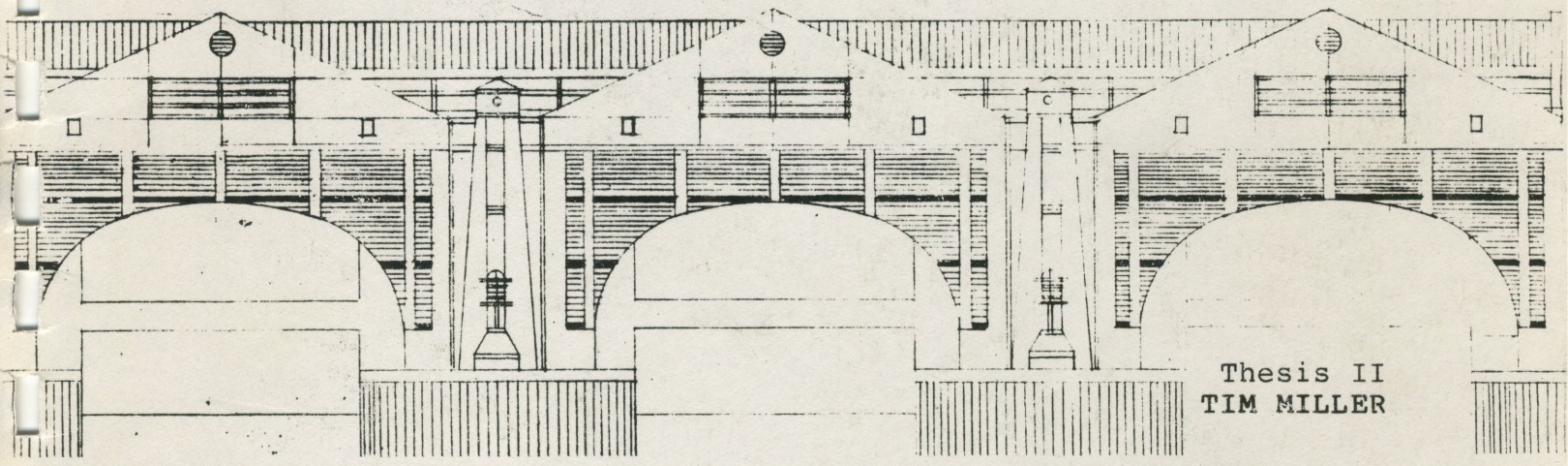
# SOUTH FERRY PLAZA



Thesis II
TIM MILLER

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# SOUTH FERRY PLAZA

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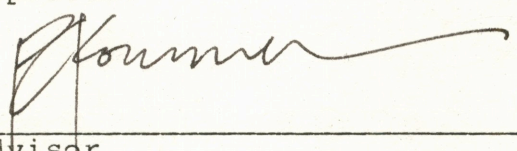
TIMOTHY W. MILLER

A professional paper submitted in partial fulfillment
of the requirements for the degree

of

BACHELOR OF ARCHITECTURE

Approved:



Advisor



Thesis Coordinator



Director, School of Architecture

MONTANA STATE UNIVERSITY

Bozeman, Montana

June 8, 1987

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Timothy W. Miller 6/12/87

TIMOTHY W. MILLER

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## INTRODUCTION

- Statement of Purpose and Scope
- Methodology

## STATEMENT OF PURPOSE AND SCOPE

One of New York City's greatest natural assets is its extensive waterfront. For this Thesis project, I have chosen a site which is located at the southern most tip of Manhattan Island in New York City. This site represents a unique opportunity to provide the public's enjoyment of this waterfront asset. The site is located at the foot of Whitehall and South Streets and is adjacent to the east of Battery Park in Manhattan. This important site, at the present time, includes the Staten Island Ferry terminal, the landmark Battery Maritime Building, and the Coast Guard building. For the site, I propose the elimination of the present Staten Island terminal for redesign, also the complete elimination of the existing Coast Guard building. I propose the redesign of the present vehicular traffic immediately north of the site to create the design of an exterior public open space and a new entrance into the South Ferry subway station. The continuation of the Battery Park on and through the site for later connection with development proposals for the lower Manhattan waterfront to the east of the site.

With the redesign of the present vehicular traffic patterns and ferry stacking lanes, this will create an exterior plaza to the north of the proposed ferry terminal buidling. This plaza will create a transition and orientation space for pedestrians while organizing the whole site as one. This proposal will consist of approximately eighty thousand square feet which will

include within the new design of the South Ferry subway station entrance.

The major structure of this site will be the redesign of the Staten Island Ferry terminal.

"The Staten Island Ferry terminal attracts more than two million visitors annually. With the increased development of downtown Manhatten as a tourist attraction, (South Street Seaport Museaum, The Work Trade Center observation deck, the Statue of Liberty, and Ellis Island), this traffic is expected to increase. The architectural design of the present terminal does not afford good views of the river, nor the ferry docking and passenger unloading activity."[1]

[1] New York City Department of Transportation, "Whitehall Street Ferry Terminal Design Parameters." (New York: February, 1985) pp. 2 - 9

## METHODOLOGY

The methodology of this project began with the research of the Lower Manhattan area to familiarize myself with as much of the area as possible including existing, new and proposed projects which would have an influence on the Lower Manhattan experience. I then proceeded with more specific investigations of research of the immediate site itself. Delving into the history of this area, the role of the waterfront and the ferry terminals during the past eighty years. I then proceeded to examine and analyze the forces within and near this site which would or could influence this project. Through this analysis, I came to the realization of two projects contained within the site of the proposed South Ferry Plaza:

One - to untangle the pedestrian and vehicular circulation which is immediately to the north on the land-side of the ferry terminal.

Two - the integration and redesign of the Staten Island Ferry terminal.

Through this discovery, I propose the solving of the circulation problem, vehicular and pedestrian access to be a foreground for the heart of this project, the Ferry Terminal building. The second phase will consist of the design of the terminal building with the set functional foreground and the many other forces to be explored at a later and more appropriate period.

## PROJECT SENERIO AND GOAL STATEMENTS

- Site
- Open Public Space/Public Access
- The Ferry Terminal Facility
- South Ferry Subway Entrance
- Goals Of The District

## PROJECT SENERIO AND GOAL STATEMENTS

"South Ferry Plaza is probably the most unique site the City has ever offered for development. It is an unparalleled opportunity to create a new landmark for New York."

An exerpt from the 1976 Consultant Report on pedestrian space improvements:

> "South Ferry is practically a district in itself, including several active ferry terminals, the southern end of Water Street (with one New York Plaza), and part of Battery Park, all grouped around a vast and confused auto intersection. This is potentially a spectacular entry to the downtown, as well as a magnificent termination to Manhattan, but at present is in sorry disarray. The river is nearly but mostly unseen. Ferries come and go, but invisibly; buses, not boats, dominate the space. Below grade, the complexity and importance of the subway is altogether concealed. At street level vehicles move in incomprehensible patterns, while the pedestrian must find a way from one traffic island to another, headed toward doubtful destinations..."
>
> "... given cooperation between the public and private sectors, there are many possibilities for this space. One of the most intriguing is a dramatization of a transit interchange function. The water and boats might be made more visible from the junction of Whitehall and Water Streets. Views could be opened down to the subway... The knot of auto circulation should be untangled and if necessary, a second level built to guide pedestrians safely and confidently through this experience..."

The proposal for South Ferry Plaza should demonstrate a balanced and integrated concept for commercial, transportation and public functions.

## GOALS — THE SITE

a. To recognize the uniqueness of this waterfront location at the tip of Manhattan being both terminus and entry point simultaneously.

b. To respect lower Manhattan's pattern of bulk, open space and circulation.

c. To develop a design which is conducive to successful commercial development and which allows for efficient internal movement.

d. To provide entry to the project area by extending principal streets onto the site.

e. To create a view corridor in line with Whitehall Street

f. To provide convenient and safe access to and from external crosswalks, streets buses, taxis and subway stations.

g. To provide integration with pedestrian accessible connections to Battery Park and the proposed Manhattan Esplanade.

h. To maintain solar access to plazas and public open spaces to the north of the site.

i. To provide a solution which will be sympathetic to the existance of the landmark Battery Maritime building.

j. For the new terminal building and its surroundings to become integrated with its context and not to dominate the site in sheer mass.

k. To not complicate the circulation of this area by introducing large amounts of commercial or residential involvement within this site.

GOALS OPEN SPACE/PUBLIC ACCESS

a. To maximize physical and visual access from upland areas to and along the waterfront, for users of the facilities and general public.

b. To provide the maximum amount and variety of open spaces with minimum coverage of shadows.

c. To provide observation decks, terraces, etc., along the water's edge that can accommodate large numbers of visitors, that offer unrestrictive views, and where appropriate, to be lined with public uses such as restaurants, shops, cafes, etc.

d. To provide public amenities in addition to street lighting, furnishings, etc. within all public areas.

e. To provide direct access to structure's main entrances from these open spaces.

f. To provide an esplanade that will link the loggia of the Battery Maritime building, the Ferry Terminal and Battery Park.

g. To incorporate within the design of the esplanade, the transition down to street level from any raised portion of the esplanade.

h. The esplanade, where possible, to be given access to waterfront vistas.

i. The esplanade is to be open to the general public and not obstructed by private uses.

j. The esplanade must be a minimum of twenty feet wide.

## GOALS — THE FERRY TERMINAL FACILITY

a. To create a "sense of place" that provides a convenient, safe and attractive space for commuters as well as tourists.

b. To provide the facility's interior with access to and views of the waterfront.

c. To provide the facility's interiors with views out to the upland areas.

d. To facilitate the movements of passengers between the ferries, subways and buses.

e. To provide improved access, visibility, signage and lighting indicating clearly defined circulation patterns.

f. To minimize the adverse traffic impacts on streets in the immediate adjacent area.

g. To provide separation of inbound and outbound passenger movements.

h. To provide separation of passengers and vehicles.

i. Fare control consolidated on one level.

j. To provide pedestrian convenience, design level of service: doors, waiting rooms, corridors, ramps, stairs, escalators.

k. To provide passenger security, orientation, open spaces, direct lines of sight and movement.

l. Materials and finish designed for both esthetic appearance and maintainability, non-slip floors.

m To provide for passenger amenities - restrooms, concession space, others.

n. Enhancement of ferry "experience", views of river, ferry docking, passenger activity.

o. To provide directional signing, visitor information.

p. External vehicular access, ferry stacking lanes, off-street freight delivery capability.

q. Flexability to accommodate different types of ferries than currently used.

r. To provide integration with pedestrian accessible connections to Battery Park and the Manhattan esplanade.

s. For individuals to be able to sense a gradual transition from land and water.

GOALS SUBWAY ENTRANCES

- To provide an above-grade statement which announces it presence to the public.
- To provide proper signage which informs the public of its function and potential destination from within this station.
- To provide a graceful transition from the exterior environment to a subterranean experience for the individual in a straight forward manner.

## THE GOALS OF THE DISTRICT

"The basic goal of the Battery Park City and Manhattan Landing special zoning districts is to reinforce the Lower Manhattan business district by providing diversified residential communities close to downtown, which will encourage a much greater variety of cultural, recreational, and retail shopping opportunities than the commuter-oriented working population can presently support.

A fully-functioning 24-hour community will make the area more attractive both for workers and for residents by increasing demand for shops and services within the core as well as within the special districts themselves. The presence of more people in the area for a greater part of the day will reduce the dependence of shops and restaurants on lunchtime trade.

Recreational and cultural facilities, such as the waterfront esplanades, the South Street Seaport, the Downtown Whitney Museum, and the Custom House, will further add to the strengths of a 24-hour community, not only providing amenities for the workers and residents of the area, but also attracting visitors, who in turn will help support the shops and restaurants so necessary to an urban environment of high quality.

A key to the viability of Lower Manhattan is transportation, beginning with a rational and convenient pedestrian circulation network, and including improved access to the area from other parts of the City and region -- to be provided by the Second Avenue subway, improvement of existing subway stations and ser-

vice, expanded PATH service, and increased-capacity passenger ferries to Staten Island, as well as improvements in the street network, the FDR Drive, and the West Side Highway, and further development of express bus service.

Large increases in the services and amenities available in Lower Manhattan, coupled with improvements in transportation, should ensure the viability of Lower Manhattan as a national, regional, and local center capable of attracting new business and creating new jobs, thereby enchancing the economy of the entire City.

The goals outlined below are incorporated in the special zoning districts for the Lower Manhattan Waterfront to help integrate these new-towns-in-town into the existing urban fabric with maximum public benefit, and minimum administrative interference.

## ACCESS TO THE WATERFRONT

Historically the Lower Manhattan waterfront has been devoted to commercial use related to shipping activity. Now the opportunity exists to make the waterfront available for public access and use by employing various features of the special zoning district to control the redevelopment of land along the water's edge.

A closer relationship between the core of downtown and the waterfront can be established in several ways: by providing visual corridors through the new project areas, by providing

pedestrian paths along the corridors, and by providing further circulation along the river's edge.

To obtain a greater sense of contact with the waterfront, a person should be able to enjoy a clear, unobstructed view to the river and the farther shore from various positions throghout the innermost core of downtown. The view should orient the viewer to his position on the City street grid and remind him of the presence of the river and of his relation to it. In addition, the pedestrian should sense that he can reach the waterfront by following the axis of view. Finally, having gained access to the river, a person should be able to move parallel to the river along a public esplanade allowing continuous circulation along the entire waterfront of Lower Manhattan, but permitting reentry to the core at various points along the way.

VARIETY OF RETAIL SHOPPING AND SERVICE OPPORTUNITIES

The special districts have been designed to ensure that an adequate amount of appropriate retail and service uses will be provided as part of each development. The new residential and office projects planned for the Lower Manhattan waterfront will bring a large influx of people into an area of the City that has been traditionally underserved by restaurant and retail facilities. The new population will not be able to rely on an existing infrastructure to provide adequate services. Shopping facilities in the waterfront districts, if they are integrated with a pedestrian network that is continuous within the

waterfront development and ties into the core at regualr intervals, can prove to be a resource for the core of downtown as well as the new neighborhoods on the periphery.

## NEW RESIDENTIAL NEIGHBORHOODS

The new residential neighborhoods along the Lower Manhattan waterfront will represent a major positive step towards increasing the vitality of the downtown center of the City and thereby implementing The Lower Manhattan Plan. New residents will stimulate a diversification of activity in Lower Manhattan that will increase the attractiveness of the working population as well. The special districts seek to encourage cultural, recreational, and shopping uses that will be necessary and viable when the new residential communities are established.

Along with providing much needed housing, the new residential developments will make it possible for a substantial percentage of the new population to walk to work. In addition, those using public transportation to travel to work will be able to take advantage of underutilized capacity in the non-peak direction, which exists on most of the subway lines.

The special districts are designed to make the housing portions of these projects into new residential neighborhoods by requiring that service retail be distributed among all neighborhoods and by requiring that standards for open space for the tenants be maintained, by requiring mandatory grade separation of pedestrian circulation wherever possible, by requiring cer-

tain community facilities to be provided, and by inviting access both to the core of the City and the waterfront esplanade.

## DEVELOPMENT OF INSTITUTIONAL ATTRACTIONS

The South Street Seaport Museum, the downtown branch of the Whitney Museum, and the Custom House proposal are all part of an effort to introduce new institutional attractions into Lower Manhattan which can make a bridge between the financial community and the new residential development along the waterfront, serving as educational and recreational facilities for both, and drawing the general public to Lower Manhattan as well.

Lower Manhattan has certain inherent advantages: it is compact, it can be walked easily, it is well served by public transportation. It has 'character', it is steeped in history. On the other hand, Lower Manhattan suffers from a lack of diversification. It has no theater. Its few museums are of restricted scope. Its shopping opportunities are limited. One encouraging sign, however, is the formation of the Lower Manhattan Cultural Council to help coordinate cultural activity and publicize public events in the area. These include the annual Flower Show, and the Fourth of July celebration; performances at Trinity Church, Federal Hall, Castle Clinton, and the Seaport; craft shows organized by Creative Time; and lecture series at Pace University.

The institutions that have been proposed or are developing share several characteristics. Generally speaking, they make

use of existing space (outdoor and indoor), and they offer the opportunity to recycle buildings that might otherwise be torn down (the Custom House, the old Ferry Terminal, the South Street Seaport) or use vacant space in new office buildings (the Whitney Museum at 55 Water Street). Both the Seaport and the Custom House are multifunctional, offering shops, restaurants, office space, museum space, and performance space; they imply a wider sense of place than a particular location; and they have the ability and opportunity to grow as Lower Manhattan develops.

The special districts seek to encourage this institutional growth, which will make Lower Manhattan into a more advanced community cognizant of its unique advantages.

## CONTINUITY WITH THE EXISTING CITY

The notion of continuity with the existing City is deceptively simple but crucial. It is worth reiterating because so many projects have been built in ignorance of its importance, especially since the Second World War. It means that new development should take its cues from the form of the existing City, from streets and circulation routes, from open spaces, respecting the dominant street pattern and selectively relating to the height and mass of existing buildings.

The new developments along the river contain large areas without mapped streets or walkways, separated from the main part of downtown by express highways. As such, they are susceptible to being treated as isolated precincts unless urban design

controls intervene to ensure continuity with the existing City inland of the highways.

The goal of continuity with the existing City is essentially conservative, but at the same time liberating because is contains the suggestion that cities need not begin anew with each succeeding generation.

The active seeking of greater correspondence between old and new recognizes that the making of cities is primarily a public act.

## IMPROVED PEDESTRIAN AND VEHICULAR CIRCULATION SYSTEM

Lower Manhattan suffers from what could become a terminal case of vehicular congestion. The existing streets in Lower Manhattan have very limited capacity. There are few through streets south of the Civic Center: West Street, Broadway, Water Street, and South Street running north-south; only the Liberty Street-Maiden Lane couple running east-west. In addition, traffic is likely to be disrupted over the next ten years by work on the Second Avenue Subway along Water Street, by modifications to the FDR Drive, and by reconstruction of the West Side Highway.

There are positive aspects to this situation. At present the capacity restraint on the Lower Manhattan street network probably does serve to discourage unnecessary trips to the downtown core. In addition, because the bulk of parking in Lower Manhattan is located around the periphery, a greater proportion of street space within the core could probably be turned over to

pedestrian use while still providing adequate vehicular access. It should be kept in mind, however, that the lack of space for circulation in Lower Manhattan impinges on pedestrians as well as motorists.

Several steps have been taken utilizing the special district and related planning instruments to structure both the pedestrian and vehicular circulation requirements of the new projects to minimize their impact on the existing system and provide an attractive environment within the districts.

The special districts are designed to effect a maximum separation of pedestrian and vehicular circulation, which has the advantage of improving traffic flow and safety. An upper level pedestrian circulation system is aided by the opportunity to connect to an upper level that is gradually developing within the core: at 55 Water Street, within the Special Greenwich Street Development District; at the World Trade Center; and within the Washington Street Urban Renewal Area. Pedestrian bridges are mandated by the special districts at specified locations to assure connections from the new projects across the highways to the developing upper level network. Within the districts the pedestrian circulation system is related to retail shopping and to the waterfront, so that important paths of movement have associated activities.

Parking policy have been guided by the principle of discouraging the accommodation of commuter parking, providing

only those spaces that experience in Manhattan has shown to be used by the residents. This policy, which anticipated a similar change in the general zoning resolution for high density residential districts, is designed to reduce peak hour traffic.

The special districts require a service road running the length of each project rather than a series of cul de sacs so that parallel through streets in the core will not experience an increase in traffic. Access points are carefully selected to relate to the street grid of Lower Manhattan and to the proposed highway modifications.

## EFFICIENT LAND USE

Land is scarce in Lower Manhattan and subject to intense development. Large-scale development makes it possible, with effective design controls, to use land carefully and economically so as not to forfeit the amenities of greenery and open space vital to the urban setting. Freed from the constraints of typical block development, large-scale developments offer the opportunity to coordinate large tracts of land with continuous pedestrian circulation and open space, an integrated raodway system, consolidated service functions, and the advantages of shared facilities. Once planning is freed from the two dimensional limitations of the land use map, there is the opportunity to provide a vertical layering of uses withing the same development, a layering both demanded and supported by the intensive new waterfront development.

Within the overall structure of the special districts this complex arrangement of mixed uses can operate efficiently by taking adantage of certain economies of scale. Open space can be provided on the roof of garage areas. Park areas can effectively serve a wider area because of the absence of grade crossings. Truck loading areas can be grouped so that the total number of spaces can be reduced and the need for turnaround space minimized. The proportion of the site given over the streets can be minimized and much of that recaptured as open space on roof areas. Coordinated development offers the opportunity to provide weather protected circulation and shopping areas because continuity from building to building is assured.

Essentially, the special zoning districts permit bulk placement more sensitively attuned to urban design considerations than the conventionally zoned parcel, which does not take specific account of the next site to be developed or, for that matter, of the appropriate response to specific existing configurations. Within the special district is designed to fit into the fabric of the existing City. The special zoning district contributes to efficient land use by sustaining multiple objectives, with bulk use to define public spaces, to frame views, and to ensure physical and visual connections.

## SIMPLICITY OF ADMINISTRATION

The special districts depend on private development and seek to encourage it. Therefore, it is essential that the provisions

of the special district result in a minimum of delay and administrative complication. Such delays and uncertainties mean significantly increased costs to the developer, primarily additional legal and planning fees, property carrying charges, escalation of building costs, and greater difficuly in attracting future tenants and therefore financing. If these costs seem excessively large or unpredictable, the developer will be discouraged from attempting to develop property within the special district.

