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A Walk Around Royal Naval Dockyard, Bermuda

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A Walk Around Royal Naval Dockyard, Bermuda

by

Daniel Scott

A Design Thesis

Presented to the Faculty of

The College of Architecture at the University of Nebraska

In Partial Fulfillment of Requirements

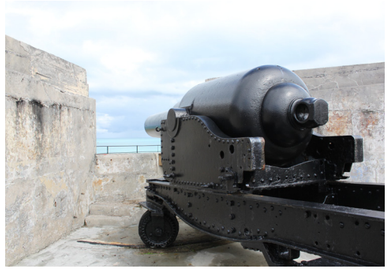
For the Degree of Master of Architecture

Major: Architecture

Under the Supervision of Professor Peter Hind

Lincoln, Nebraska

August 2013



A WALK AROUND ROYAL NAVAL DOCKYARD, BERMUDA

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FOREWORD

Royal Naval Dockyard, Bermuda aims to become a national center of distinction, a thriving new district in Bermuda, and a flagship in the economic regeneration of the West End. It will be a place unlike any other in Bermuda, offering cultural, residential, office and tourist amenities that are rooted in the fabric of Bermuda, and the diverse and vital history of the Royal Naval Dockyard.

Building on its history, and preparing it to fulfill it full potential for the future the Dockyard will need to transform to meet the changing needs of Bermuda's economy. With a weakening tourist industry and a strengthen international financial sector, the dockyard will need to make adjustments to meet these changing statistics

Heavily based on cruise ship arrivals the Dockyard has a seasonal importance that does not harvest its full potential.

The challenge of the masterplan is to capitalize on these assets in the unique setting of Ireland Island on Bermudas West End, and transform the site into an area that can be identified as an individual piece built upon Bermuda's unique charter and personality. The success of the plan will be in the sites ability to overcome significant issues, the lack of local interaction and the lack of amenities for local residents throughout the island.

To overcome these issues a dialogue has been created to begin the process to envision what the site can become. Using its ever-changing landscape in its favor the site can once again transform with the changing times. Originally designed as a naval station for sail ships and morphed into a dockyard for steam power the site can once again adapt to changing times of the 21st Century.

This document presents the ideas and concepts that combine the emerging Masterplan and development of Casemates prison into a new destination for Bermuda.

THESIS STATEMENT

Topic: Insertion of new architectural program into an established historical site.

Statement: Adaptive use of the historic Royal Naval Dockyard, Bermuda into a multiuse community, with emphasis on sustainability.

Thesis Statement: Architectural progress should not dismiss buildings of the past. The existing context and its character should be encouraged to evolve and transform but not at the sacrifice of the current established structures, thus establishing a sense of historical importance and an agent for progressive architectural change.

Context Statement: By thorough and careful exploitation of the existing circulation networks, political climate, economic vitality, social structure and environmental issue facing the island of Bermuda, the current void of a middle/creative class housing will be transformed into a vibrant place for interaction through the development of new local and vistor programming through newly built and reprogrammed architecture structures.

Scope: The adaptive reuse of an existing 16-acre site, on the Northwest tip of Bermuda, first built in 1775 and used as a fortress until 1958. Currently used as a tourist destination with attractions such as Bermuda Maritime Museum, shopping and a mega-cruise ship dock. Reprogramming of the existing structures with new insertion of architecture to create a new architecture program harmonious between the historically important and the new.

Topic: Insertion of new architectural program into an established historical site.

Established Historical Site

Statement: Adaptive use of the historic Royal Naval Dockyard, Bermuda into a multiuse community, with emphasis on sustainability.

Adaptive

Thesis Statement: Architectural progress should not dismiss buildings of the past. The existing context and its character should be encouraged to evolve and transform but not at the sacrifice of the current established structures, thus establishing a sense of historical importance and an agent for progressive architectural change.

Evolve and Transform

Context Statement: By thorough and careful exploitation of the existing circulation networks, political climate, economic vitality, social structure and environmental issue facing the island of Bermuda, the current void of a middle/creative class housing will be transformed into a vibrant place for interaction through the development of new local and vistor programming through newly built and reprogrammed architecture structures.

