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Waterfront Revitalization: Bridgeport Aquarium and Waterfront Promenade

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Waterfront Revitalization: Bridgeport Aquarium and Waterfront Promenade

Ryan Devenney

Master of Architecture/Bachelor of Science

School of Architecture, Art, and Historic Preservation

Roger Williams University

Spring 2011

**Waterfront Revitalization:
Bridgeport Aquarium and Waterfront Promenade**

Author: Ryan Devenney

Author's Signature _____

Date: _____

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Date: _____

Dean of School of Architecture: Stephen White, AIA

Dean's Signature: _____

Date: _____

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Abstract

I am proposing a new public institution, a waterfront aquarium, along with a waterfront promenade, to be located in Bridgeport, Connecticut. This new development will be linked to an existing park, ferry terminal, and an Amtrak train station, along with two other proposed parks. This project will help support urban revitalization in the city. It is based off of several similar projects such as the National Aquarium located in Baltimore's Inner Harbor district, and the Adventure Aquarium located on the Camden Waterfront. These projects include an aquarium as the centerpiece of their waterfront-based renewal scheme. This new public institution will help bring people into the city, give the residents of the city something new and exciting to do, generate taxes for the city through ticket sales, and educate the public about the wonders of aquatic wildlife.

Problem Statement

Bridgeport, Connecticut's largest city, is currently one of the most distressed and poorest cities in the region. The city was once an industrial powerhouse, but the factories have long since moved away along with the jobs that they provided. The waterfront is currently underdeveloped, and there is little reason for outsiders to visit the city.

Bridgeport has recently seen a few new major developments: a dog racing track, a baseball stadium for the Bridgeport Bluefish, and the Bridgeport Center complex. These developments have pumped some new life into the city center. However, the stadium and dog racing track are used only seasonally, and the Bridgeport Center is focused on business. Bridgeport needs a cultural institution that functions year round, rain or shine.

The southern portion of the central business district is ripe for new development. It is easily within walking distance of the Amtrak Train Station, which receives heavy use as it is an important stop along the busy northeast-corridor, and the Bridgeport-Jefferson, NY ferry terminal, which transports automobiles, pedestrians, and even allows for bicycles. In addition, Interstate 95, one of the most heavily traveled roads in the country, runs directly through the southern part of the business district.

Parti

The aquarium will be located partially on land, but mostly over the water, supported on piers. This will establish a more intimate connection with the waters of the Long Island Sound, which will be a theme in the exhibit areas. There will be a fenced off area underwater that will connect the exterior dolphin exhibits to the interior dolphinarium, allowing the dolphins to travel freely in and out of the building. The geometry of the building will reflect the shape of the adjacent site. The waterfront promenade will physically connect important landmarks with the aquarium and more importantly, the water itself.

Common Aquarium Design Issues

Many existing aquariums, such as the Camden Adventure Aquarium and the New England Aquarium in Boston, have no relation to the waterfront. They are essentially closed off boxes that provide no views to the outside, and cut off visitors from the wonder of the waterfront. Aquariums should more closely relate to the natural environments that they display, instead of having the plants and animals contained in a purely artificial environment.

Proposed Design Solutions

My proposed aquarium will provide vast glass curtain walls that will provide spectacular views of the Bridgeport harbor and Long Island Sound, as well as replacing artificial lighting with an abundance of natural light. The exterior exhibits will display animals and plants in a more natural setting. The dolphin exhibits, with their interior and exterior roaming spaces, will bring the waterfront into the center of the building, and will erase the barrier between interior and exterior exhibits.

Program Description

Exhibit Areas - The exhibit areas will contain different specimens in many different natural environments including habitats from the Long Island Sound (which Bridgeport is located on) along with adjacent tributaries and marshes. There will also be an exhibit that will display specimens from different regions of the Atlantic Ocean.

Dolphinarium - The Dolphinarium will be an area where visitors to the aquarium may attend shows in which dolphins perform tricks directed by their trainers. There will be an interior pool for the dolphins along with seating for approximately 200 spectators. The interior exhibit is connected to the exterior exhibit through operable underwater containment doors.

Cafes - There will be two cafes, one for the public, located on the second floor, and a private cafe for the staff, located on the first floor. Both cafes will have excellent views south-east towards the bay. The public cafe will give aquarium visitors a place to socialize, connect with one another, and plan the rest of their adventure at the aquarium.

Support Areas - The support areas will contain mechanical equipment as well as areas for tank and animal care. In this area, staff and biologists provide food for the animals and take care of all the animals in the exhibit areas. Holding tanks are special tanks that take care of wounded animals from the aquarium.

Exterior Exhibits - The exterior exhibits display animals in a more natural environment, the outdoors. Several different tanks and ponds will simulate different natural environments. Visitors waiting in line to buy tickets will be able to catch a glimpse of this area and get prepared for what they will observe within the aquarium.

Classrooms - Five classrooms located north of the lobby will provide a learning space for students traveling on field trips to the aquarium. Students can be educated here by the biologists and other staff in addition to seeing the physical exhibits.

Program Areas

Exhibit Areas

1. Long Island Sound
2. Marshes and Wetlands
3. Tributaries
4. Atlantic Ocean
5. Dolphinarium

Total = 27,800 s.f.

4,600 s.f.

4,200 s.f.

4,500 s.f.

6,000 s.f.

8,500 s.f.

Front Entrance Area

- Lobby
- Tickets
- Coat Storage

Total = 4,300 s.f.

3,700 s.f.

400 s.f.

200 s.f.

Educational

- Classrooms (3)
- Lecture Hall
- Seminar Room

Total = 3,050 s.f.

600 s.f. each (Total = 1,800 s.f.)

850 s.f.

400 s.f.

Program Areas

Gift Shop

Retail Area

Storage

Total = 2,100 s.f.

1,850 s.f.

250 s.f.

Cafes (2)

Public Cafe

Kitchen

Bathrooms

Staff Cafe

Kitchen

Bathrooms

Total = 8,950 s.f.

2,800 s.f.

900 s.f.

700 s.f.

3,000 s.f.

850 s.f.

700 s.f.

Exhibit Support

Water Storage, Pumps, Filters, Elec/Mech.

Biologist's Lab/Holding Tanks

Biologist Offices (3)

Equipment Storage

Total = 9,610 s.f.

5,800 s.f.

1,850 s.f.

420 s.f. (Total = 1,260 s.f.)

700 s.f.

Program Areas

Administration

Private Offices (6)

Open Office

Conference Room

Total = 5,150 s.f.

450 s.f. (Total = 2,700 s.f.)

1,800 s.f.

650 s.f.

Exterior Spaces

Exterior Exhibits

Exterior Dolphin Exhibit

Dolphin Refuge Area

Decks

Waterfront Promenade

Total = 101,800 s.f.

56,000 s.f.

20,600 s.f.

3,100 s.f.

9,500 s.f.

12,600 s.f.

Total (Interior Spaces)

60,960 s.f.

Total (Int. Spaces w/ Circulation)

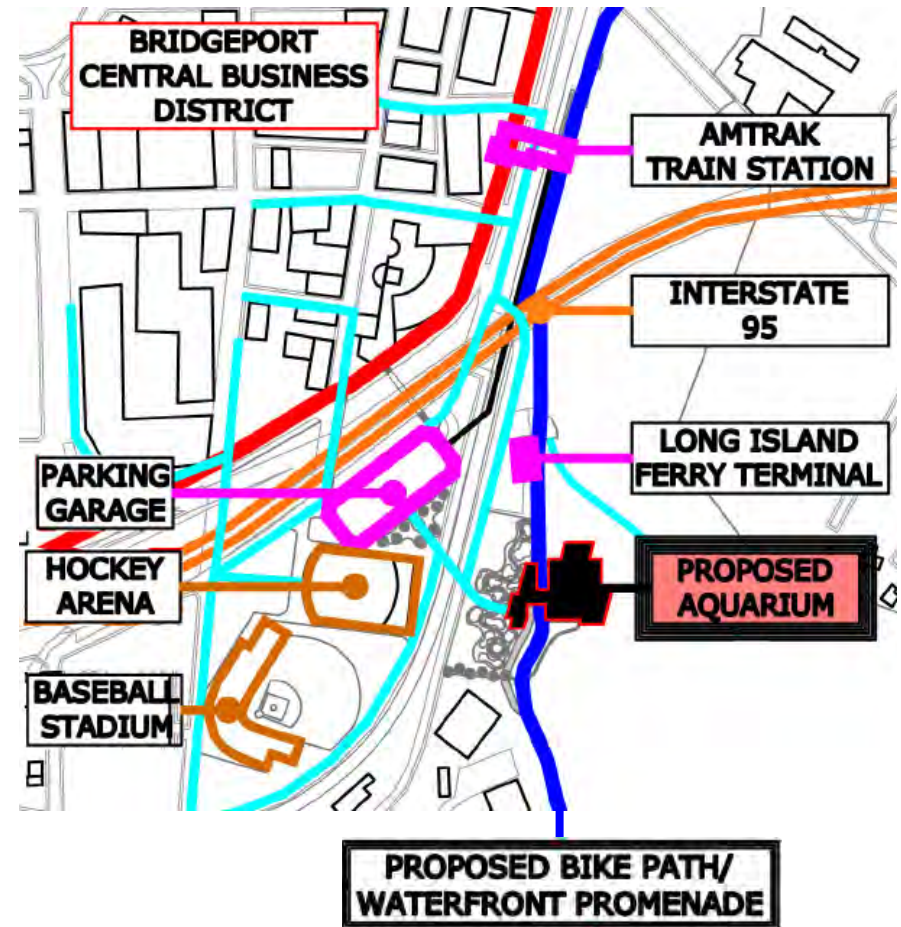
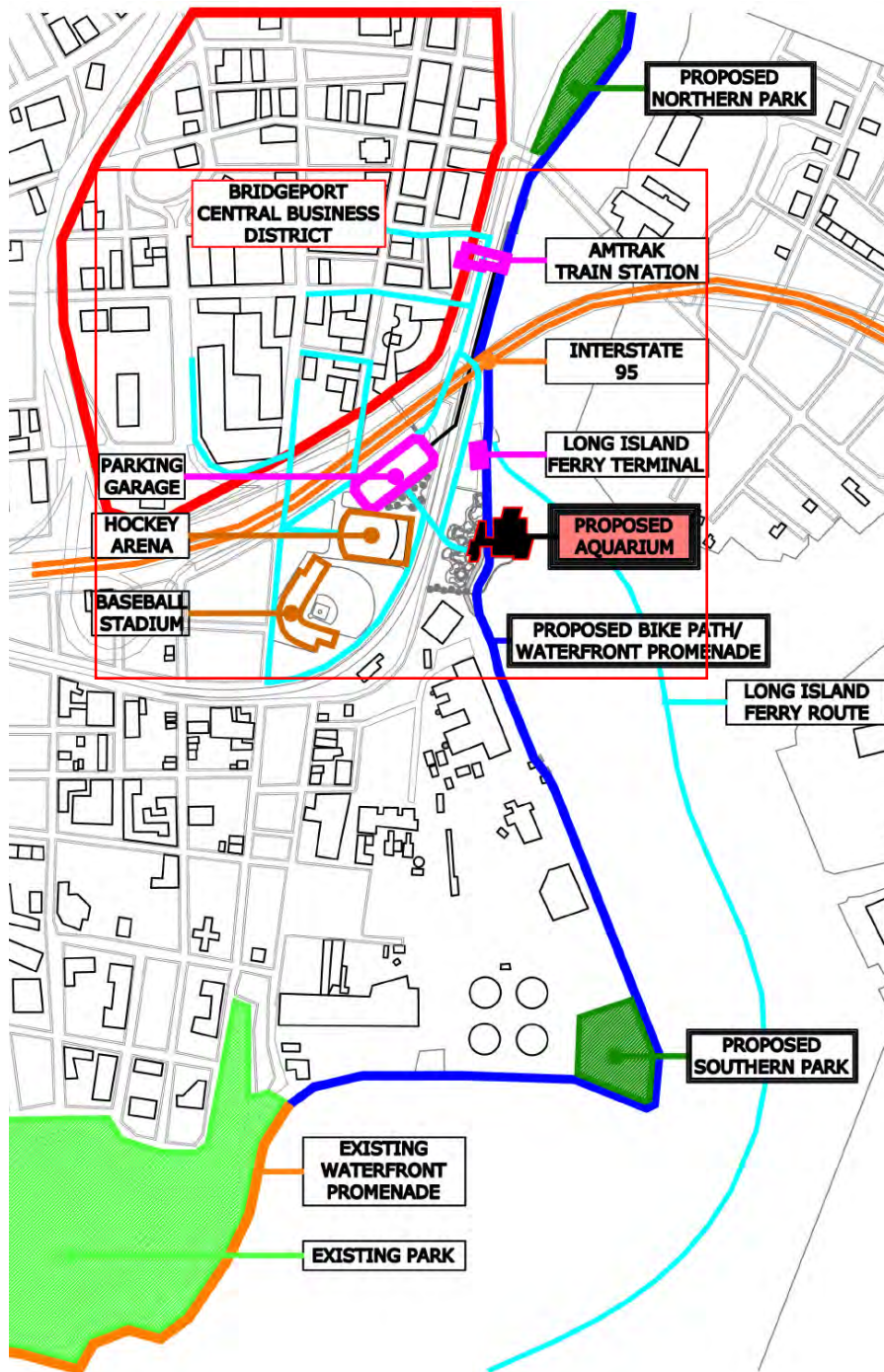
91,250 s.f.

Grand Total (Interior+Exterior Spaces)

193,050 s.f.

Final Presentation

City-Wide Site Strategy



Site Aerial View



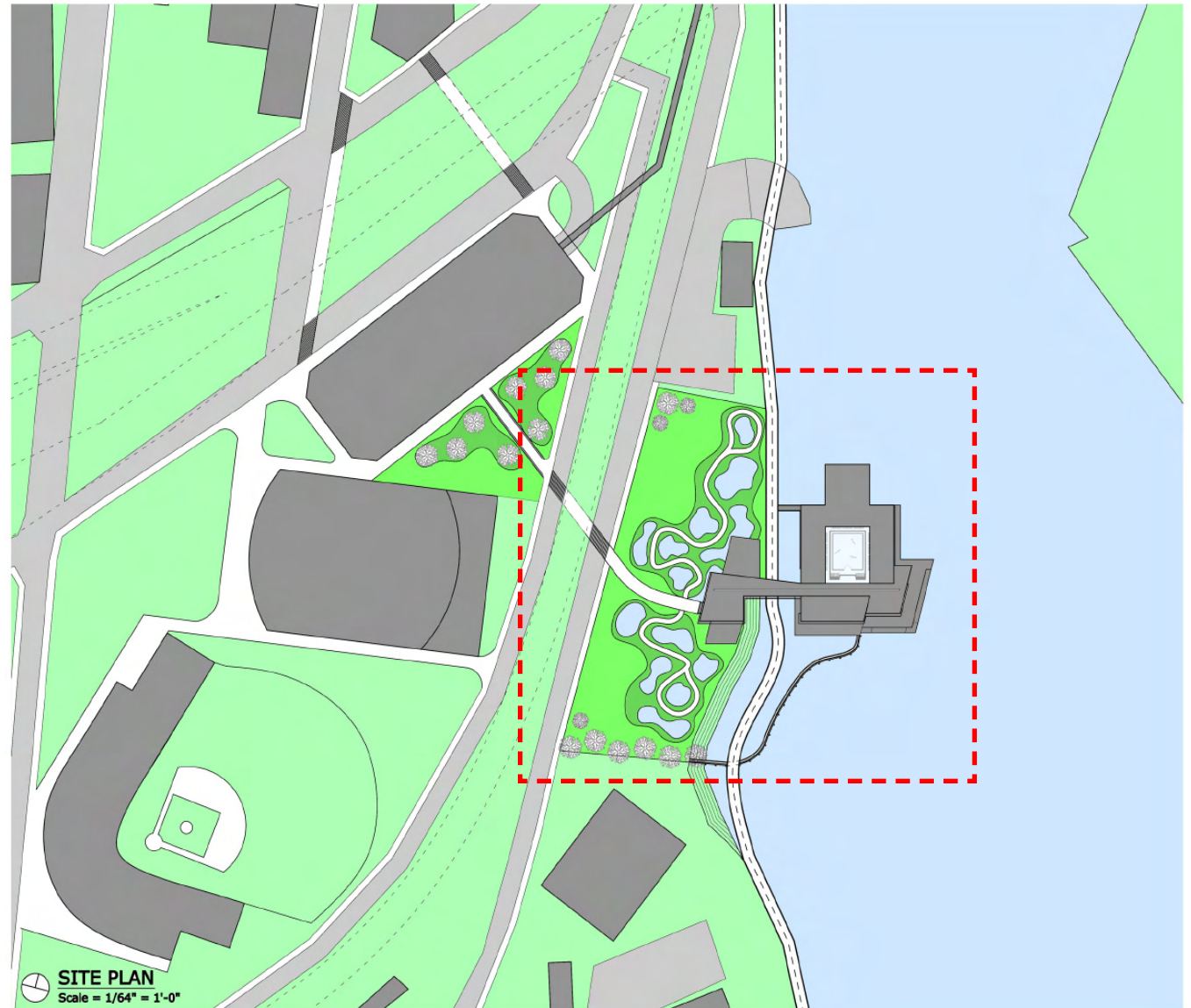
Existing Site

Site with Proposed Aquarium

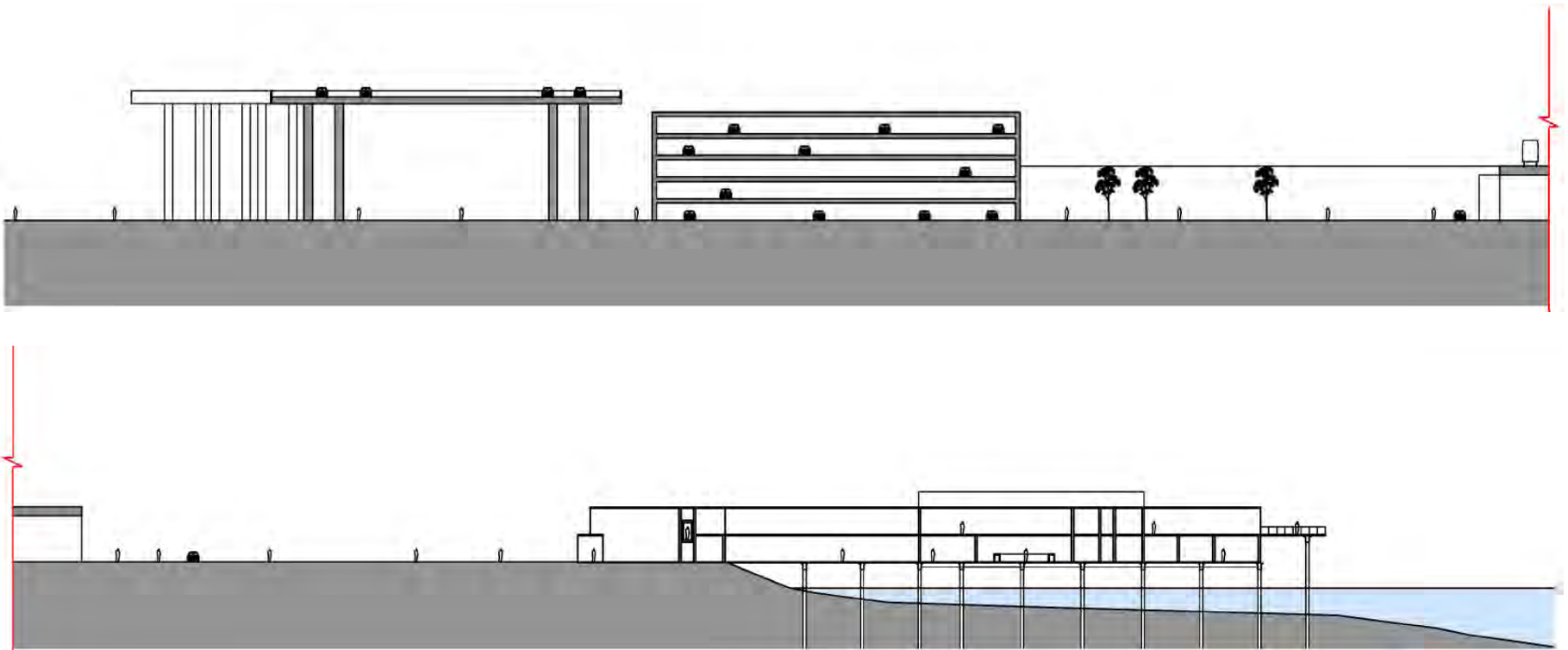


Site Plan

Photos from Site



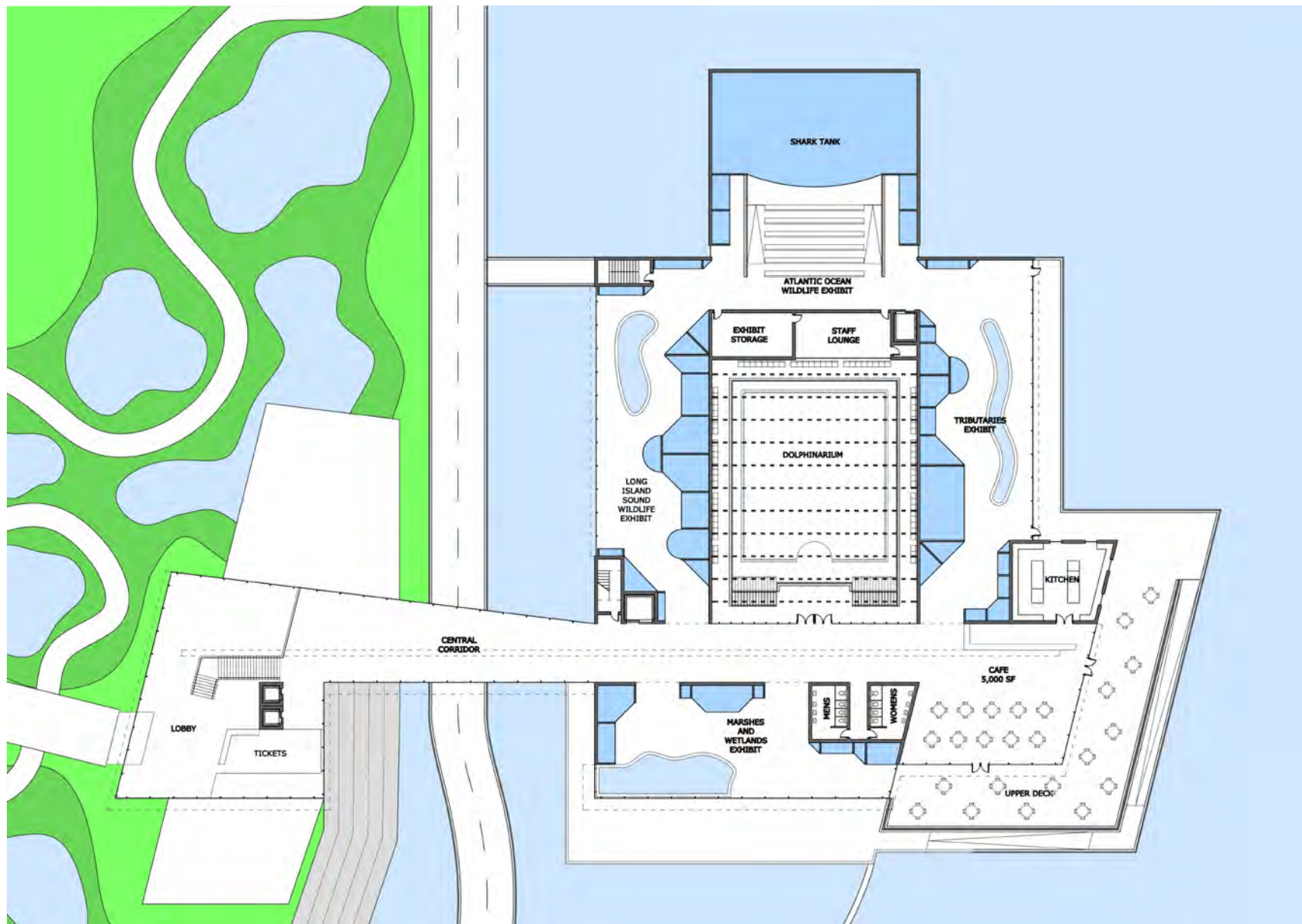
Site Section



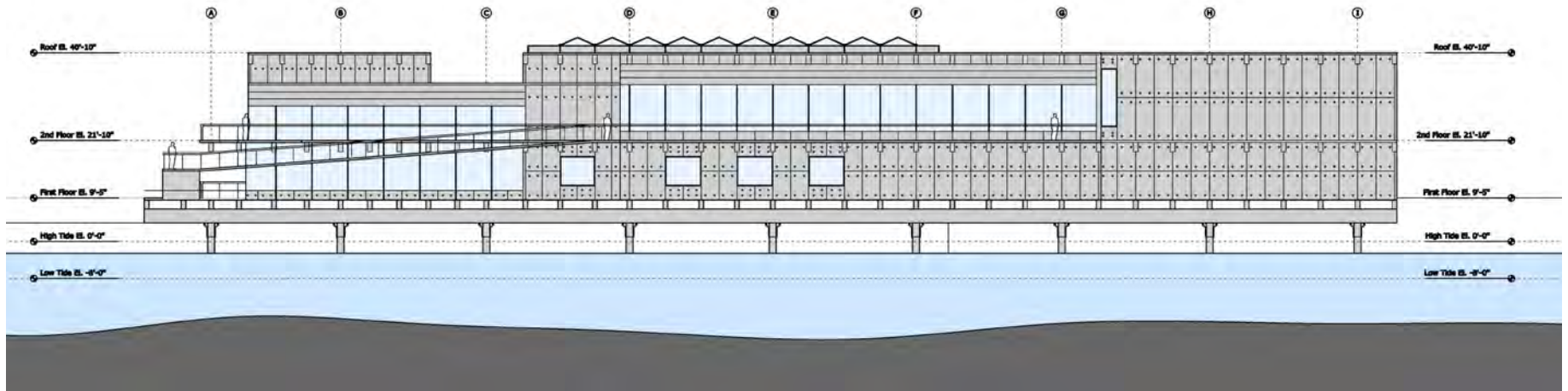
First Floor Plan



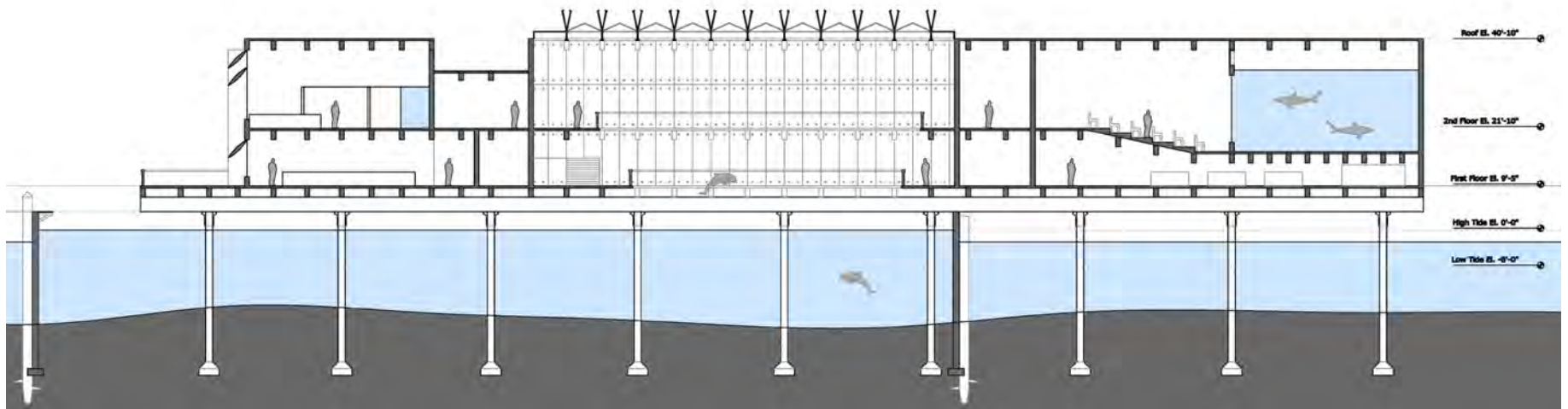
Second Floor Plan



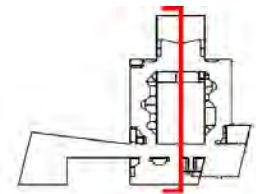
Sections/Elevations



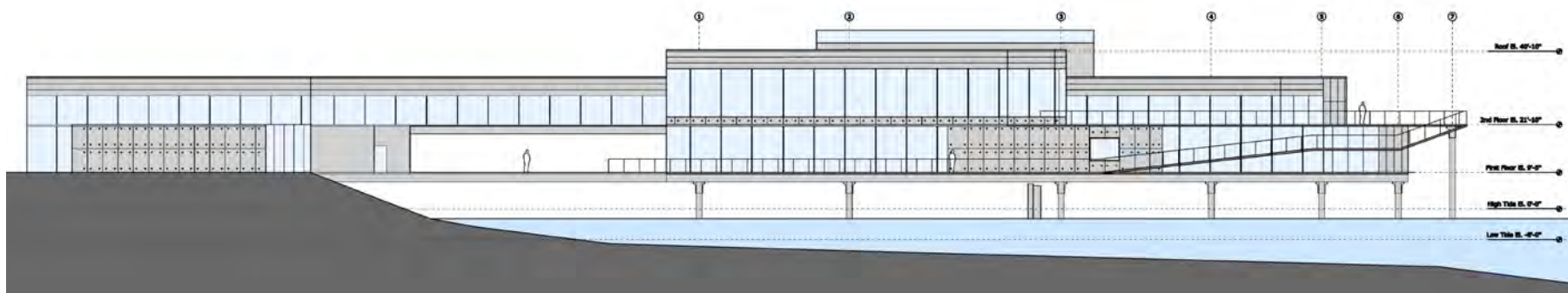
East Elevation



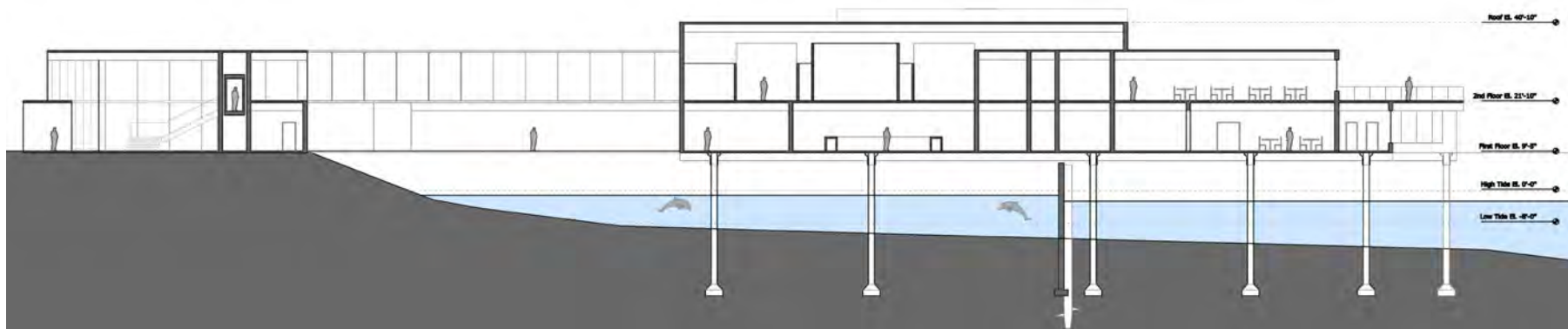
North/South Section



Sections/Elevations



South Elevation



East/West Section

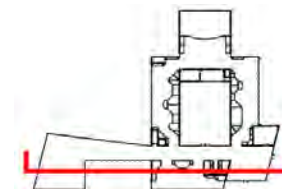
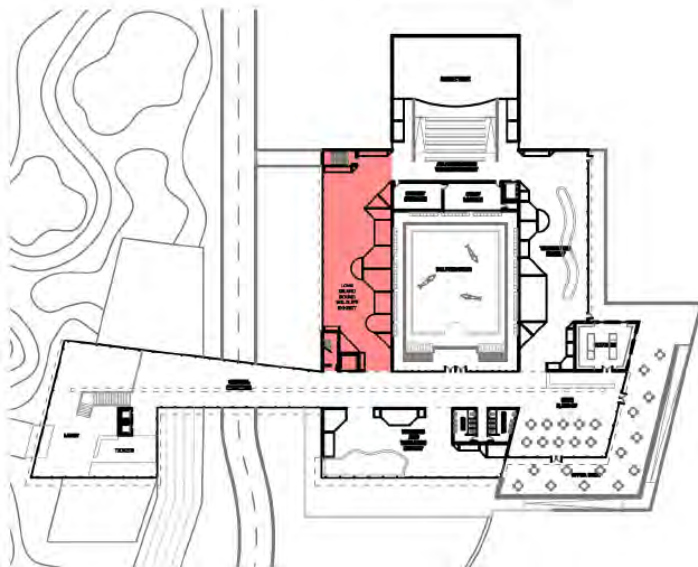
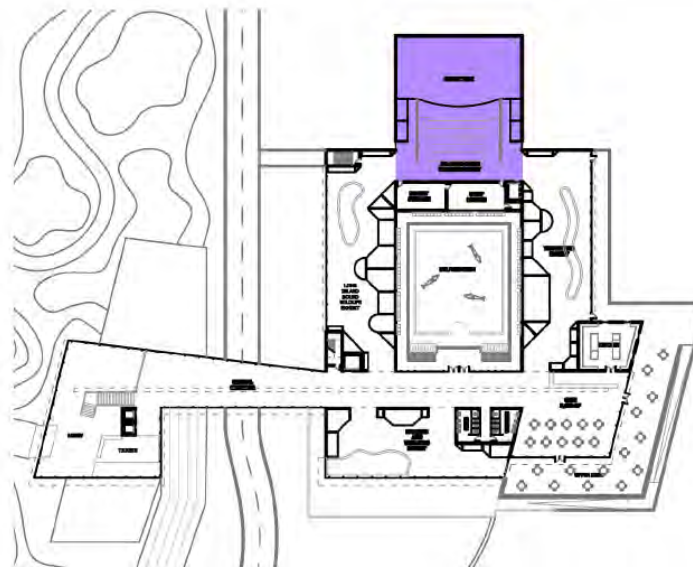


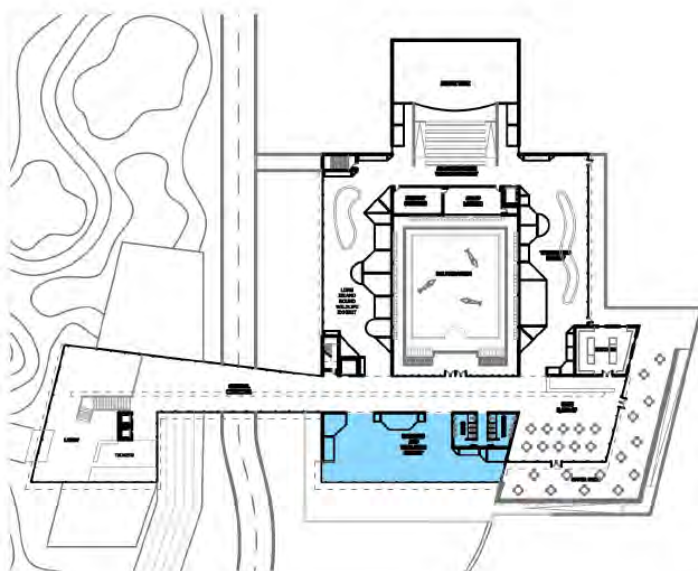
Exhibit Areas



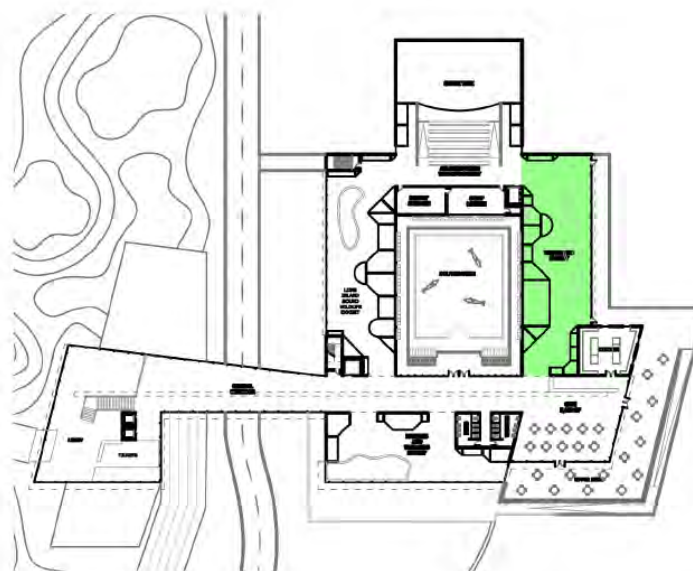
Long Island Sound Wildlife Exhibit



Atlantic Ocean Wildlife Exhibit

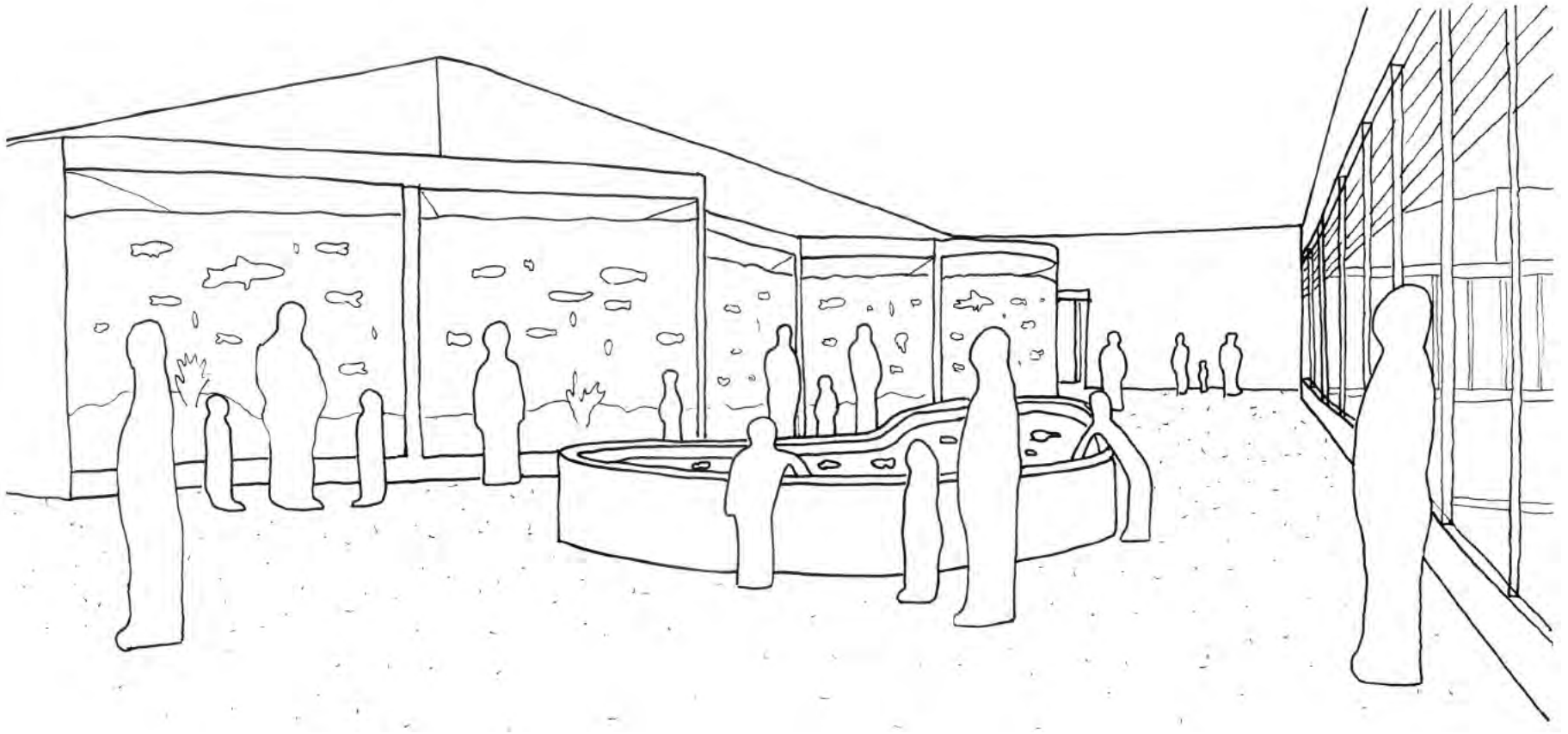


Marshes and Wetlands Exhibit

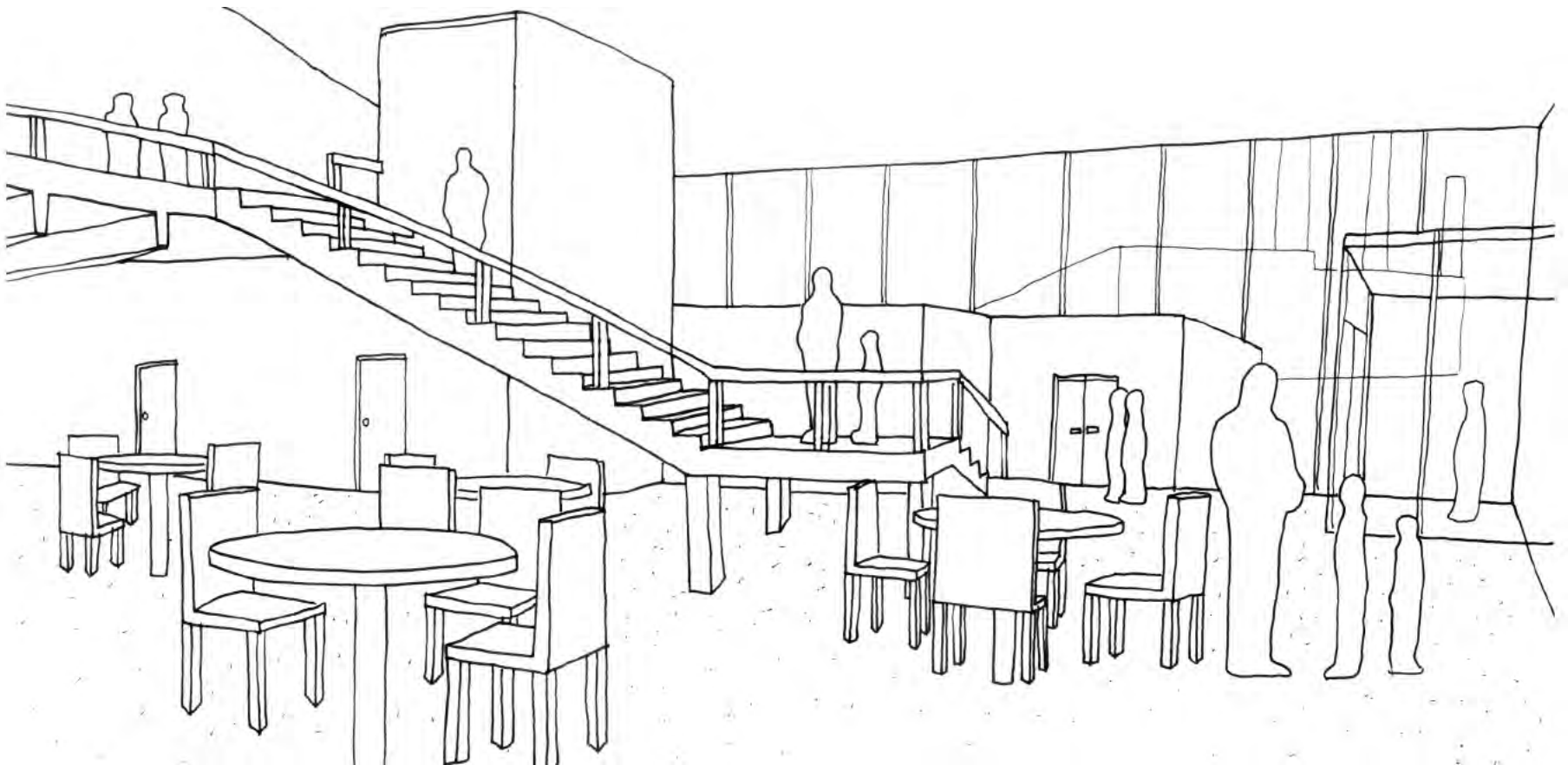
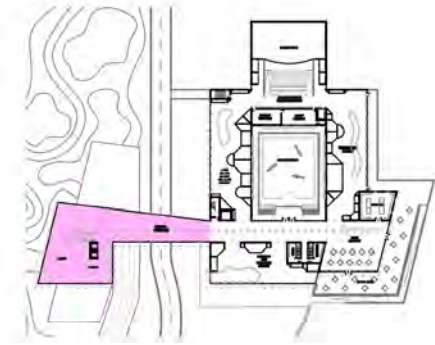