The special districts have been submitted for public review through the City's legislative process and are now part of the Zoning Resolution. The special districts do not require separate approval at each stage from the Planning Commission and the Board of Estimate, but simply certification of compliance with stated controls of the special districts."2

2 New York Planning Commission, "The Lower Manhattan Waterfront," (New York: June, 1975) pp. 17 - 23

## EXISTING CONDITIONS ON SITE

- Existing Transportation Elements and Locations
- Access to Site
- Existing Physical Description of Staten Island Ferry Terminal Facility
- Existing Conditions Of South Ferry Subway Entrance
- Existing Esplanade Conditions

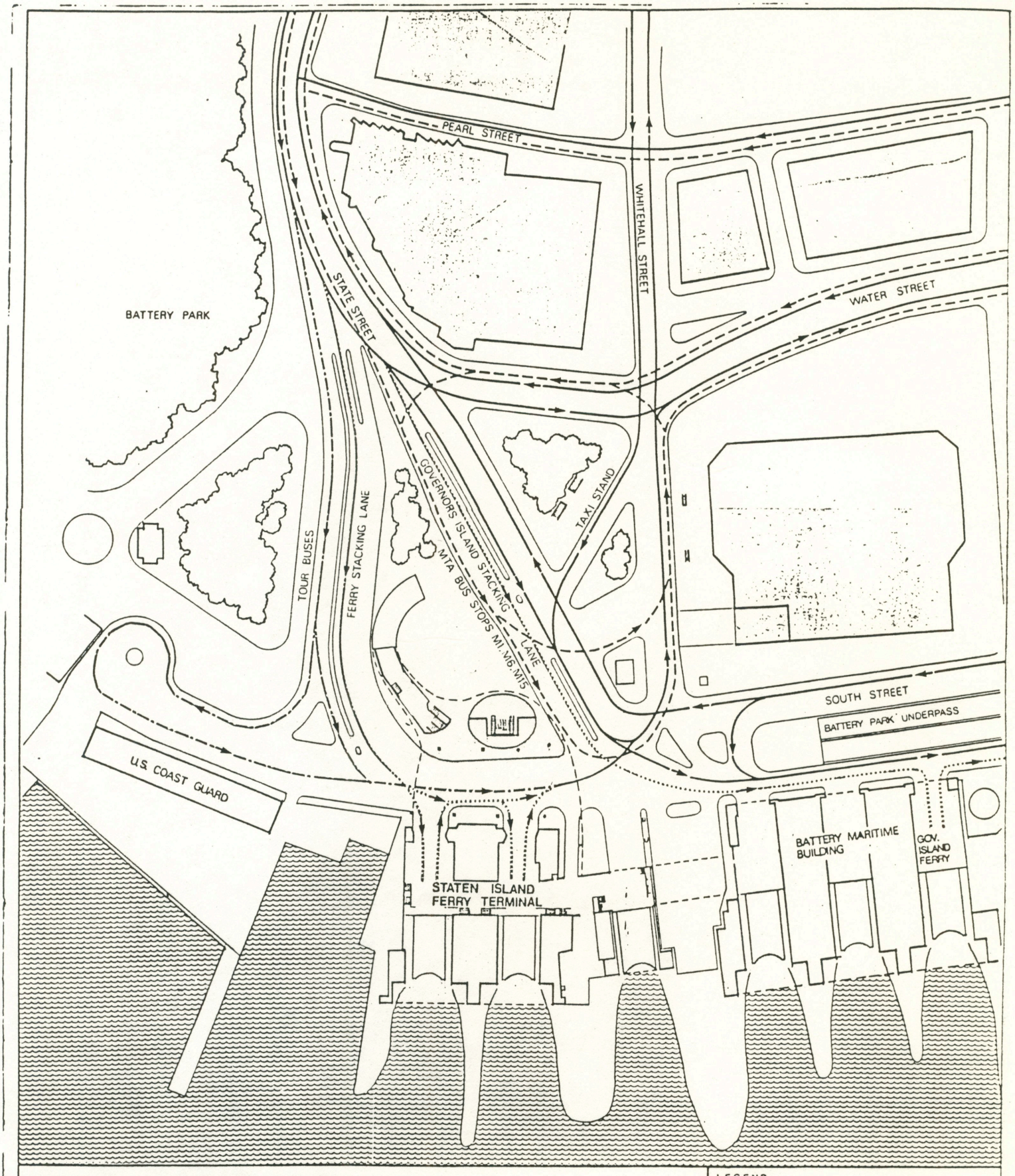
EXISTING CONDITIONS ON SITE

## EXISTING TRANSPORTATIONAL ELEMENTS AND LOCATIONS

- MTA bus stop - unprotected curb terminal along State Street near junction with South Street.
- Tour bus stop - unprotected curb terminal along State Street at eastern edge of Battery Park.
- Subway:
    - #1 - IRT - below north entrance to terminal;
    - RR - BMT - adjacent to I New York Plaza.
- Taxi - stand on traffic medium at Peter Minuit Plaza.
- Two vehicle stacking lanes, to board outbound ferries to Staten Island off of State Street.
- One vehicle stacking lane, to board outbound ferries to Governer's Island on State Street and South Street.

## EXISTING CONDITIONS ON SITE  ACCESS TO SITE

- 59% by walking;
- 19% by IRT (South Ferry Subway Station);
- 11% by BMT (Whitehall Subway Station);
- 7% by MTA Bus System;
- 2% by Taxis




STATEN ISLAND - MANHATTAN FERRY TERMINALS

# WHITEHALL TERMINAL

EXISTING CONDITIONS

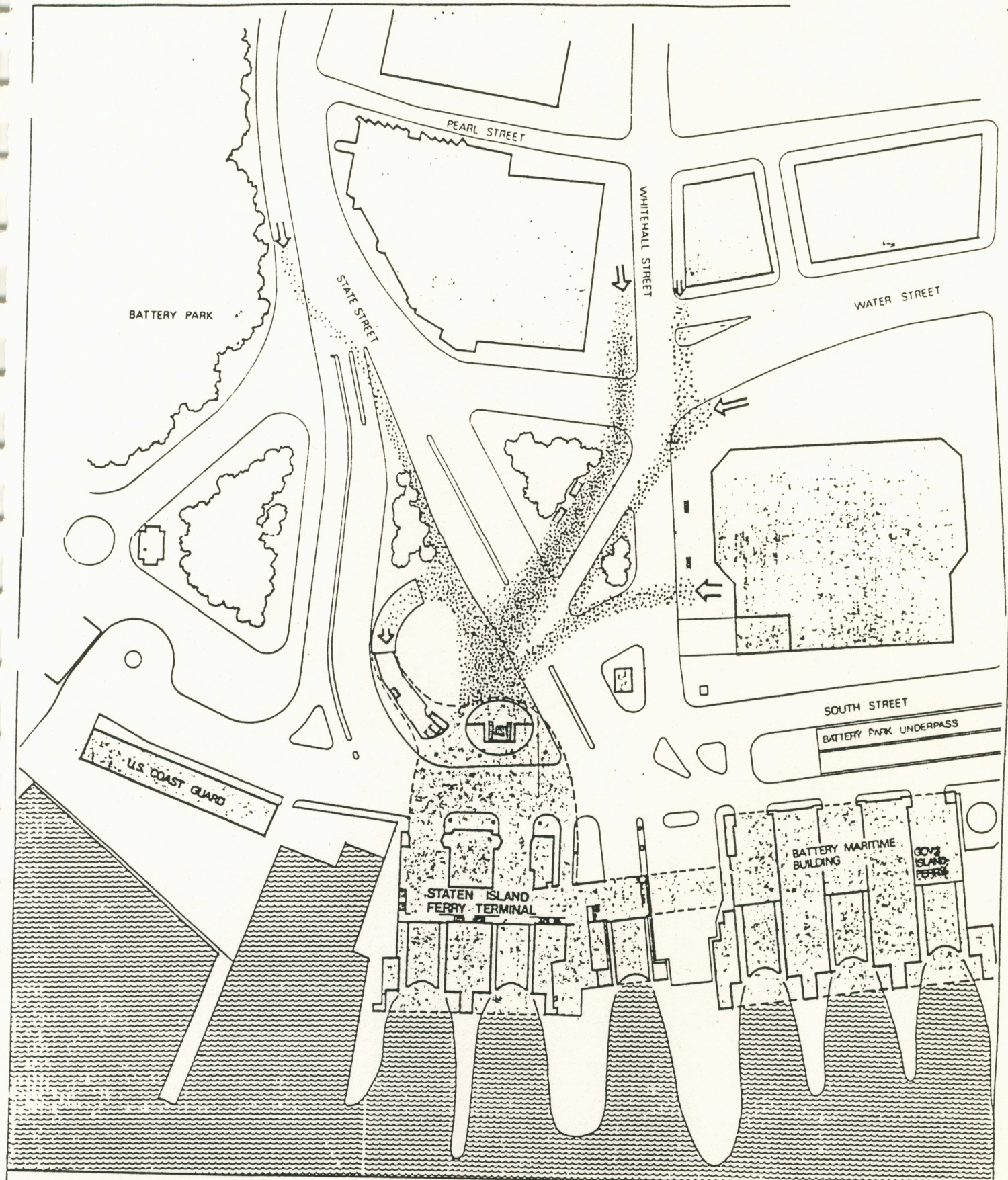
PEDESTRIAN PLAZA

LEGEND

- THRU TRAFFIC
- TOUR BUS
- MTA BUS
- FERRY VEHICLES

0 40 80 160 FT

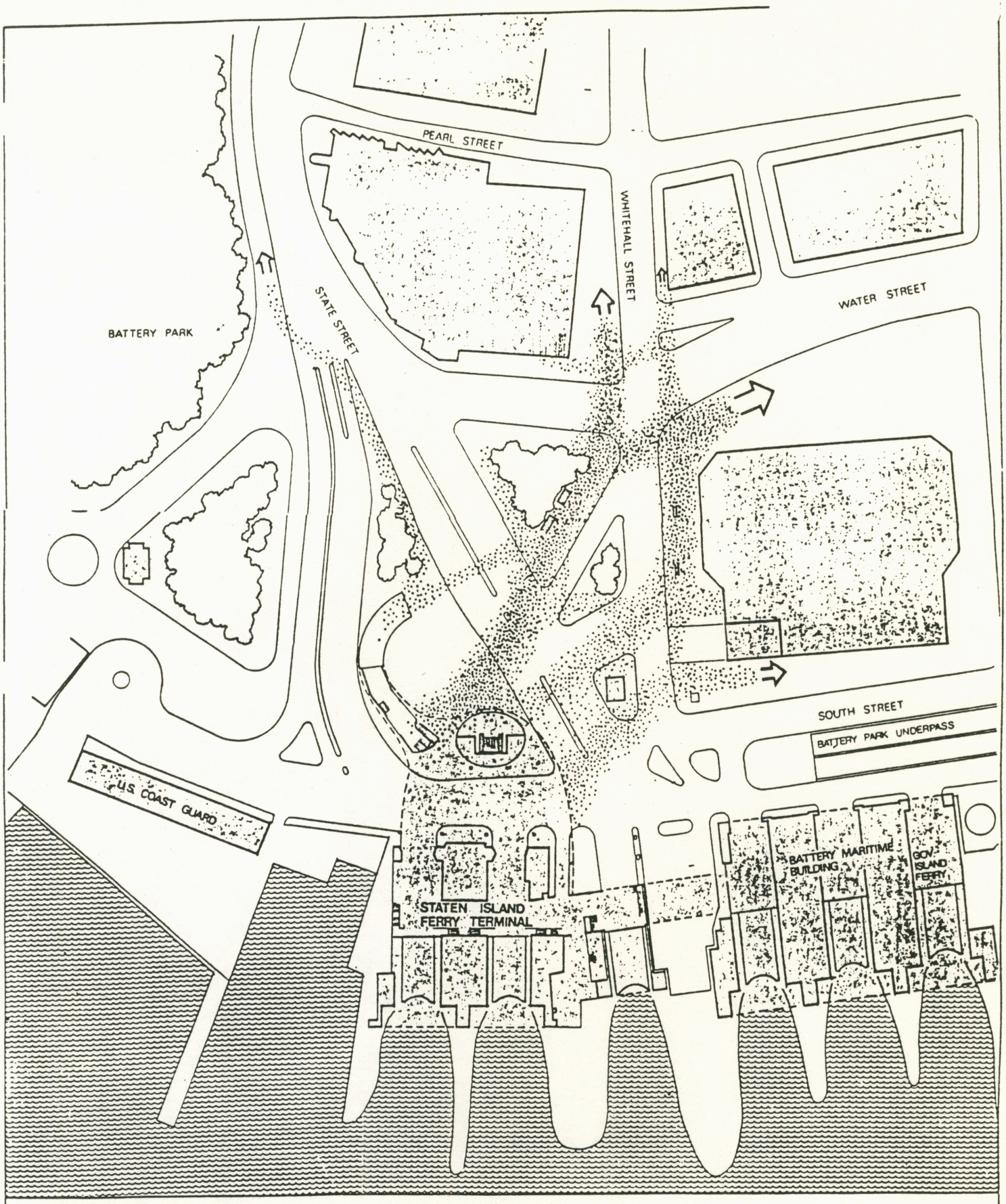
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STATEN ISLAND - MANHATTAN FERRY TERMINALS

# WHITEHALL TERMINAL

PEDESTRIAN CIRCULATION - P.M. EXISTING




STATEN ISLAND - MANHATTAN FERRY TERMINALS

# WHITEHALL TERMINAL

PEDESTRIAN CIRCULATION - A.M. EXISTING

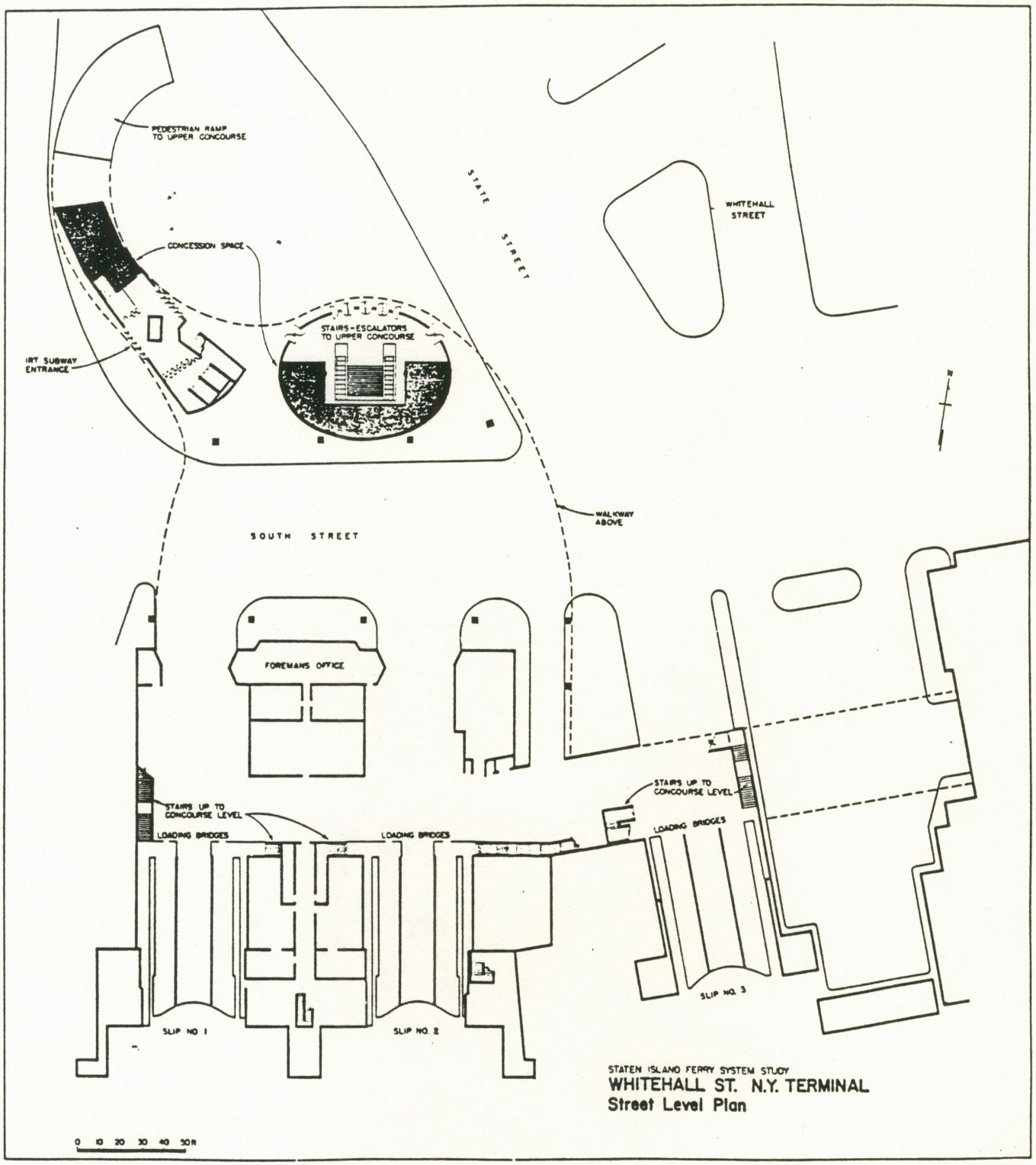
## EXISTING CONDITIONS ON SITE

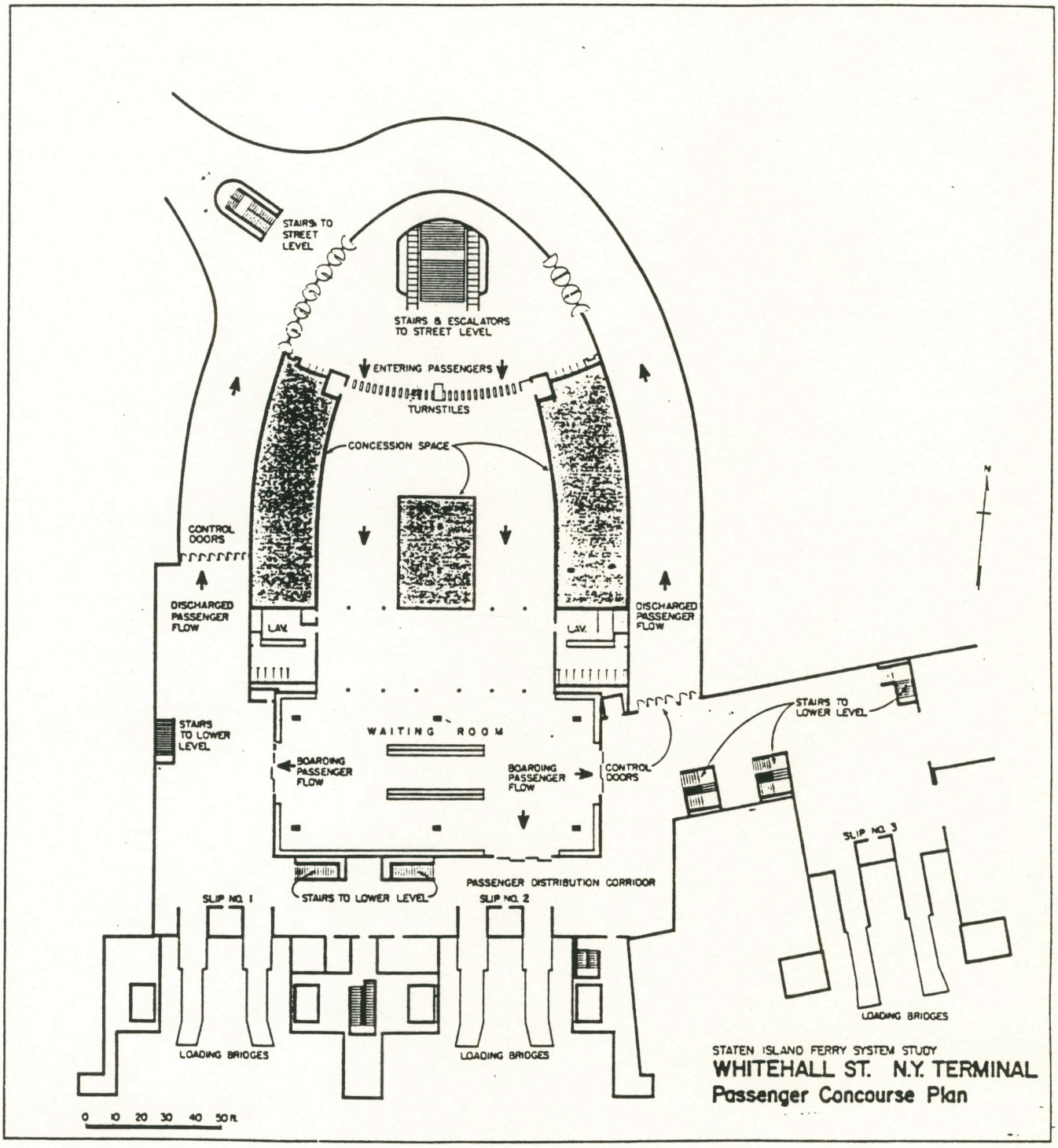
### EXISTING PHYSICAL DESCRIPTION OF FERRY TERMINAL FACILITY

"The Whitehall Terminal is a two-level, "L" shaped structure serving 3 ferry slips situated along 400 feet of river frontage. The main passenger concourse, 18.75 feet above street level, consists of a peripheral passenger distribution corridor surrounding a central fare control zone which includes a 15,000 feet area waiting room, 4,000 square feet of concession space, and restroom facilities. The lower level of the terminal consists of access roadways from South Street for the vehicles carried on the ferry, and sidewalks for passenger discharged from the lower deck of the ferry.