Exploitation

Scope: The adaptive reuse of an existing 16-acre site, on the Northwest tip of Bermuda, first built in 1775 and used as a fortress until 1958. Currently used as a tourist destination with attractions such as Bermuda Maritime Museum, shopping and a mega-cruise ship dock. Reprogramming of the existing structures with new insertion of architecture to create a new architecture program harmonious between the historically important and the new.

New, Harmonious, Historically

BERMUDA

AN ISLAND IN THE ATLANTIC

GLOBAL LOCATION

The Island of Bermuda is an archipelago consisting of 123 islands, located in the North Atlantic Ocean, with the nearest landmass being Cape Hatteras, North Carolina off the eastern coast of the United States. This distance makes Bermuda the second most isolated inhabited island in the world. Considered a self-governing Overseas territory of the United Kingdom, Bermuda is not an independent country but a member of the Commonwealth. It is one of the final remnants of the once vast British Empire.

First discovered by the Spanish captain Juan de Bermudez in 1505. While Bermudez never settled the archipelago the territory was claimed for the Spanish Empire. The first settlement of the islands took place in 1609, when an English ship crashed on the Northern part of the extensive coral reefs surrounding Bermuda, during a hurricane. Starting 1609 Bermuda was administered by the Virginia Company until in 1684 its charter was revoked and the British Crown took control.

The city of St. George was settled in 1612 and became the capital of Bermuda, with its establishment in 1612 the city is the oldest continuously inhabited, English speaking town in the Western Hemisphere. St. George would act as the territory's governing capital until the capital was moved to its current location of Hamilton in 1815.

The importance of Bermuda increased after the lose of the American Colony's to the British Empire in 1783. The island became the headquarters for the Royal Navy's North American fleet. This began

in influx of economic growth on the island and an increase of improvements to the island's harbors. The commanding location was located on the Northwest part of the territory, Ireland Island.

With a population of 64,268 on 20.6 square miles the islands offers some of the most populated land areas in the world. Having a population of around 2,000, Hamilton is the smallest capital city in the world. It acts as the islands main shipping port, tourist destination, as well as a major international financial centre for offshore banking and reinsurance. This mix of financial services is the islands largest economic sector and creates one of the world's highest GDP's per capita.

Location in the North Atlantic, the islands maintain a subtropical climate, due to the path of the Gulf Stream. Experiencing hot and humid conditions from spring to fall and cold temperatures in the winter months.

The archipelago has no natural water source and rain fall must be collected for consumption.

BROTHERS LIMITED

POPULATION DENSITY

POPULATION DENSITY

One of the world's most isolated places, yet Bermuda is also on of the most populated. Its proximity to the United States and governing laws allow for a mix of international business and tourist destination. Of the 123 islands making up Islands of Bermuda only around 20 are inhabited.

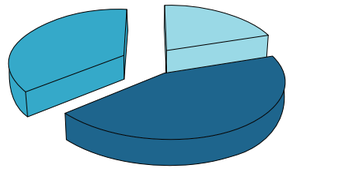
Currently ranked ninth in worlds most populated places, after Malta and above, Sint Maarten. As of October 17, 2011 Bermuda's official population was 64,268, averaging 3,060 people per square mile. The island is currently experiencing a population growth of 0.647 percent.

In terms of people per square mile, Bermuda is ranked third following Monaco with 15,921 and Singapore with 6,891. After Bermudas 3,060 is the Vatican with 2,200 and Malta with 1,229.

The island is divided into three major land areas; high-density residential, low density residential, and open space including crop cultivation. Within the 20.6 square miles of Bermuda the major amount, 9.1 square miles or 44 percent of land is used for high density residential, this would include the city of Hamilton (highlighted in Orange) and town of St. George. With no apartment complexes, the high-density areas are made up of close-kit single-family homes, with property owners renting rooms or apartments to individuals.

Low-density residential areas make up for 36 percent of land density on the islands. This accounts for 7.4 square miles of land. Tuckers town, on the northeast side of Bermuda, is the lease-populated area of Bermuda. The remaining 20 percent or 4.1 square miles is open space, such as parks and golf courses and used for crop cultivation.