Tributaries Exhibit

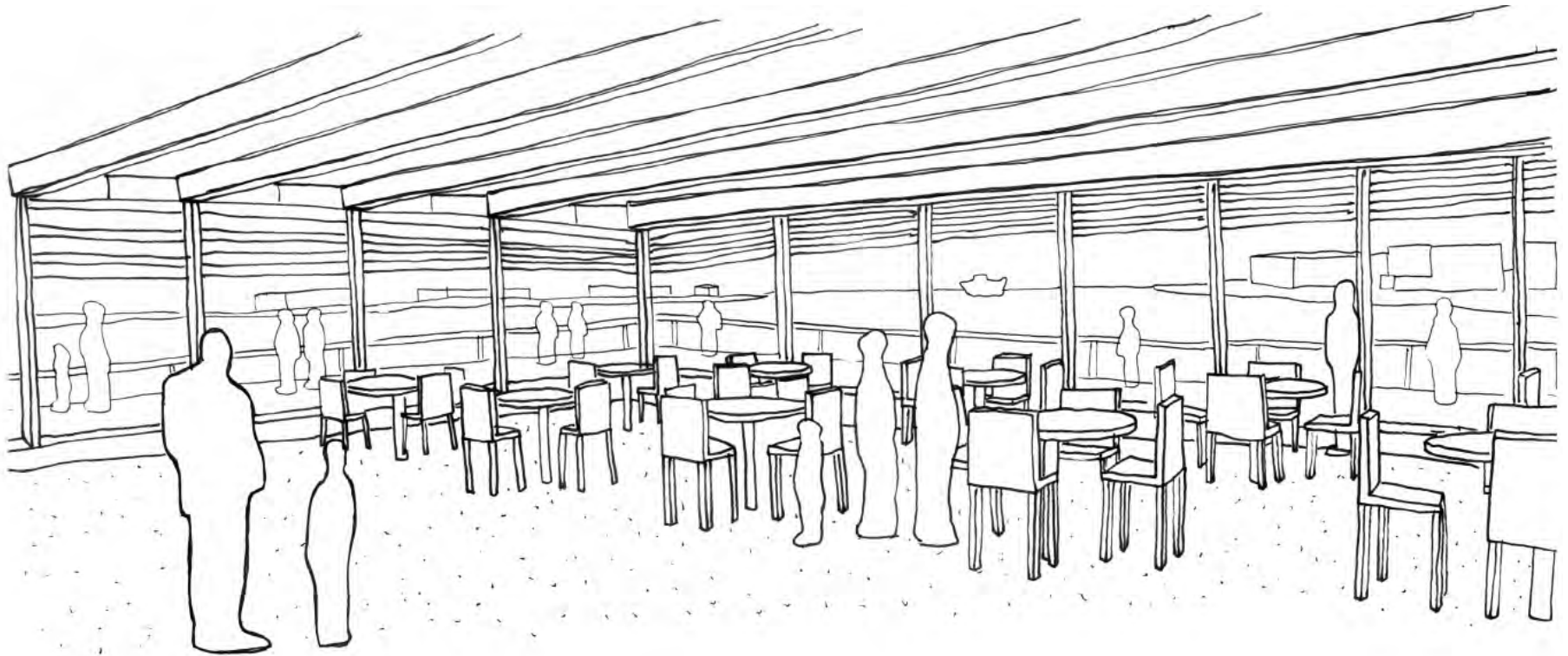
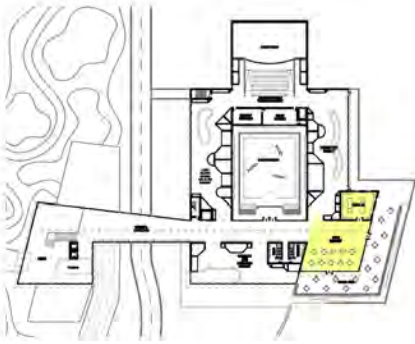
Exhibit Area Perspective



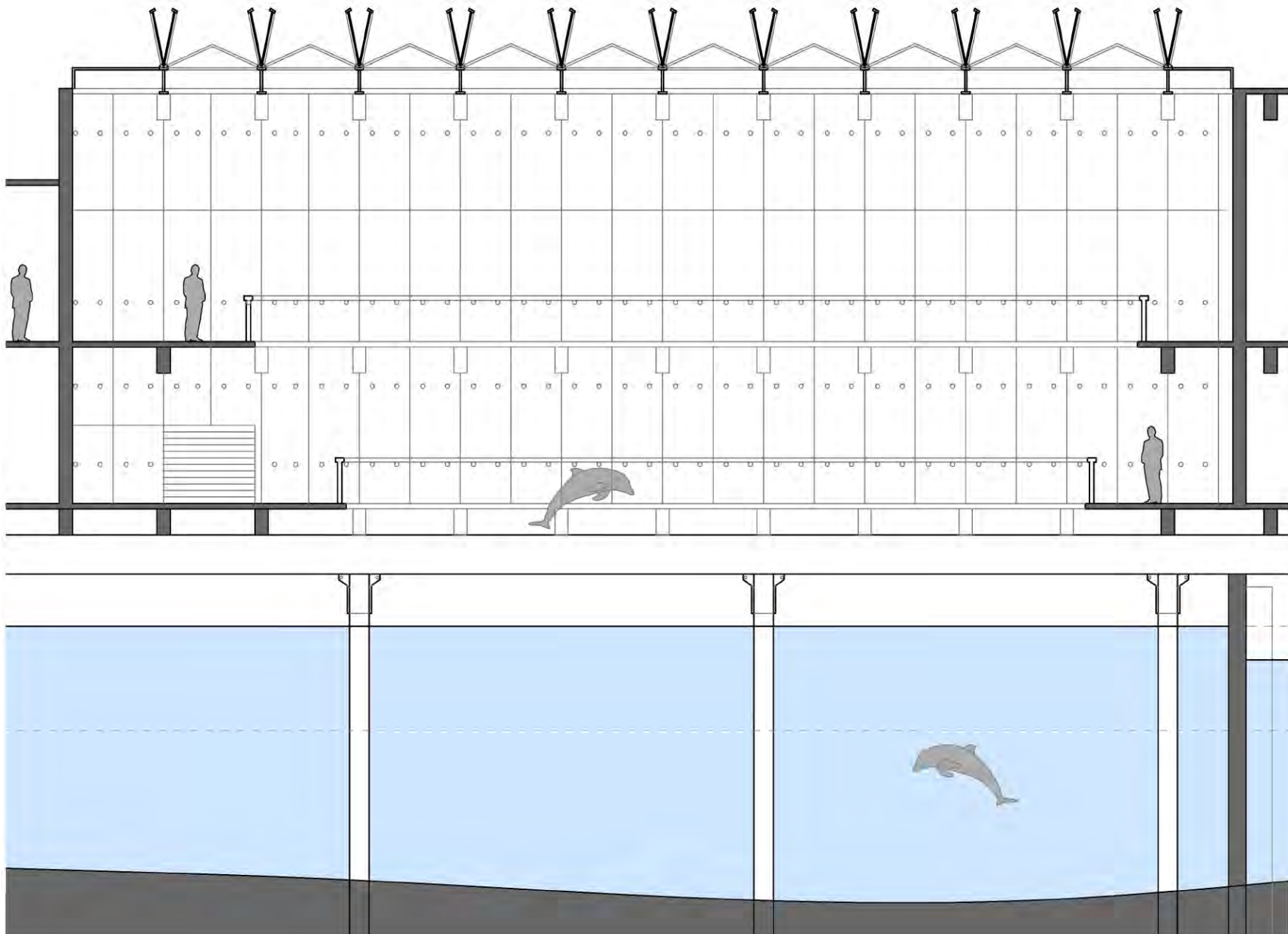
Lobby Perspective



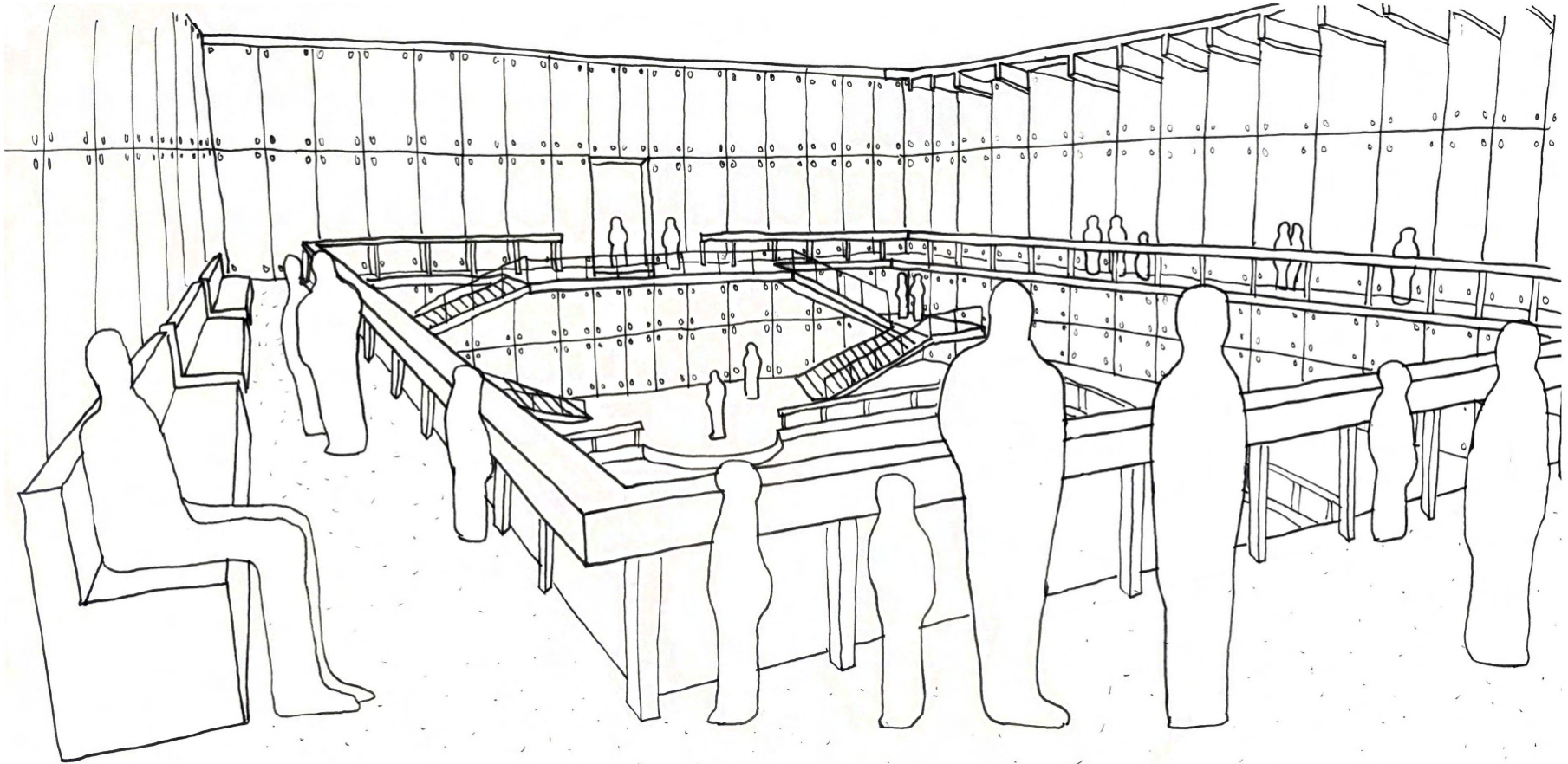
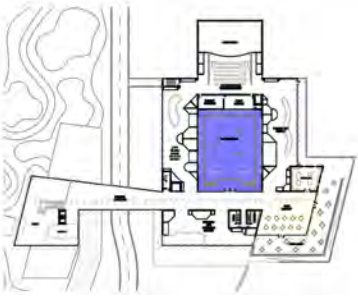
Public Cafe Perspective



Dolphinarium Section

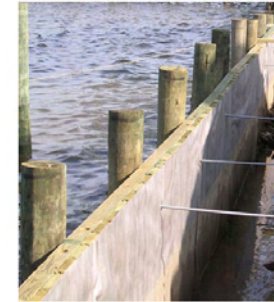
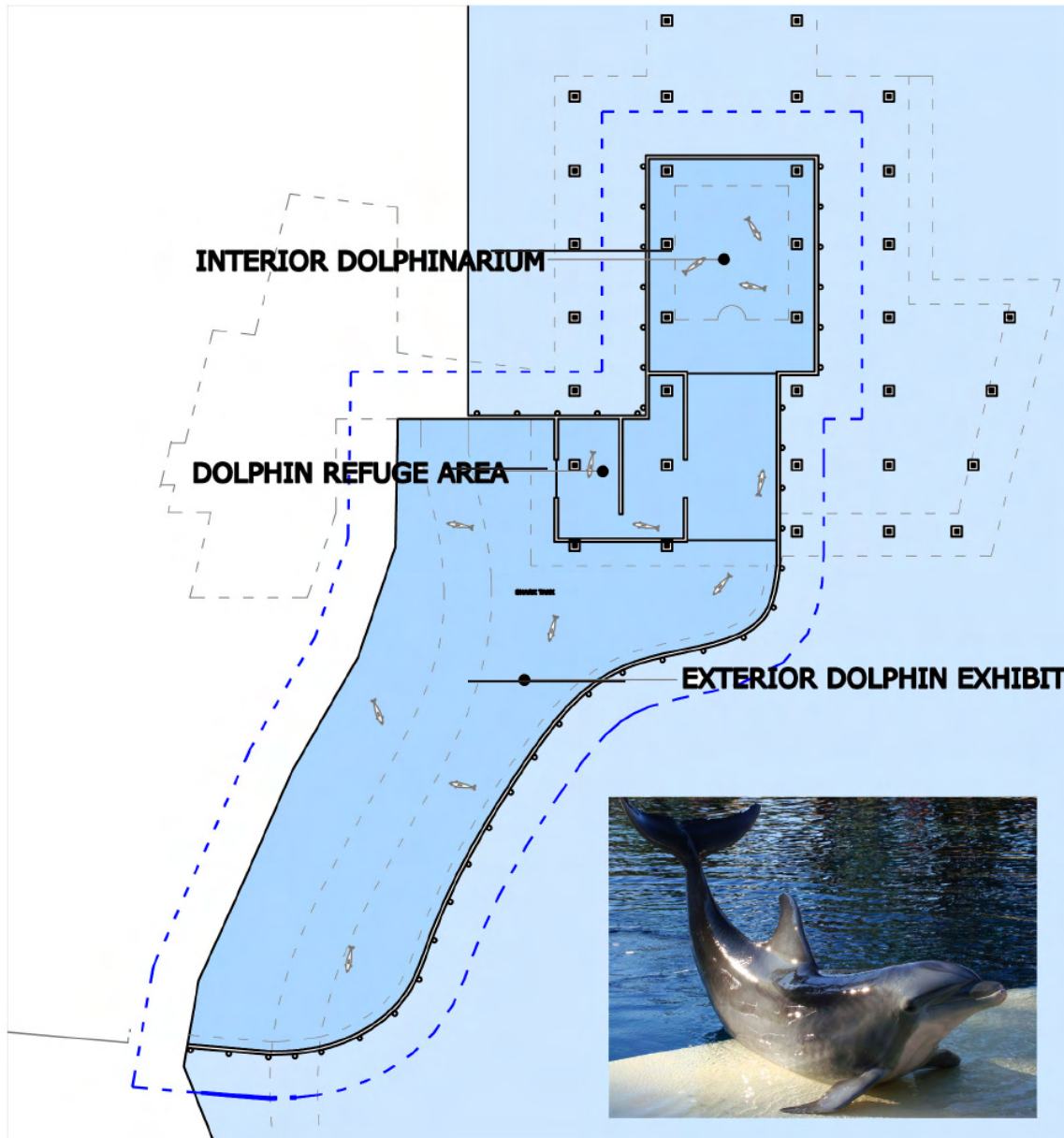