With the exception of a small number of cyclists and disabled persons, all Staten Island bound passengers must use the upper passenger concourse, entering the fare control zone through a bank of 20 coin operated turnstiles. Vertical access to the main passenger concourse is provided by a 14 feet wide internal stairs flanked by 2 - 48 inch size escalators, and external stair, and a ramp which overpasses South Street and connects to a pedestrian plaza north of the terminal. Vertical access to the street for inbound passengers discharged into the peripheral distribution corridor is by 6 stairways connecting with lower level sidewalks near the ferry slips, and by the external ramp and stairs." [3]

3 New York City Department of Transportation, "Whitehall Street Ferry Terminal, Design Parameters." (New York: February, 1985) pp. 1-1 - 1-2

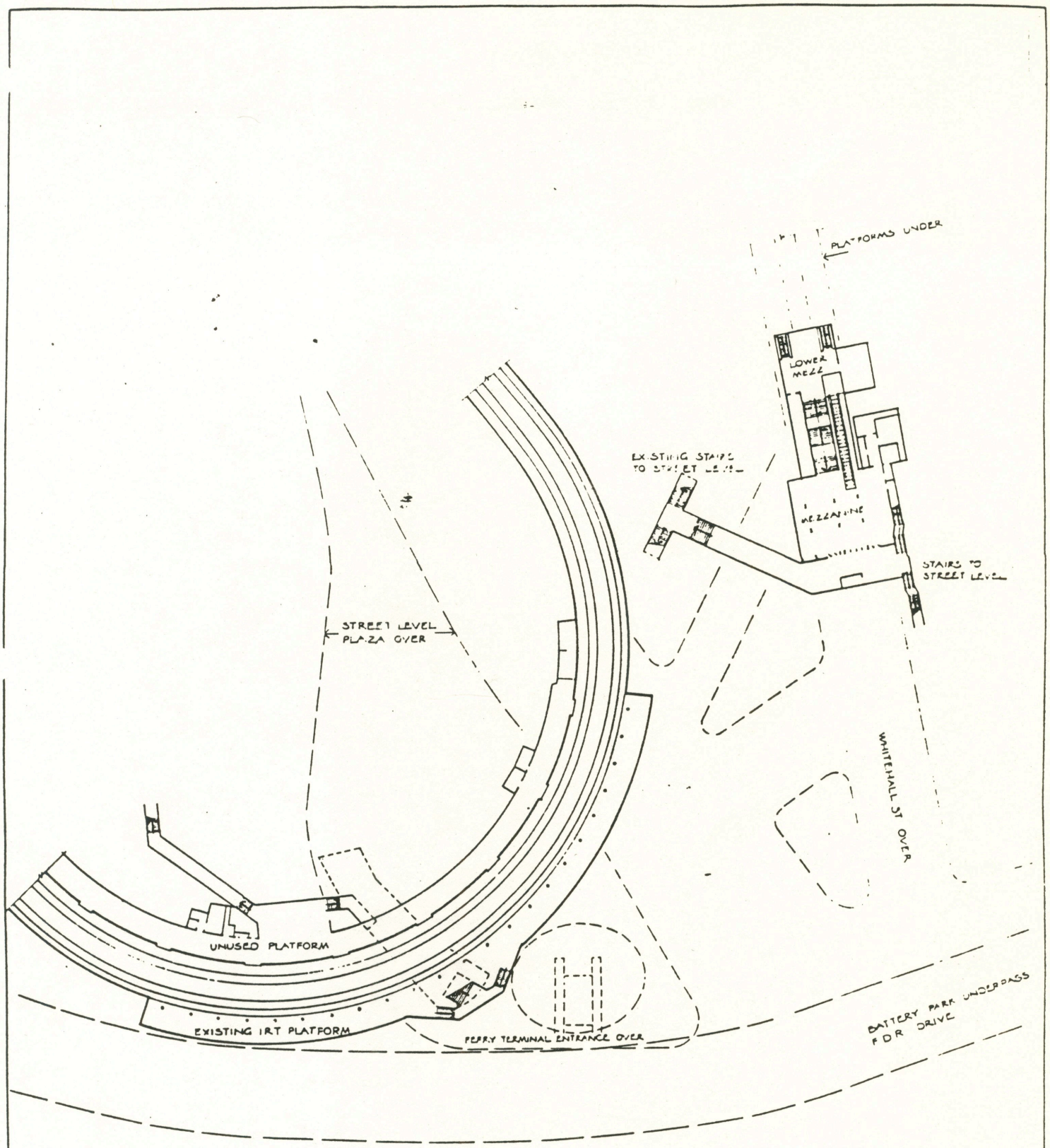

PEDESTRIAN RAMP TO UPPER CONCOURSE
CONCESSION SPACE
IRT SUBWAY ENTRANCE
STAIRS-ESCALATORS TO UPPER CONCOURSE
STATE STREET
WHITEHALL STREET
N
WALKWAY ABOVE
SOUTH STREET
FOREMANS OFFICE
STAIRS UP TO CONCOURSE LEVEL
LOADING BRIDGES
LOADING BRIDGES
STAIRS UP TO CONCOURSE LEVEL
LOADING BRIDGES
SLIP NO. 1
SLIP NO. 2
SLIP NO. 3
0 10 20 30 40 50ft
STATEN ISLAND FERRY SYSTEM STUDY
WHITEHALL ST. N.Y. TERMINAL
Street Level Plan


STAIRS TO STREET LEVEL
STAIRS & ESCALATORS TO STREET LEVEL
ENTERING PASSENGERS
TURNSTILES
CONCESSION SPACE
CONTROL DOORS
DISCHARGED PASSENGER FLOW
LAV.
LAV.
DISCHARGED PASSENGER FLOW
STAIRS TO LOWER LEVEL
WAITING ROOM
BOARDING PASSENGER FLOW
BOARDING PASSENGER FLOW
CONTROL DOORS
STAIRS TO LOWER LEVEL
PASSENGER DISTRIBUTION CORRIDOR
STAIRS TO LOWER LEVEL
SLIP NO. 1
SLIP NO. 2
SLIP NO. 3
LOADING BRIDGES
LOADING BRIDGES
LOADING BRIDGES
N
0 10 20 30 40 50 ft.
STATEN ISLAND FERRY SYSTEM STUDY
WHITEHALL ST. N.Y. TERMINAL
Passenger Concourse Plan

EXISTING CONDITIONS ON SITE

## EXISTING CONDITIONS OF SOUTH FERRY SUBWAY ENTRANCE

The present entrance into the South Ferry Subway Station is almost completely concealed fron view by the pedestrian. The entrance into the subway station is presently located underneath the pedestrian ramp which leads up to the main passenger level of the Staten Island Ferry Terminal. There is no signage which informs the public of its presents or any other visual clues to its existance. The Mass Transit System of New York City is vital to almost all individuals within the City, and for this transition to be understated is a tragedy.




STATEN ISLAND – MANHATTAN FERRY TERMINALS

# WHITEHALL TERMINAL

IRT & BMT SUBWAY STATIONS

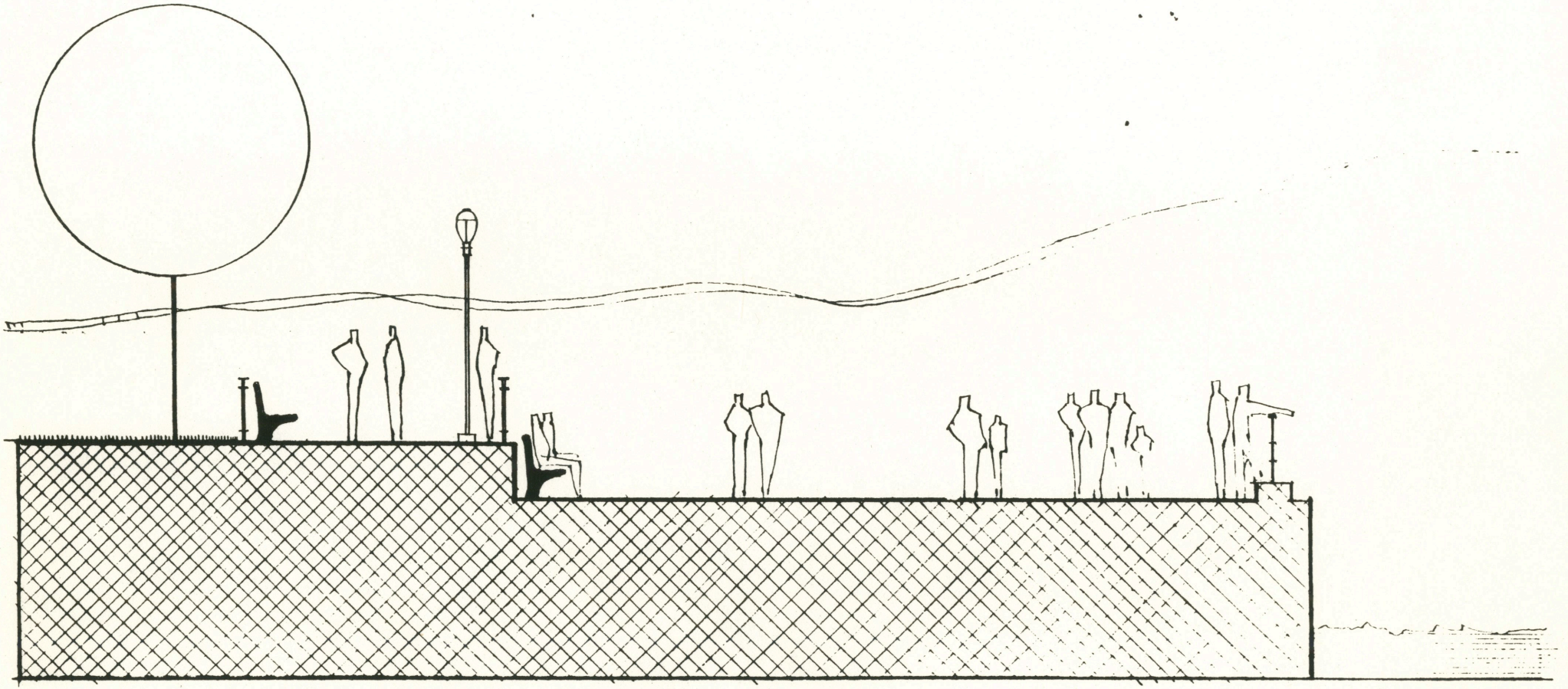
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EXISTING CONDITIONS ON SITE

## EXISTING ESPLANADE CONDITIONS

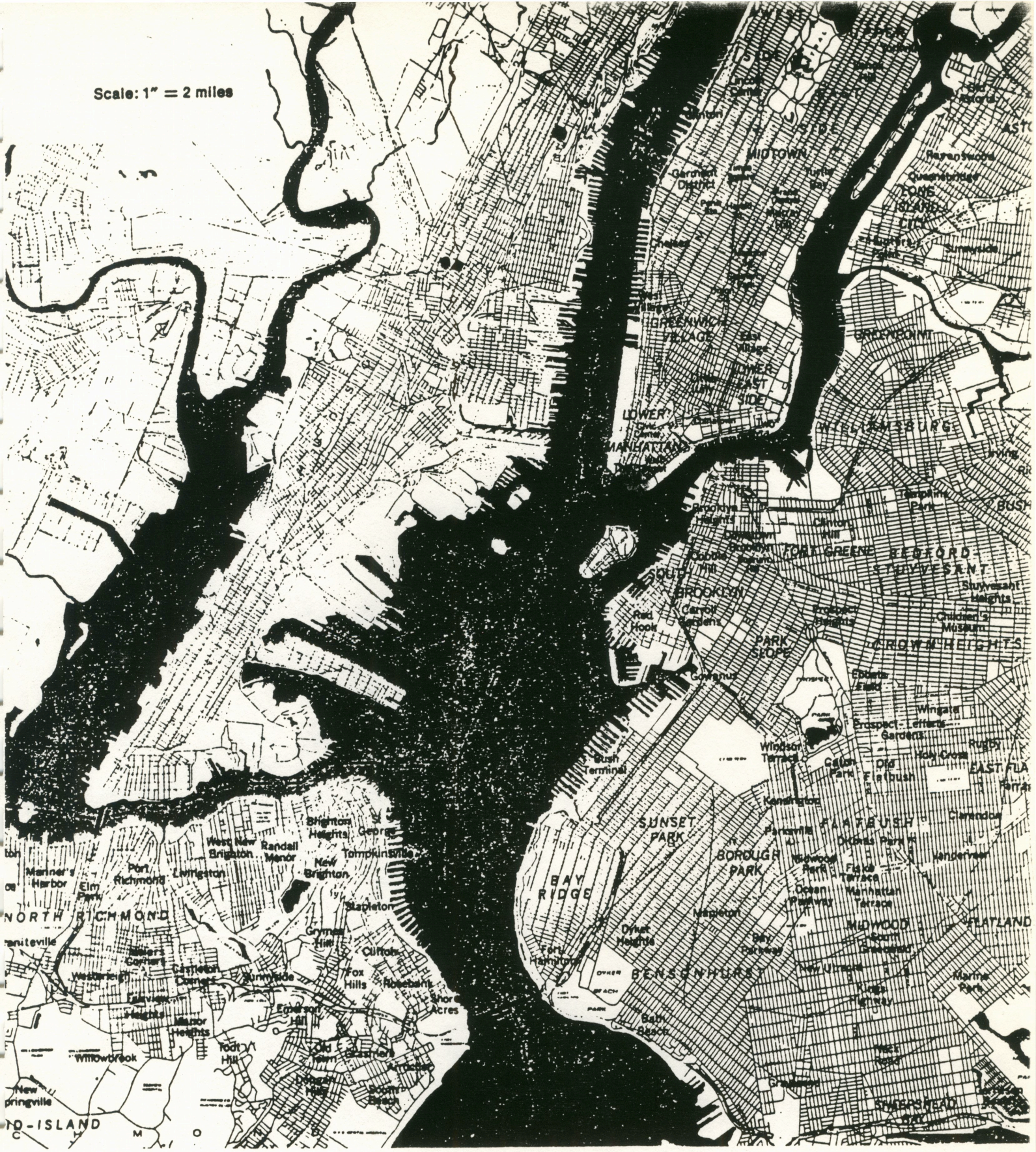
The present esplanade in Battery Park varies in its width, but in general its width is forty feet across. The esplanade is bounded from the water by the handrail which is four feet from the base of the esplanade. The inner boundary of the esplanade is flanked with benches for pedestrians to pause on their journeys. On this inner ring there is a second lever which is three feet above the main esplanade. This upper level also has a handrail at its edge. Old fashion lamp posts are on this level which light the ten foot path of this level. The inner ring of the second level is also flanked by benches which are fortunate to have a canopy of foliage from the trees behind the benches.



THE ESPLANADE AT BATTERY PARK

1/8" = 1'—0"