On the map on the previous page you view the population density map of Bermuda. Open space on the island has been grayed to show the dense population and land area correlation. In the center of the map the City of Hamilton has been highlighted in orange.



44% High Density Residential
36% Low Density Residential
20 %Open Space and Crop Cultivation

Total Population: 64,268 (October 2011)

Population per square mile: 3,139 (May 2010)

Bermuda ninth most dense location in the world

LAND AREA COMPARISON

With a total land area of 20.6 square miles, little natural resources and no potable water on the island, Bermuda created the first conservation laws in the New World in 1616. Formation of eight main islands; Ireland Island North, Ireland Island South, Boaz Island, Watford Island, Somerset Island, Bermuda Island, St. George Island and St. David Island are connected by bridges to create the fishhook landmass.

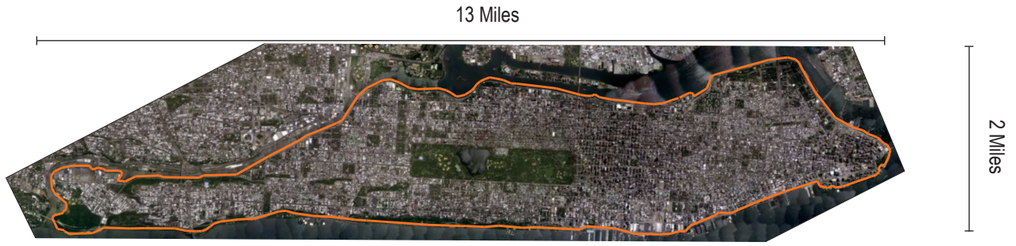
The archipelago measures 14 miles by 10 miles and is two miles across at its widest point. The landmass is drivable from one end to another in an hour and international terms considered very tiny. When comparing Bermuda's land area to that of New York City's Manhattan Island several comparisons can be made.

Both islands are a major international financial hub and tourist attraction point. Both were discover by European powers but became under British control. Bermuda became an extension of the British Empire in 1604 and Manhattan in 1653. Of these similarities the one that is most interesting is land comparison.

The island of Bermuda has 20.6 square miles of land area. Manhattan Island has 22 square miles. This fact makes the country of Bermuda smaller than the most populated location in the United States.

Bermuda is the fifth smallest country in the world, following Vatican City, Monaco, Nauru and Tuvalu.

Bermuda 20.6 Square Miles
1604- Came under English control



Manhattan 22 Square Miles
1653- Came under English control

ECONOMIC DEPENDENCY

One may expect Bermuda's economy to be largely based on tourism, as is the norm in island nations in the tropics, however for Bermuda this is not the case. Bermuda enjoys one of the highest per capita incomes in the world. It has done this by successfully exploited its location by providing offshore financial services for international banking institutions and reinsurance firms, along with luxury facilities for high-end visitors. Bermuda maintains a reputation for the integrity of its financial regulatory system, making it a top destination for financial sector interest.

The tourist industry accounts for 28 percent of the countries GDP and attracts 84 percent of its tourism from visitors from the United States. This amount is less than half of the economic importance of the international finance sector and continues to be the island's number two industry.

International banking from firms the likes of HSBC and reinsurance companies such as ACE Limited, account for 4,701 jobs or 12.5 percent of all employment in Bermuda. Currently there are 15,078 International companies registered in Bermuda and 5,000 captive insurance companies. It continues to be Bermuda largest industry with $442 billion in assets.

A number of reinsurance companies relocated to the island following the September 11, 2001 attacks on the US, contributing to the expansion of an already robust international business sector.

With limited resources and arable land most capital equipment and food must be imported. Bermuda's industrial sector is largely focused on construction and agriculture is limited, with only 20% of the land being arable.

Currently tourism and international financial services account for 70 percent of the economic sector. The role of international business on the island's economy is expanding, while the importance of tourism is contracting.

