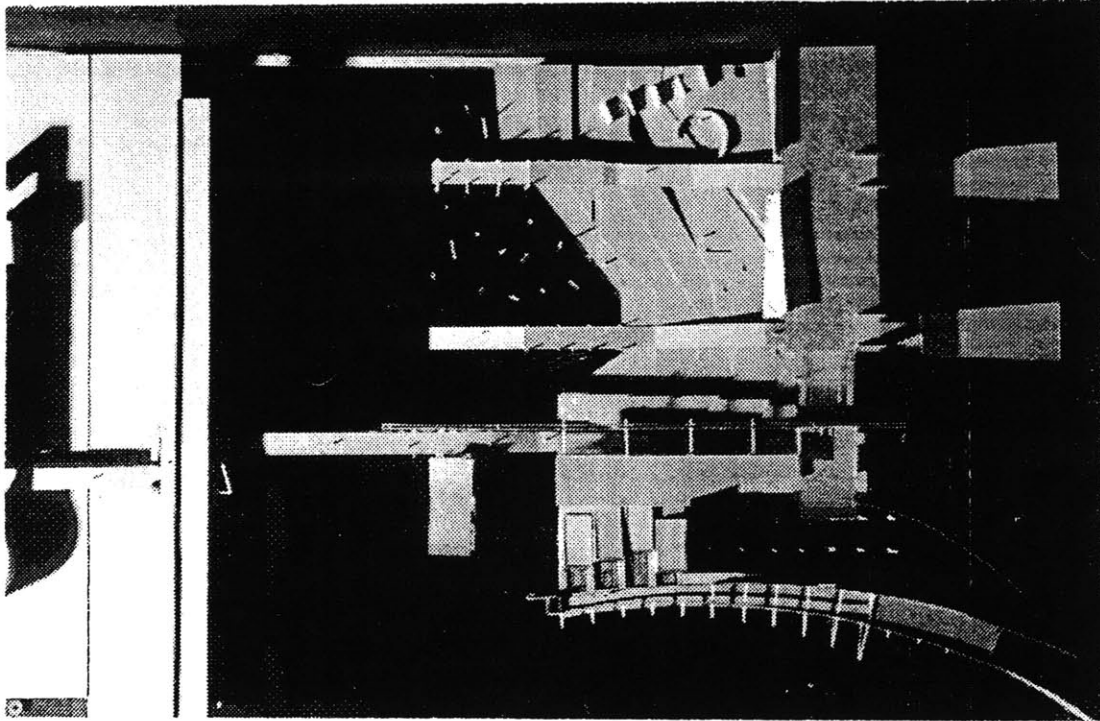
- Anchors And Ties
- Floating Masses
- Floating Barges
- Pier Structures
- Walls
- Roof Forms

74. Plan view of model.

75. Spashing water

76. The droplet level (RVC)

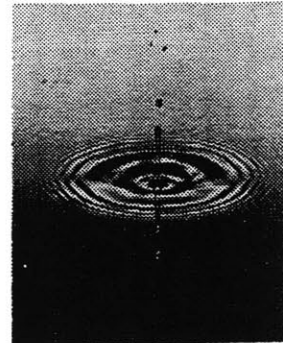
77. Hydraulic dredge filling Cambridge wetlands, ove the seawall. 1898. (M.I.T. Museum)



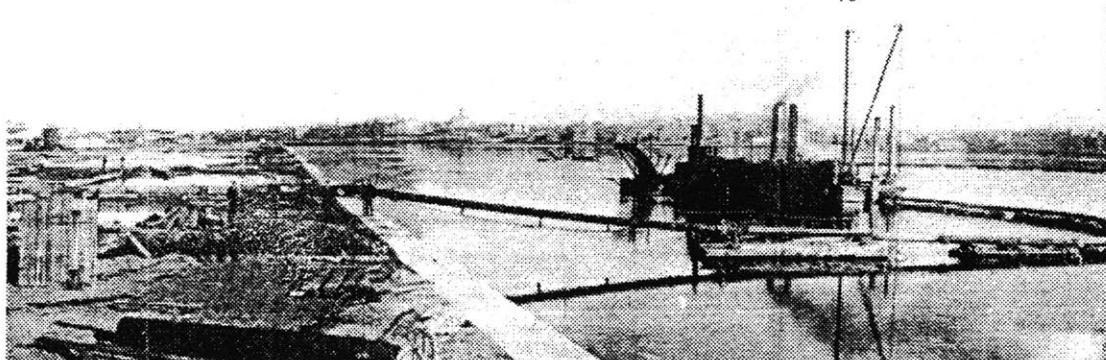
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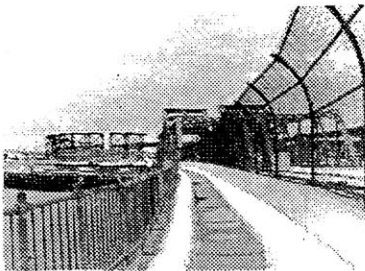
76



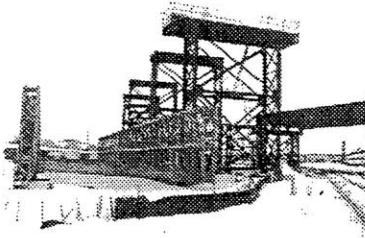
77

78-81. Bridge structures on the site.

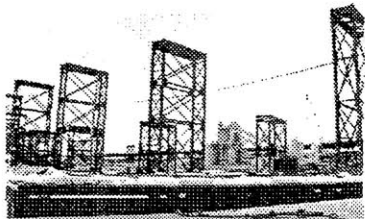
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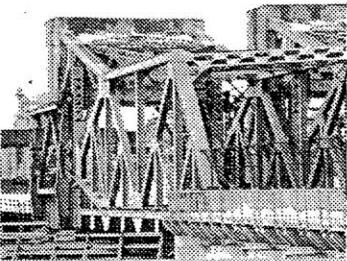
78



79



80



81

DESIGN PRINCIPLES

Juxtapose Geometries

One of the principles of Le Corbusier's architecture is to set up a curvilinear form against a straight line to juxtapose the geometries. I can apply the principle in the following way:

- The bar building versus the curved ramp of the highway
- The curve of the seawall versus the straight edge of the museum
- The undulating edge of the wave-like plaza versus the building

Express Dialectic Relationships

Temporal Versus Permanent

- The temporal aspect of the site can be seen in the changing shoreline due to historical infill, and the fluid, moldable, ever-changing quality of water.
- The existing Central Artery Expressway, will be demolished and replaced by a new one. What seems to be new will become old soon. What then, is temporary, and what is permanent?

Establish Active Versus Passive

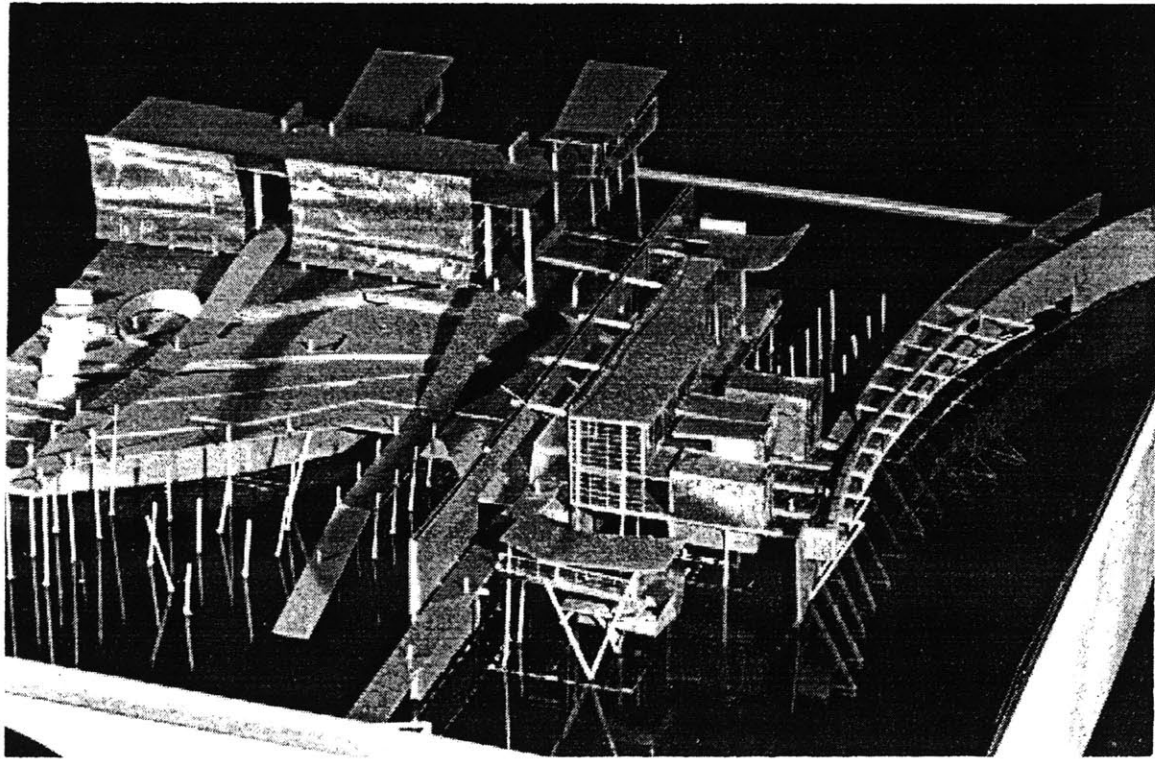
- Establish a system of active and passive designs for using water, just as a solar-energy building in which there is an active and passive way of using the sun.
- This project will mainly take on a passive design for water, intending to set a stage for people to see the otherwise unseen properties of water.

82. The joint between the Museum and the Water Garden.

83. Spanning pier structure. London.

84. Boston piers. (Kanda)

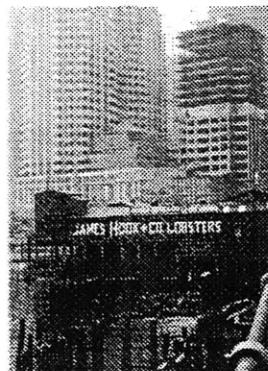
85. Unloading colliers. Broad Canal, 1899. (Maycock)



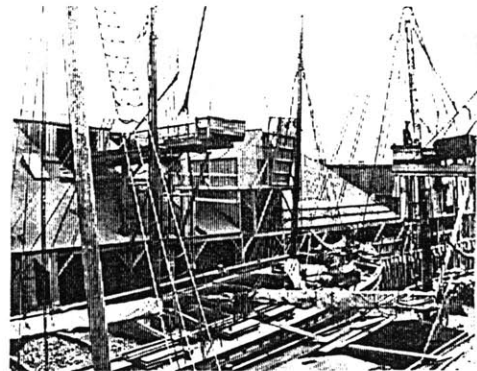
82



83



84



85

86-88. Transitions at the Ponte Vecchio, Florence.

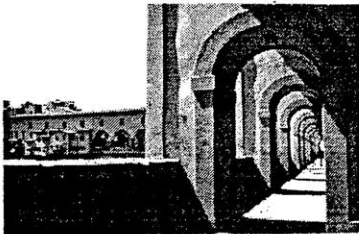
89. Layers are established through a window in Rotterdam.

90. Depth of spaces is established through garden gate view in Venice.

60



86



87



88



89



90

- In the waterwall and water shoots, however, there will be an active experience to highlight the ceremonial aspects of water.

Express the Penetration and Transition of Spatial Zones

Between different spatial zones such as the inside and the outside, there should either be a transition or a dramatic penetration. In the project, I will provide the dialectic experience of being above a vast body of natural, uncontained water (in the water garden) and being below or next to a contained body of water (in the in-between zone of the museum and the garden).

Design a Memorable Entry Sequence

- Allow multiple entry options with a distinct experience in each case.

Make connections to near and far

- Establish near connections with the bar building, and distant visual connection to the city's edge.

Design An Experiential Movement Pattern

- Provide opportunities to go up, down, around, and through¹

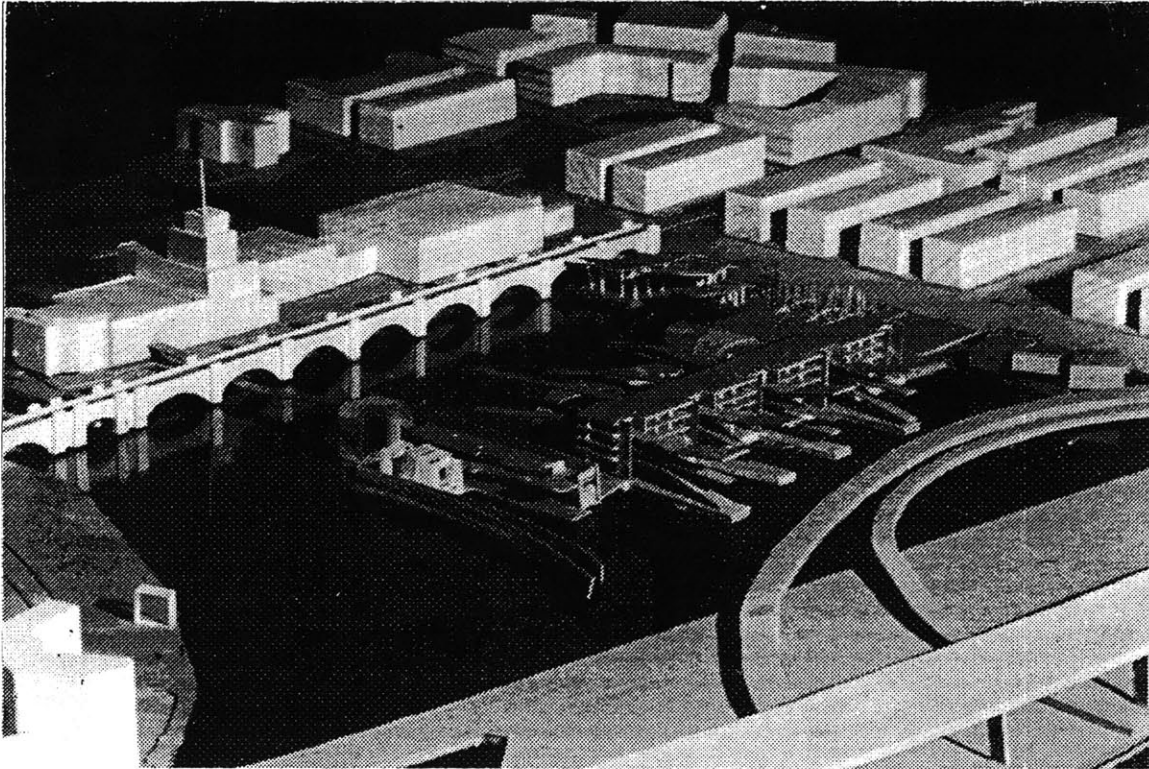
Establish Layers

- Provided multiple layers to the design, just as there are different layers in a wave section and in the depth of water.

91. Connections with the context

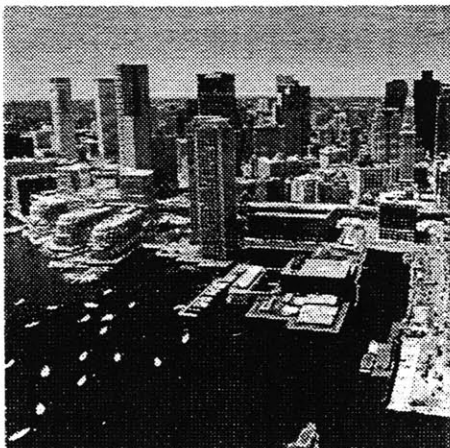
92. Whaves in Boston (Process)

93. Lechmere Canal at half tide, 1902.

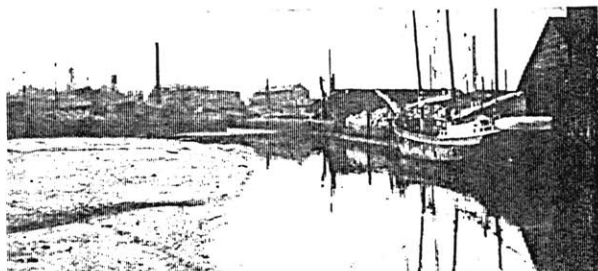


61

91



92



93

94. Sunlight through window.
Marine Museum,
Rotterdam.

98. Project in the morning light.

95. Connect the horizontal
ground plane with the
vertical dimension of the
sky. Hamburg.

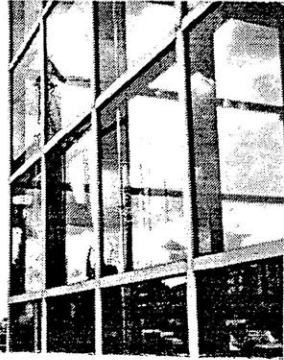
99. Project at noon time.

96. Interaction of light
and water. South
Street Seaport.

100. Project in the late
afternoon.

97. The drama of light.
National Gallery of Art
(Higuchi)

62



94

Connect Spaces Horizontally And Vertically

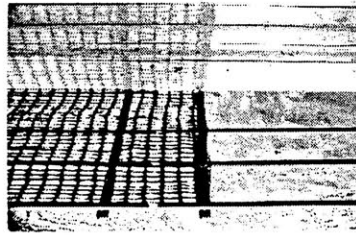
- Create the interplay of plan and section by exchanging and connecting spaces horizontally and vertically.

Orient Spaces For Sunlight

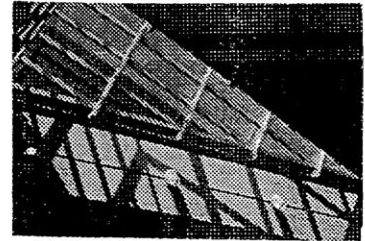
- Orient the building to face southeast to sunlight.
- Orient the water to face southwest so that the lower sun can penetrate deep into the space through the running water, creating ripple-like shadows at the entry.



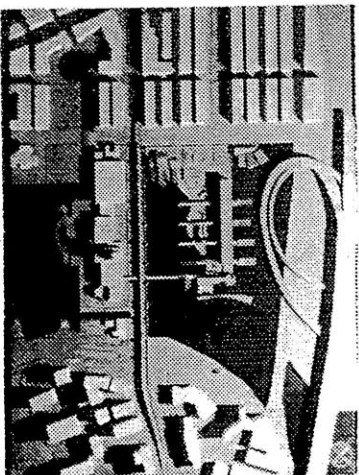
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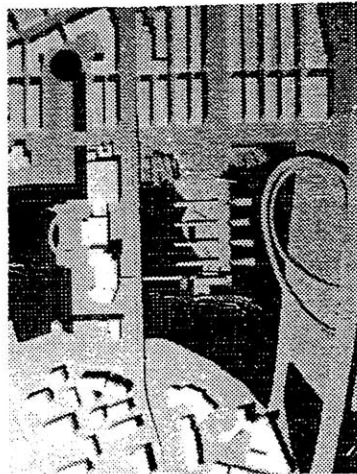
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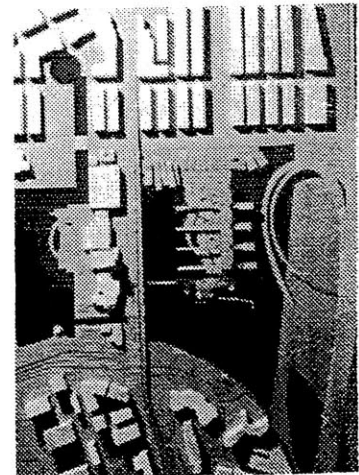
97



98



99



100

101. Axonometric view of model.

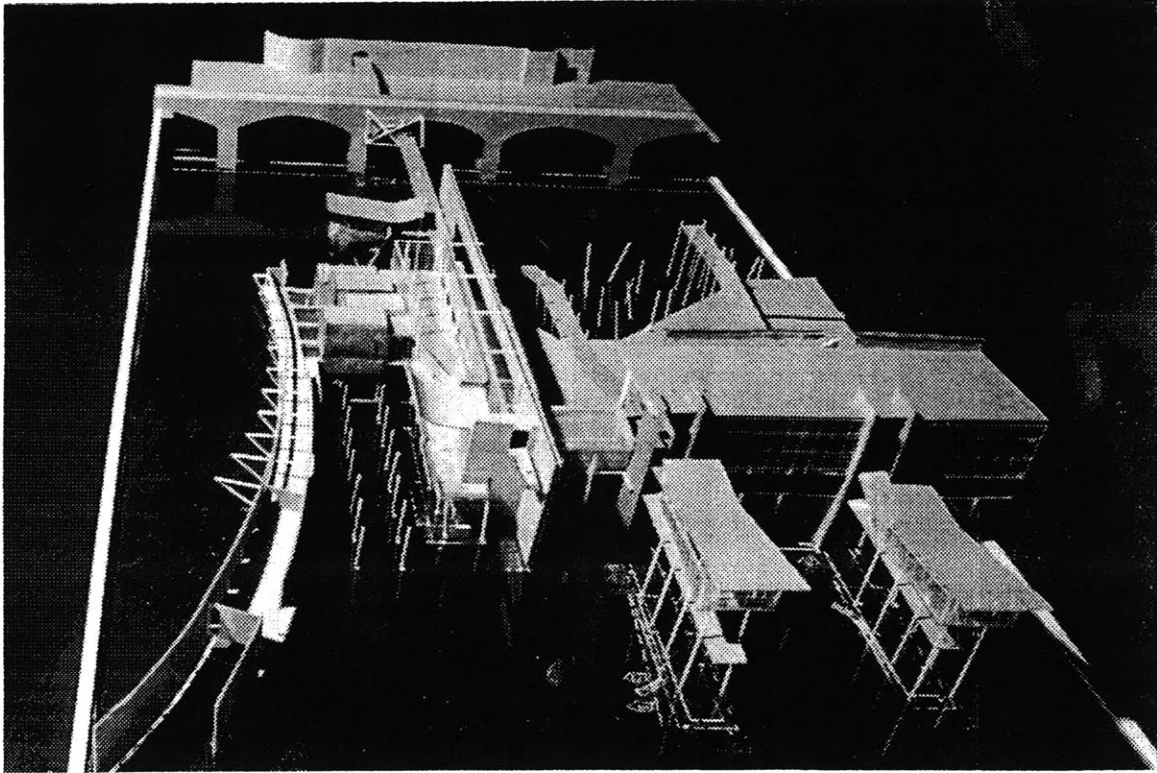
102. Canal opening in Amsterdam.