# SITE AND ANALYSIS

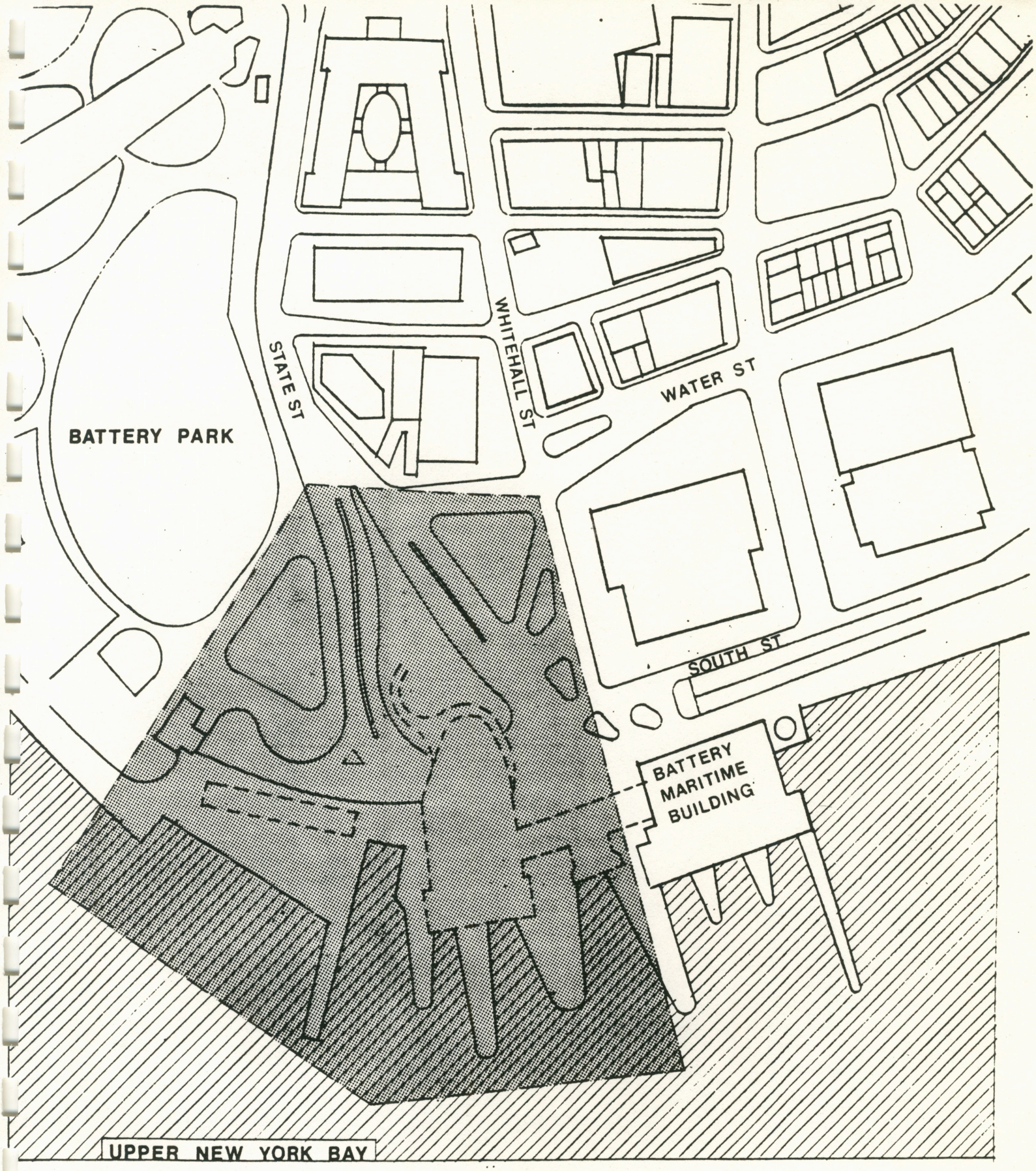



SOUTH FERRY PLAZA

N
Y C

# WATERFRONT DEVELOPMENT AREAS

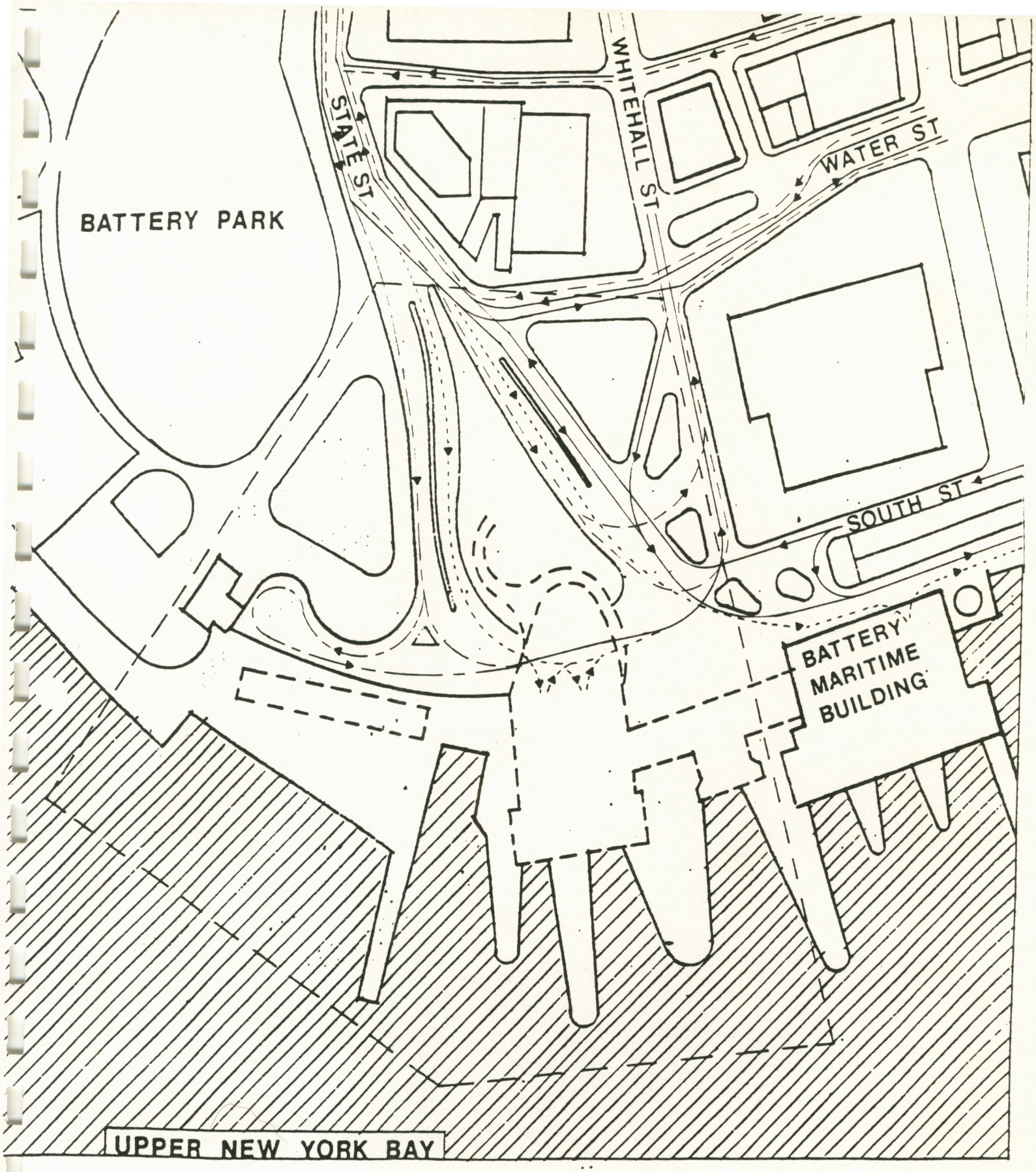





SOUTH FERRY PLAZA

SITE

NYC



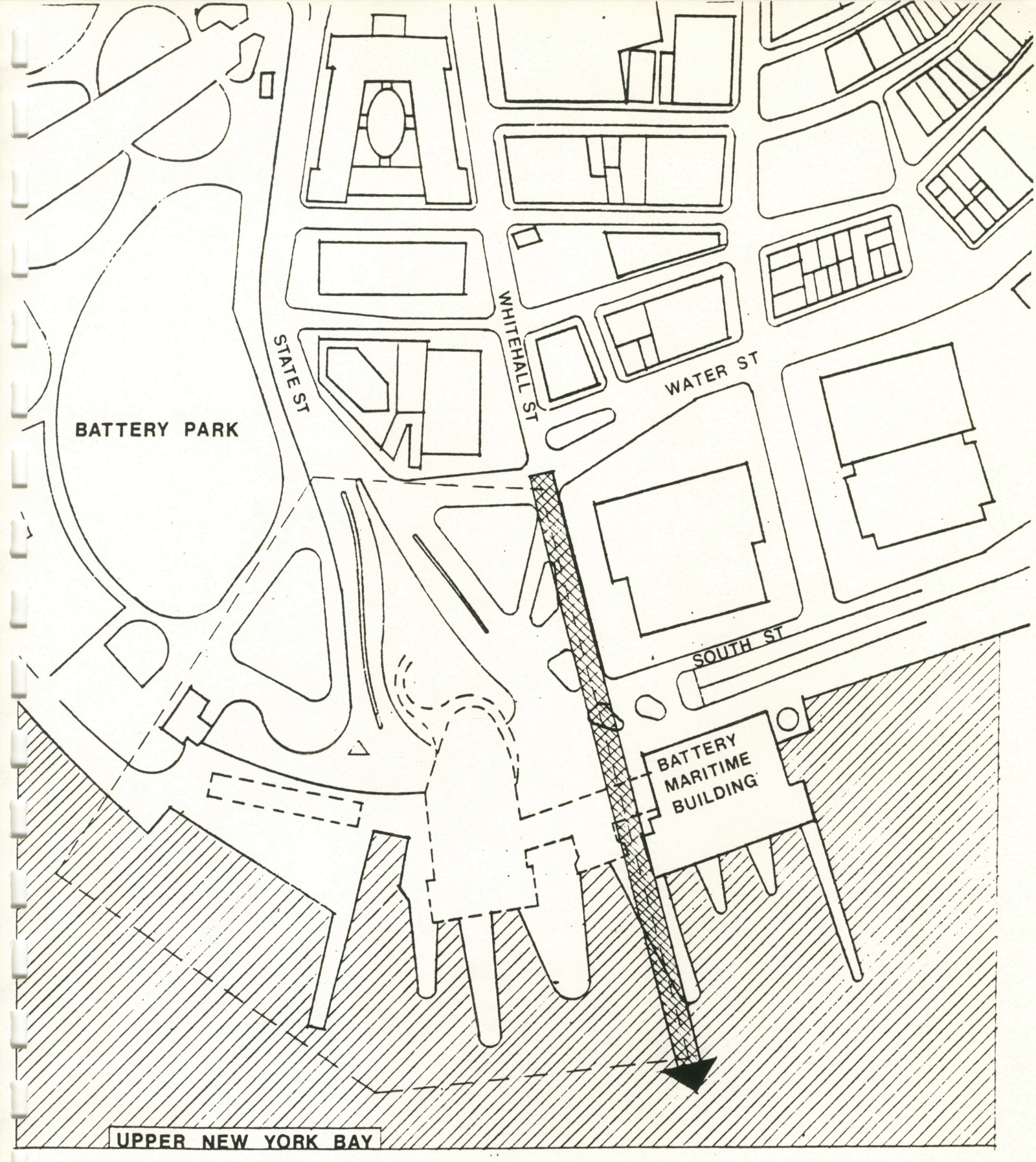

SOUTH FERRY PLAZA

EXISTING VEHICULAR CIRCULATION

LEGEND

THRU TRAFFIC
TOUR BUS
MTA BUS
FERRY VEHICLES

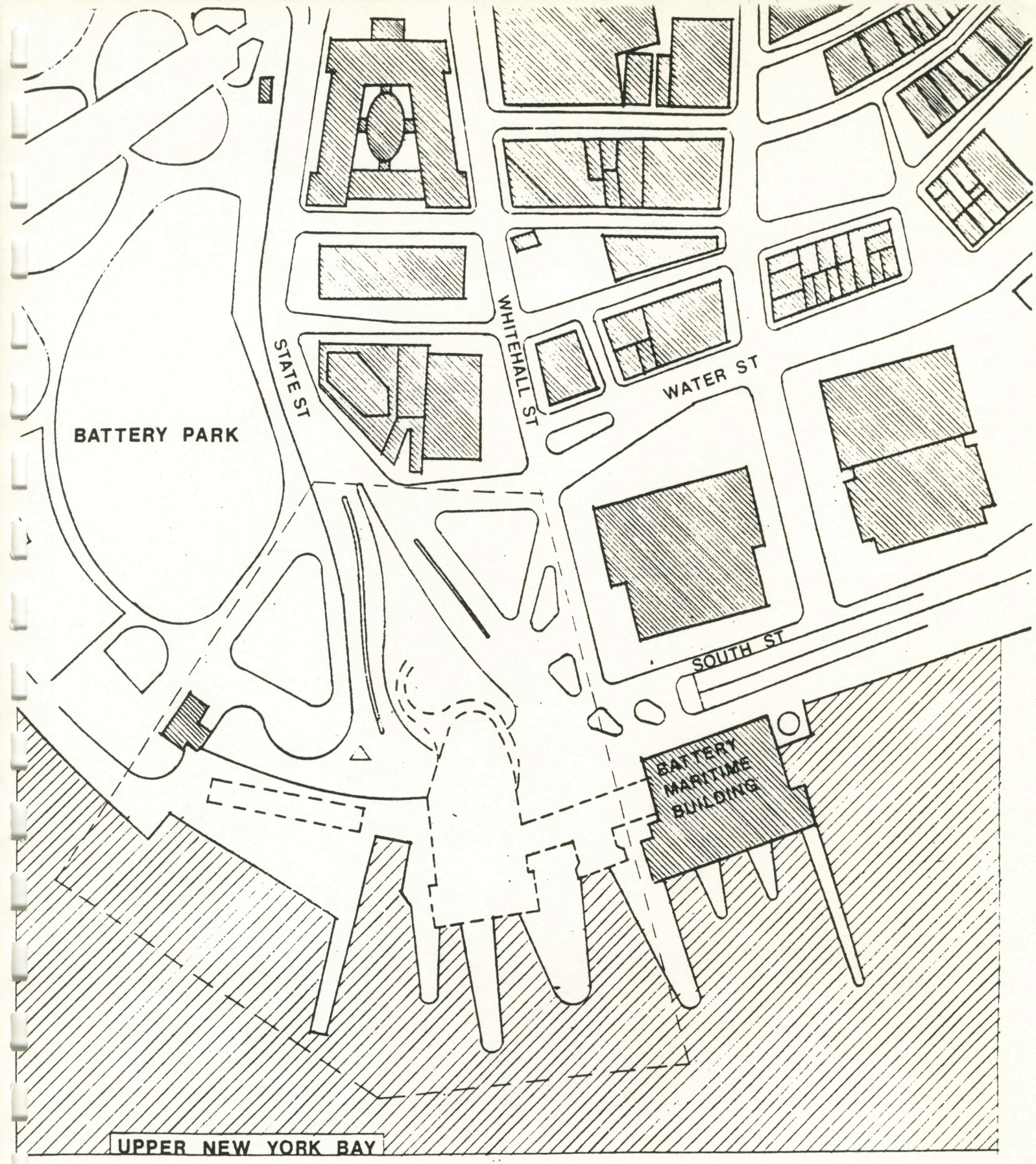
NYC




SOUTH FERRY PLAZA

VIEW CORRIDOR

NYC




SOUTH FERRY PLAZA

FIGURE GROUND

NYC

## CONTEXT

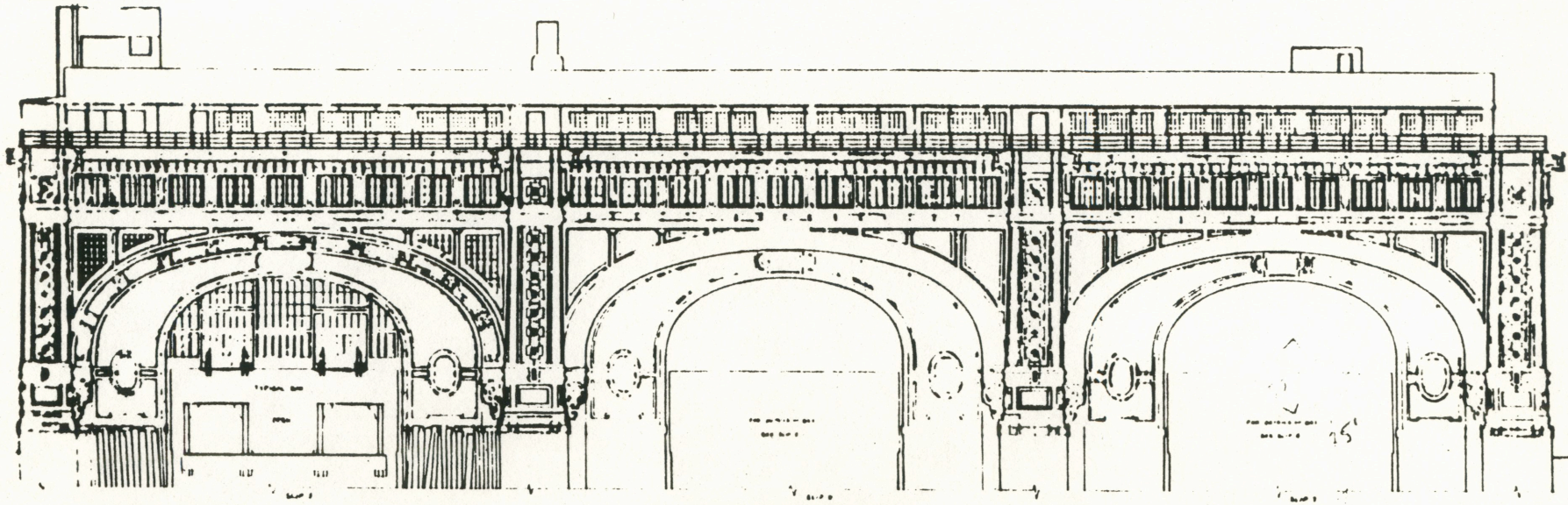
- Battery Park City
- The Landmark Battery Maritime Building

In 1986, the New York State Legislature established the Battery Park City Authority as a public benefit corporation with the mandate to develop a new residential and commercial community on ninety-two acres of Hudson River landfill in Lower Manhattan. A master plan, drawn up in 1979 by Cooper Eckstut Associates, calls for fourteen thousand units of privately developed rental, cooperative, and condominium housing situated to the north and south of the six million square foot World Financial Center, a four-building commercial complex currently under construction that was designed by Cesar Pelli and Associates. In addition to offices and housing, the plan stipulates that thirty percent of the entire site be given over to public parks, plazas and a riverfront esplanade.

The guidelines specifically call for an extension of the City's historic grid street system into the area and requires that the new buildings be grouped around Rector Park, a two acres green space. (AR, December, 1983, pp. 28)

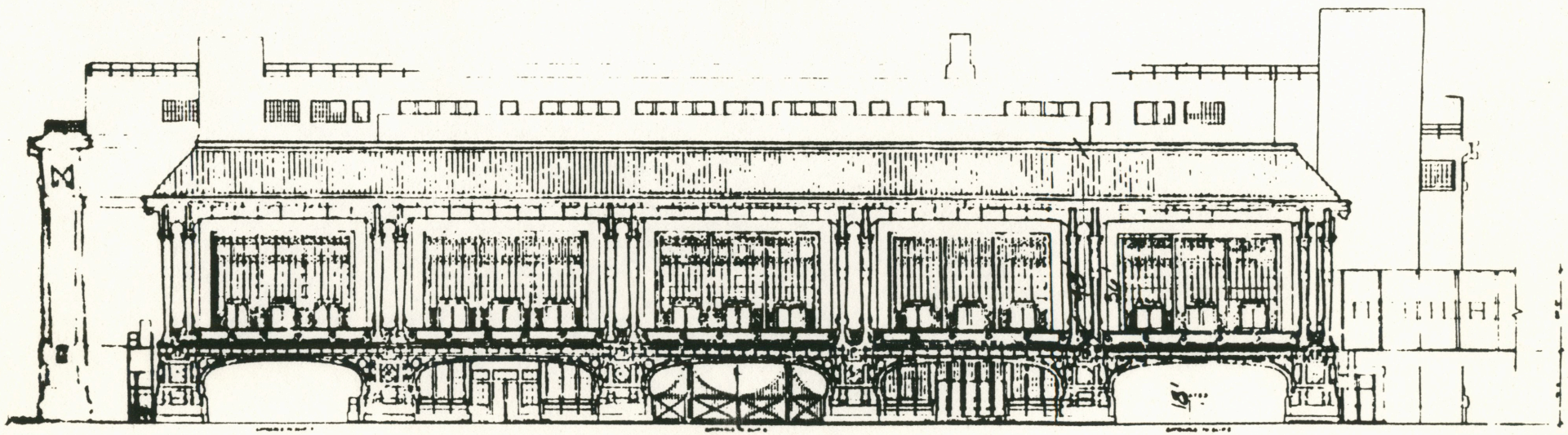
> "We wanted a place to be part of New York. We weren't reproducing it, we were interpreting it. The second thing was that we wanted it to be a pleasurable walking environment with park like streets. To get that, we needed variety and we needed buildings that related mostly to the public spaces before they go off and do their own thing. We had to manipulate heights to make sure that views and sunlight were not obstructed. The guidelines were structured to continue the theme of New York, but also to get buildings to relate together to talk to each other." (PA, June, 1983, pp. 37 - 38)

CONTEXT THE LANDMARK BATTERY MARITIME BUILDING



WATER FRONT ELEVATION

SCALE 8 INCH - ONE FOOT



LAND FRONT ELEVATION

SCALE 8 INCH - ONE FOOT

# FERRY HOUSE

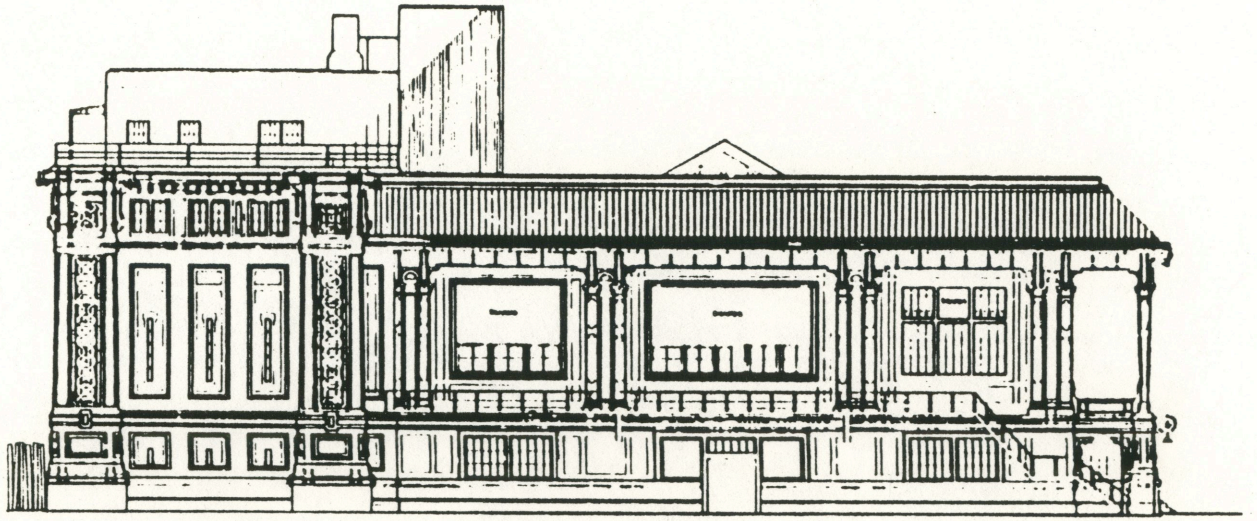
FOR THE

## NEW 39TH STREET FERRY - MANHATTAN TERMINAL

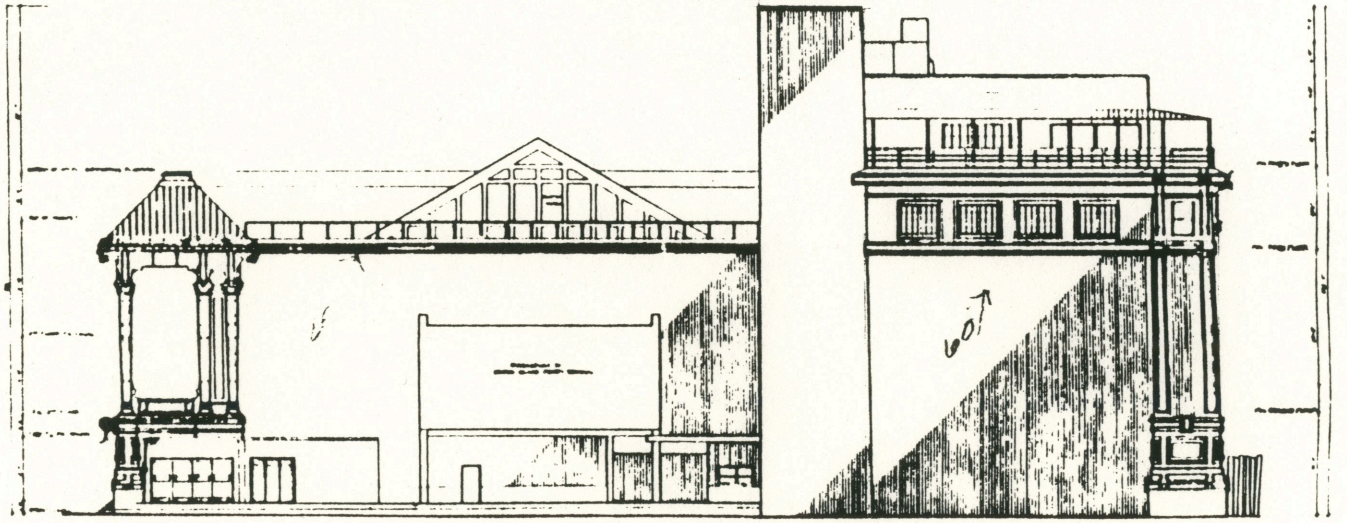
DEPT OF TRANSPORTATION

WATER FRONT ELEVATION
LAND FRONT ELEVATION

7



EAST ELEVATION



WEST ELEVATION

# FERRY HOUSE

FOR THE

# NEW 39TH STREET FERRY-MANHATTAN TERMINAL

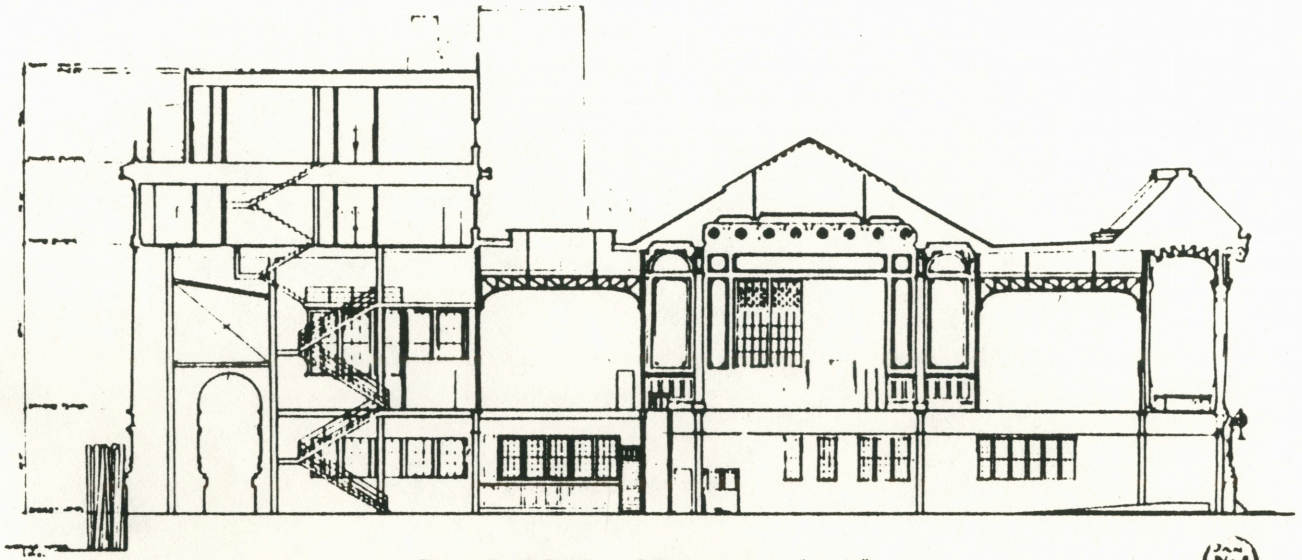
FOOT OF WHITEHALL STREET — BOROUGH OF MANHATTAN, N.Y.

SCALE: 1/8"-1'-0"

DEPT. OF TRANSPORTATION

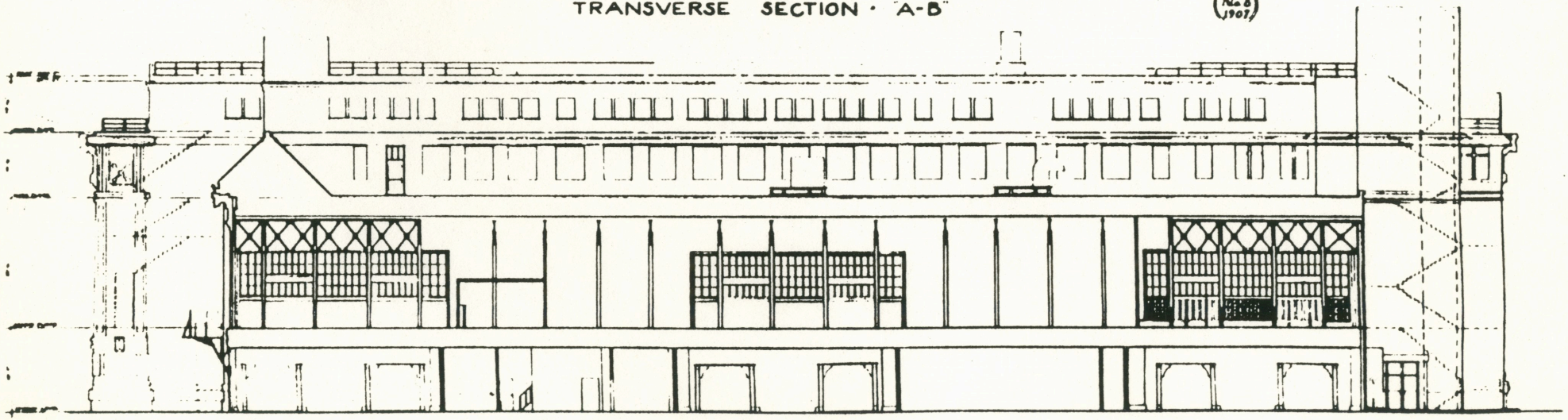
EAST ELEVATION &
WEST ELEVATION

8



TRANSVERSE SECTION · "A-B"

Jan No 8 1907



LONGITUDINAL SECTION · "C-D"

# FERRY HOUSE

FOR THE

# NEW 39TH STREET FERRY · MANHATTAN TERMINAL

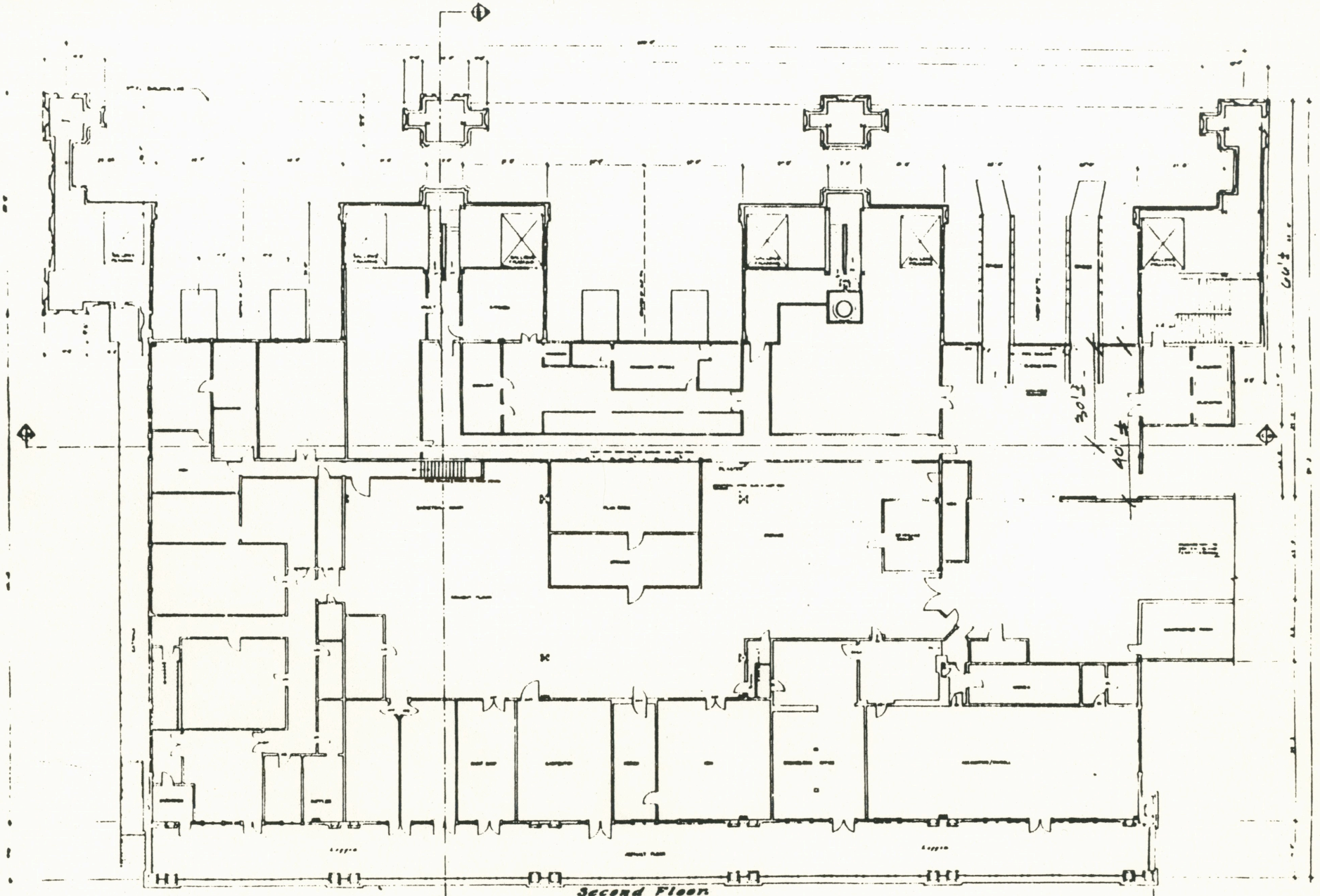
FOOT OF WHITEHALL STREET BOROUGH OF MANHATTAN, N.Y.