RANK	COUNTRY	GDP - PER CAPITA	DATE OF INFORMATION
1	Liechtenstein	$ 141,100	2008
2	Qatar	$ 104,300	2011
3	Luxembourg	$ 81,100	2011
4	Bermuda	$ 69,900	2004
5	Singapore	$ 60,500	2011
6	Jersey	$ 57,000	2005
7	Falkland Islands	$ 55,400	2002
8	Norway	$ 54,200	2011
9	Brunei	$ 50,000	2011
10	Hong Kong	$ 49,800	2011
11	United States	$ 49,000	2011
12	Unitedf Arab Emirates	$48,800	2011

CLIMATE CONDITIONS

Bermuda is not located in the Caribbean Sea and therefore not in the tropics. The island is located in the sub-tropics and enjoys its climate from the Arctic air mass, the Westerlies, and the Gulf Stream.

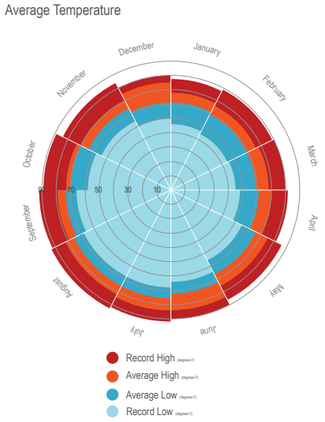
The weather patterns of Bermuda create a spring and summer with high humidity and high heat index, but moderate actual temperatures. The hottest part of the year is May through October when temperatures range from 75 to 85 degrees Fahrenheit with humidity over 85 percent. Humidity reaches its height in July and August but last till mid-October.

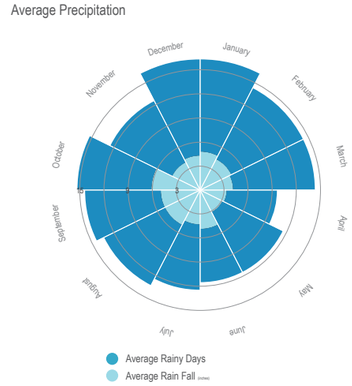
Winters temperatures are chilly with powerful winds and wet conditions. The temperature maintains a steady mid 60s and freezing temperatures have not been recorded since the 19th century.

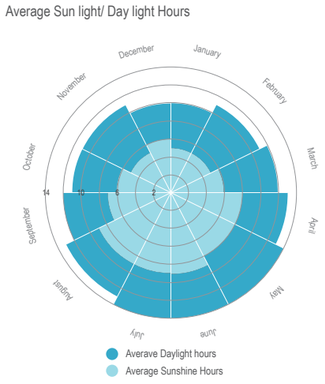
Temperatures rarely drop below 55 degrees or exceed 90 degrees. The lowest temperature ever recorded was 43.6 degrees and the highest 94 degrees.

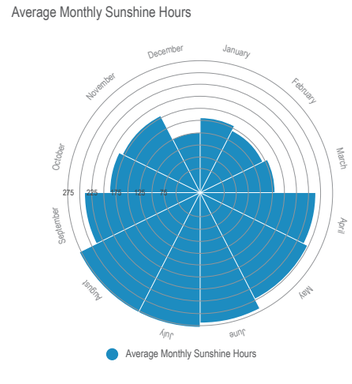
The summer climate creates a favorable condition for the attraction of visitors. The heights of the tourist season ranges from mid-April to end of September. This is due to a mix of land based and water based tourism. Cruise ships season runs from April to September, with land based last year round but increasing in the summer months.

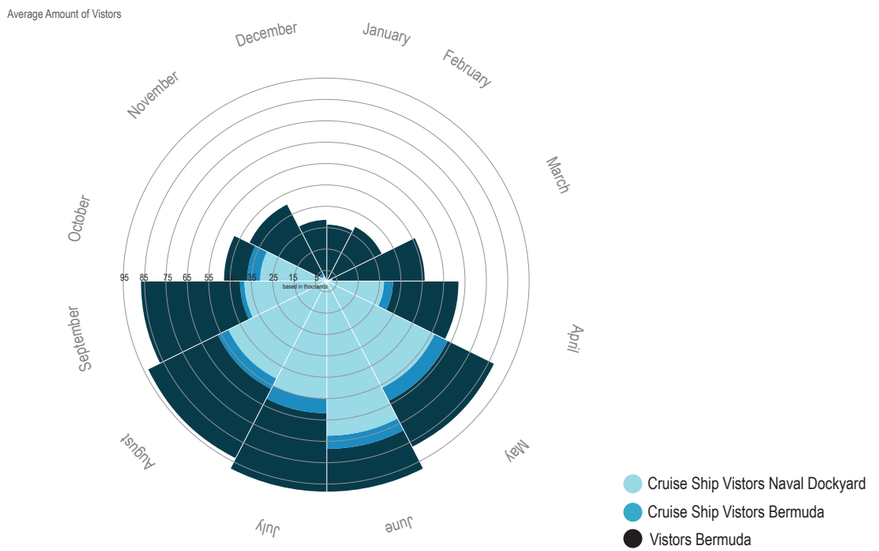
Due to its location in the North Atlantic Ocean and the Gulf Stream the island is in the Hurricane Belt. Hurricane season runs from May to September with devastating storms affecting the island every six to seven years.