103. Lock in Hamburg harbor.

104. Bridging the edge. Hamburg.

105. Bridge. Rodring Perez de Arce and Vago Conde (Sites)

106. Structural complexity



101



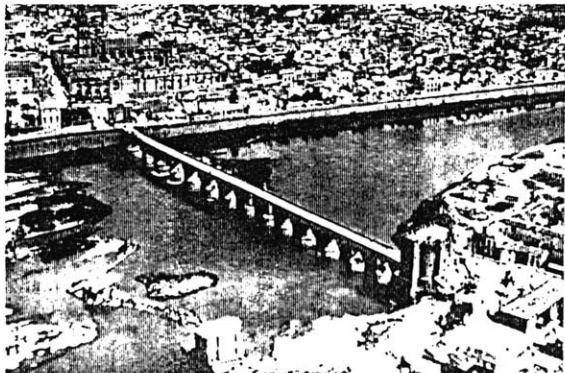
102



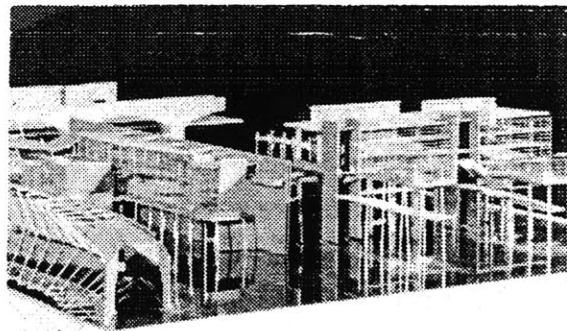
103



104

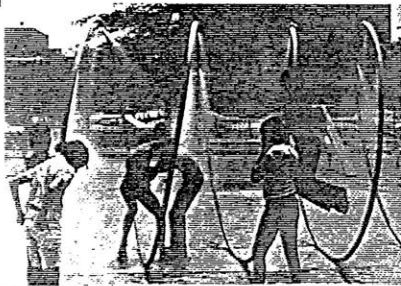


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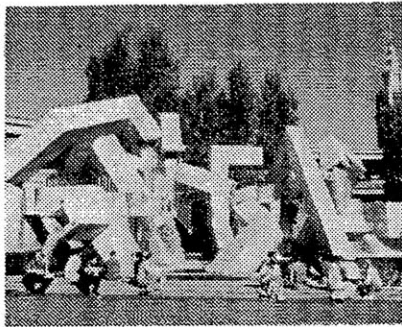


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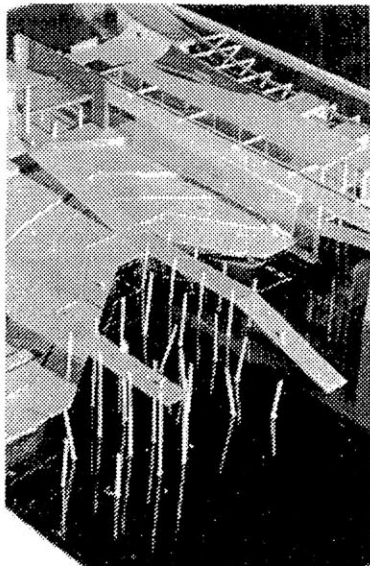
107. "Play sculpture"--spiral pipe with water sprouting forth in the middle. (Water Space Today)



107



108



109

108. Water sculpture. (Higuchi)

109. The changing edge of the water garden.

THE PROGRAM:

A Contemporary Museum of Art and Water Garden

The Elements

The Water Garden

Activities

The water garden serves a place for people to seek refuge from the crowded city during lunch hour, to rest and read on the steps after work, and for families to come and picnic on weekends. Children can learn about water through hands-on experimentations in the museum and in the garden. The garden itself will exhibit the nature of water and will educate and serve its different user groups in a variety of ways.

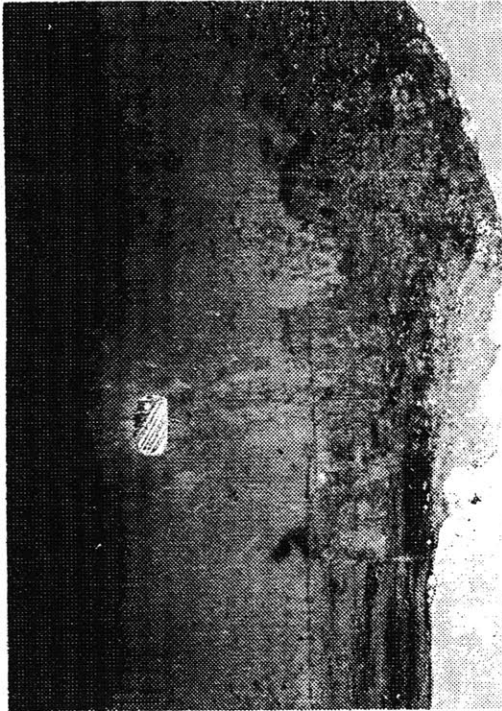
The Changing Edge Phenomenon

Usually an edge is a straight line in section and one cannot see the changes in water level from a plan view. By disintegrating the straight edge and sloping it, an increase in water level will mean a constantly changing shoreline. The different levels of the plaza can thus exhibit the level changes of water due to the tide and precipitation. It adds delight to the visitor who will find the water come up to a different level of the plaza, meaning changing accessibility, at different times of the day and of the year.

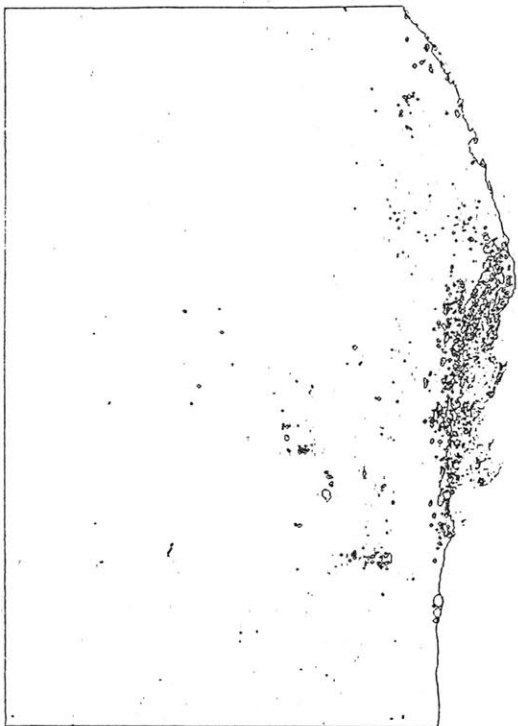
The Form: Disciplined Complexity

Water's form changes, and is thus hard to capture. I thus represent the plan form of the water garden in its true way—keeping it to the conceptual level

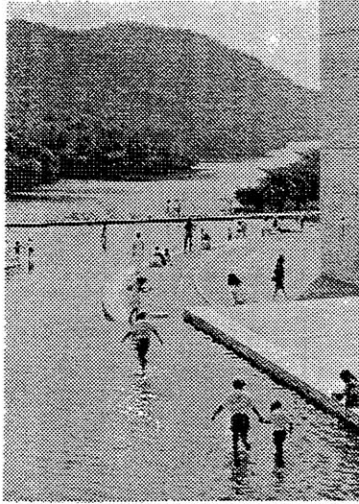
110. Photograph of a wave section.
Reverse of a wave section.
Outline of a wave section.
Reversed outline of a wave section.



65



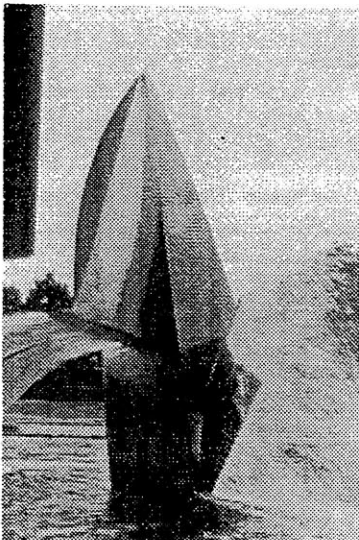
111. An edge broken down into stepped sections. Borrowed landscape in a distance.



111



112



113

112. Dynamic water sculpture.
Office Building Plaza.
David von Schlegelt.

113. Water sculpture.
(Higuchi)

66

by showing a snapshot of a wave at one particular instance through a glass window in the exhibit in the Museum of Science.

I call the process in the making of the wave disciplined complexity which includes the following steps:

Capturing the wave — using a section of a water to form the plan of the garden

Disciplining the wave — approximate the form into level changes which stops at each interval of the four urban piers.

Geometricizing the wave — making straight walls to oppose the untamed form of the water to express human intervention.

Inhabiting the wave — making seating, spray walls, steps, tree-lined walks, etc. for people to use the garden.

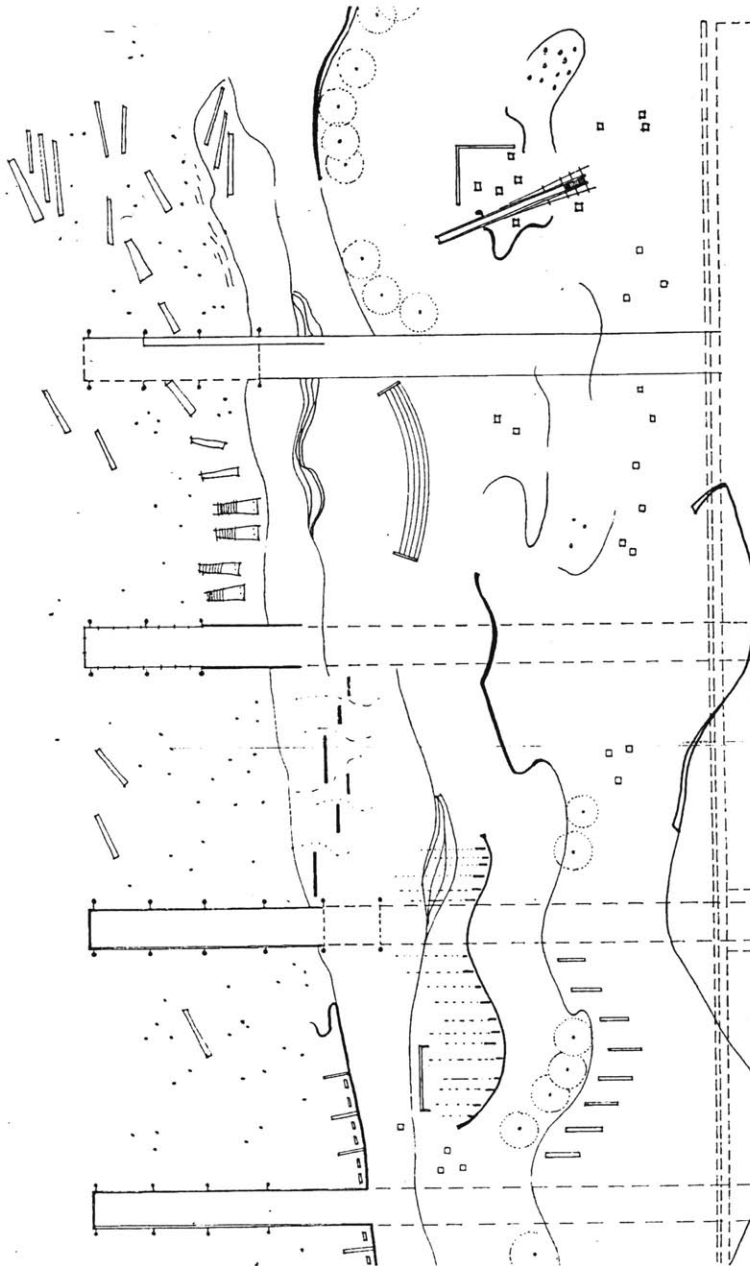
Materials

A range of textures will pave the water garden. A fine material like slate and polished concrete will go near the building edge while rougher and more rustic materials will form the lower levels. Nature will then do its part in polishing the surfaces through time. Some use of marble will accent important pedestrian areas whereas softer materials can include flower beds and grass. Lastly, wood planks and wood piers will appear on the edge.

Water Sculptures

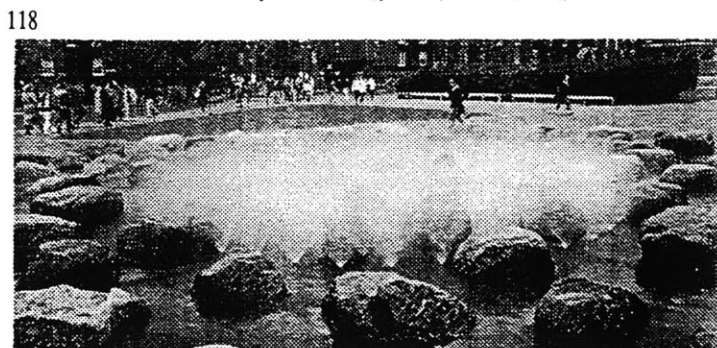
Water sculptures will further exhibit the tidal change and other properties of water such as buoyancy. For example, calibrated poles inserted in potholes will be pushed up to a different height when water fills up the

114-117. Materials in the water garden. (RVC)



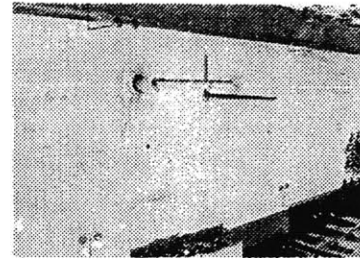
118. Plan of the water garden.

119. Rock and water garden. Harvard University. (Higuchi)

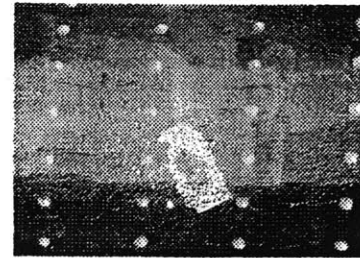


119

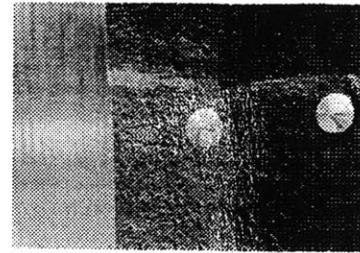
120. The curvilinear form of the river. Painting, Youngja Oh.



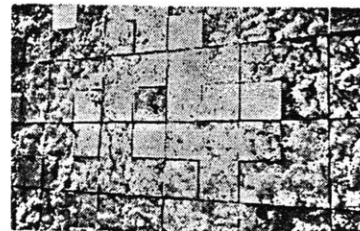
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116



117



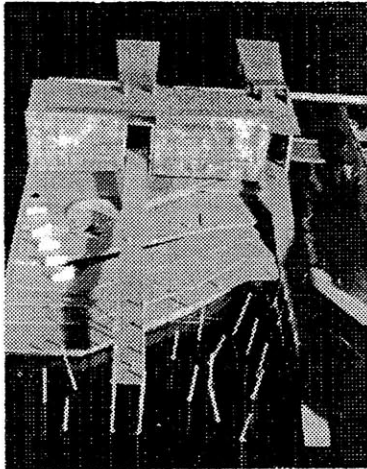
120

121. The bar building and the piers intersecting through it.

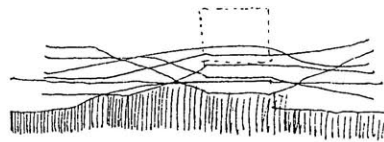
122. The wave form sections in the pendulum.

123. The dialogue between the towers,

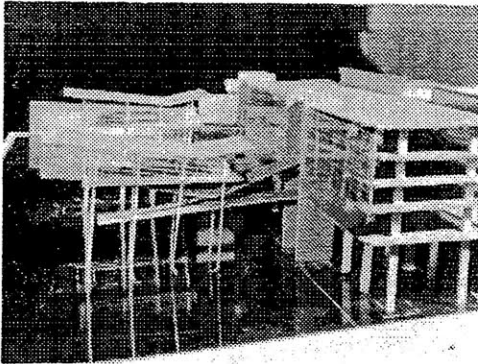
124. A pier structure.



121



122



123



124

hole each time. While some pools at the lower plazas will constantly be filled, some tracks and pools will only be filled when the water level reaches a certain threshold. In other times it may empty out when the water retrieves. Thus the variation in displaying the tidal difference will be limited only to the imagination of the artists who are invited to make the periodic installation.

The Bar Building and The Four Piers

The bar building and the four arms that extend on both sides set up an orthogonal framework for the site. The four arms correspond to the piers in the viaduct, thus establishing a rhythm from the existing order. The fluid curve of the plaza will then become subordinate to the framework.

The bar building is a mixed-use building lifted on pilotis to open up the view on both sides. The ground floor will be open with retail shops at some unobstructing locations. Activities and markets can spill out into the plaza to activate the edge and provide for a reason for visitors to come to the site for lunch and other purposes. On the top floors can be offices, artist lofts and light industries. Clubs and restaurants and special user groups can occupy the towers on the piers.

The building act as a *pendulum* of which four piers act upon.

On the water side, the piers will penetrate the building, span across the plaza, and take the visitor onto four different experiences on the water:

1. On the datum level
2. Under water experience with the eye level on the horizon

125. The bar building, the four towers, and the piers, responding to the viaduct arches.

126. Building edge. Rotterdam.

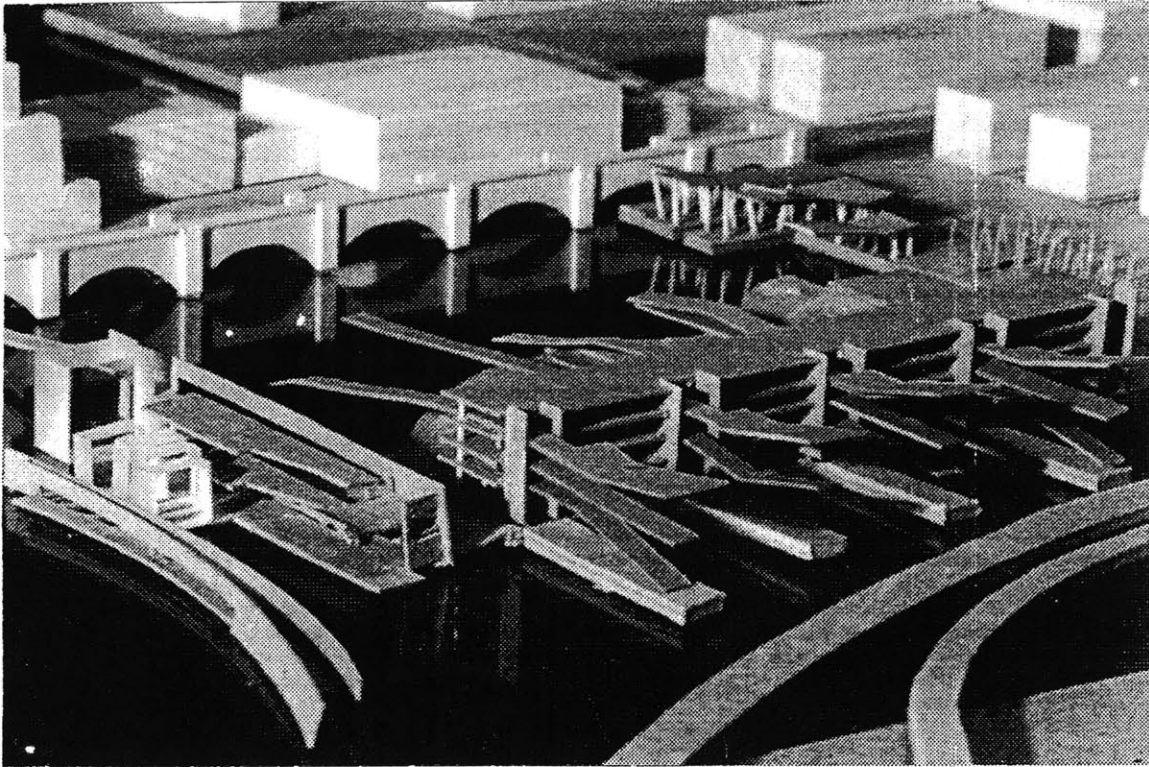
127. Piers and docks.