Dolphinarium Perspective



Dolphin Range/Containment

Interior/Exterior Dolphin Range



Dolphin Containment Barrier



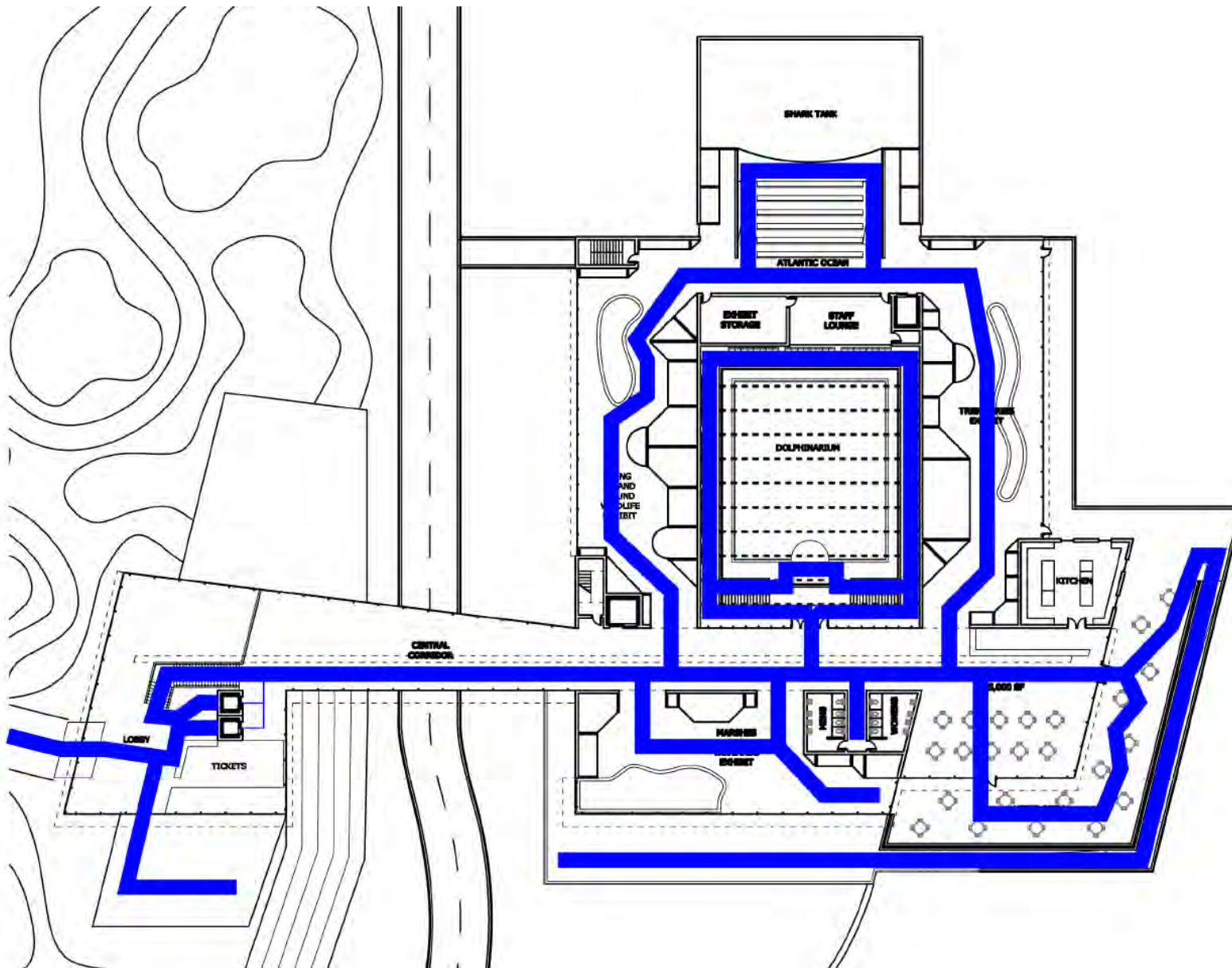
Underwater Containment Door



Retractable Roof

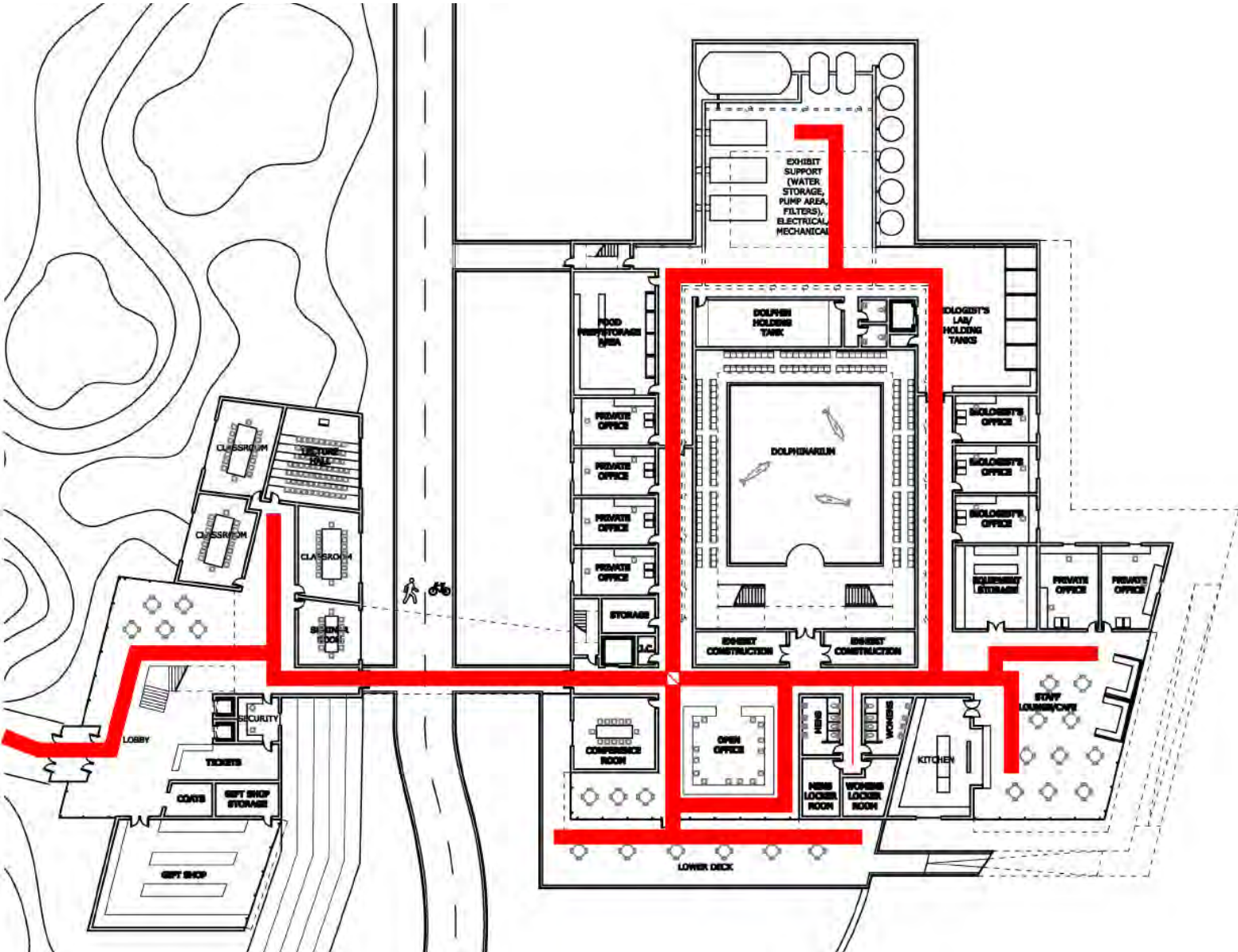


Public Circulation



Second Floor

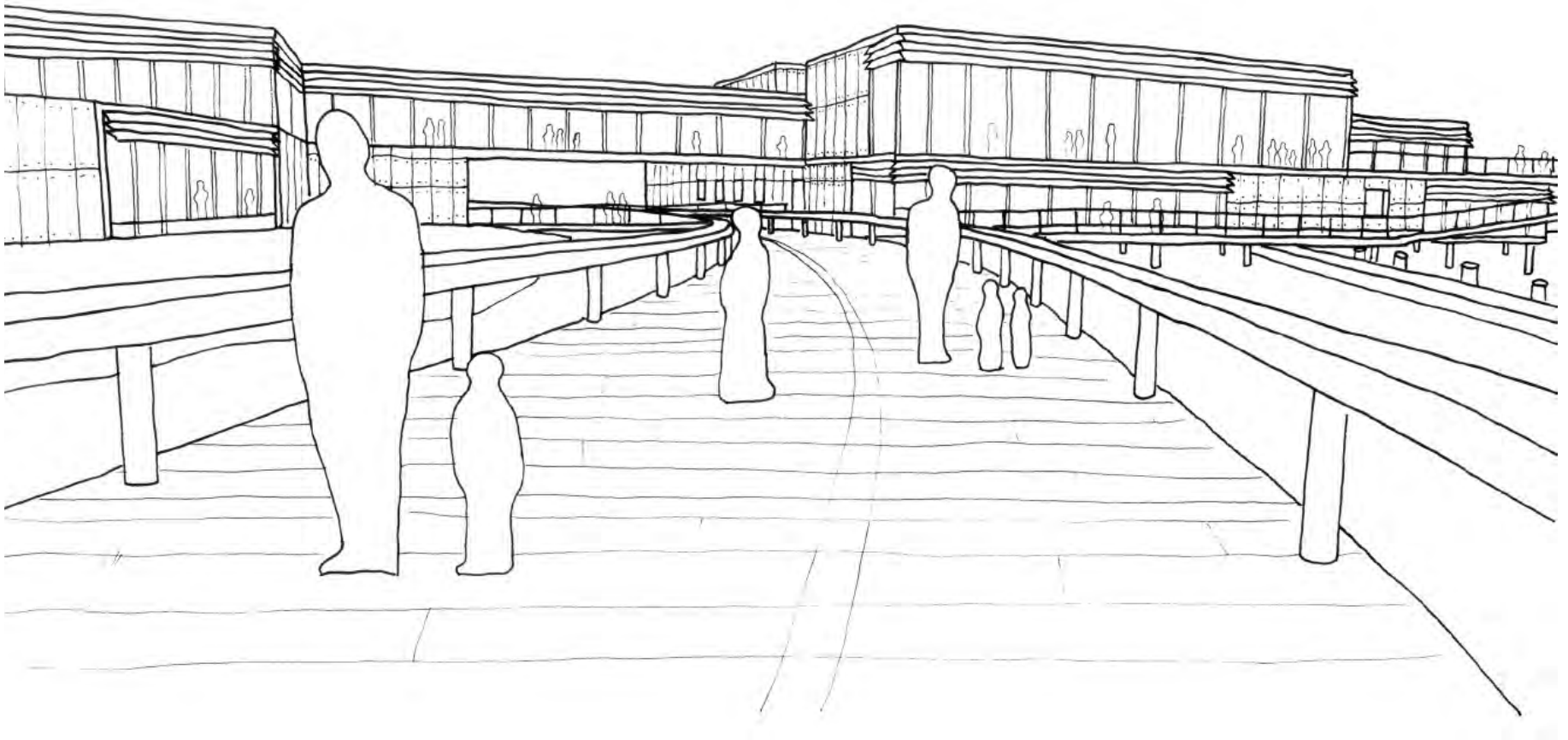
Private Circulation



First Floor

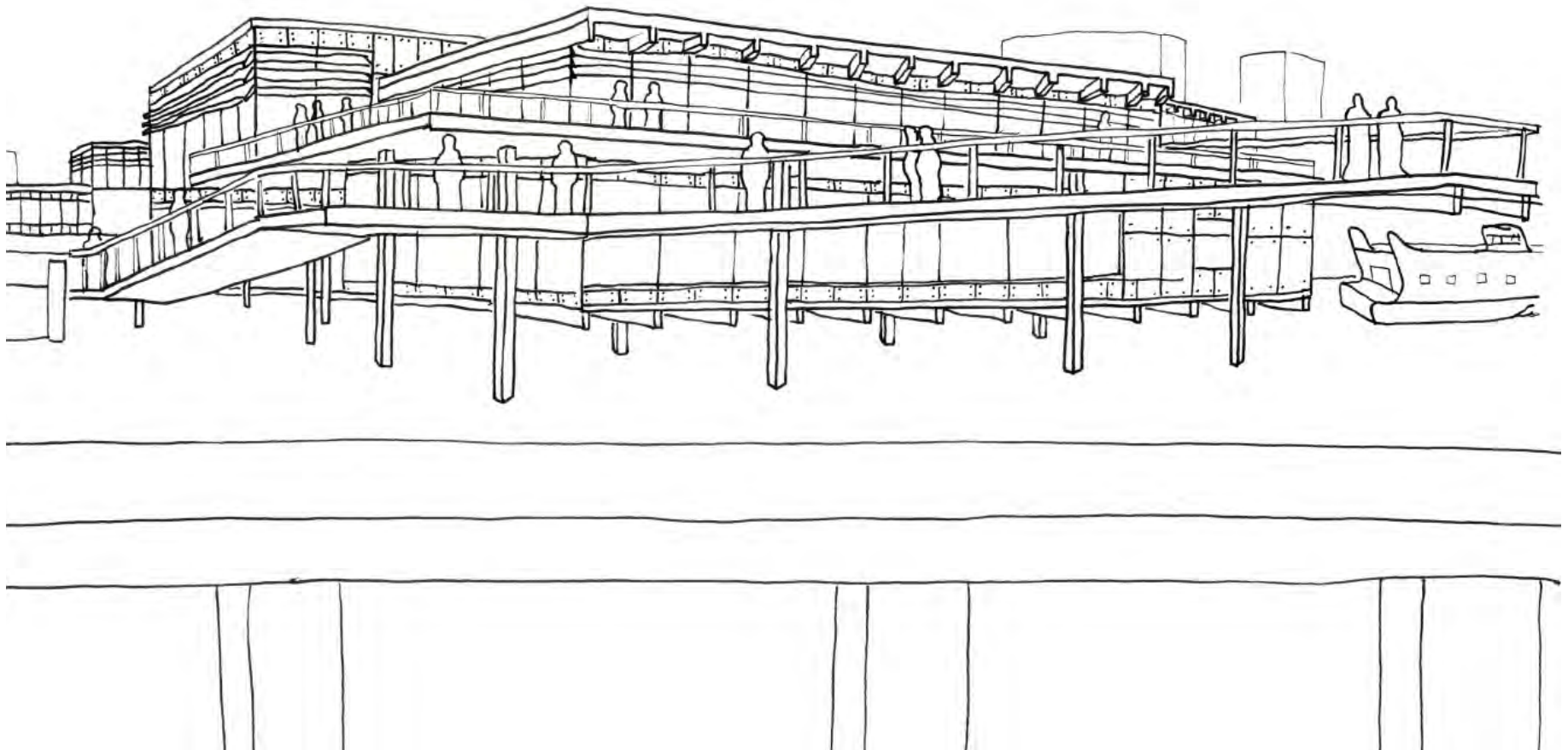
Exterior Perspectives

Perspective from Waterfront Promenade



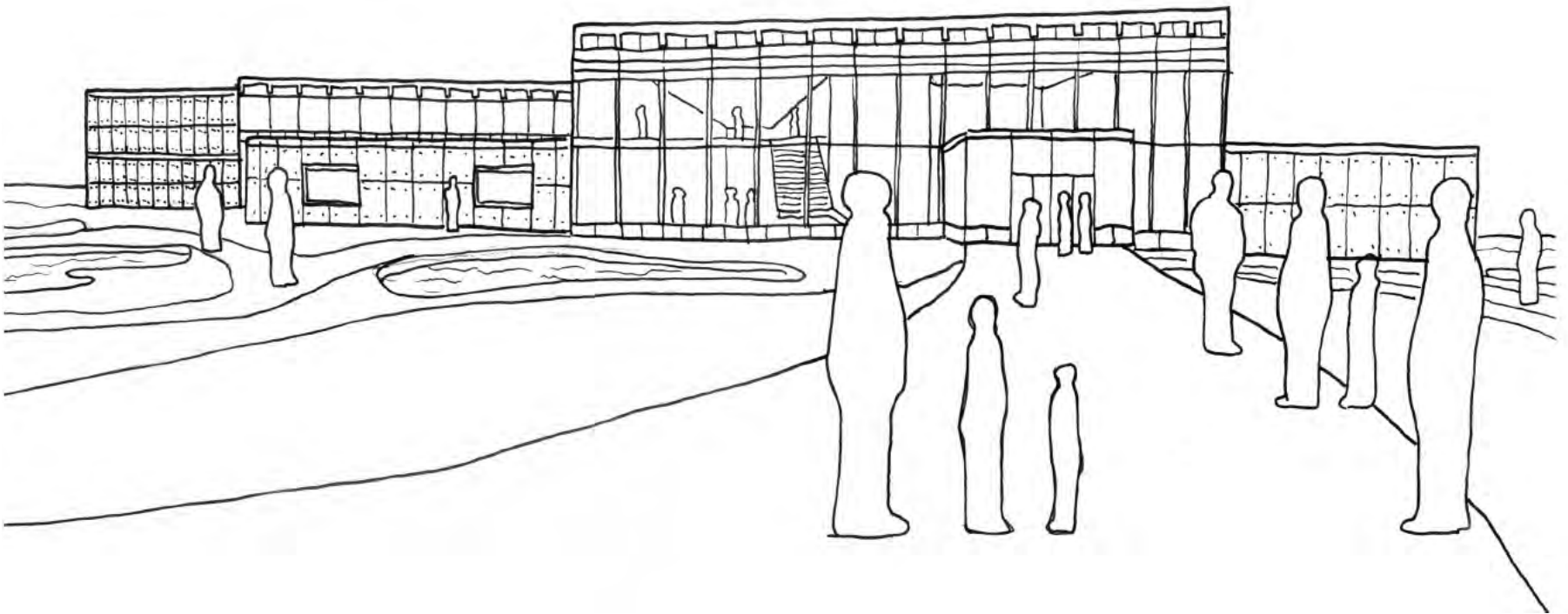
Exterior Perspectives

Perspective from Ferry



Exterior Perspectives

Approach to Building Perspective





POLISHED CONCRETE FLOOR



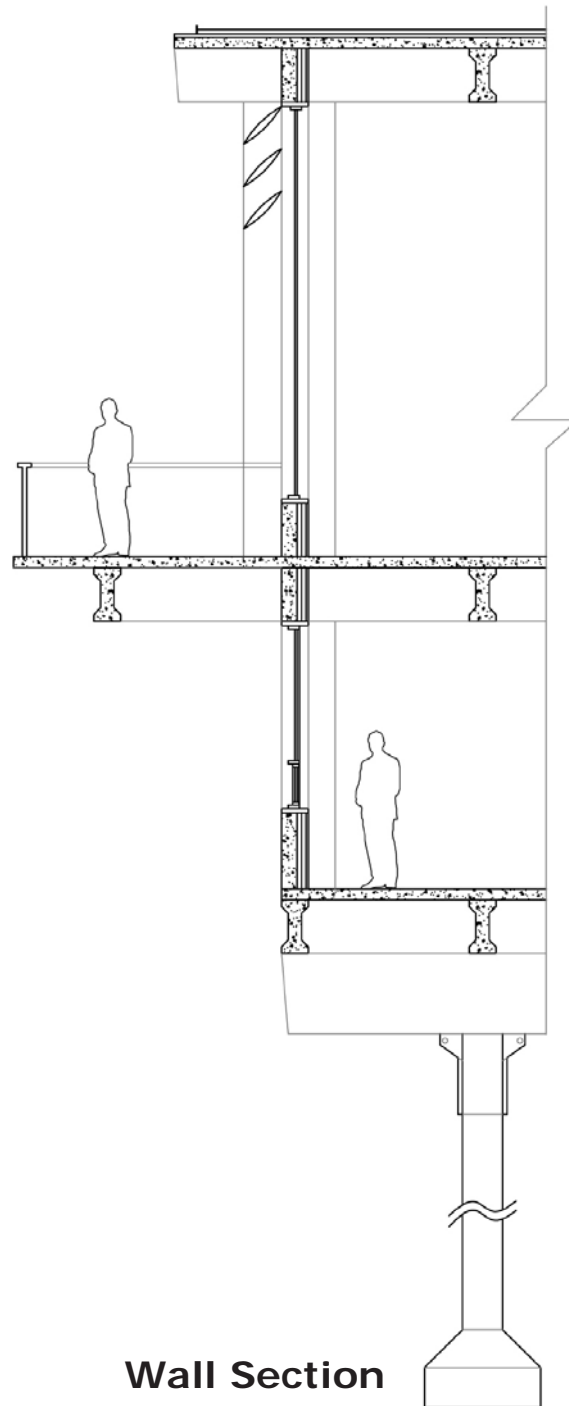
WOODEN DECKING



RETRACTABLE ROOF



ACRYLIC GLASS FISH TANK

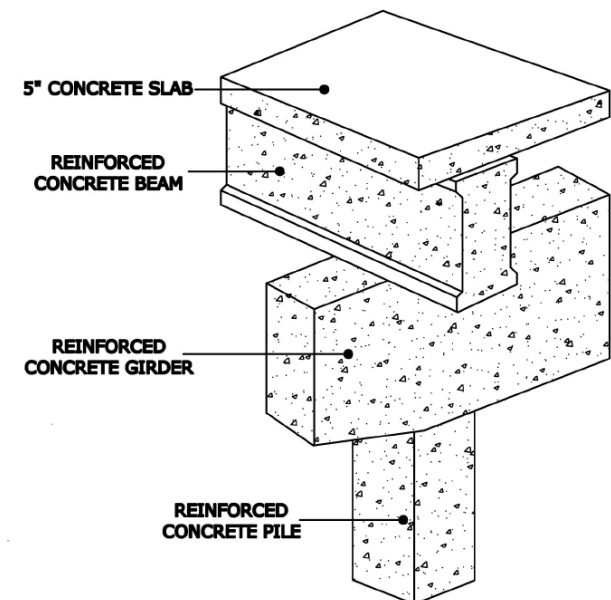


Wall Section

Structure/Materials

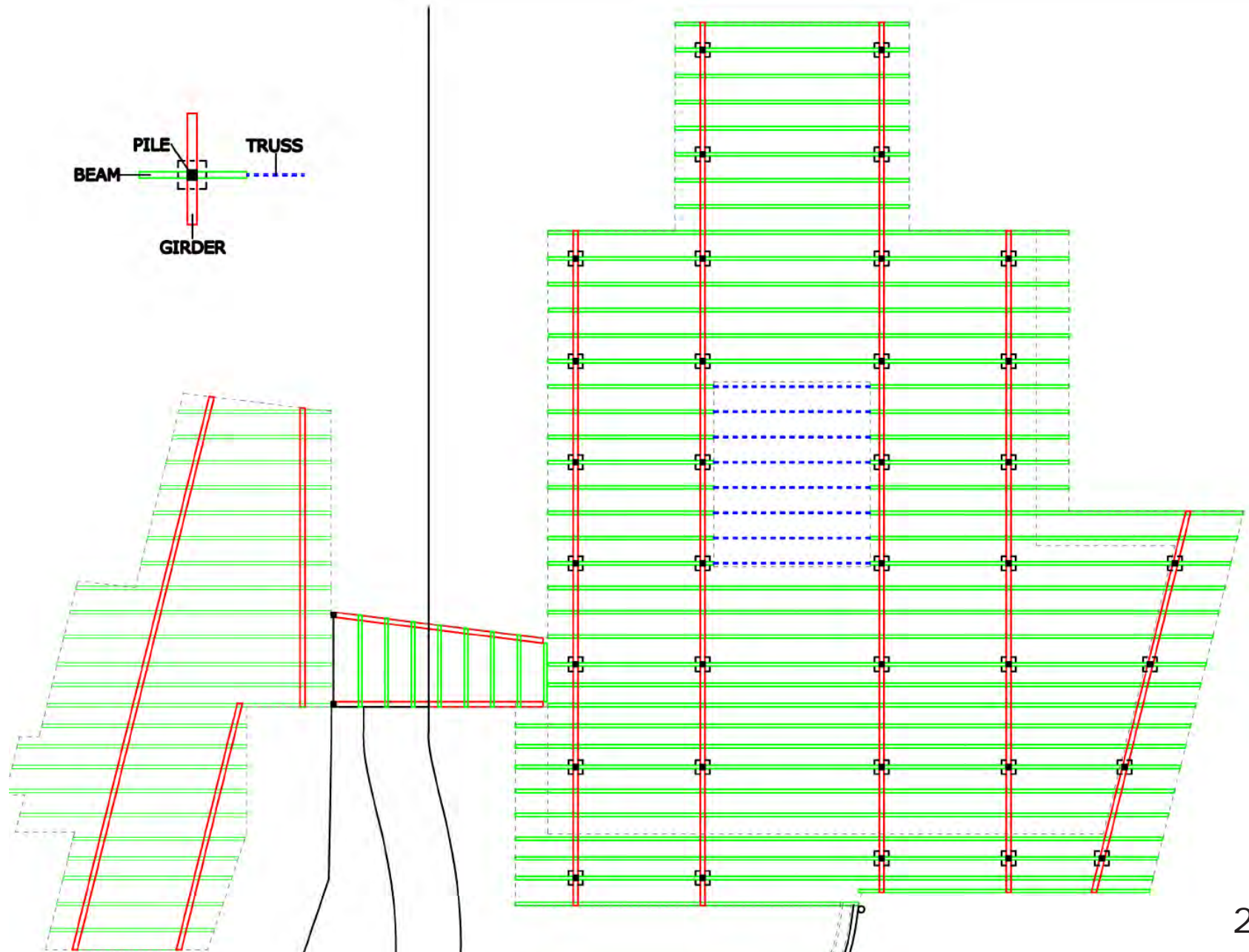


REINFORCED CONCRETE BEAMS

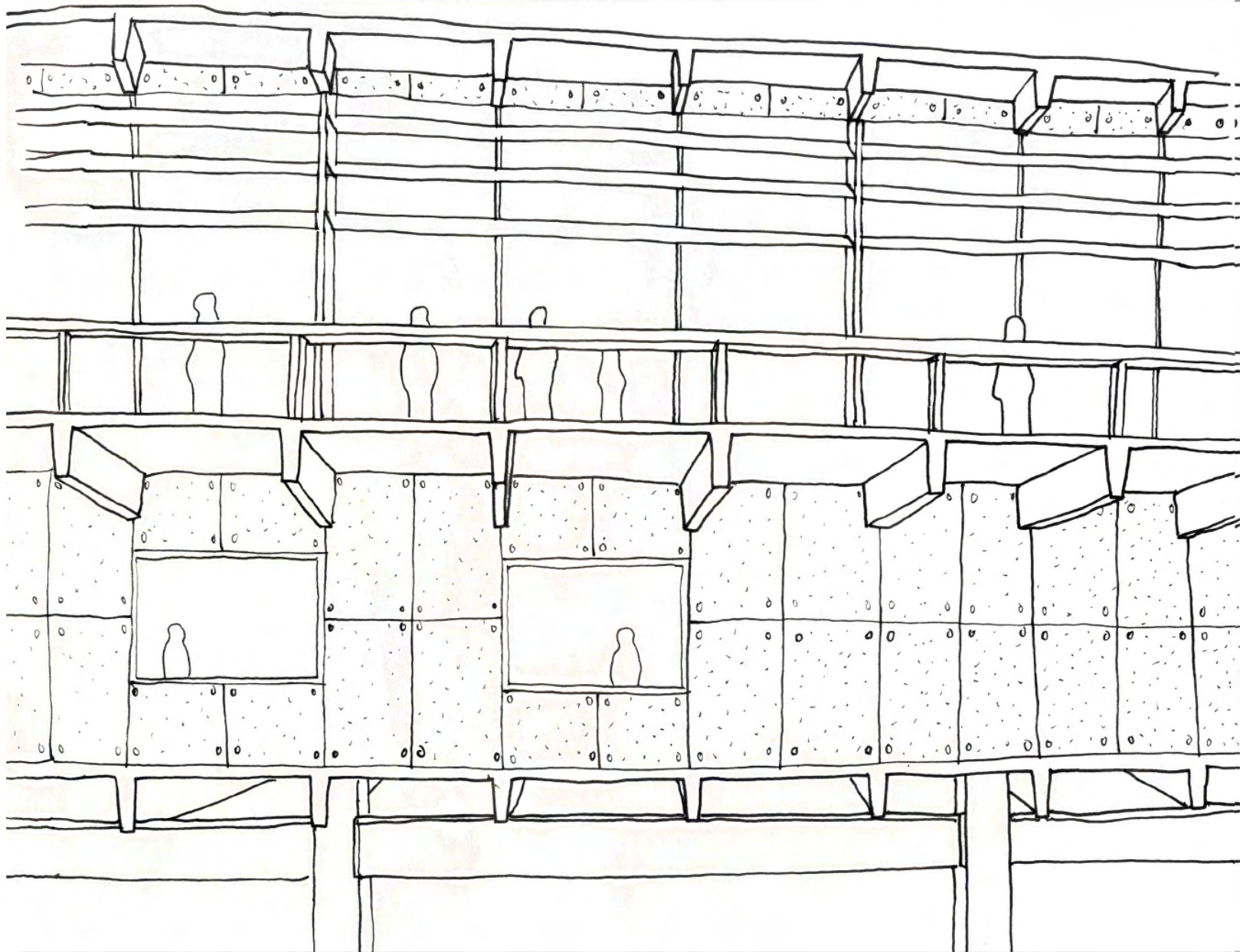


Construction Detail

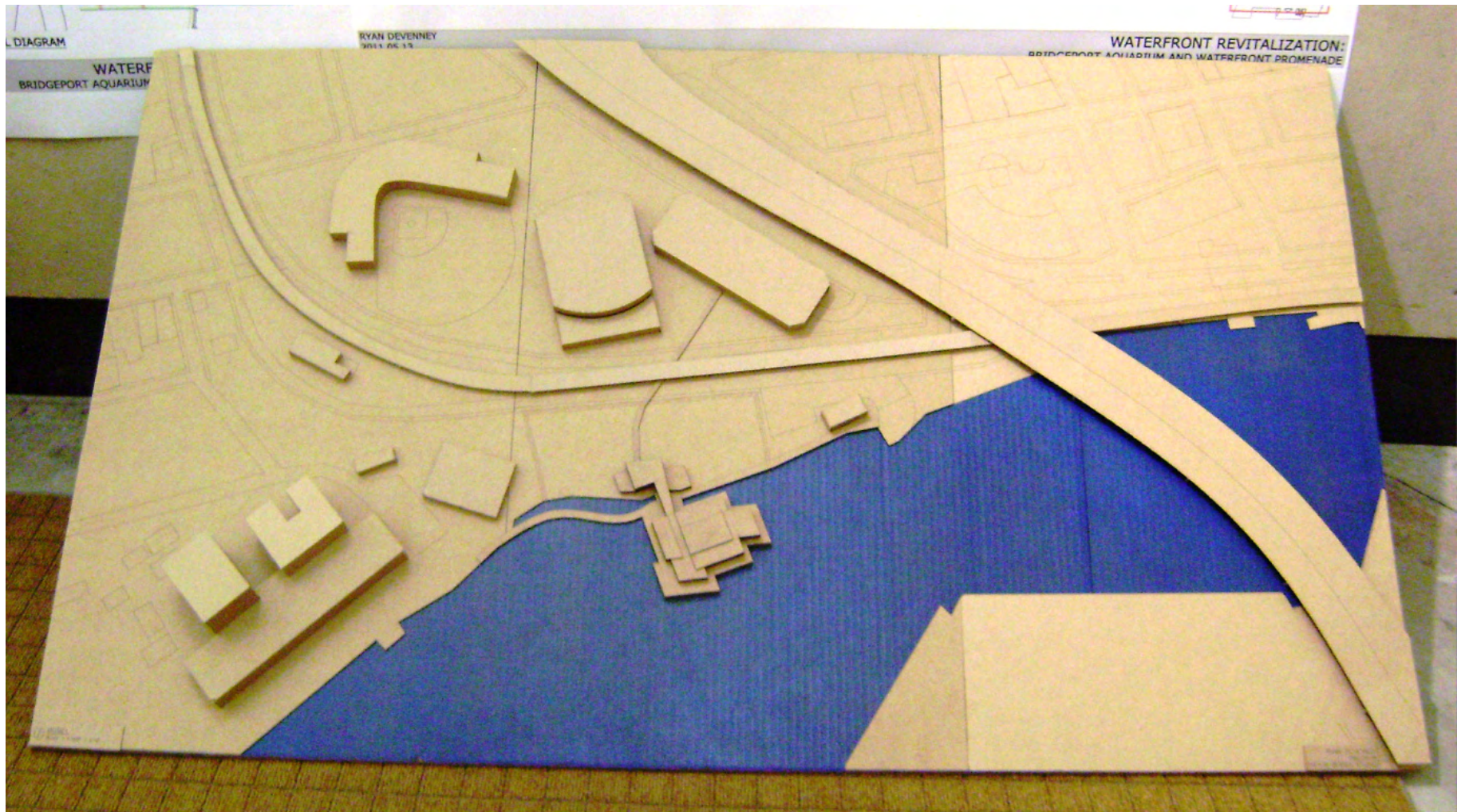
Structural Diagram



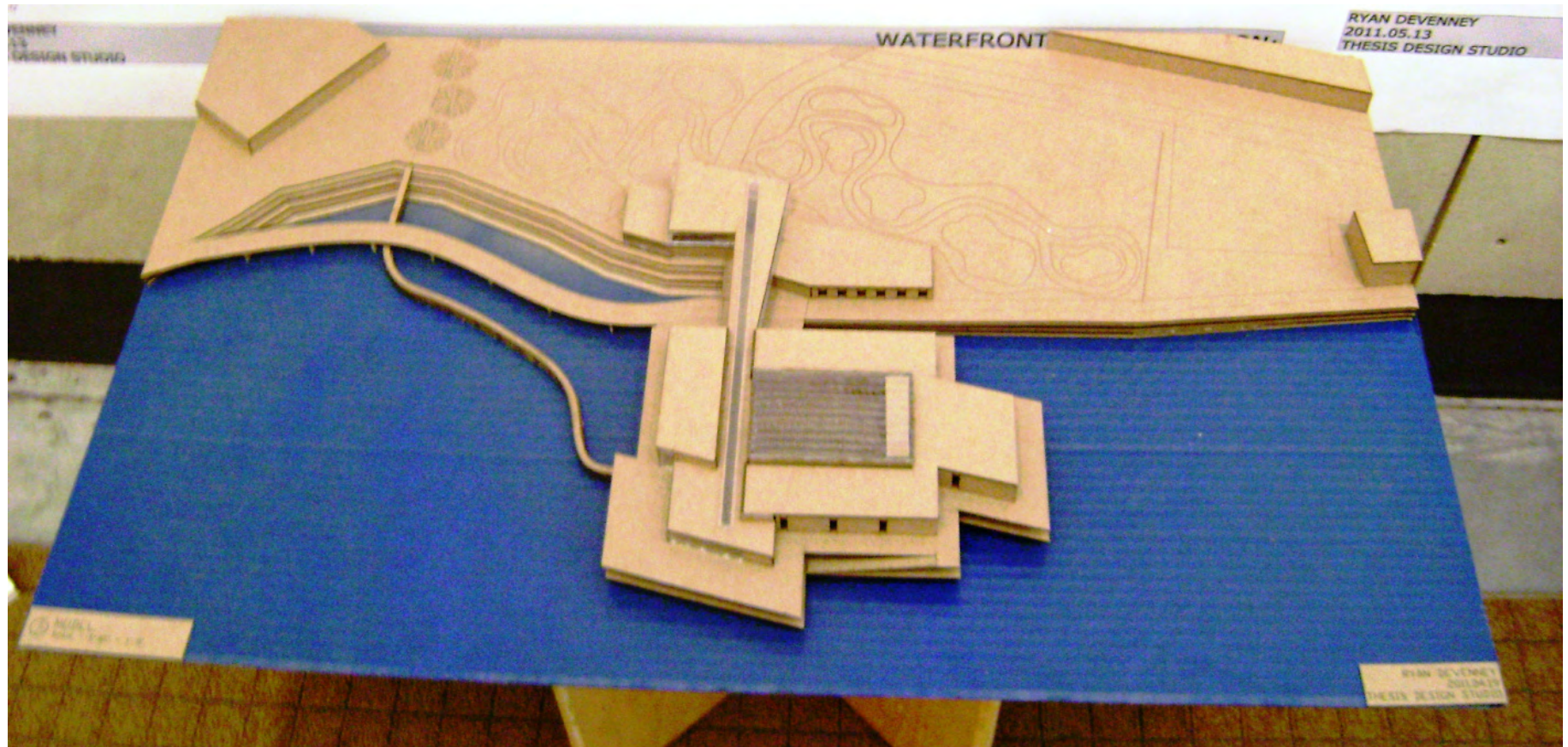
Ext. Perspective w/ Structure



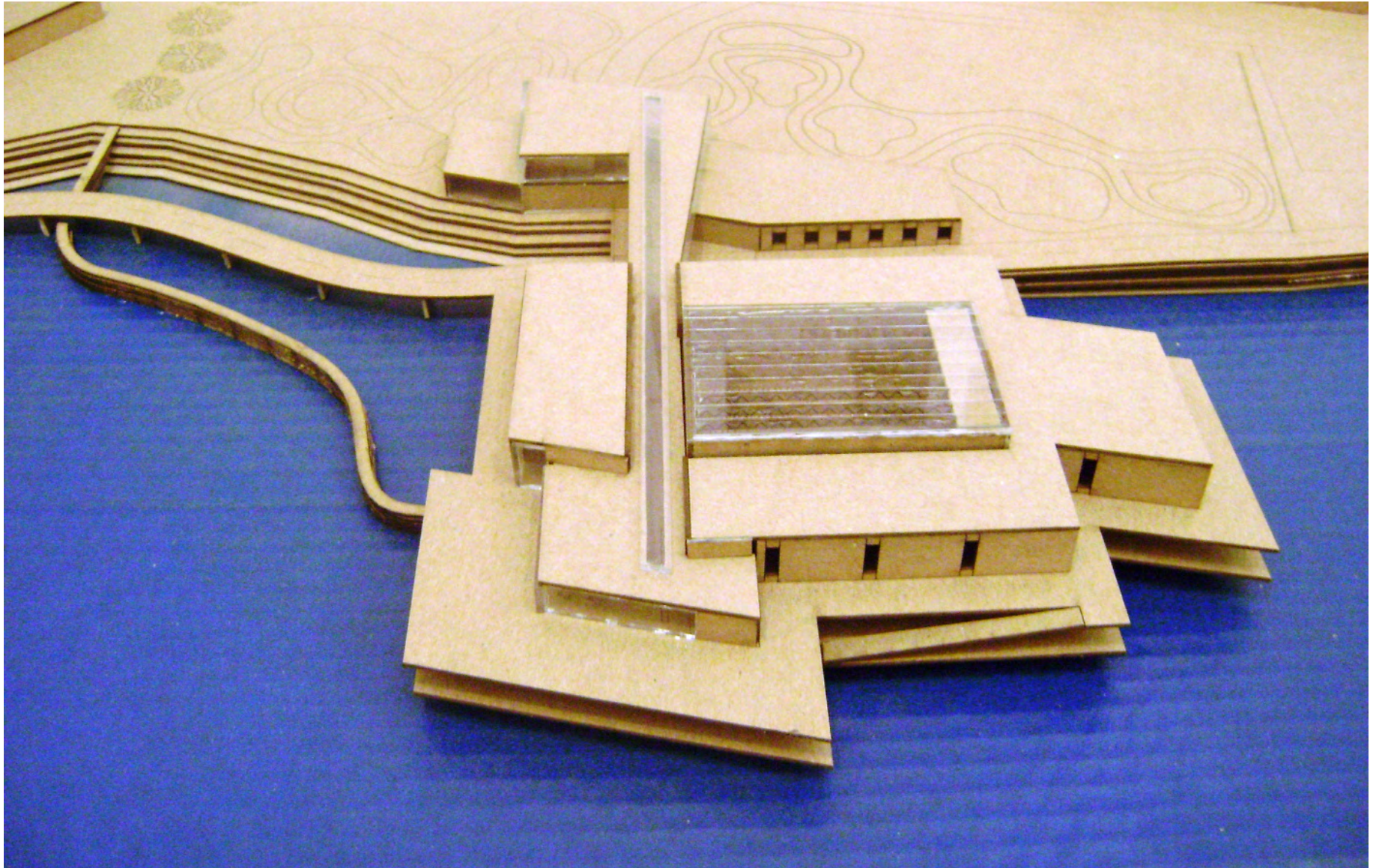
1/128 Scale Site Model



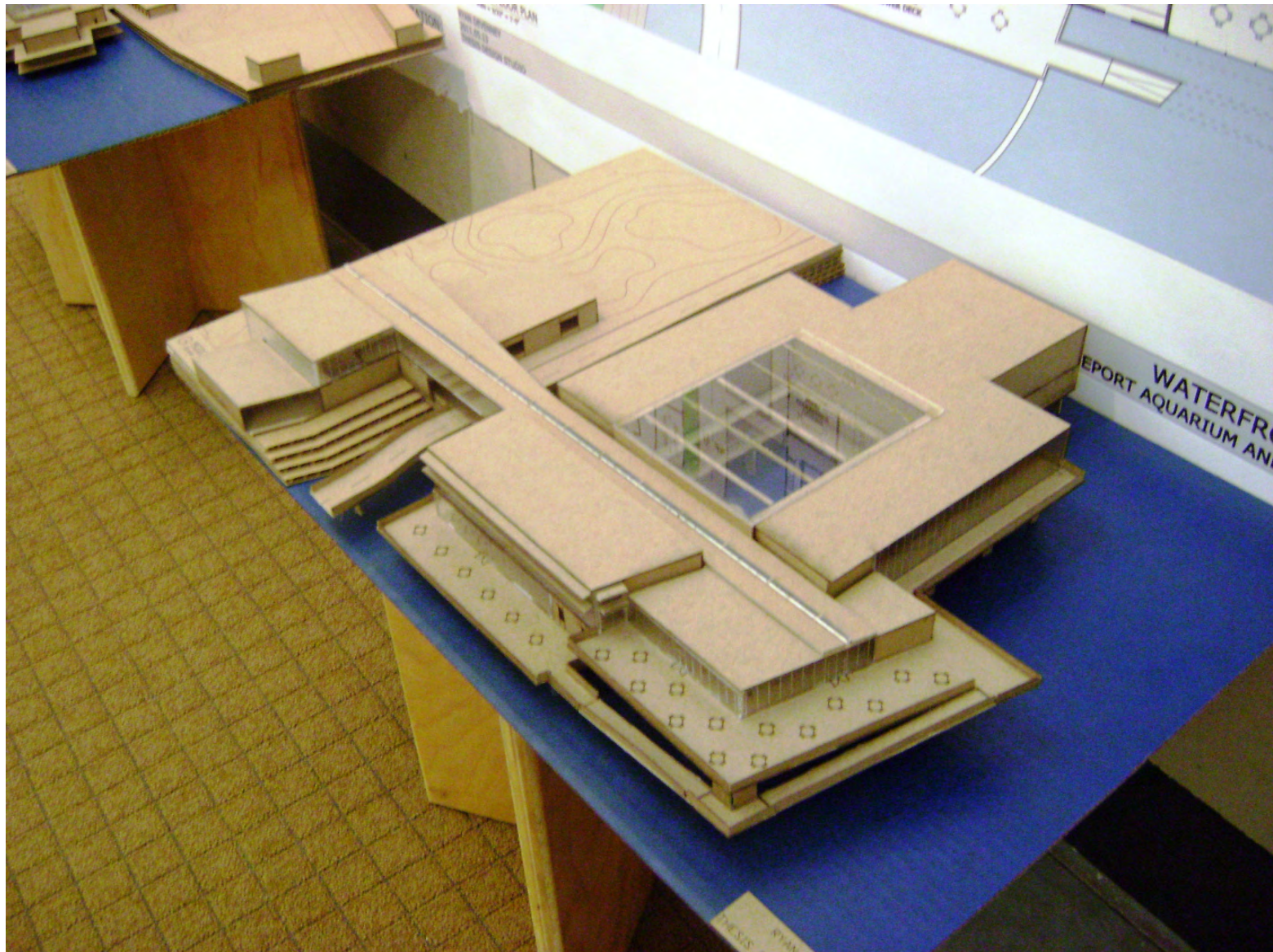
1/32 Scale Model



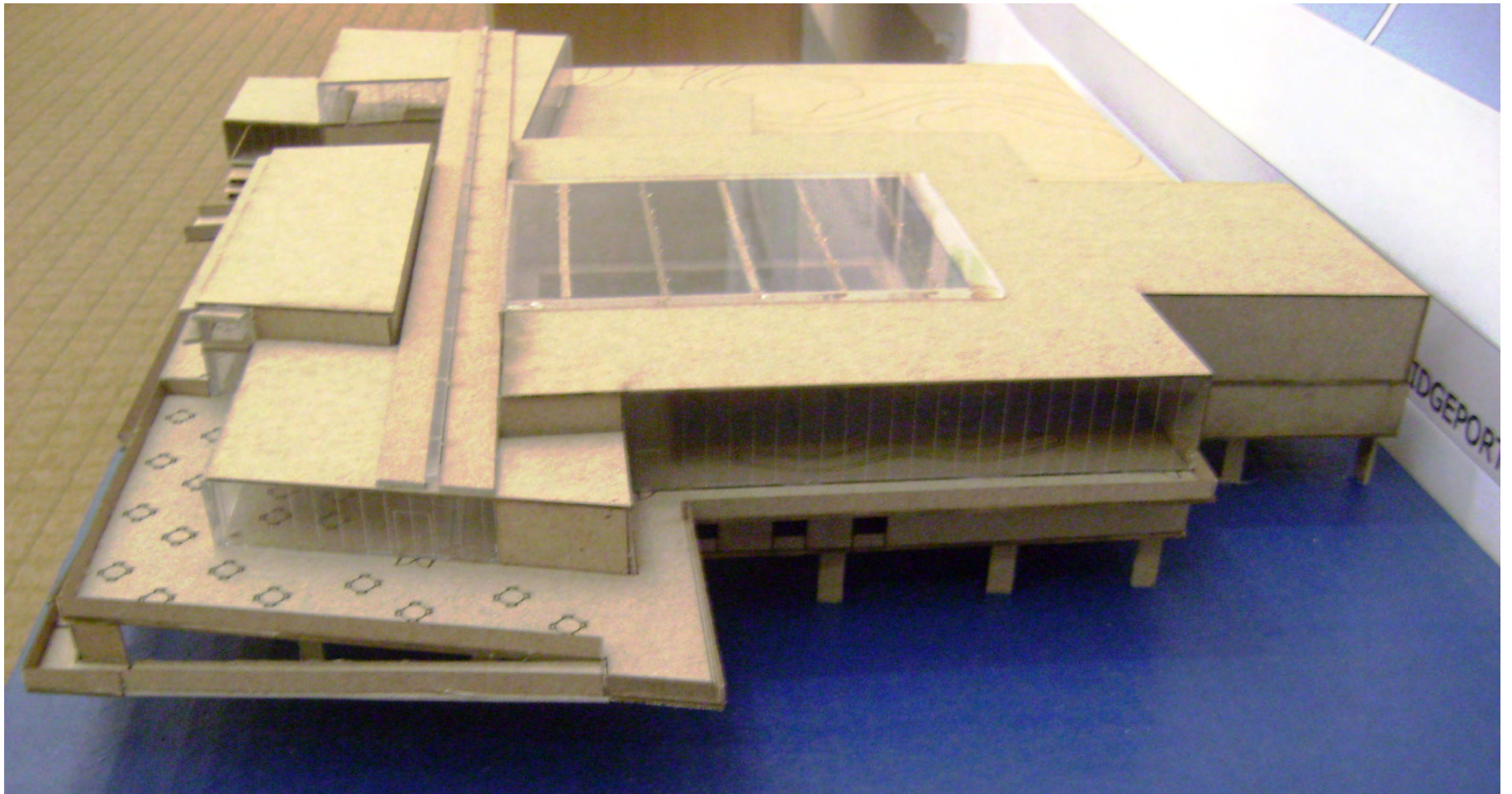
1/32 Scale Model



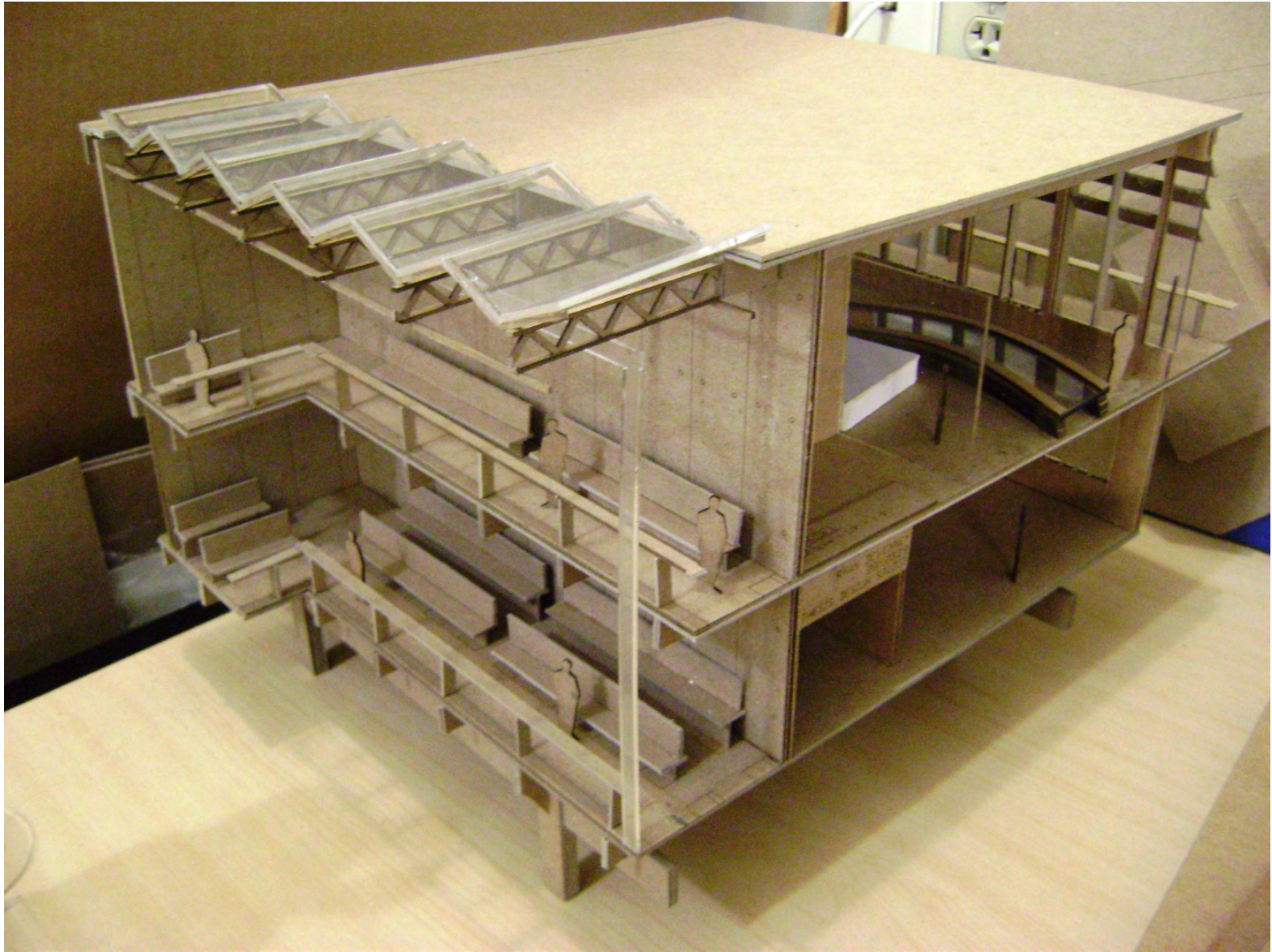
1/16 Scale Model



1/16 Scale Model



1/2 Scale Model



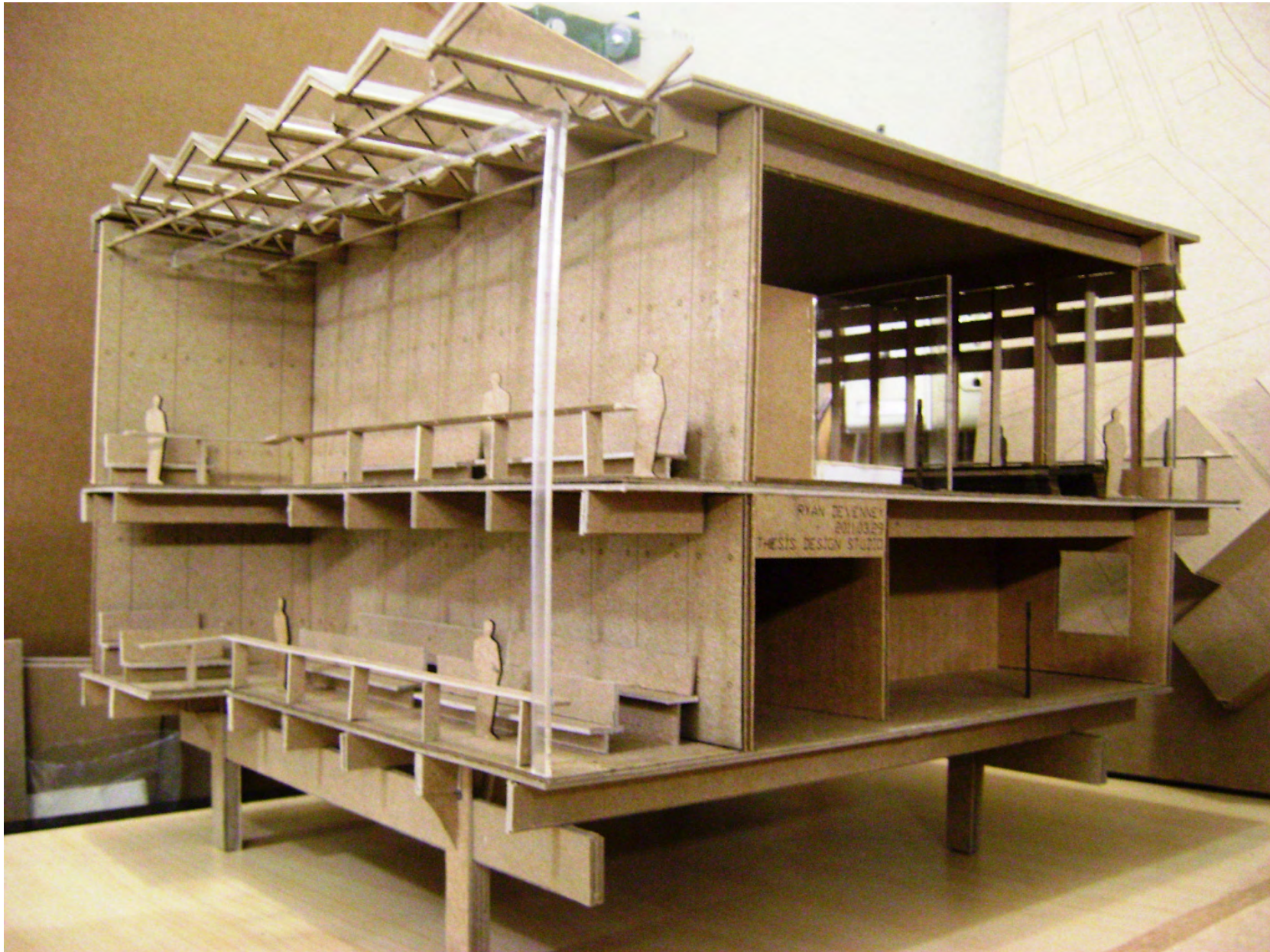
1/2 Scale Model



1/2 Scale Model



1/2 Scale Model



Site, Zoning, Code Analysis

Site Location

Site: Bridgeport, CT

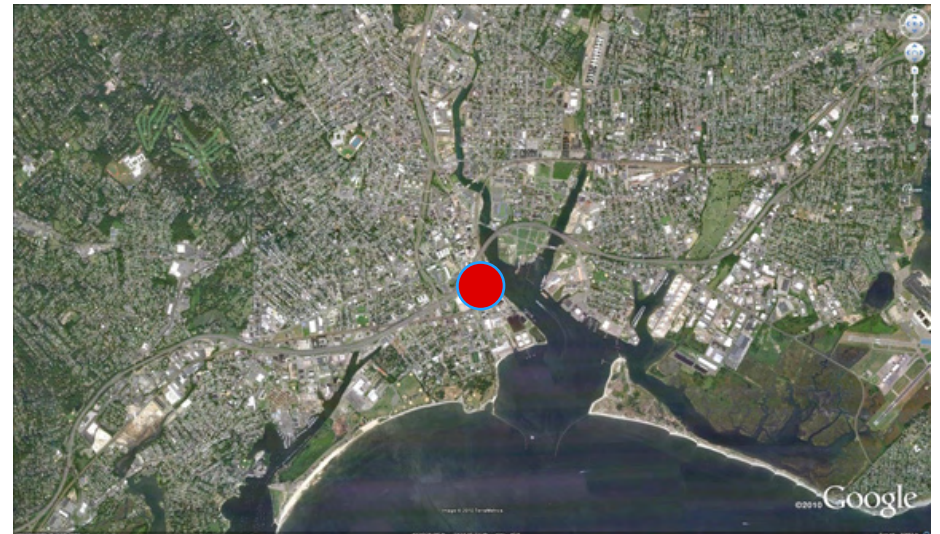
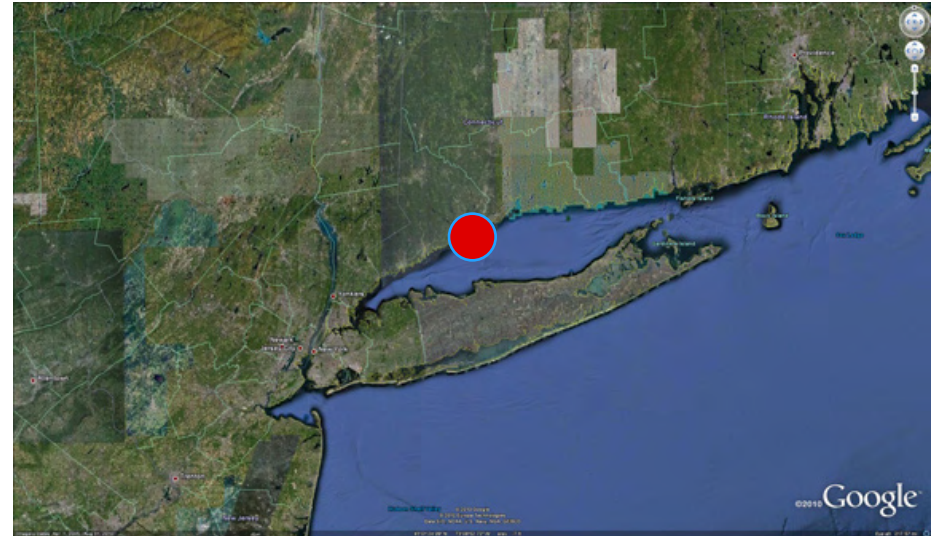
County: Fairfield

Population: 137,000

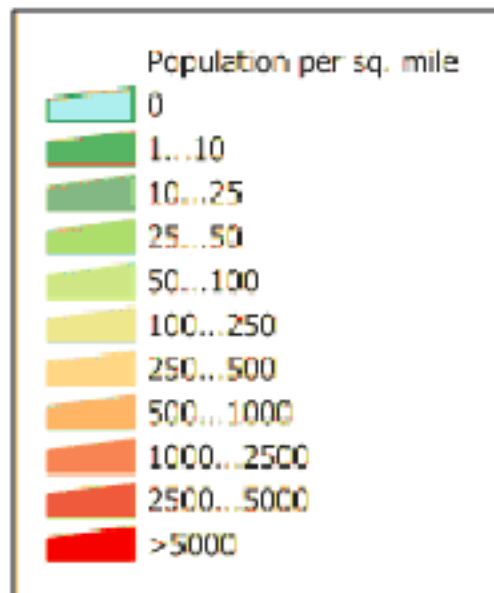
City Area: 19.4 Square Miles

Bridgeport, CT, is chosen as the location of the aquarium for several reasons. It is currently the largest city in Connecticut, in one of the most densely populated regions of the state. The city has excellent access to the surrounding area including cities such as New York City, Stamford, and New Haven via Interstate 95 and the Northeast Corridor Rail System. The city also has waterfront on the Long Island Sound and ferry access to Port Jefferson, NY.

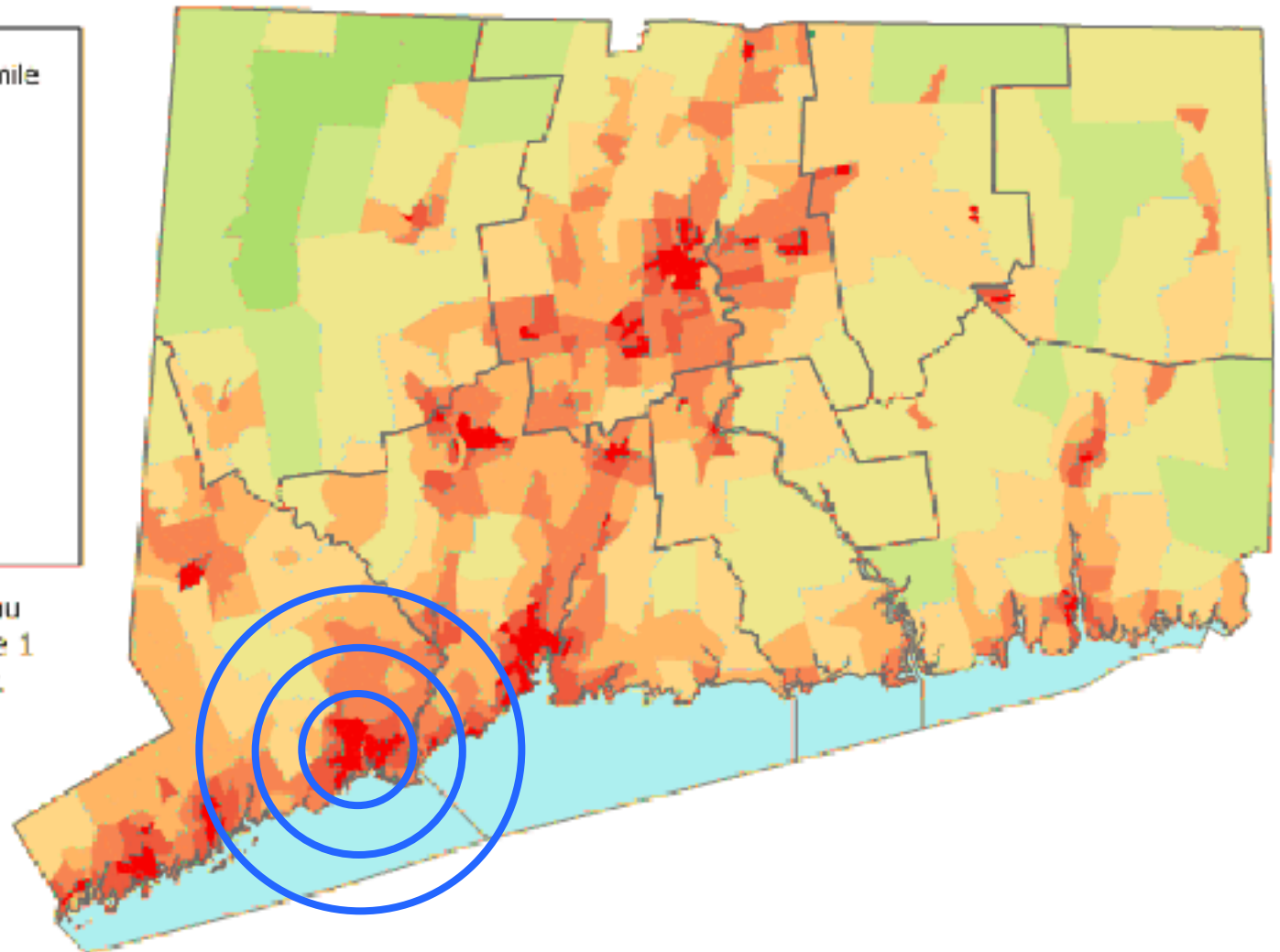
Bridgeport is one of the most economically distressed areas in the region and could strongly use an exciting new cultural institution that would help to revitalize the city center and benefit both the residents of the city and the image of the city itself. Recent developments in the city have been met with success and the CBD is ripe for additional development.



Population Density



Source: U.S. Census Bureau
Census 2000 Summary File 1
population by census tract.



Bridgeport, Connecticut

Site/Local Landmarks



A site in downtown Bridgeport has been selected as the site for the Aquarium. It is within walking distance of the Amtrak Train Station. Landmarks such as the Bridgeport Center, Arena at Harbor Yard, and Ballpark at Harbor Yard have brought some revitalization to the city and they are within close proximity to the site. The site is located adjacent to the Central Business District.

AMTRAK TRAIN STATION

BRIDGEPORT CENTER

BRIDGEPORT-JEFFERSON FERRY

PARKING GARAGE

ARENA AT HARBOR YARD

BALLPARK AT HARBOR YARD

Transportation Routes



Several transportation routes make Bridgeport a regional transportation hub.

Interstate 95 is the main highway on the east coast of the United States. It travels from Maine to Florida, but the portion around New Jersey, New York, and Connecticut receives the heaviest traffic volume. The site is a half mile away from the nearest exit.

Northeast Rail Corridor is a heavily traveled route operated by Amtrak with a station located in downtown Bridgeport. The tracks offer quick access to New York City as well as many cities and towns along the Long Island Sound.

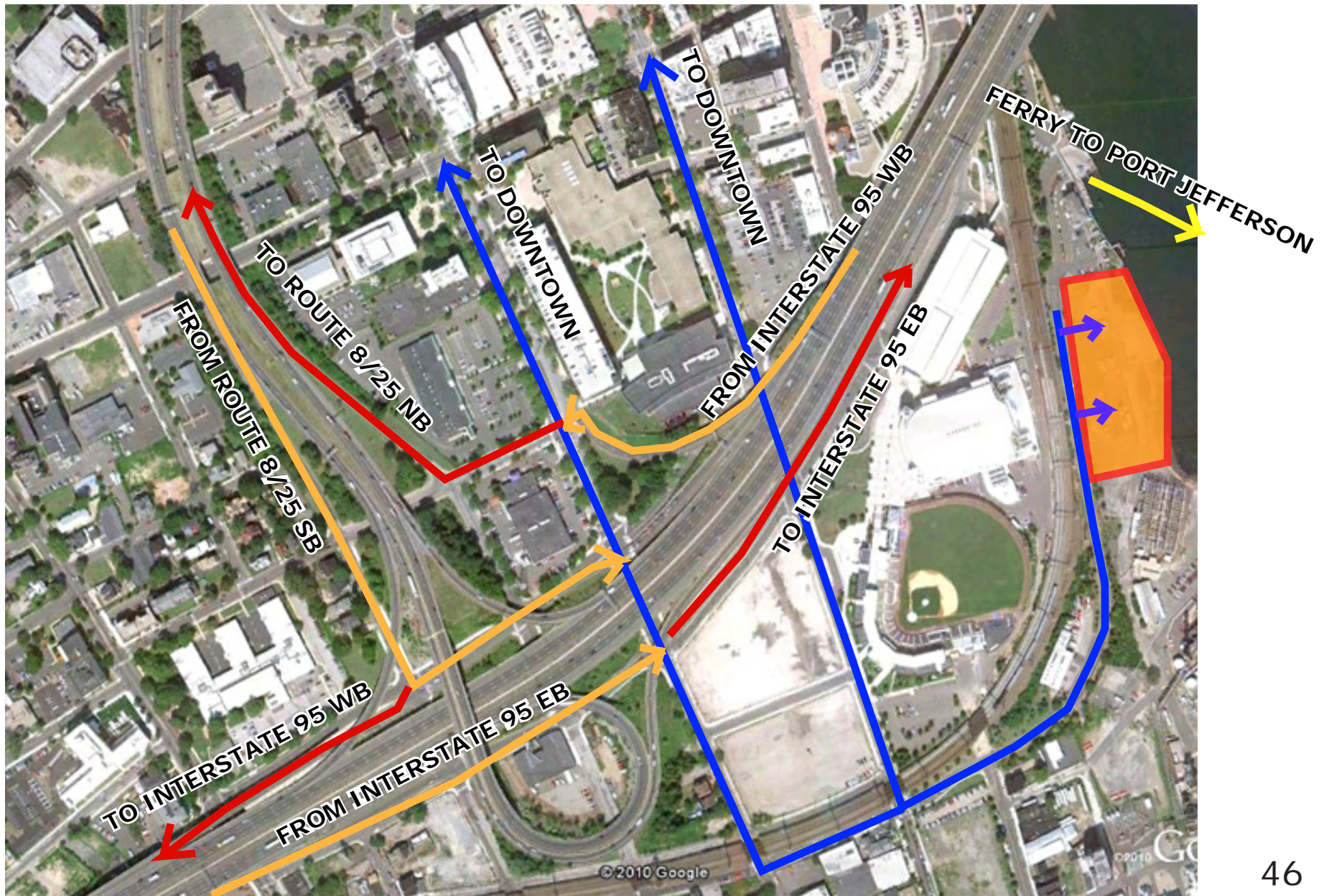
Bridgeport-Port Jefferson Ferry transports roughly 1 million people from Bridgeport to Port Jefferson, NY every year. The site is directly adjacent to the Ferry terminal.