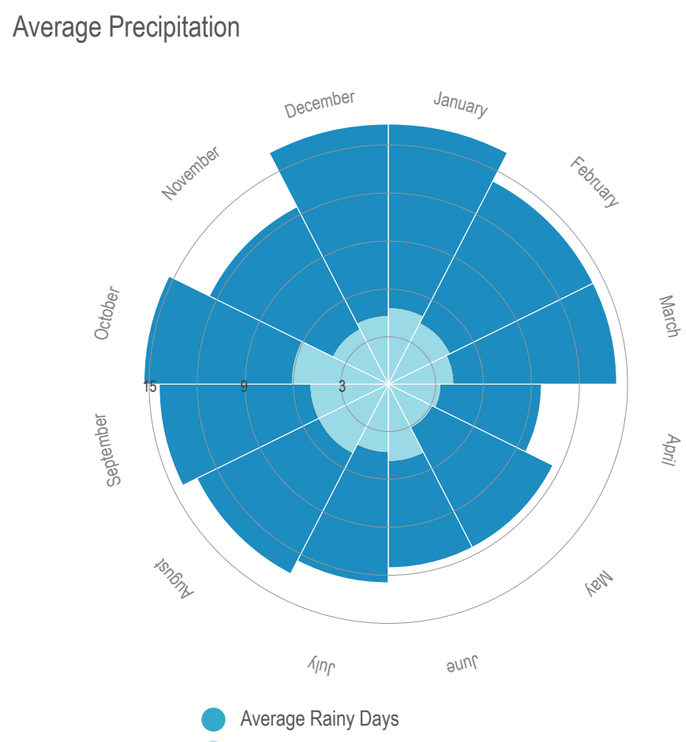


RAINFALL DEPENDENCY

The greatest issue facing Bermuda is the lack of a natural potable water source. This issue is solved by the collection of rainwater, with an average of 57.4 inches a year. The months of April to July are the driest with August to March the wettest. The maximum monthly rainfall totals occur between August and October.