128. High up at the edge. Hamburg.

129. Descending. Rotterdam

130. The four piers in context.

131. The towers shooting from the openings.



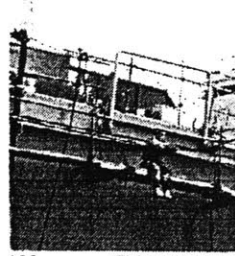
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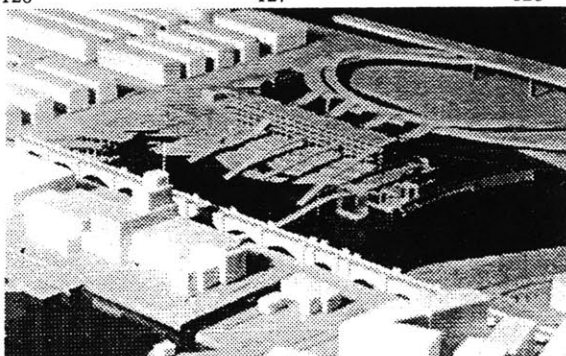
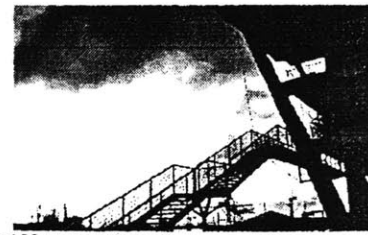
126



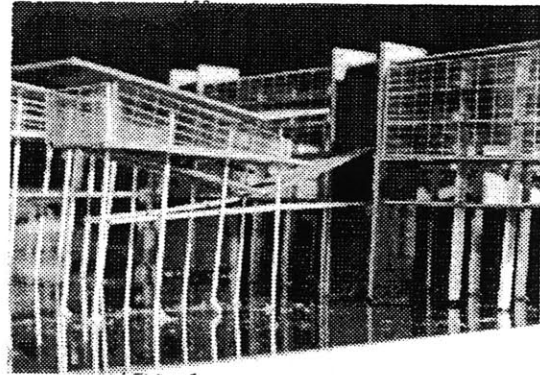
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128



130



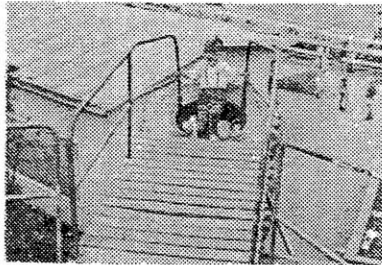
131

132. Climbing high. (Allen)

133. Hiding low. (Allen)

134. From high to low.

135. The pavillions at the city's edge submerged in water.



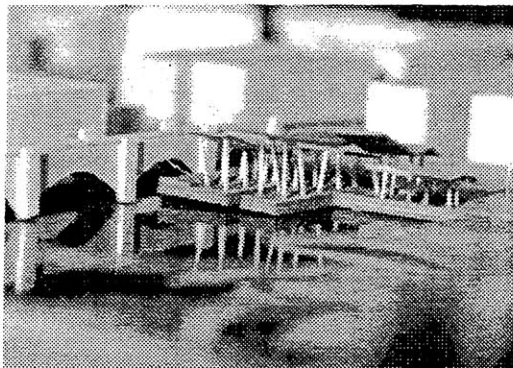
132



133



134



135

3. High-up- in-the-air experience, looking down to the plaza and the other piers
4. A continuous pier that ramps down into the water. Only the water level can determine the end of the walk.

The *movement pattern* involves going down under water to rising up above the ground. In section, the four arms will form four slopes which take the form of four *progressing waves* which one can see from the elevation and the superimposed sections.

The building itself acts as an *urban screen* or backdrop. The curtain wall curves in a concave manner to encompass the thrust of the sky and sweeps it to the ground. The regularity of the plan is exchanged for the play in the *section*. The section responds to the slope of the four ramps and thus creates a dialogue with the context while the arms perform differently while they stretch out to the water.

The four corresponding towers on the other side of the pendulum are oriented with the long side facing the sun and the short way facing the highway ramp. In addition, people from leisure boats can also access through the towers' side of the building and traverse across to the water garden side, thus crossing the line between the wet zone to the dry land zone.

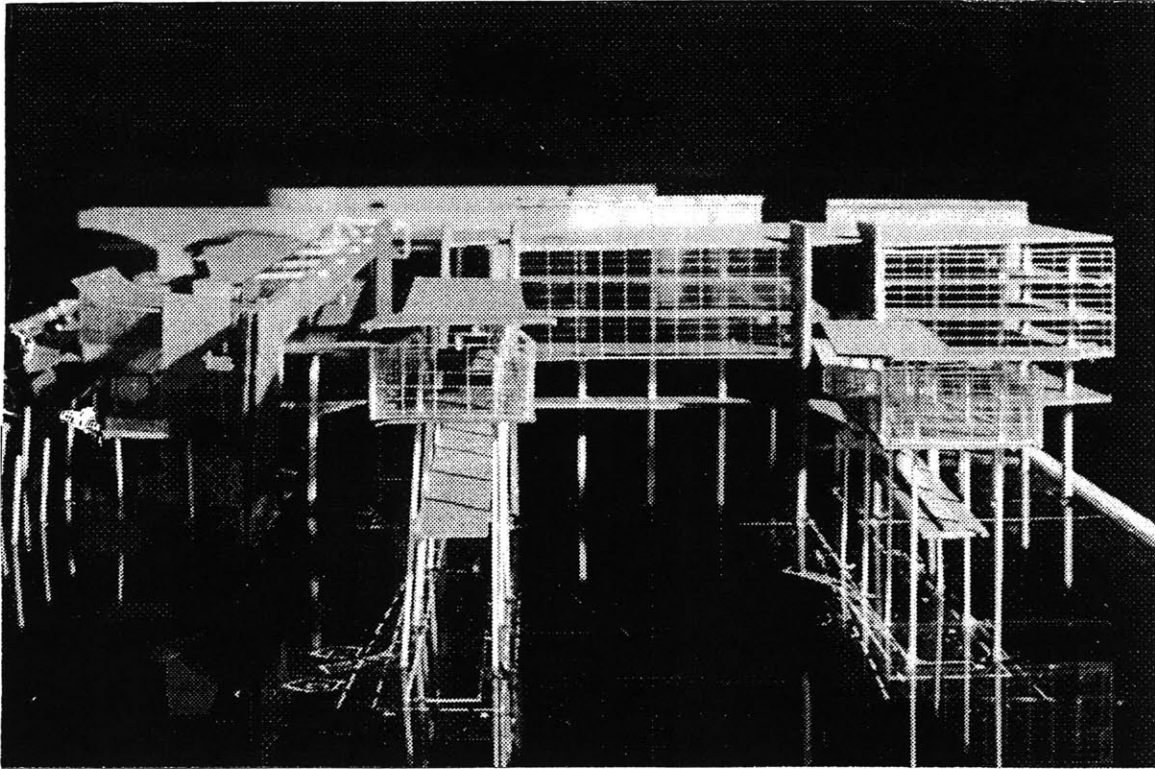
At the City's Edge

A water plaza, a pavilion, and a performing arts theater form the edge of the city to meet the zone belong to the water.

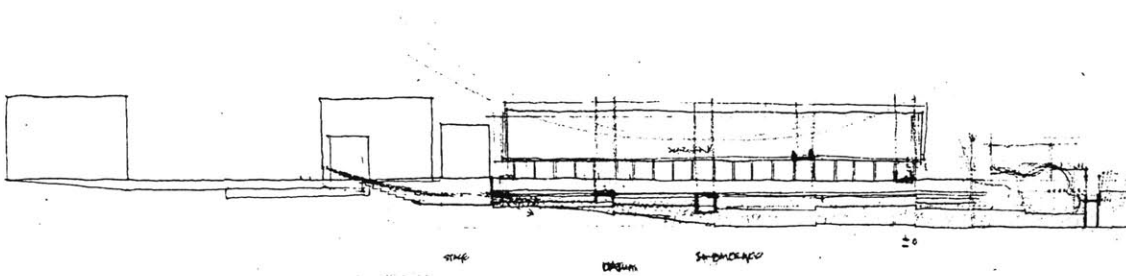
136, 138. The Towers with different sections.

137. Section showing piers at different levels.

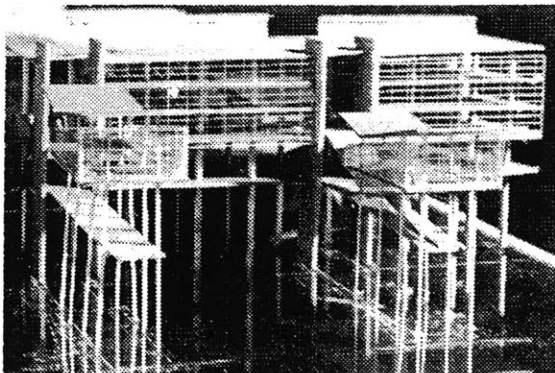
139. The piers reaching out to the water.



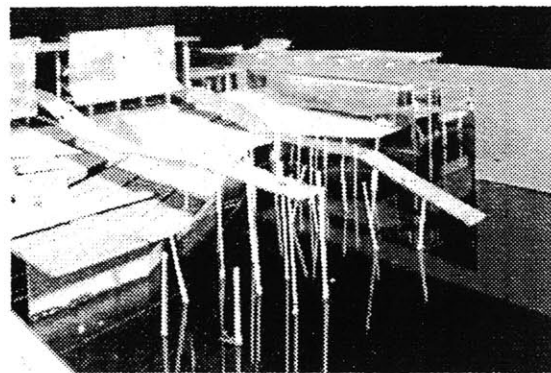
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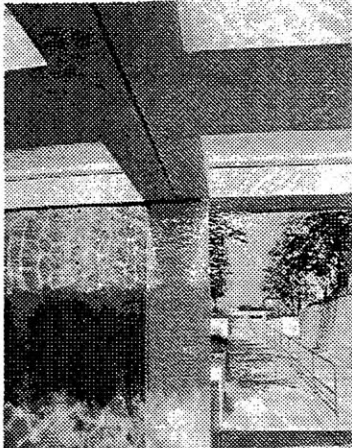
139

140. Water above glass-top arcade. (RVC)

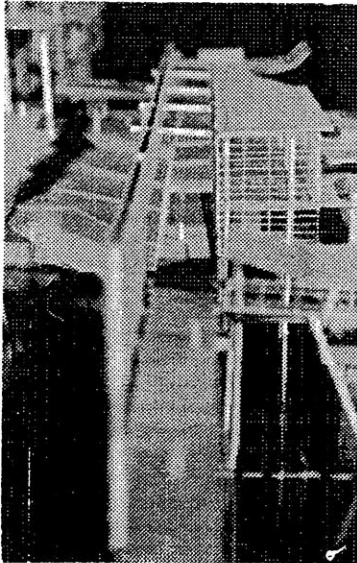
141. Museum crossing.

142. Academia Bridge, Venice.

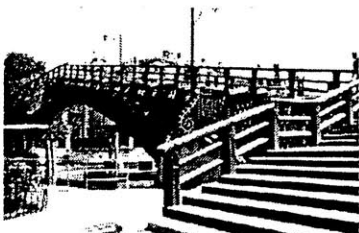
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141



142

Program for the Contemporary Museum of Art for Water

Why a Museum?

I have chosen the program as an educational institute for people to appreciate the art of water and the history of the river.

I have developed the program from the experiential point of view; it can facilitate my explorations in the following manner:

The different kinds of spaces for exhibition such as volumetric galleries and walls,

The experiential movement pattern through one space to another, and

The lighting requirements for different kinds of exhibits such as sculpture, painting, floating sculpture.

Entry Sequence

Entry From the Garden

Below a transparent water tray which drops water onto the next linear pool, before concluding to the water wall.

Lobby

Upon entering, the visitor will see the shadow of water on the curved ceiling which is lowered for compression at the entry. One will then find the open view of the river and the outdoor deck on axis.

Museum Crossing

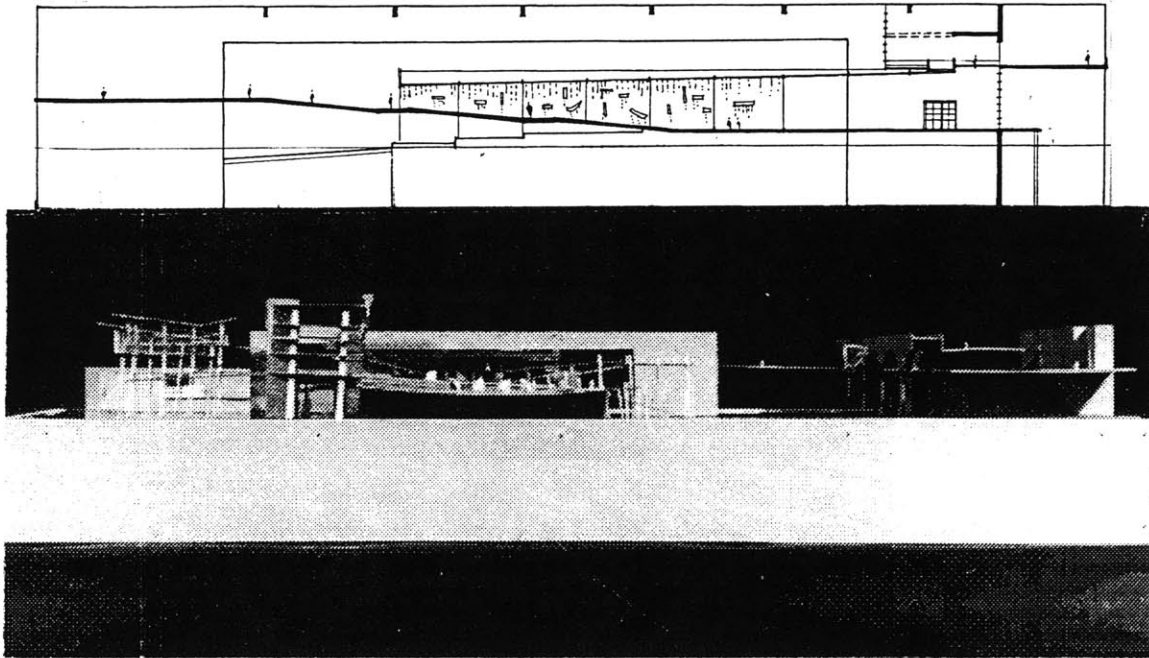
Entry from the Museum of Science and viaduct side starts from the bridge over the river. One then passes the guard house and descends from the stairs on the side of the Museum of Art, with the water in the pool

143. The waterwall with obstacles imitating boulders on the river bed. turned vertical.

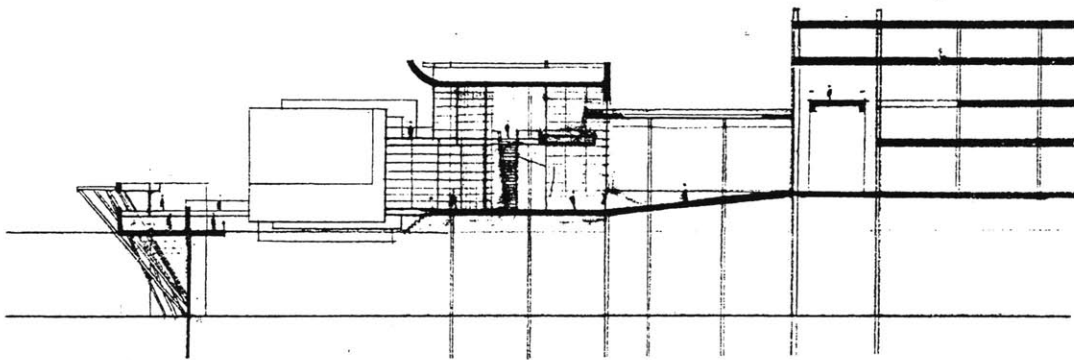
144. Model of a section cutting through the city's edge, showing the bar building, the towers on one side, and the water garden on the others side. The museum becomes a gateway.

145, 146. Section and model showing the entry sequence: Descending from the land's datum level to the water's datum level.

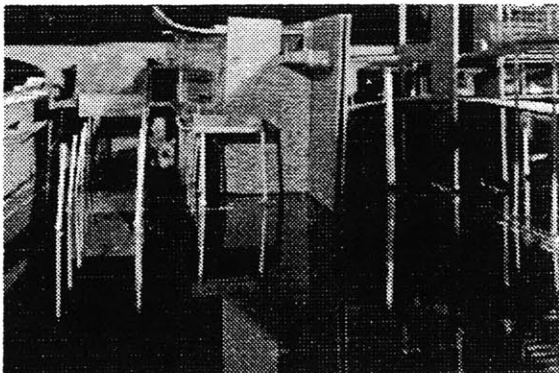
147. Entry from the museum crossing, under the pools, behind the waterwall.



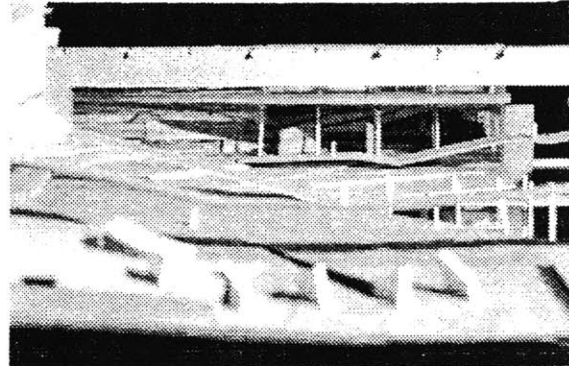
143, 144



145



146



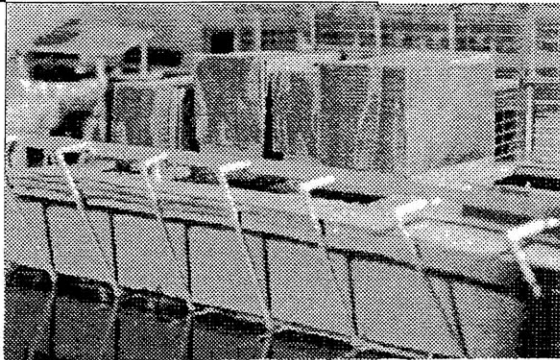
147

148. The four galleries.

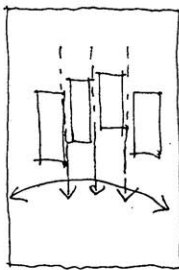
149, 150, 152. Compression and release in movement.

151. Constricted spaces between buildings on a canal. Venice.

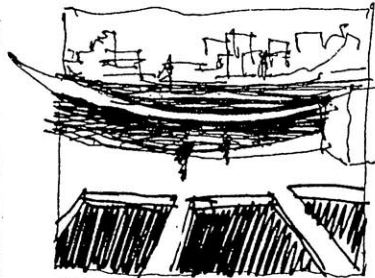
153. Former New England Glass Co. Wharf. (Maycock)



148



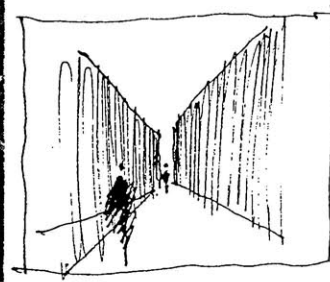
149



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152



153

in trapezoidal section seemingly rushing at his or her direction. At the same time, a sheet of water falls down on the waterwall on the left.

Four Galleries

Image

The four volumetric galleries take their form and arrangement through the imagery of cargoes coming into the warehouse. Metaphorically they are reminiscent of one one of floating ice cubes in section, ordered only by the water level that joins them all in the intersecting plane. Through the constricted corridors between them, the visitors will experience the stunning openness and vista of the outdoor seawall gallery.

Spaces

The interiors of the galleries are controlled for filtered light for exhibits sensitive to light.

Detail

Louvre in windows will facilitate the casting of shadows through light bouncing off the water, establishing a rhythm on the walls resembling ripples.

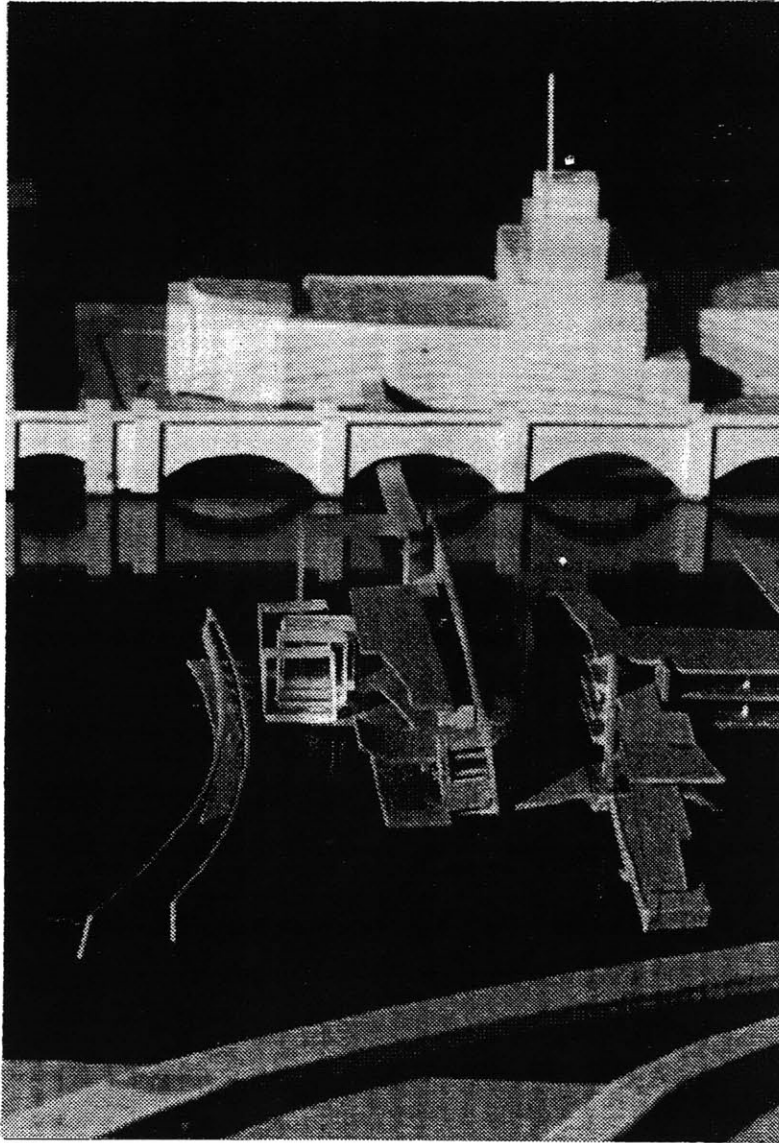
Open Gallery

A system of walls that align with the level changes in the water garden make up the open gallery, thus making the continuity of space between the outside the inside. It also links the lobby to the outdoor seawall gallery.