Routes 8/25 connect Bridgeport and I 95 with the Merrit Parkway and northern towns such as Waterbury, CT. The highway continues to travel northwards to Massachusetts.

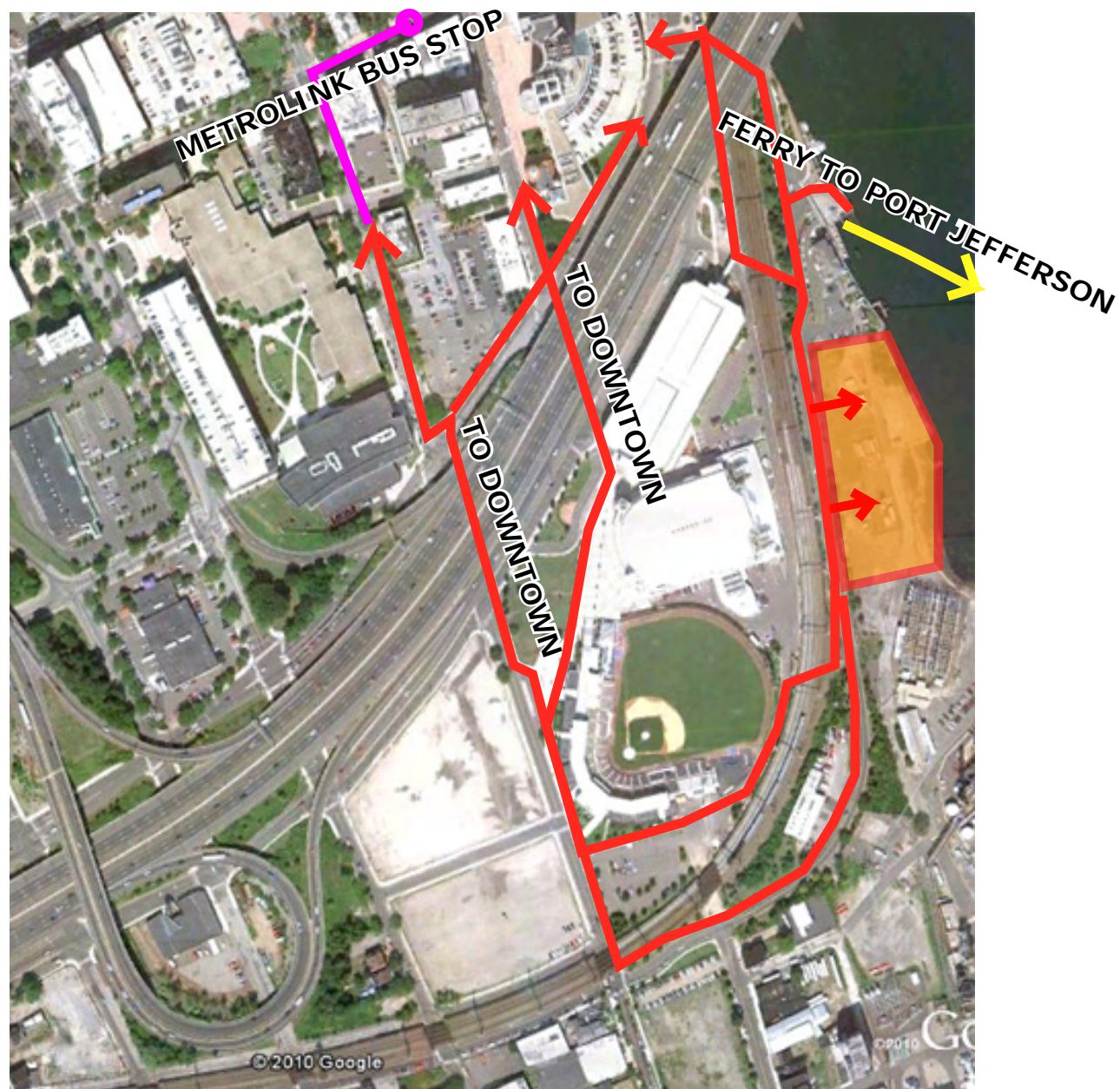
Local Landmarks



Vehicular Access



Pedestrian Access



Site Dimensions



The site is 150,800 square feet. It is located on the Bridgeport waterfront. It borders the Bridgeport-Port Jefferson Ferry on the north. On the west it borders The Arena at Harbor Yard, The Ballpark at Harbor Yard, and a parking garage. On the south side is an electrical substation for the Bridgeport Generating Station. The site contains 590 feet of waterfront on the Long Island Sound on the east side.

The site is located on the northern tip of property owned by the Bridgeport Generating Station, a large power plant. The site is currently zoned for heavy industry. However, a nearby site was also formerly zoned for industrial use and has since been rezoned for mixed development.

The site currently contains about a dozen trailers, two oil tanks, two equipment sheds, and a dead-end dirt road. These objects could easily be relocated or reconstructed in locations further south on the property of the plant.

Site Weaknesses/Strengths



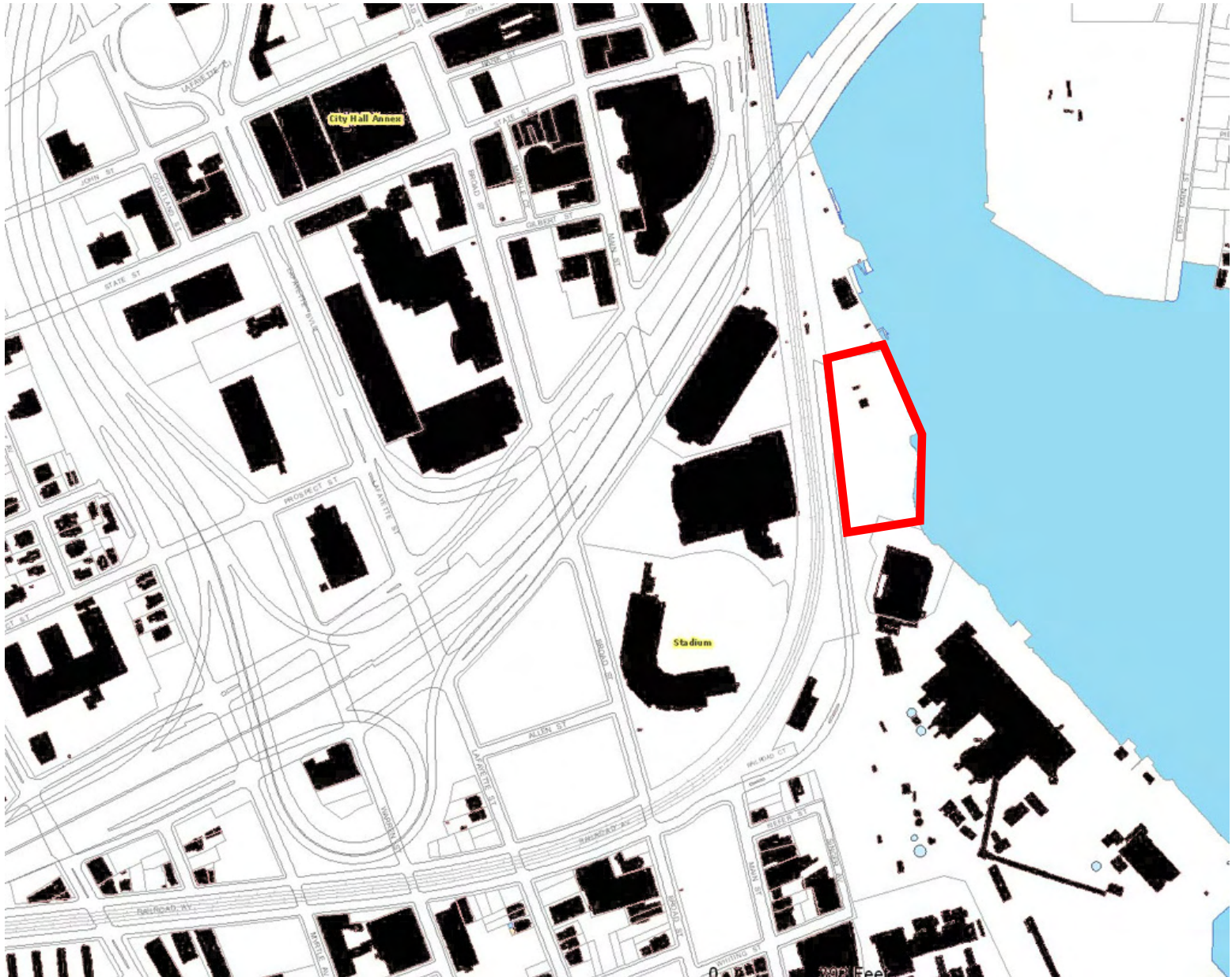
Strengths

- located directly on waterfront
- excellent access to ferry
- easy access to Amtrak Station
- located close to existing parking garage
- less vehicle noise from Interstate 95 (shielded by parking garage, adjacent structures, further away from highway)

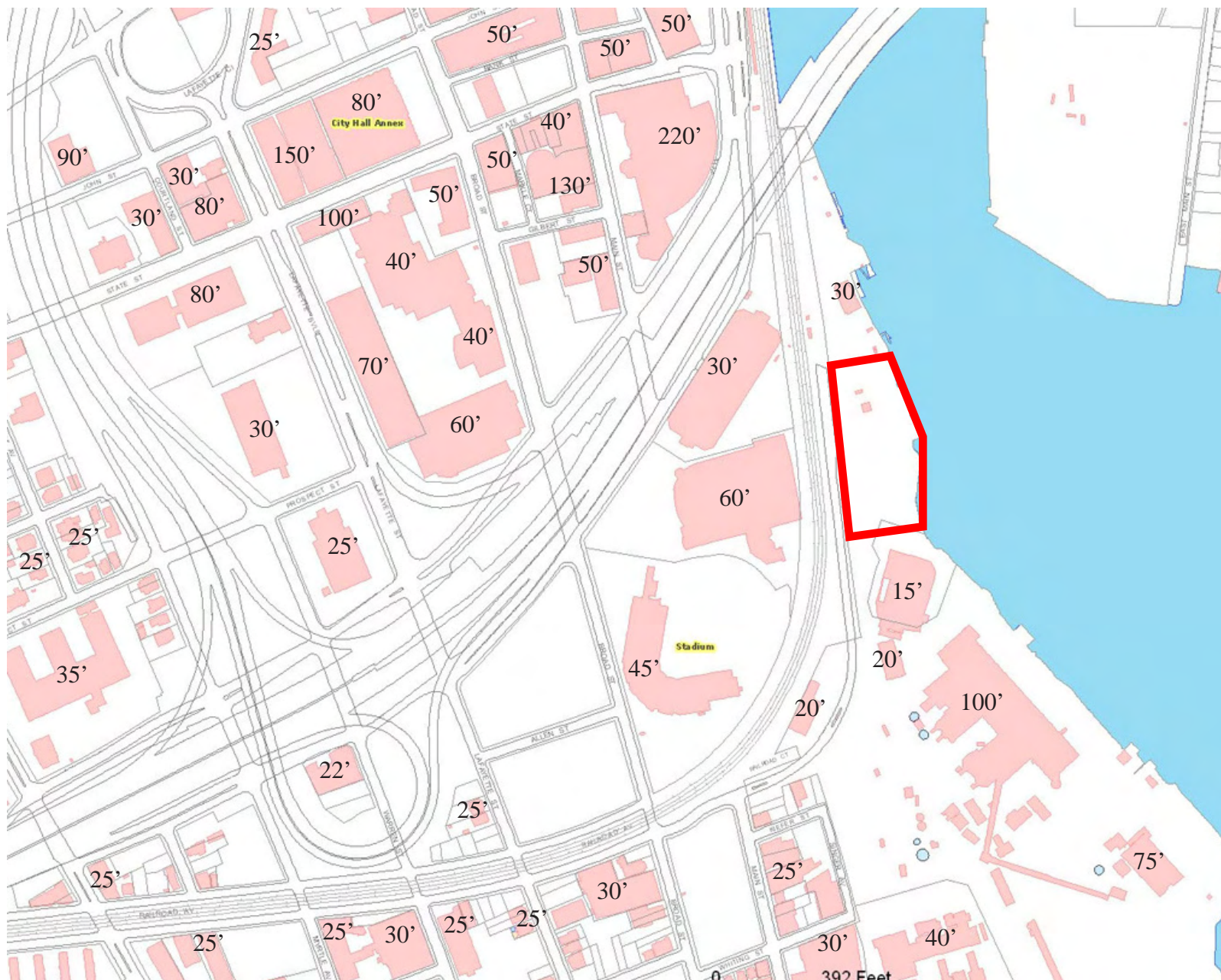
Weaknesses

- hardly visible from Interstate 95
- existing objects on site need to be removed
- faces rear facade of Arena, Baseball Stadium

Figure Ground



Building Heights



Bridgeport Annual Weather

The climate in Bridgeport is warm during summer when temperatures tend to be in the 80's and very cold during winter when temperatures tend to be in the 30's.

The warmest month of the year is July with an average maximum temperature of 81.90 degrees Fahrenheit, while the coldest month of the year is January with an average minimum temperature of 22.90 degrees Fahrenheit.

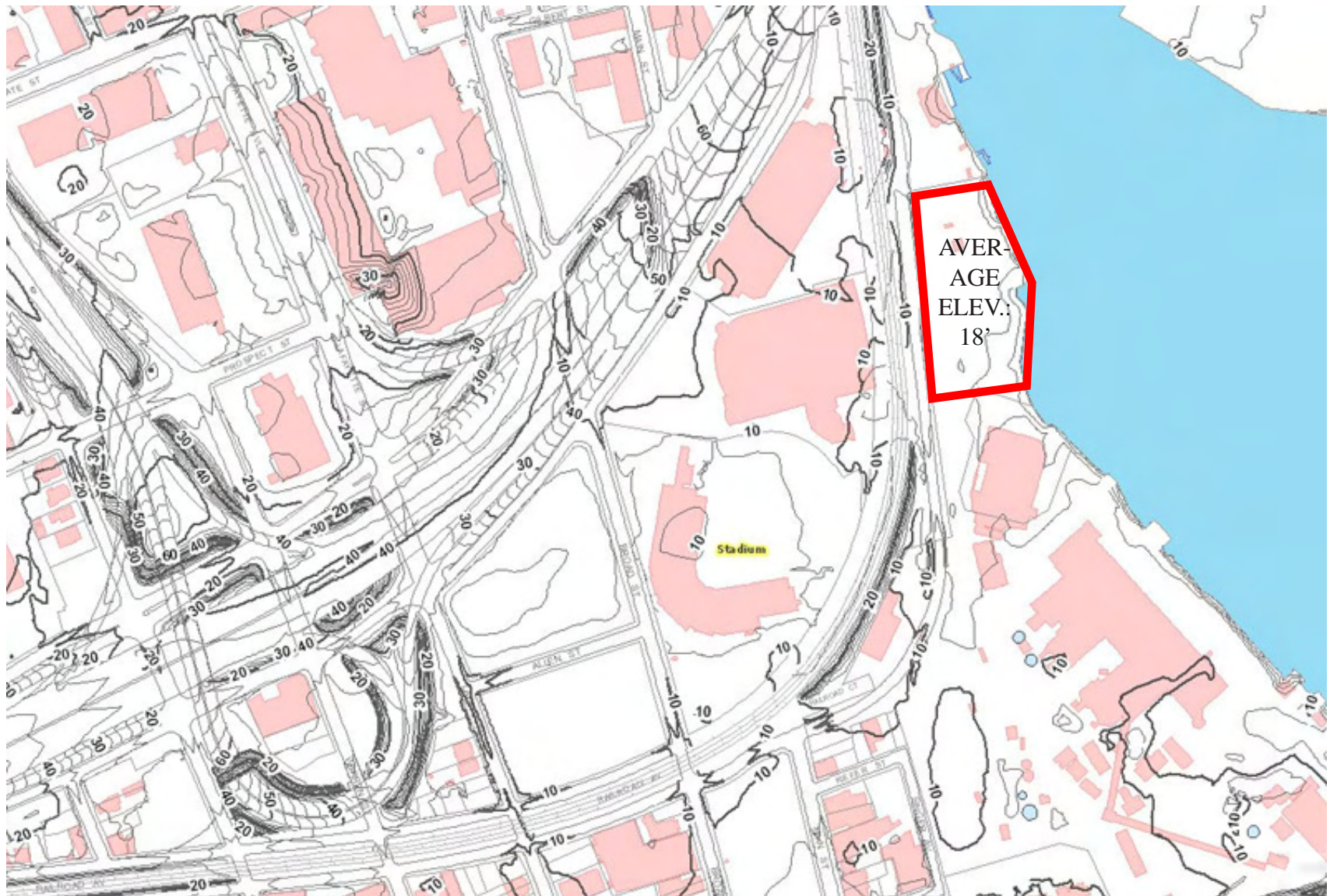
Temperature variations between night and day tend to be fairly limited during summer with a difference that can reach 16 degrees Fahrenheit, and fairly limited during winter with an average difference of 14 degrees Fahrenheit.

The annual average precipitation at Bridgeport is 44.15 Inches. Rainfall in is fairly evenly distributed throughout the year. The wettest month of the year is March with an average rainfall of 4.15 Inches.

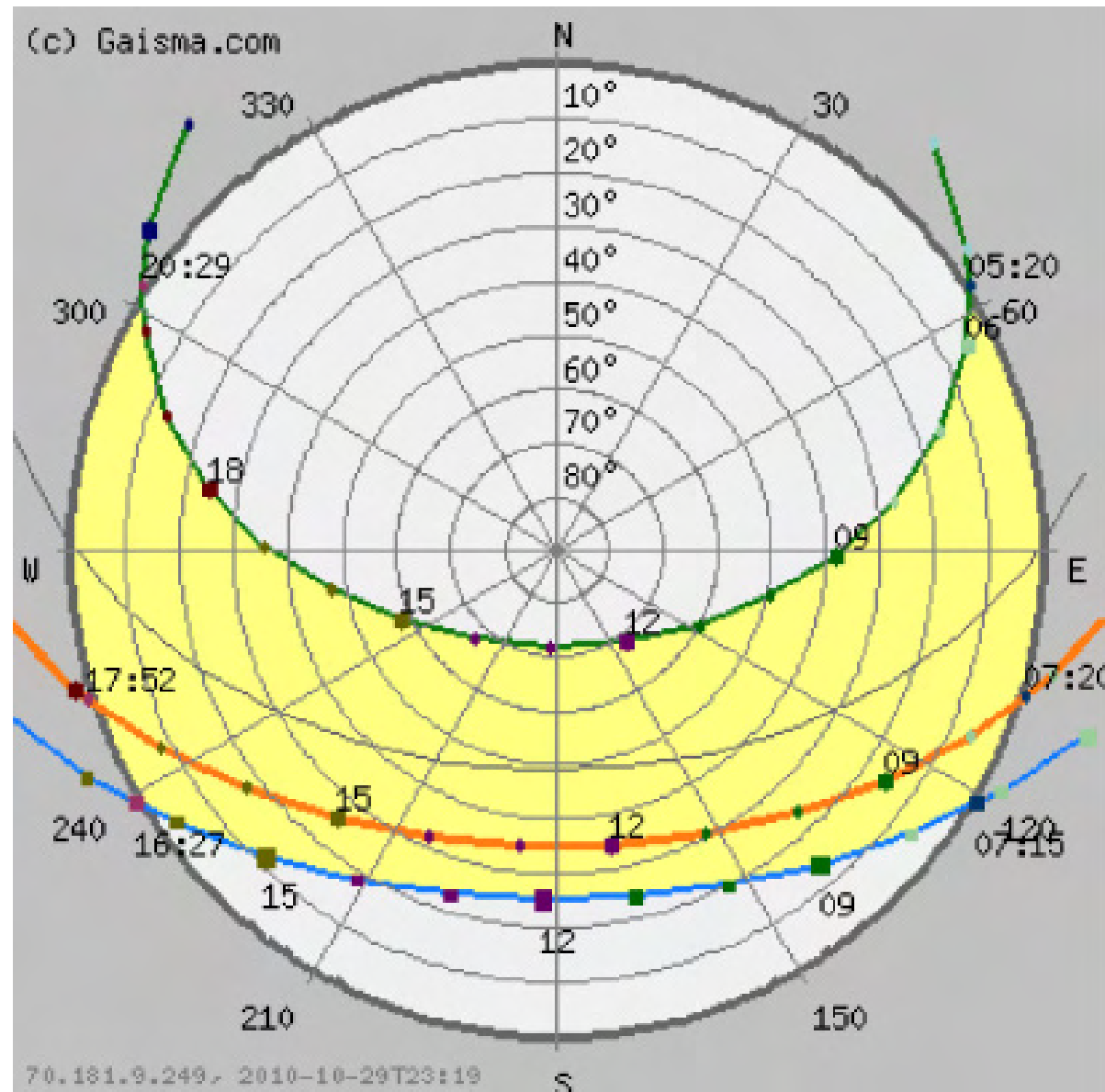
Climate data for Bridgeport, Connecticut													
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Record high °F (°C)	68 (20)	67 (19.4)	84 (28.9)	91 (32.8)	97 (36.1)	97 (36.1)	103 (39.4)	100 (37.8)	99 (37.2)	89 (31.7)	78 (25.6)	76 (24.4)	103 (39.4)
Average high °F (°C)	38.9 (2.72)	38.8 (3.78)	46.9 (8.28)	57 (13.9)	67.4 (19.67)	76.4 (24.67)	81.9 (27.72)	80.7 (27.06)	73.6 (23.11)	63.1 (17.28)	52.6 (11.44)	42.1 (5.61)	59.8 (15.44)
Average low °F (°C)	22.9 (-5.06)	24.9 (-3.94)	32 (0)	40.7 (4.83)	50.6 (10.33)	59.6 (15.33)	66 (18.9)	65.4 (18.56)	57.7 (14.28)	46.3 (7.94)	37.5 (3.06)	28 (-2.2)	44.3 (6.83)
Record low °F (°C)	-7 (-21.7)	-5 (-20.6)	4 (-15.6)	18 (-7.8)	31 (-0.6)	41 (5)	49 (9.4)	44 (6.7)	36 (2.2)	26 (-3.3)	16 (-8.9)	-4 (-20)	-7 (-21.7)
Precipitation inches (mm)	3.73 (94.7)	2.92 (74.2)	4.15 (105.4)	3.99 (101.3)	4.03 (102.4)	3.57 (90.7)	3.77 (95.8)	3.75 (95.3)	3.58 (90.9)	3.54 (89.9)	3.65 (92.7)	3.47 (88.1)	44.15 (1,121.4)
Snowfall inches (cm)	8.5 (21.6)	7.2 (18.3)	4.3 (10.9)	0.9 (2.3)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0.7 (1.8)	3.2 (8.1)	24.8 (63)
Avg. precipitation days	11	9.8	11.1	10.3	11.4	10.7	8.5	9.2	8.6	8.2	9.8	11.4	120
Avg. snowy days	5.3	4.4	2.5	0.4	0	0	0	0	0	0	0.7	2.9	16.2

Source: <http://www.noaa.com>

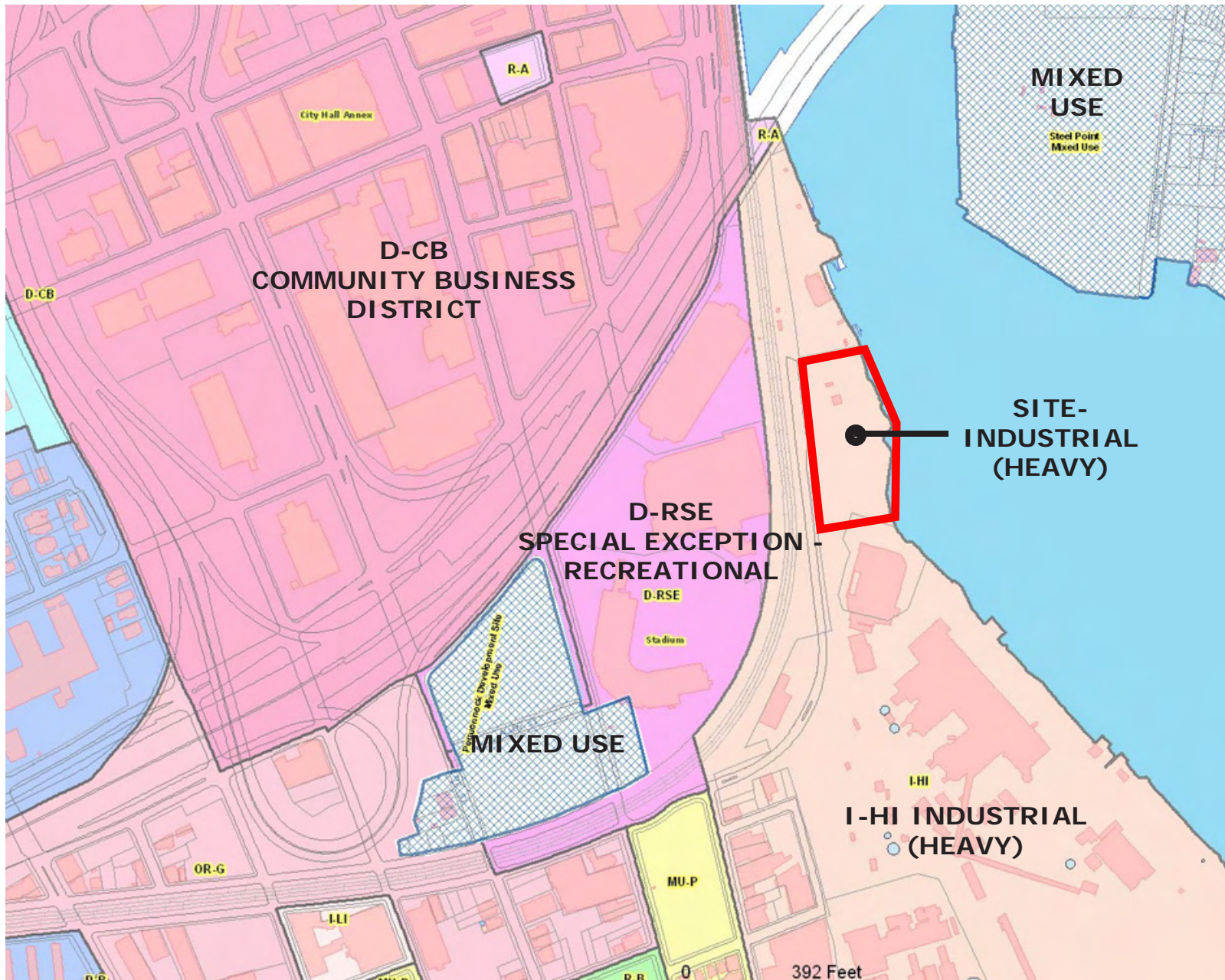
Contour Map



Bridgeport Solar Diagram



Zoning Map



Zoning Variance

The site is currently zoned for heavy industry. In order to change the current zoning for an area, one must fill out a petition for a **Variance** or **Waiver** of the zoning regulations.

The Zoning Variance form for Bridgeport, CT, has five preliminary steps.

1. Petition must be prepared and work submitted in accordance with attached checklist.
2. The acceptance of the plot plan and building plan with accompanying application shall be subject to approval of the Administrator of the Board of Zoning Appeals.
3. All questions must be answered. No application will be accepted if received by mail.
4. Photos and/or any other data as the Administrator may require shall be submitted to clearly present the petition to the Board.
5. No petition will be accepted until all requirements contained herein are completed.

If the Administrator for the Board of Zoning Appeals approves the variance, the sites will be rezoned as a **Public Institutional Zoning District**.

PUBLIC INSTITUTIONAL ZONING DISTRICT

1. **Intent:**

The public institutional designation is intended to:

- A. Provide an area for activities relating to the purpose of state and local governmental entities and semi-public institutions providing necessary public services;
- B. Provide for continued operation and facilitate managed growth of existing major institutions;
- C. Provide and protect parks, open space and other natural, physical assets of the community to improve the aesthetic and functional features of the community.

2. **Permitted Uses:**

Permitted uses in the Public Institutional Zoning District include but are not limited to the following:

- A. Continuation of uses already legally existing within the zone at the time of adoption of this title;
- B. Parks, greenbelts and open space for active or passive recreation or enjoyment;
- C. Government buildings or offices such as fire stations, schools and colleges, hospitals, community meeting or recreation halls;
- D. Libraries, **museums**, or similar cultural facilities;
- E. Churches;
- F. Public Utilities, such as electrical, sewer, water, natural gas, storm water, telecom facilities and other similar uses

Setback/Building Height

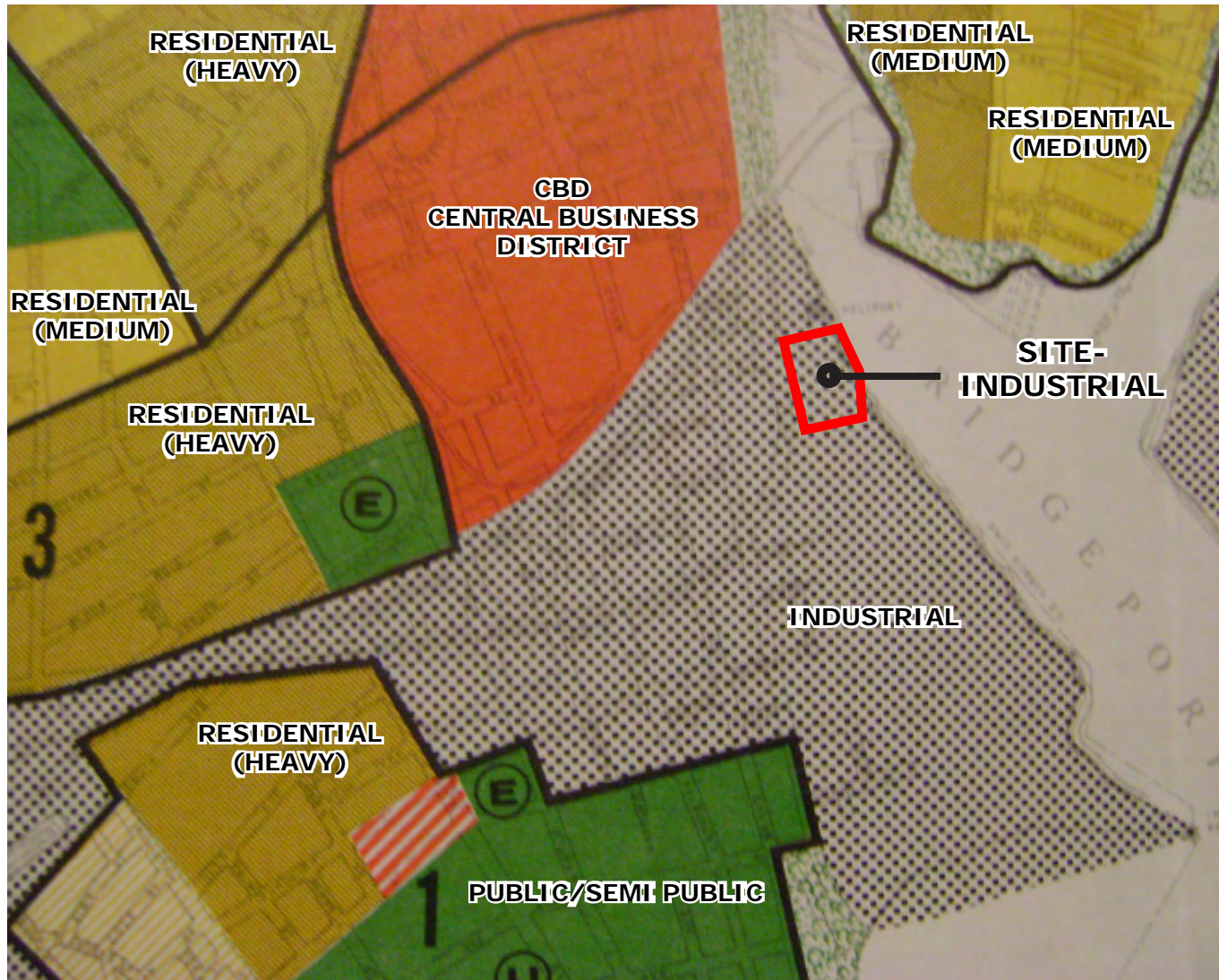
- A. **Site Area:** The minimum size and shape of the site shall be appropriate to the proposed use of said site and its relationship to abutting properties and traffic patterns in the vicinity of the site.
- B. **Building Height:** Maximum height of buildings shall be 45 feet.
- C. **Building setback requirements:**
1. If adjacent properties are in the same or in a less restrictive land use district:
 - a. Side yard minimum **15 feet**;
 - b. Rear yard minimum **15 feet**.
 2. If adjacent properties are in any residential district:
 - a. Side yard minimum **25 feet**;
 - b. Rear yard minimum **25 feet**.
 3. Setbacks from right-of-way:
 - a. If property fronts on a private street or drive, **25 feet**;
 - b. If property fronts on public street, **35 feet**.
- D. **Maximum Height:** Maximum height in the Public Institutional district shall be as follows: **45 feet**, except when adjoining a more restrictive use district, in which case any structure located within 100 feet of the more restrictive zone shall have a maximum height as imposed by the more restrictive district. Height may be further restricted by airport overlay zoning, where applicable. Deviation from this standard will be processed as a special use permit.

Historical Zoning



Source: Bridgeport Masterplan, 1980

Historical Zoning



The site was formerly zoned for industrial use. Since a nearby site has since been rezoned for mixed use, it can be assumed that the current site will be able to be rezoned for institutional use through a variance. The Steel Point site (across the harbor) has also since been rezoned for mixed use. The sites to the west of the site have been rezoned for recreational use.

LAND USE	
	RESIDENTIAL (LOW) 2-4 U/A
	RESIDENTIAL (MODERATE) 5-14 U/A
	RESIDENTIAL (MEDIUM) 15-30 U/A
	RESIDENTIAL (HIGH) MORE THAN 30 U/A
	NEIGHBORHOOD COMMERCIAL
	CBD (CENTRAL)
	SECONDARY COMMERCIAL
	INDUSTRIAL
	PUBLIC / SEMI PUBLIC
	PARKS, OPEN SPACE & RECREATION
	CEMETERY

Source: Bridgeport Masterplan, 1980

Special Amusement Buildings - (Public Aquarium)

Definition- A special amusement building is any temporary or permanent building or portion thereof that is occupied for **amusement, entertainment, or educational purposes** and that contains a device or system that conveys passengers or provides a walkway along, around or over a course in any direction so arranged that the means of egress path is not readily apparent due to visual or audio distractions or is intentionally confounded or is not readily available because of the nature of the attraction or mode of conveyance through the building or structure.

Automatic Fire Detection - Special amusement buildings shall be equipped with an automatic fire detection system

Automatic Sprinkler System - Special amusement buildings shall be equipped throughout with an automatic sprinkler system.

Alarm - Activation of a single smoke detector, the automatic sprinkler system or other automatic fire detection system shall immediately sound an alarm at the building at a constantly attended location from which emergency action can be initiated

Emergency voice/alarm communications system - An emergency voice/alarm communications system shall be provided which is permitted to serve as a public address system and shall be audible through the entire special amusement building

Exit marking - Exit signs shall be installed at the required exit or exit access doorways of amusement buildings. Where designs that disguise the path of egress travel such that they are not apparent, low level exit signs and directional path markings shall be provided and located not more than 8 inches above the walking surface. Such markings will become visible in an emergency.

Ceiling Height - The means of egress shall have a ceiling height of not less than 7 feet 6 inches

Protruding Objects - Protruding objects are allowed to extend below the minimum ceiling height required provided a minimum headroom of 80 inches.

2009 INTERNATIONAL BUILDING CODE

Horizontal projections - Structural elements, fixtures or furnishings shall not project horizontally from either side more than 4 inches over any walking surface between the heights of 27 inches and 80 inches above the walking surface.

Floor Surface - Walking surfaces of the means of egress shall have a slip-resistant surface and be securely attached.

Elevation Change - Where changes in elevation of less than 12 inches exist in the means of egress, sloped surfaces shall be used. Where the slope is greater than one unit vertical in 20 units horizontal, ramps shall be used. When the difference in elevation is 6 inches or less, the ramp shall be equipped with either handrails or floor finish materials that contrast with adjacent floor finish materials.

Stairways - In order to be considered part of a means of egress, the egress stairway must have a clear width of 48 inches minimum and shall incorporate an area of refuge with a minimum dimension of 48 inches.

Minimum number of exits for occupant load:

1-500 occupants = 2 exits per story

Two exits or exit access doorways from any space shall be provided.

Minimum egress width:

150 occupants $\times 0.3' = 45' \sim 4'$

Accessible spaces shall include toilet and bathing rooms and any exterior spaces including patios, terraces or balconies.

One accessible means of egress per accessible space.

All public entrances shall be accessible.

Accessible entrance is not required to areas not required to be accessible.

2005 CONNECTICUT SUPPLEMENT BUILDING CODE

Building codes in Bridgeport usually follow the International Building Code, unless otherwise specified in the Connecticut Supplement Building Code.

Appendix K - Bridgeport Snow Loads, Wind Speeds, MCE Spectral Accelerations

Ground Snow Load (psf) - 30

Basic Wind Speed (3 sec. gust) - 110

MCE Spectral Accelerations - 0.340 S_s, 0.088 S₁

Vehicle Space Size - 10'x20' for people with disabilities - 15' wide with 5' of cross hatch. For vans, 16' wide with 8 feet of cross hatch.

Floor or Ground Surfaces - Accessible parking spaces shall have a surface with a gradient not more than one unit vertical to 50 units horizontal. 1:50

Bridgeport Buildings Subject to Damage from:

Weathering: Severe

Frost Line Depth: 42 Inches

Termite: Moderate to Heavy

Decay: Slight to Moderate

Winter Design Temperature: 7 degrees Fahrenheit

Ice Shield Underlayment Required: Yes

Air Freezing Index - 1,500 or less

Exterior Walls - Exterior walls with a fire separation distance less than 3 feet shall have not less than a one-hour fire-resistive rating with exposure from both sides. Projections extending into the fire separation distance shall have not less than one-hour fire resistive construction on the underside.

Minimum Height - Rooms, hallways, corridors, bathrooms, and basements shall have a ceiling height of not less than 7 feet.