SCALE · 1/8 IN-1 FOOT

Jan No 6 1934

DEPT OF TRANSPORTATION

TRANSVERSE AND LONGITUDINAL SECTIONS

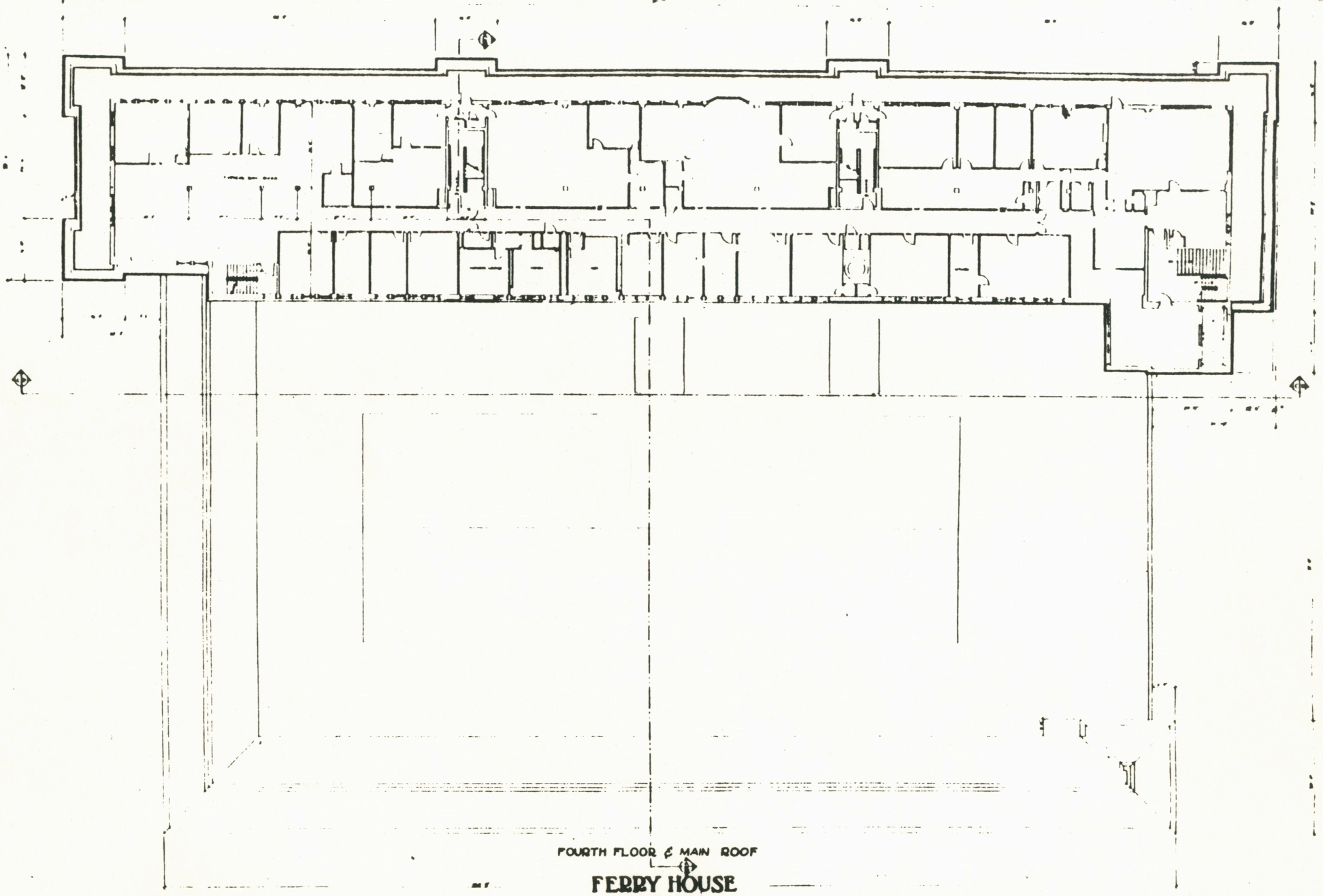



Second Floor
of
NEW 30 ST FERRY HOUSE
MANHATTAN TERMINAL
NEW YORK CITY

DEPT OF TRANSPORTATION

SECOND FLOOR PLAN

3



FOURTH FLOOR & MAIN ROOF

# FERRY HOUSE

FOR THE

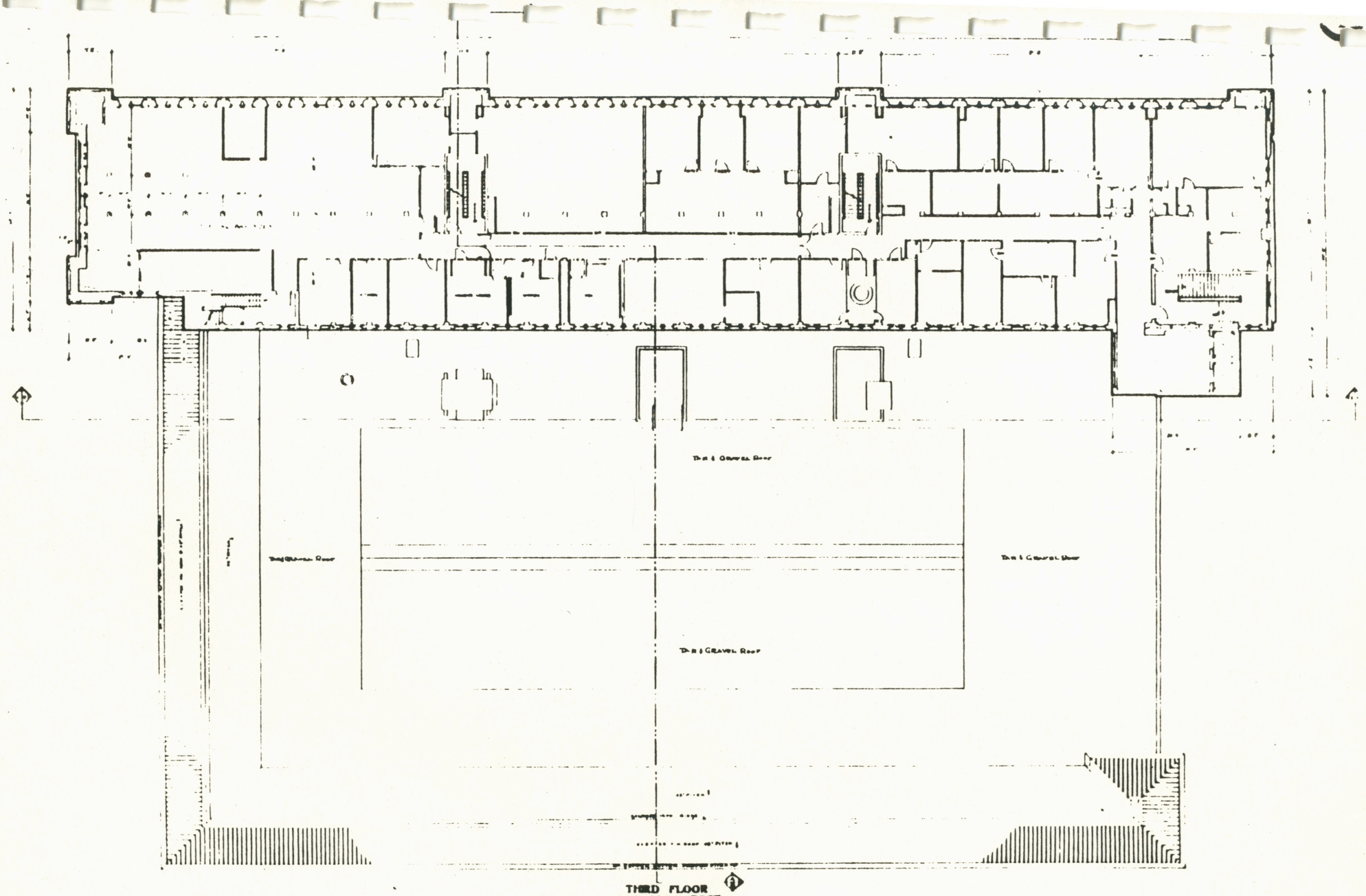
## NEW 39TH STREET FERRY MANHATTAN TERMINAL

FOOT OF WHITEHALL STREET, BOROUGH OF MANHATTAN, N.Y.

SCALE-1/8 INCH-1 FOOT.

DEPT OF TRANSPORTATION

FOURTH FLOOR & MAIN ROOF



THIRD FLOOR
AND MAIN ROOF

# FERRY HOUSE

FOR THE

## NEW 39TH STREET FERRY · MANHATTAN TERMINAL

FOOT OF WHITEHALL STREET — BOROUGH OF MANHATTAN N.Y.

SCALE-1/8TH-1FOOT

DEPT OF TRANSPORTATION

THIRD FLOOR & MAIN ROOF

## TYPOLOGY

- Larkspur Terminal
- St. George Terminal
- Staten Island Terminal
- Subway Entrances

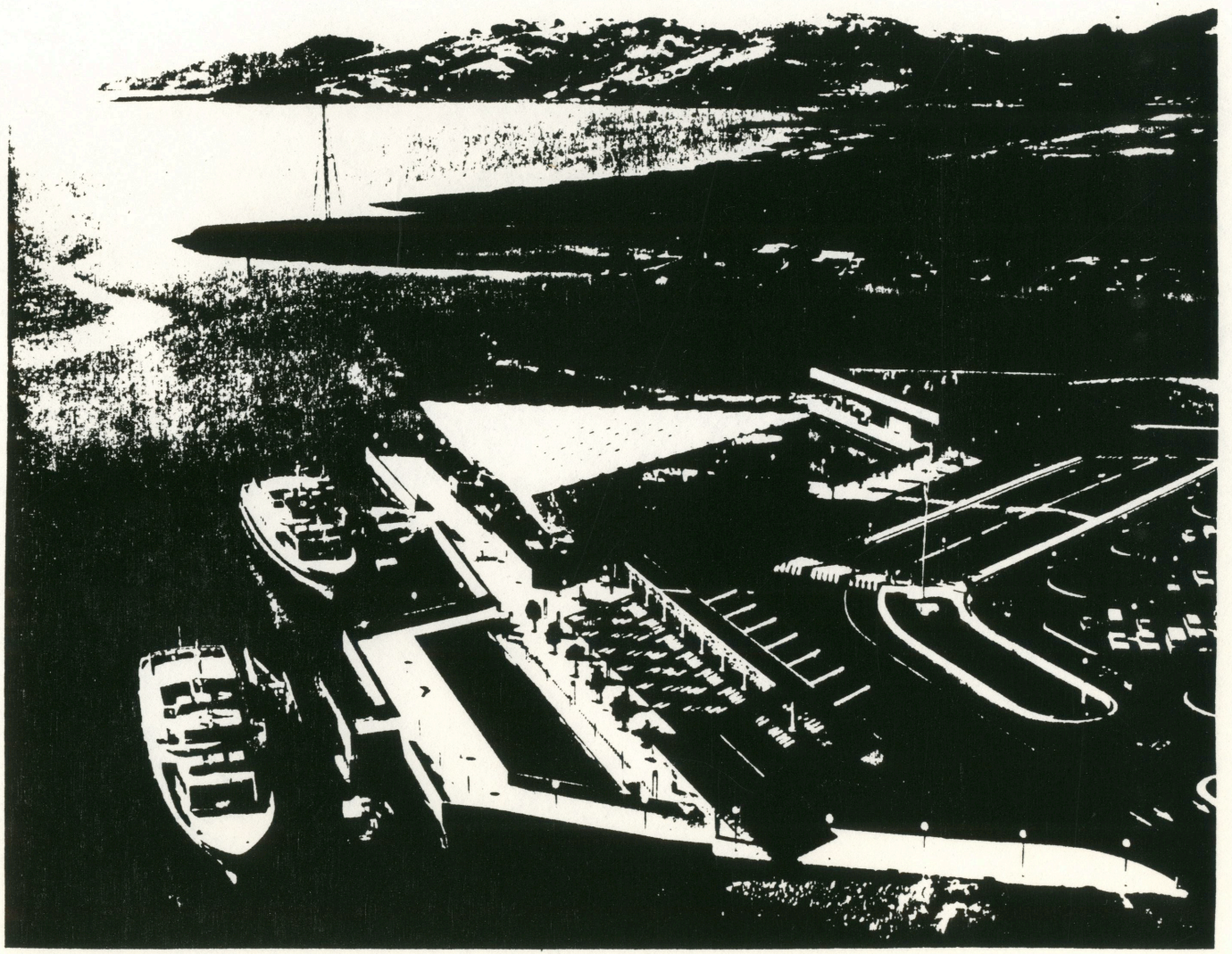
## Terminal Planning and Design

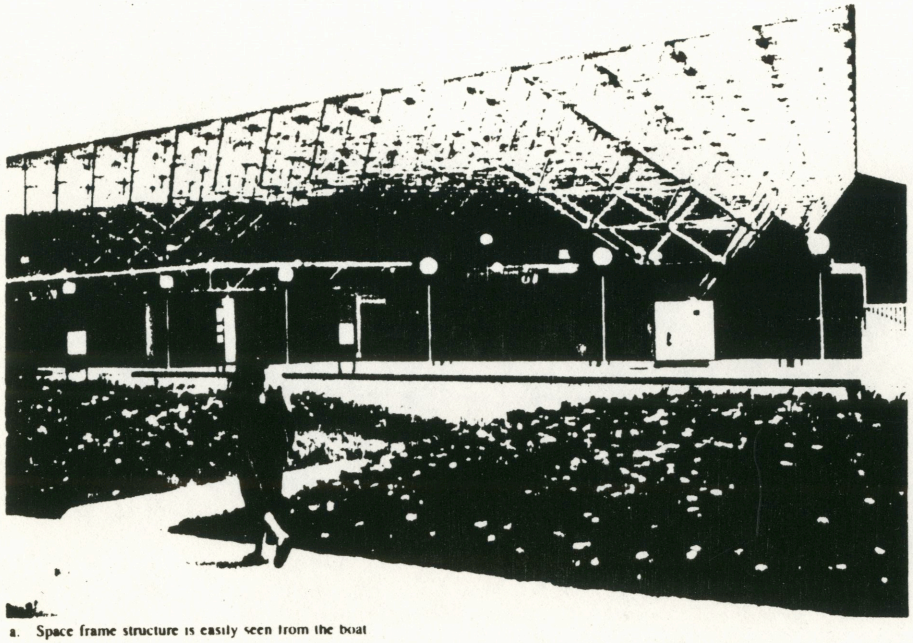
The Larkspur Terminal includes an elaborate feeder bus service connecting to pickup points in the suburban communities and coordinated with the ferry schedule. Access to the terminal is a simple, efficient operation. The Downtown Terminal, located within a few minutes walk of Embarcadero subway station, is very convenient for most commuters. Visual connections and paths to this terminal are not, however, well developed and seem more remote than they should. The main aesthetic virtues of the terminal layouts are that they do not cause uncertainties, delays or other barriers on the trip.

The two terminals have a similar architectural vocabulary, despite very different site conditions. The Downtown Terminal is a small addition to the extensive older Ferry Building complex and is somewhat dominated by the environment that was already there. Larkspur, the more ambitious of the two structures, was built on a previously undeveloped site. It was a catalyst to other developments now beginning to grow up around it.

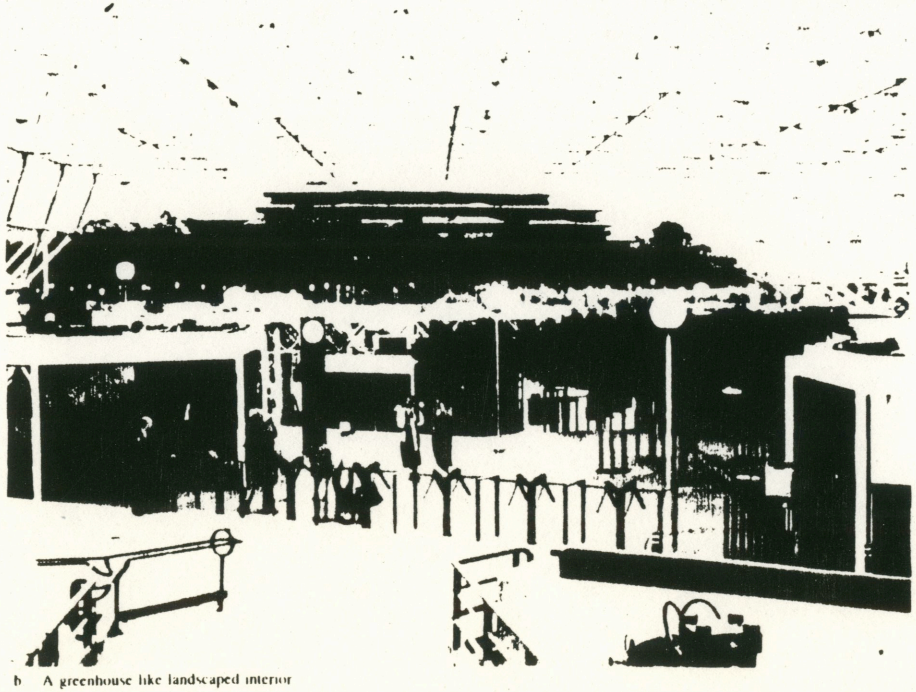
The Larkspur Terminal is dominated by a dramatic, white space frame structure that is prominently visible from the approaching boat. It has a strong presence in its otherwise nondescript surroundings. The waiting areas inside are richly landscaped with orange trees, flowers and shrubs and provide small, intimate seating groups along the major pathways. The overall effect resembles a light, spacious greenhouse. Dozens of songbirds have taken up residence among the space frame struts and provide continuous sound effects. The space frame extends to form a canopy over the bus drop-off points and an entrance to the parking lot. The parking lot is clearly organized with islands and dividers, which are planted with trees and

Terminal building visually commands its site





a. Space frame structure is easily seen from the boat



b. A greenhouse like landscaped interior

flowering groundcover plants. The building and site are spotlessly maintained.

In spite of its attractiveness, this building provoked some controversy. Its $13.6 million cost was greatly above estimated budget. On rainy, windy days the open space frame does not provide enough protection, and the addition of screen walls now being considered is made somewhat difficult by the architectural design. Generally, however, the terminal is a wonderful place at which to arrive or wait.

## Costs and Resources

| | |
|---|---|
| 3 Vessels | $13.0 million |
| Downtown and Larkspur Terminals | $23.8 million |
| Total System | $36.8 million (in 1974) |
| US-DOT-Transit funding: | $26.9 million |

## Clients

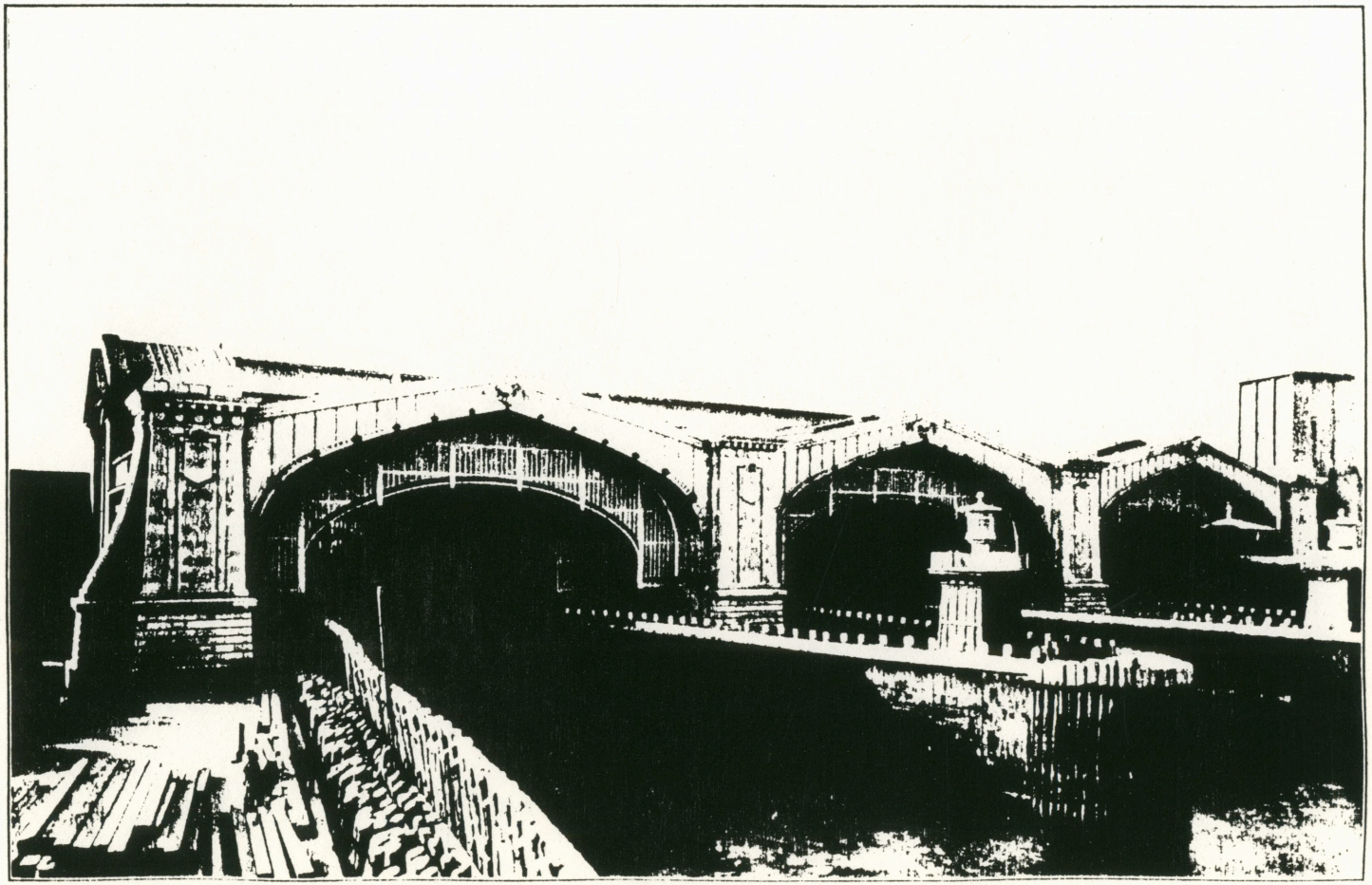
The ferry system was developed and is operated by the Golden Gate Bridge, Highway and Transportation District. This agency is also responsible for the operation of the bridge and for providing commuter bus service from Marin County. As a result it is in a good position to balance the three modes of commuting from the county to downtown San Francisco.

