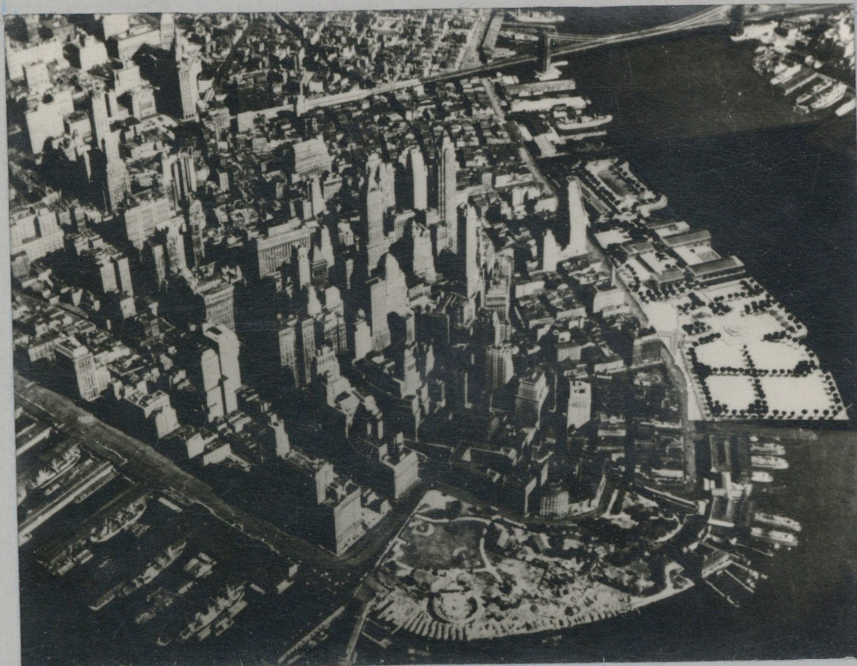


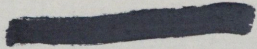
MANHATTAN LANDING AQUARIUM & WATERFRONT PARK



by

DAWN E. FICKE

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Dawn E. Ficke

MANHATTAN LANDING AQUARIUM AND WATERFRONT PARK

BY

DAWN E. FICKE

a thesis submitted in partial fulfillment
of the requirements for the degree of

BACHELORS OF ARCHITECTURE

MONTANA STATE UNIVERSITY

1987

Approved By:

Ralph Johnson: Advisor

Robert C. Utzinger: Director, School of Architecture

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this thesis project is dedicated to
my parents, who have always been an
inspiration to me.....

Make no little plans; they have no
magic to stir men's blood and probably
themselves will not be realized. Make
big plans; aim high in hope and work.
Remembering that a noble, logical
diagram once recorded will never die,
but long after will be a living thing,
asserting itself with evergrowing
intensity. Remember that our sons
and grandsons are going to do things
that would stagger us. Let your watchword
be order and your beacon beauty.

Daniel Hudson Burnham
1846-1912

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PROPOSAL

PROPOSAL

One of New Yorks' greatest assets is its' extensive waterfront. For my thesis project I am designing an Aquarium and a waterfront park concept for Lower Manhattan. The site that I have chosen is located on the waterfront, between the Battery Park (to the south), and the South Street Seaport (to the north). Developing the waterfront between Battery Park and the South Street Seaport provides a unique opportunity to exploit the waterfront for the public's enjoyment. The proposed aquarium would open the waterfront up to the public, and it would act as a catalyst for the area. The aquarium and park would function as a connection between the downtown core and the waterfront, and the South Street Seaport and Battery Park. The future of New York will be enhanced with this project (as well as ensuring the growth and the popularity of Lower Manhattan) by improving the variety and quality of attractions to the city while retaining the surrounding area's integrity. The horizons for the future will be expanded while the problems of today are responded to.

To justify the use of such a prominent and influential site, a high level of performance must be required of the development. The goals will be clearly stated and responded to. The visual and the physical corridors and the need for public accessibility are major factors that the form of the development will have to take into consideration. Other considerations that will be addressed in the project are: the existing dominant open spaces, the existing pedestrian and vehicular patterns, and the continuity of the city through selectively relating to surrounding building heights and bulk placement.

HISTORY

THE HISTORY OF NEW YORK CITY

The history of New York City is very intriguing, beginning with Peter Minuits acquisition of Manhattan Island from the Alongiquin Indians, to the growth of the largest financial district in the world. The layers of history are visible in the streets of the city, which reflect the events, eras and hardships that have been experienced there. It is this aura that is the soul of New York City¹.

The Dutch territory of New Amsterdam was seized by the British in 1664; it was renamed New York: and had a population of 800. New York had an important location in the colonial days because it was situated between Boston to the north and Philadelphia and Virginia to the south. In 1676 the construction of the great Dock, located near the foot of Broad Street, stimulated New York's growth as a seaport.²

At the beginning of the American revolution New York fell quickly to the British. It was soon thereafter that one third of the city was destroyed by fire: The entire mercantile district along Broad Street, 1000 homes and shops, and the Trinity Church were reduced to ashes. During the seven years of the British occupation New York was a haven for refugee loyalist and runaway slaves.³

In late 1773 the American flag was flying over New York. It wasn't long before New York was flourishing. In 1789 New York became our nations first capital, and George Washington took the oath of office as its first president. Alexander Hamilton opened the city's first bank in the same year, and in 1792 the New York Stock and Exchange Board was established at 21 Broad Street (it moved to Wall Street 10 years later). As Irish, German and Scots immigrated to the city, the wealthier residents moved out to Long Island or the suburbs uptown to escape the industrial noise. In 1800 New York had a population of 60,515, and was the largest city in America.⁴

¹ Goldman, Tribeca Historical Aspects, Office of lower Manhattan Development.

² Ibid

³ Ibid

⁴ Ibid

During the nineteenth century New York's economy was stimulated by many factors. Trade and shipping developed along the waterfront, and insurance and law firms followed the stock exchange and the shipping companies. A new City Hall was built on Chambers Street, which was then on the north edge of town. The Bay linked New York with the rest of the world. The waterfront was a source of activity. With the river linking the city with upstate, the Long Island sound linking it with New England, and with the completion of the Erie Canal in 1821 and the extensions of the railroads in the mid century, New York's economy flourished.⁵

During the middle of the nineteenth century New York's business district was expanding northward. The retail activity was initially at Union Square then at 23rd Street, then 34th Street and finally its present location in Midtown. Manufacturers and wholesalers also moved north.⁶

The financial community thrived and by the first quarter of the twentieth century Wall Street was the symbol of capitalism throughout the world. The financial crash in 1929 was followed by depression and then war. Technological developments made many commercial and industrial facilities in the area obsolete. Manufacturing and wholesale activities declined rapidly. Docks fell idle, and with new methods of handling cargo, shipping companies were forced to new locations.⁷

Following World War II and up until 1955 the building boom left lower Manhattan virtually untouched, and centered itself in Midtown. During this period numerous banks, insurance companies, law firms, and corporate headquarters moved from deteriorating offices in lower Manhattan to new buildings in Midtown.⁸

There were several factors that did prevent the total decline of lower Manhattan:

1. Finance and government were growing rapidly requiring more office space than what the new buildings could provide thus causing modernization of old buildings.
2. In 1955 Chase Manhattan Bank announced its decision to build a 60 story building in lower Manhattan.
3. The city decided to back private investments with

⁵ Goldman, Tribeca Historical Aspects, Office of Lower Manhattan Development, June 1974.

⁶ Ibid

⁷ Ibid

⁸ Ibid

3. (continued)public monies for projects such as a new civic center, the Brooklyn Bridge, the southwest renewal area, and the relocation of the Washington Market.

From this arose an unprecedented boom in office construction (the World Trade Center, the New York Stock Exchange, and Battery Park City). By 1970 19 million square feet of new office space had been incorporated in the city, with more than 70 buildings being renovated between 1965 and 1970.⁹

In 1965, 450,000 people worked below Canal Street, with nearly 200,000 people concentrated between Beekman and Beaver, and Water and Church Streets. The construction boom was to have added another 120,000 people by 1972. The Majority of these workers were in the financial community. The nation's major stock exchanges, commodity markets, commercial banks, insurance companies, major utilities, shipping companies, and many of the largest law firms all have central offices located in this area. Finance dominates the office core and will continue to do so, as long as stock trading continues to increase.¹⁰

⁹ Goldman, Tribeca Historical Aspects, Office of Lower Manhattan Development, June 1974.

¹⁰ Ibid

THE HISTORY OF AQUARIUMS

The enduring mystery of the aquatic world is a fascination that is hard to explain. It is a fascination that is dated back to the Sumarians in 2500 B.C., when ponds and pools were stocked with fish for food. It is the Chinese who are credited with engineering the home-aquarium hobby, with the domestication of carp more than 2,000 years ago, and with the developing of fancy goldfish to be kept inside porcelain vessels (during the Sung dynasty, 960-1278). The Chinese are considered the first fish watchers which today has no territorial bounds. Carp and goldfish are freshwater fish; however, the ancient Romans penned marine fish in pools connected to the sea and kept them as pets.

Although zoological parks have existed for more than 2,000 years, it was not until the middle of the last century (1853) that a fish house was opened in the Garden of Regents Park, by the Zoological Society of London. The fish house consisted of a number standing glass aquariums in a conservatory-like building, holding both freshwater and saltwater fish. The exhibit was incredibly successful and set off a craze in England for keeping fish in homes.¹¹

America was slow to follow suit, and it was not until 1896 that the New York Aquarium opened as the first permanent exhibit in the United States. There are presently well over 100 permanent exhibits in the United States.

¹¹ Bridges, The New York Aquarium Book of the Water World.
New York, 1970.

SITE

SITE

The decision to use Lower Manhattan as the site for my thesis was not a planned one. However, with the opportunity, and some initial research, the inspiration that the city generates was enough to make my decision easy. The site that I chose, Manhattan Landing, reinforced my attraction to the city. The challenge that the site provides is unquestionable. The issues that need to be responded to are clear and straightforward.

The restrictions of the site are both implied (by the issues and the previous proposals), and physical. These restrictions are covered in the programming part of this document. Due to existing conditions, the project will be built using pile and platform construction with a reinforced concrete deck. The factors limiting the construction method are the great number of subways under the East River, the higher ratio of perimeter to filled land in the East River, the speed of construction, and the consideration that platforms can be depreciated.¹²

¹² Baiter, Lower Manhattan Waterfront, Office of Lower Manhattan Development, June 1975. pp.11.



Site

CLIMATE ANALYSIS

Climate analysis for the New York area.

1. TEMPERATURE:

Highest recorded temperature is 102 degrees F ; lowest -14 degrees F. Recommended summer design temperature is 88 degrees F based on conditions occurring on exceptionally hot afternoons from May through September. Winter design temperature will be taken as 8 degrees F, a condition which is exceeded only 1% hours yearly.

TEMPERATURE DISTRIBUTION IN ANNUAL HOURS,

over 85 degrees F	3% occurring sometimes in July and August
65 - 85 degrees F	28% major summer climate
45 - 65 degrees F	32% spring and fall
25 - 45 degrees F	31% major winter climate
0 - 25 degrees F	6% occurs in December, January, and February

2. SUN:

The distribution of clear and cloudy days is fairly uniform throughout the year. Maximum amount of possible sunshine occurs in September (68%), minimum in January (53%). Solar heat can be a valuable contribution during underheated times. Shading is necessary in the hot periods. Careful balance should be established.

3. WIND:

Wind velocities are generally stable throughout the year, with 10 mph summer and 12 mph winter average speeds. Prevailing winds during underheated periods (October - April) come from the NW direction; during the overheated season they are variable from S to SW. During the hottest part of summer days the prevailing direction is south. High velocity winds (over 15 mph) are infrequent. In January and February, however NW, W, and SW strong winds occur. 40 mph wind velocities are probable in any month; velocities over 60 mph are seldom measured.

4. PRECIPITATION:

Monthly averages are fairly uniform throughout the year; varying from 3.0" in November to 4.3" in August. Greatest precipitation of 14.5" was recorded in September. Heavy cloudbursts in summer might bring 1" of rainfall in fifteen minutes, or 4" - 5" in a single day.

5. SNOW:

Design for snowfall up to 1'. Amount of snowfall varies considerably. Snow cover lasts normally only a couple of days.

6. RELATIVE HUMIDITY AND VAPOR PRESSURE:

Yearly average of relative humidity lies between 56-76%. The relative humidity is lower in the winter than in the summer, where it rises to 80% or more through four months. Vapor pressure is highest in July and August averaging 24mm Hg, but in extreme situations it rises to 24 mm Hg during these three months.

APPLICATION

HOUSING LAYOUT

1. Site selection -

Slopes East of South are preferable, similar to orientation requirements. "Warm slope" area is best, but lower and upper inclined positions are also advantageous if wind sheltering is provided. **Breeze utilization in warm periods is important.**

2. Town Structure -

An open and free layout of buildings which tend to merge with nature is preferred. Town pattern utilizes the possibilities of free arrangement.

3. Public Spaces -

Open lawns with grouped **shade trees** are desirable. **Roads are best planned in SW direction to avoid winter winds and to channel summer breezes.** Walking distances can be arranged freely.

4. Landscape -

Indoor and outdoor relationships in house design should be considered. Use of outdoor living areas can be extended for several months as **adjuncts to interior areas**, if properly designed.

5. Vegetation -

Windbreaks are desirable against winter NW wind direction. **Tree layouts, however, should not block prevailing SW summer breezes.** Evergreen trees are best for wind protection; deciduous for shading purposes. **Lawns near structure are useful for radiation absorption. Shade trees are preferred on E and W sides of residences.**

SHELTER DESIGN

1. House Types -

This region permits the most flexible arrangements. A close relationship between house and nature is desirable and possible. Unilateral buildings can be developed with relatively free formations.

2. General arrangement -

The large range of thermal conditions requires the utilization of radiation and wind effects, as well as protection from them. Hence, a dual role is required of the structure.

3. Plan -

Freedom in plan design is characterized by spatial connections of outdoor and indoor areas. **Buildings should open to S-SE and be closed on westerly sides.** Bedrooms should be located on easterly sides, open porch on S-SE side (useful 31% of year, or if glass enclosed, 61% of the year).

4. Form, Volume -

Wings protruding along the N-S axis receive less "penalty," than in other zones. Therefore cross-shaped or free building formations are possible; however, elongation in E-W axis is preferable, with the optimum shape being 1:1.6. Volume effect is not too important.

5. Orientation -

Sol-air orientation of 17 1/2 degrees E of S secures balanced heat distribution. The orientation of high buildings should be correlated with wind exposure.

6. Interior -

Provision for adequate cross ventilation is necessary. **Humidity-producing areas should be separated from the rest of the building.** Sun penetration is desirable; therefore depths of interiors should not be excessive.

7. Color -

Medium colors are advantageous; Dark colors only in recessed places protected from summer sun; light colors on roof surfaces.¹³

¹³ Olgay, Design With Climate, Princetown University Press, 1963, copied directly from page 160.