Precedent Analysis

New England Aquarium

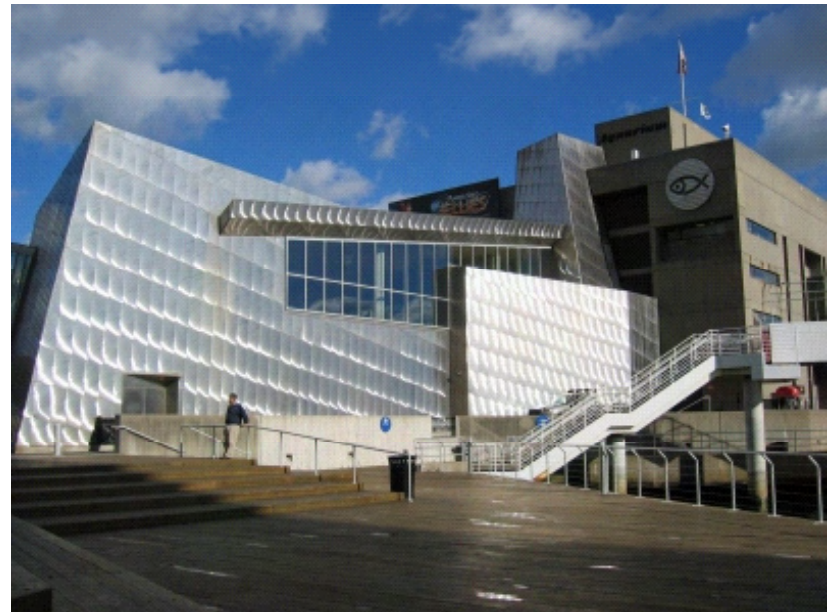
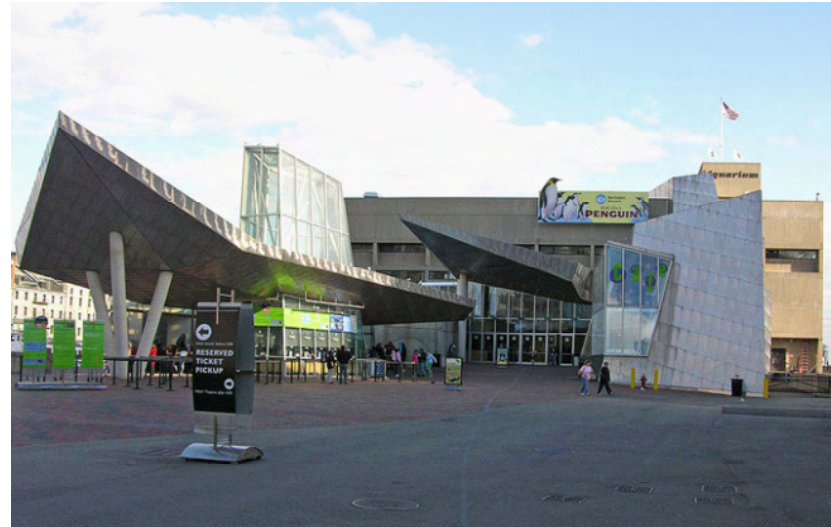
Location: Boston, Massachusetts

Architect: Cambridge Seven

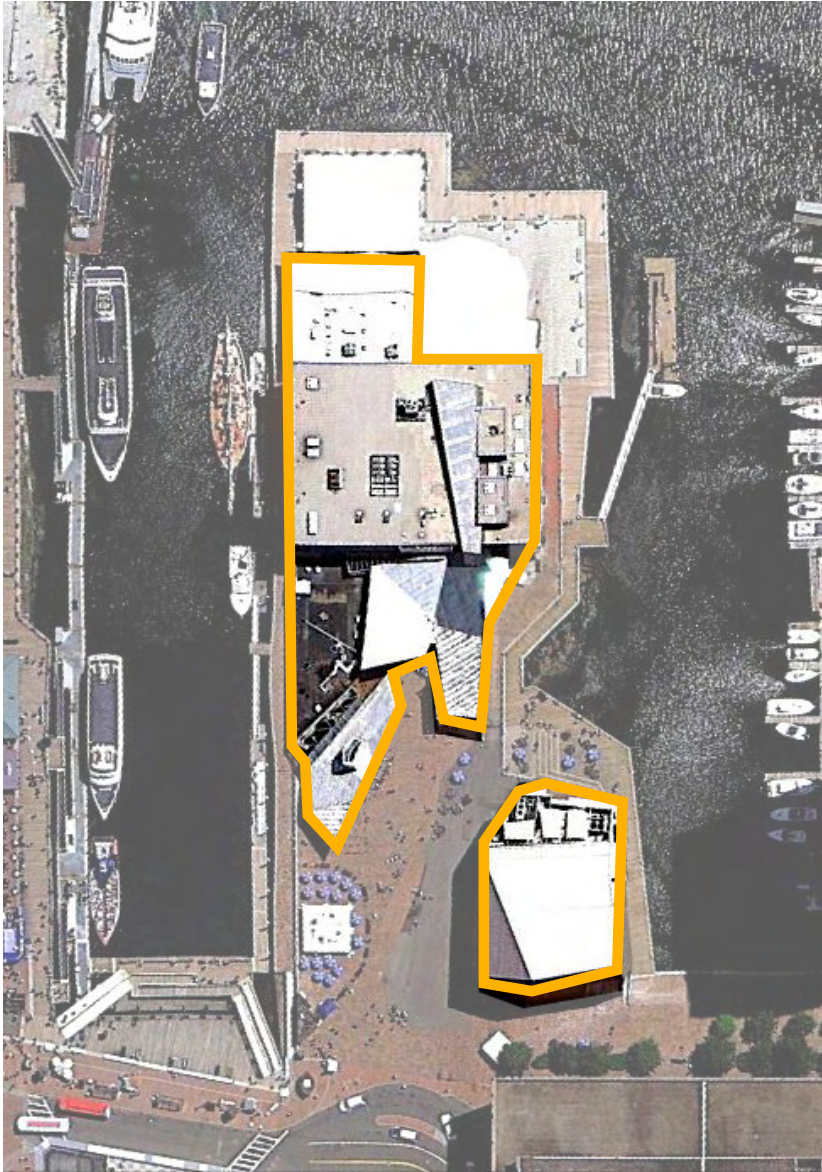
Associates

Completed: 1969

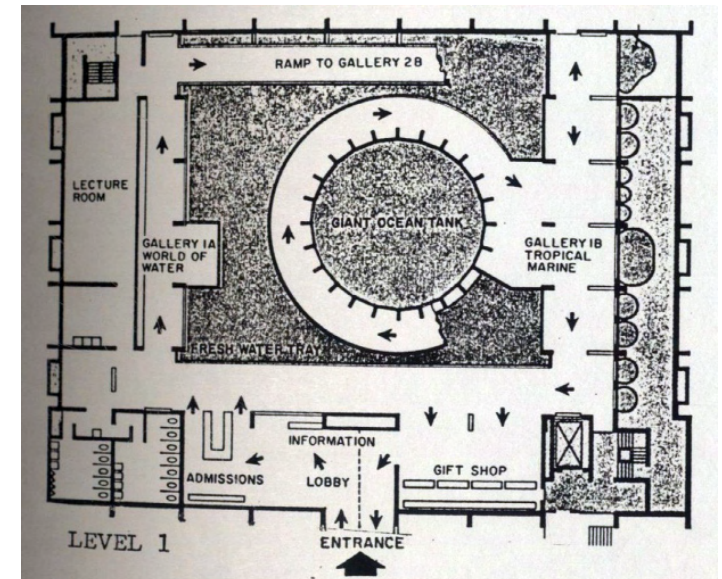
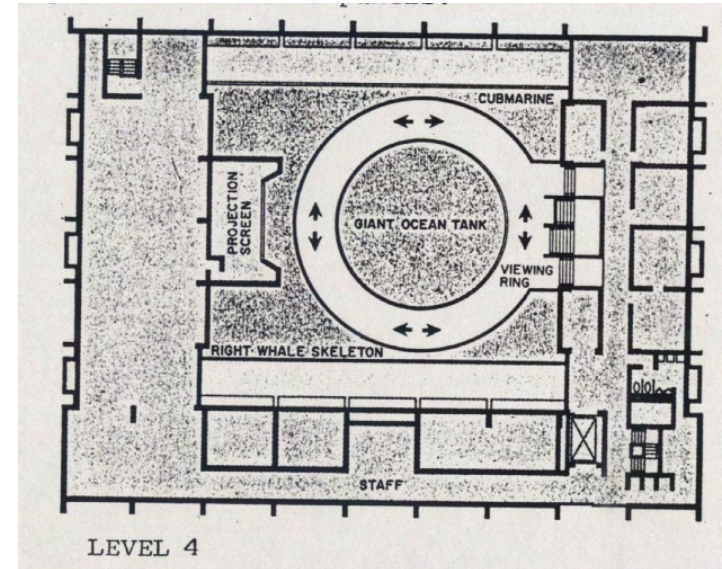
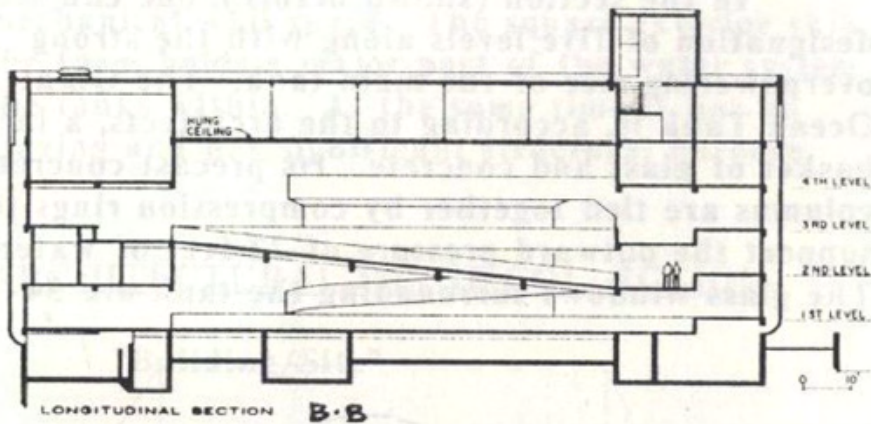
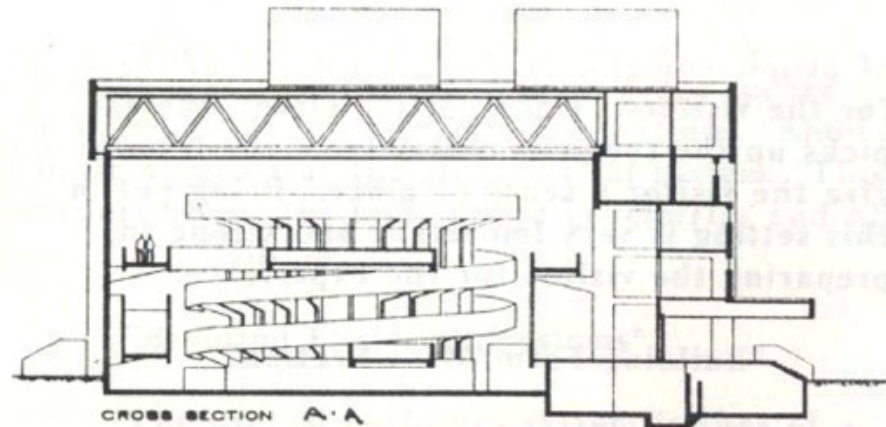
The New England Aquarium was founded in 1969 on the city's waterfront and is widely considered one of the first modern public aquariums in the United States. The building features a post-modern addition located on the front of the structure that features many unusual shapes and angles that help the building stand out among its surroundings. The building contains a large Imax theater and also docks which provide for whale watching trips in the Atlantic Ocean. The interior of the building features a large spiraling concrete ramp that surrounds a three story cylindrical tank.



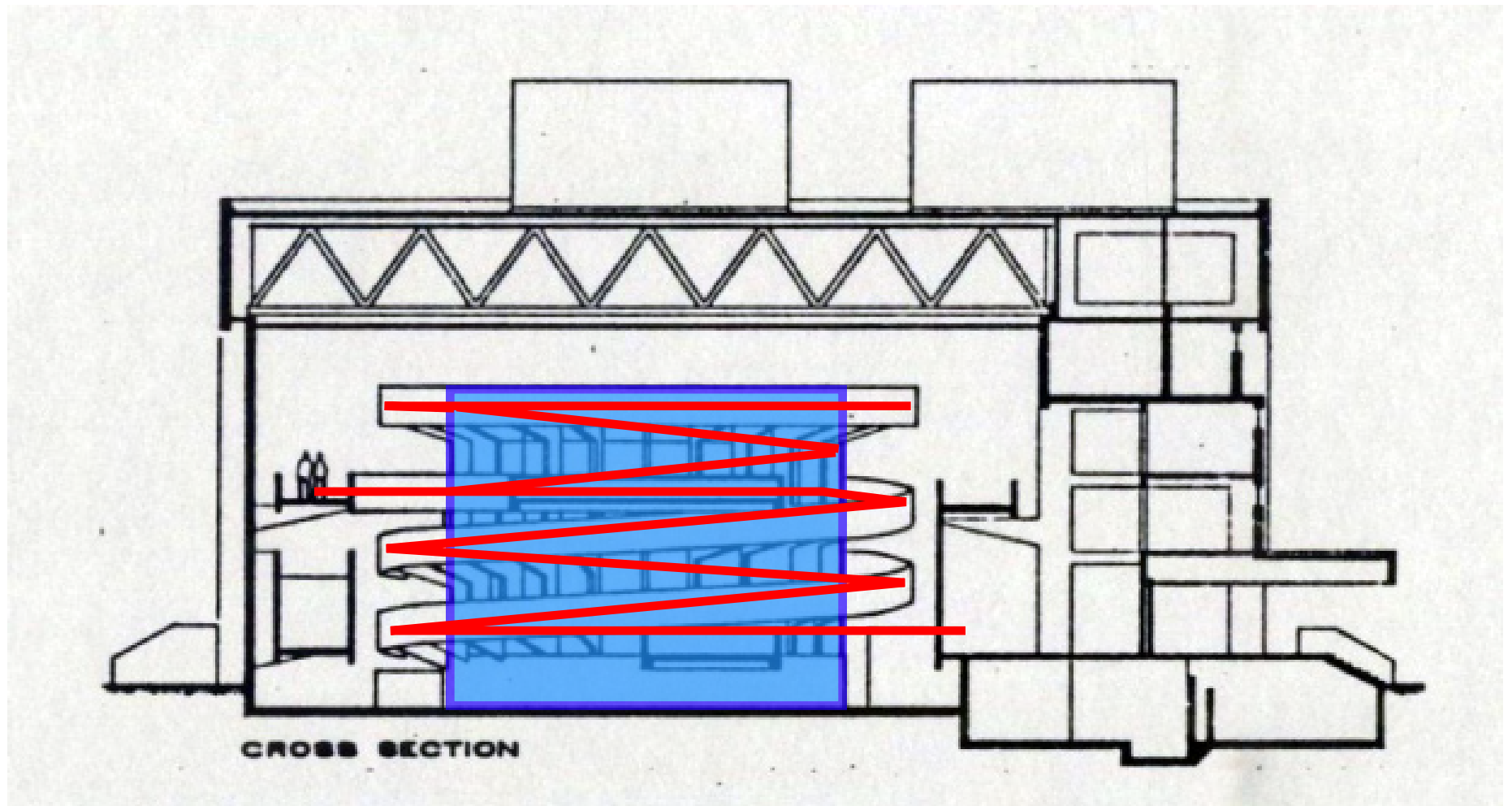
Site Size Comparison



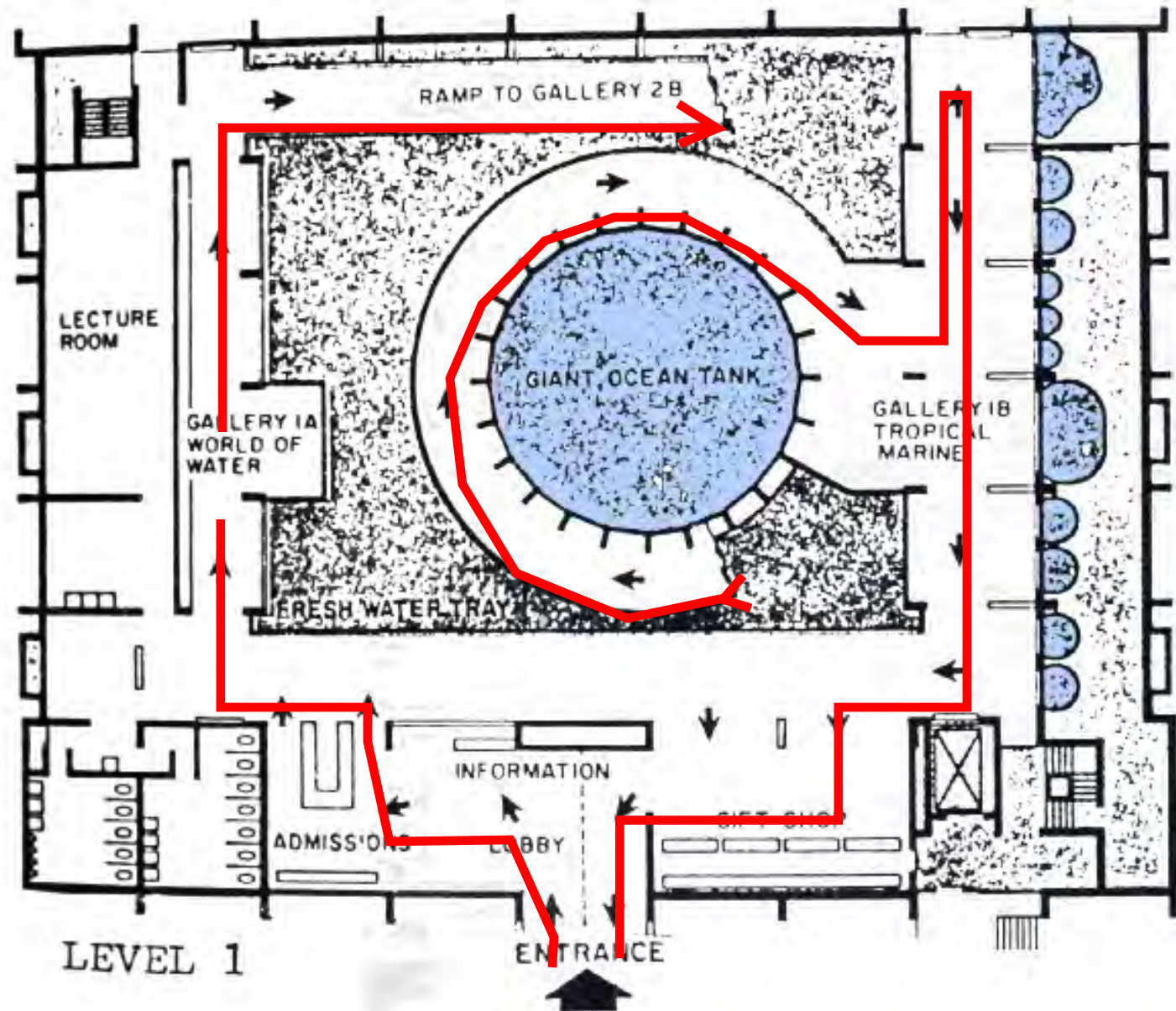
Plans and Sections



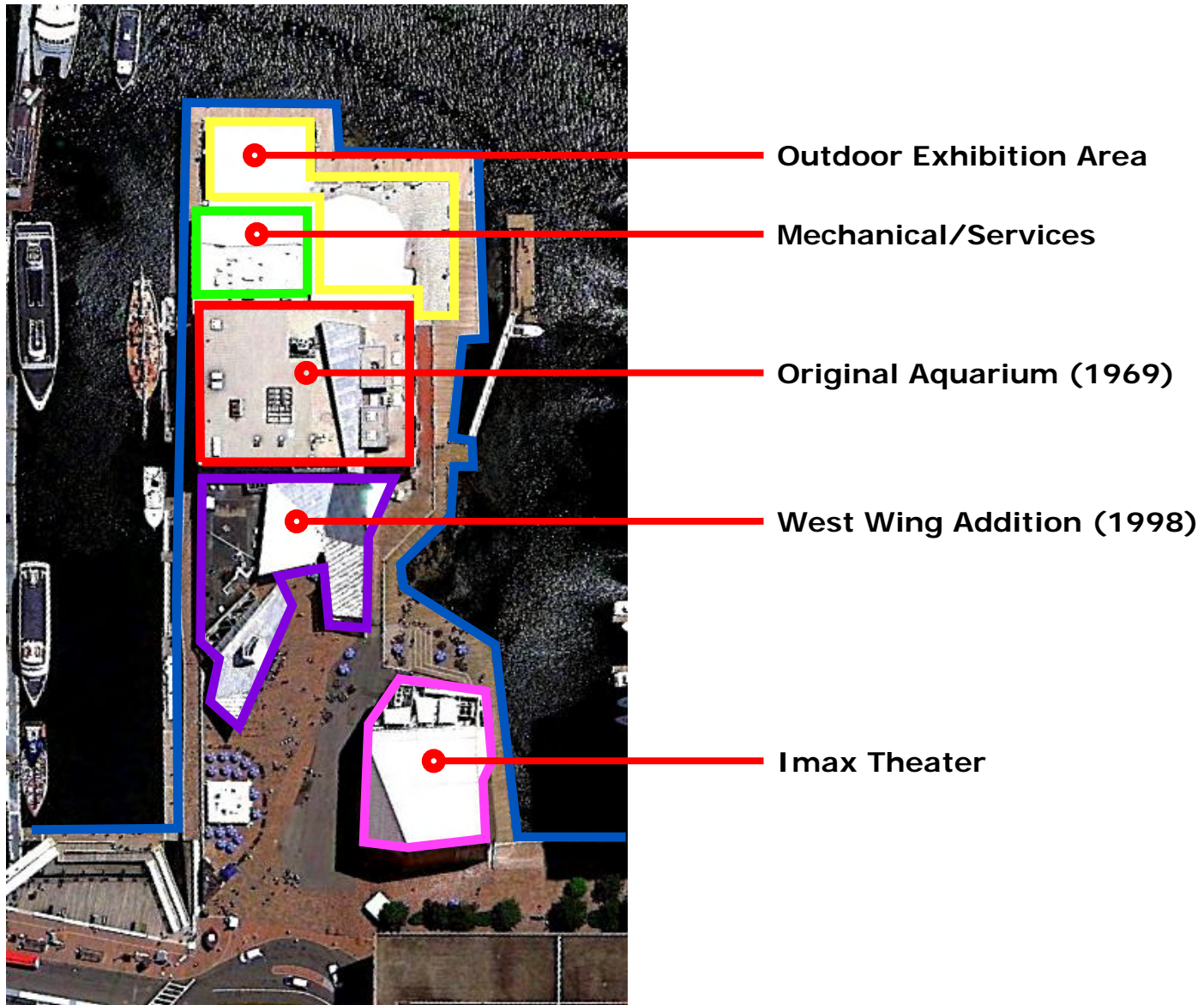
Central Tank + Circulation



Tanks and Circulation



Program (Site Plan)



Aerial Perspective



Waterfront Location



The National Aquarium

Location: Baltimore, Maryland

Architect: Cambridge Seven Associates

Completed: 1981

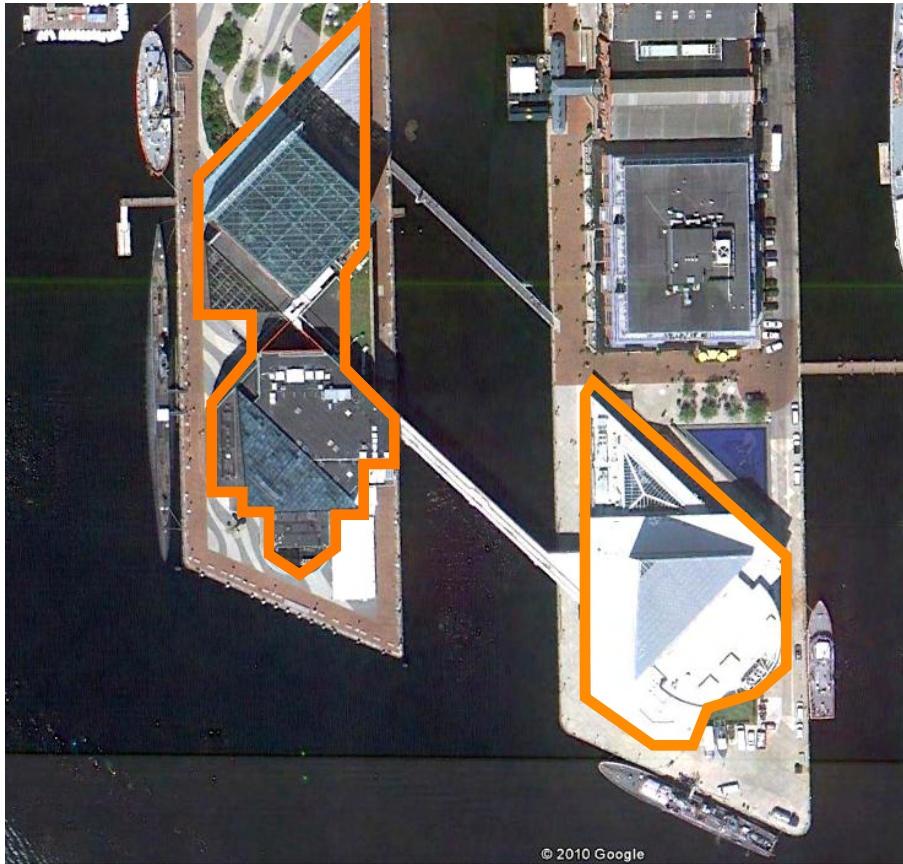
The National Aquarium in Baltimore is widely considered to be one of the most successful aquariums in the United States. The aquarium was the essential component of the revitalization of Baltimore's historic inner harbor district. The aquarium features a striking contemporary design. Opened in 1981, the aquarium has an average annual attendance of 1.6 million visitors.

The Glass Pavilion expansion was completed in 2005 and is located on an adjacent pier.

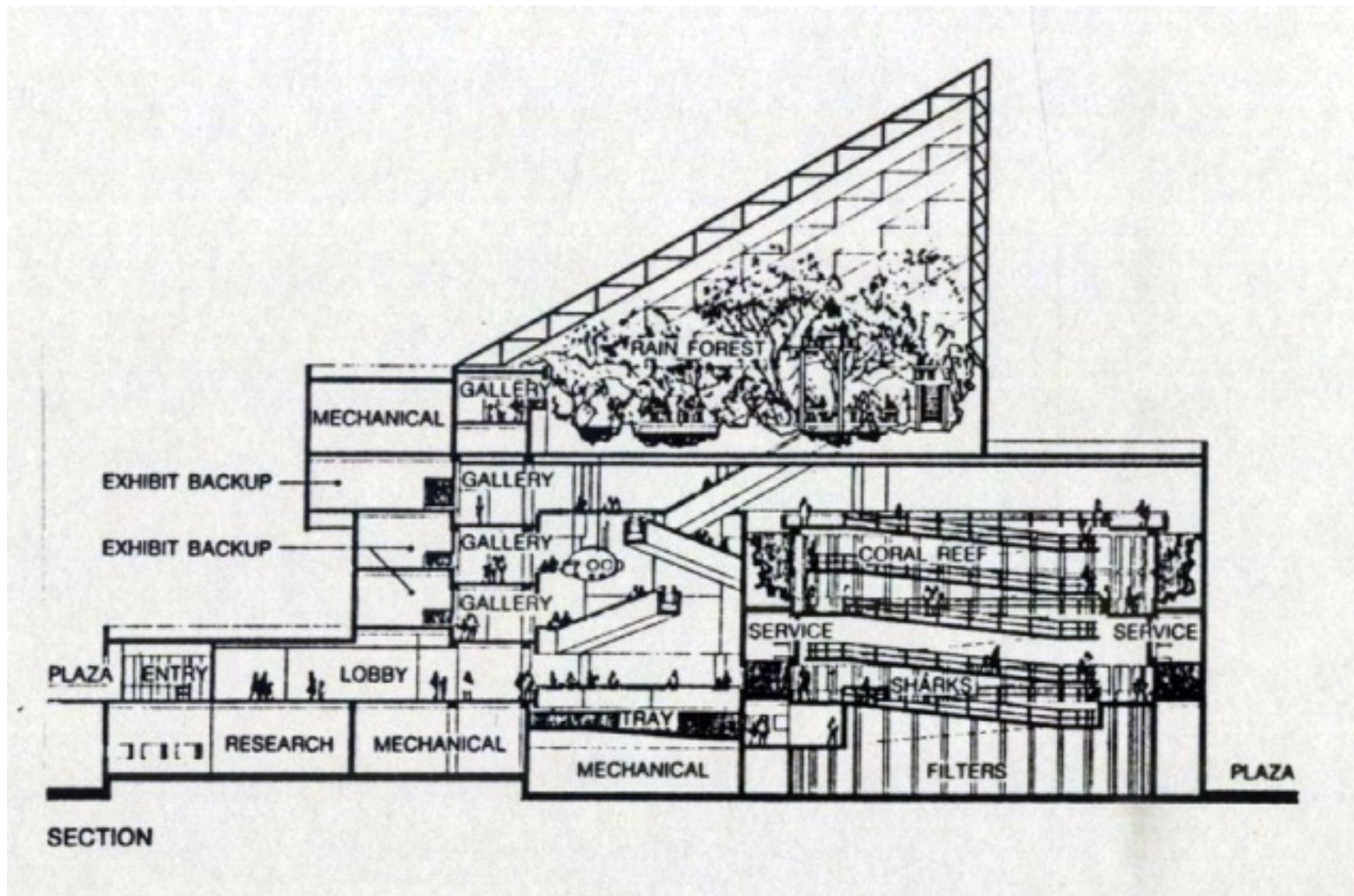
The aquarium is constructed primarily of concrete, metal cladding, and glass. Space frames are used to support the gigantic glass curtain walls.



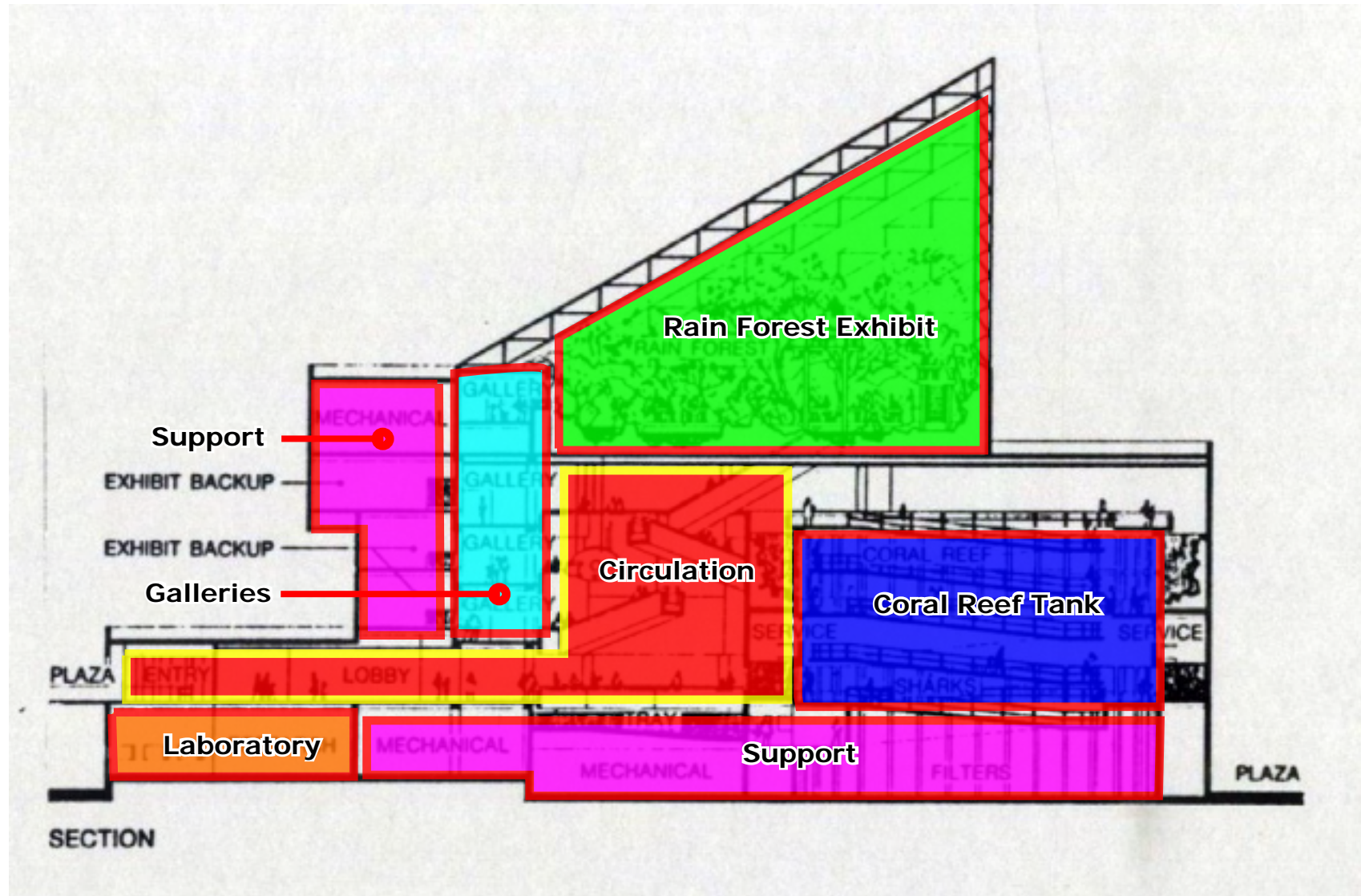
Site Size Comparison



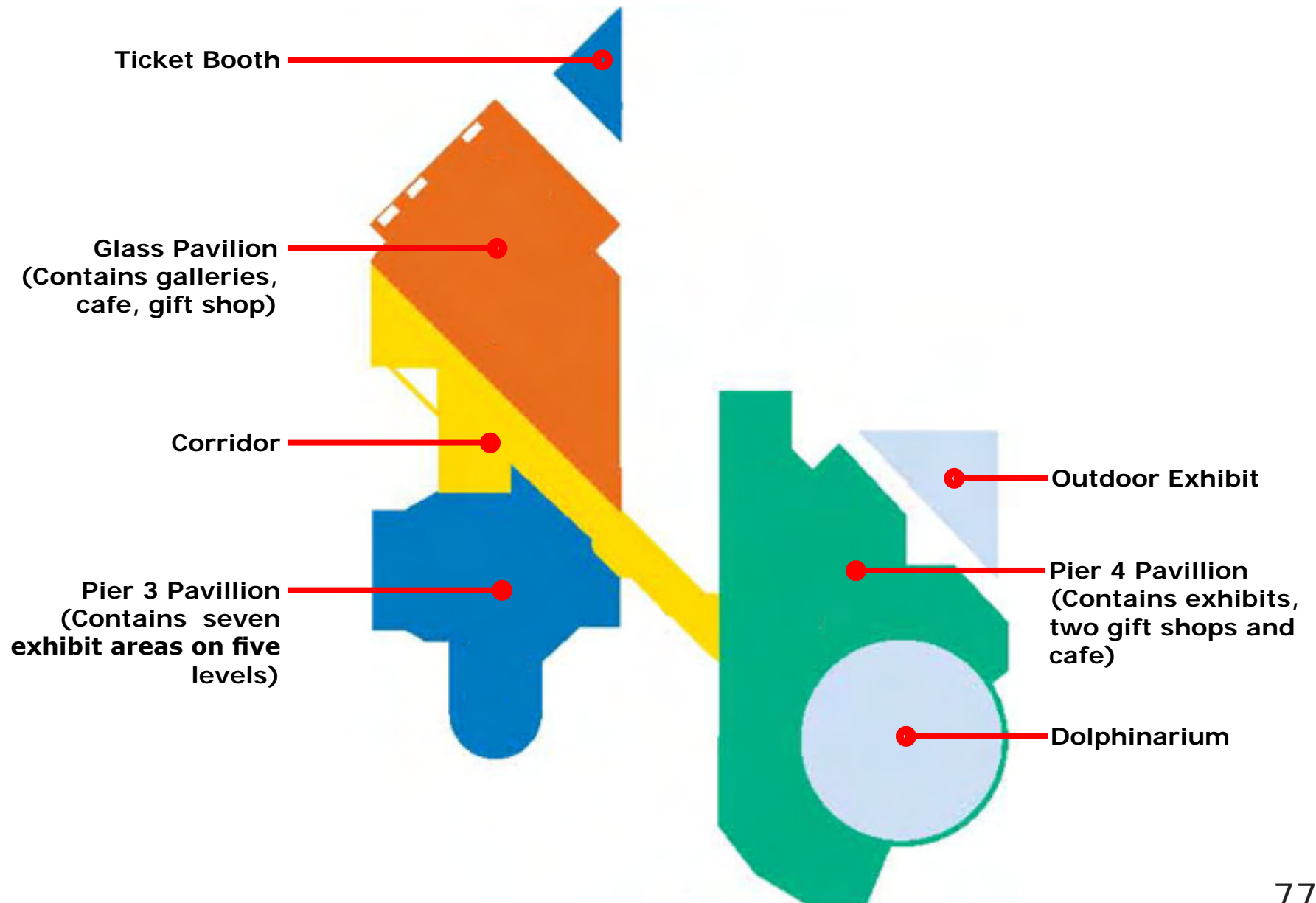
Section



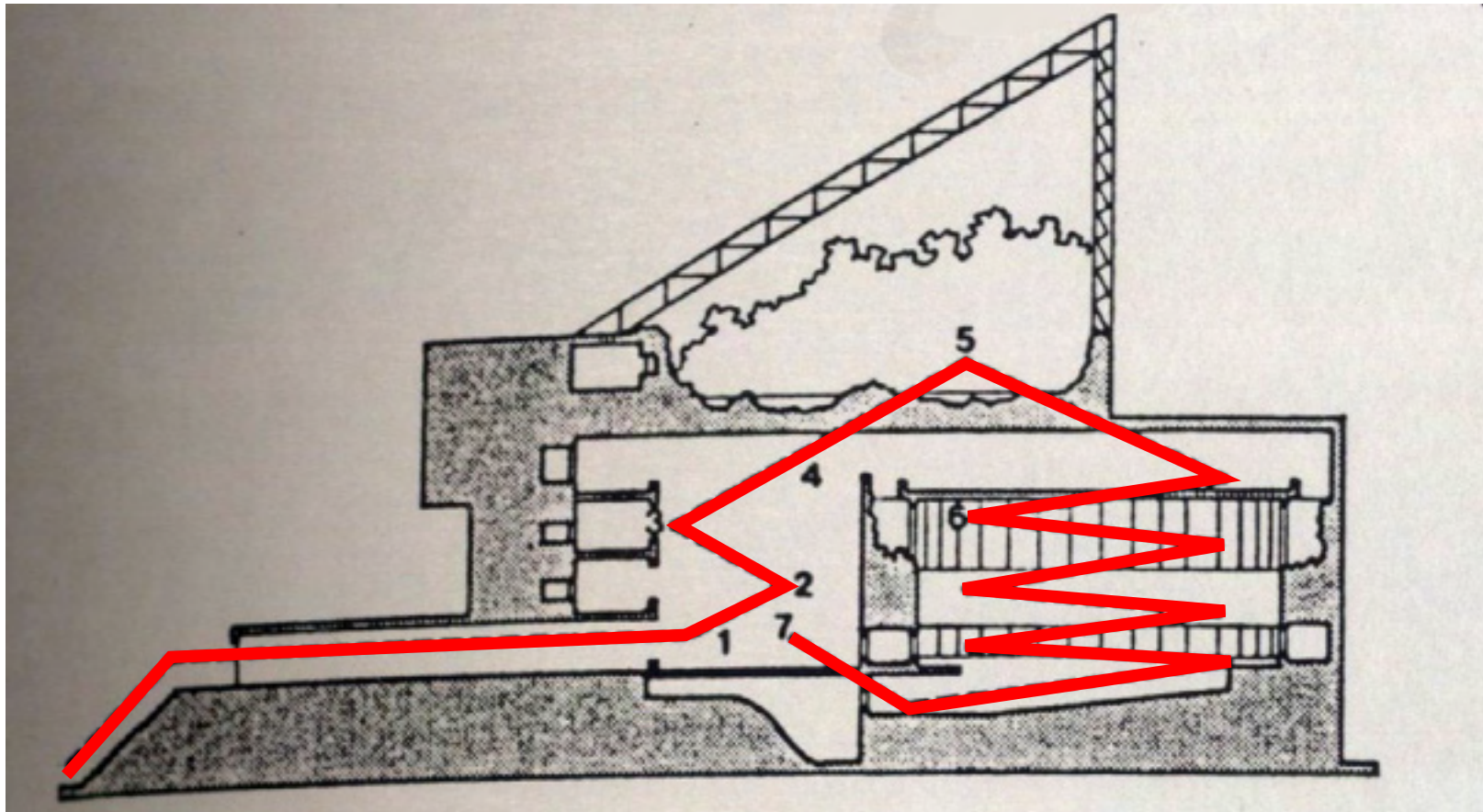
Program (Section)



Program (Plan)



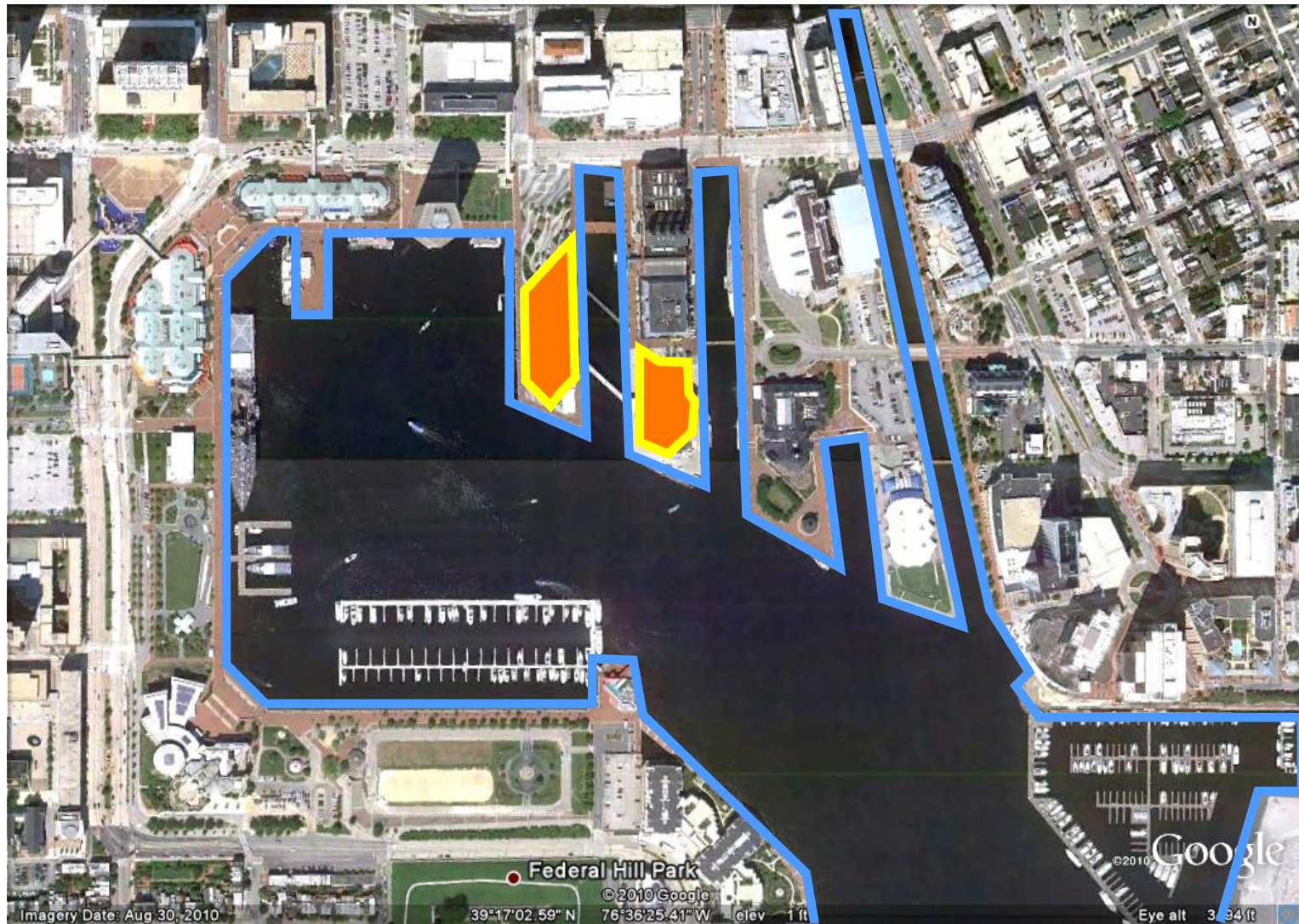
Vertical Circulation



Aerial Perspective



Waterfront Location



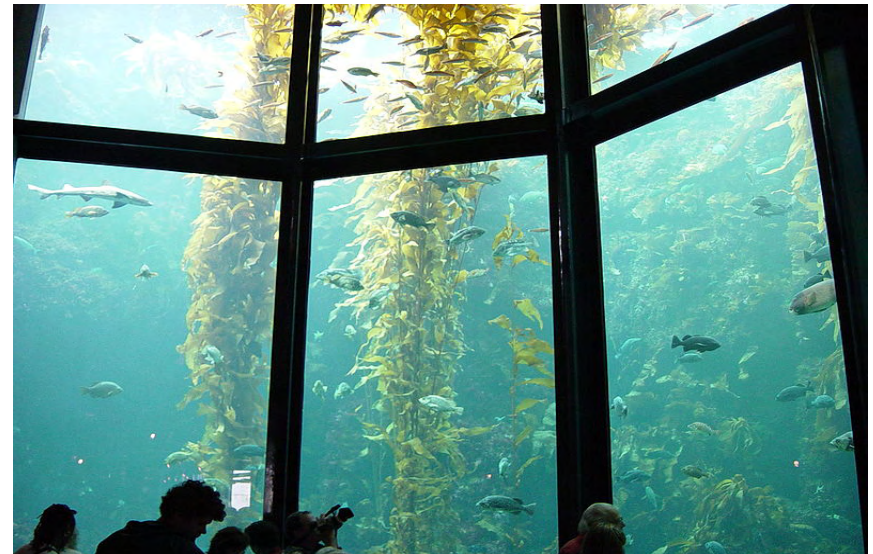
Location: Monterey, California
Architect: Esherick Homsey Dodge & Davis
Completed: 1984

Monterrey Bay Aquarium

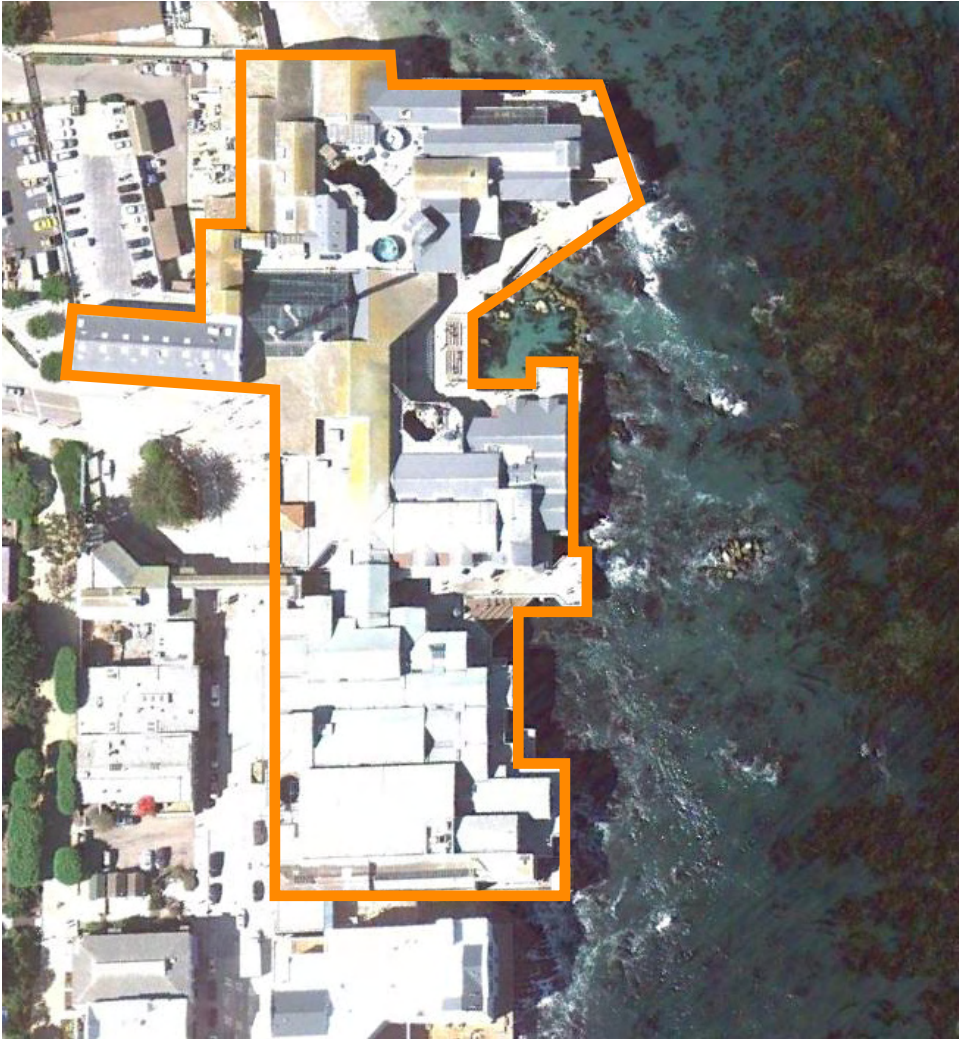
The Monterey Bay Aquarium is one of the largest and most popular public aquariums in the United States, receiving 1.8 million visitors per year. It contains 35,000 animals representing 623 different species.