Assembly Hall

The lines of level change in the stepped sections align with the gallery walls underneath, and continue

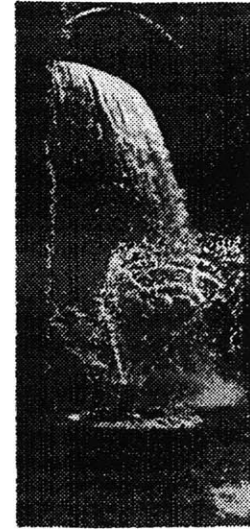
154. The four galleries as conceptual ice cubes or cargoes docking into the building.



154

155. Chute et jet en couronne Gesier. (Fachard)

156. East River, New York. (Eckardt)

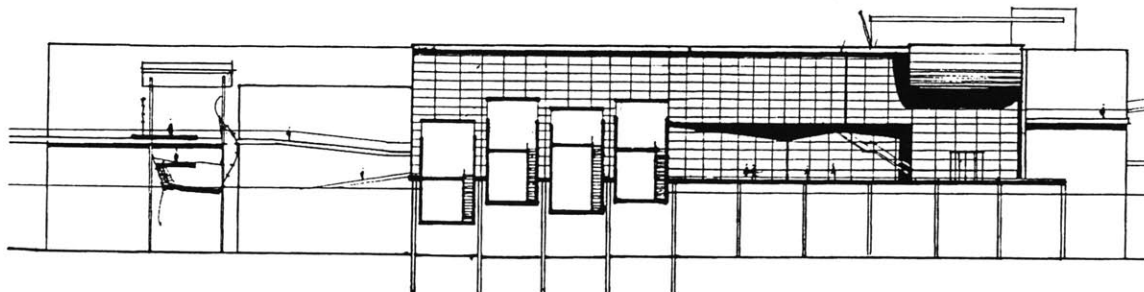


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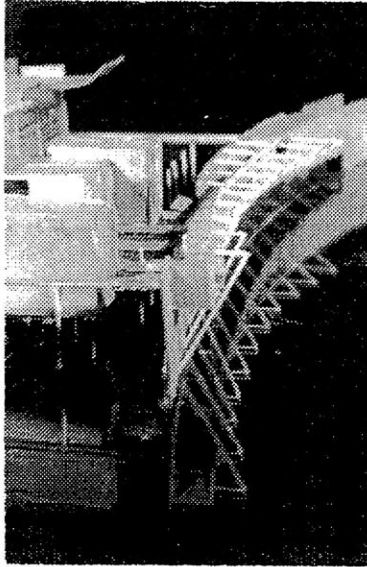
158. The seawall gallery and its reflection on water.

159. The water chamber and its opening.

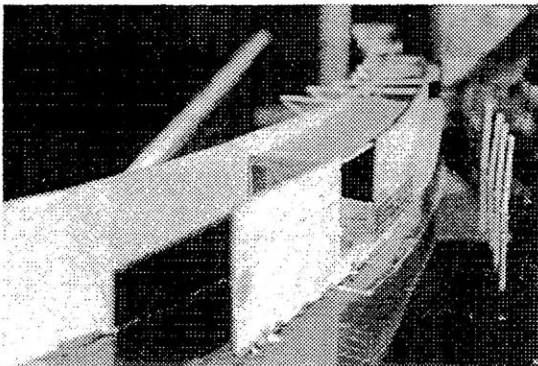
160. Water on the edge of a building. (RVC)

161. Waterwall. British Pavillion. Seville. Nicholas Grimshaw.

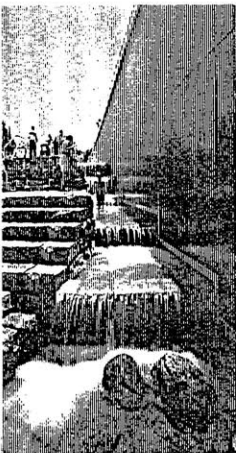
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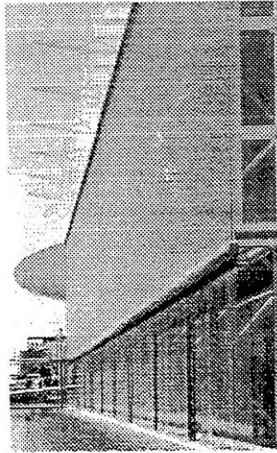
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160



161

with the steps in the plaza. A glass wall allows an open view out to the plaza and can be shaded when the room needs to be dark.

Seawall Gallery and the Water Chamber

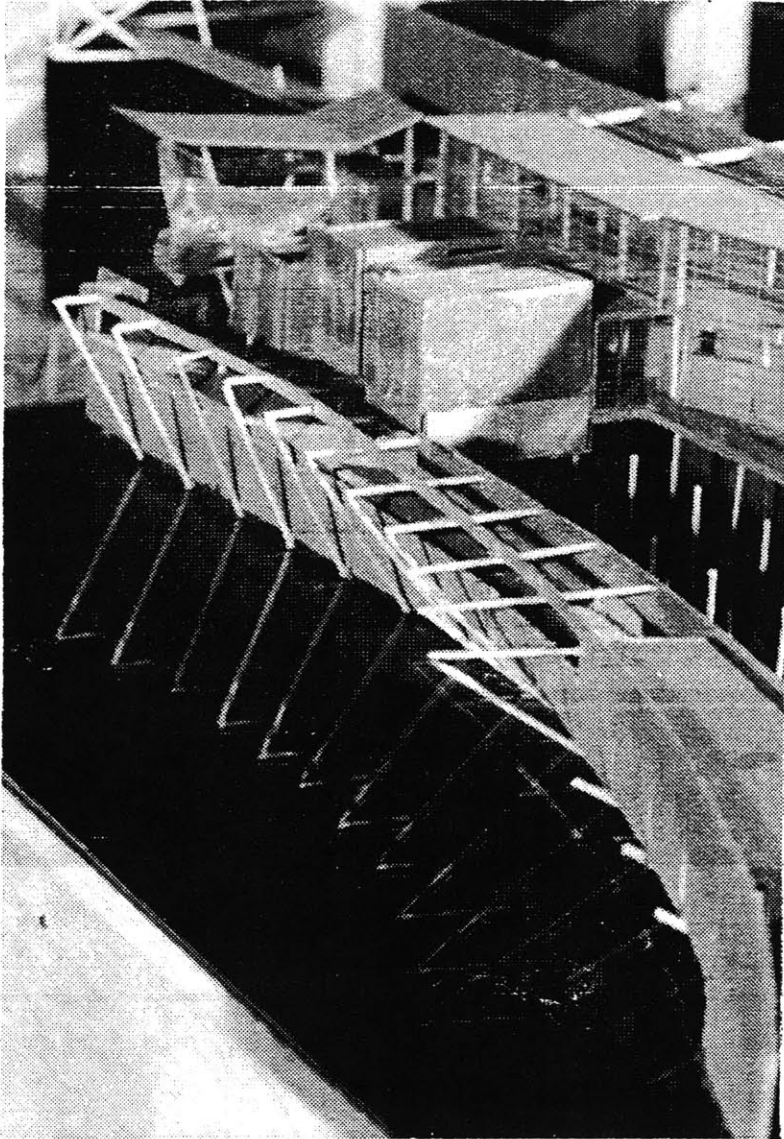
The curve of the seawall gallery marks the original line of the existing seawall. It is also constructed with part of the original blocks of the seawall to show a continuity of history. It also gives a new public facade to the embankment which can be viewed from Boston and from boats sailing down the river. From the gallery, one can also enjoy a long view back to the opening of the old dam.

The movement forms a passage from an above water deck to underground walk. The walls are high enough to protect water from coming into the skylight-lit gallery even in a storm. Windows diminish in size and finally become slits with vertical dimensions that mark the historical high and low water level of the river. The ramp takes people down to the under-water chamber as a special room for functions and meditation, and wraps around the wall on the other side so that people can have an opposite experience ascending back to the building. It also provides a reference and dialogue back to the main building and the outdoor deck.

Water Wall

The waterwall serves as an important feature in the entry sequence. Framed by the wall of the museum from behind, it acts as a gateway into the water garden landscape. Ending the zone of the museum and beginning the zone of the garden, the falling water symbolizes

162. The seawall gallery marking the historical seawall and giving the water's edge a new facade.



162

163. Light and movement.

164. Void space/hinged space (Steven Holl)

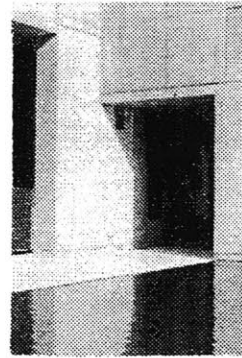
165. Perspective of moving down below water in the gallery.

166. The dialogue between the seawall gallery and the building.

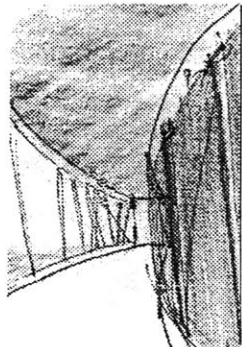
167. Low tide in the lower basin around the turn of the century. The new Cambridge seawall on the right. (M.I.T. Museum)



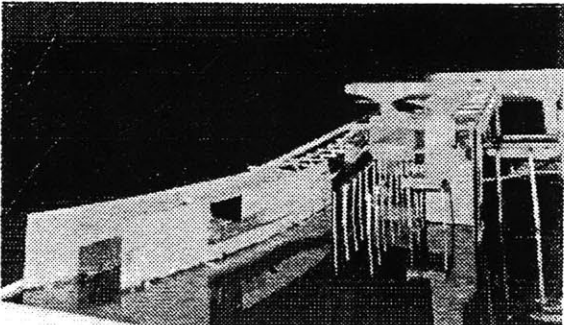
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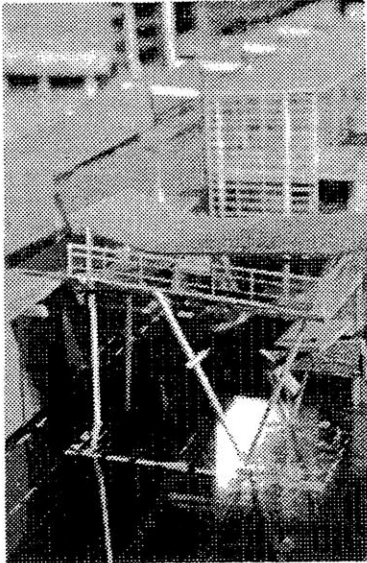


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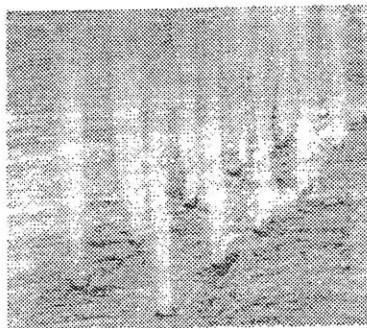
168. The guard house on pier structure.

169. The under-water lights.

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Notes:

- ¹ Bill Kleinsasser, *Synthesis 9: A Comprehensive Theory Base For Architectural Design*. University of Oregon. 1991
- ² Francisco Javier Biurrun, *A Monument to Water*, Plaza of Coronation, Estella, Navarra, Spain. (Sites 25 pp.140-143)¹ Bill Kleinsasser, *Synthesis 9: A Comprehensive Theory Base For Architectural Design*. University of Oregon. 1991

the source or generator of the wave in the plaza. On the other side at the city's edge, the inversion of water movement in the upward water fountain plaza echoes the wall.

Outdoor Deck

The outdoor deck is the building edge that one sees upon entry. It starts the next zone of claimed water in the floating exhibits area.

Floating Exhibits

Certain exhibits float between the columns in the claimed water. One senses a trace of the structural grid of the building in the in-between zone of the building and the curve of the seawall gallery.

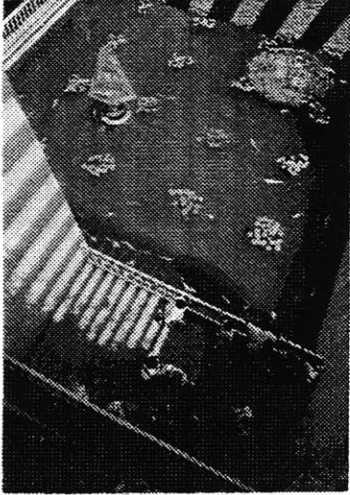
Guard House

The guard house monitors boats coming through the gate and provides a workshop for children to perform hands-on experiments with water such as getting samples from the Charles River. It is an active working place where people can obtain data on the Charles River, something that was not earlier available in working on this thesis.

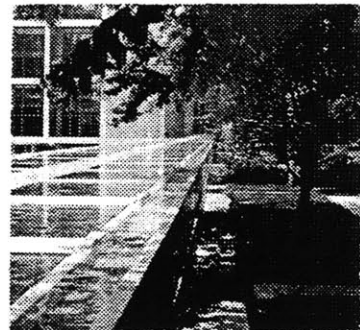
The lower deck floats with the fluctuation of the water level, within the constraints of the columns.

Underwater Spot Lights

The light intensity of the underwater spotlights varies due to refraction through the water medium. At high water level, the lights will produce a hazy glow on the water surface and at low water level, they will warn people in case of a draught.



CONCLUSIONS



1. Lily pond. (RVC)

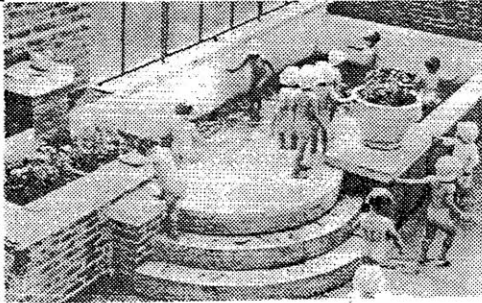
2. Water drop

3. Crossing the water's edge. From being dry to getting wet. A roof-top paddling pool. (Allen)

4. The edge: the in-between zone. Splashing pool in New York. (Allen)

5. Waterwall, British Pavillion, Seville. Nicholas Grimshaw.

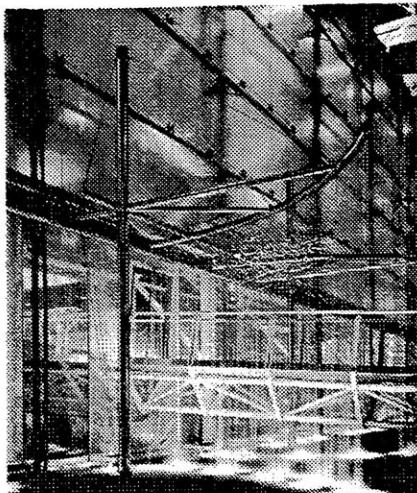
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3



4



5

Through the design explorations, the phenomenology of water has been expressed through an integrated design of architecture and the urban landscape.

This thesis set out to explore the following principles and objectives and this is how the design has demonstrated the hypothesis:

1. Regarding the use of the **phenomenology of water** as a generator of design in the compositional and symbolic aspects, the project has expressed **the changing properties of water with form**:
 - The **changing edge**: by creating different levels in the water garden and a wave-like edge so that water can meet the edge at different levels. Water sculptures and walls, etc. will exhibit the tidal change and juxtapose the sinuous quality of water with the manmade orthogonal structure of the bar building with the four piers.
 - The **changing movement** of water, the psychological effect and the character of the spaces made:
 - by providing a variety of water features like:
 - water as a changing context: the naturally course and level change of the river dramatized passively in the water park and in the view out the windows in the seawall gallery
 - the containment and quiet nature of water in the quiet pools in the building,
 - the roaring and celebratory aspect of water through the active design of water

6. A phenomenal window.
National Gallery of Art.
I. M. Pei.

7. Nature in the city. The
lake in Geneva.

8. Water in a lobby. Dallas.

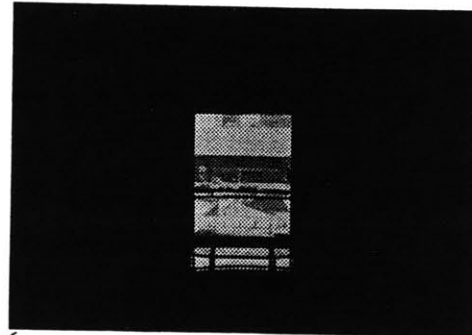
9. Layers, edges, and
thresholds of a city.
Madonna of Chancellor
Rolin c.1435. Jan van
Eyck (Musee National
du Louvre)

shoots in the plaza at the city's edge,

- and the slow down falling of the waterwall
- Exploring water and light: set up views in certain parts of the project to experience the light shimmering on the water, views under water in the underwater chamber, across water to the city, and the reflections off water, the phenomenal lens.

2. Designing the Water's Edge: the In-between Zone

- Penetrate different spatial zones through a variation of experiences through the water's edge such as a passage from an elevated plane to the underwater chamber, the outside-inside transition through the space between the landscape and the building, and the experiences on the four piers.
- Create a **threshold** — the in-between, a transition and the penetration at the water's edge
 - through the wall between the landscape and the building;
 - the passage from the open gallery to the seawall curve through the four galleries, from restriction to release, and then the passage from the outdoor above ground to the underwater chamber.
 - Express through urban design the idea of the threshold between the harbor and the river: by providing recreational program of a riverfront and the working and formal references of the wharves and industrial structures.



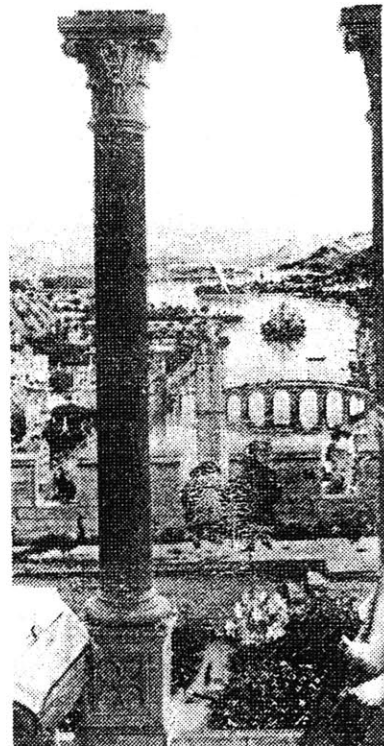
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10. People and water. Water park. (Higuchi)

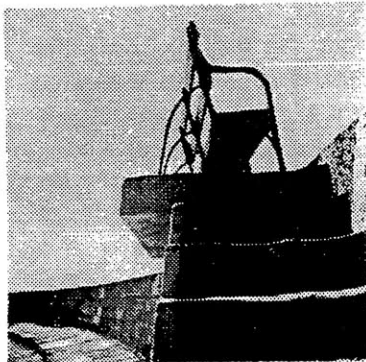
11. The inhabited edge, above datum. (Gordon Cullen)

12. Threshold of the site.

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10



11



12

3. Reclaiming the Water's Edge for People

- Continue the city fabric to meet the water in a dynamic exchange at the edge by terminating the axis in the garden and opening up the view to the water.
- Return the water to the city by bringing water to the land.
- Provide access for people by developing the water garden as an active open space instead of building up the whole site.
- Create a narrative of historical meaning of the working waterfront through the form of the "cargo-like" galleries and
 - the changing shoreline in the urban infill process through the expression of the existing seawall in the making of the new curved gallery.
- Invoke sensory experiences and public memory of water by movement, materials and details.

Although this thesis proposes a scenario for Boston, one can easily generalize the attributes of the site and apply to other waterfronts. Since the site is an infilled industrial left-over area with traces of history and thus public memory. These site attributes are indispensable in bringing references and thus meaning to the project that may otherwise become a mere formal exercise.