ZONING DISTRICTS

The proposed site is within the Manhattan Landing, which consists of approximately 113 acres extending along the East River waterfront from the ferry terminal to the Manhattan bridge, between the U.S. pierhead line and South Street. The site lies within this area, running along the waterfront from the ferry terminal to the Brooklyn Bridge. The entire area of Manhattan Landing is controlled by leases from the city to the developers of a lot, by the urban renewal plan, by the special zoning district, and by underlying zoning. The area between the U.S. Pierhead line is subject to federal declaration of non-navigability and a permit from the U.S. Army Corps of Engineers. The development must comply with the requirements of various city and state agencies that have jurisdiction over particular aspects of the project.¹⁴

The special Zoning districts were approved in 1973 by the Board of Estimate of the city of New York for the districts of Battery Park City and Manhattan Landing. These Districts are now incorporated in the New York City Zoning Resolution.¹⁵

Special Zoning districts are a fairly recent innovation in zoning. The first special zoning district in New York was the Theatre District incorporated in the city zoning resolution in 1967. Some objectives of the Special Zoning Districts are: to provide civic and urban design amenities; to improve the pedestrian circulation system; to increase retail shopping opportunities; to preserve parks, neighborhoods, and historic landmarks; and to control large scale development.¹⁶

The specific goals of the Lower Manhattan waterfront districts are: continuity with the existing city; efficient land use; contact with the waterfront; improved pedestrian and vehicular circulation; sufficient retail shopping and services; new residential neighborhoods; and simplicity of administration. The special districts try to accommodate the needs of a pluralistic society.

The underlying zoning designations are what establishes the basic bulk and land use requirements for Manhattan Landing,

¹⁴ Baiter, Lower Manhattan Waterfront, Office of Lower Manhattan Development, June 1975, pp. 10-23.

¹⁵ Ibid

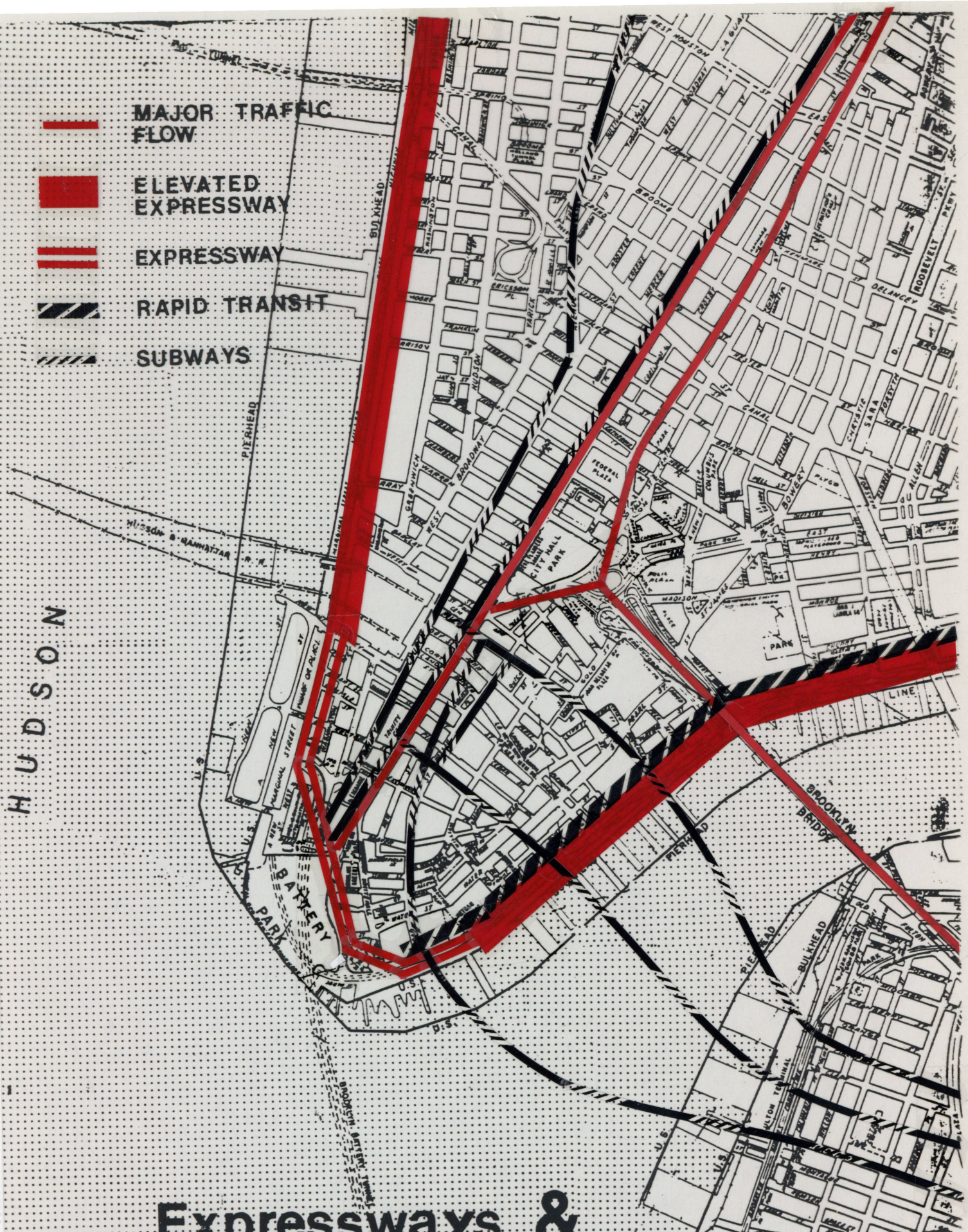
¹⁶ Ibid

rather than the Special District. Parcels which are to be devoted to recreational purposes have been zoned C2-8. Parcels intended for office or mix use have been zoned C5-3CR. Modifications of underlying zoning have been made to deal effectively with programmatic considerations and the unique character of waterfront development. These modifications to bulk, land use, open space, and parking have been accomplished through the technique of the special zoning district, which is an effective tool for relating general zoning regulations to a particular context.¹⁷

¹⁷ Baiter, Lower Manhattan Waterfront, Office of Lower Manhattan Development, June 1974.



Zoning



MAJOR TRAFFIC
FLOW

ELEVATED
EXPRESSWAY

EXPRESSWAY

RAPID TRANSIT

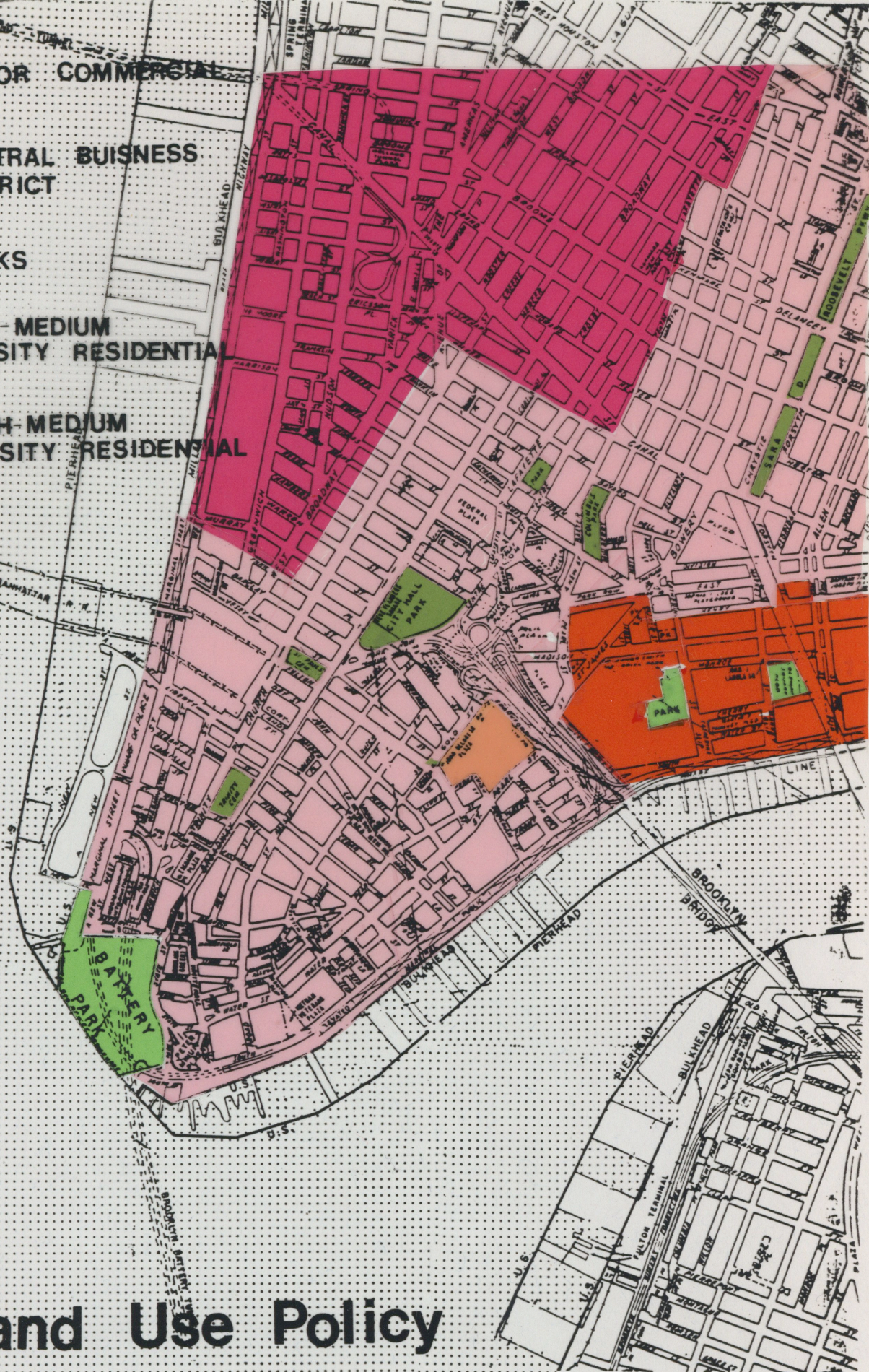
SUBWAYS

HUDSON

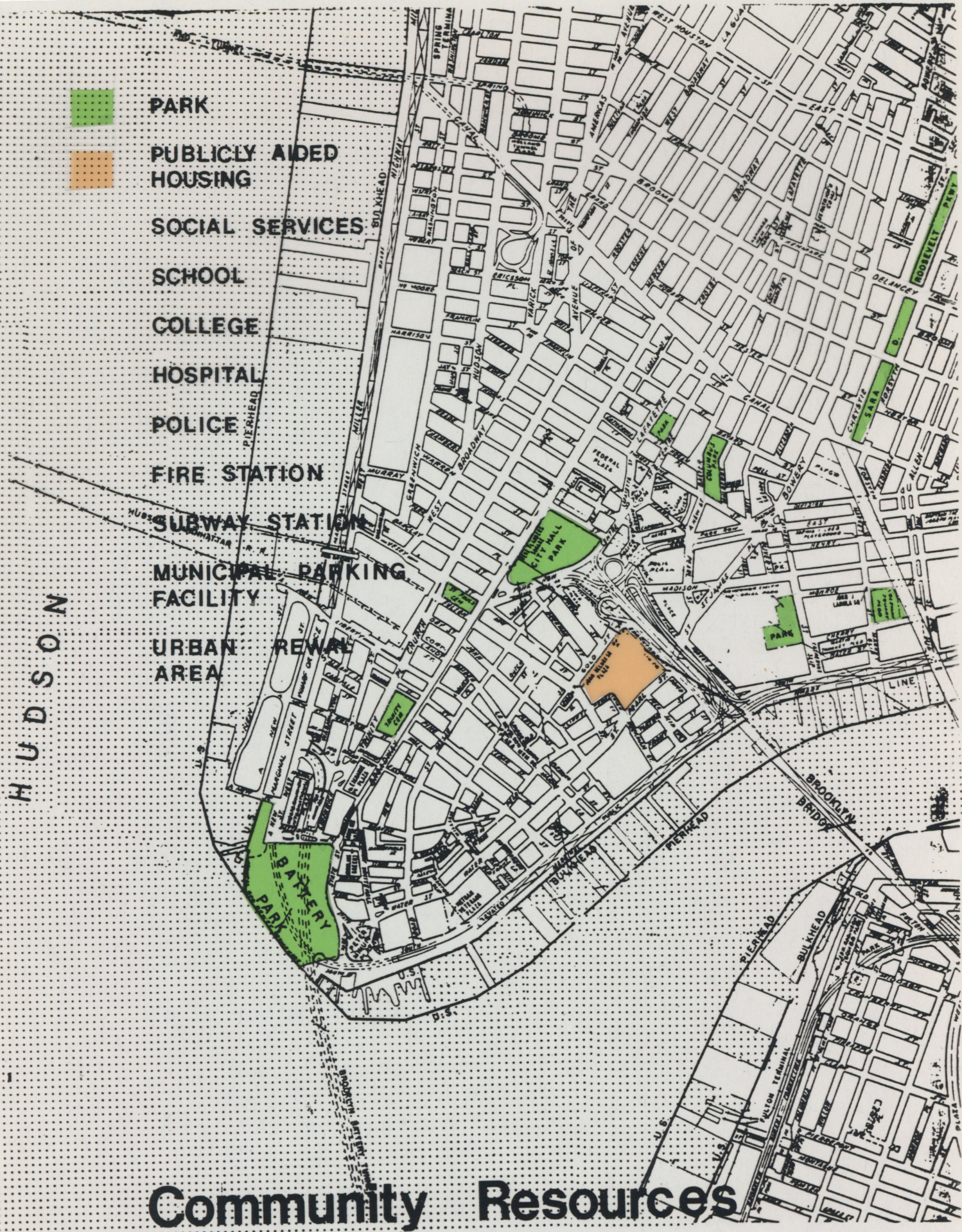
Expressways & Mass Transit

- MAJOR COMMERCIAL
- CENTRAL BUSINESS DISTRICT
- PARKS
- LOW-MEDIUM DENSITY RESIDENTIAL
- HIGH-MEDIUM DENSITY RESIDENTIAL