The building is on the site of a former Sardine Cannery and the architecture of the aquarium pays respect to the original structure. The aquarium pumps 2000 gallons of seawater from the Monterey Bay every minute through more than 100 exhibit tanks. During the night, the water coming from the bay is unfiltered, which allows it to bring in natural food in the form of plankton to feed the fish in the aquarium.

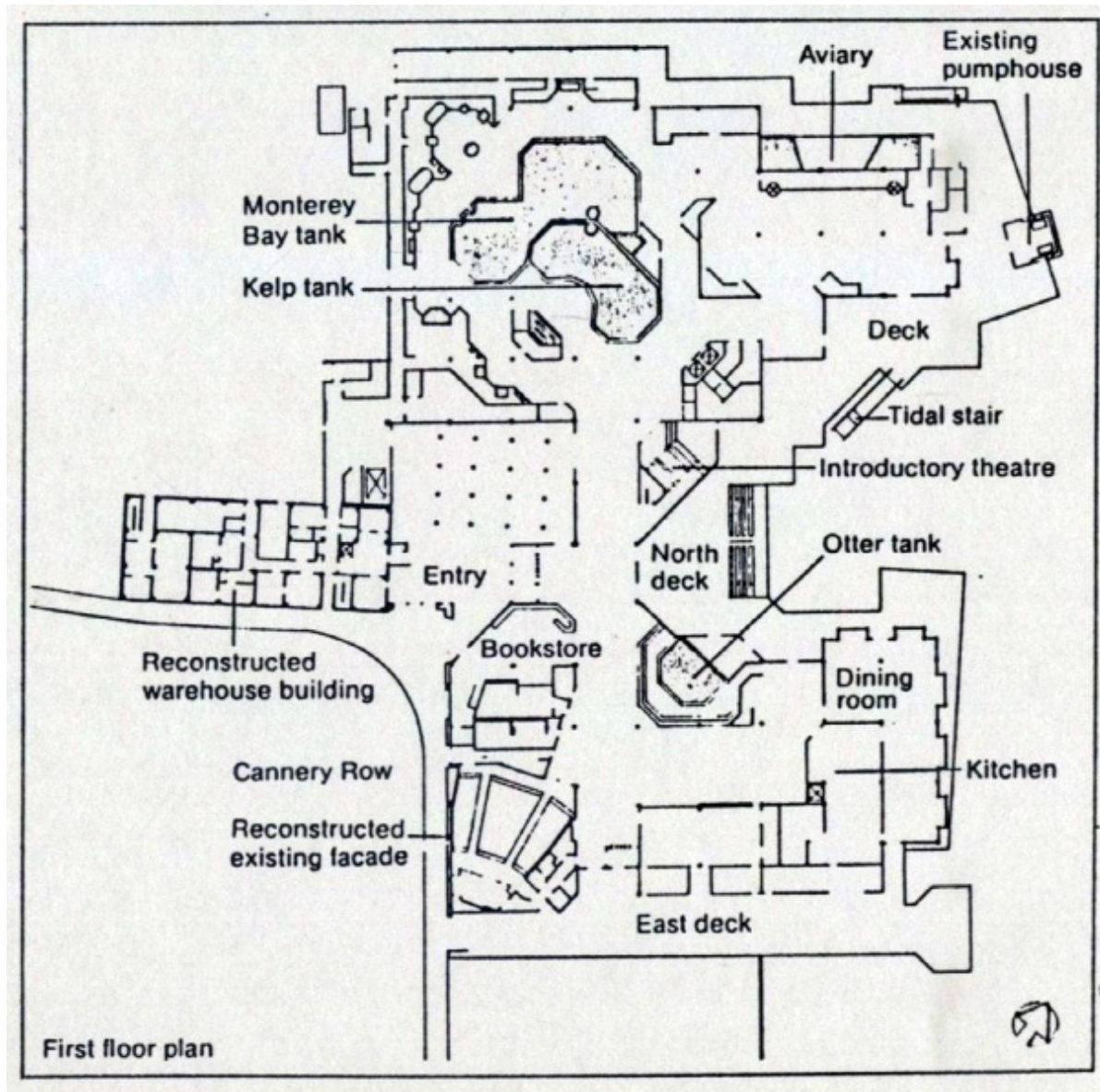
In 1996, the aquarium received a massive expansion called the Outer Bay Wing, which nearly doubled the size of the aquarium.



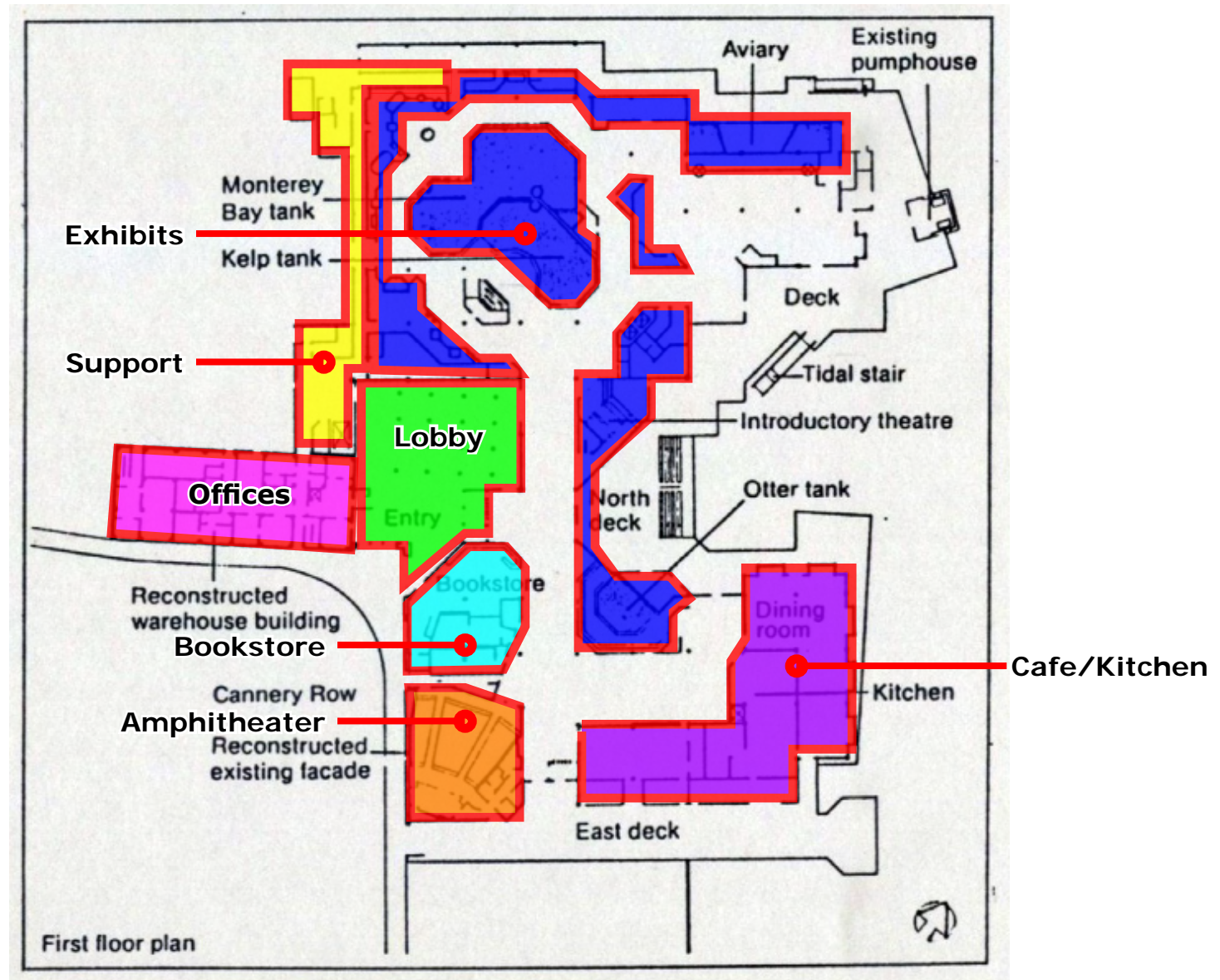
Site Size Comparison



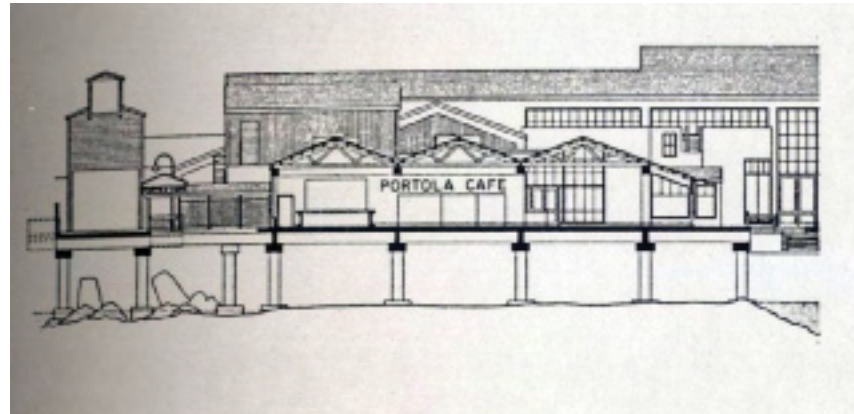
First Floor Plan



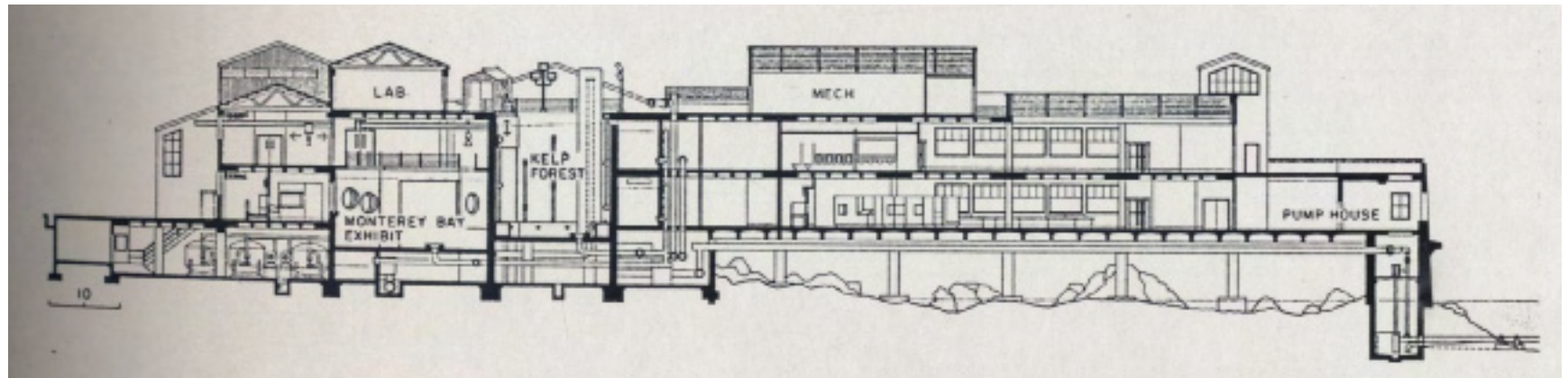
Program (Plan)



Sections

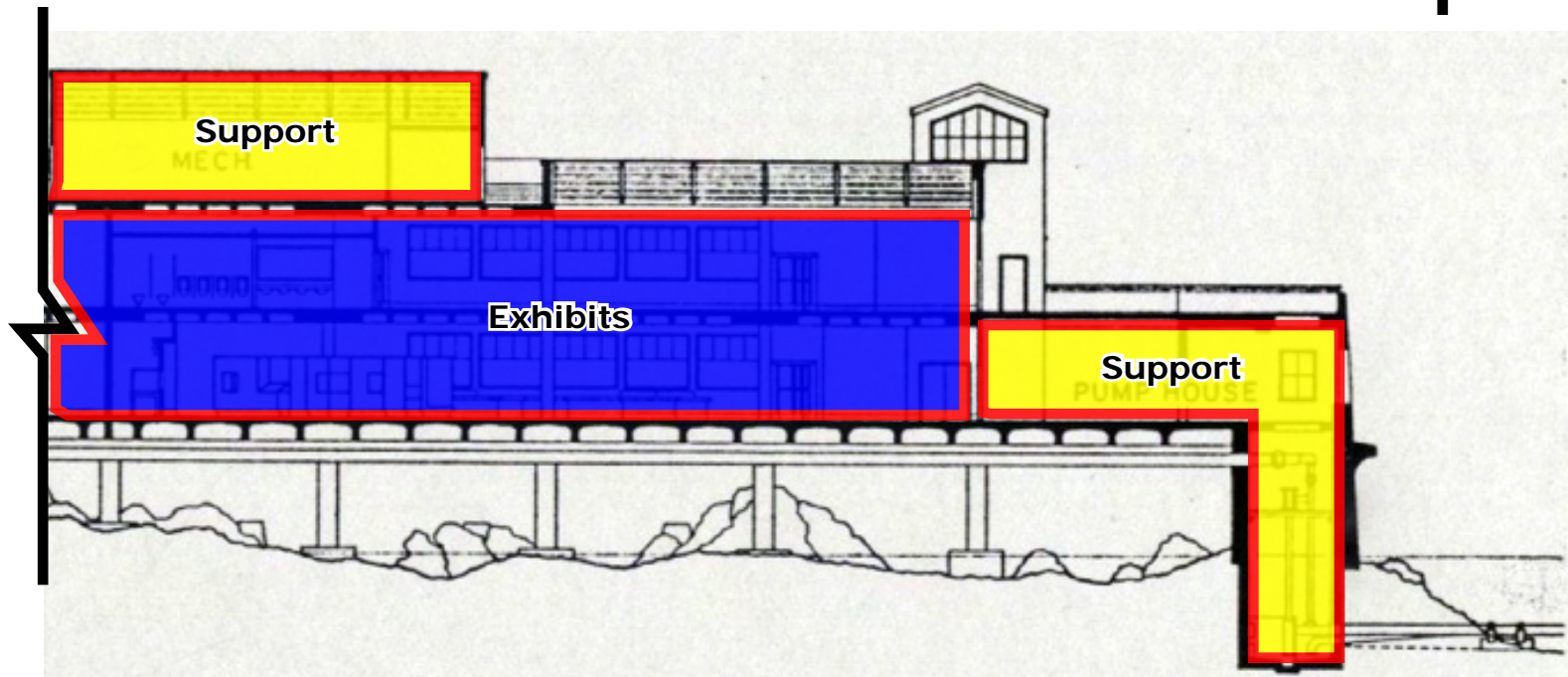
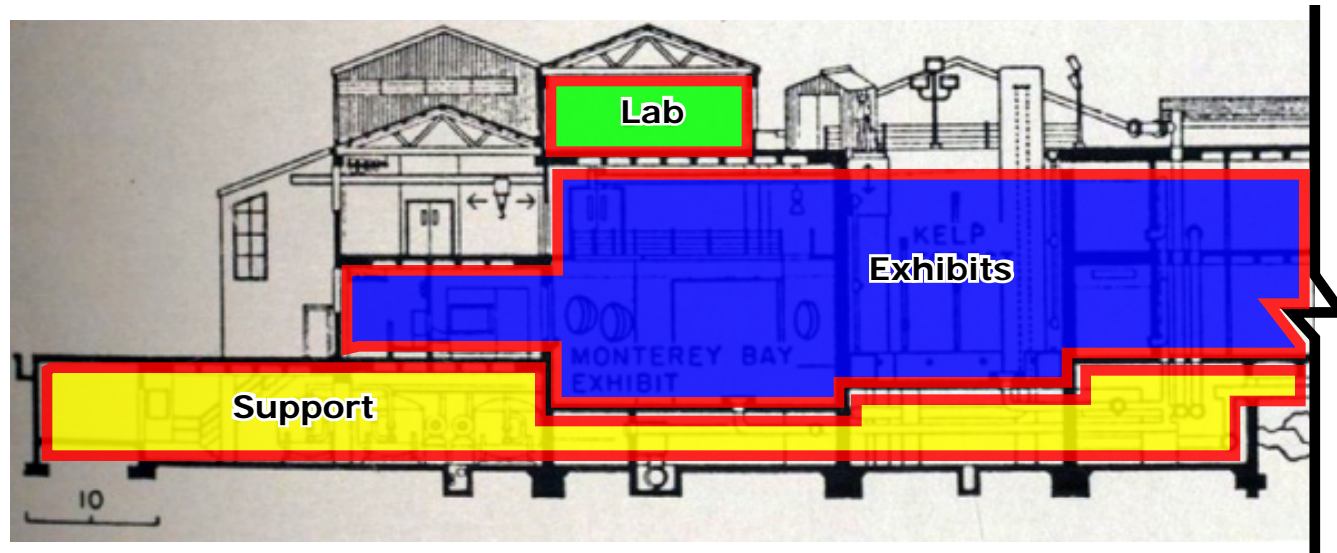


Cafe Section

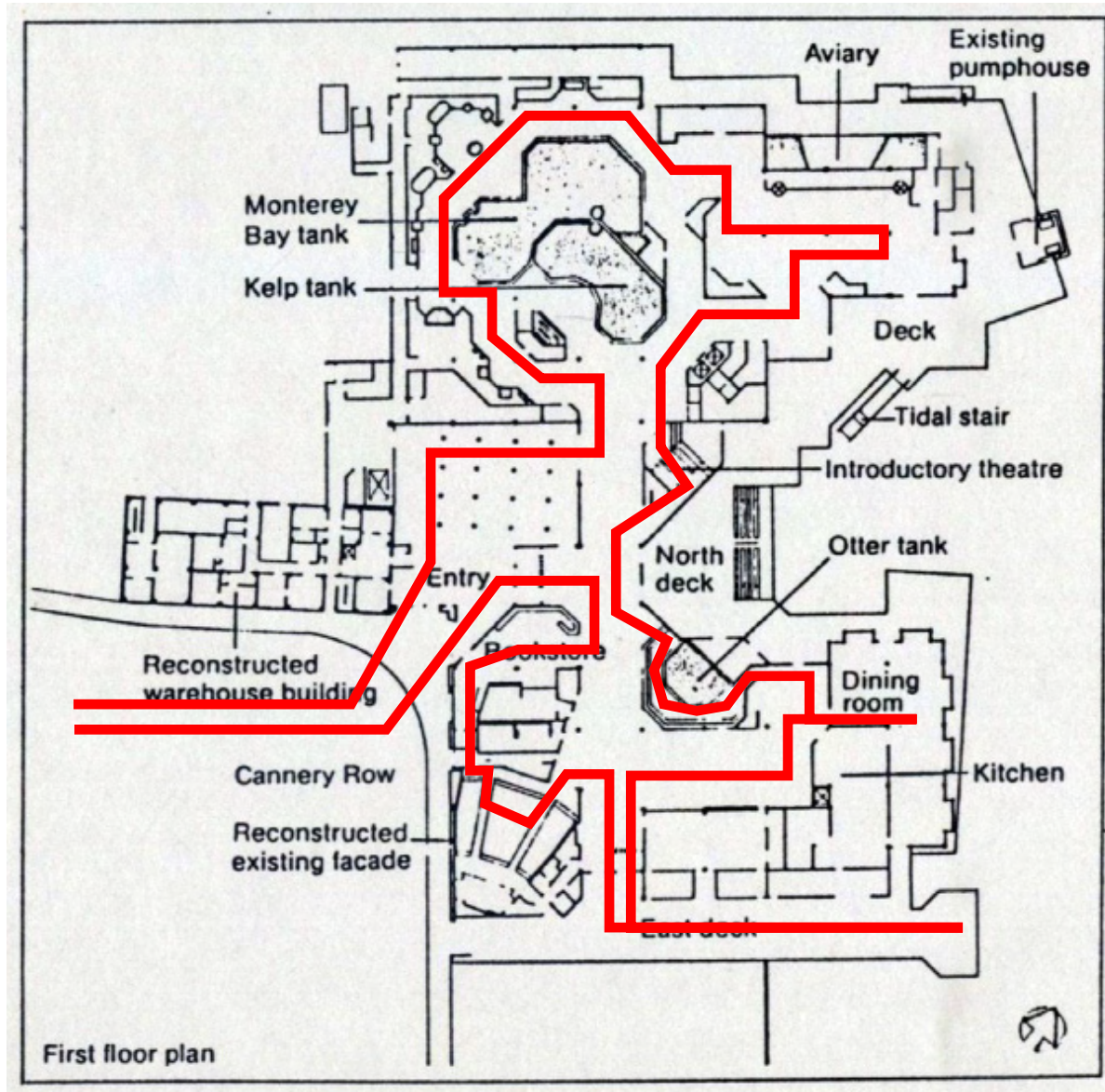


Building Section

Program (Section)



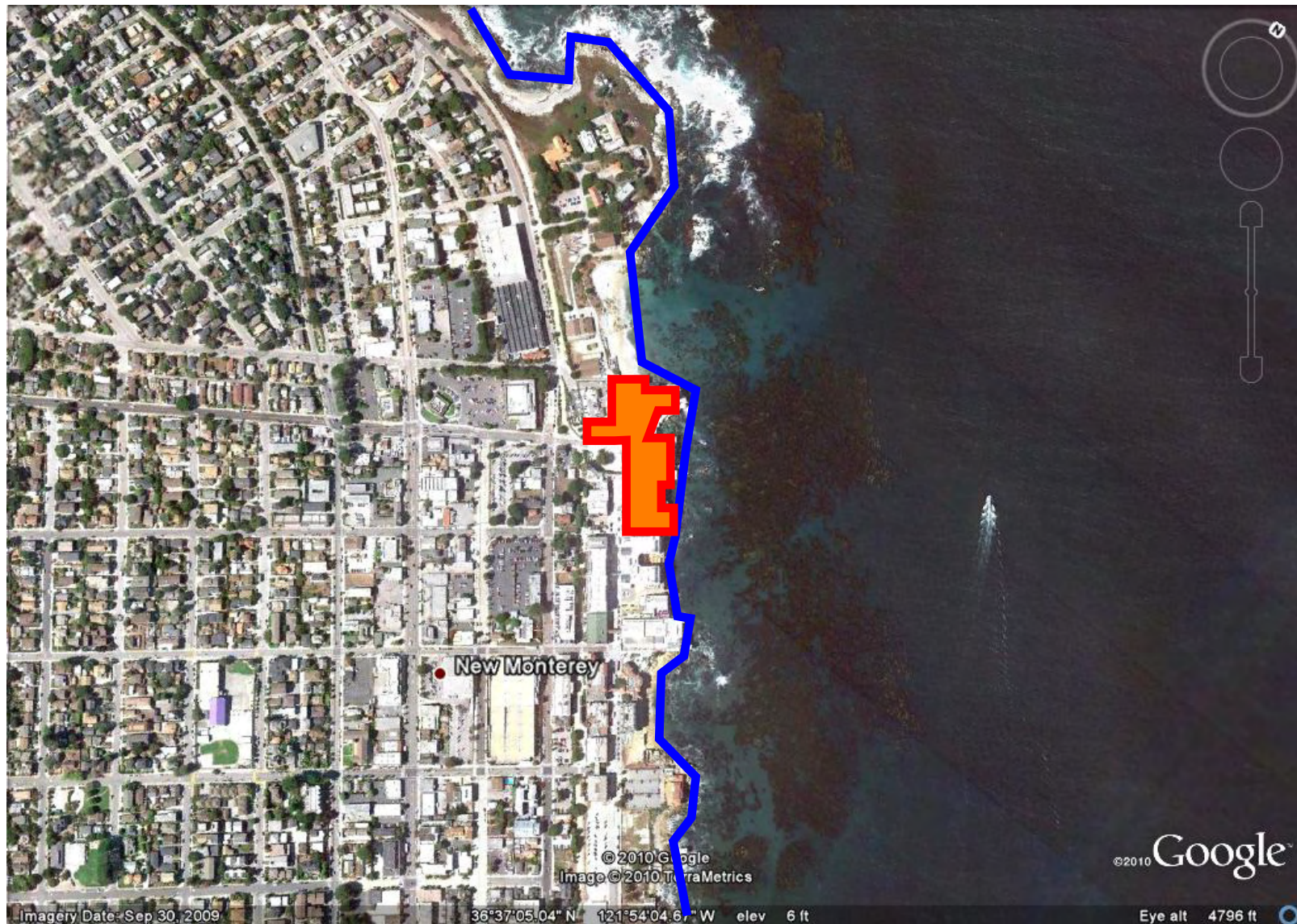
Circulation



Aerial Perspective



Waterfront Location



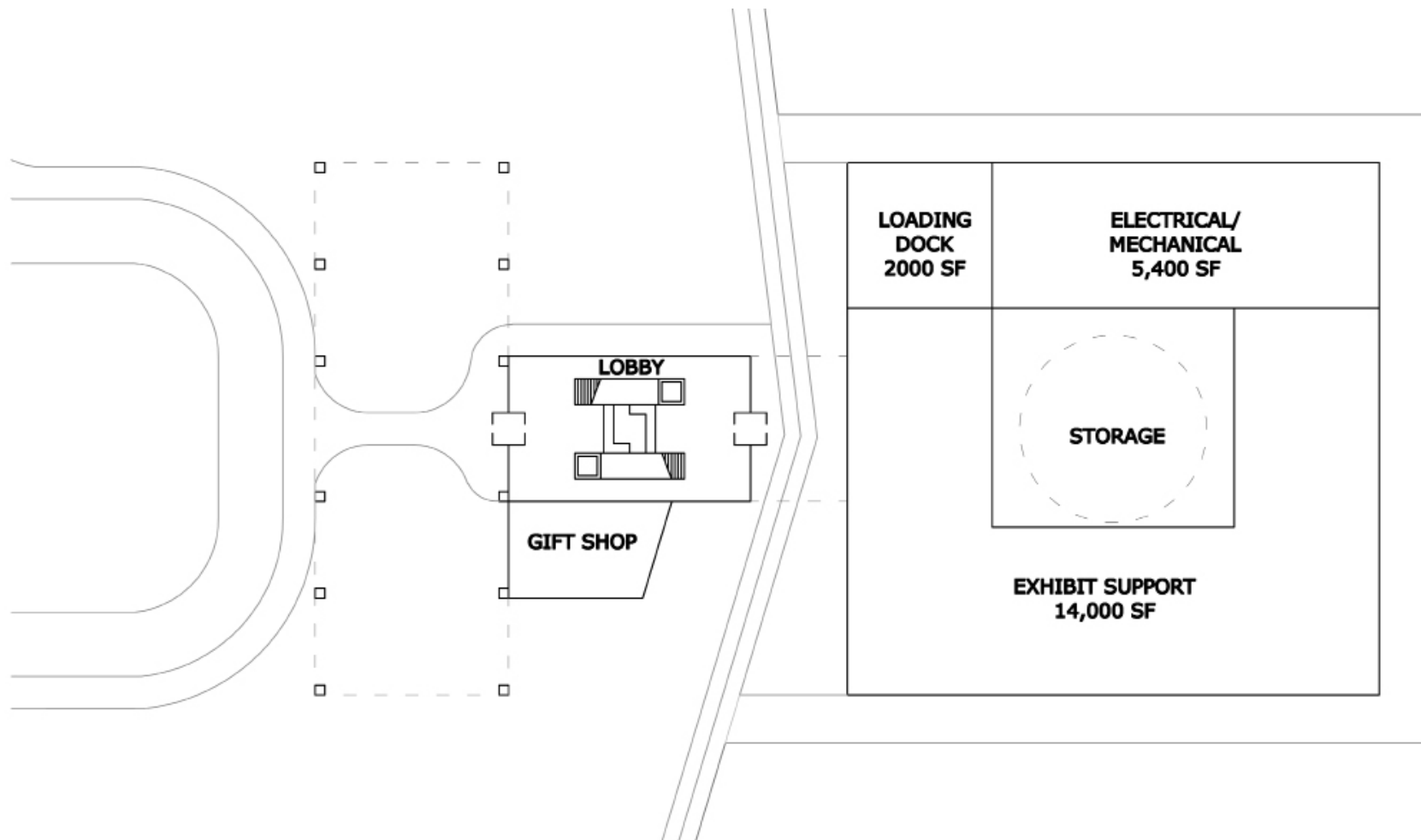
Process Work

First Review



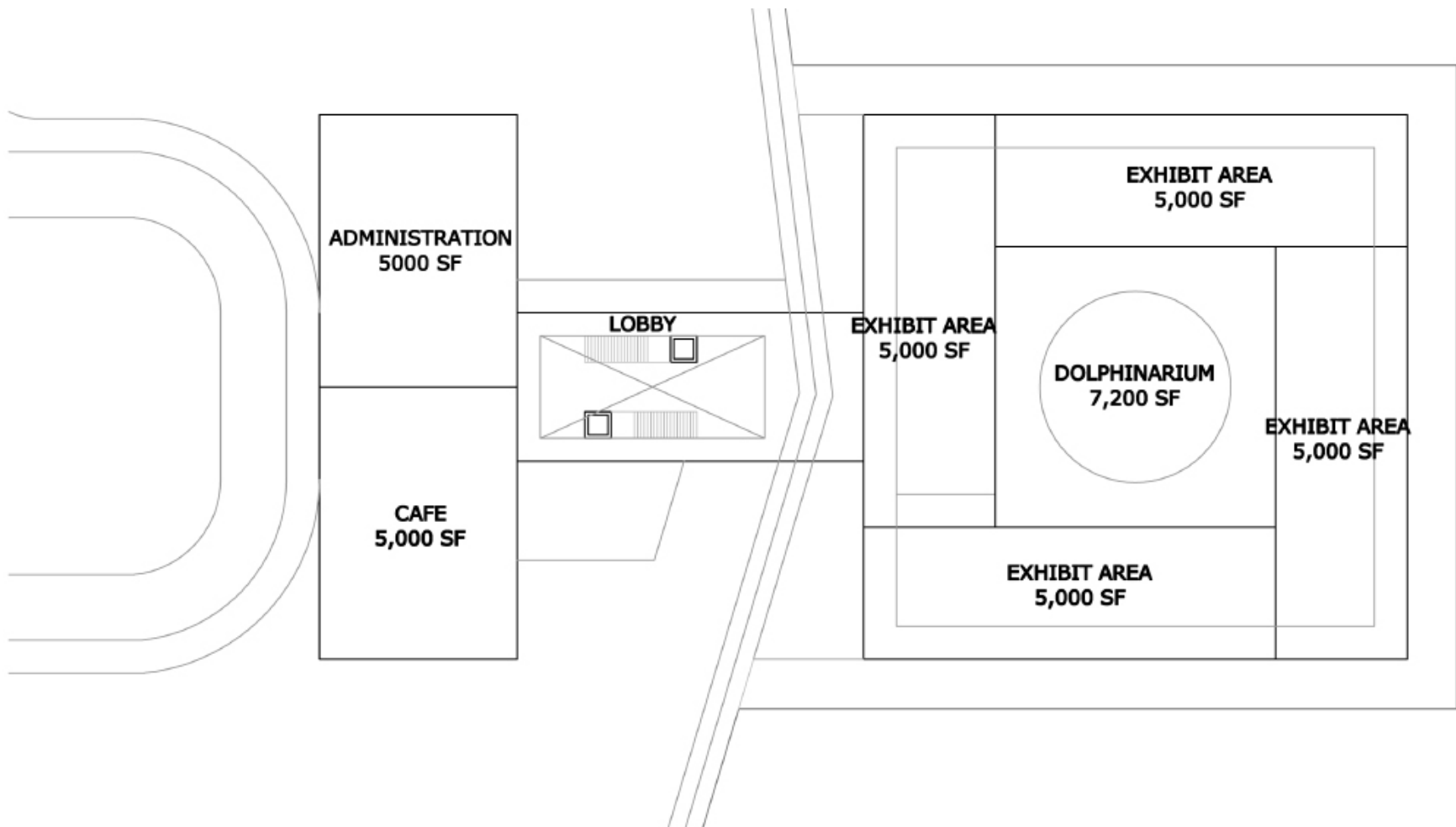
Site Plan

First Review



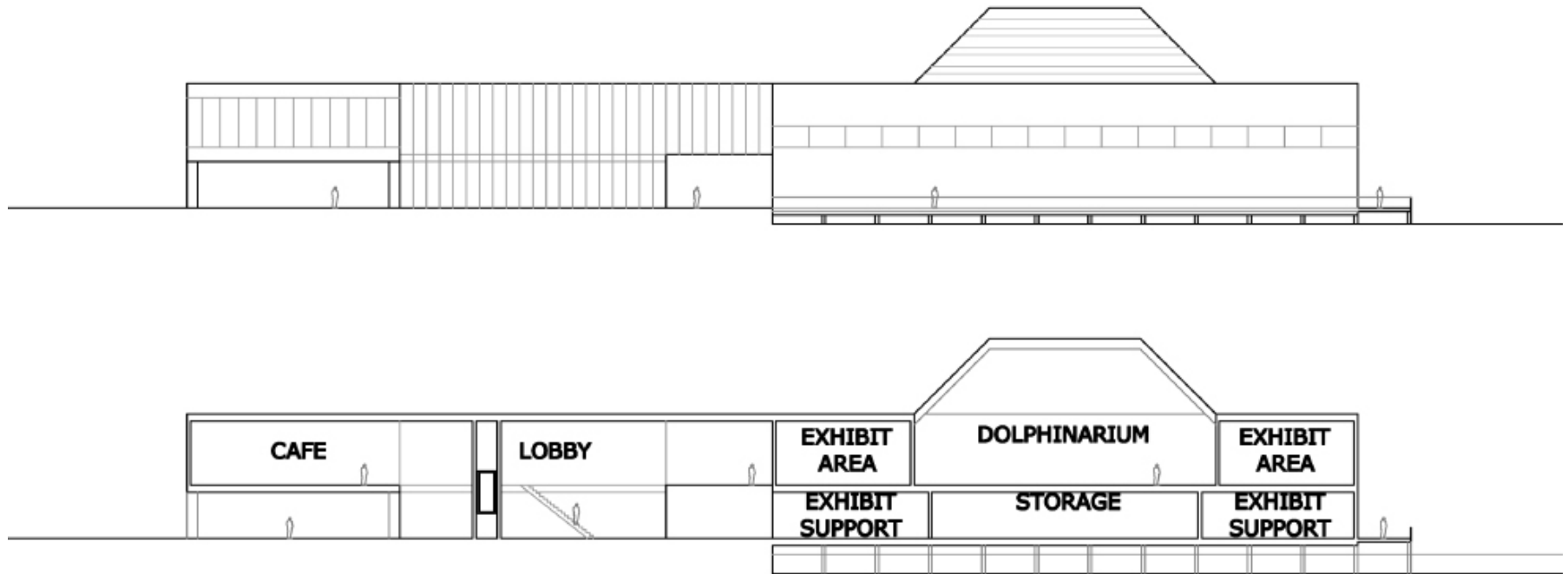
First Floor Plan

First Review



Second Floor Plan

First Review



Elevation/ Section

First Review Critique

The initial design for the Bridgeport Aquarium received both positive and negative criticism. Several of the basic elements of this first design can still be seen to have an influence on the final design, such as the entry sequence and programmatic layout.