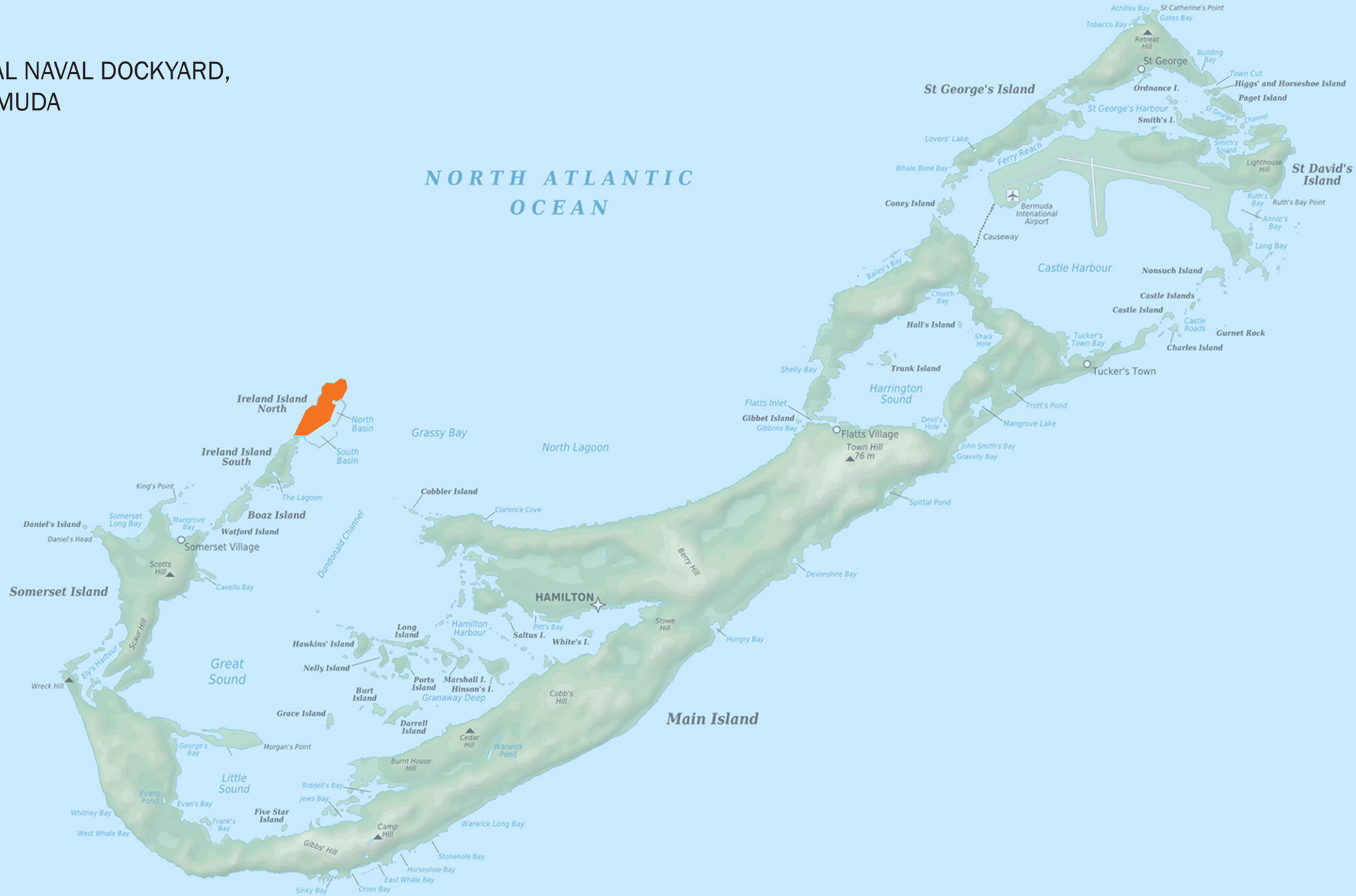
Every building in Bermuda collects rainwater from the roof and is stored in large underground water tanks. Bermuda law requires every building to include rainwater harvesting adequate for the residents. This is supported by the large amount of annual rainfall.

For the majority of residents, supplementary water is required due to small catchment area, or occasional lower than usual rainfall. Sources for supplementary water are treated water from the government commercial sources and treated seawater.



ROYAL NAVAL DOCKYARD, BERMUDA

ROYAL NAVAL DOCKYARD,
BERMUDA



ROYAL NAVAL DOCKYARD, BERMUDA

After the defeat of the British Empire by the American Colonies in 1783 and the signing of a peace treaty in 1785, the British government was in need of a naval outpost from their controlling interest in Canada and the Caribbean. The Admiralty began its quest for a new permanent naval base in 1795. At this time the development of Ireland Island took place at the Northwest extremity of the archipelago. The work at first relied on local Bermudian labor either free or enslaved. This proved to be scarce as most Bermudian labor was skilled and used in the seafaring and shipbuilding.

After the war of 1812, where Bermudian acted as a staging ground for attacks on the United States, Black American refugees were used. In 1823 to cut cost the Admiralty began to import convict labor from the United Kingdom.

In 1822 Chief Architect of the Royal Navy Edward Holl designed the Commissioner's House. The house was designed with cast-iron, replacing all wood structure. It was the first residential building in the world to use cast-iron framing. The framing was constructed in England and shipped to Bermuda, becoming the first prefabricated construction in the Western Hemisphere.

In 1851 Charles Thomas Thomas was appointed foreman and responsible for development of the Royal Naval Dockyard, Bermuda. The first phase of building was complete in the 1860's and with changing political ideologies convicts were last used in 1863.