HUDSON

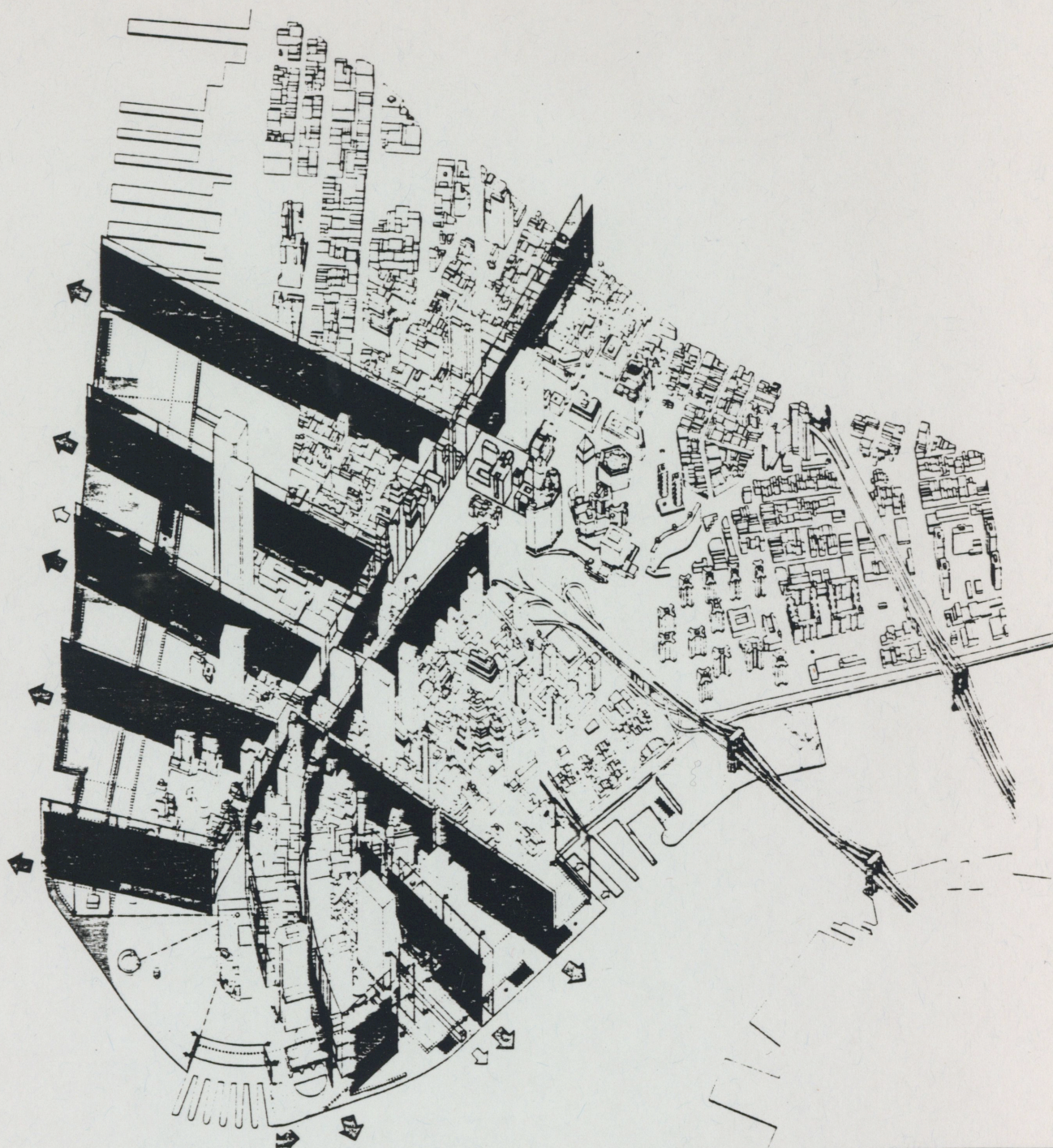


Land Use Policy



- PARK**
- PUBLICLY AIDED HOUSING**
- SOCIAL SERVICES**
- SCHOOL**
- COLLEGE**
- HOSPITAL**
- POLICE**
- FIRE STATION**
- SUBWAY STATION**
- MUNICIPAL PARKING FACILITY**
- URBAN AREA**

Community Resources



View Corridors

- 1650
- 1776
- 1850
- 1973
- 1980

Landfill





Figure Ground

CASE STUDIES

CASE STUDY 1

THE NEW ENGLAND AQUARIUM

SITING / LOCATION: Boston Harbor, Central Wharf.

FUNCTIONAL ORGANIZATION: Le Corbusiers' Museum scheme.

RATIONAL / PHILOSOPHY: "World of water as it relates to man".

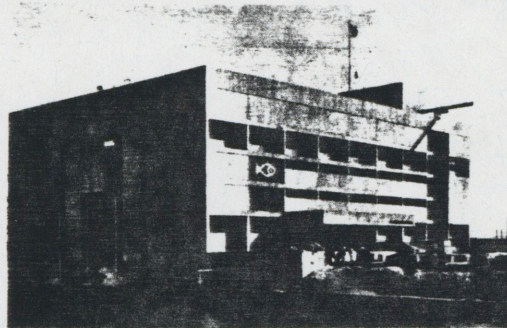
SQUARE FEET:

PEOPLE / DAY:

6000

ARCHITECTS:

Cambridge Seven and Associates



The New England Aquarium is located on Central Wharf in Boston harbor. It is along part of the waterfront that has gone through major renovation. It is one the main attractions for the "walk to the sea" which is part of the city's plan for opening the waterfront up for the public, primarily the pedestrian. The Aquarium opened up in June of 1969, and has since drawn more than 6000 visitors a day to the waterfront area. The Aquarium was designed by Cambridge Seven Associates, with a goal of creating an aquatic museum.

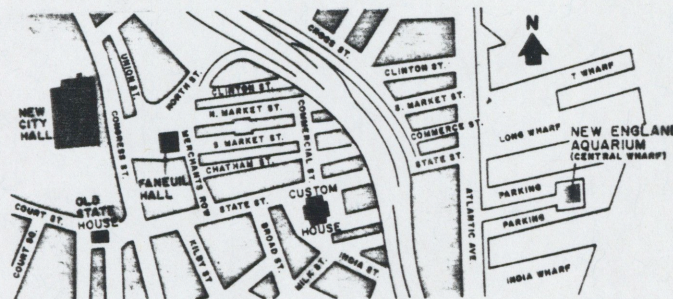
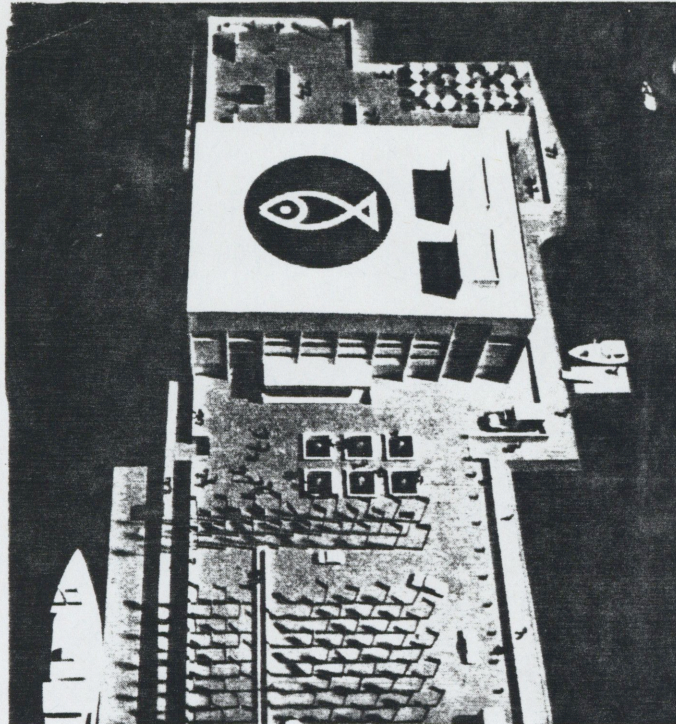
The theme of the aquarium is to display " the world of water as it relates to our communities in areas of health, recreation, aquaculture, industry and commerce, since mans proper utilization of water is crucial to his survival on this planet." This is done by the various exhibits throughout the aquarium. The exhibits represent more than 70% of the earths' surface, fresh and saltwater, from temperate to tropical to cold climates. The exhibits are on 5 levels connected by a rectangular spiral of narrow ramps on the perimeter of a rectangular plan for traffic moving upwards. It utilizes a one way flow of traffic to ensure crowds moving steadily through on overcrowded weekends, and to offer constantly changing views.

The water exhibits are alternated with graphic presentations (murals, photographs, etc.) offering an interesting visual variety for the visitor. This also provides a good opportunity to introduce the appropriate text for each display.

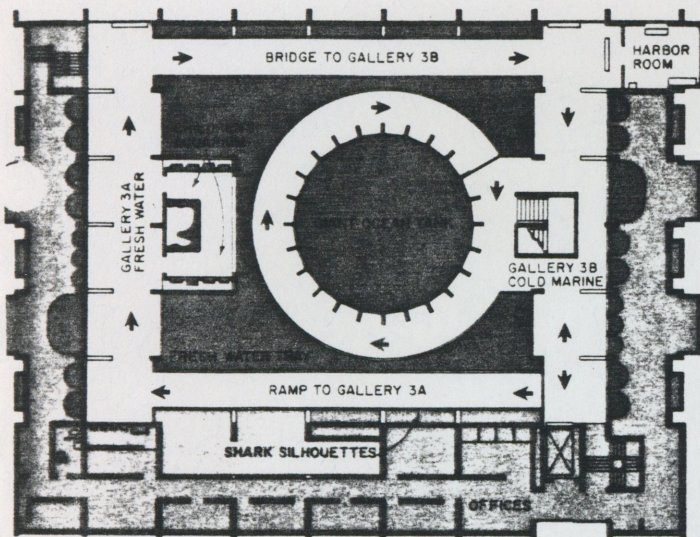
CASE STUDY 1

NEW ENGLAND AQUARIUM (continued)

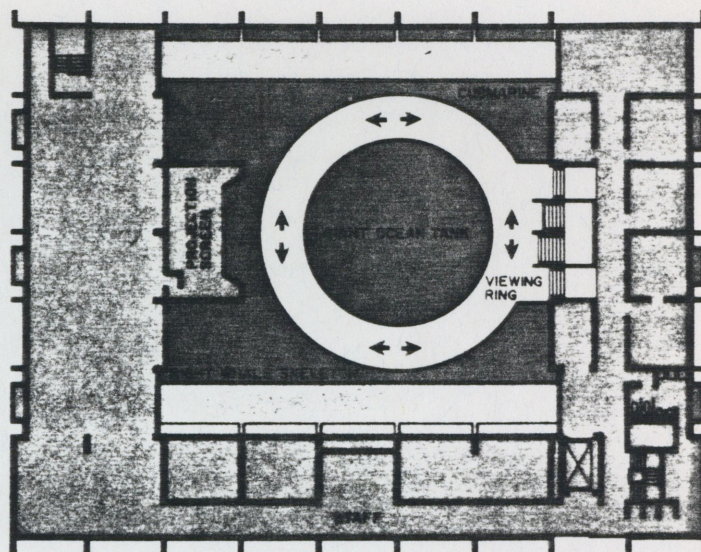
The geometry of the aquarium is a crisp, simple, and reticently sophisticated rectangular box. The poured-in-place precast concrete structure is enclosed with precast-on-site concrete panels. A large quasi supergraphic logo and a permanent overhead crane above the service stair provide pop like ornament.¹⁸



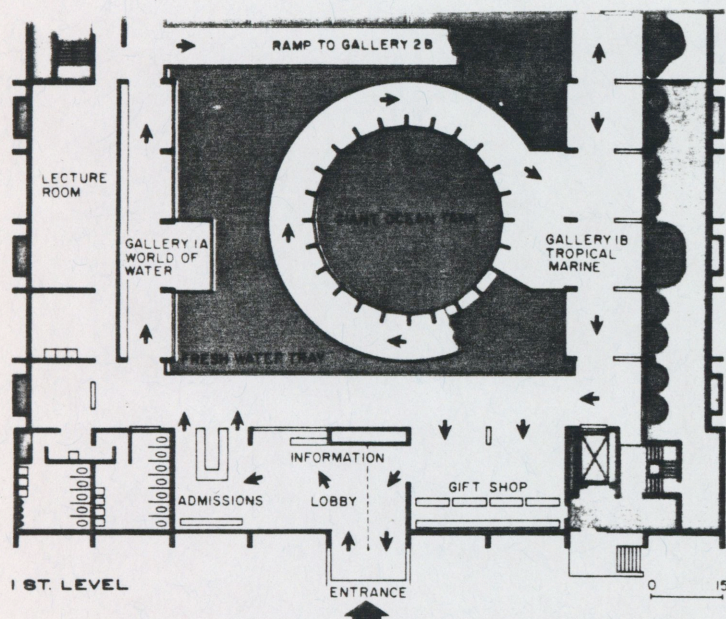
¹⁸ "Bostons Underwater Enviroment: The New England Aquarium: Cambridge Seven Associates". Progressive Architecture, 50:96-10, December 1969.



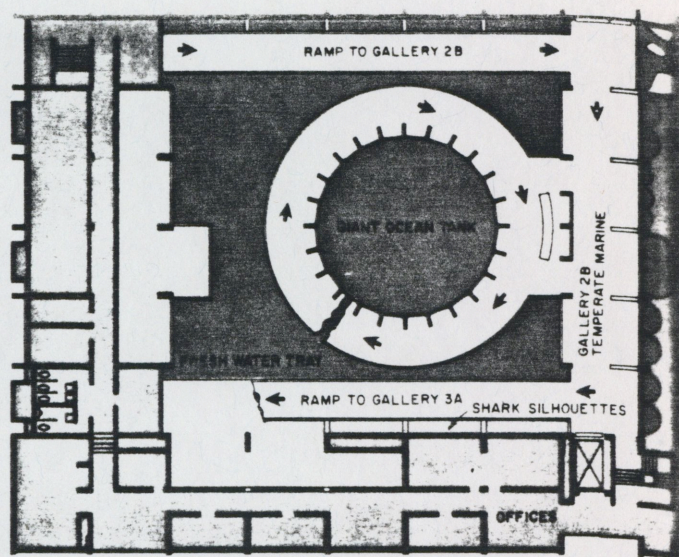
3RD LEVEL



4TH. LEVEL



1ST. LEVEL



2ND LEVEL

CASE STUDY 1
THE NEW ENGLAND AQUARIUM

PROGRAM

1-2	Entrance/Exit/Lobby/ Information	600 s.f.
3.	Admissions	400 s.f.
4.	Restrooms	600 s.f.
5.	Lecture Room	1100 s.f.
6.	Gallery 1A World of Water	1080 s.f.
6a.	Mechanical	1260 s.f.
7.	Gift Shop	600 s.f.
8.	Giant Ocean Tank four floors @ 1256 s.f.=	5026 s.f.
9.	Freshwater Tray	7200 s.f.
10.	Gallery 2B Temperate Marine	1080 s.f.
10a.	Mechanical	1260 s.f.
11.	Shark silhouettes	400 s.f.
12.	Offices	1680 s.f.
13.	Gallery 3A Freshwater	1080 s.f.
13a.	Mechanical	1260 s.f.
14.	Childrens Aquarium	1500 s.f.
15.	Harbor Room	225 s.f.
16.	Gallery 3B Cold Marine	1080 s.f.
16a.	Mechanical	1260 s.f.
17.	Staff	4200 s.f.
18.	Projection Screen	360 s.f.