Although I chose a site in a port city where water is everywhere, the same principles can apply at other scales to buildings and urban design even in arid places where water is scarce. Since one can discuss the

13. Joy in water. Aspraypool.
Tarken playground,
Philadelphia. (Allen)

14. Water court.
(Steven Holl)

15. Fountain in Nice
downtown.

16. Water kinetics.
P o m p i d o u
Center.

17. Celebratory water.

topics of the water's edge from the scale of an ocean to a droplet, the potential to generate design is unlimited. This thesis share the same attitude in desgning for the river's edge:

*"The project must balance the energy of place
and its history.
The energy of architectonic space must balance
the history.
The energy of objects is in balance with
The energy of natural space
The energy of the river.*

*The history of
The elements and materials
don't project because of form
because of volume
because of color
in a visual esthetic,*

*but because of the inner energy....."*²

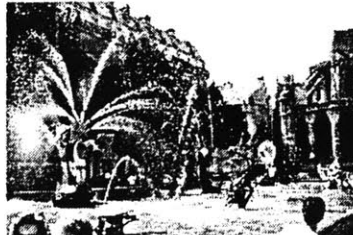
*- Francisco Javier Biurrun, A Monument to
Water, Plaza of Coronation, Estella,
Navarra, Spain¹*

Notes:

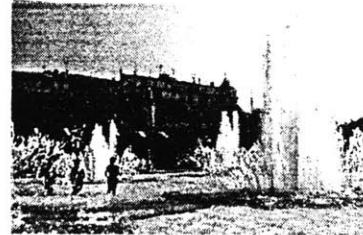
¹ Francisco Javier Biurrun, A Monument to Water,
Plaza of Coronation, Estella, Navarra, Spain.
(Sites 25 pp.140-143)



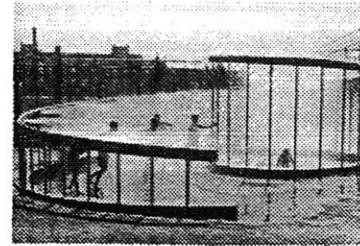
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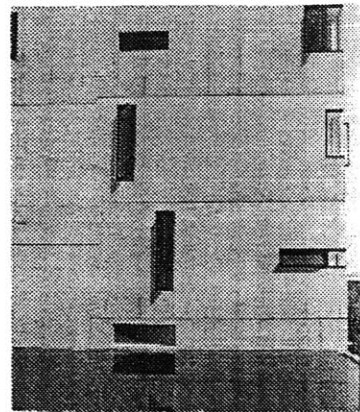
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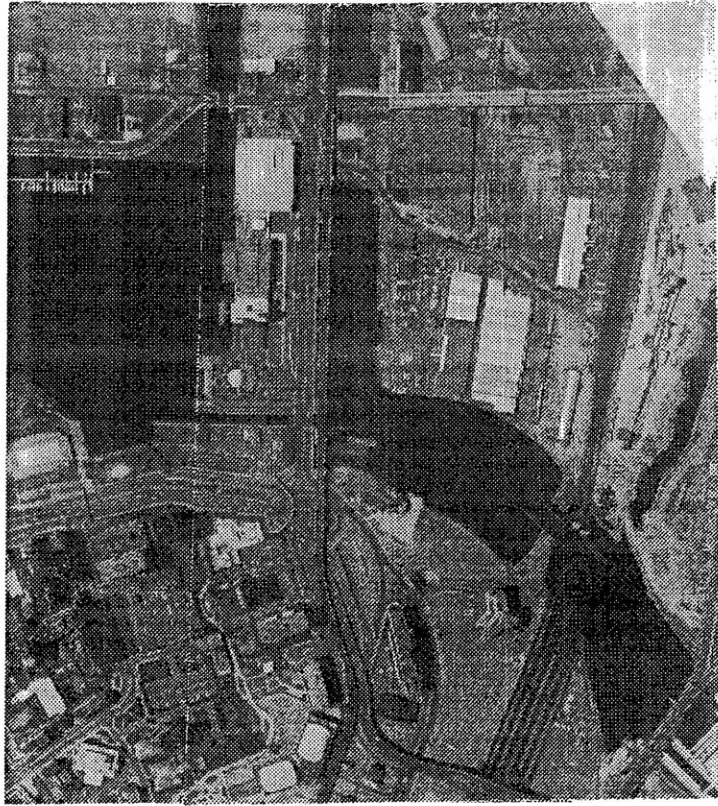
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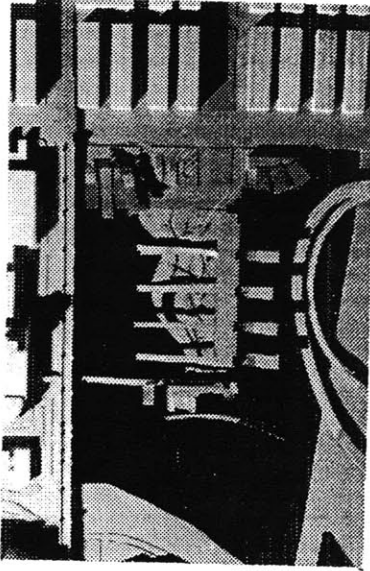
1. Aerial photo of the existing site.

2.,3. Urban design plan



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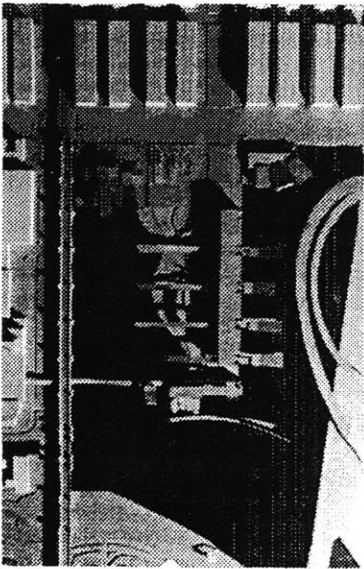




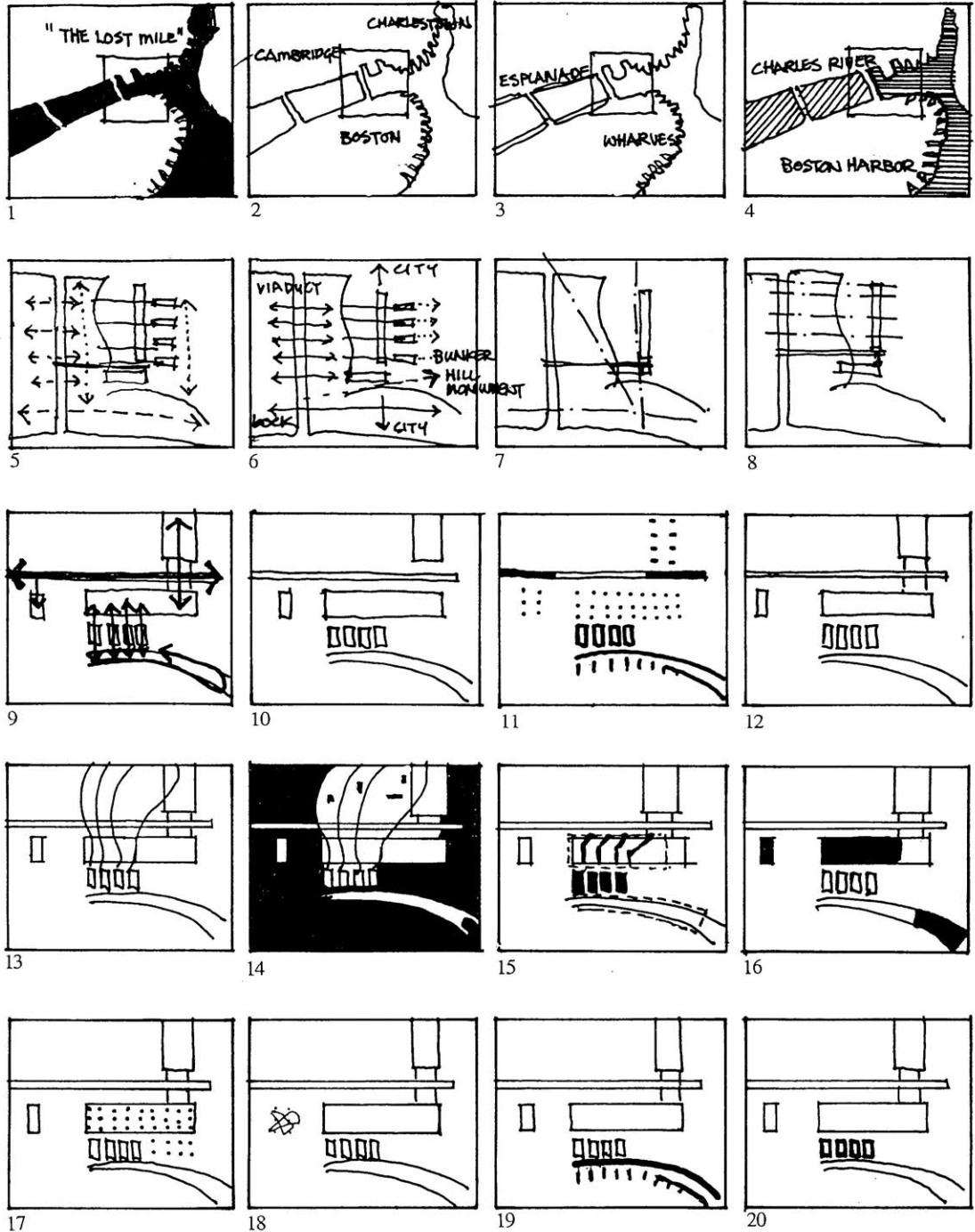
THE PROJECT

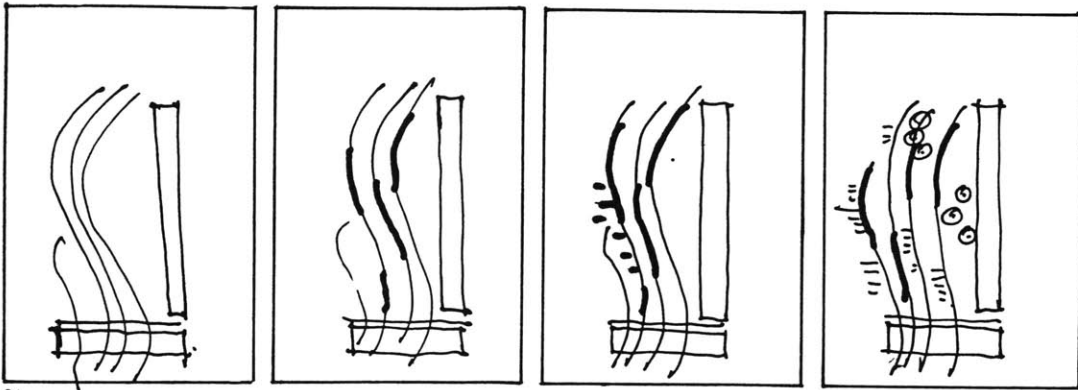
DRAWINGS

MODELS

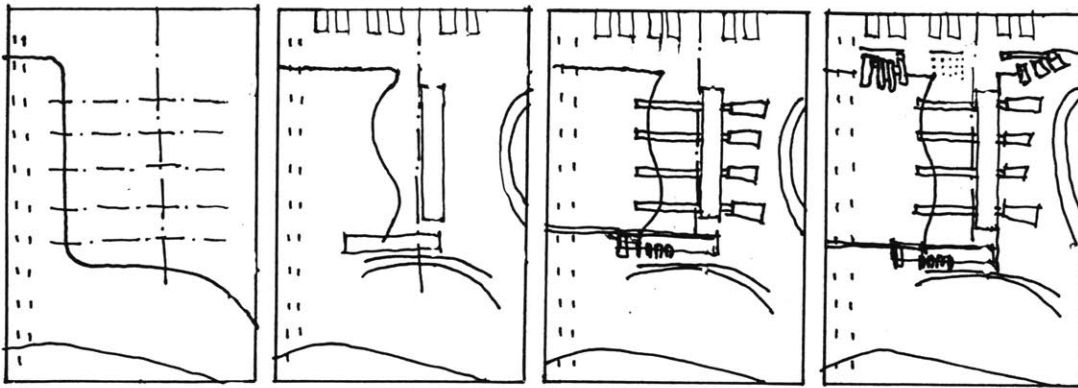


- DIAGRAMS
1. THE LOST MILE
 2. BETWEEN CAMBRIDGE, BOSTON, AND CHARLESTOWN.
 3. BETWEEN THE ESPLANADE AND THE WHARVES
 4. BETWEEN THE HARBOR AND THE RIVER.
 5. RIVER FLOW
 6. VIEWS
 7. PRIMARY AXES
 8. SECONDARY AXES
 9. MOVEMENT
 10. ENTRY
 11. STRUCTURE
 12. VERTICAL CIRCULATION
 13. NATURAL WATER
 14. CONTAINED WATER
 15. GALLERY SPACE
 16. SPECIAL FUNCTIONS
 17. BARGE STRUCTURE
 18. PIERS
 19. SEAWALL
 20. FLOATING CARGO
 21. CAPTURING WATER
 - DISCIPLINING WATER
 - INHABITING WATER
 22. ORGANIZATIONAL CONCEPT OF THE URBAN DESIGN
 23. ORGANIZATIONAL CONCEPT OF THE BUILDING
 24. TRANSFORMATION OF THE PAVILLIONS
 25. TRANSFORMATION OF THE PERFORMING ARTS CENTER

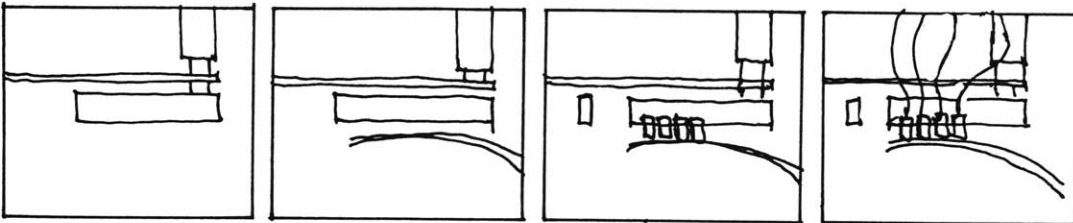




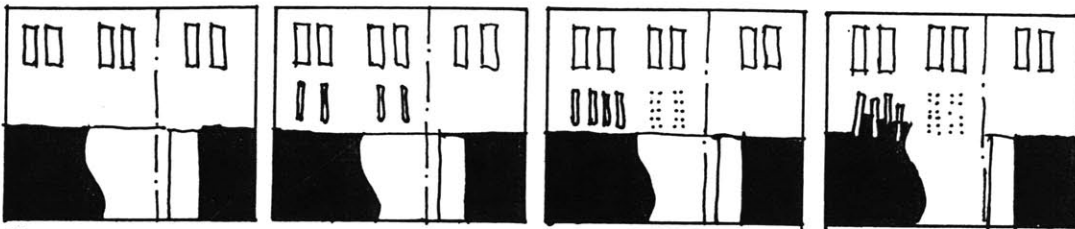
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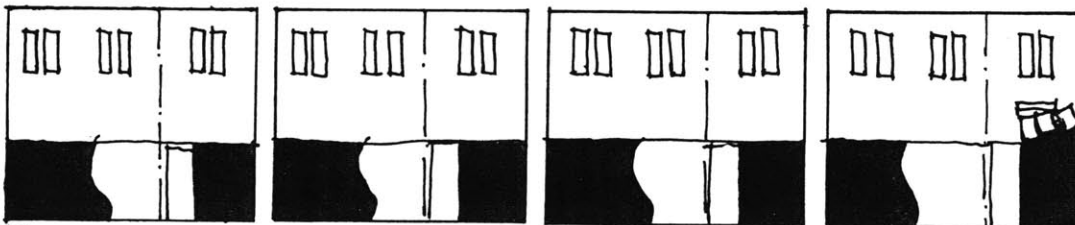
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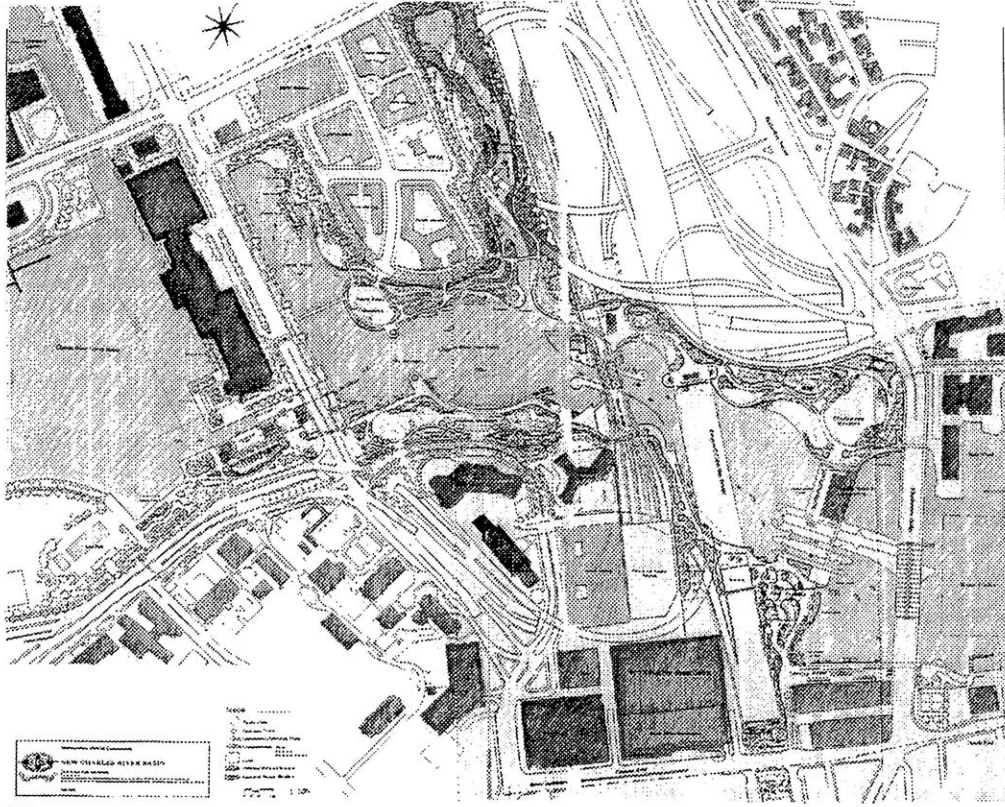
25



26. 1993 Metropolitan District Commission plan for the lower Charles River Basin: Charles River Crossing.

27. "A New Vision For Boston." Paul R. Mortensen Designs.

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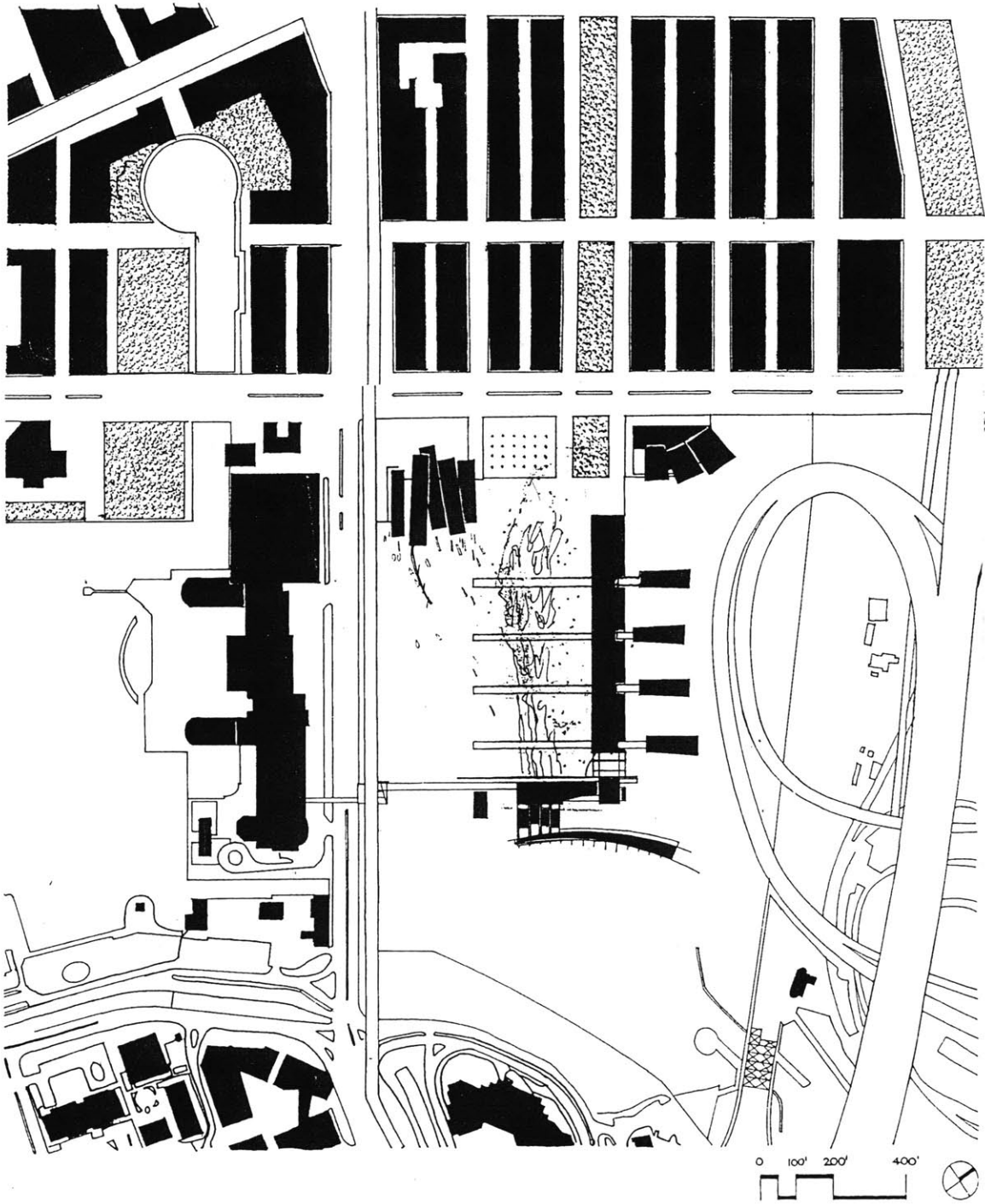