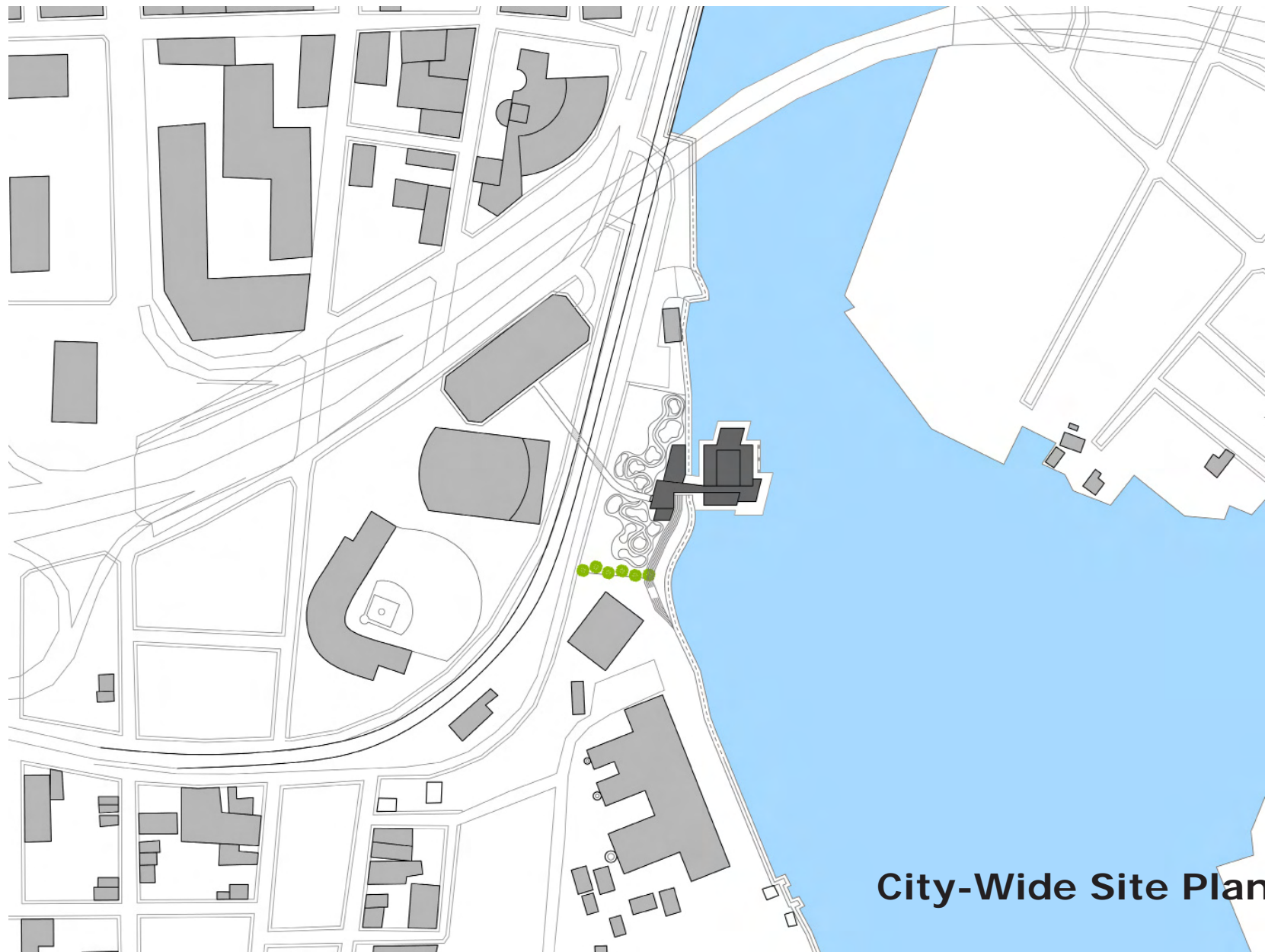
Design Strengths

- Exhibit areas encircling the dolphinarium provide for a continuous loop of circulation without dead-end hallways
- Waterfront promenade passing underneath second floor walkway is successful because it provides a physical link between city-wide strategy and proposed aquarium
- Exhibit support areas located on the first floor directly below exhibit areas for convenient access
- All exhibit areas have views of the bay

Design Weaknesses

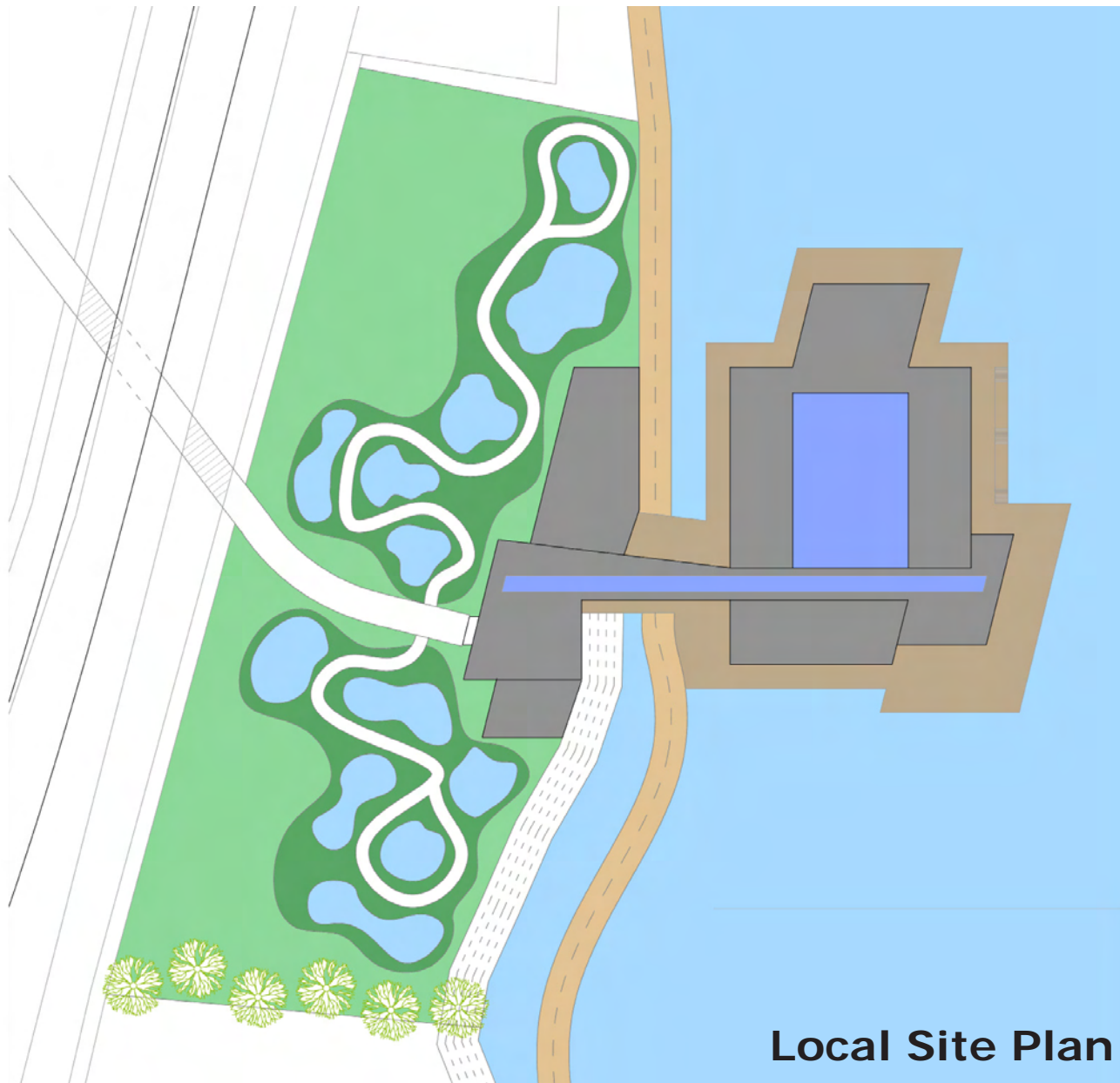
- Cafe and Administration areas have poor views of the waterfront
- Building form does not relate to the physical site, waterfront
- Building needs to be integrated with the water, provide physical link to the water which is the primary focus of the exhibits within the Aquarium
- Architecture needs to be more expressive

Mid Review

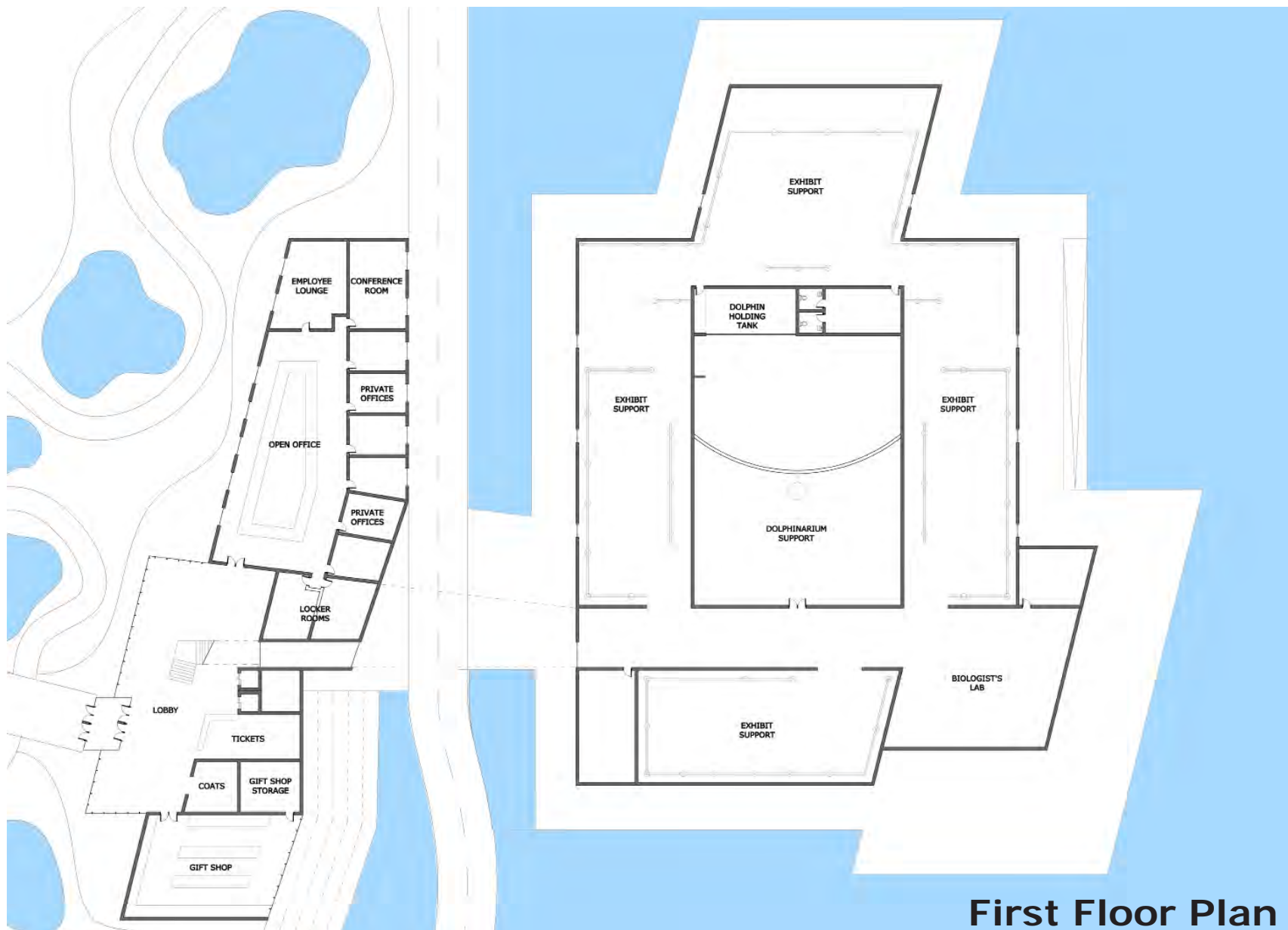


City-Wide Site Plan

Mid Review

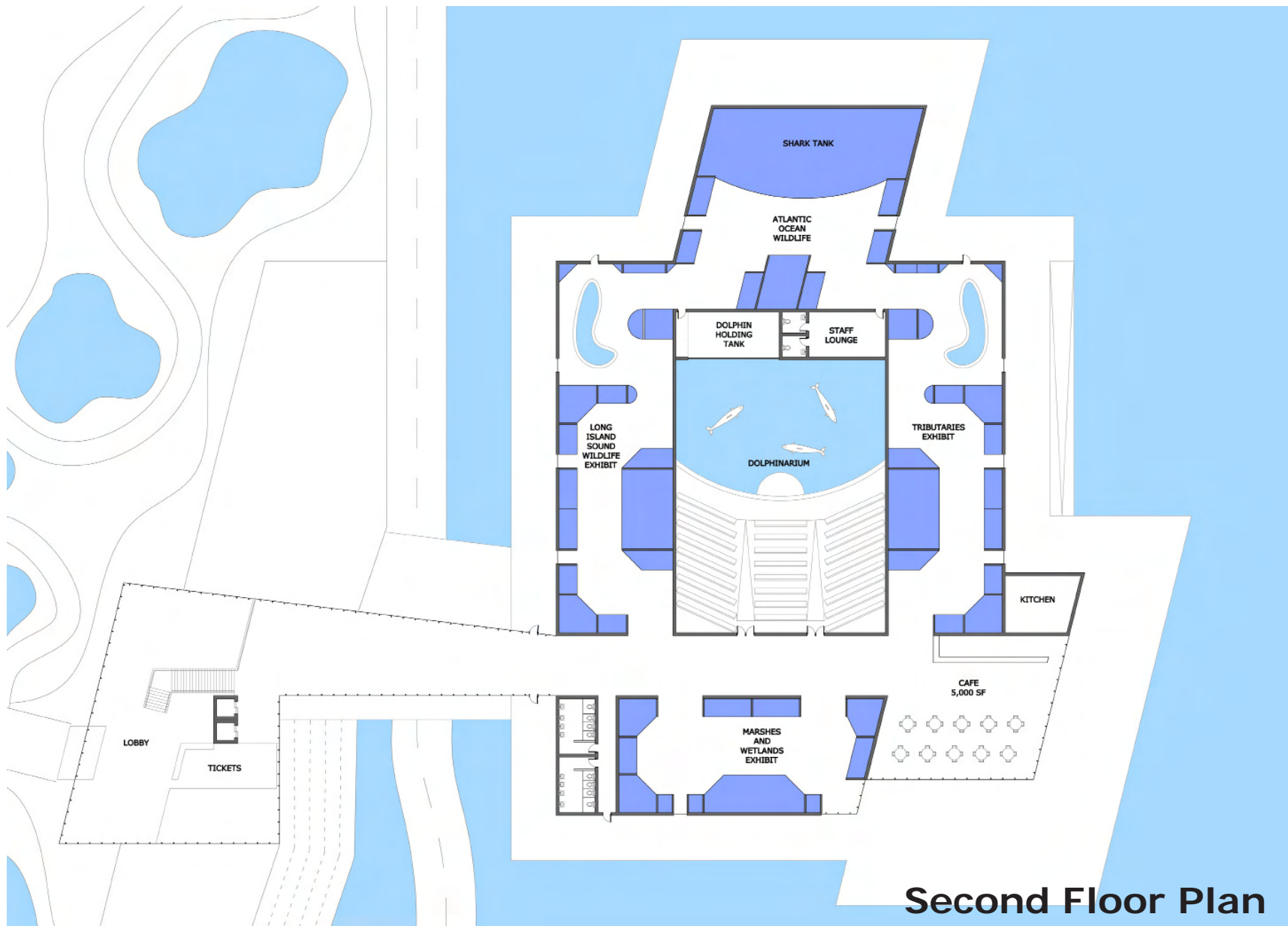


Mid Review



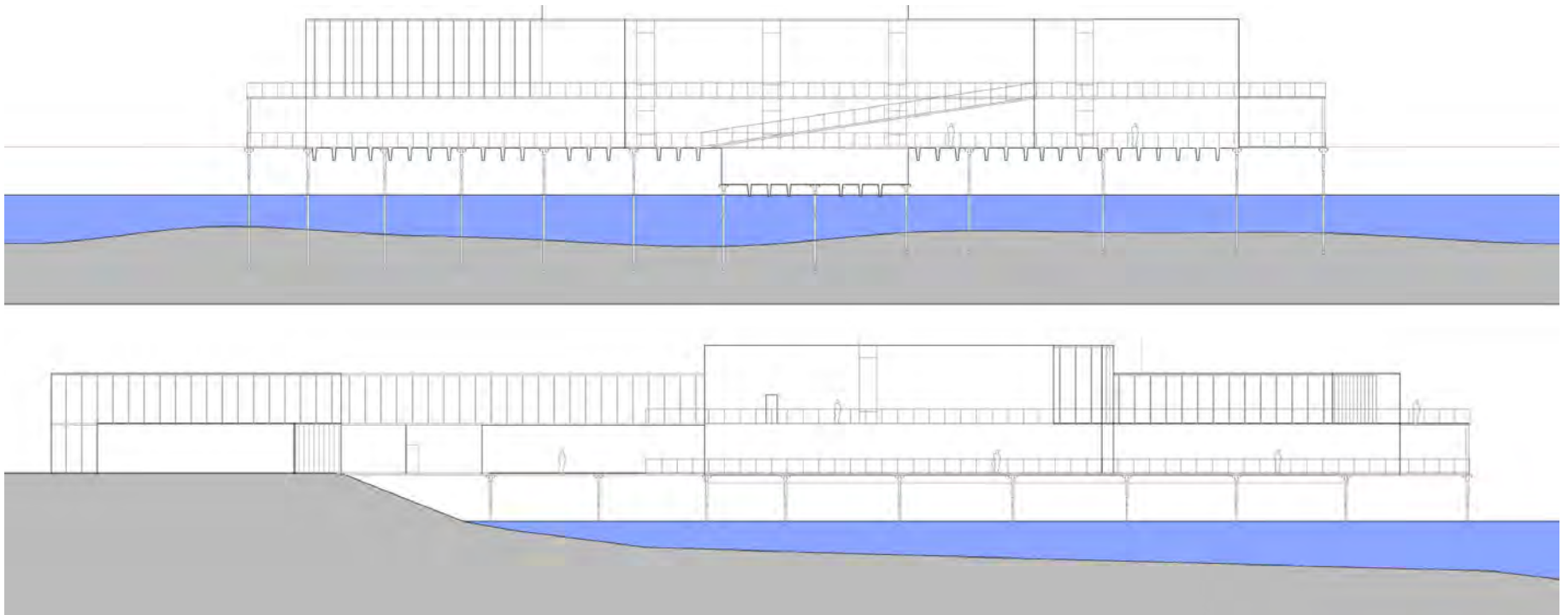
First Floor Plan

Mid Review



Second Floor Plan

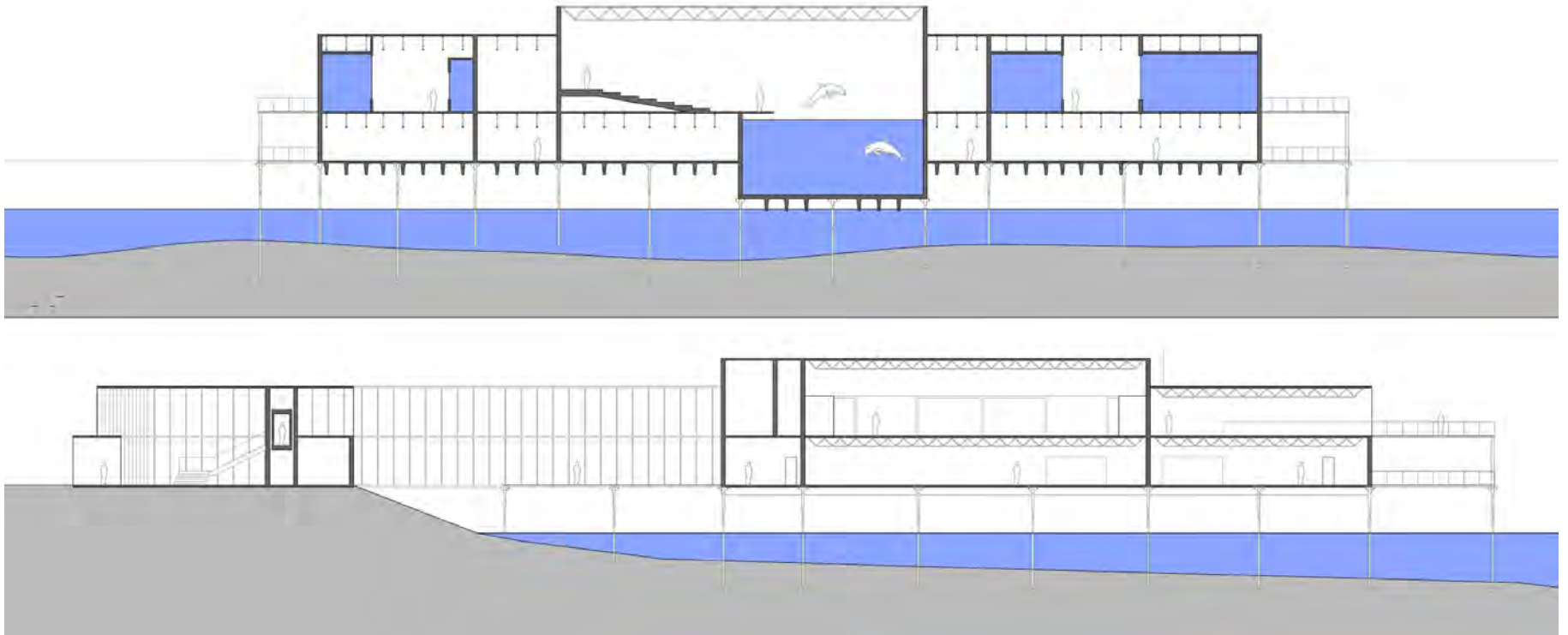
Mid Review



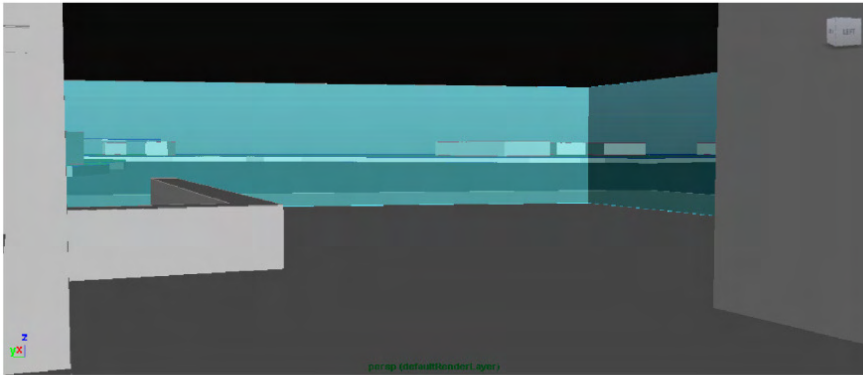
Elevations

100

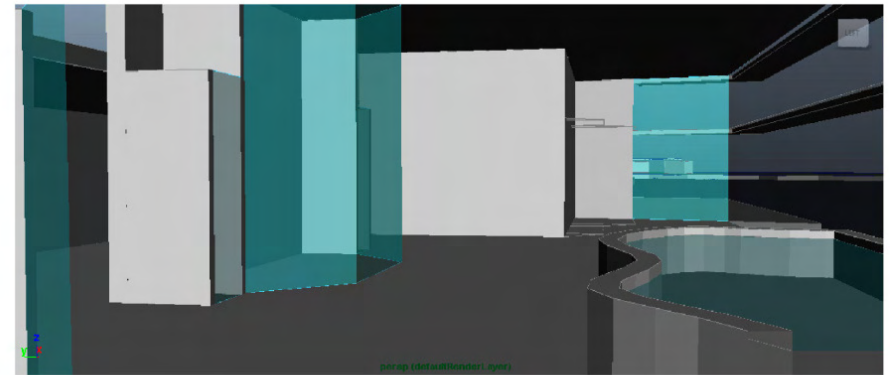
Mid Review



Mid Review



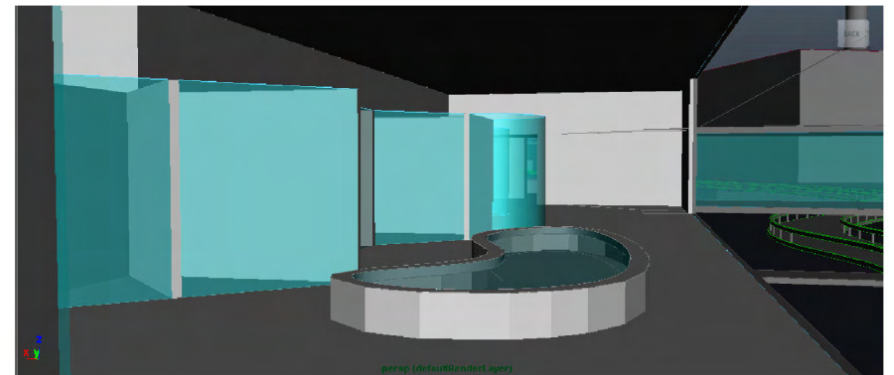
Cafe



Marshes and Wetlands Exhibit



Dolphinarium



Long Island Sound Exhibit

Perspectives

Mid Review Critique

The mid review for the Bridgeport Aquarium took the project away from the initial schematic phase and provided a much clearer sense of scale and tectonics. The exterior form of the building would only change slightly after this point in the project. While the second floor would remain largely the same, the first floor would require significant design changes.

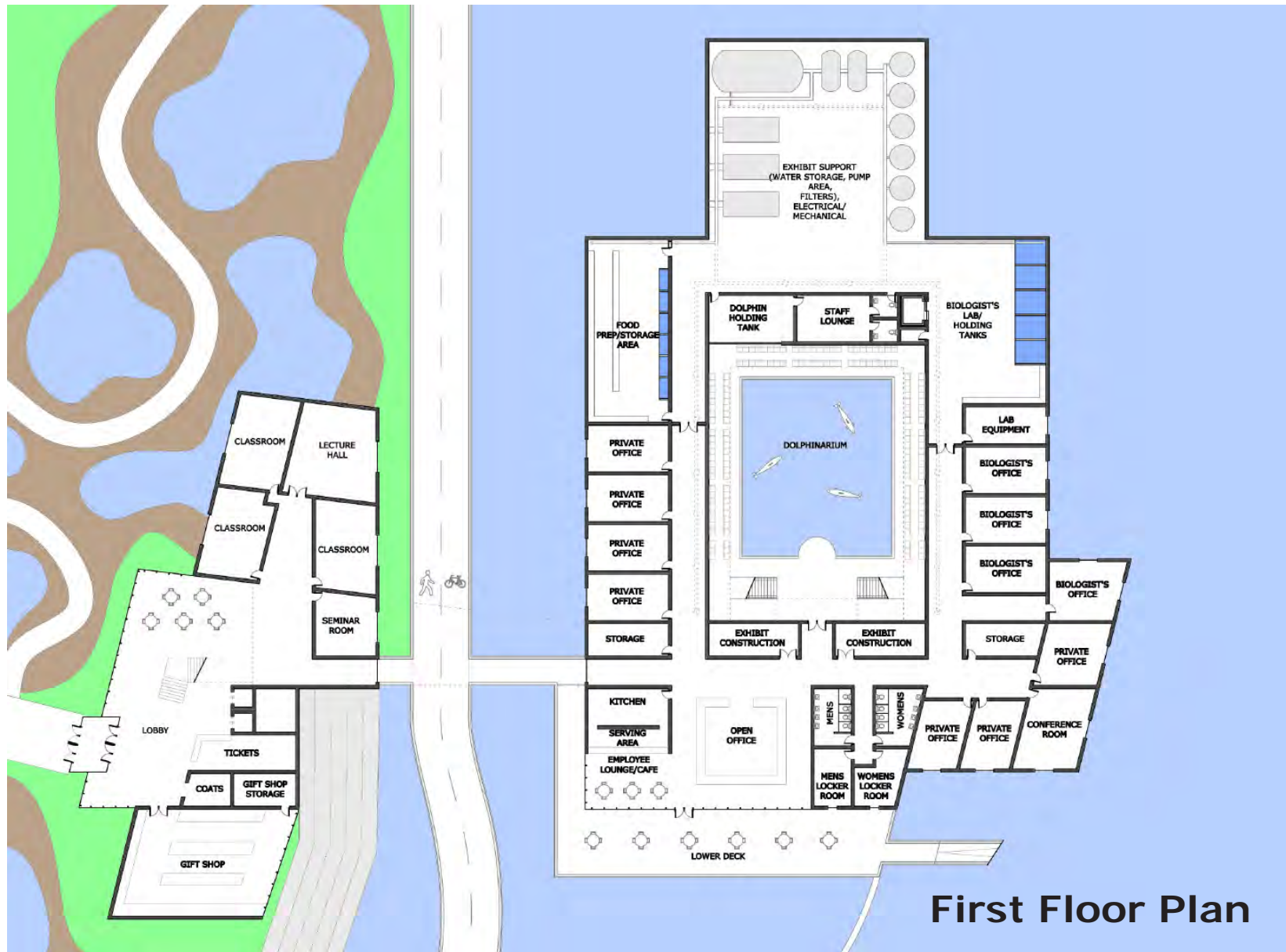
Design Strengths

- Lobby, gift shop, exhibit areas and public cafe work well with overall design scheme, these elements would only require minor revisions.
- Cafe and second floor of lobby provide excellent views of the Long Island Sound
- Organic-styled exterior exhibits provide for a transition from the natural world to the man-made environment, and the help building fit into landscape
- Basic circulation strategy separates public and private spaces

Design Weaknesses

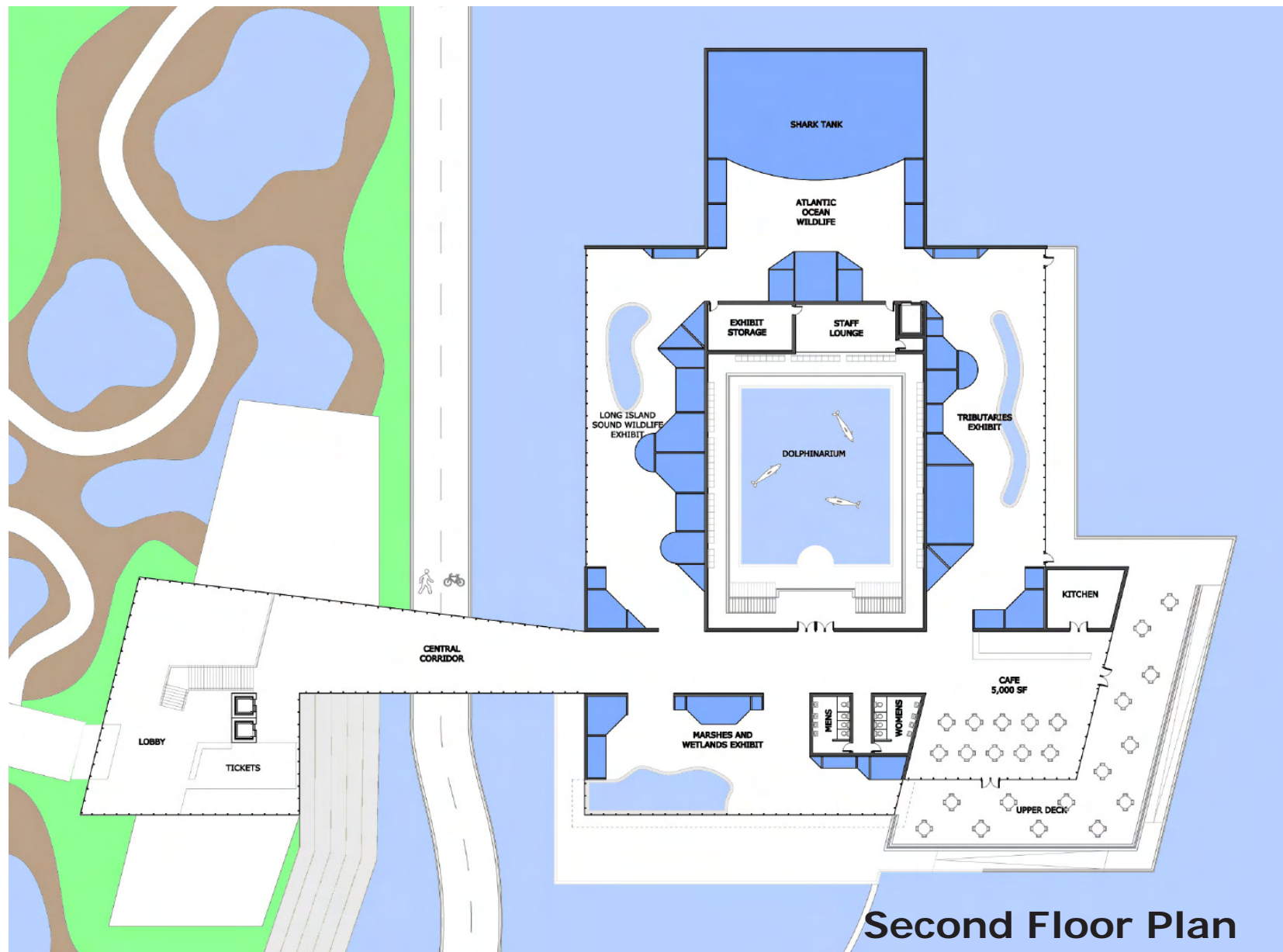
- Double loaded exhibit areas restrict natural light, eliminate views of bay, reduce spacious feel of interior areas
- Exhibit support areas still schematic, too large
- Administration areas should move to the eastern side of the first floor, under exhibit areas, current location is too prominent, restricts views of exterior exhibits from the bike path
- Dolphinarium restricts dolphin habitat, does not serve as the central grand space as was originally intended. The dolphinarium should open up to the exterior environment, allow for dolphins to travel from interior of the building to the exterior, natural environment
- Interior renderings are not helpful, do not show materials clearly

Gate Review



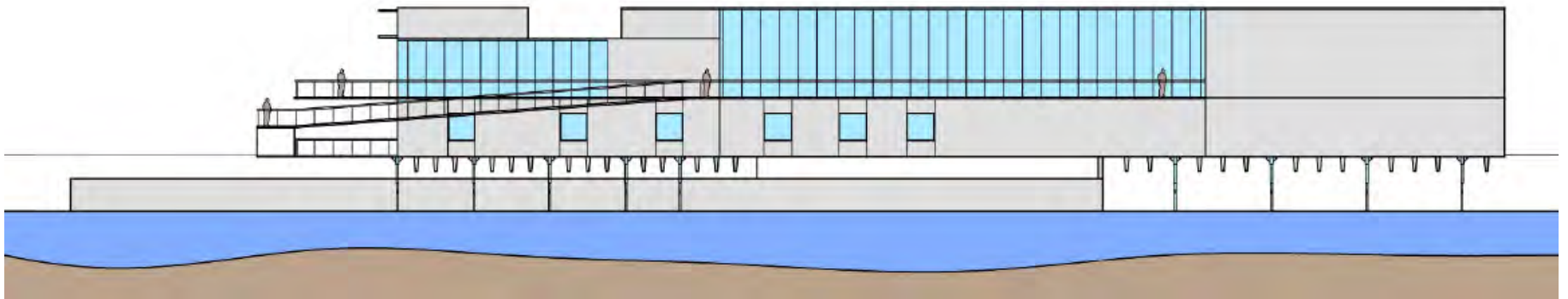
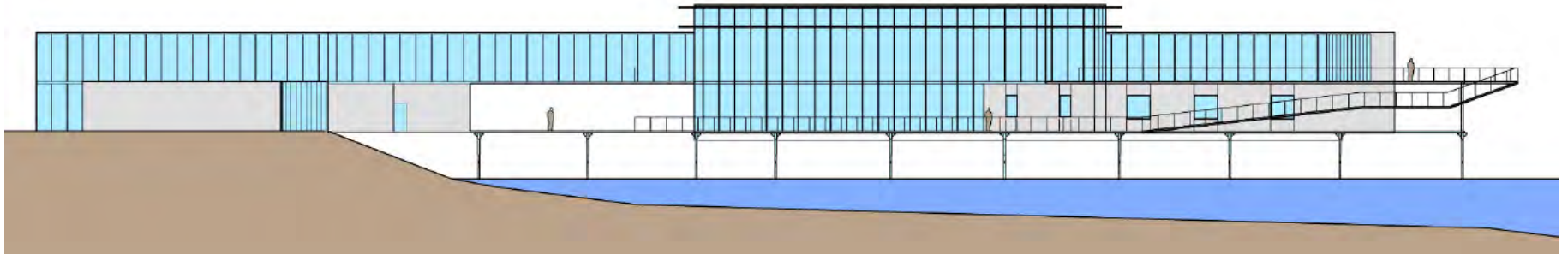
First Floor Plan

Gate Review



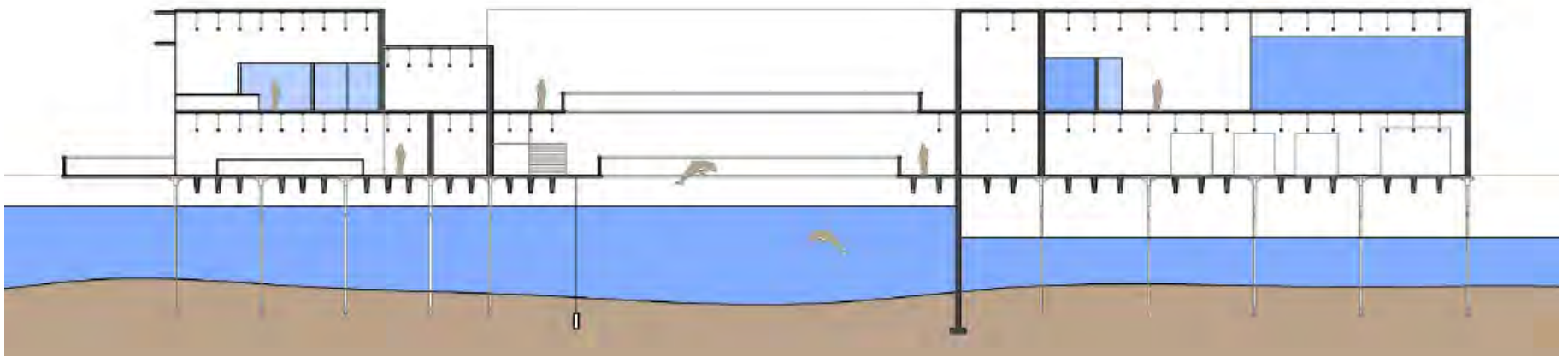
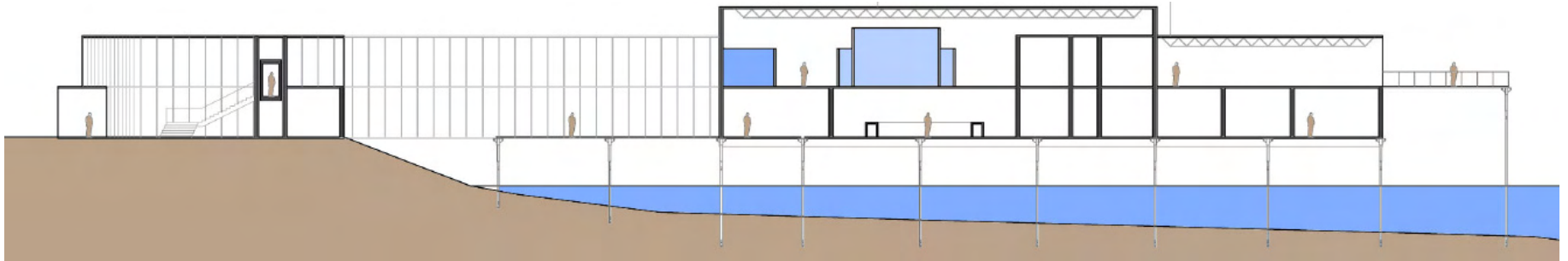
Second Floor Plan

Gate Review



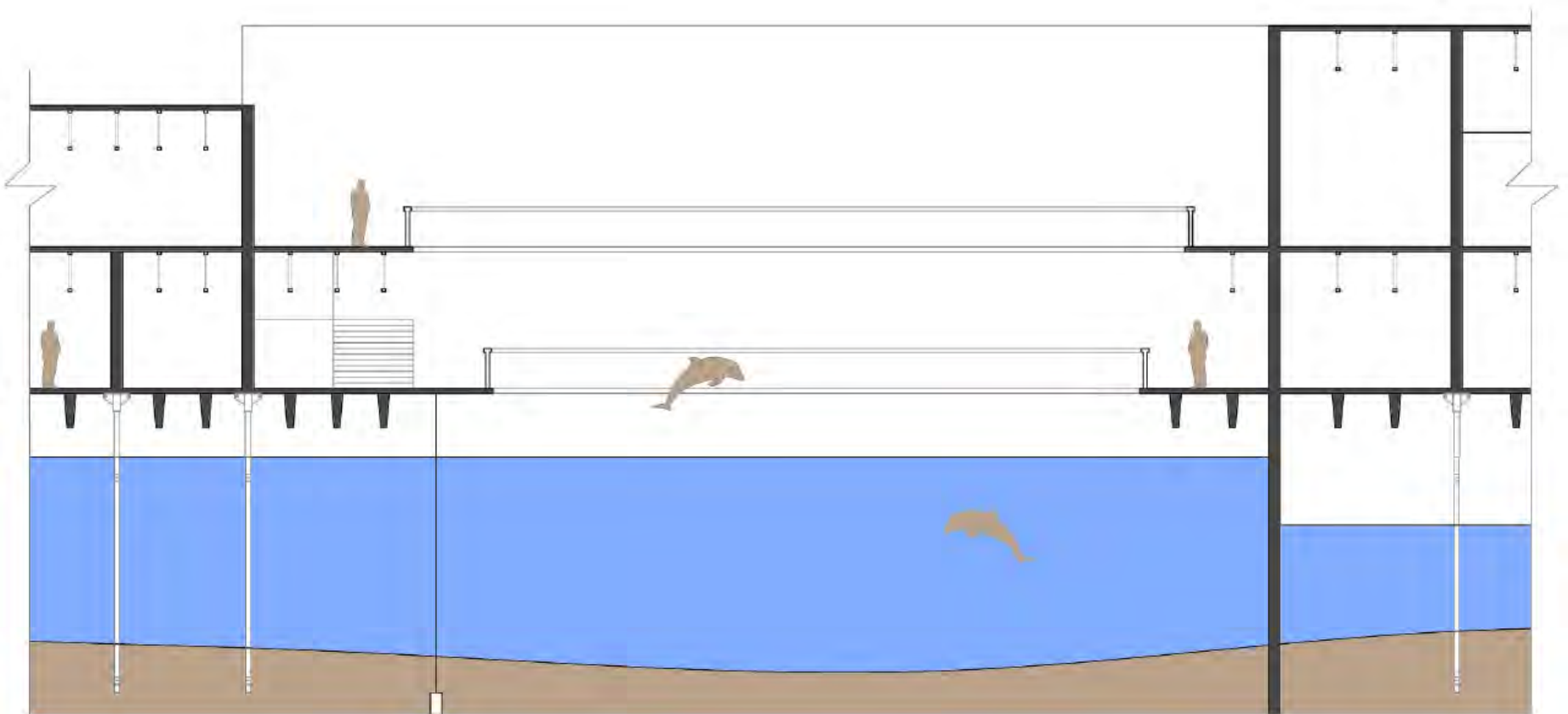
Elevations

Gate Review



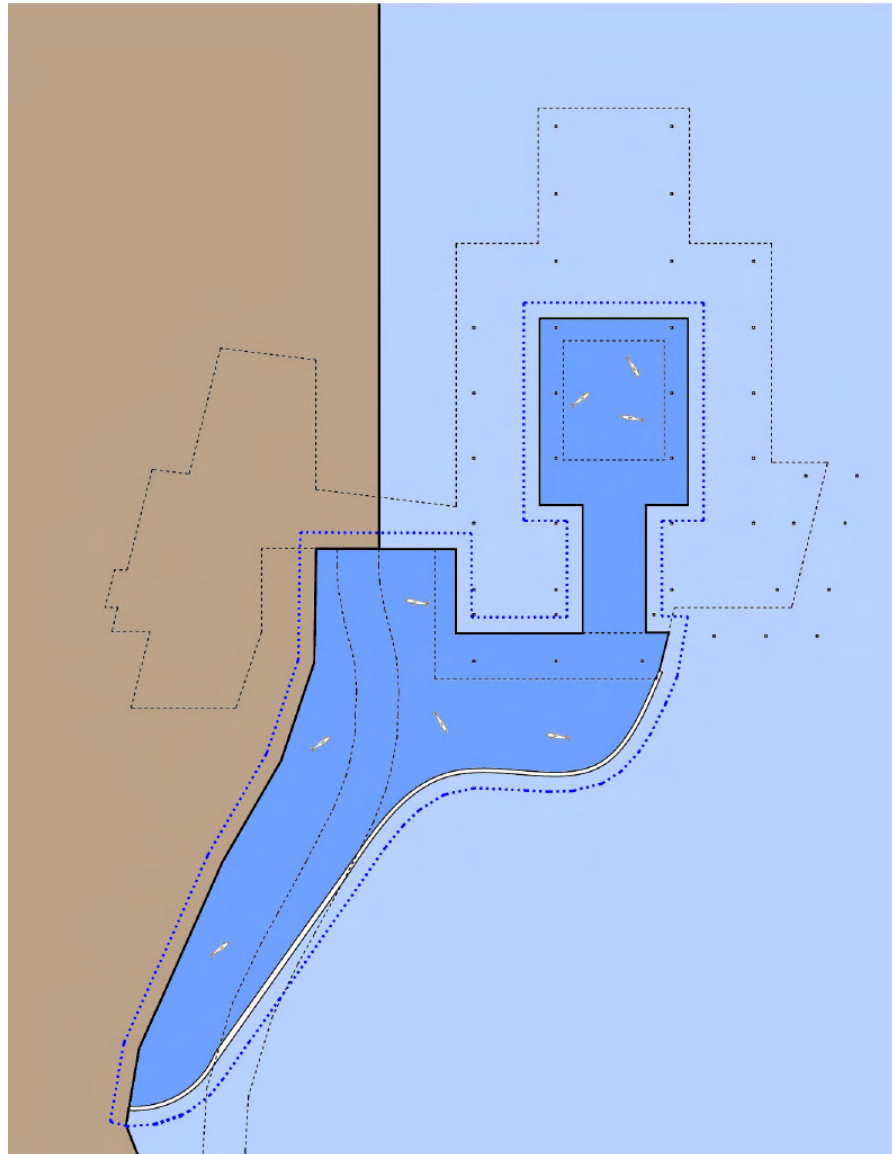
Sections

Gate Review



Dolphinarium Section (Enlarged)

Gate Review



Interior/Exterior Dolphin Range 109

Gate Review Critique

At the gate review, the design for the aquarium in plan was essentially complete. The sections and elevations required minor adjustments. The main criticism for the presentation was the lack of diagrams which were to clarify structure, materials, and circulation, along with perspectives that would provide a sense of experience within the building.