CASE STUDY 1

THE NEW ENGLAND AQUARIUM PROGRAM (continued)

Total Square Feet for Functions
(exhibits, programs, support) 33,415 s.f.

Total Square Feet for Circulation 12,045 s.f.

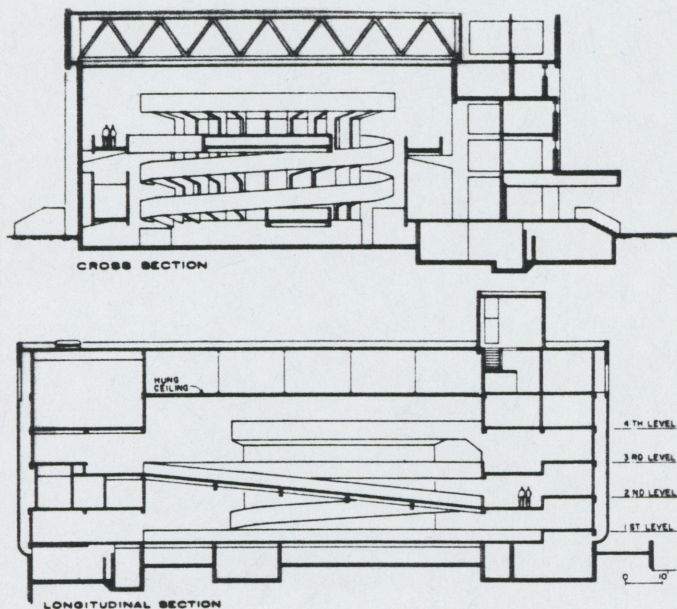
Open Space 8,000 s.f.

Total Square Feet
(including structure) 53,460 s.f.

Total square feet of tanks 18,046 s.f.

Total square feet of Mechanical 5,040 s.f.

$5,040/18,046 = 30\%$ of water s.f. = mechanical s.f.



CASE STUDY 2

THE BALTIMORE AQUARIUM

SITING / LOCATION: On the end of a pier, jutting into the the Baltimore harbor.

FUNCTIONAL ORGANIZATION: Carefully organized, one directional route. Consisting of a beginning, climax and resolution.

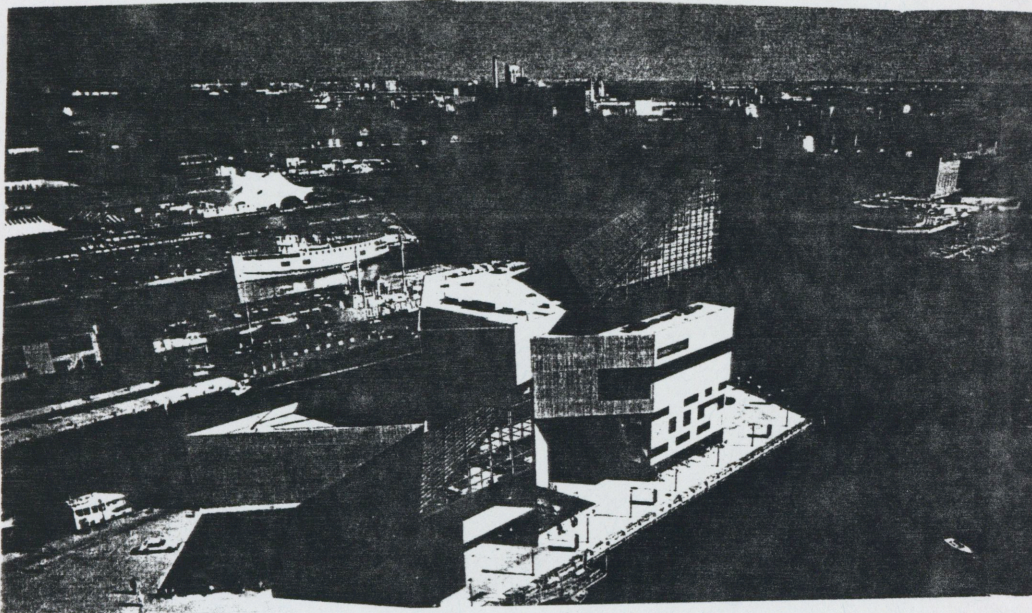
RATIONAL / PHILOSOPHY: To provoke people into thinking about the responsibility we have for what we do. Dynamism and activity of living animals with educational programs and exhibits.

SQUARE FEET:

PEOPLE / DAY:

ARCHITECTS:

Cambridge Seven and Associates



The Baltimore Aquarium is located on a very dramatic site; It is the newest attraction to Baltimores' thriving Inner Harbor. It is on the end of a pier, jutting out into the harbor. The Aquarium has a prescence that is only matched by a massive old power plant to the north.

The Baltimore Aquarium was designed for a one-directional non-detouring path for two reasons: for a more efficient use of a small amount of space and to add cohesiveness to the visit, for a visit "that is really not unlike a poem or a book" with a beginning, climax and resolution or conclusion (very similar to

CASE STUDY 2

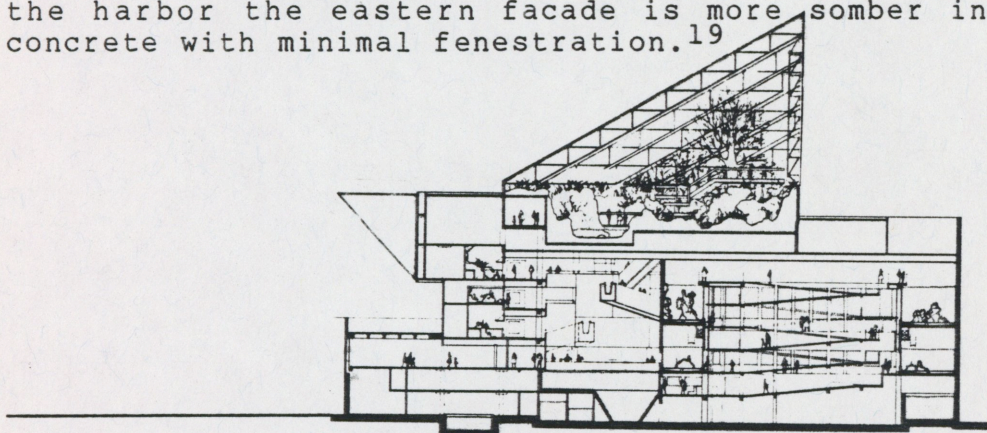
BALTIMORE AQUARIUM (continued)

the type of circulation that Cambridge Seven used in the New England Aquarium).

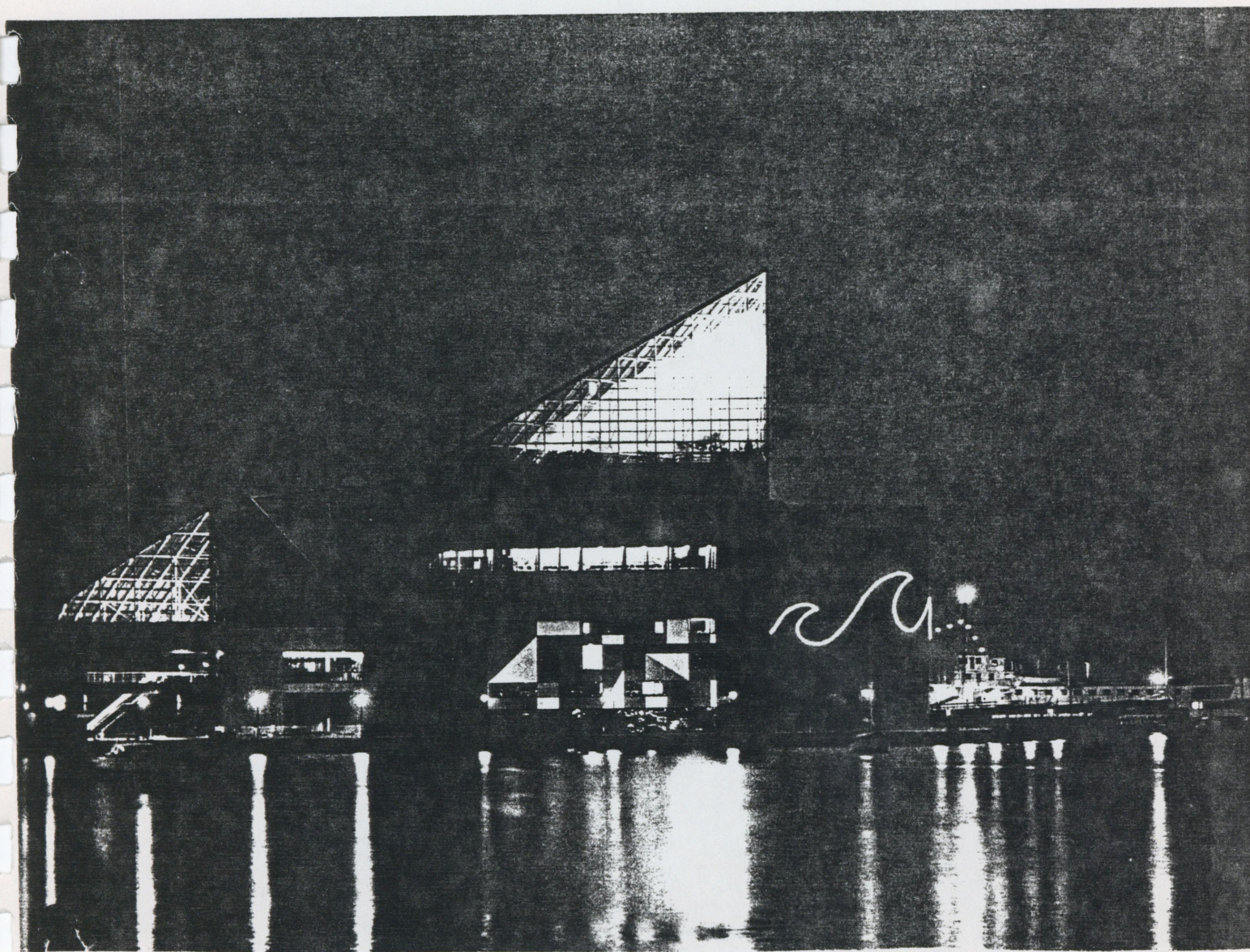
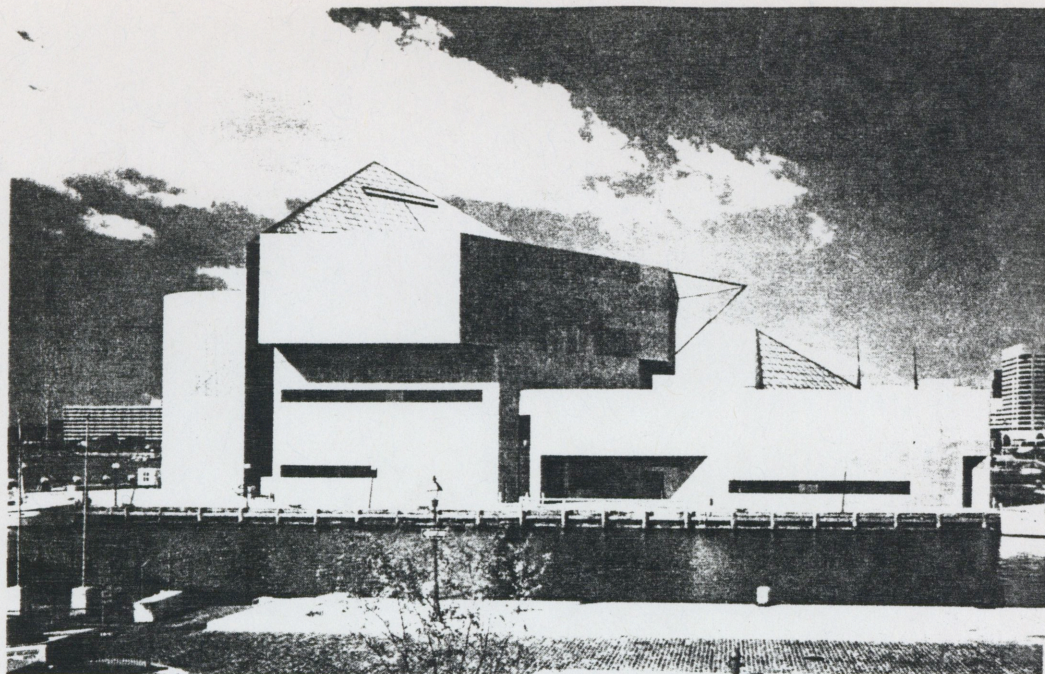
Chermayeff, the chief designer for the New England Aquarium and also the Baltimore Aquarium, wanted to introduce some fresh thinking into the museum world, and the zoo and aquarium world, by combining the educational aspects of exhibits and programs with that of live, active dynamic animals. He wanted to build exhibits where people could really get close to unique ocean environments.

The Baltimore Aquarium also attempts to present a balanced view of environmental preservation. It tries not to be exaggerated or extreme in its point of view, on economic interest, or disappoint those people who are very concerned with increasing the public awareness of the fragility of natural systems. The aquarium advertises recreation: however, it is the education the visitors leave with that they feel is important. The aquarium also has a future goal to incorporate research into its program.

The aquarium "reaches out to the sea" with a thrusting glass pyramid. The large pyramid shelters a tropical rainforest and is repeated as a canopy over the entrance. Both are echoed by a bright orange pipe sculpture located next to the small pyramid. The two pyramids sit atop the buildings concrete base; on the western facade the area underneath them is smooth plywood-formed concrete painted a deep blue to articulate the glass forms and give them a base. To create a festive image the blue panels are decorated with brightly colored squares resembling signal flags. While this western facade reflects the "recreational" image of the harbor the eastern facade is more somber in its unadorned concrete with minimal fenestration.¹⁹



- ¹⁹ Freeman, A. "National Aquarium: Baltimores Inner Harbor". Gaskie, M.F. "National Aquarium in Baltimore: Cambridge Seven Associates". Greer, N.K. "Another Powerfull Harborside Attraction: The Cambridge Seven National Aquarium in Baltimore". "Citation: Architecture Design [Baltimore Aquarium]".



CASE STUDY 3

THE MONTEREY BAY AQUARIUM

SITING / LOCATION: Waterfront on Monterey Bay in Monterey, California. Previous site of Hovden Cannery.