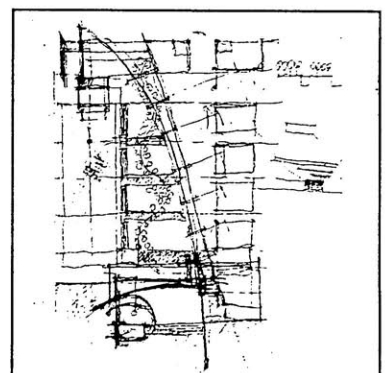
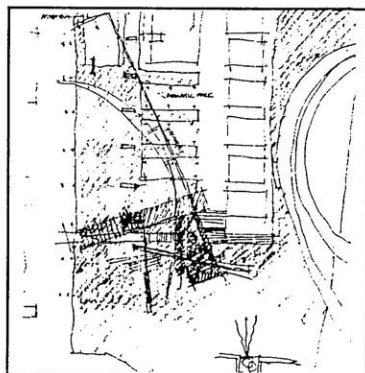
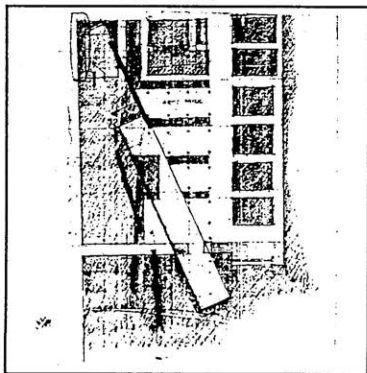
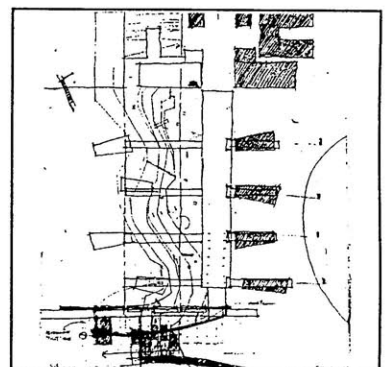
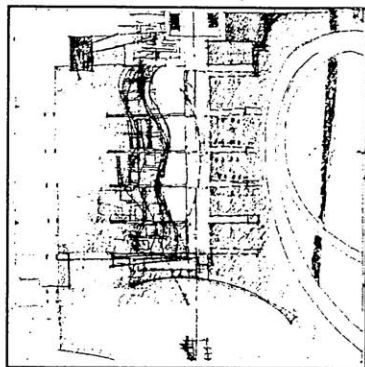
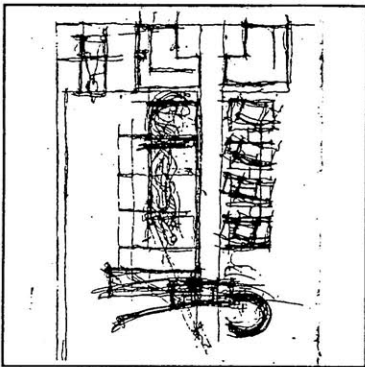
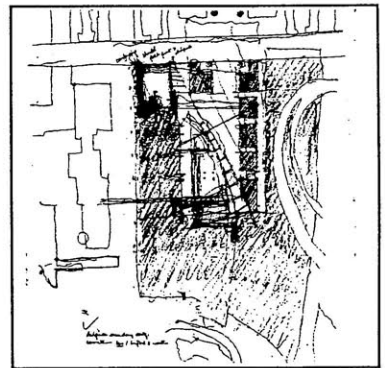
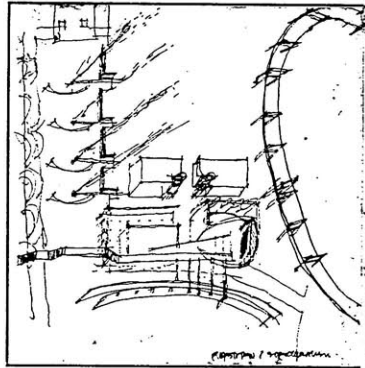
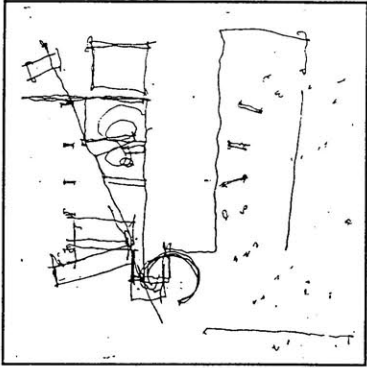
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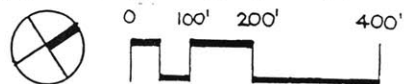
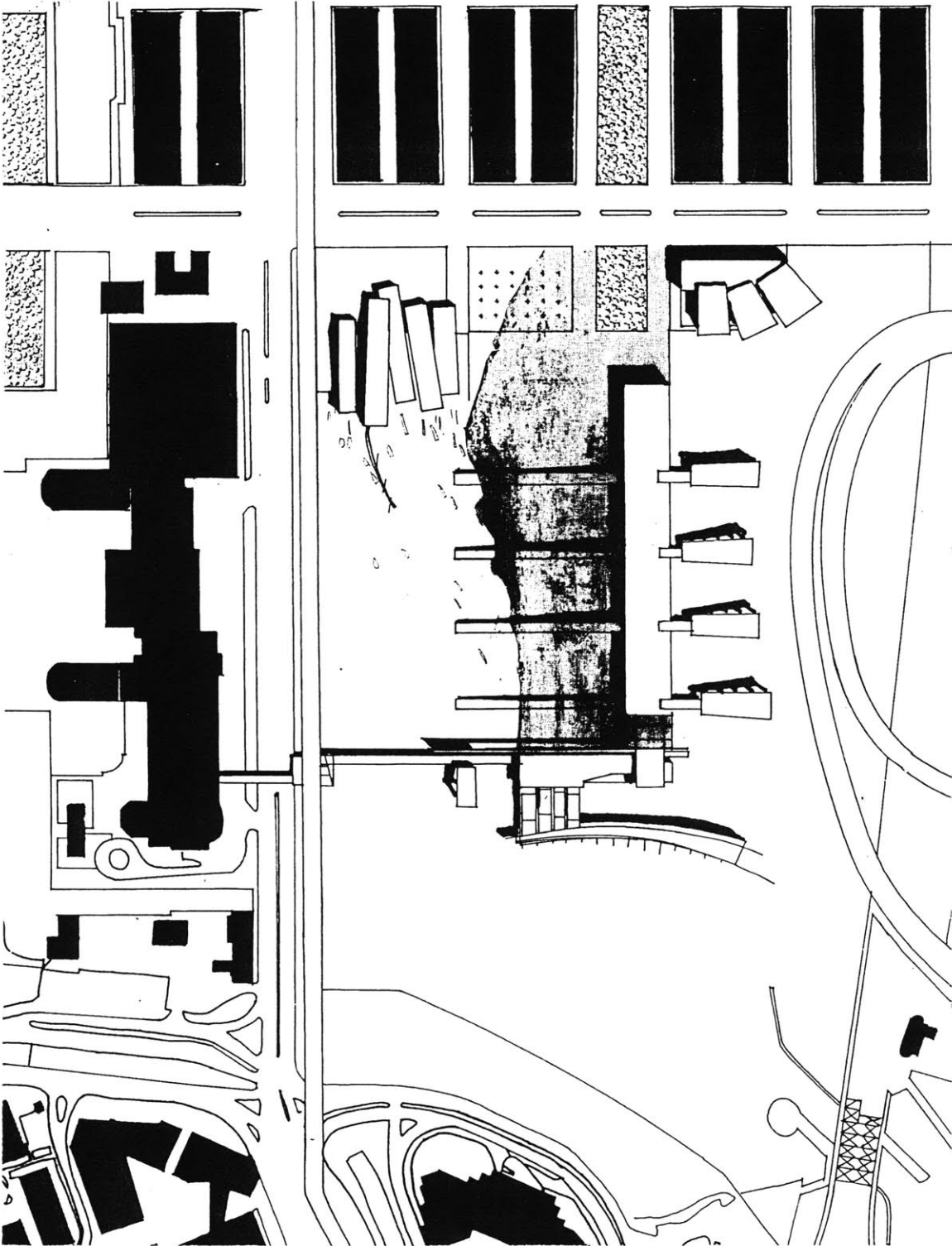


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28. Figure-ground of urban design plan.



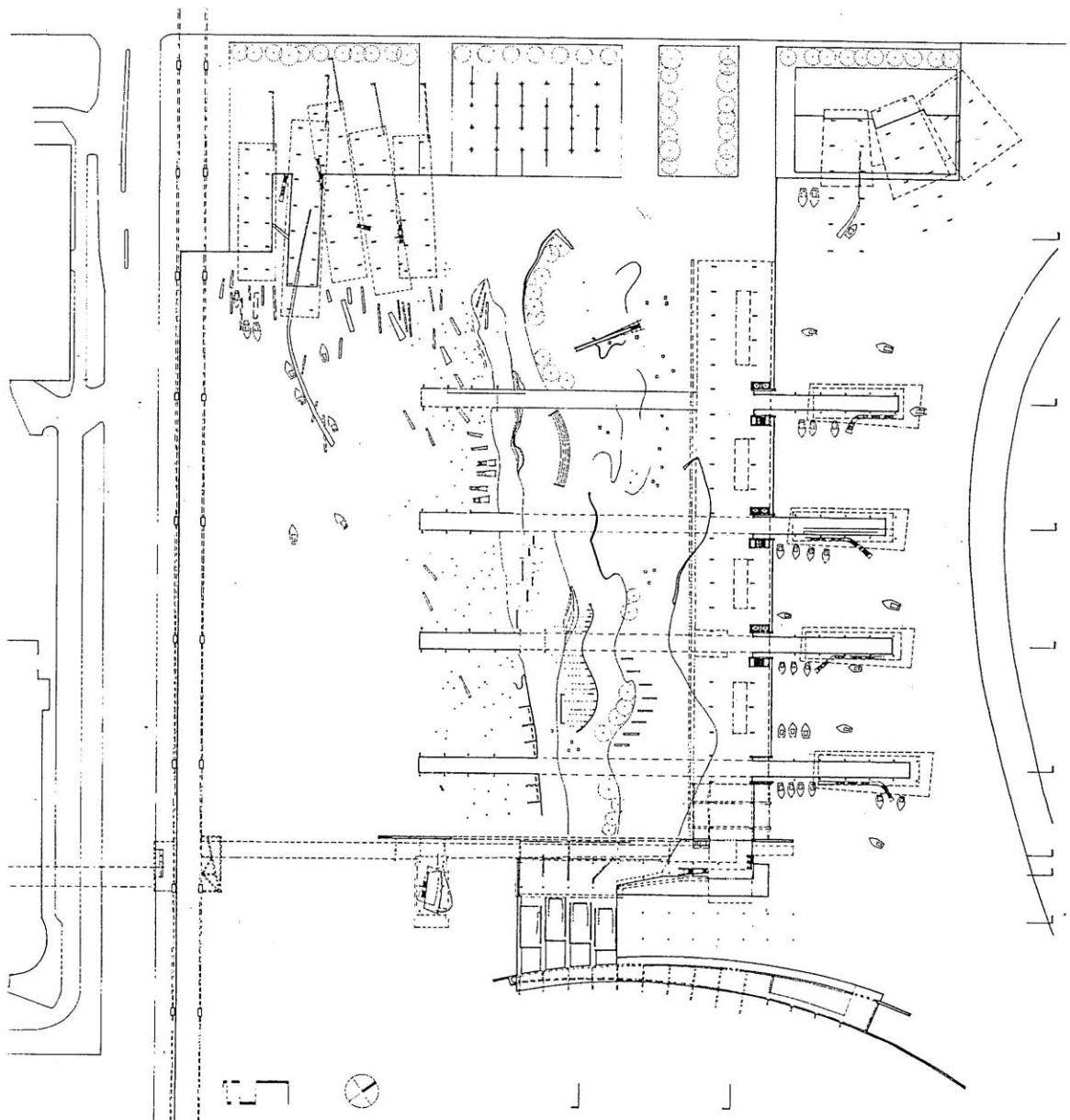




31. Urban Design Plan showing the elements:
1. The Museum of Art for Water
 2. the Water Garden
 3. the pendulum building
 4. the pavillions
 5. the fountain place
 6. the performing arts center.
 7. the existing Museum of Science and proposed crossing



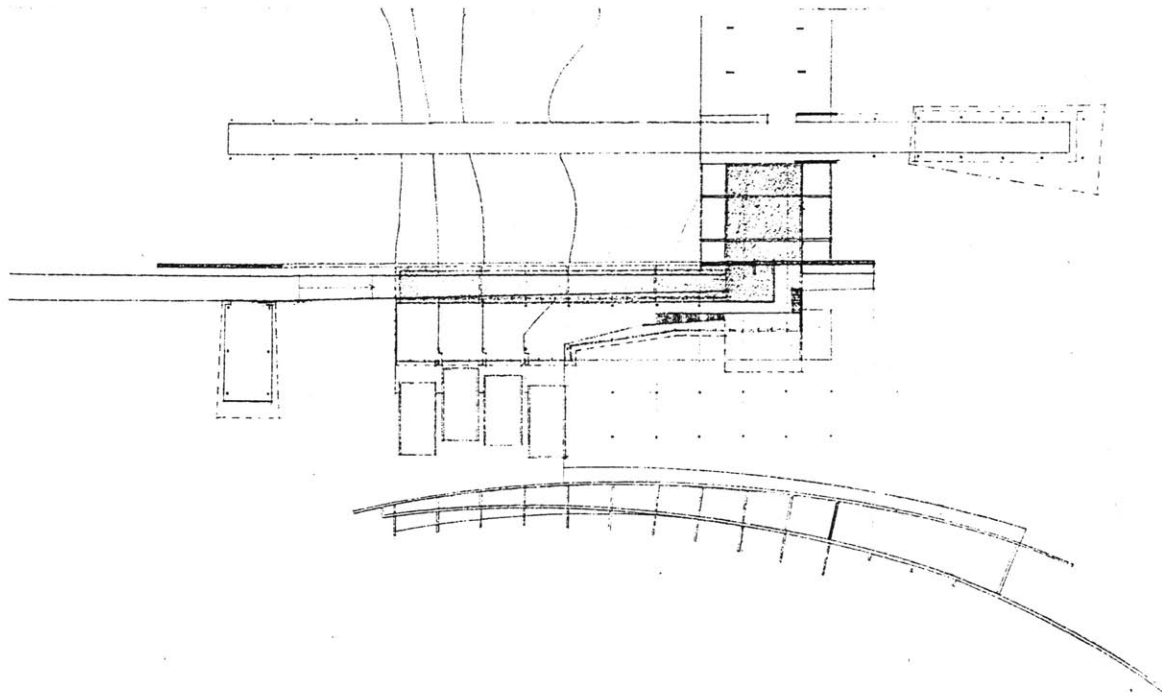
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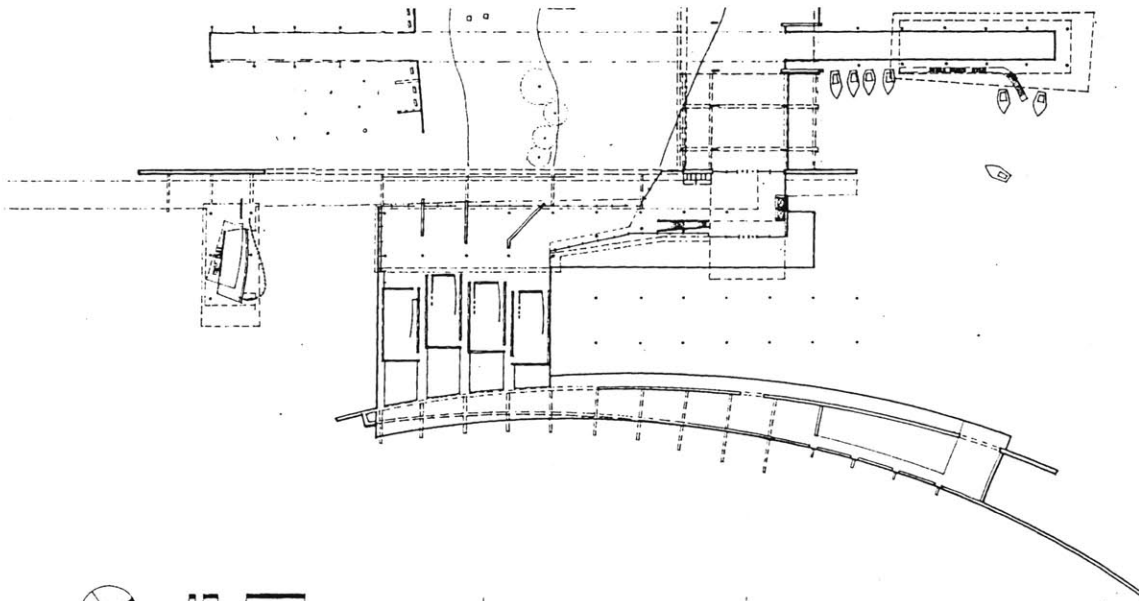
31

32. Upper level floor plan

33. Ground level plan



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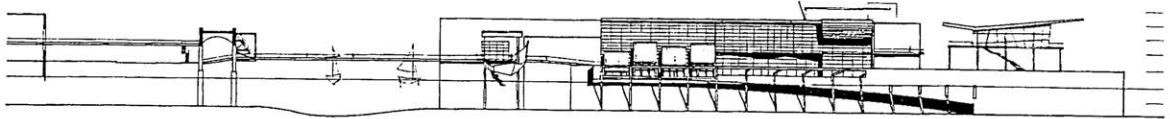


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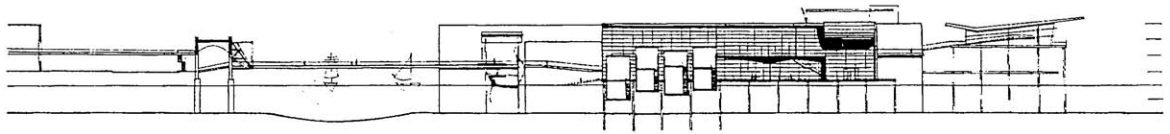


- 34. Elevation
- 35. Section through the four galleries
- 36. Section through the assembly space above and the gallery below.
- 37. Section showing the waterwall and the museum crossing.
- 38. Section showing the pavillions and the performing arts center at the city's edge.

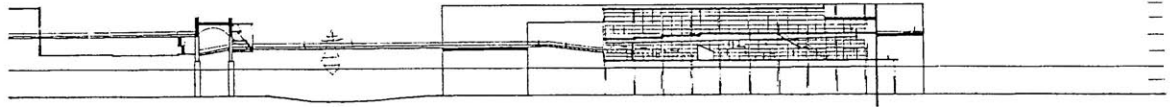
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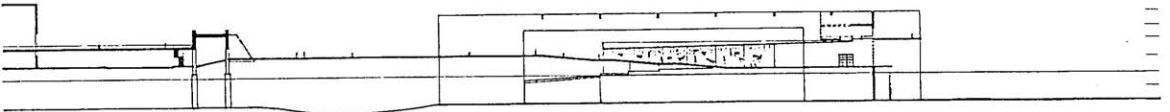
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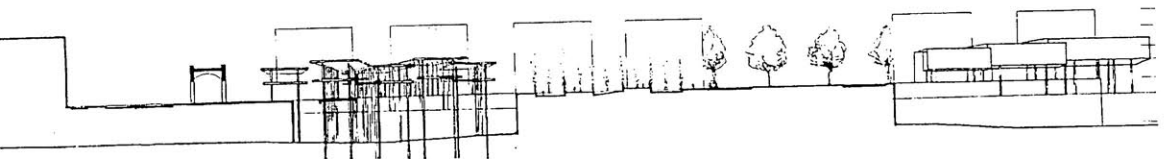
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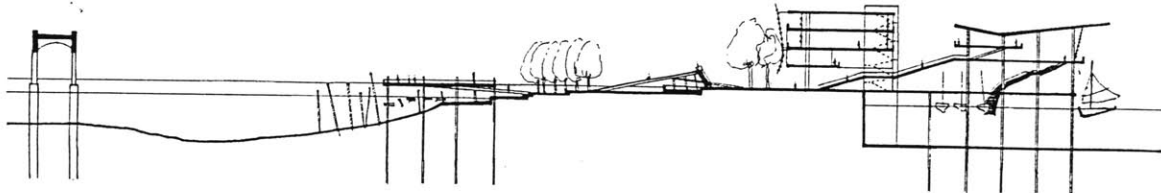


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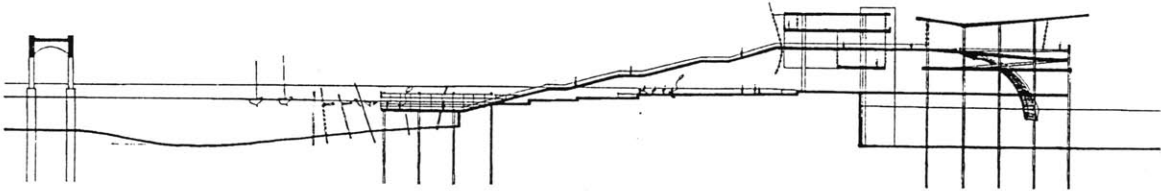


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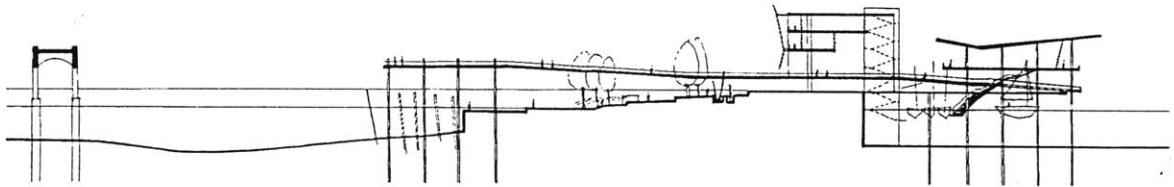
- 39. Section showing the pier on the land's datum level.
- 40. Section showing the pier leading to an underwater observation deck.
- 41. Section showing the pier at an elevated level.
- 42. Section showing the pier extending below water.