## Credits

Larkspur Terminal Architects: Braccia/DeBier/Heglund
Downtown Terminal Architects: Environmental Planning and Design Associates

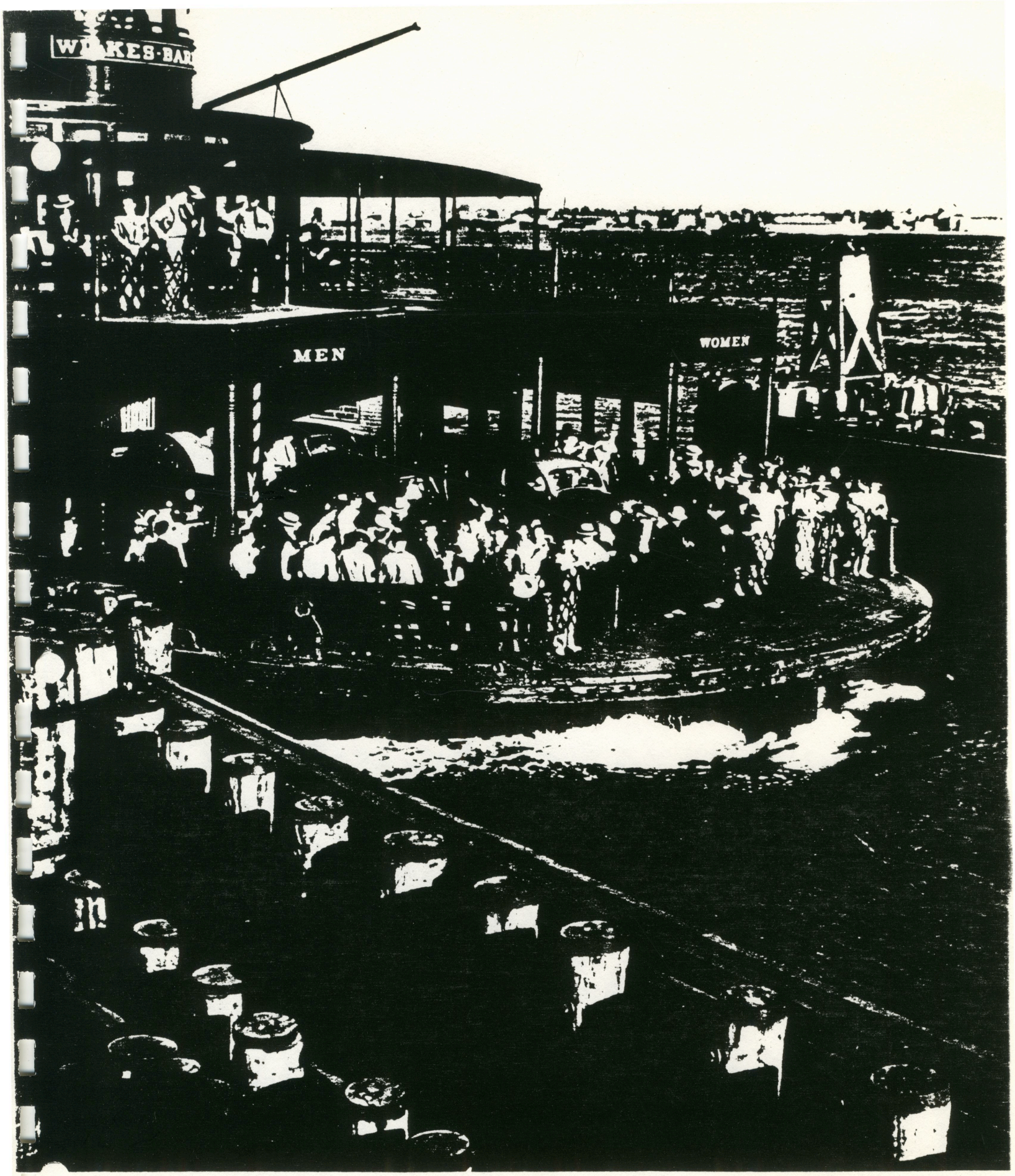
## Lessons

- The Golden Gate Ferry is unique because it shows that a boat system with the latest technology can be very attractive for commuter service.
- The responsible agency's control over several modes of transportation gave it some flexibility in developing, operating and marketing the new system.
- The diversity of on-board facilities is one of the primary reasons why the ride is such a pleasant experience.
- Some of the design features would be attractive only under the right climatic conditions. In Northern cities, both boats and terminals would need more protection from inclement weather.
- The items that caused problems—inefficient engines, excessive terminal costs, and inadequate weather protection—could have been avoided without reducing aesthetic benefits.

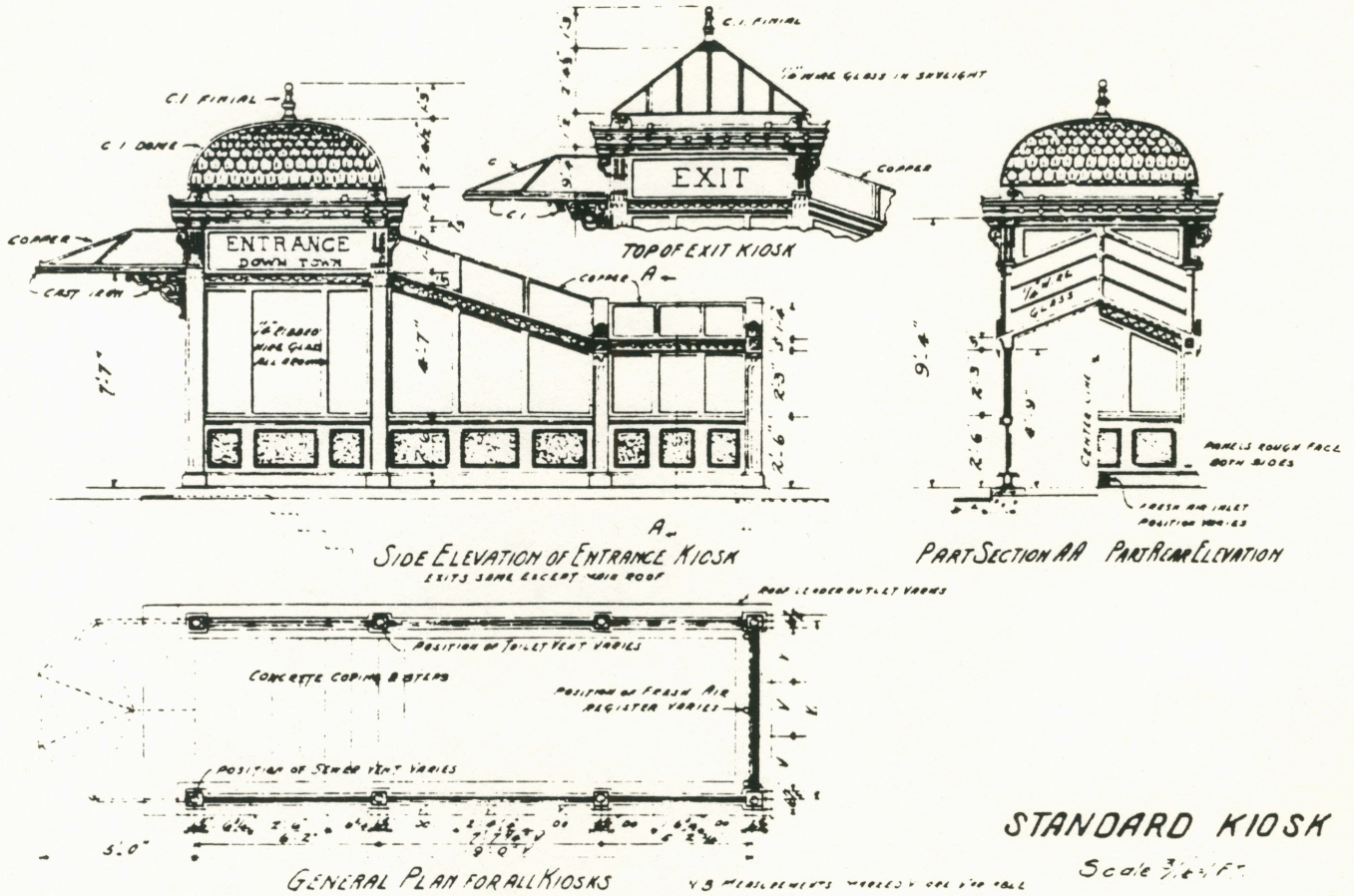


FERRY TERMINAL AT ST. GEORGE, STATEN ISLAND (1904).

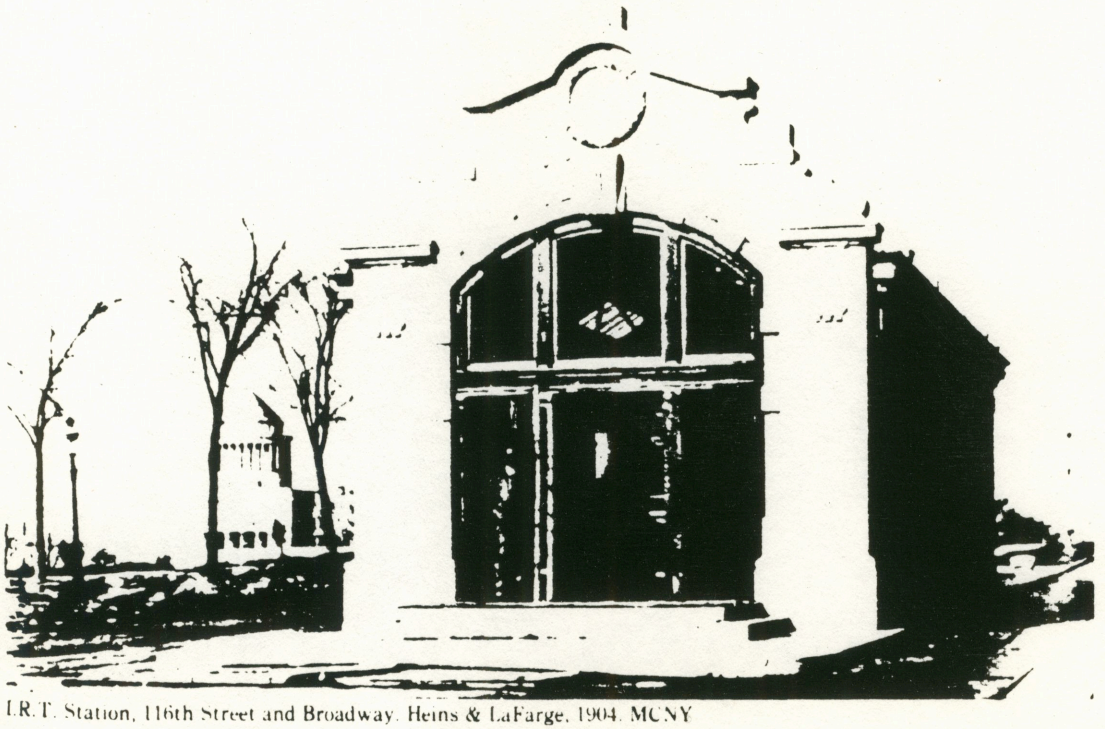





During the 1930's sixty million ferry passengers used to cross the Hudson annually. Now a steadily increasing majority come via the Lincoln and Holland tunnels and over the George Washington Bridge. Each year finds fewer ferry boats on the river. However, from the ferry you get a good view of the ships (ten thousand a year enter the New York-New Jersey waterfront area) and if you're lucky you may see a transatlantic liner steaming along with her attendant tugs or maybe even a welcome on a maiden voyage.




Standard kiosk, I.R.T. Subway. Heins & LaFarge, 1904. Plan, section and elevations. MCNY



I.R.T. Station, 116th Street and Broadway. Heins & LaFarge, 1904. MCNY

## FACTS

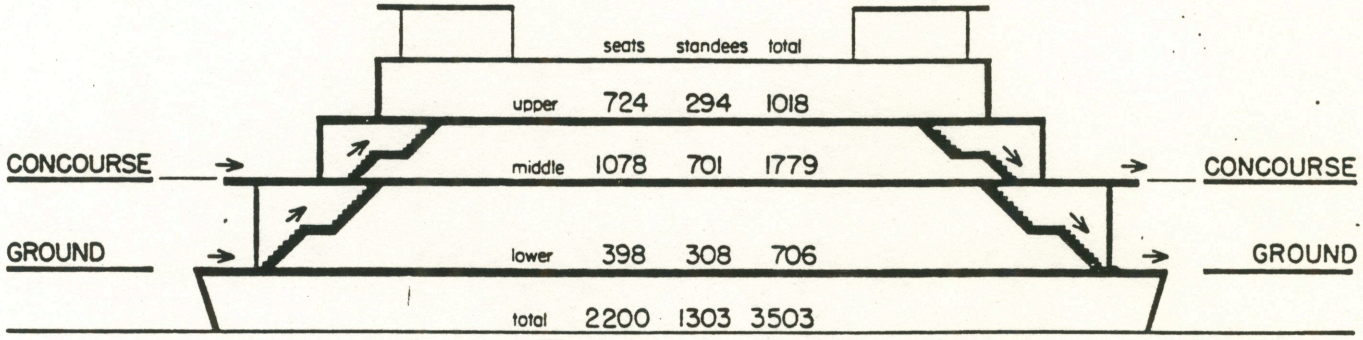
- Terminal Appendix
- Vehicular Requirements

TITLE

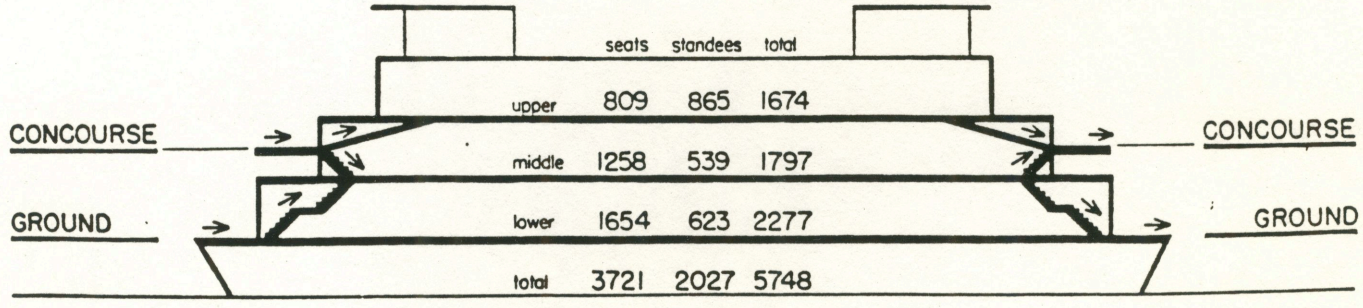

| | |
|---|---|
| Ferry Capacities by Decks | A-1 |
| Ferry Schedule | A-2 |
| Modal Split New York Terminal | A-3 |
| Outline Functional Considerations | A-4 |
| Hourly Passenger Volumes (Graph) | A-5 |
| Ferry Unloading Configurations | A-6 |
| Waiting Room Area Analysis | A-7 |
| Pedestrian LOS - Walkways | A-8 |
| Pedestrian LOS - Stairways | A-9 |
| Pedestrian LOS - Queuing Areas | A-10 |

# SCHEMATIC ELEVATION OF FERRIES

## KENNEDY CLASS




## BARBERI CLASS



DEPARTMENT OF TRANSPORTATION
BUREAU OF FERRIES

FERRY SCHEDULE - MONDAY TO FRIDAY

| AM | | | PM | | |
|---|---|---|---|---|---|
| S.I. | | N.Y. | S.I. | | N.Y. |
| 12:00 | P&V | 12:30 | 12:00 | P | 12:30 |
| 1:00 | P&V | 1:30 | 12:30 | P&V | 1:00 |
| 2:00 | P&V | 2:30 | 1:00 | P | 1:30 |
| 3:00 | P&V | 3:30 | 1:30 | P&V | 2:00 |
| 4:00 | P&V | 4:30 | 2:00 | P | 2:30 |
| 5:00 | P&V | 5:30 | 2:30 | P | 3:00 |
| 6:00 | P&V | 6:30 | 3:00 | P | 3:30 |
| 6:30 | P | 7:00 | 3:30 | P | 4:00 |
| 6:45 | P | 7:15 | 3:50 | P&V | 4:20 |
| 7:00 | P&V | 7:30 | 4:10DH | | 4:40 |
| 7:20 | P&V | 7:50 | 4:10 | P | 5:00 |
| 7:40 | P | 8:10 | 4:30 | P | 5:15 |
| 8:00 | P | 8:30 | 4:50 | P&V | 5:30 |
| 8:15 | P&V | 8:45 | 5:10 | P&V | 5:45 |
| 8:30 | P&V | 9:00 | 5:30 | P | 6:00 |
| 8:45 | P | 9:15 | 5:45 | P | 6:15 |
| 9:00 | P | 9:30 | 6:00 | P&V | 6:30 |
| 9:30 | P&V | 10:00 | 6:15 | P&V | 6:45 |
| 10:00 | P | 10:30 | 6:30 | P | 7:00 |
| 10:30 | P&V | 11:00 | 6:45 | P | 7:20 |
| 11:00 | P | 11:30 | 7:00 | P&V | 7:40 |
| 11:30 | P&V | 12:00 | 7:30 | P&V | 8:00 |
| | | | 8:00 | P | 8:30 |
| | | | 8:30 | P&V | 9:00 |
| | | | 9:00 | P&V | 9:30 |
| | | | 9:30 | P&V | 10:00 |
| | | | 10:00 | P&V | 10:30 |
| | | | 10:30 | P&V | 11:00 |
| | | | 11:00 | P&V | 11:30 |

*Between 9AM & 2PM we will attempt to run a car-carrying boat at least once an hour. Call 727-2508 for schedule during these hours.

*P&V - PASSENGERS & VEHICLES
*P - PASSENGERS ONLY

Saturdays, Sundays, Holidays

12:30AM to 9:30AM - Every Hour
9:30AM to 9:30PM - Every 30 Min.
9:30PM to 12:30AM - Every Hour

SAT. SUN. & HOLIDAYS - ALL BOATS CARRY VEHICLES

## STATEN ISLAND FERRY SYSTEM STUDY

### SURVEY NEW YORK TERMINAL PASSENGER ARRIVALS[1]
### 4:00-6:00 PM PEAK PERIOD THURSDAY 2/27/75

| MODE OF ARRIVAL | PASSENGERS | | | PEAK PERIOD AS PER CENT TOTAL |
|---|---|---|---|---|
| | PEAK BOAT 5:26[2] | PEAK HOUR 4:43-5:40[3] | PEAK PERIOD 4:00-6:00 | |
| PEDESTRIANS | 1530 | 6560 | 8310 | 59.3% |
| IRT SUBWAY | 470 | 2030 | 2600 | 18.6 |
| BMT SUBWAY | 250 | 1140 | 1470 | 10.5 |
| MABSTOA BUS RTS. 1, 6, 15 | 180 | 770 | 990 | 7.1 |
| TAXI | 40 | 250 | 270 | 1.9 |
| AUTO ON BOAT | 60 | 230 | 360 | 2.6 |
| TOTALS | 2,530 | 10,980 | 14,000 | 100.0% |

NOTES:

(1) Minor rounding of passenger counts. Not adjusted for seasonality.
(2) 5:20 scheduled departure left at 5:26.
(3) Includes 5 peak period ferry departures.

# SOUTH FERRY PLAZA PASSENGER TERMINAL DEVELOPMENT
Outline of Functional Considerations

## INTERNAL ELEMENTS

### FERRY TERMINAL

Ferry capacities
Peak in/out volumes
Pedestrian LOS
Separation in/out psgrs. & veh.
Fare control
Waiting room
Turnstiles, doors, corridors
Escalators, stairs ramps,
Concessions, rest rooms
Maintainable finishes, non-slip flrs.
Passenger orientation, signs
Open spaces, clear lines of sight
Ferry "experience"
Visitors info. center
E & H accessibility
Contingency access BMB
Waterfront ped. Esplanade
External element access
Slips - Internal roadway or exist.
Truck access
BMB landmark preservation
Passenger safety during const.
Maintain operations during const.