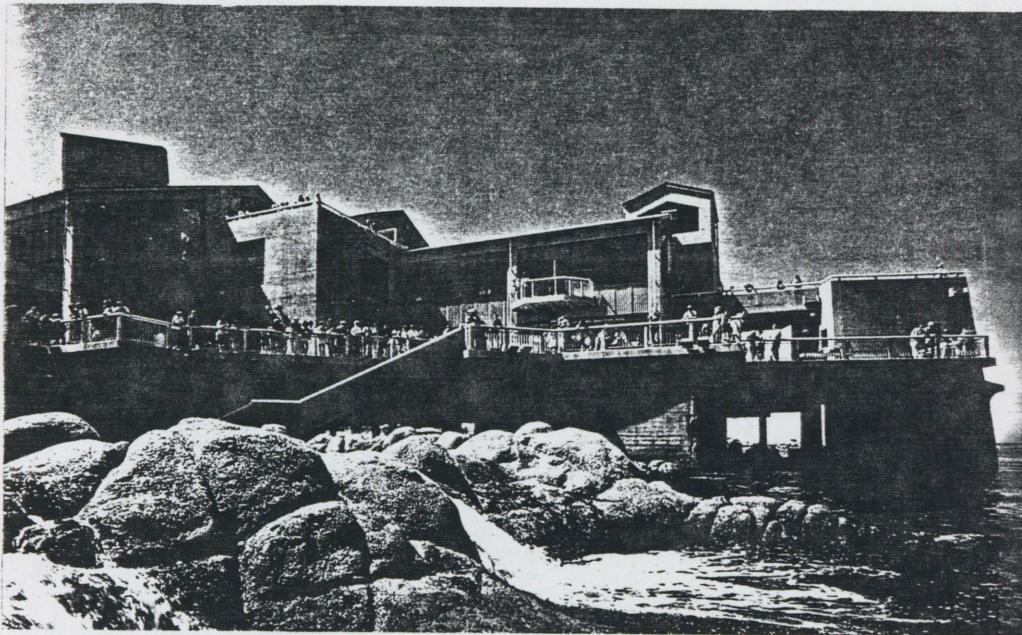
FUNCTIONAL ORGANIZATION: Movement random and unobstructed.

RATIONAL / PHILOSOPHY: Focuses specifically on diverse marine habitats found in Monterey Bay itself, and doesn't just exhibit them it wants to you experience them.

SQUARE FEET:

PEOPLE / DAY:

ARCHITECT:



The Monterey Bay Aquarium is located on the waterfront of Monterey Bay in California, situated on the former site of the Hovden Cannery. Monterey is also the setting for John Steinbecks novel Cannery Row. Stanford Universities Hopkins Marine Station , an educational and research facility, is also located nearby.

The organization of the interior displays is random and unobstructed. A tightly ordered circulation sequence was not desired by the client or the architect. The Aquarium contains two

CASE STUDY 3

MONTEREY BAY AQUARIUM (continued)

classrooms and an auditorium. Teaching materials and instructors are provided for visiting classes. Elsewhere education is less formal but no less effective. Life size imitation whales, dolphins, sea lions and seals are displayed in the Marine Mammal Gallery. Graphic displays and video programs explain why the bay is such a haven for such creatures.

The main concept behind the Aquarium was to provide an environment in which the visitor could experience as well as look at the marine animals of Monterey Bay. It blends education with entertainment, of which the hands on pools are a good example of this. The theme of the Aquarium is to promote public knowledge of the dynamic and fragile marine world.

The original plan was to recycle the original Hovden Cannery building which was owned and being used as a warehouse by Hopkins. After an initial investigation it was determined that the building was in too poor of condition to use. The decision was to tear down the old building and replace it with one as much like it in appearance as possible. The factory loft-like spaces easily accommodate the huge fish tanks, laboratories, classrooms, dining facilities, technical backup spaces and vast mechanical equipment areas that the aquarium requires. The open, airy three story building followed the footprint of the old cannery and recalled its massing, proportions, roof pitches, building materials and structure in order to achieve the characteristics of the bay area.²⁰



²⁰ Ellis, J. "Cannery Show". Knight, C. "Purposefull chaos on Cannery Row: Monterey Bay Aquarium". Schermtz, M.F. "Monterey Bay Aquarium, Monterey, California".

CASE STUDY 3**THE MONTEREY BAY AQUARIUM****PROGRAM**

1.	Administration	2500 s.f.
2.	Tickets/Entry/Side	3100 s.f.
3.	Gift and Bookstore (restrooms)	4900 s.f.
4.	Auditorium	4500 s.f.
5.	Sea Otters	3000 s.f.
6.	Marine and Mammal Hall	4800 s.f.
7.	Classrooms 2 @ 1200 s.f. =	2400 s.f.
8.	Cafe	3000 s.f.
9.	Kithchen	2200 s.f.
10.	Shipping and Receiving	1000 s.f.
11.	Old Boilerhouse Courthouse	2400 s.f.
12.	Octopus and Kin	1750 s.f.
13.	Deep Reefs	700 s.f.
14.	Kelp Forest	2800 s.f.
15.	Sandy Seafloors	1200 s.f.
16.	Monterey Bay Exhibit	
17.	Shale Reefs	
18.	Pelagic Reefs	
19.	Wharf	3200 s.f.
20.	Slough	700 s.f.
21.	Dunes and Marshes	1400 s.f.
22.	Bat Rays	700 s.f.
23.	Rocky Shores	1500 s.f.
24.	Hands-on-Pool	200 s.f.
25.	Wave Crash	1500 s.f.

CASE STUDY 3**THE MONTEREY BAY AQUARIUM
PROGRAM (continued)**

26. Tide Pools	1200 s.f.
27. Pumphouse	400 s.f.
28. Waterfall	800 s.f.
29. Trout stream	1200 s.f.
30. Theatre	1600 s.f.
31. Greater Tide Pool	4000 s.f.
32. Mechanical	10,000 s.f.

Total area of Tanks	25,850 s.f.
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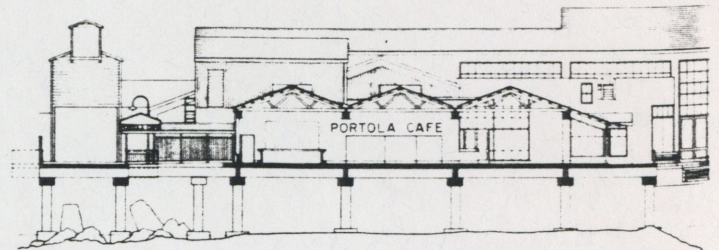
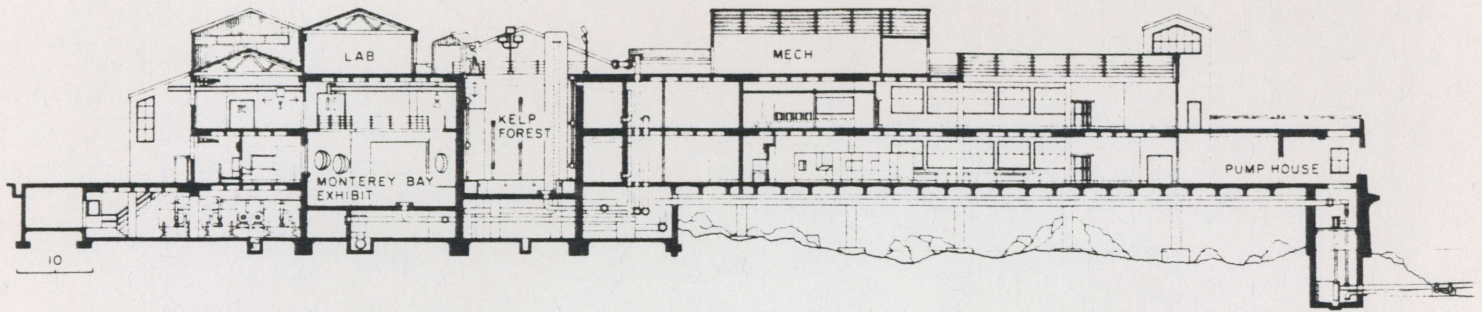
Total area of Mechanical	10,000 s.f.
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10,000/25,850 = 40 % of water s.f. = mechanical square feet

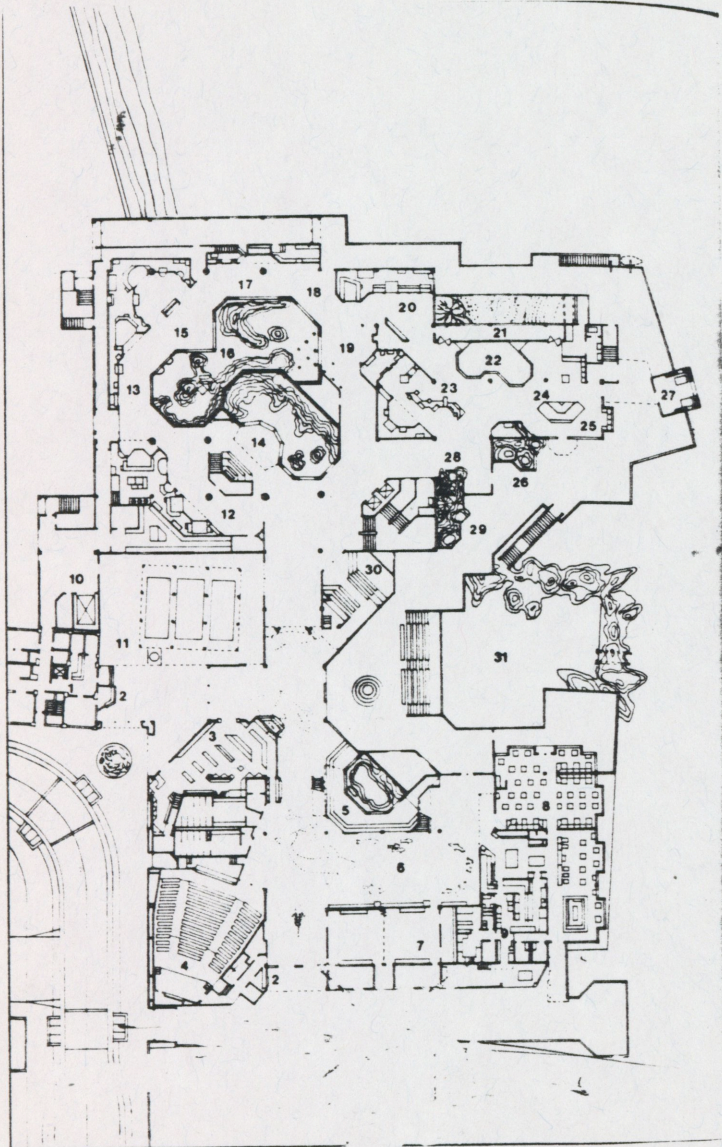
Total Square Feet for Functions . (exhibits, programs, support)	56,250 s.f.
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Circulation	57,150 s.f.
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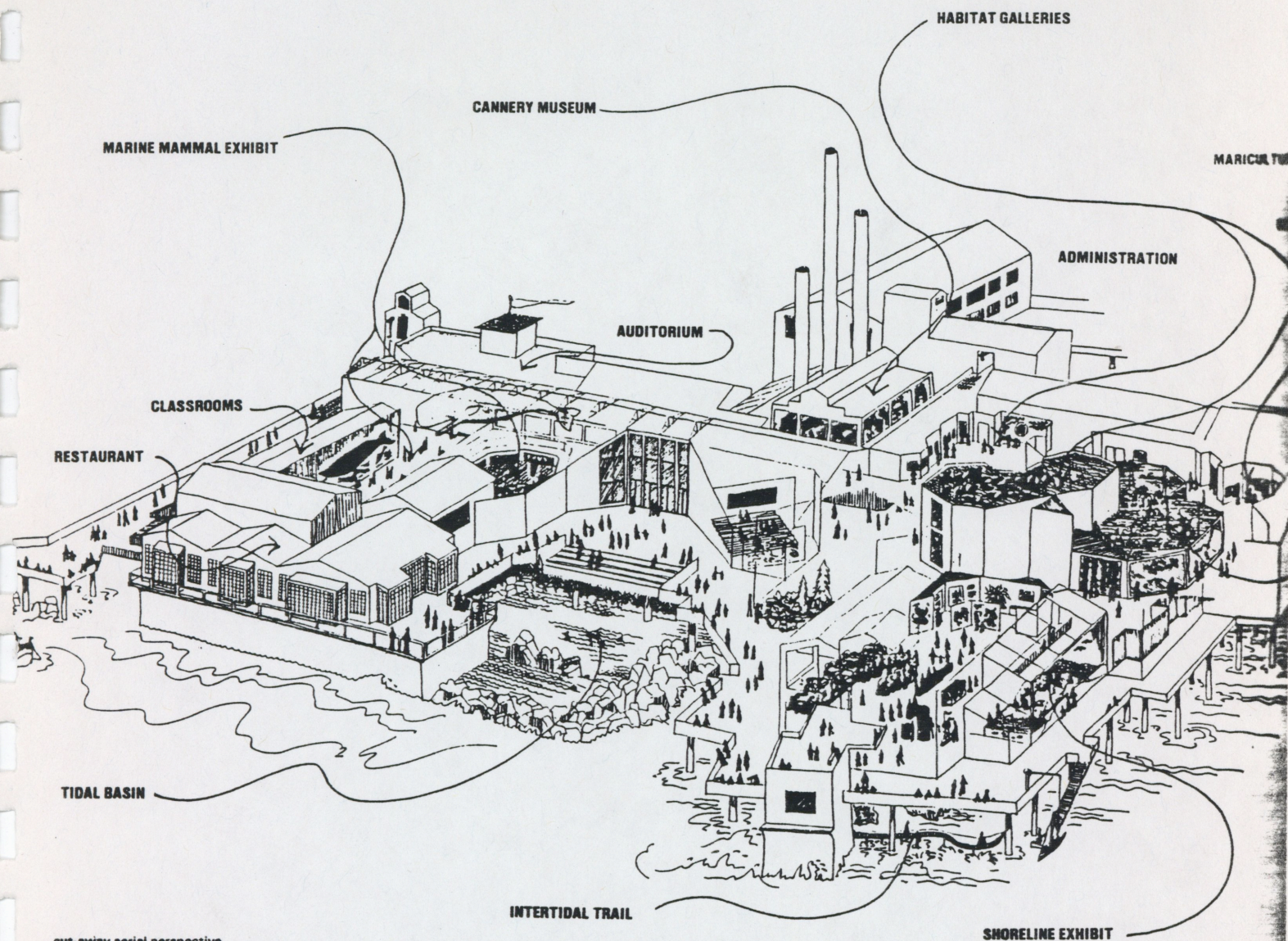
Total Square Feet Main Floor	113,400 s.f.
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Adapted from drawing by Jim Latt