The second phase of development began at the end of the 19th century, still unable to find native Bermudian manual labors the navy imported labor from the sugar plantations in the British territories in the Caribbean.

The Dockyard would be vital to the Royal Navy, serving as a staging area for trans-Atlantic convoys during both World Wars. During World War Two the naval base acted as a staging ground for transatlantic voyages. After the end of World War Two, The United Kingdom gave up ownership to the local Bermudian government. The dockyard would remain in operation until 1963 when it was closed.

At its closure the Royal Naval Dockyard was transformed into a tourist destination and a prison for Bermuda. This saw the addition of local attraction, shops, and the National Museum of Bermuda, and the islands major cruise ship port.

1830's Wind powered sail ships used by Royal Navy

1840's Introduction of steam driven paddle wheel

1850's Introduction of steam driven propeller

Dockyard becomes obsolete at opening

1838

1858

1790 1800 1820 1840 1860 1880 1900

1790: Royal engineers sent to Bermuda to survey and improve existing forts

1795: Admiralty purchased Ireland Island

1809: Work begun on the Royal Naval Dock-yard

1810: work stops do to War of 1812

1823-64 British convicts brought to speed construction

1828

1838 Construction Begins on Casemates

1840 Construction is completed and the åbuilding is used as a military barracks.

1847

1910 1920 1940 1960 1980 2000

WWII

After WWII, the United State's global dominance, and NATO the naval base importance diminished in importance to the Admiralty.

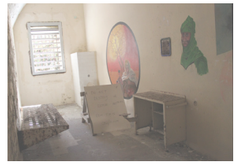
1958 Dockyard facilities are closed and land sold to the local government

1960 Casemates becomes Bermudas Maximum Security Prison

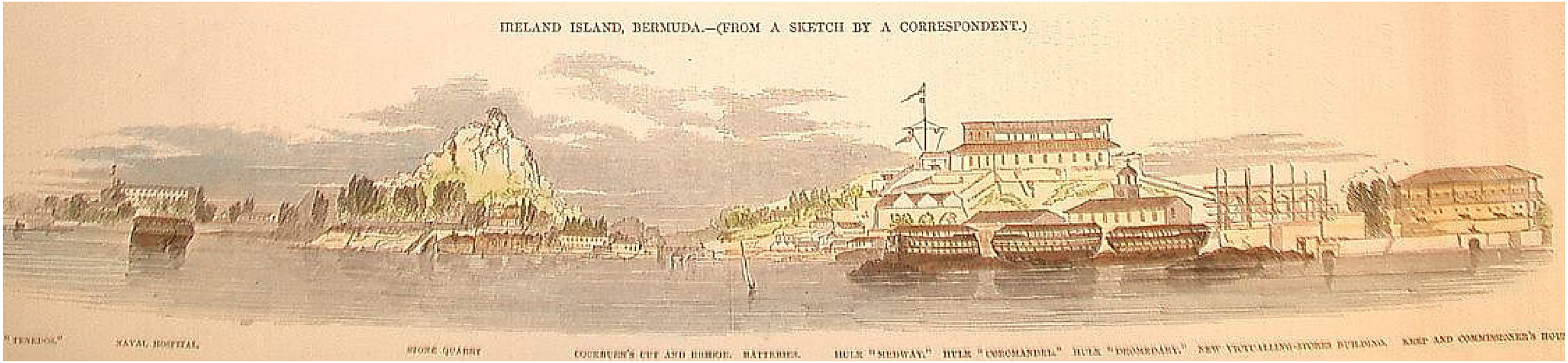
1974 The Bermuda Maritime Museum takes control of the Keep

1975 Queen Elizabeth II officially open the Queen's Exhibition Hall

1993 Prison is closed



2010 Becomes National Mesume of Bermuda with the addition of the old Casemates prison



IN THE BEGINING

After the American War of Independence the Admiralty was in need of a dockyard between the British colonies of Canada and the Caribbean. This began in 1790 when royal engineers were sent to Bermuda to survey and improve the existing forts, this lead to the purchase of Ireland Island in 1795 on the Northwestern part of the island.