## EXTERNAL ELEMENTS

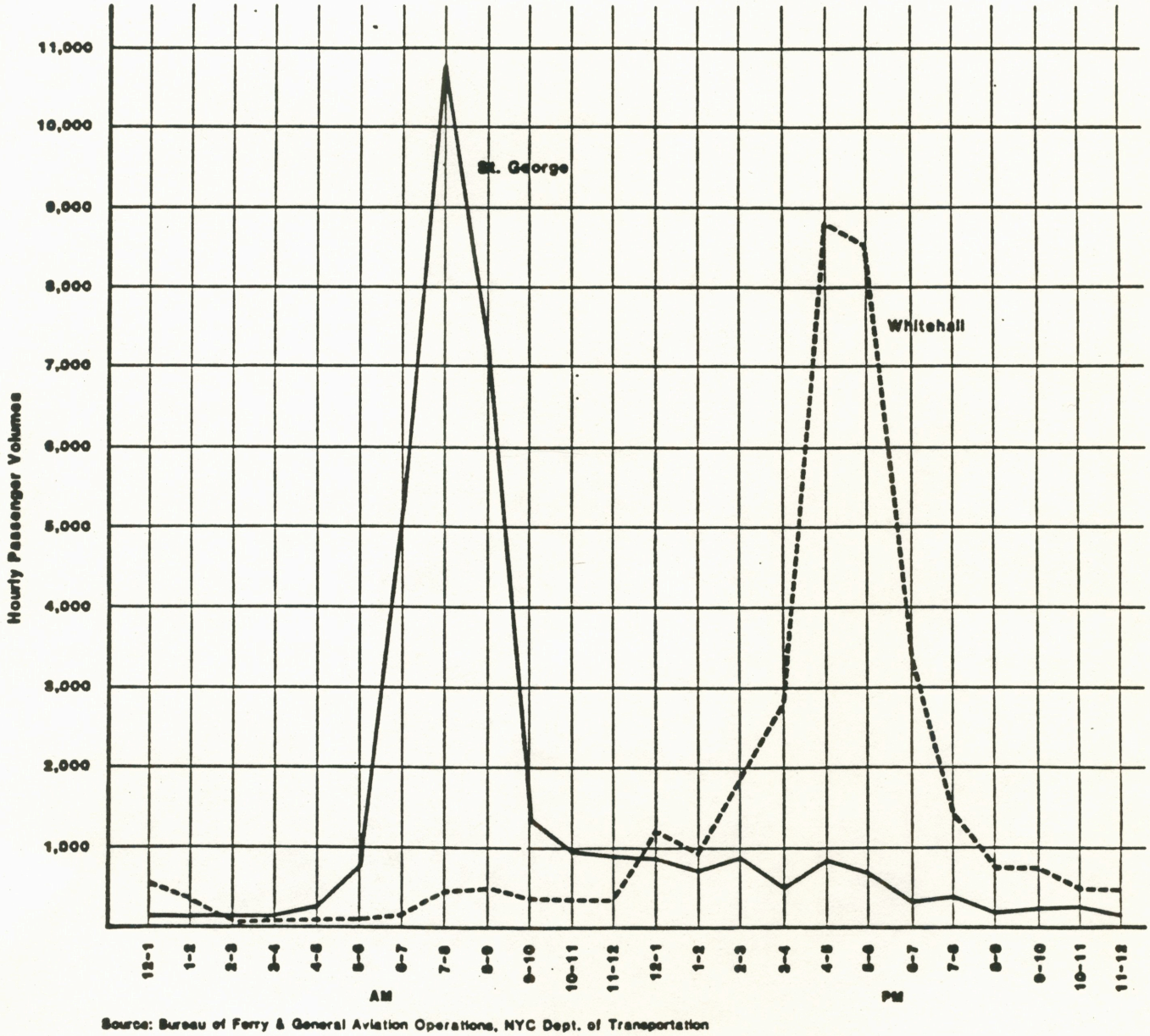
### PEDESTRIAN

Waterfront Esplanade
S. Ferry Subway sta.
Whitehall St. Subway sta.
MABSTOA bus access
Taxi stand access
Street crossings, crosswalks,
Signals, controls
Park consolidation
External access during const.

### VEHICULAR

Freight deliveries
Off-street truck berths
Ferry stacking lines
(S.I. & Gov's. Is.)
Taxis HRB & ferry psgr.
MABSTOA buses
Pedestrian conflicts, safety
Parking access
Liberty, Ellis Is. tour buses

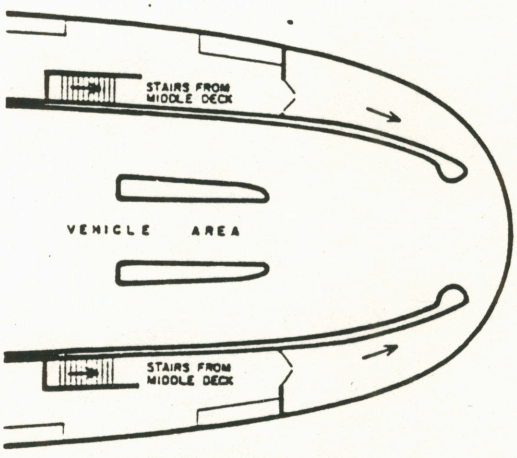
## HOURLY PASSENGER VOLUMES, WEDNESDAY, APRIL 13, 1983



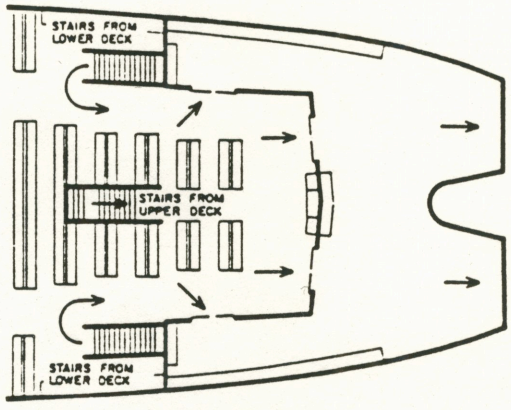

Source: Bureau of Ferry & General Aviation Operations, NYC Dept. of Transportation

# SCHEMATIC PLANS OF FERRIES

## KENNEDY CLASS

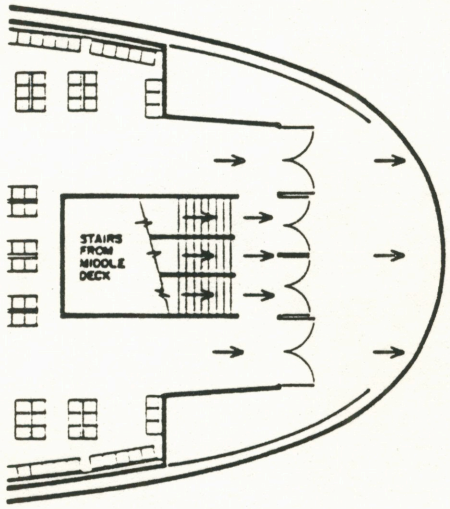



LOWER EMBARKATION LEVEL

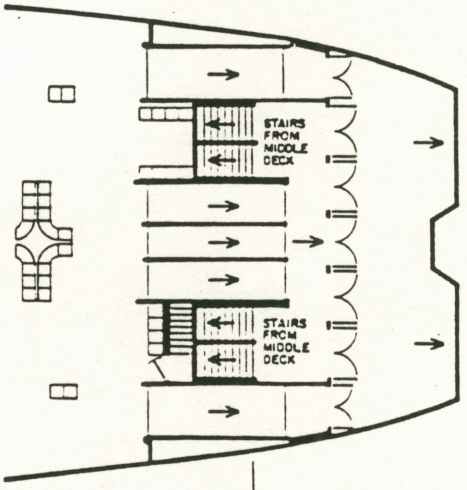



UPPER EMBARKATION LEVEL

## BARBERI CLASS




LOWER EMBARKATION LEVEL




UPPER DECK → UPPER EMBARKATION LEVEL

## Waiting Room Area Analysis

Assumed peak hour passenger arrival rate = 12,000 persons

Average peak arrival rate = 12,000/ 60 min. = 200 PPM

Average passenger waiting time during peak hour is the 15 minutes headway between departures less ferry loading time of 5 minutes, or: 10 minutes .

200 PPM avg. x 10 min. = 2,000 persons

Queuing LOS C (also NYC Building Code theater lobby standard), is 10 square feet per person .

Required area = 2000 persons x 10 SFP = 20,000 square feet

Evaluation of "missed schedule" - one peak period ferry , 30 minutes between ferries, less 5 minutes loading time,

or: 25 minutes x 200 PPM = 5000 persons

Area per person = 20,000 SF/5000 persons = 4 SFP

4 SFP is Queuing LOS D , standing without touching, circulation severely restricted, long term waiting discomforting, (acceptable within context of ferry). Closing of turnstiles and prevention of access to waiting area would become necessary for any peak period delay exceeding 30 minutes.

## Sample Corridor Analysis

Corridor demand allocation: 180 PPM

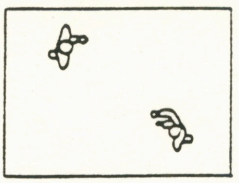
Net effective width LOS C: 180 PPM/12 PFM = 15 feet

Edge affect addition: 15 feet + 1.5 feet = 16.5 feet

Corridor width = 16.5 feet

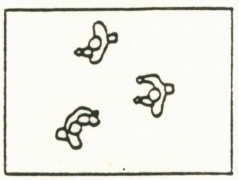
**WALKWAY LEVEL OF SERVICE A**

Average Flow Volume: 7 PFM* or less
Average Speed: 260 ft/min.
Average Pedestrian Area Occupancy: 35 sq.ft./person or greater
Description: Virtually unrestricted choice of speed; minimum maneuvering to pass; crossing and reverse movements are unrestricted; flow is approximately 25% of maximum capacity.



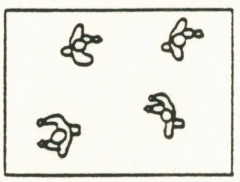
**WALKWAY LEVEL OF SERVICE B**

Average Flow Volume: 7-10 PFM
Average Speed: 250-260 ft/min.
Average Pedestrian Area Occupancy: 25-35 sq.ft./person
Description: normal walking speeds only occasionally restricted; some occasional interference in passing, crossing and reverse movements are possible with occasional conflict; flow is approximately 35% of maximum capacity.



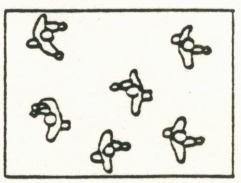
**WALKWAY LEVEL OF SERVICE C**

Average Flow Volume: 10-15 PFM
Average Speed: 230-250 ft/min
Average Pedestrian Area Occupancy: 15-25 sq.ft./person
Description: walking speeds are partially restricted; passing is restricted but possible with maneuvering; crossing and reverse movements are restricted and require significant maneuvering to avoid conflict; flow is reasonably fluid and is about 40-65% of maximum capacity.



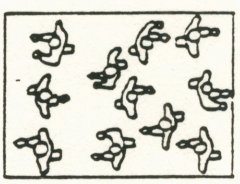
**WALKWAY LEVEL OF SERVICE D**

Average Flow Volume: 15-20 PFM
Average Speed: 200-230 ft/min.
Average Pedestrian Area Occupancy: 10-15 sq.ft./person
Description: walking speeds are restricted and reduced, passing is rarely possible without conflict; crossing and reverse movements are severely restricted with multiple conflicts; some probability of momentary flow stoppages when critical densities might be intermittently reached; flow is approximately 65-80% of maximum capacity.



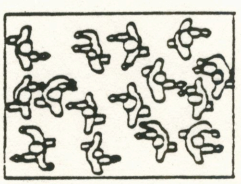
**WALKWAY LEVEL OF SERVICE E**

Average Flow Volume: 20-25 PFM
Average Speed: 110-200 ft./min.
Average Pedestrian Area Occupancy: 50-10 sq.ft./person
Description: walking speeds are restricted and frequently reduced to shuffling; frequent adjustment of gait required; passing is impossible without conflict; crossing and reverse movements are severely restricted with unavoidable conflicts; flows attain maximum capacity under pressure, but with frequent stoppages and interruptions of flow.



**WALKWAY LEVEL OF SERVICE F**

Average Flow Volume: 25 PFM or more
Average Speed: 0-110 ft./min.
Average Pedestrian Area Occupancy: 5 sq.ft./person or less
Description: walking speed is reduced to shuffling; passing is impossible; crossing and reverse movements are impossible; physical contact is frequent and unavoidable; flow is sporadic and on the verge of complete breakdown and stoppage.



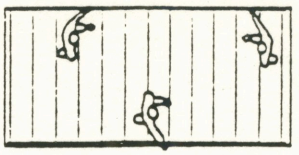
*PFM = Pedestrians per foot width of walkway, per minute.

Source: Fruin, John J., Pedestrian Planning and Design, MAUDEP Inc., 1971.

Walkway Level Of Service Descriptions

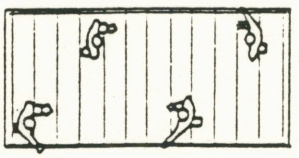
**STAIRWAY LEVEL OF SERVICE A**

Average Flow Volume: 5 PFM* or less
Average Speed: 125 ft/min. or more
Average Pedestrian Occupancy Area: 20 sq.ft./person
Description: unrestricted choice of speed; relatively free to pass; no serious difficulties with reverse traffic movements; flow is approximately 30% of maximum capacity.



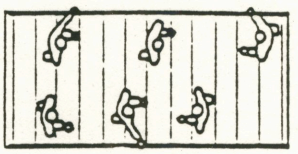
**STAIRWAY LEVEL OF SERVICE B**

Average Flow Volume: 5-7 PFM
Average Speed: 120-125 ft/min.
Average Pedestrian Occupancy Area: 15-20 sq.ft./person
Description: restricted choice of speed; passing encounters interference; reverse flows create occasional conflicts; flow is approximately 34% of maximum capacity.



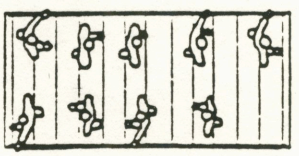
**STAIRWAY LEVEL OF SERVICE C**

Average Flow Volume: 7-10 PFM
Average Speed: 115-120 ft/min.
Average Pedestrian Area Occupancy: 10-15 sq.ft./person
Description: speeds are partially restricted; passing is restricted; reverse flows are partially restricted; flow is approximately 50 percent of maximum capacity.



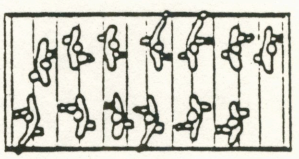
**STAIRWAY LEVEL OF SERVICE D**

Average Flow Volume: 10-13 PFM
Average Speed: 105-115 ft/min.
Average Pedestrian Area Occupancy: 7 - 10 sq.ft./person
Description: speeds are restricted; passing is virtually impossible; reverse flows are severely restricted; flows are approximately 50-65% of maximum capacity.



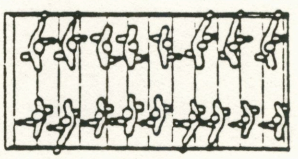
**STAIRWAY LEVEL OF SERVICE E**

Average Flow Volume: 13-17 PFM
Average Speed: 85-115 ft/min.
Average Pedestrian Area Occupancy: 4-7 sq.ft./person
Description: speeds are severely restricted; passing is impossible; reverse traffic flows are severely restricted; intermittent stoppages of flow are likely to occur; flows are approximately 65-85% of maximum capacity.



**STAIRWAY LEVEL OF SERVICE F**

Average Flow Volume: 17 PFM or greater
Average Speed: 0 - 85 ft./min.
Average Pedestrian Area Occupancy: 4 sq.ft./person or less
Description: speed is severely restricted; flow is subject to complete breakdown with many stoppages; passing as well as reverse flows are impossible.



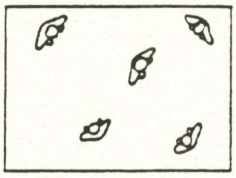
*PFM = Pedestrians per foot width of stairway, per minute.

Source: Fruin, John J., Pedestrian Planning and Design, MAUDEP Inc., 1971.

Stairway Level Of Service Descriptions

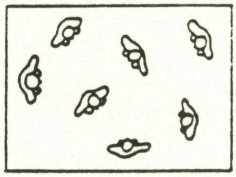
**QUEUING LEVEL OF SERVICE A**

Average Pedestrian Area Occupancy: 13 sq.ft./person or more
Average Inter-person Spacing: 4 ft., or more
Description: standing and free circulation through the queuing area is possible without disturbing others within the queue.



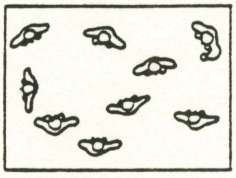
**QUEUING LEVEL OF SERVICE B**

Average Pedestrian Area Occupancy: 10-13 sq.ft./person
Average Inter-person Spacing: 3.5-4.0 ft.
Description: standing and partially restricted circulation to avoid disturbing others within the queue is possible.



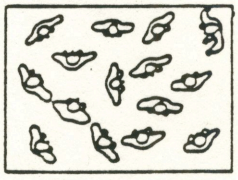
**QUEUING LEVEL OF SERVICE C**

Average Pedestrian Area Occupancy: 7 - 10 sq.ft./person
Average Inter-person Spacing: 3.0 - 3.5 ft.
Description: standing and restricted circulation through the queuing area by disturbing others within the queue is possible; this density is within the range of personal comfort.



**QUEUING LEVEL OF SERVICE D**

Average Pedestrian Area Occupancy: 3 - 7 sq.ft./person
Average Inter-person Spacing: 2 - 3 ft.
Description: standing without touching is possible; circulation is severely restricted within the queue and forward movement is only possible as a group; long term waiting at this density is discomforting.



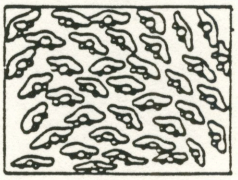
**QUEUING LEVEL OF SERVICE E**

Average Pedestrian Area Occupancy: 2 - 3 sq.ft./person
Average Inter-person Spacing: 2 ft. or less
Description: standing in physical contact with others is unavoidable; circulation within the queue is not possible; queuing at this density can only be sustained for a short period without serious discomfort.



**QUEUING LEVEL OF SERVICE F**

Average Pedestrian Area Occupancy: 2 sq.ft./person or less
Average Inter-person Spacing: close contact with persons
Description: virtually all persons within the queue are standing in direct physical contact with those surrounding them; this density is extremely discomforting; no movement is possible within the queue; the potential for panic exists in large crowds at this density.



Source: Fruin, John J., Pedestrian Planning and Design, MAUDEP Inc., 1971.

Queuing Level Of Service Descriptions

## FACTS VEHICULAR REQUIREMENTS

SEMI:

- Length - 55' 0"
- Width - 8' 5"
- Height - 13' 6"
- Turning Radius - 50' 0"

STRAIGHT BODY TRUCK:

- Length - 17' 0" - 35' 0"
- Width - 8' 0"
- Height - 13' 6"

CARS:

- Length - 10' 0" - 18' 0"
- Width - 6' 8"

BUSES:

- Length - 45' 0"
- Width - 9' 0"

FIRETRUCK:

- Length - 31' 4"
- Width - 8' 1"

## PROGRAM

- Ferry Terminal Facility
- Restaurants/Rental Shops
- Subway Entrances
- Open Space/Public
- Spacial Relationship Diagrams

PROGRAM FERRY TERMINAL FACILITY

TOTAL - = 200,000 Sq. Ft.

- Waiting room area
  - Minimum of 30,000 sq. ft.
- Concession space
  - Minimum of 10,000 sq. ft.
- Restrooms
  - Approximately 3,000 sq. ft. (combined)
- 20 fare turnstiles
  - Approximately 700 sq. ft.
- Foreman's office and other offices
  - Approximately 4,500 sq. ft.
- Circulation space
  - Approximately 20,000 sq. ft.
- Vehicular Circulation Space
  - Approximately 70,000 sq. ft.
- Vertical circulation
  - Approximately 3,500 sq. ft.
- Loading berts (3)
  - Approximately 8,000 sq. ft.
- Storage
  - Approximately 5,000 sq. ft.
- Mechanical
  - Approximately 5,000 sq. ft.
- Display space
  - Approximately 900 sq. ft.
- Roof garden
  - Approximately 45,000 sq. ft.

## RESTAURANTS/RENTAL SHOPS

- Restaurants:
  - Approximately 12,000 sq. ft.

- Rental Shops:
  - Approximately 5,000 sq. ft.

## SUBWAY ENTRANCES

- Exterior entrance down into subway.
  - Approximately 450 sq. ft. each

## OPEN SPACE/PUBLIC

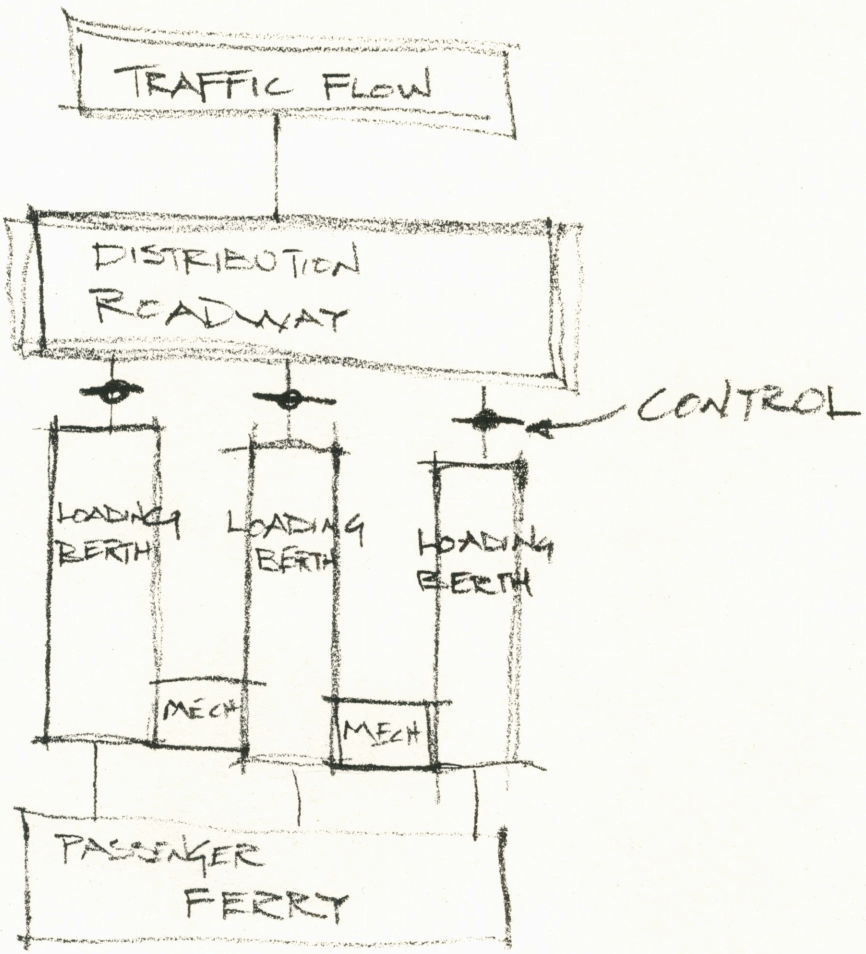
- Exterior Plaza
  - Approximately 80,000 sq. ft.

- Esplanade
  - 20 - 75 ft wide X _____.