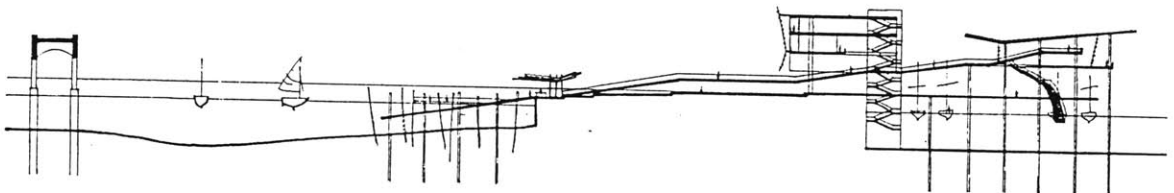
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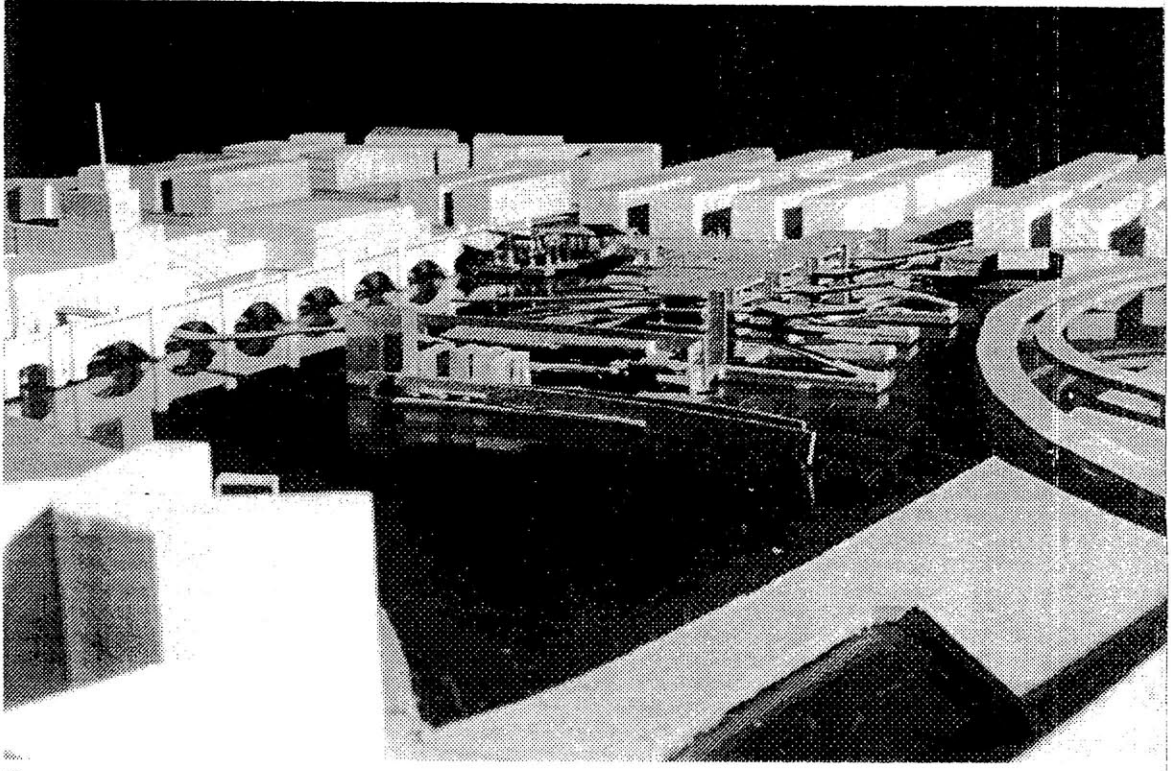
42

43. Overall view of the project.

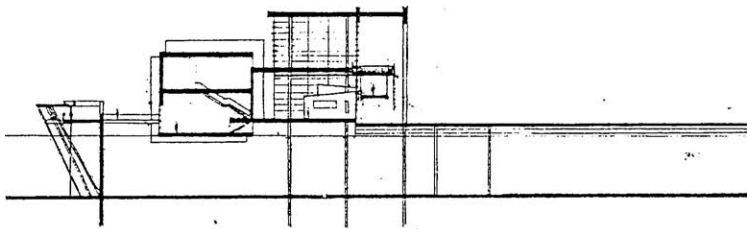
44. Section through the galleries, the open exhibition space, the assembly hall, and the waterwall.

45. Section through entry sequence.

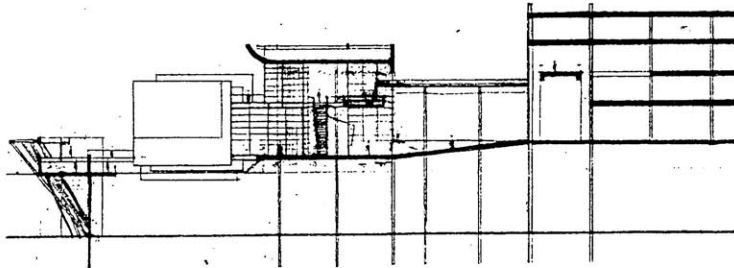
46. Water: the life-giver. John Hancock Center and the Frog Pond at Boston Common. (Kanda)



43



44



45

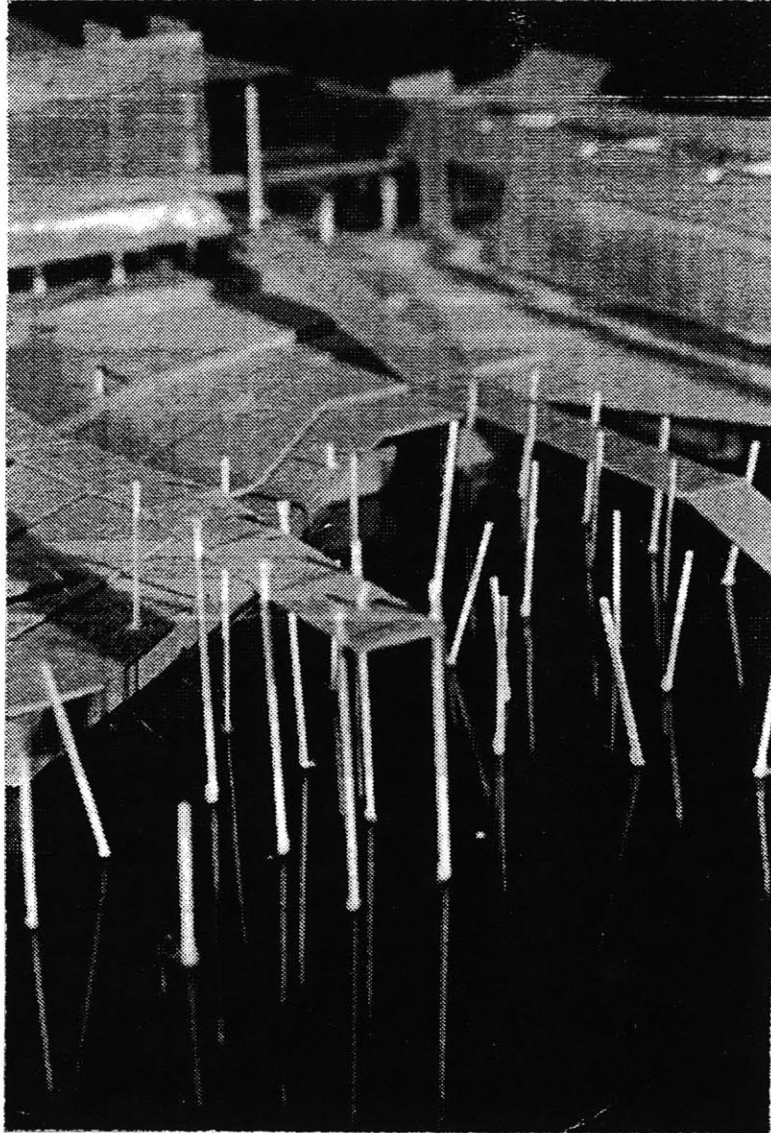


46

47. The urban piers.

48-49. Piers, Venice.

50. The stairs between the building and the water. Museum of Literature. (Takase)



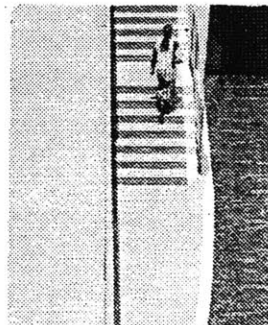
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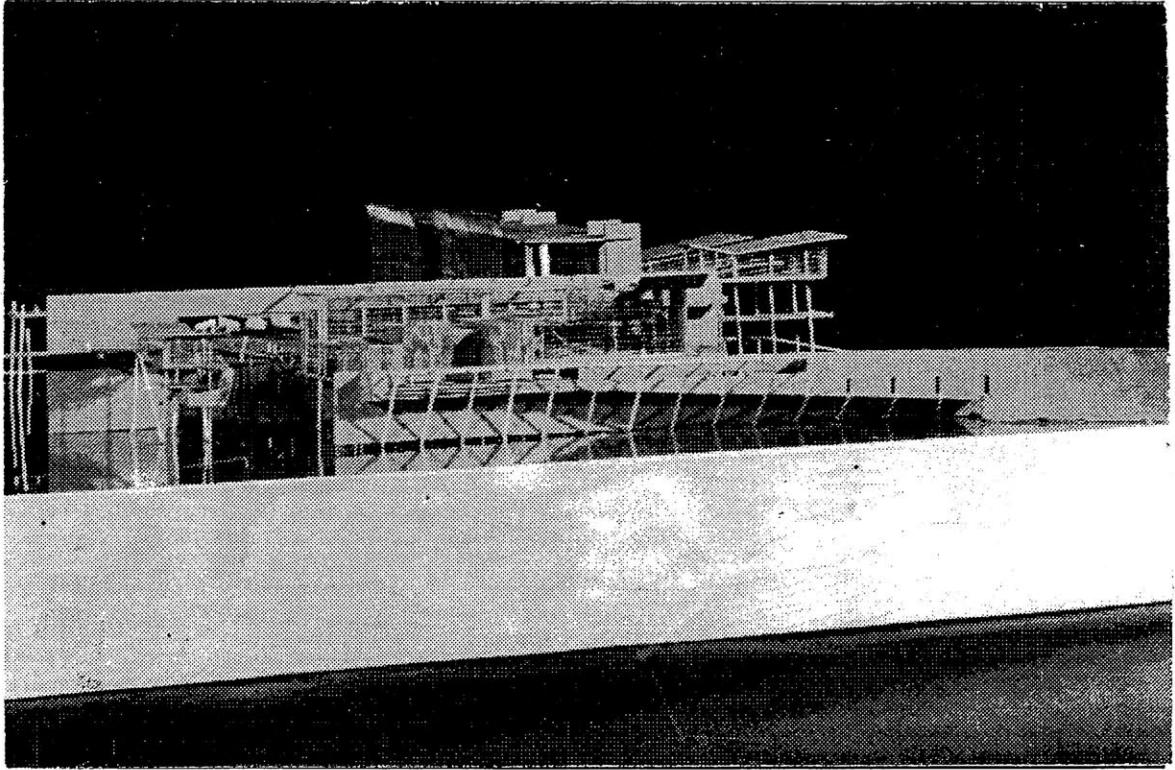
51-52. Front elevational view.

53. Boat by the edge, Venice.

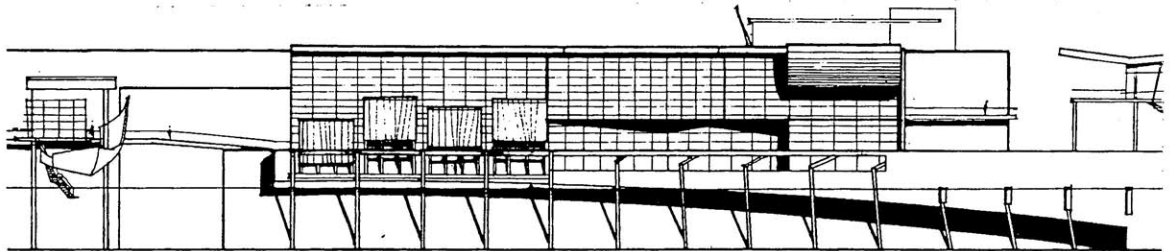
54. The site in winter, birds on the edge.

55. Offshore oil rig (Colin Rowe)

56. Interweave of spaces.



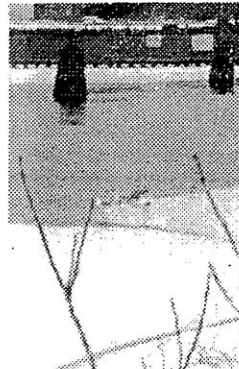
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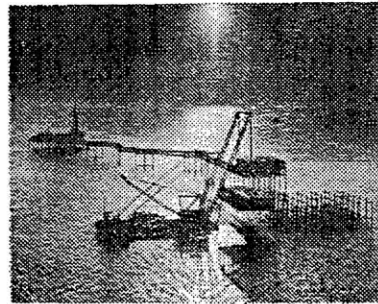
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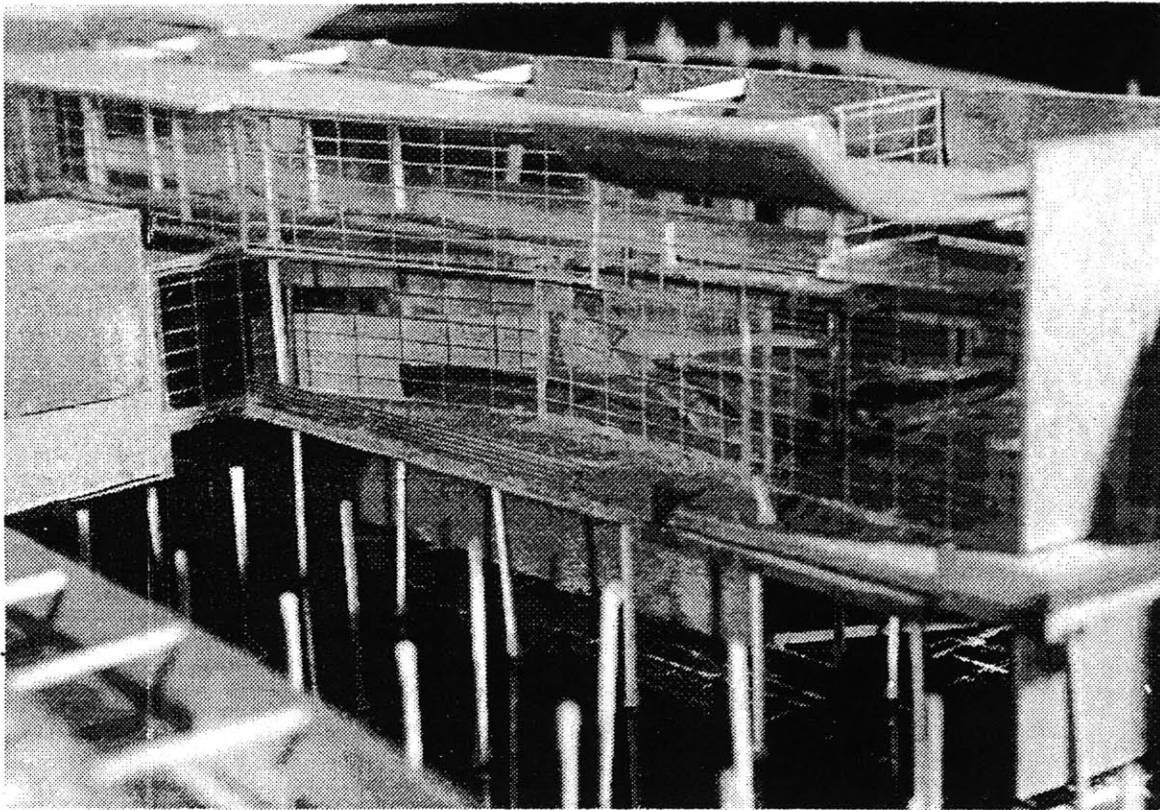
57. The glass wall, the deck, and the floating exhibits.

58. Section showing assembly space and gallery.

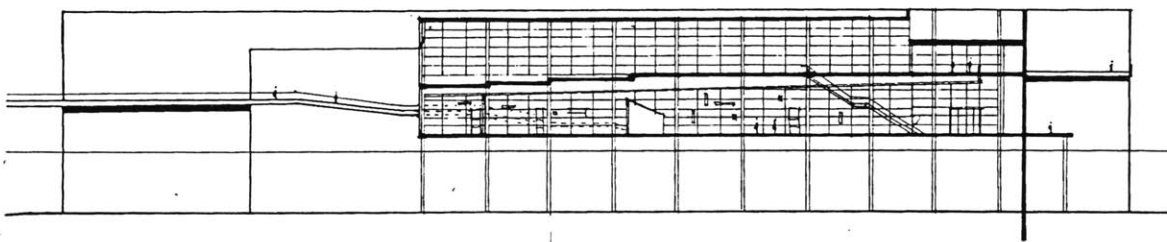
59. Floating. Nagasaki (Eaux)

60. Piers. San Francisco Ferry Building. (Kent Watson).

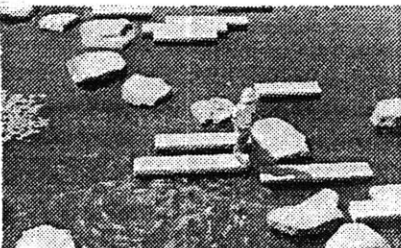
61. Venice.



57



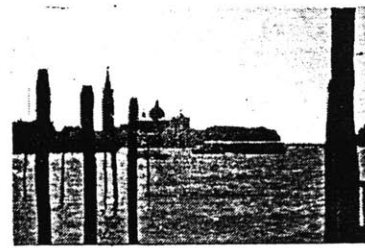
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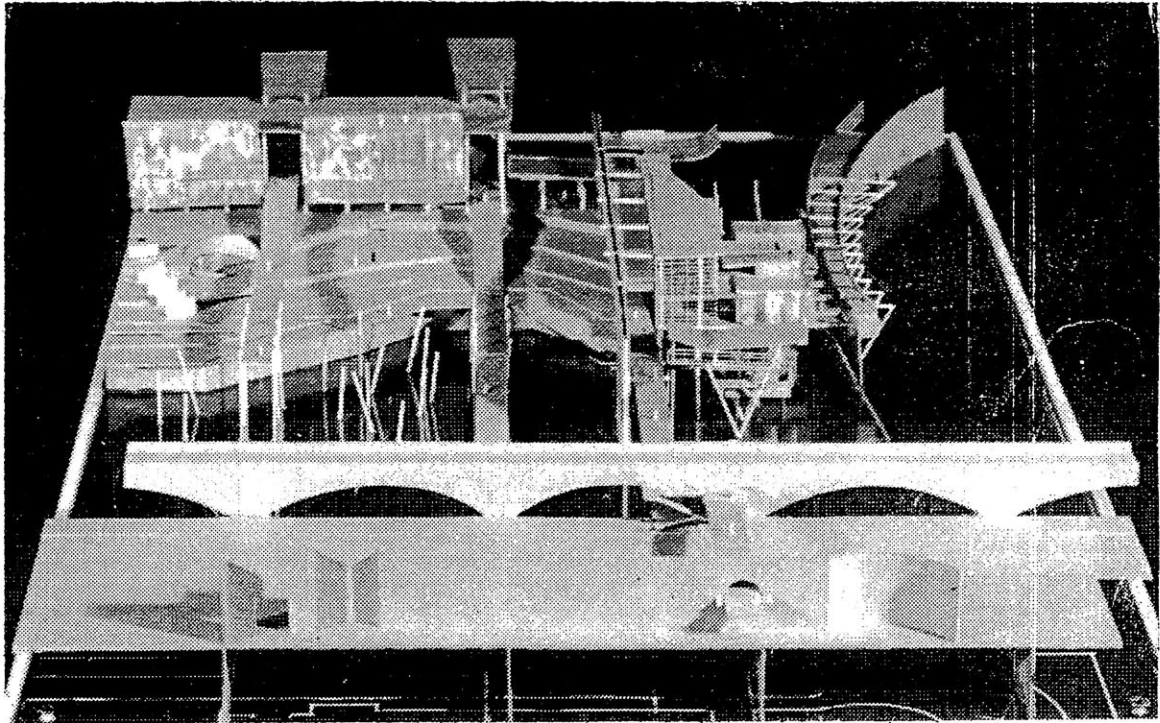
62. Water garden connecting to the Museum of Science.

63. Section of Pier and activities in the water garden and tower.

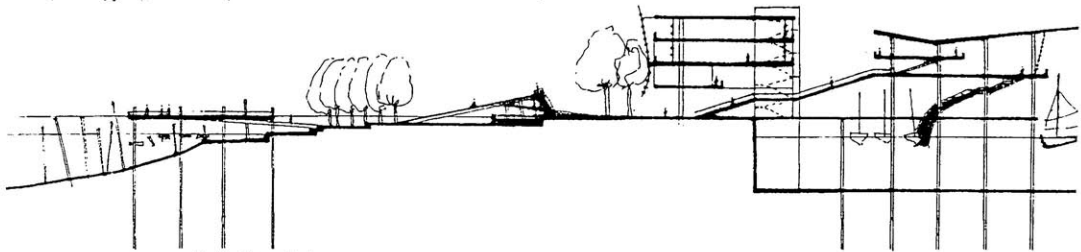
64. Sculpture progresses from land to water.