- | | |
|-------------------------------|-----------------------|
| 1. Administration | 17. Shale reefs |
| 2. Tickets | 18. Pelagic fishes |
| 3. Gift and bookstore | 19. Wharf |
| 4. Auditorium | 20. Slough |
| 5. Sea otters | 21. Dunes and marshes |
| 6. Marine Mammal Hall | 22. Bat rays |
| 7. Classroom | 23. Rocky shores |
| 8. Cafe | 24. Hands-on pool |
| 9. Kitchen | 25. Wave crash |
| 10. Shipping and receiving | 26. Tide pools |
| 11. Old boilerhouse courtyard | 27. Pumphouse |
| 12. Octopus and kin | 28. Waterfall |
| 13. Deep reefs | 29. Trout stream |
| 14. Kelp forest | 30. Theater |
| 15. Sandy seafloors | 31. Great tide pool |
| 16. Monterey Bay exhibit | |



cut-away serial perspective

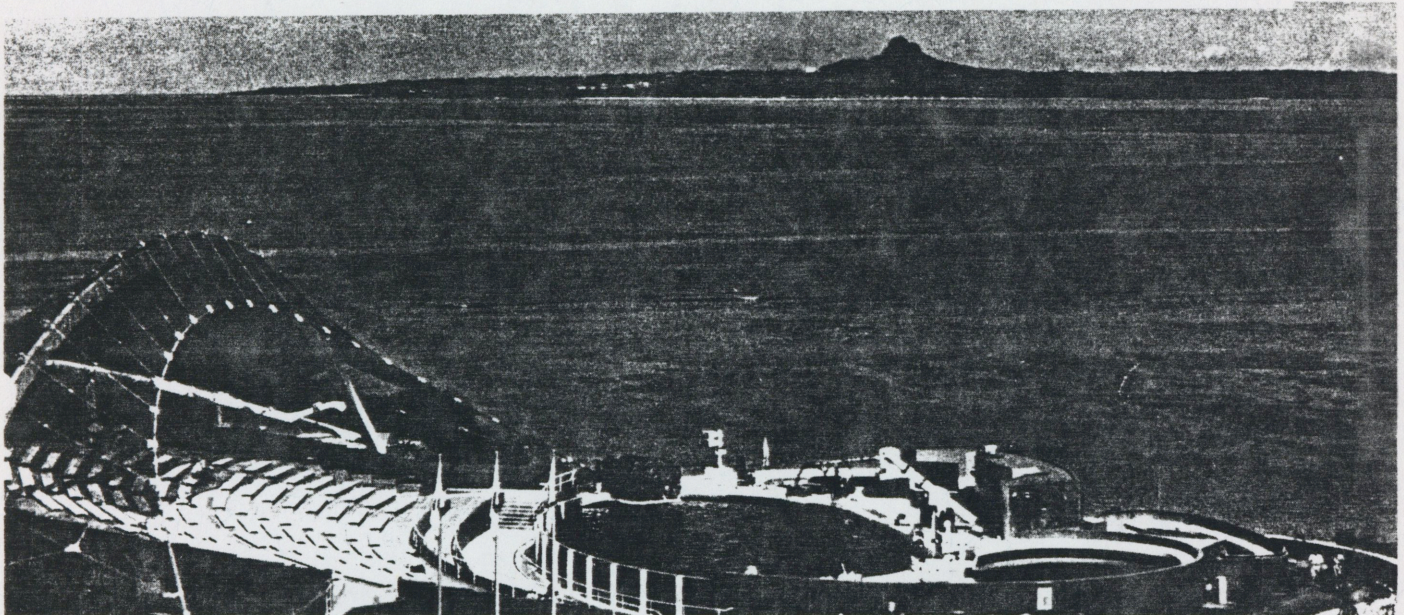
22|3



CASE STUDY 4

THE NATIONAL AQUARIUM AT OKINAWA

SITING / LOCATION:	International Ocean Exposition 1975, Okinawa, Japan.
FUNCTIONAL / ORGANIZATION:	Fluid arrangement of space.
RATIONAL / PHILOSOPHY:	Naturalness of context, not superclassification of curators.
SQUARE FEET:	
PEOPLE / DAY:	
ARCHITECT:	Fumihiko Maki



The National Aquarium at Okinawa was the only permanent facility in the National Ocean Exposition of 1975, it occupies a narrow north-south site between a rocky shoreline and a steep, verdant rise. It is a "path of shade" as Maki describes it, using a two level arcade as a sun and wind breaker, thus determining the buildings major expressive element and defining its professional nature.

The spectator's areas inside, show actual biological groupings within some of the worlds largest fish tanks. Lining the tanks, which viewed through expansive panels of frameless acrylic are comfortable carpeted lounges, bathed in background

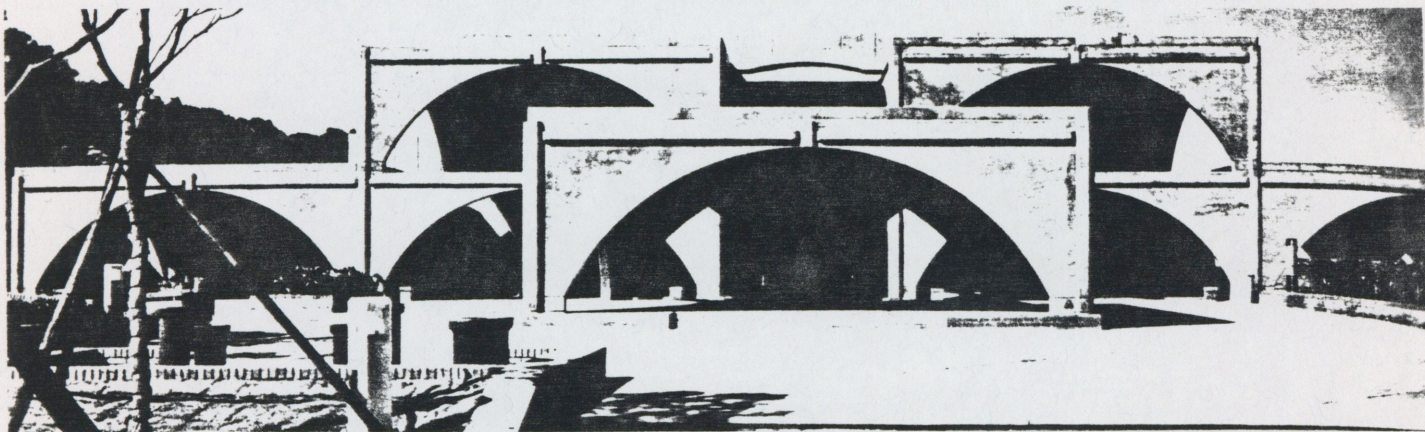
CASE STUDY 4

THE NATIONAL AQUARIUM AT OKINAWA (continued)

music, where visitors can contemplate the spectacle amidst subdued colors. These exhibits are a cause of reflection in a visual sense, too, as the corridors and lounges with their lighting and finishes pick up the effvanescent play of light , water, and marine life within the tanks. Visitors are further schooled by specific exhibits in the areas around the tanks each concentrating on a particular species, set of interacting species or patterns of biological and social behavior. The fluid arrangement of spectator space avoids the familiar exhibition fallacy of people bunching together around repetitive little windows in order to get a glimpse of one fish or another taken out of its' larger environmental context. What one experiences is an immersion in what is real - not an artificial rendition - to the extent that the displays have an almost surreal impact on the senses.

The arcades set up a lyrical rhythm, they are composed of concrete that expresses the dry jointed juncture of precast, three hinged parts. This geometry is followed throughout the main aquarium. Outside and to the south of the main building is Dolphin Land, which is composed of the Dolphin Theatre (Okichan) and the Dolphin Pool which is protected with a fish net canopy that is suspended from a simple bow-shaped arch.

The general scale of specific detailing of the structure is meant to evoke the characteristics of local custom and culture. The external wall surfaces are painted amber, similar to many Okinawan homes. The rounded tile-covered handrails pickup the designs of local lineage. There are fierce lion statues guarding either side of the entry in the plaza at the northern end of the complex. The bow shaped roof and the play of arches go back to the traditional use of such formal themes.²¹



²¹ "National Aquarium at Okinawa", "Aquarium: F. Maki", "National Aquarium: International Ocean Exposition, Okinawa, 1975", "Aquarium National, Okinawa".

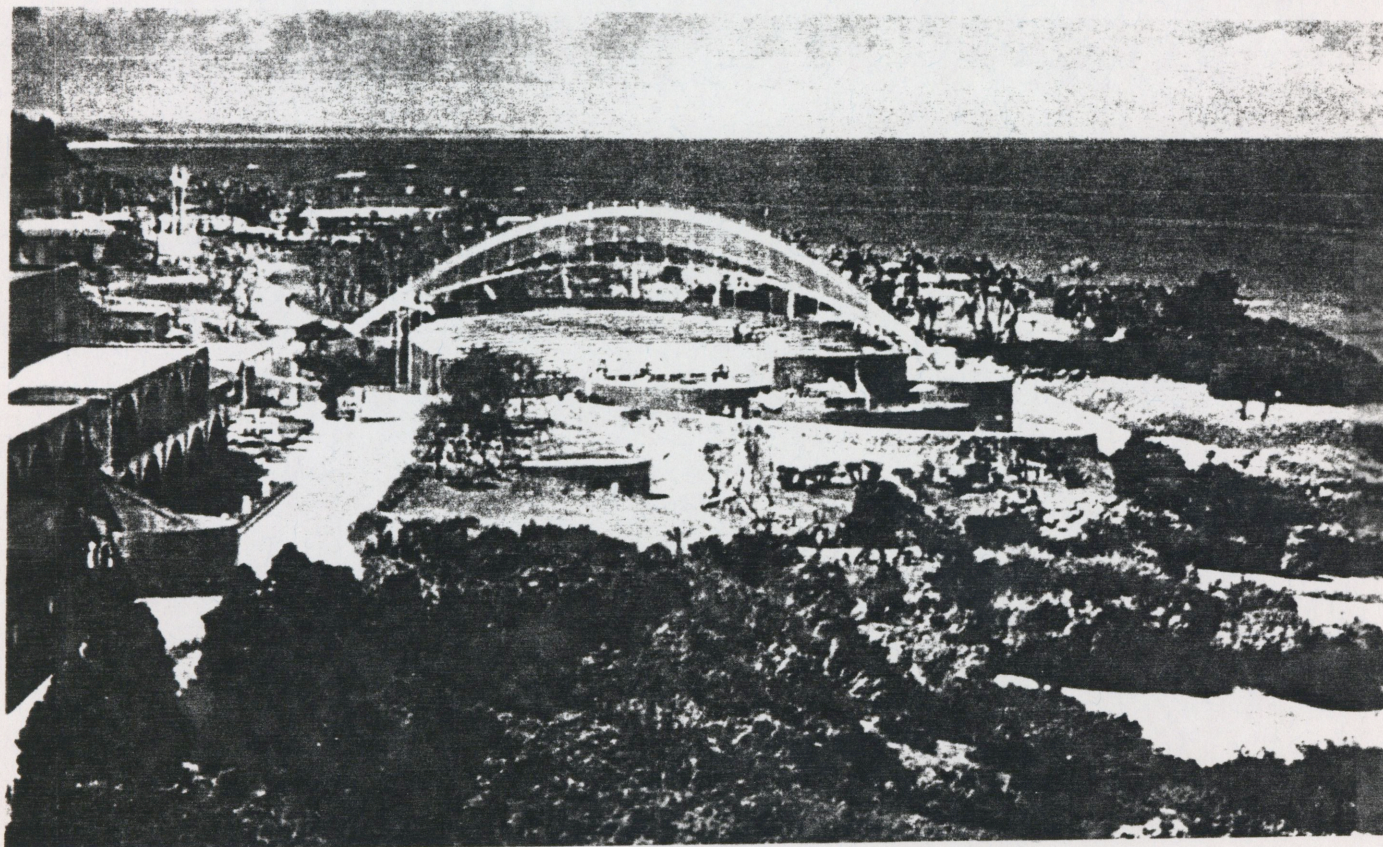
CASE STUDY 4**THE NATIONAL AQUARIUM AT OKINAWA****PROGRAM**

1.	Machinery Room	10,000 s.f.
2.	Trench	5,600 s.f.
3.	Alcove	2,640 s.f.
4.	Main Hall	8,000 s.f.
5.	Terraces	3,200 s.f.
6.	Entrance	1,600 s.f.
7.	Cylindrical Water Tank 2 @ 800 s.f.=	1,600 s.f.
8.	VIP Lounge	2,000 s.f.
9.	VIP Anteroom	600 s.f.
10.	Support	4,000 s.f.
11.	Service Yard	1,600 s.f.
12.	Coral Sea	1,500 s.f.
13.	Current Sea	3,500 s.f.
14.	Machinery Room	5,400 s.f.
15.	Support	4,800 s.f.
16.	Lounge	8,800 s.f.
17.	Offices	4,800 s.f.
18.	Anteroom	1,500 s.f.
19.	Machinery Room	5,400 s.f.
20.	Offices	3,000 s.f.
21.	Spare water storage	11,200 s.f.

CASE STUDY 4

THE NATIONAL AQUARIUM AT OKINAWA PROGRAM (continued)

TOTAL SQUARE FEET FOR FUNCTIONS	79,540 s.f.
TOTAL SQUARE FEET FOR CIRCULATION	107,060 s.f.
TOTAL SQUARE FEET	186,600 s.f.
TOTAL SQUARE FEET FOR TANKS	23,400 s.f.
TOTAL SQUARE FEET FOR MECHANICAL	20,800 s.f.
$20,800/23,400 = 88\%$ Mechanical s.f. per Water s.f.	
Okichan Hall small theatre, and live underwater shows.	15,000 s.f.
Dolphin Pool pools for performance and living, with outdoor amphlitheatre.	25,000 s.f.



PROGRAM

1. GOALS - WHAT WE WANT TO ACHIEVE AND WHY.

FUNCTION:

PEOPLE

Interaction - public/residents/visitors/workers

Pedestrian circulation - waterfront continuity,
improved path system, visual connection
w/downtown, pedestrian connection w/
downtown.

Activities - 24 hour community activity, visitors
and residence can take some of the shops
and restaurants dependency off the lunchtime
trade. Increasing recreational and
cultural activities to draw residents,
visitors and workers.

Vehicular - improving streets and parking facilities
for easier accessibility.

ACTIVITIES

Aquarium - aquarium: provide residents, visitors,
workers (lunchtime), w/permanent exhibits,
a research center, special exhibits.

Shopping/Retail - create diverse, interesting and
active environment.

Restaurants - provide support services to workers,
residents, and visitors.

Waterfront Esplanades - provide visual and physical
connection w/downtown.

Ferries/cruise - help support 24 hour community by
drawing activity.

RELATIONSHIPS

Experiences-

Visual importance - waterfront
w/downtown

Pedestrian importance - downtown
w/water-front

Waterfront circulation - pedestrian
and vehicular

4. GOALS

TIME:

Past -

Respond to waterfront historical aspects.

The impact of the waterfront on the growth of Manhattan, and the significance of it on the character of the area.

Present -

To provide a continuous and inviting waterfront experience for the pedestrian that has visual and physical connections with the core of lower Manhattan. Developing the area from Battery Park to the north side of the Brooklyn Bridge.

To allow for the continuity of the city by relating to the massing, the waterfront, and the visual and physical corridors of the area.

Future -

Create an inviting environment for retail, pedestrian, workers, visitors, and residents to stimulate the growth while retaining the New York waterfront "experience".

To provide an attraction to lower Manhattan that would add to the cultural, recreational and the variety of the city.

2. GOALS

FORM:

Site -

To provide access to waterfront.

To respond to waterfront architecture and massing.

Open areas: To create visual and physical connection w/downtown core. To provide recreational and leisure areas with an inviting atmosphere.