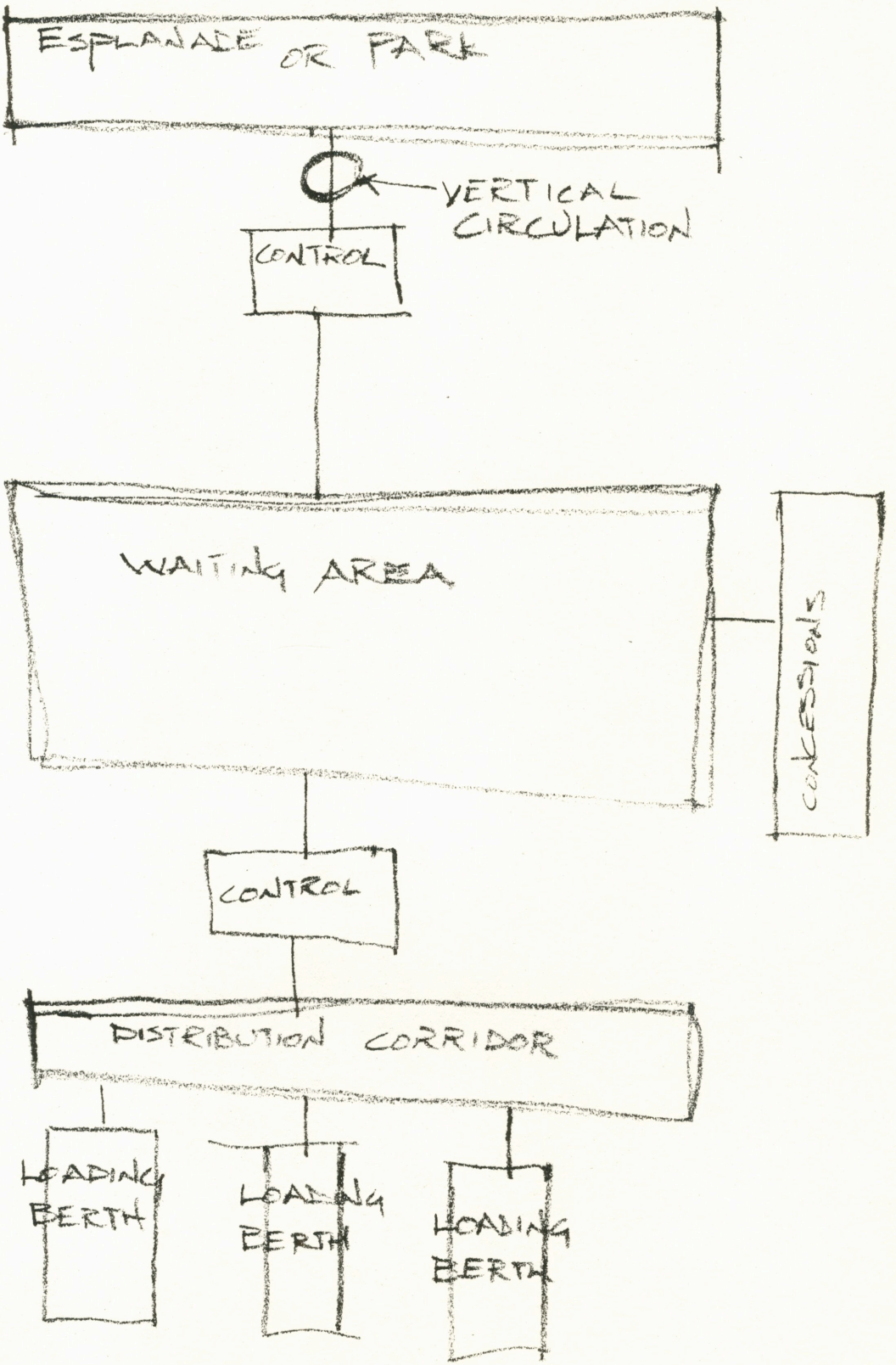
- Exterior toll booths
  - Approximately 100 sq. ft. each

PROGRAM SPACE RELATIONSHIPS DIAGRAMS

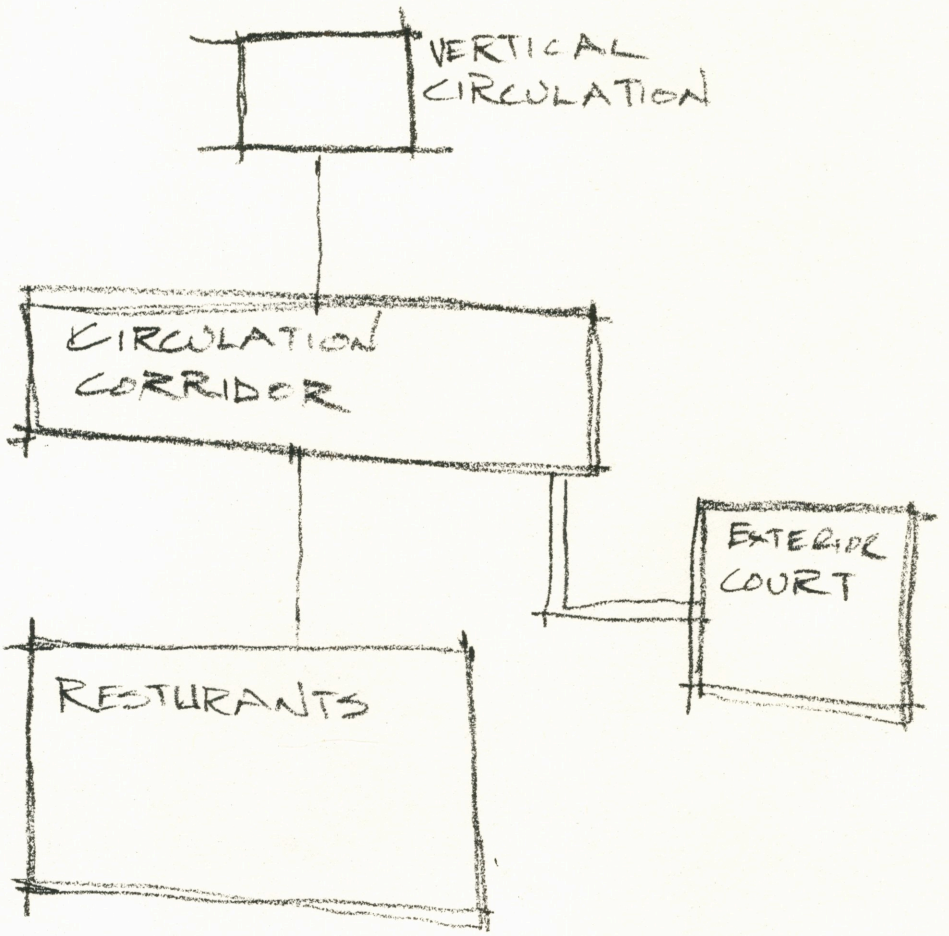
GRADE LEVEL (1st)



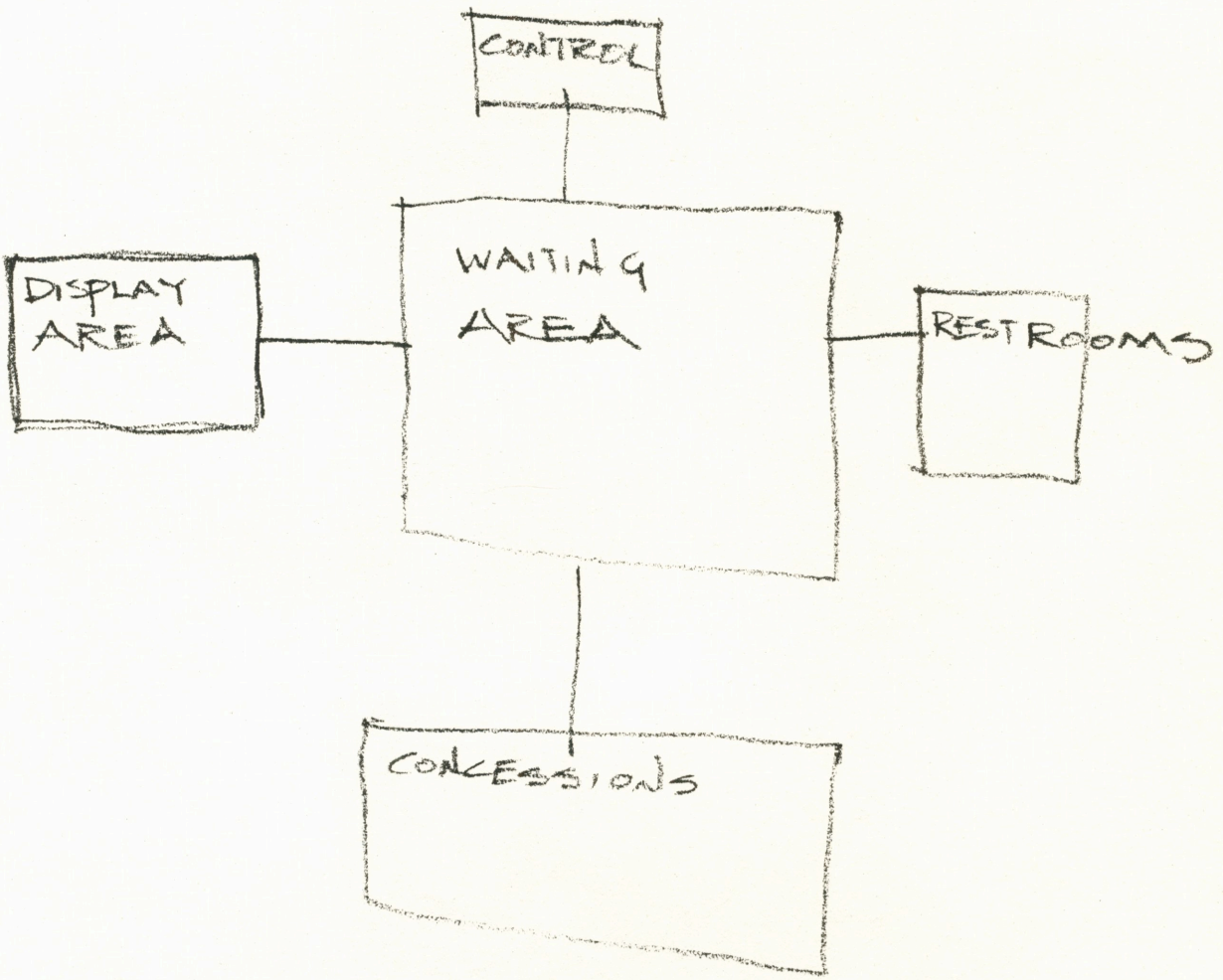
CONCOURSE LEVEL (2nd)



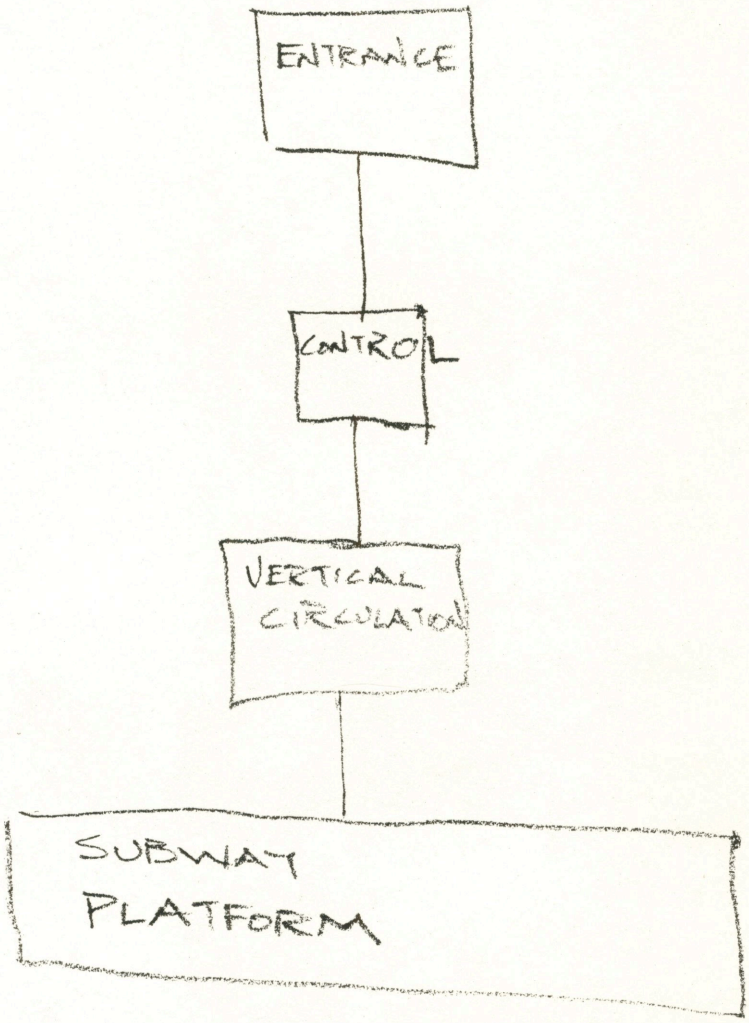
UPPER LEVEL (3rd)



WAITING ROOM



## SUBWAY ENTRANCES



# SUMMARY DESIGN PRESENTATION

# BIBLIOGRAPHY

## BIBLIOGRAPHY


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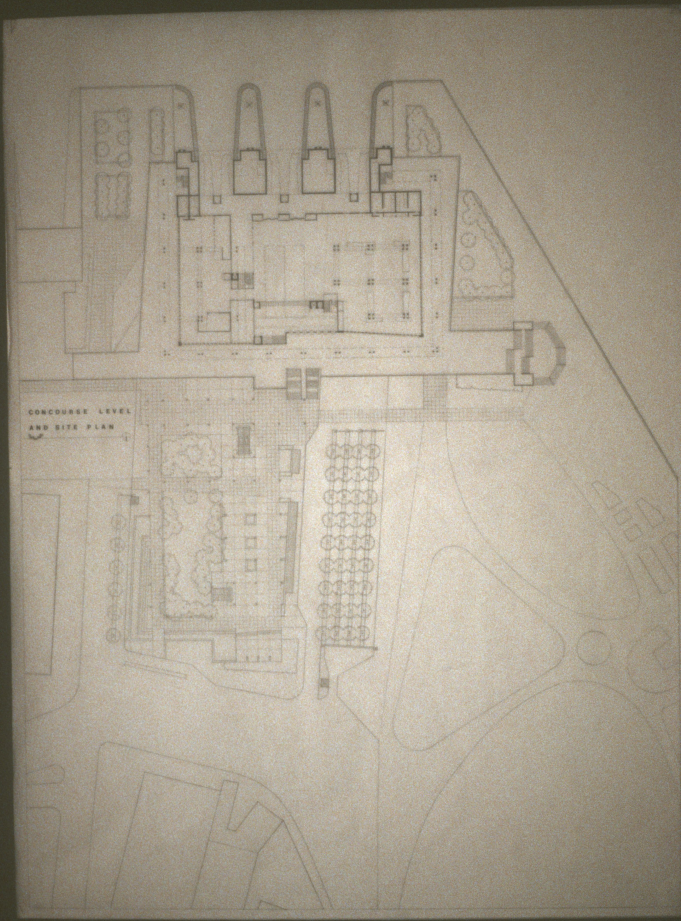
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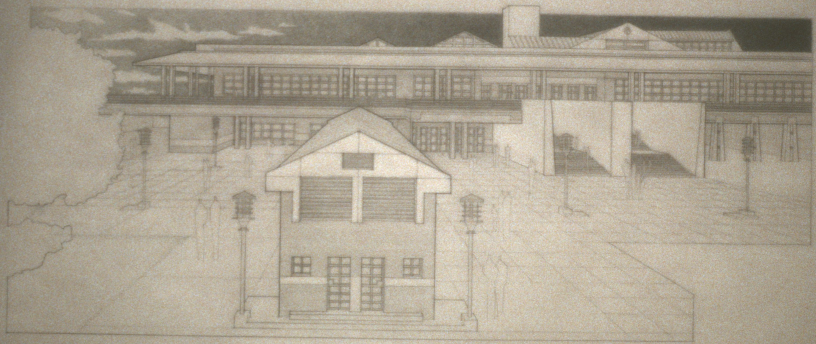
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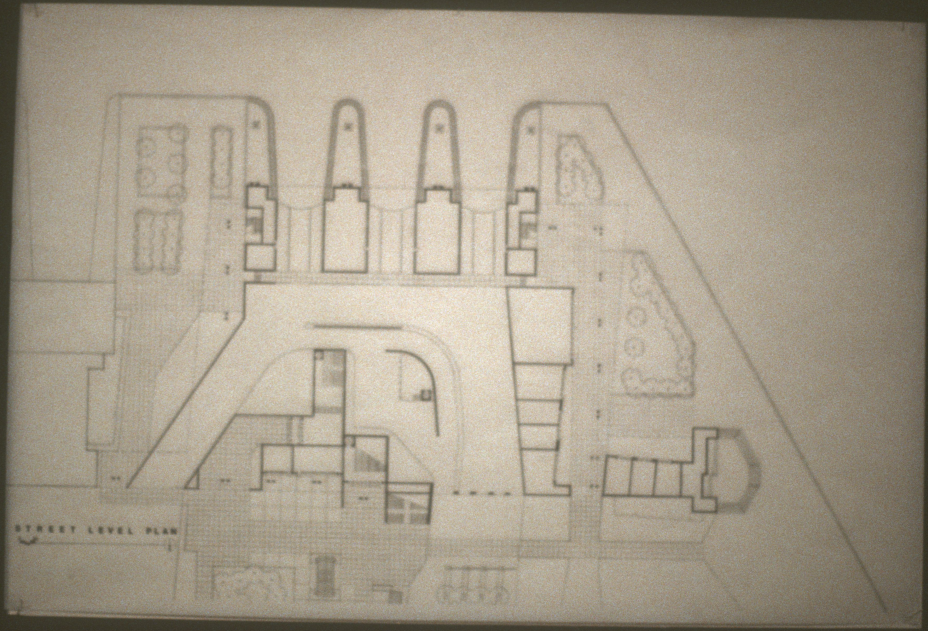
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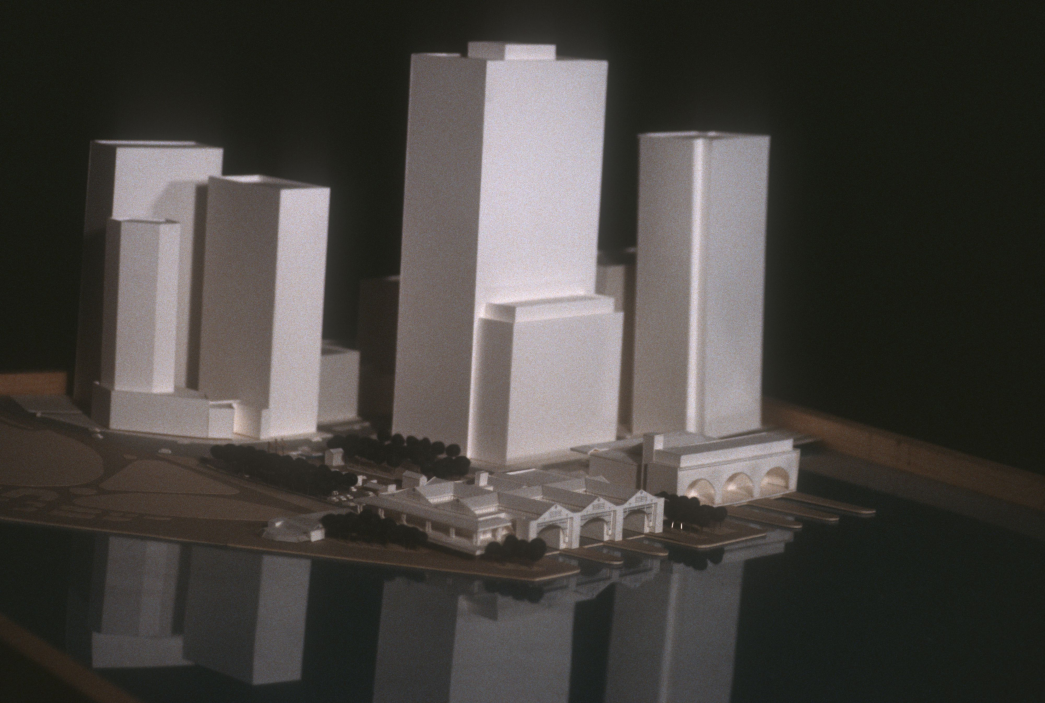
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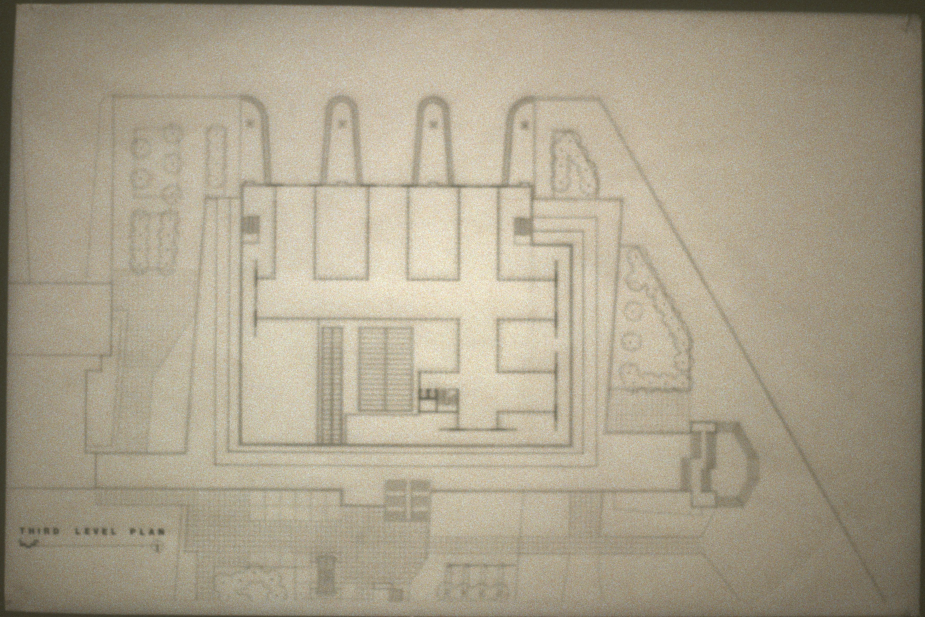

CONCOURSE LEVEL
AND SITE PLAN



PERSPECTIVE


STREET LEVEL PLAN



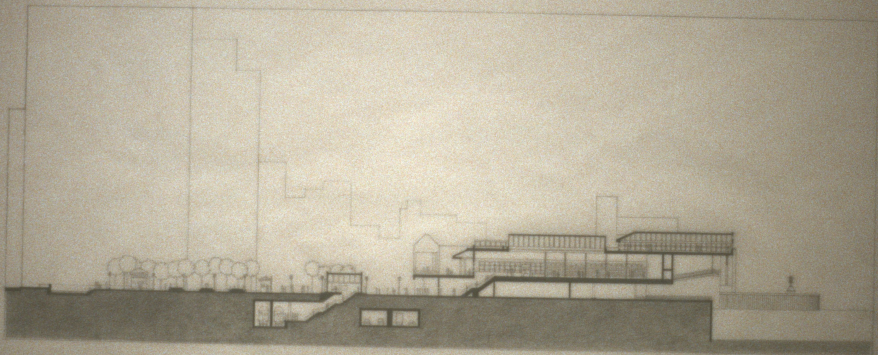

THIRD LEVEL PLAN



WATER FRONT ELEVATION



LAND FRONT ELEVATION



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