Design Strengths

- Single loaded exhibit areas provide excellent views, connection with outside
- First floor fully developed with offices, downsized exhibit support areas
- Private cafe provides employees with chance to socialize and connect with each other
- Educational wing for students replaces prominent location of administration spaces
- Administration spaces relocated under exhibit areas
- New exterior dolphin exhibit provides connection to interior dolphinarium, helps to connect natural environment with the man-made environment
- Waterfront promenade travels above exterior dolphin exhibit, providing excellent views

Design Weaknesses

- Exterior dolphin exhibit lacks refuge areas for dolphins from storms, harsh winter weather
- Piers supporting the entire building are too slender
- Construction details and wall section needed to understand tectonics
- Perspectives needed to express building from the human scale
- Structure in section is too redundant, more space needed between beams
- Diagrams showing materials and structure needed
- Dolphinarium could be enhanced with operable roof

Final Presentation Boards

1. Thesis Summary

THESIS STATEMENT

I am designing a public aquarium along with a waterfront promenade that will help revitalize the city and establish a waterfront that will benefit both the residents of the city and tourists alike.

PROBLEM STATEMENT

Bridgeport, Connecticut's largest city, is currently one of the most distressed and poorest cities in the region. The city was once an industrial powerhouse, but the factories have long since moved away along with the jobs that they provided. The waterfront is currently underdeveloped, and there is little reason for outsiders to visit the city.

PROJECT STATEMENT

I am proposing a new public institution, a waterfront aquarium, along with a waterfront promenade that will link an existing park, ferry terminal, and an Amtrak train station with the new proposed aquarium along with two other new parks. This project will help support urban revitalization, and is based off of several similar projects that included an aquarium as the centerpiece of a waterfront-based renewal scheme. This new public institution will help bring people into the city, give the residents of the city something new and exciting to do, as well as generate taxes for the city through ticket sales.

PART I

The aquarium will be located partially on land, but mostly over the water, supported on piers. This will establish a more intimate connection with the waters of the Long Island Sound, which will be a theme in the exhibit areas. There will be a fenced off area underwater that will connect the exterior dolphin exhibits to the interior dolphinarium, allowing the dolphins to freely travel in and out of the building. The geometry of the building will reflect the shape of the adjacent site. The waterfront promenade will physically connect important landmarks with the aquarium and more importantly, the water itself.

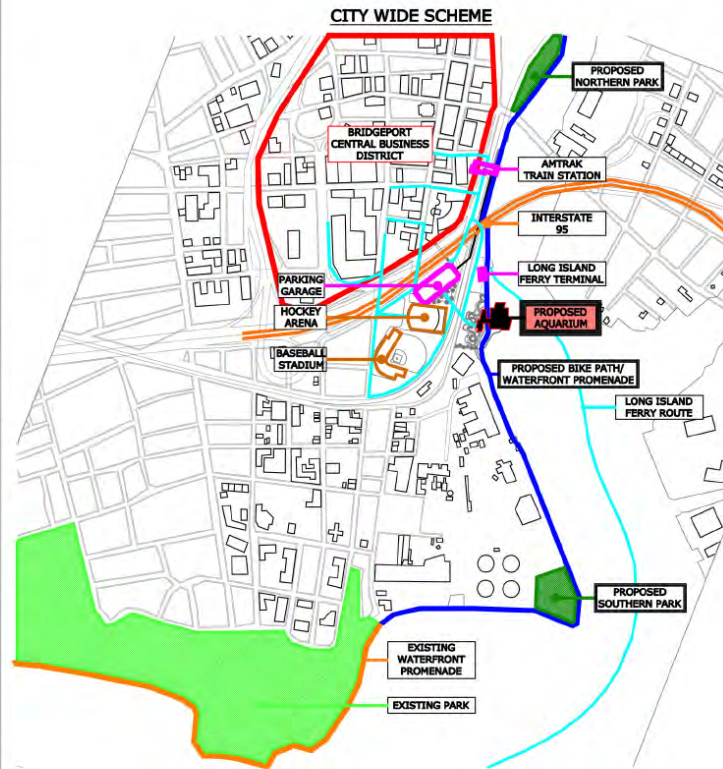
AQUARIUM DESIGN ISSUES

Many existing aquariums, such as the Camden Adventure Aquarium, and the New England Aquarium in Boston have no relation to the waterfront. They are essentially closed off boxes that provide no views to the outside, and cut off visitors from the wonder of the waterfront.

SOLUTIONS

My proposed aquarium will provide vast glass curtain walls that will provide spectacular views of the Bridgeport harbour and Long Island Sound. The exterior exhibits will physically link nature with the building, as the dolphin exhibits will bring the waterfront into the center of the building.

WATERFRONT REVITALIZATION: BRIDGEPORT AQUARIUM AND WATERFRONT PROMENADE



FROM THIS....



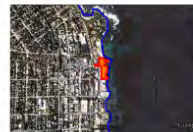
TO THIS.



PRECEDENTS



MONTERREY BAY AQUARIUM, MONTERREY, CALIFORNIA



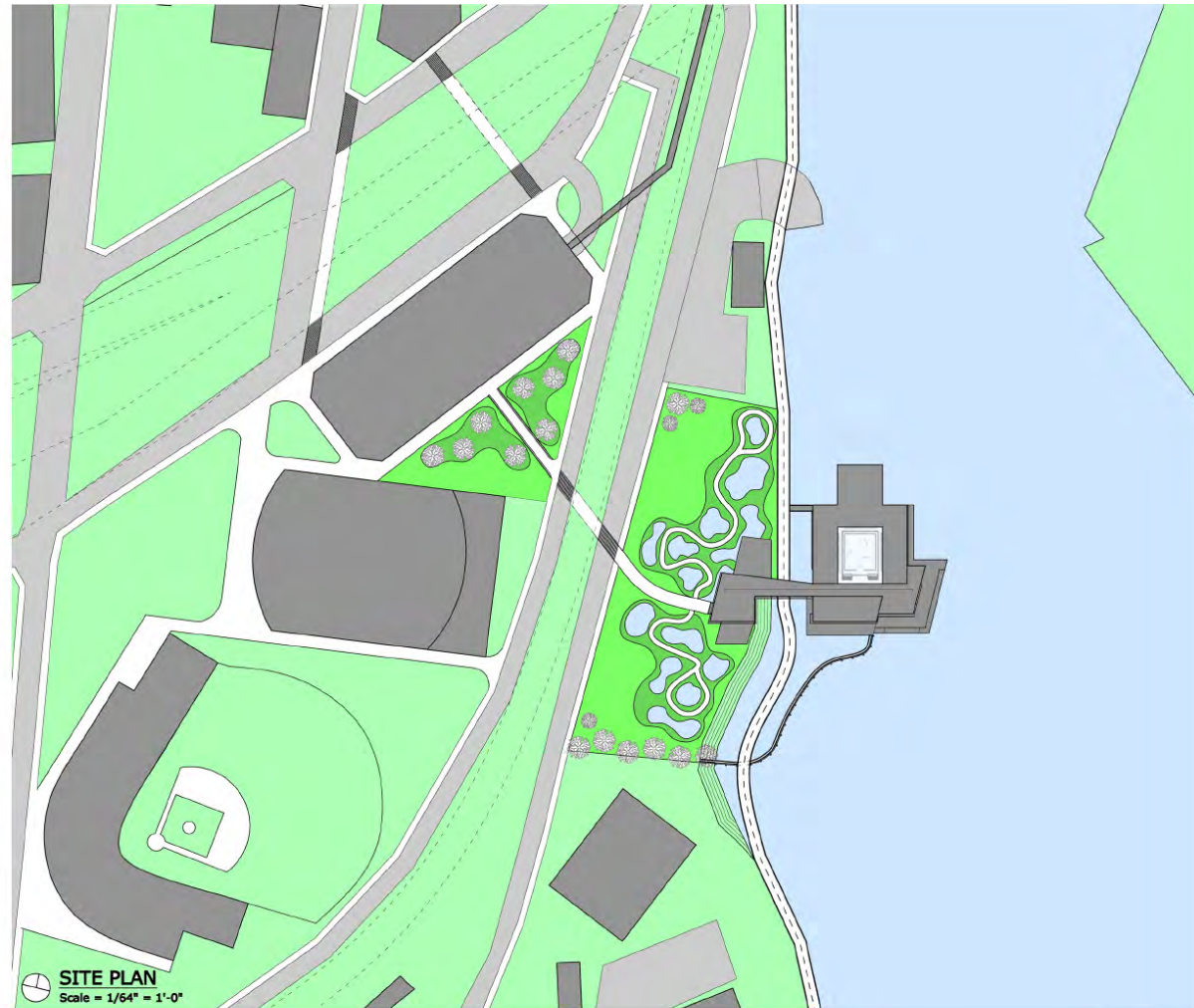
NATIONAL AQUARIUM, BALTIMORE, MARYLAND



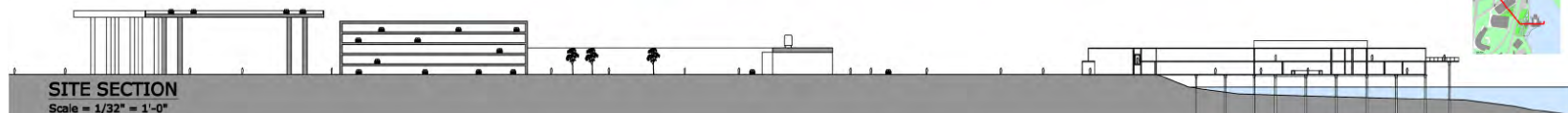
NEW ENGLAND AQUARIUM, BOSTON, MASSACHUSETTS



2. Site Plan/Site Section



SITE PLAN
Scale = 1/64" = 1'-0"

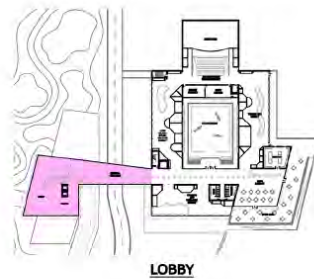


SITE SECTION
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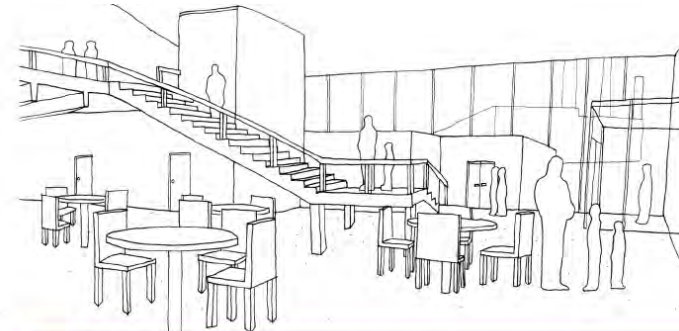
RYAN DEVENNEY
2011.03.29
THESIS DESIGN STUDIO

WATERFRONT REVITALIZATION:
BRIDGEPORT AQUARIUM AND WATERFRONT PROMENADE

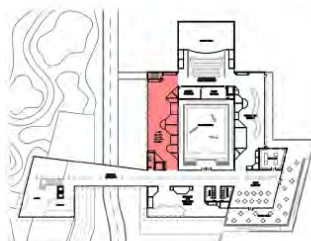
3. Diagrams/Perspectives



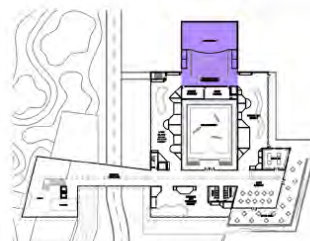
LOBBY



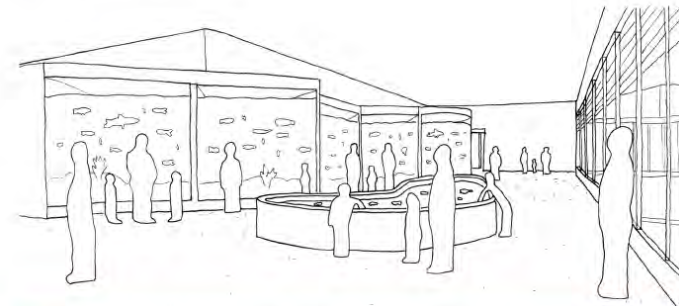
LOBBY PERSPECTIVE



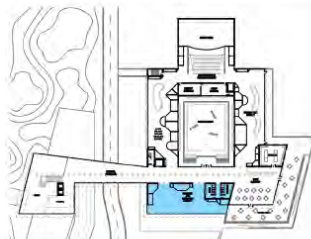
LONG ISLAND SOUND WILDLIFE EXHIBIT



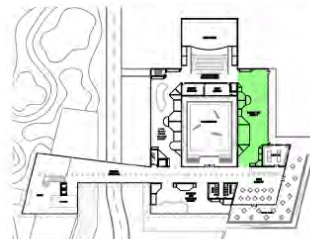
ATLANTIC OCEAN WILDLIFE EXHIBIT



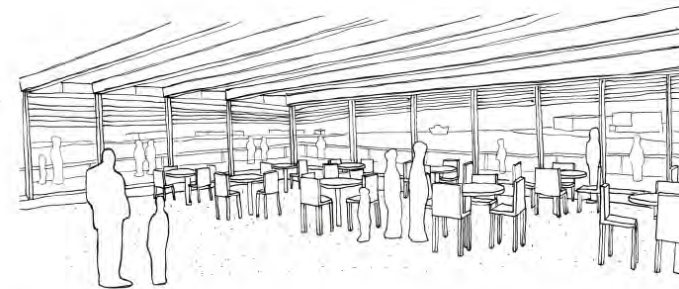
LONG ISLAND SOUND EXHIBIT PERSPECTIVE



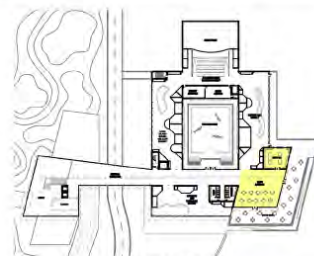
MARSHES AND WETLANDS EXHIBIT



TRIBUTARIES EXHIBIT

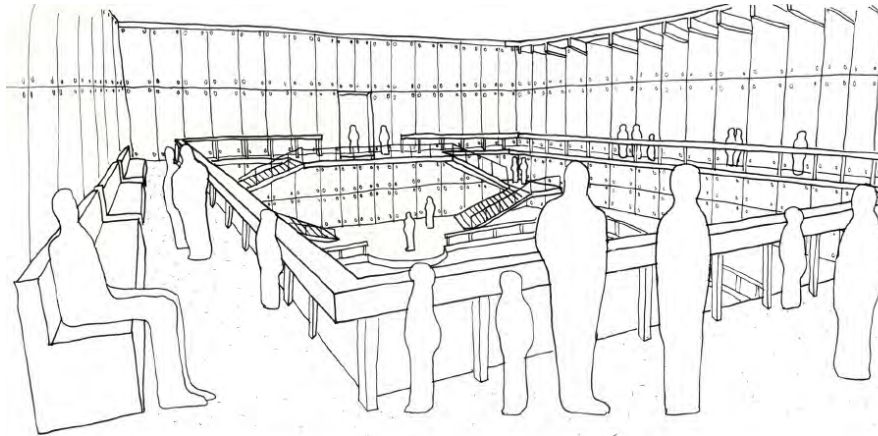


PUBLIC CAFE PERSPECTIVE

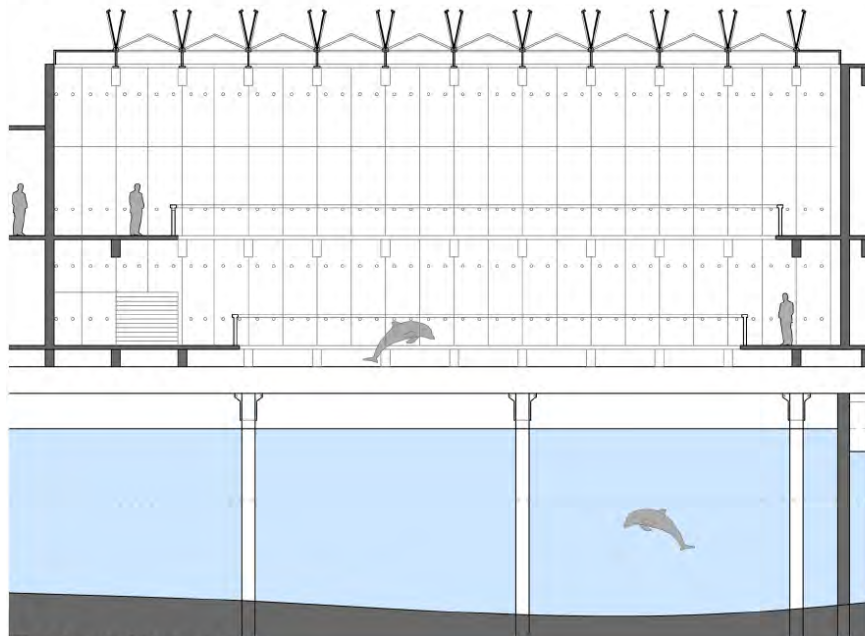


PUBLIC CAFE

4. Dolphinarium



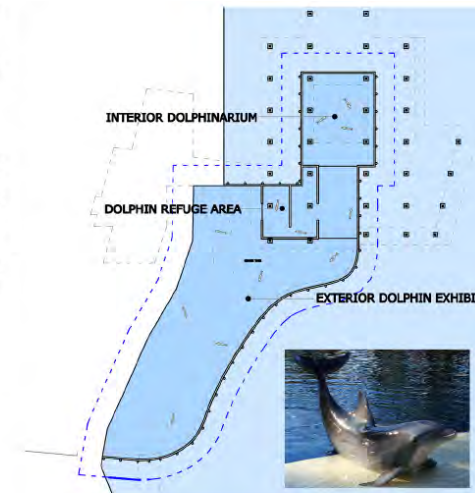
DOLPHINARIUM PERSPECTIVE



DOLPHINARIUM SECTION

Scale = 1/4" = 1'-0"

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THESIS DESIGN STUDIO



INTERIOR/EXTERIOR DOLPHIN RANGE
Scale = 3/32" = 1'-0"



DOLPHIN CONTAINMENT BARRIER/WATER DOOR

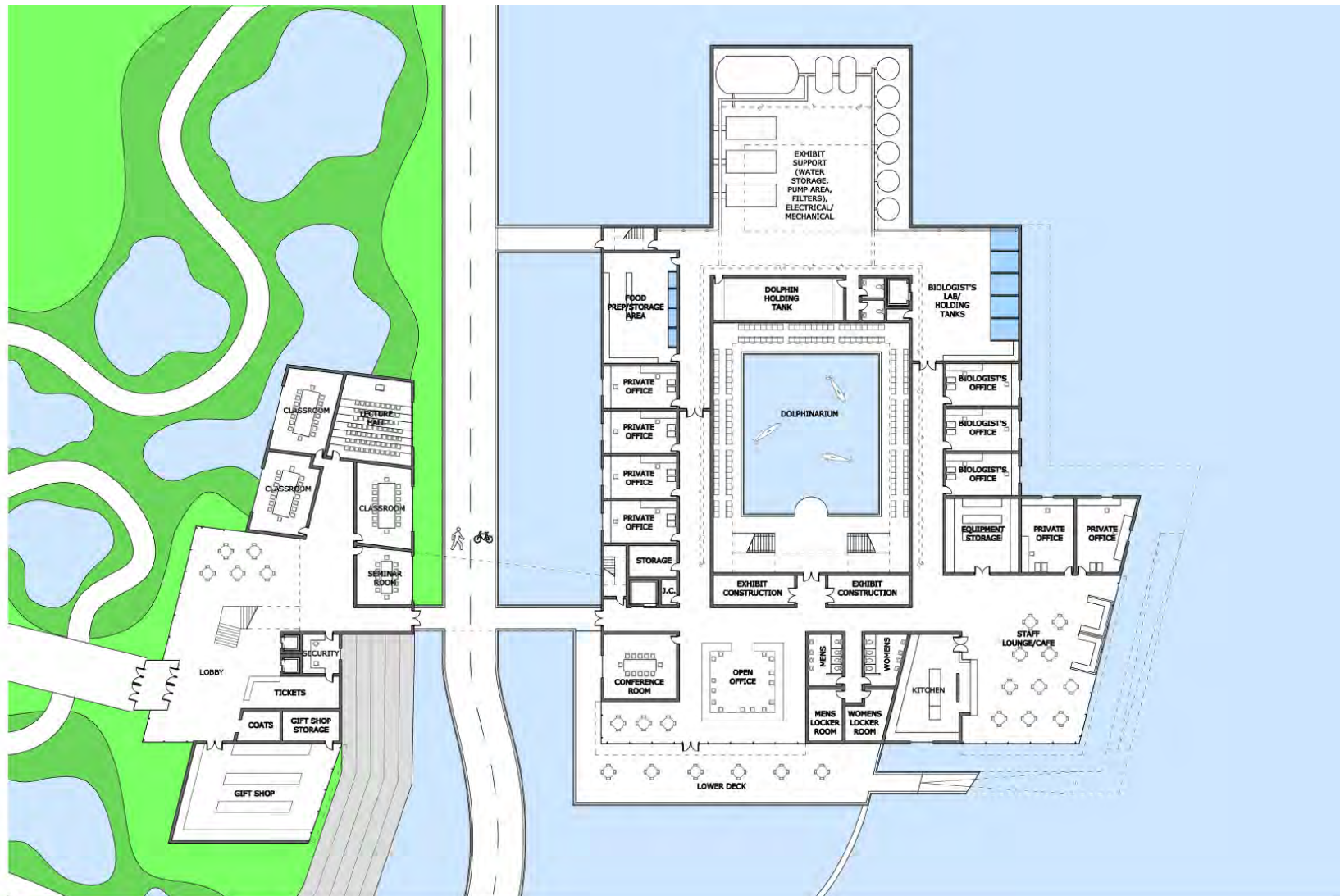


DOLPHINARIUM RETRACTABLE ROOF



WATERFRONT REVITALIZATION:
BRIDGEPORT AQUARIUM AND WATERFRONT PROMENADE

5. First Floor Plan

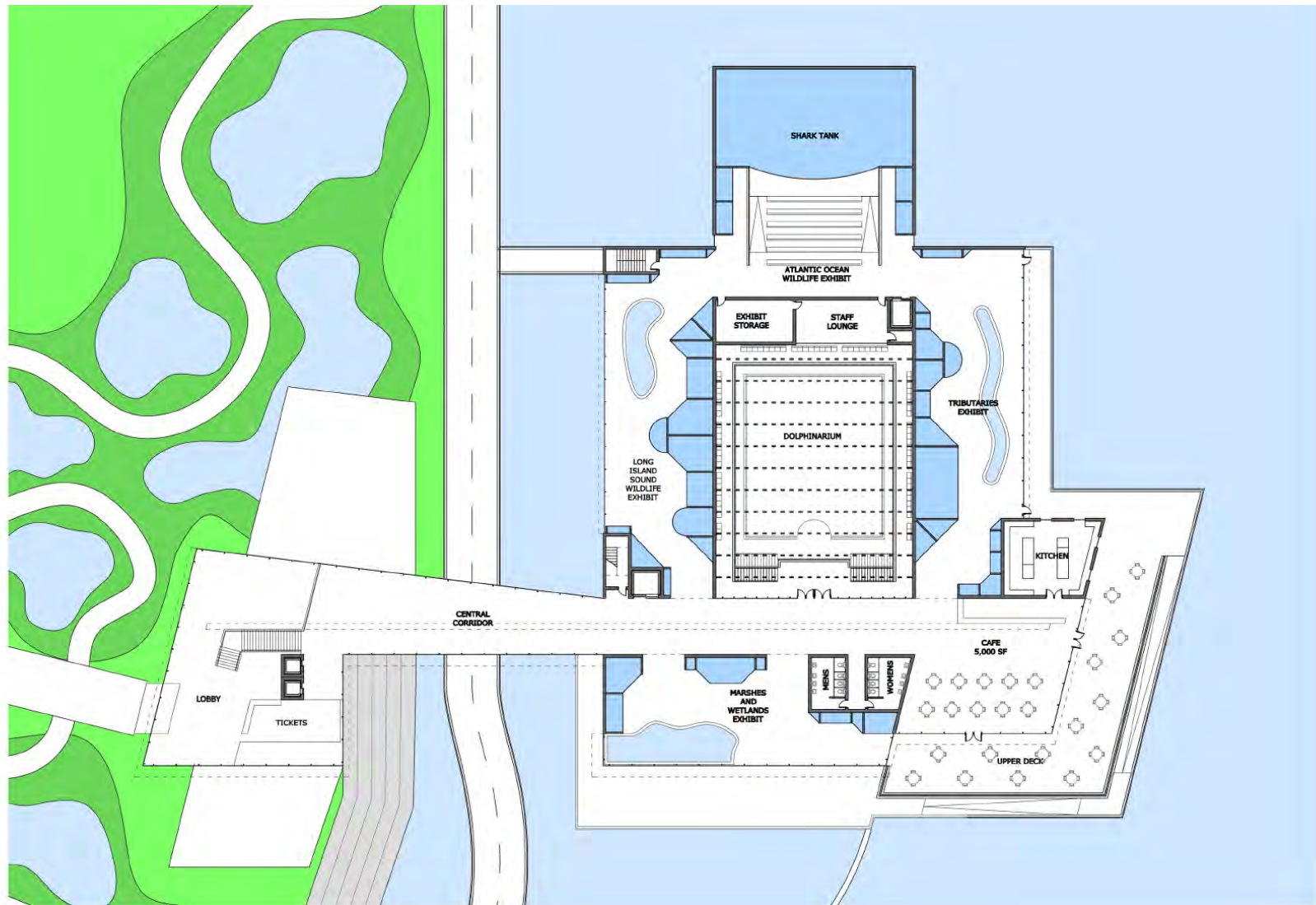



FIRST FLOOR PLAN
Scale = 3/32" = 1'-0"

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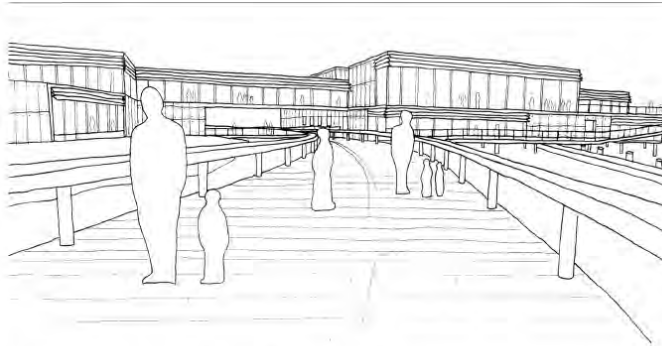
WATERFRONT REVITALIZATION:
BRIDGEPORT AQUARIUM AND WATERFRONT PROMENADE

6. Second Floor Plan

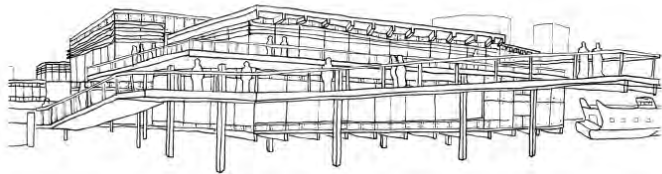


 **SECOND FLOOR PLAN**
Scale = 3/32" = 1'-0"

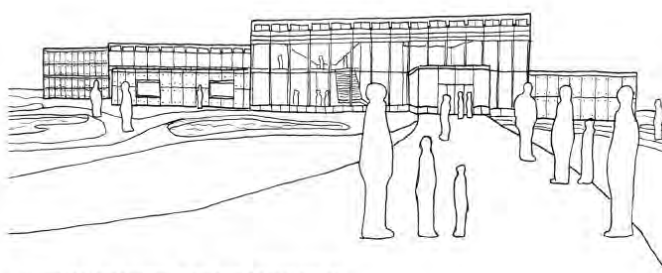
7. Perspectives/Diagrams



EXTERIOR PERSPECTIVE (WATERFRONT PROMENADE)

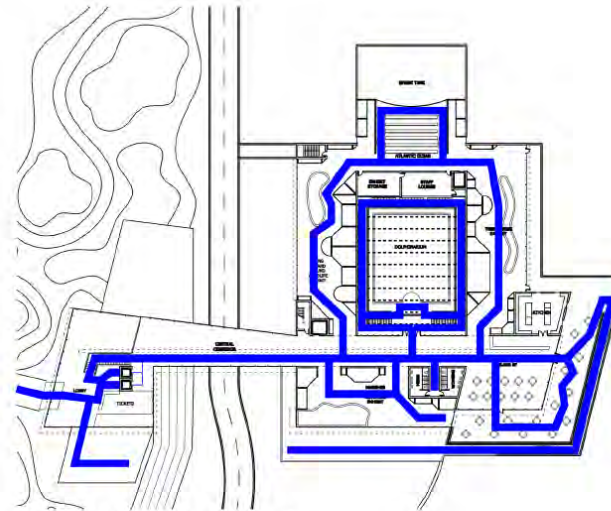


EXTERIOR PERSPECTIVE (FROM FERRY)

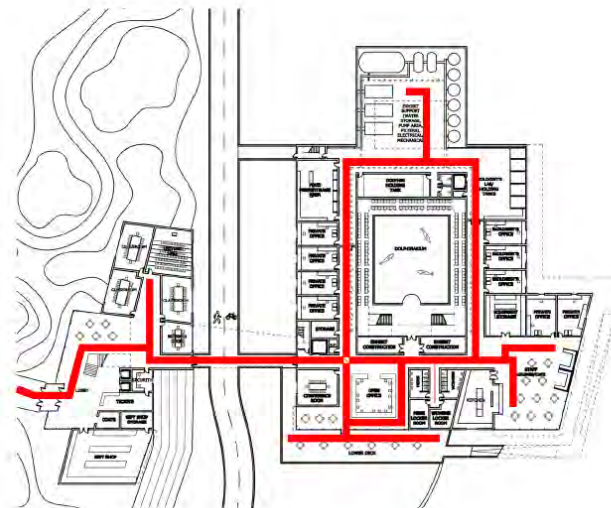


EXTERIOR PERSPECTIVE (FRONT OF BUILDING)

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2011.05.13
THESIS DESIGN STUDIO



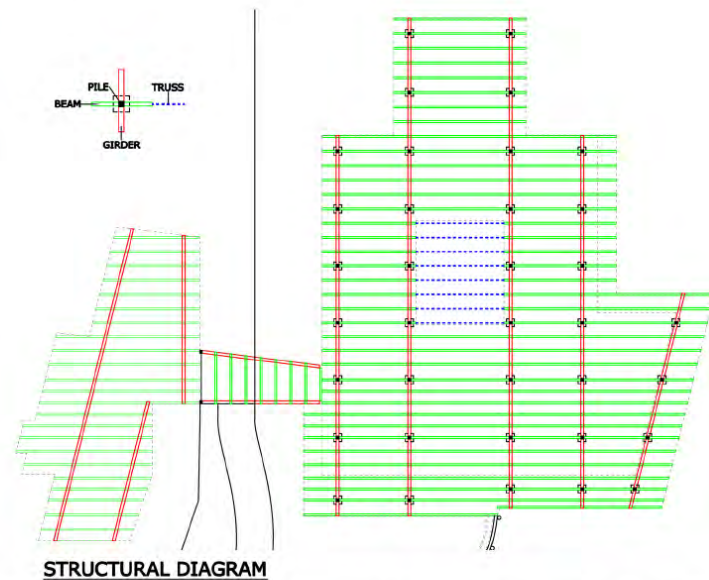
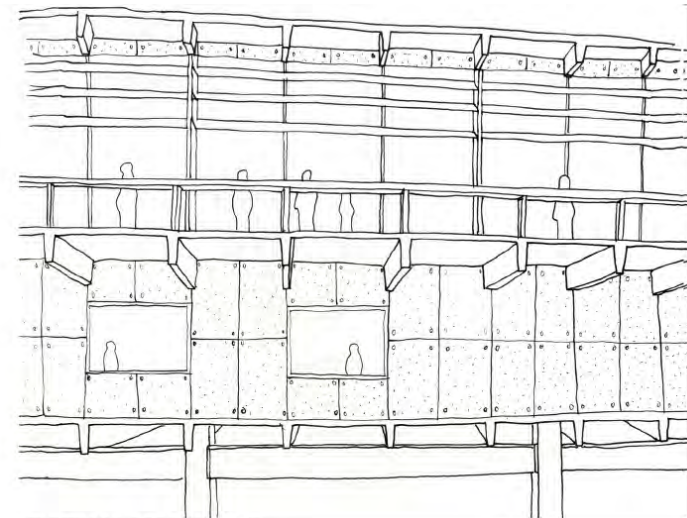
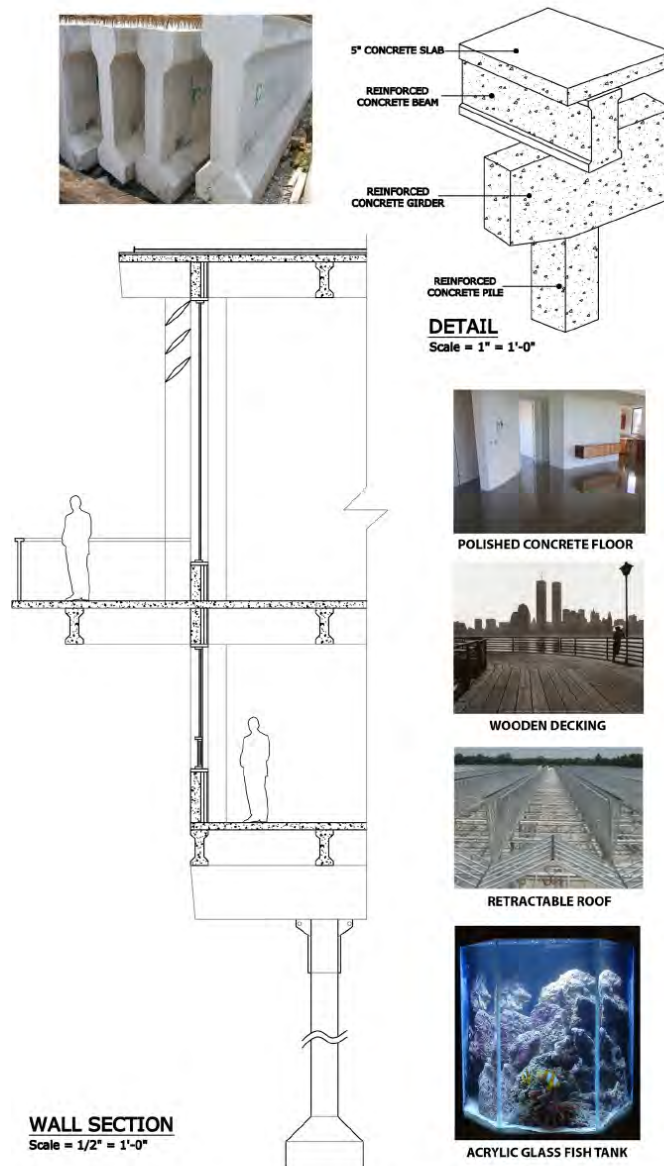
PUBLIC CIRCULATION (SECOND FLOOR)



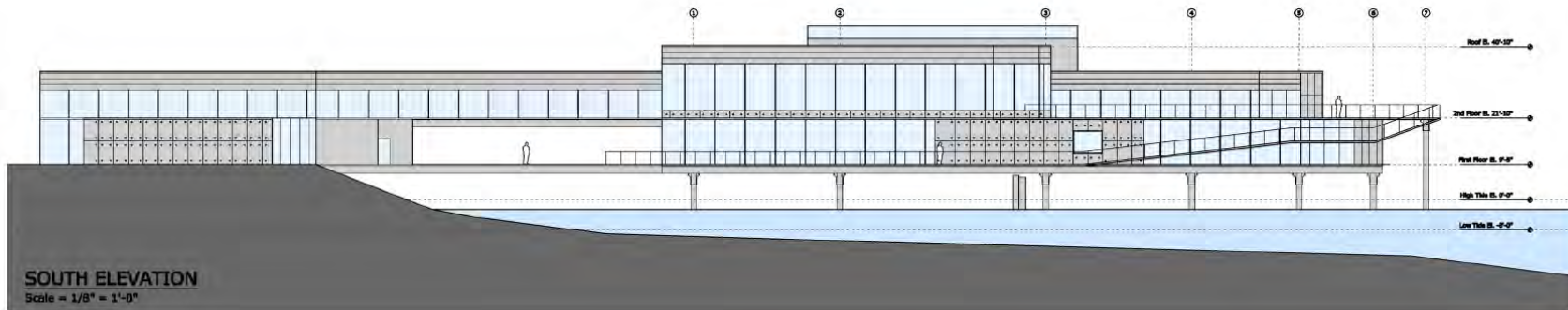
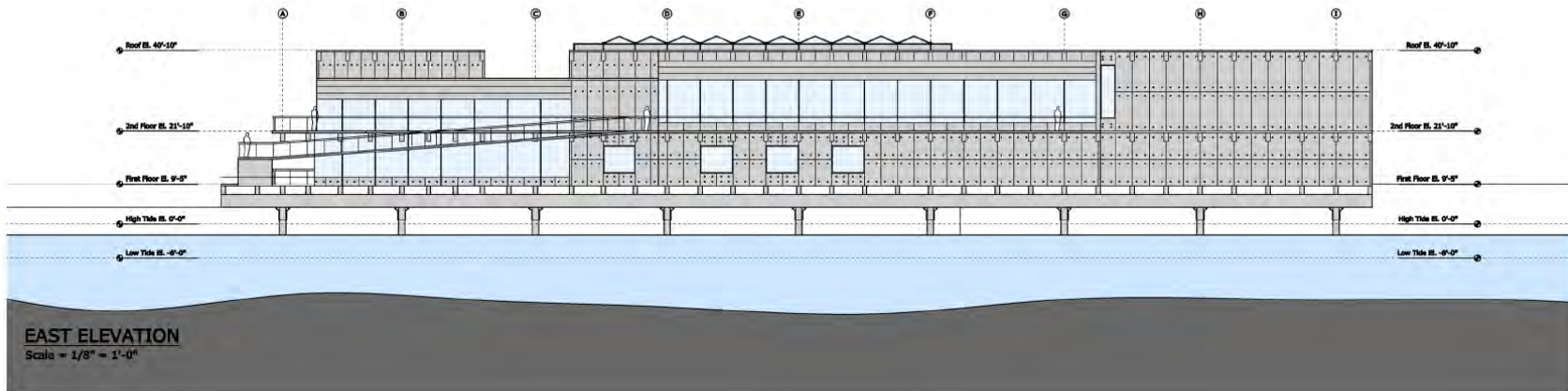
PRIVATE CIRCULATION (FIRST FLOOR)

WATERFRONT REVITALIZATION:
BRIDGEPORT AQUARIUM AND WATERFRONT PROMENADE

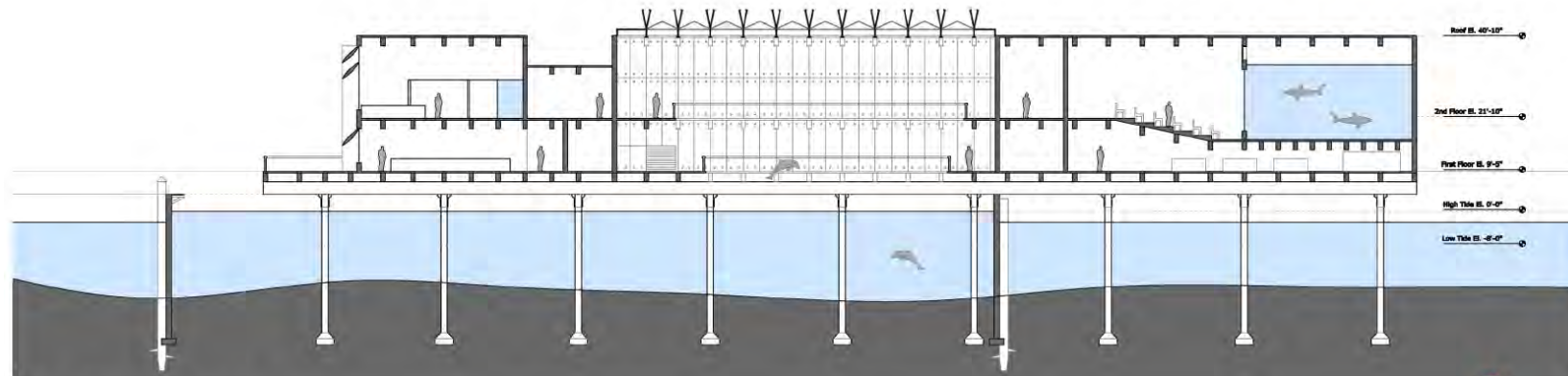
8. Structure/Materials



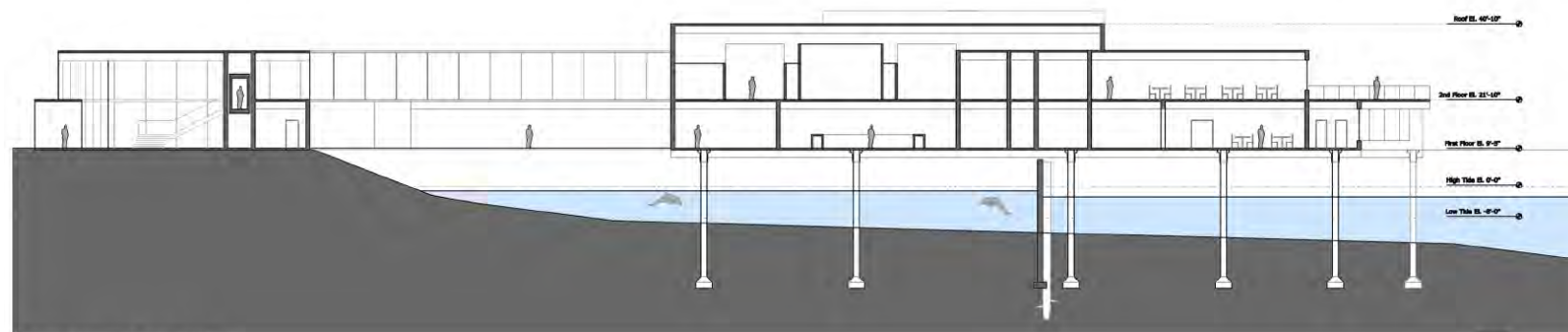
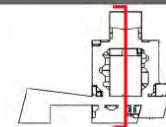
9. Elevations



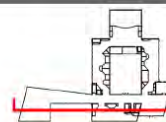
10. Sections



NORTH-SOUTH SECTION
Scale = 1/8" = 1'-0"



EAST/WEST SECTION
Scale = 1/8" = 1'-0"



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