Careful land use, through effective design controls, land in this area is a very scarce and important commodity so it should be exploited for the public's benefit.

Environment -

Efficient land use through multiple objectives. Because land is such a scarce commodity, in order to justify a development, it will have to accommodate and service many people and activities.

Bulk placement sensitively responding to urban design considerations, bulk used to define public places, frame views and to ensure physical as well as visual connections.

Quality -

Continuity of existing city, streets circulation routes, from Manhattan.

Respecting dominant open spaces and street patterns, and selectively relating to height and massing of existing buildings.

To correspondence between the old and the new.

3. GOALS

ECONOMY:

Initial Budget -

The initial budget of the aquarium development will not have any financial limitations placed on it. The need for such a cultural, recreational, and research center in this area would have more than ample user support and provide such a draw for the local community as well as the city that an extravagant budget could be justified. The increase in the activity would also help alleviate the dependence of the local merchants on the lunch and regular customers. The funding of an extravagant budget could in all probability be financed partially through the city and also through affiliated university and private investors.

Operating Cost -

The operating cost ideally would be minimal. Having the aquarium used as a research center would allow student help and in theory the aquarium would be self-supporting through the revenue generated by the visitors to the aquarium exhibits, shows and museum.

Life Cycle Cost -

Because of the tremendous impact the development would have on the surrounding community and the positive effect on the city, determining the life cycle cost of the development would not be significant because of the numerable unaccounted for aspects that the project would create.

1. FACTS-

FUNCTION:

People- Residents (Stats.)
Workers (Stats.)
Visitors (Stats.)
User characteristics, (use
South Street Seaport as reference).
Pedestrian (Maps)
Vehicular (Maps)
Land use (Maps)
- Recreation
- Commercial
- Retail

Activities-

Aquarium Case studies:
-Baltimore
-Boston
-Okinawa
Increase activity = growth in economy.

Water sport / activities increase. Ferry
activity increase, dinner / lunch / tour
cruises.

Shopping, attract local residents as
well as visitors and lunch crowd.

Night life will provide draw for
24 hour community.

Relationships-

Analysis of:
Waterfront circulation(vehicular
and pedestrian)
Waterfront visual connection
with
Downtown (analysis map)

1. **FACTS** (continued)

Relationships-

Analysis of:

Waterfront pedestrian connection
with
Downtown (analysis map)

Vehicular circulation analysis

- parking
- accessibility

2. FACTS

FORM:

Site- Site analysis

-wind	-views
-temperature	-access and egress
-constraints	-size and capacity
-contours	

Climate analysis

Zoning- form giving significance

Environment- Implications

- Character overview (N.Y.C.)
- Night life (L.M.)
- Existing activities (M.)
- Waterfront Activities (L.M.)
- New York, New York.
- Analyze materials of surrounding and local areas for possible influence.

Quality-

Contextual considerations

1. Waterfront
2. Aquarium
3. New York

Analyze psychological implications of form on the movement of people and vehicles.

3. FACTS

ECONOMY:

Initial Budget-

Use as design considerations:

- Time Use Factors
- Market Analysis

Operating cost-

Analyze the alternative costs for all energy sources.

Analyze the climate factors, the wear and tear level of activities and their implications on material choices.

Life cycle Cost-

4. FACTS

TIME:

Past- Waterfront significance, historical research.

Aquariums historical research.

New York City historical research.

Present-

Economic impact on the area.

Social impact on the area.

Visual impact on the continuity of the city.

Future-

Continuity of the city.

1. **CONCEPTS** - uncover and test.

Function:

People- People grouping

- aquarium determines each area (functions) optimum group size from case studies and design considerations.
- open areas determine desired grouping and ideal conditions from analysis and existing surrounding examples.
- esplanade design for maximum visual and physical connection for the pedestrian, with minimum space requirements satisfied.
- make retail as accessible as possible from pedestrian path network for maximum interaction and activity.
- new ferry service should be designed with the pedestrian and the vehicle arrival taken into consideration and adequately provided for.
- all restaurant and night life establishments should incorporate all retail considerations and use surrounding in designing for the pedestrian.

Activities-

Prioritize the importance of the activities based on social value, continuity with existing city, and impact on the community (because of the nature of this program the number one priority is the aquarium).

Create efficient and effective relationships through the interaction of the different activities all enhancing the "waterfront experience".

Security for each part will have to be evaluated based on potential loss: maximum, medium, or minimum required (this applies to the overall development as well as the individual pieces.)

1. CONCEPTS (continued)

FUNCTION:

Activities-

Flexibility

- the aquarium shall incorporate flexible design concepts in the visiting and temporary display areas, providing a versatile and convertible exhibit space.
- the open spaces shall be flexible in design to allow for a wide range of activities (impromptu concerts, planned events, street vendors, etc.)
- The retail space shall be versatile, convertible and flexible to provide for a wide variety of retail spaces.
- the esplanade should be designed with some flexibility in order to accommodate the street activities that occur, (musicians, vendors, etc.)
- flexibility in the ferry/cruise is important for the accommodation of the patrons.

Sequential Flow

- in terms of the aquarium this is a very important design consideration that should be well researched and analyzed in order to design an appropriate solution.
- this concept is of major importance for the esplanade design.

Separated Flow

- the aquarium shall utilize separated flow in isolating the employees and service functions from the public and visitor areas.

1. **CONCEPTS** (continued)

FUNCTIONS:

Activities

Mixed Flow

- the esplanades, and through the retail areas is where the mixed flow could be incorporated in the design, combining service traffic along with the pedestrian. Multi-directional and multi-purpose traffic should be a design consideration.

1. **CONCEPTS** (continued)

FUNCTION:

Relationships-

Understand the organizational concepts and the functional relationships.

Separate vehicular and pedestrian traffic.

Allow street access for pedestrians to the retail areas.

Allow public access to the waterfront whenever possible.

The massing and bulk placing of the development should respond to the surrounding area.

The project should respect the dominant open spaces, street patterns, height and massing of existing buildings, and circulation routes and respond accordingly.

2. CONCEPTS

FORM:

Site- Reinforce the waterfront accessibility to the public.

Respond to surrounding waterfront architecture, massing, and city.

The orientation of the development should respond to the city.

Environment-

Climate control:

- the aquarium will definitely require a controlled climate.

- the open spaces will have a percentage of protected areas.

- the retail will have a percentage of protected areas (arcades).

- the ferry/cruise service will have a controlled climate for the comfort of the visitors and patrons.

- evaluate climate analysis and draw implications.

Quality- Character of the development shall have a significant impact on the quality. This includes the esthetics as well as the contextual appropriateness.

The accessibility to the pedestrian shall effect the quality of the development, and promote a sense of entry and arrival.

The interdependence of the project as a whole as well as part of the city shall effect the quality of the development.

Relate the project to the quality of its surroundings and to its function.

3. CONCEPTS

ECONOMY:

Initial Budget-

By having a large initial budget the choice of materials can be chosen to maximize the life cycle/cost ratio. This would also increase the marketability of the project since the area is receptive to high quality.

Operating Cost-

The large initial budget would also cut the operating cost down with less maintenance, and by using superior quality mechanical equipment operating costs would also be minimized.

Life cycle Cost-

By designing for adaptability the retail/office spaces would be ensured of a minimal life cycle cost and would thus help to justify the large initial budget.

4. CONCEPTS

TIME:

Past-

Respond to the "Waterfront Experience":

- Public access
- Visual Corridors
- Continuity of the City

Present-

Allow pedestrian, visual and physical experience of the waterfront. Do not alienate the development from the downtown of lower Manhattan invite participation and allow penetration.

Future-

1. NEEDS

FUNCTION:

- People- Space Requirements
- Aquarium itemized partially based on case studies.
 - A. Parking requirements
 - B. Outdoor space
 - C. Building efficiency
 - D. Functional alternatives
 - Retail/Residential use Manhattan Landing program as loose outline for space requirements.
 - A. 2.5% of total floor area must be retail use (banks, airline offices, etc., limited to maximum 25% of that area with no establishment occupying more than 40% of the frontage).
 - B. Retail frontage accessible by street, or directly through lobby with special authorizations available for pedestrian access.
 - C. Emergency vehicle access to all project areas.
 - D. Vehicular circulation separate from pedestrian.
 - E. Parking, loading, and vehicular service access to all project areas. No residential parking required, may provide up to 25% of total number of dwelling units. Requirements for CR districts adhere to zoning resolution proper.

Activities-

- Outdoor space requirements follow Manhattan Landing district zoning.
- A. Privately built and maintained.
 - B. Visual corridors, spatial continuity with core of downtown.
 - C. In the esplanade there will be no buildings, the visual corridor will run along the sides of the esplanade, to insure that esplanade does not become visually isolated, and use is encouraged.
 - D. The minimum width of the esplanade is 150', 20% coverage is allowed at the pedestrian level with 30% coverage allowed above (obstructions may include building structure, lobbies, open restaurants and community facilities).

1. NEEDS (continued)

FUNCTION :

Activities-

Outdoor space requirements follow Manhattan Landing district zoning.

- E. Sun and shadow controls on open spaces:
on March 31, the spring equinox, at least 65% of the area of any public space shall be in sunlight at the following times,
9am. - 12 noon, 12 noon - 3pm.
- F. All structures built to river must provide arcade or loggia.
- G. An arcade or loggia must be provided for the entire length of the inner edge of the esplanade except at visual corridors.

1. NEEDS

FUNCTION :

Relationships-

Esplanade continuous with a minimum dimension (150') with only certain permitted encroachments.

Visual corridors that require a fixed envelope of space in which no development may occur will:

1. Provide visual continuity between existing city and new development.
2. Establish an armature for new development that extends from the core of downtown.
3. Regain contact with the waterfront.

Open spaces must function as organizing structures to distribute bulk.

2.5% of total floor area for every development must be retail in order to ensure an interesting, active, uninterrupted retail shopping area. Retail frontage must be on the street or directly through a lobby.

Pedestrian and vehicular circulation must be separated.

1 A. NEEDS

THE AQUARIUM
SPACE REQUIREMENTS

The space requirements for the aquarium are all based on the program for the Monterey Bay Aquarium.

1.	Administration	2500 s.f.
2.	Tickets/Entry/Lobby	3000 s.f.
3.	Gift and Bookstore	5000 s.f.
4.	Auditorium	10,000 s.f.
5.	Classrooms 3 @ 1200 s.f. =	3600 s.f.
6.	Mammals	
	Seal Tank	5000 s.f.
	Penguins	3000 s.f.
	Sea Otters	3000 s.f.
	Turtles	3000 s.f.
7.	Shark Exhibit and Tank	3000 s.f.
8.	Octopus and Kin Tank	2000 s.f.
9.	Bat Rays Tank	1000 s.f.
10.	Waves	1500 s.f.
11.	Sandy Sea Floor	1200 s.f.
12.	Cold Water Marine Fish	1200 s.f.
13.	River/Ocean Environment	1200 s.f.
14.	Temperate Marine	1200 s.f.
15.	Rocky Shores	1500 s.f.
16.	Tidal Pools	3500 s.f.
17.	Deep Reefs	700 s.f.

1 A. NEEDS
THE AQUARIUM
SPACE REQUIREMENTS (continued)

18.	Pelagic Reefs	700 s.f.
19.	Shale Reefs	700 s.f.
20.	Restrooms	600 s.f.
21.	Theatre	3000 s.f.
22.	Cafe Indoor/Outdoor	6000 s.f.
23.	Kitchen	3000 s.f.
24.	Cold Storage 2 @ 10'x 10' =	200 s.f.
25.	Shipping and Receiving	1500 s.f.
26.	Storage Misc.	2500 s.f.

Total Square Feet for functions	71200 s.f.
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27.	Mechanical for Tanks = 40% of total square footage for tanks .4 (38,500) =	15400 s.f.
28.	Circulation = 100% of the square footage for the exhibit, visitor, and tank =	71200 s.f.
29.	Mechanical for the building = 10% of square footage =	14240 s.f.

TOTAL SQUARE FEET	172240 s.f.
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1 B. NEEDS

THE CRUISE PIER
SPACE REQUIREMENTS

1.	Pier Access and Holding Slips	N.A.
2.	Loading and Receiving	1000 s.f.
3.	Storage (immediate)	1000 s.f.
4.	Storage for Boat Accessories	3000 s.f.
5.	Lobby/Info./Tickets	500 s.f.
6.	Administration	750 s.f.
7.	Waiting Area and Exhibits	2500 s.f.
8.	Restrooms	400 s.f.
Total Square Feet for Functions		14750 s.f.
9.	Mechanical = 10 % (14750)	1475 s.f.
TOTAL SQUARE FEET		16225 s.f.

1 C. NEEDS

THE MUSEUM

SPACE REQUIREMENTS

The space requirements for the museum are all based on the programs for the New England Aquarium and the Baltimore Aquarium.

The theme for the museum is "The Ocean then, and Now".

1.	Entrance/Info./Exit	600 s.f.
2.	Admissions	400 s.f.
3.	Administration	1200 s.f.
4.	Restrooms	600 s.f.
5.	Lecture Room	1500 s.f.
6.	Gift Shop	600 s.f.

Paleozoic-Cenozoic Period

7.	Fish-	
	Agnathia Exhibit	1000 s.f.
	Placoderms (replicas & artifacts)	2000 s.f.
	Sharks, Skates and Rays Exhibit and Tank	3000 s.f.
	Bony Fish, Exhibit and Tank	1000 s.f.
8.	Amphibians-	
	Swimming reptiles, turtles snakes and crocodiles exhibit and tank (700 s.f., 1000 s.f.)	1700 s.f.
	Plesiosaur and Mosasaurs Exhibit	500 s.f.
	Swimming Birds Exhibit and specimens	2000 s.f.
9.	Swimming Mammals-	
	Early Cenozoic whales replicas	2000 s.f.
	Pinnipeds (seals, sea lions, and walruses)	2000 s.f.

1 C. NEEDS

THE MUSEUM

SPACE REQUIREMENTS (continued)

9. (continued)

Sirenians exhibit	500 s.f.
Rodents	700 s.f.
Semi-aerial flying fish	500 s.f.

10. Fossil Invertabraes

Corals of Paleozoic	
Corals of Postpaleozoic	
Sponges	
Graptoutes	
Conodonts	
Phylum Brachiopoda	
Phylum Mollusca	2000 s.f.
Class Cephalopod	
Tank and exhibits	
Squids and Octopus	2000 s.f.
Class Pelycypod (clams and oysters)	
Echinodermat	
Phylum Arthropoda	
All in Hands-on-Pool	1000 s.f.
Exhibit	500 s.f.

11. Central Exhibit- simulated environment
w/ replicas and live species

4000 s.f.

Total Square feet for functions	36000 s.f.
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12. Circulation = 33 % of total square footage
of the exhibits and tanks =

9000 s.f.

13. Mechanical for tanks = 30 % of the
total square footage of the tanks =

3600 s.f.

14. Mechanical for the building = 10 %
of the total square footage of the
building =

4000 s.f.