65. Existing Pier at the site.

66. Piers and boats in Venice.



62



63



64



65



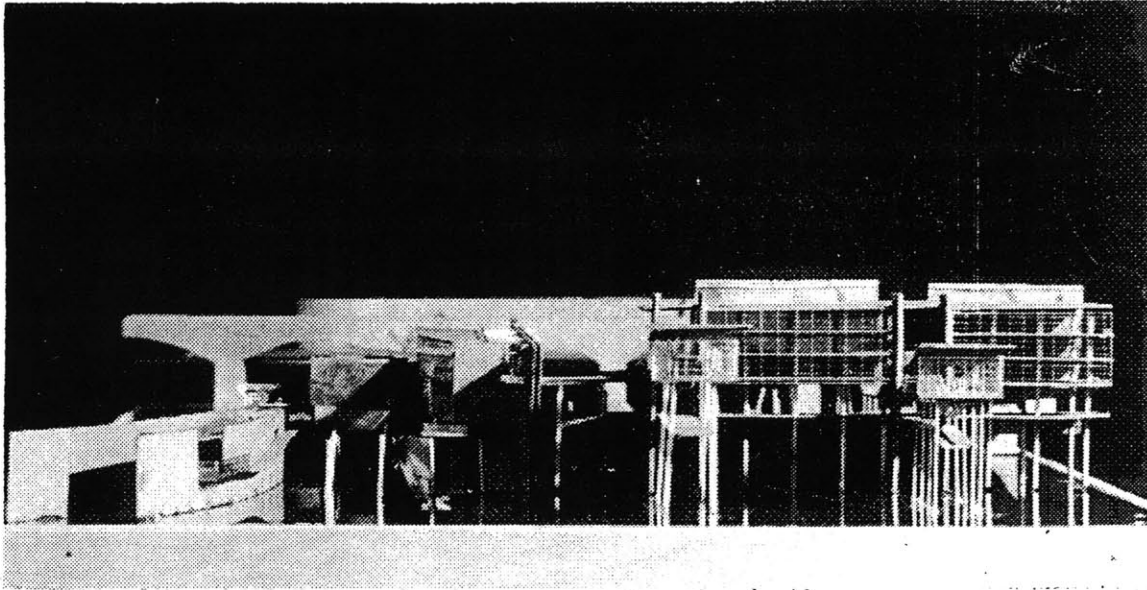
66

67. Model showing north elevation.

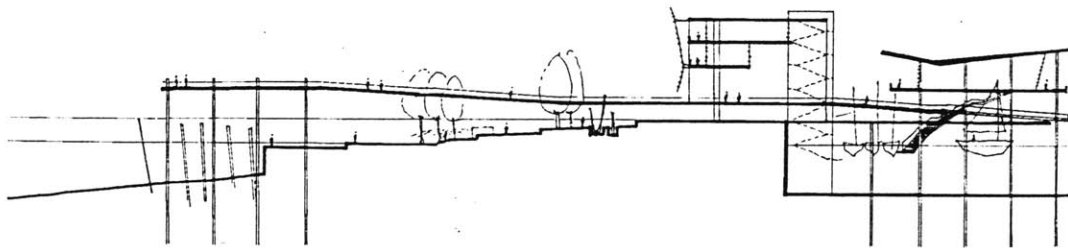
68. Section of water garden. Pier at the highest level while the tower section goes down.

69. Alone. At the Museum of Science near the site.

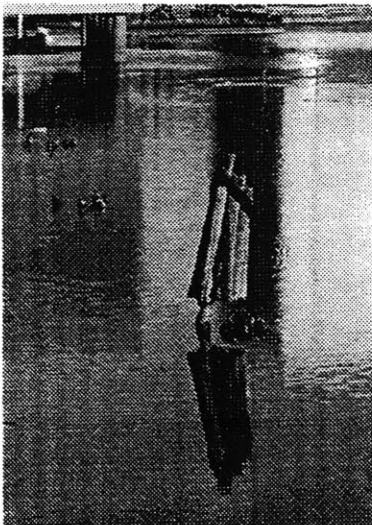
70-71. The towers



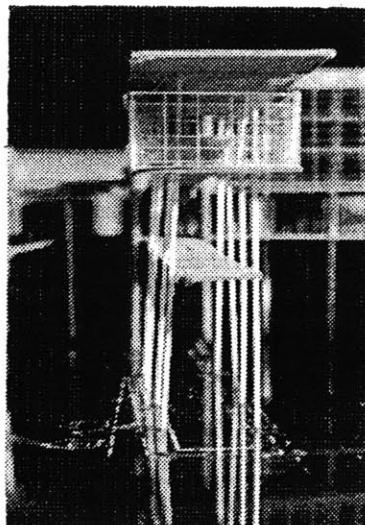
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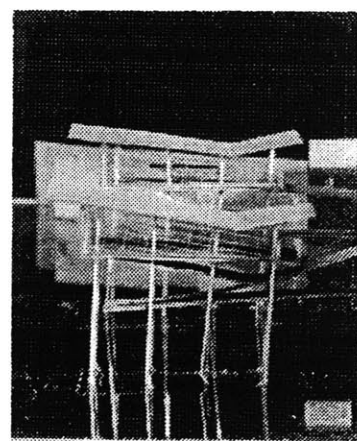
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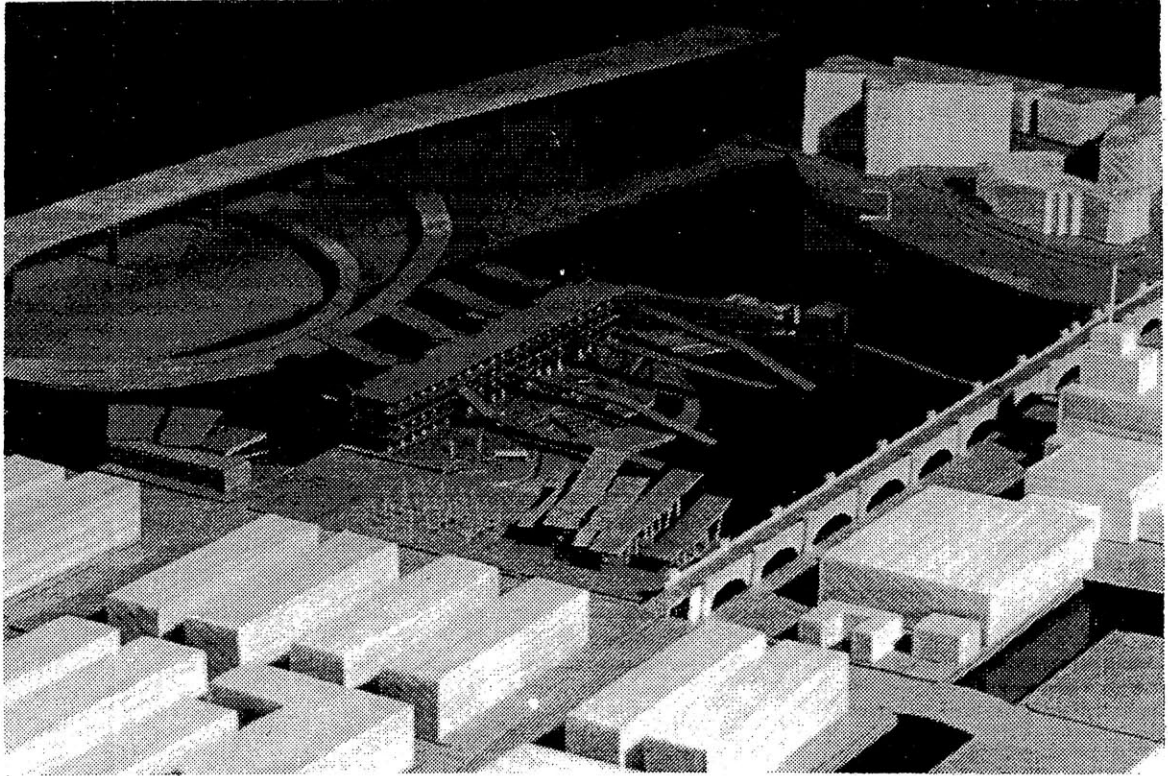
72. At the city's edge.

73. Elevation showing the pavillions, the water shoots, and the performing arts center.

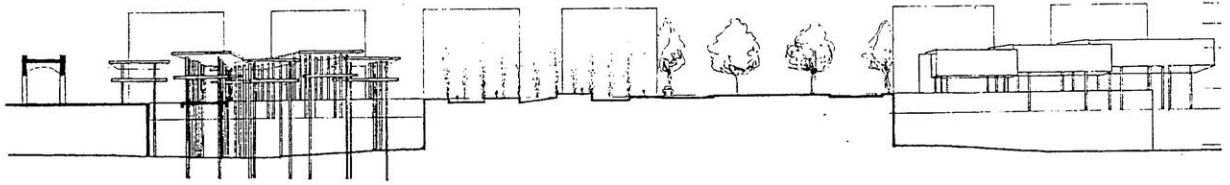
74. The Richards Medical Research Building.

75. Detail of fountain in court. Salk Institute of Technology,

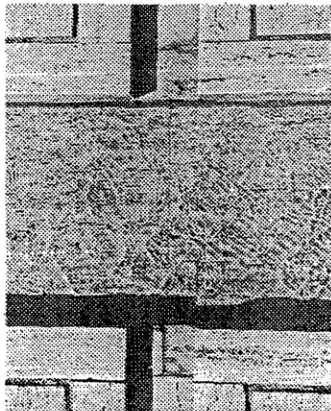
76. Entry of temple. Japan. (Eaux Et Fontais)



72



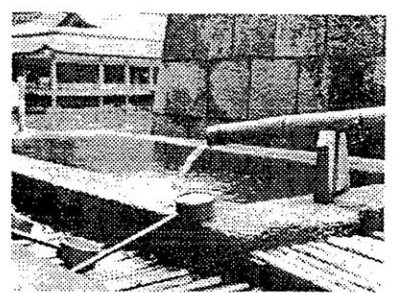
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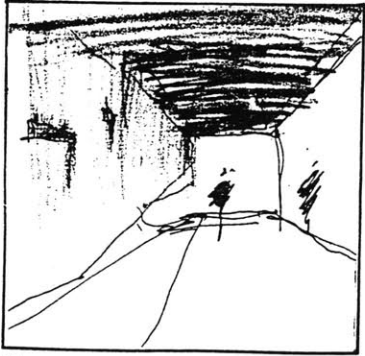


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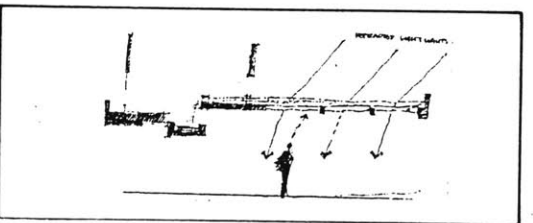
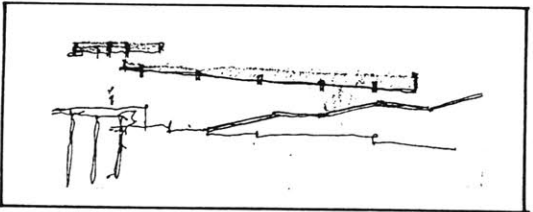
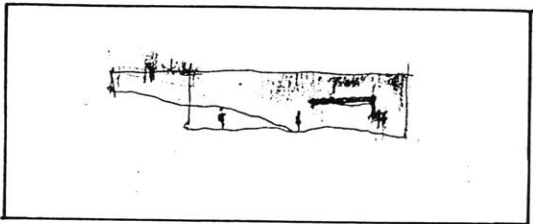
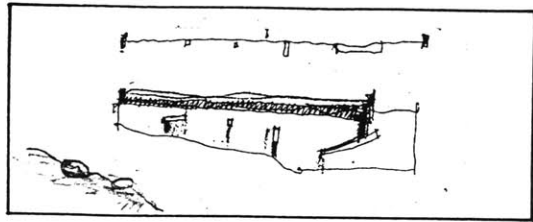
76

77. Perspective of walking between water: the waterwall to the side and the pools on top.



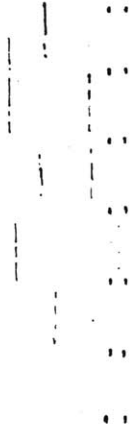
77

78. Studies of the entry sequence.



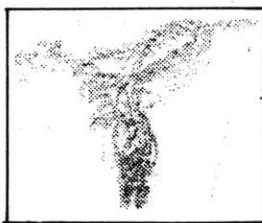
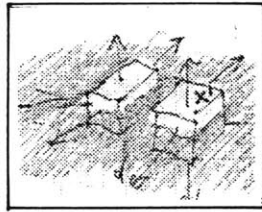
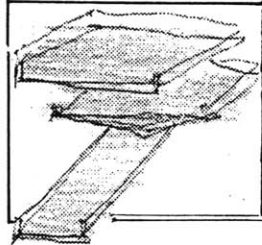
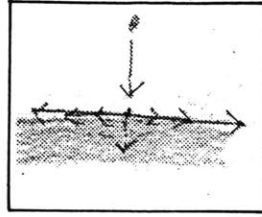
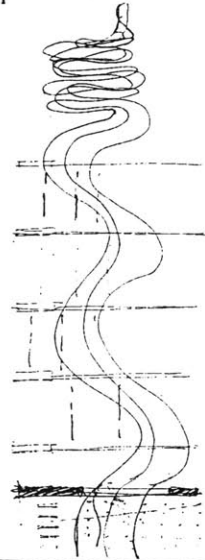
78

79. Concept of the wave washing up the city's edge.



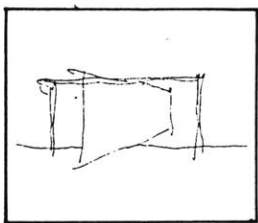
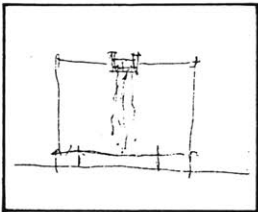
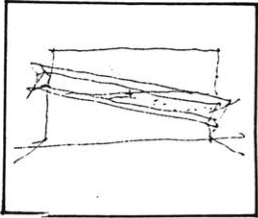
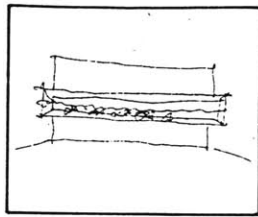
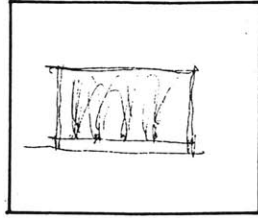
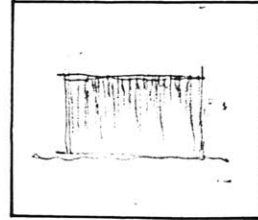
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80. Types of water forms.



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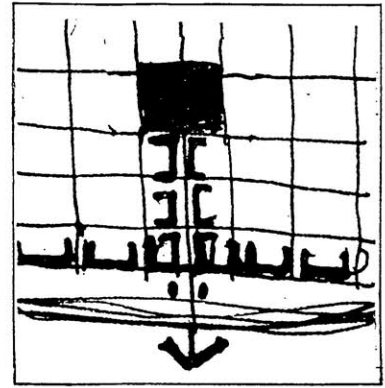
81. Types of waterwalls



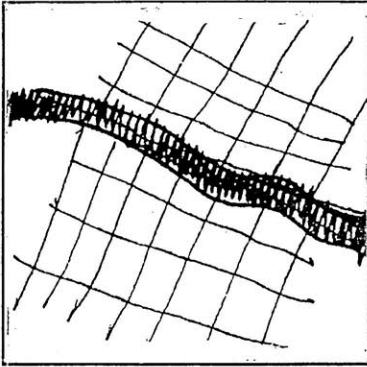
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Diagrams

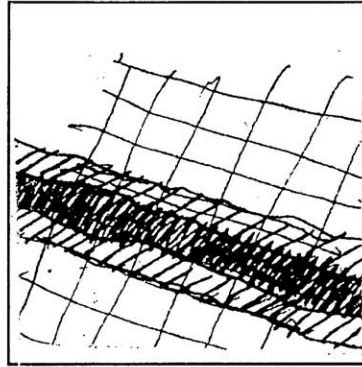
- 82. The center to the edge
- 83. Water as a divider, a seam, weaving two communities together
- 84. Linearity of the waterfront and duality of 2 sides.
- 85. Center-edge
- 86. Crossing, Transformation from side A to side B
- 87. Claimed water versus an exposed edge.
- 88. Threshold, crossing, public space with water
- 89. Linearity and termination points.
- 90. Movement system to the edge.
- 91. Multiple entry/thresholds



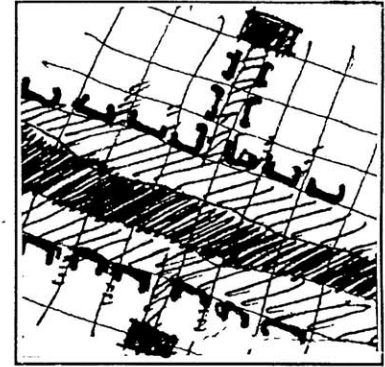
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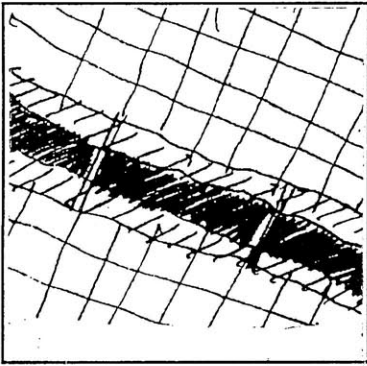
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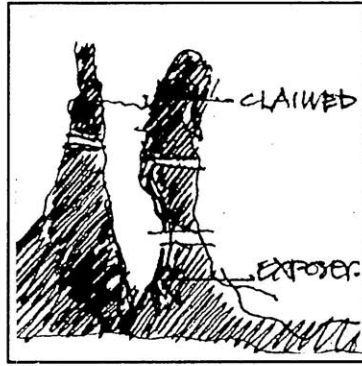
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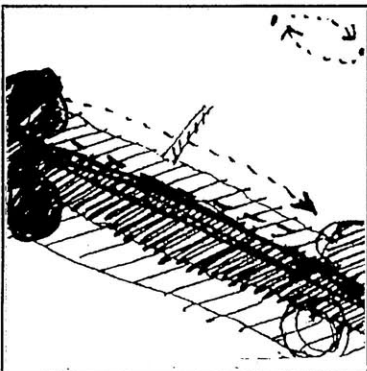
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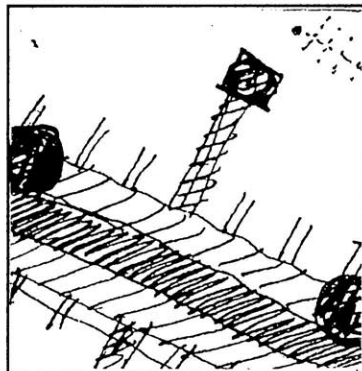
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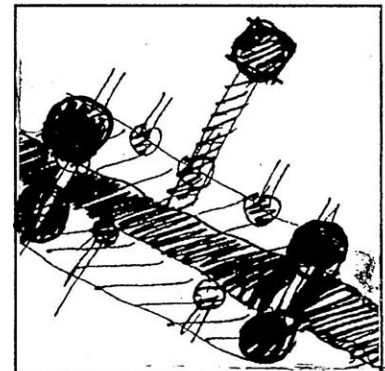
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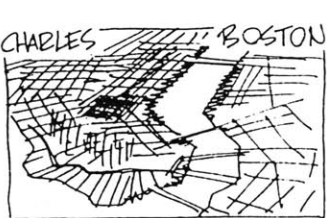
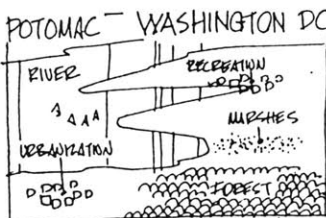
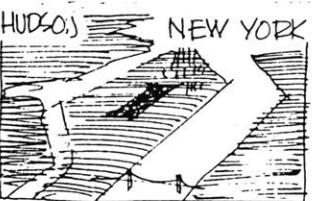
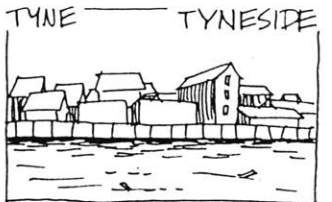
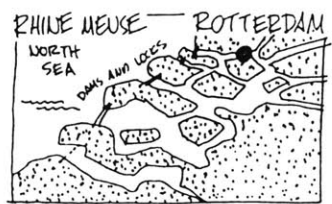
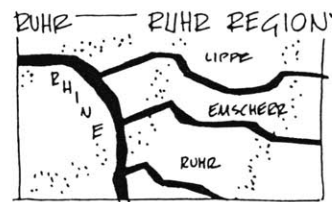
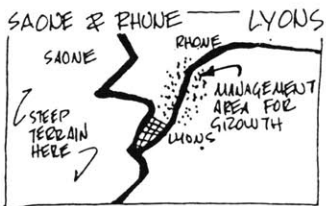
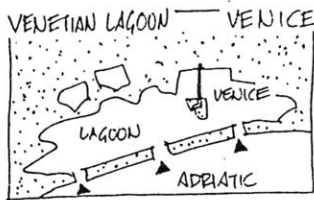
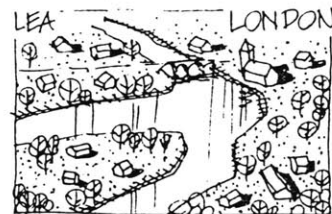
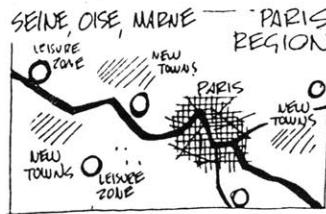
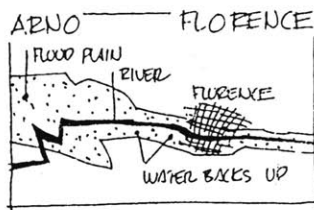
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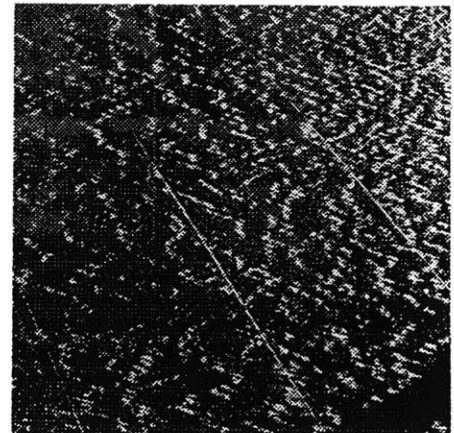
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