TOTAL SQUARE FEET

45,400 s.f.

2. NEEDS

FORM :

Site-

Since a large budget for the project is justifiable the quality of the construction based on the cost per square foot shall not be considered a limiting factor.

Environment-

The physical, and the psychological, as well as the site considerations would be used as influences on determining the construction budget.

Quality-

3. NEEDS

ECONOMY :

Initial Budget-

The cost estimate should be analyzed for comprehensiveness and realism leaving no doubt in the client's mind what the total budget required will be and would include.

Operating Cost-

Evaluate the energy budget and the outline on the operating cost.

Life cycle Cost-

Evaluate the report on the life cycle cost.

4. NEEDS

TIME :

Past-

Present-

Consider phasing the construction as an alternative in the project if the initial analysis proves unfeasible.

Future-

1. **PROBLEM** - State the Problem.

FUNCTION :

One of New York city's greatest assets is its extensive waterfront. Developing the waterfront between Battery Park and the Brooklyn Bridge (excluding the area of the South Street Seaport) provides a unique opportunity to exploit this asset for the public's enjoyment. Encouraging the private sector's participation in terms of retail and offices will help to ensure the success of the project. The project will function as a connection between the downtown core and the waterfront of lower Manhattan, and also as a linking device for the waterfront attractions.

2. PROBLEM

FORM :

The visual and physical corridors and the need for public accessibility are major factors that the form of the development will have to respond to. Other considerations that should be addressed in the proposal are: the existing dominant open spaces, the existing pedestrian and vehicular patterns, and the continuity of the city through selectively relating to surrounding building heights and bulk placement.

3. PROBLEM

ECONOMY :

A high level of performance will be required of the development in order to justify the use of such a prominent and influential site. Because of the need to respond to such a wide variety of issues and the opportunity to have a enormous effect the incorporation of budget limitations in the program should be minimal, however, cost effectiveness should be practiced.

4. PROBLEM

TIME :

The future of New York should be enhanced with this project. The project should improve the variety and the quality of the attractions to the city while retaining the surrounding area's character and integrity. The horizons for the future should be expanded while the problems of today are responded to.

PHILOSOPHY

DESIGN PHILOSOPHY FOR MANHATTAN LANDING

The design of the Manhattan Landing Aquarium was based on the concept that in order to educate the public of the delicate and fragile world of the seas, so as to ensure the preservation of our oceans and their living habitats, we must provide them with a learning opportunity that invites them to participate and will be an asset to their community. The Aquarium will be an active and evolving building. It is this activity and continually changing atmosphere that will be the major attraction of the Aquarium. The Aquarium will attract visitors of the city, however this is not its main function, the Aquariums main focus will be the residents and the workers. The Aquarium will provide the area with a learning center that offers a fascinating and relaxing atmosphere. The Aquarium will be an asset to lower Manhattan responding to the existing waterfront while remembering and retaining aspects of the historical waterfront.

The Manhattan Landing Waterfront Park provides a link between South Street Seaport and Battery Park. This provides for a continuous waterfront "experience". The Park allows for the opening up of the waterfront for the publics enjoyment. The Park ensures interaction through visual and physical connections, and by providing numerous possibilities for participation. The Park returns the waterfront to the public for their use and enjoyment. The idea of actually constructing the Park is not feasible because of economic reasons, however I feel that this a very justifiable concept. The waterfront is a limited resource and provides all of the city with relief and character, isolating the experience of the waterfront for the few that can afford to buy it would not be an acceptable resolution.

DESIGN

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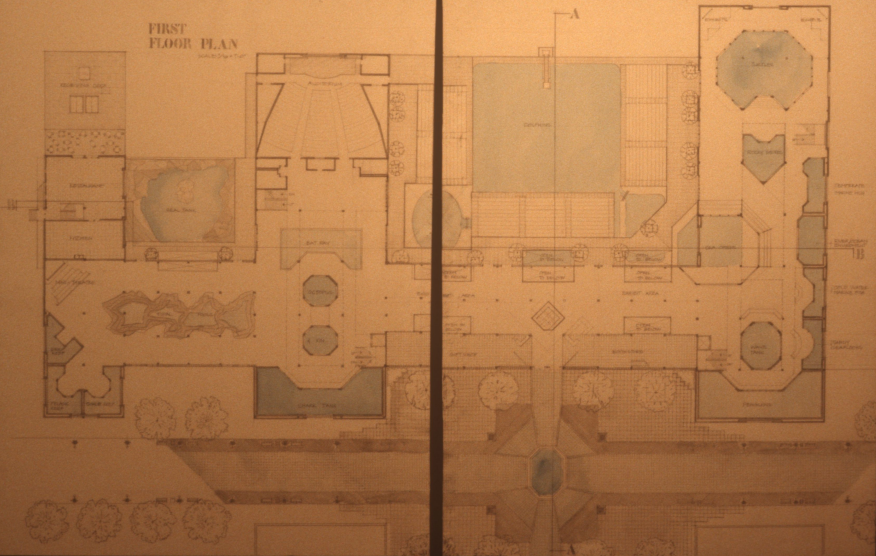
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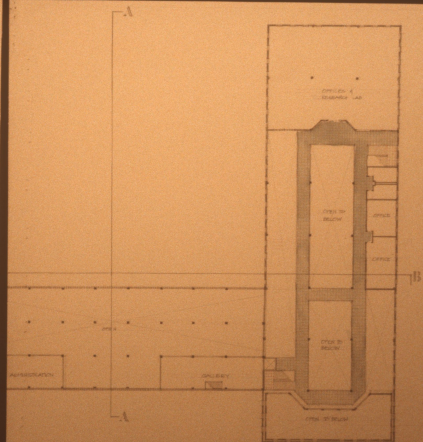
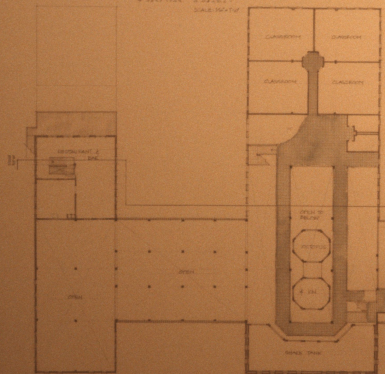
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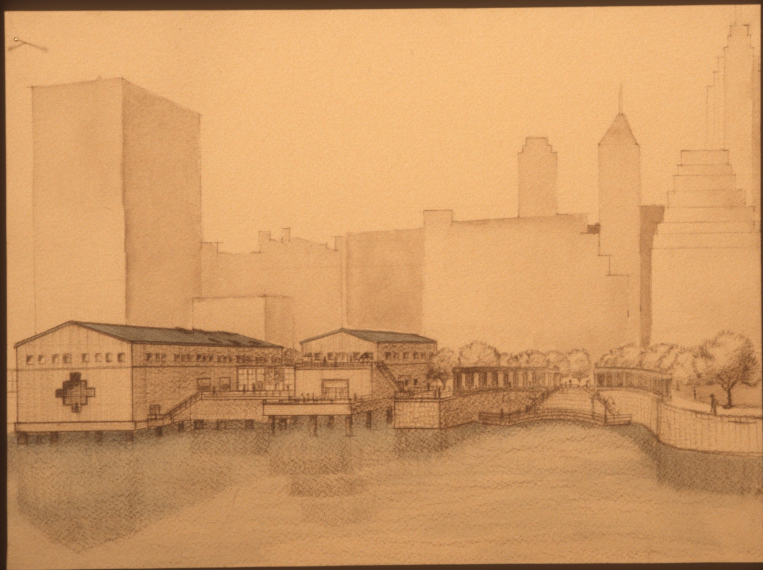
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FIRST
FLOOR PLAN

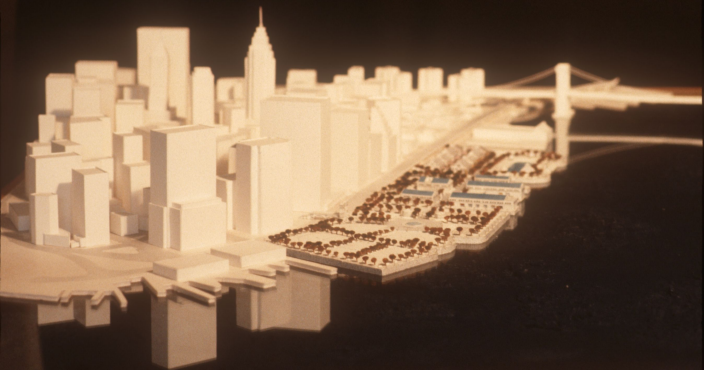
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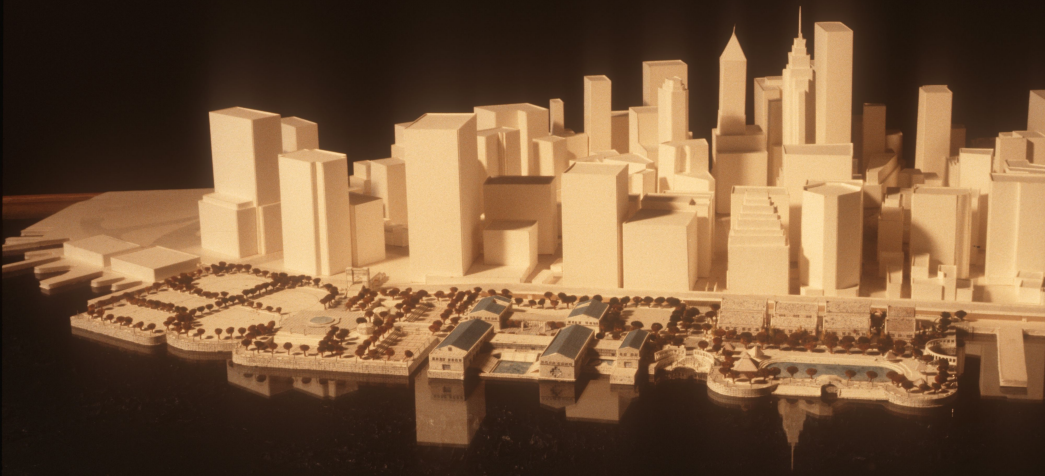


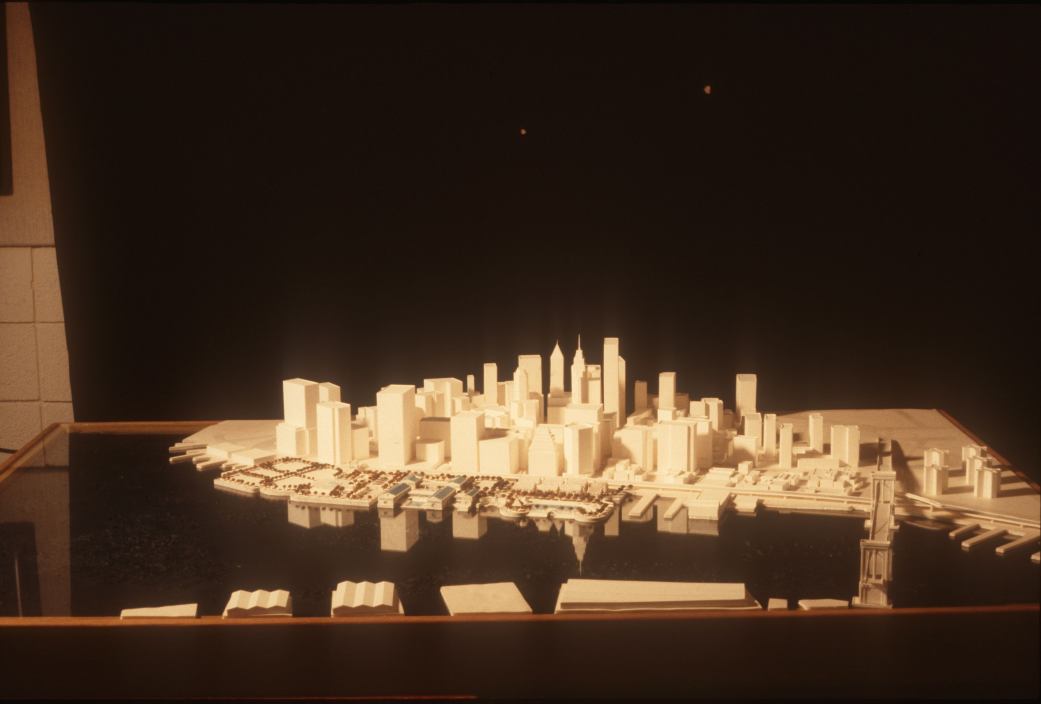


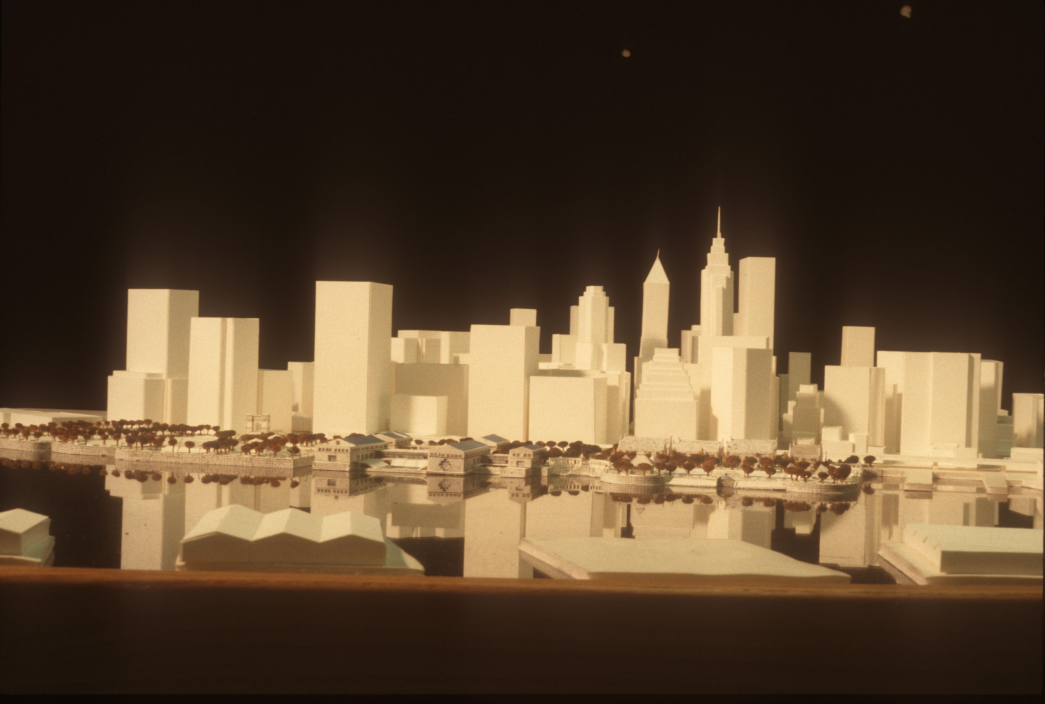


















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