This would lead to several years of planning and in 1809 construction began on the Royal Naval Dockyard. After three years of work construction was stopped as the British Empire was now at war with the United States. Work would resume in 1815 after the end of the war. To increase the speed and lower the cost of construction convict labor from the United Kingdom was used. The convicts would help to complete the first phase of construction and convict labor ended in 1863.

While the convicts worked on the Dockyard they were housed in prison ships. These ships had their mast removed and decks enclosed. This can be seen in the image above and to the right.

CHANGING TECHNOLOGIES

When the location was selected, plans conceived and construction began the form of transoceanic shipping had been the same for centuries, wind power. With the first phase of construction complete, the form of shipping power had changed twice.

Starting in the 1830's wind powered sail started the deterioration process as the form of preferred shipping. With the introduction of steam power there was a short-lived introduction of steam driven paddle wheel, replaced 10 years latter by the steam driven propeller. This quick change in technology, created a continual norm for the Dockyard, the palimpsest of the naval site.

The Dockyard was obsolete on the day of its completion. Buildings that were constructed for sail power purposes had to be repurposed or abandoned. These advancements in technology created a need for the dockyard planner to begin a second phase of building that would began in the end of the 19th century.

The dockyard started under sail power and would end with steam power that would transform to petroleum-powered engines. The continual change in technology required continual change in the buildings and their purpose.

The Dockyard site is the most complete Victorian Dockyard in existents today. While the dockyard is historical, the site is not historical precious where intervention would be allowed. Through out its history the Royal Naval Dockyard has experienced intervention.

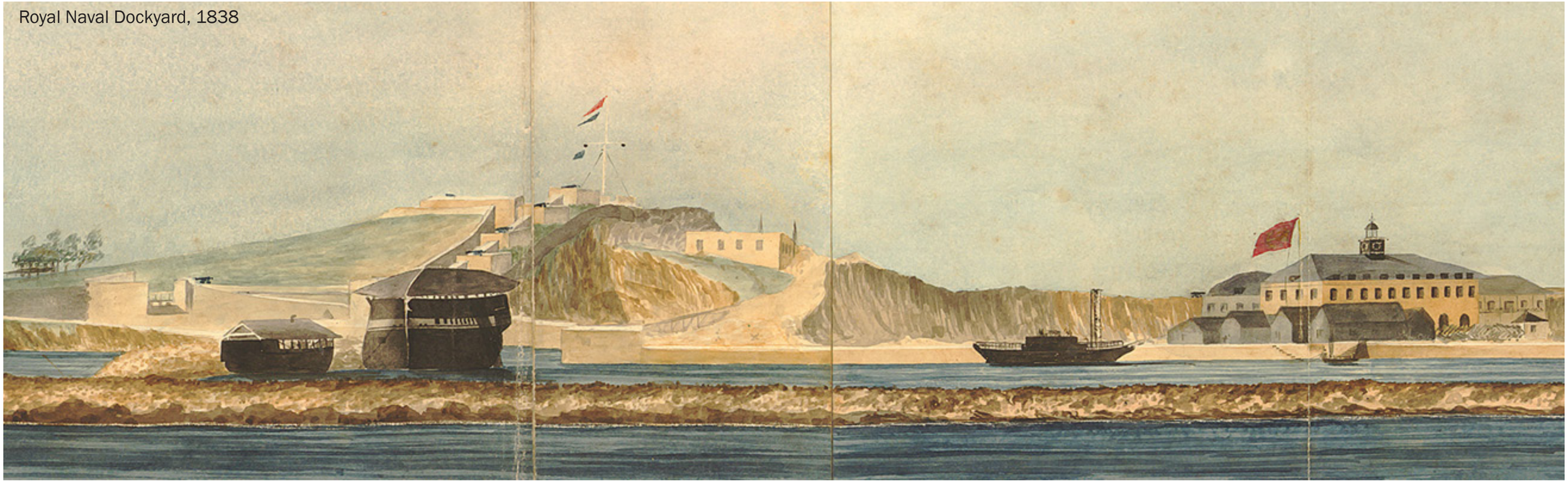
1830's Wind powered sail ships used by Royal Navy

1840's Introduction of steam driven paddle wheel

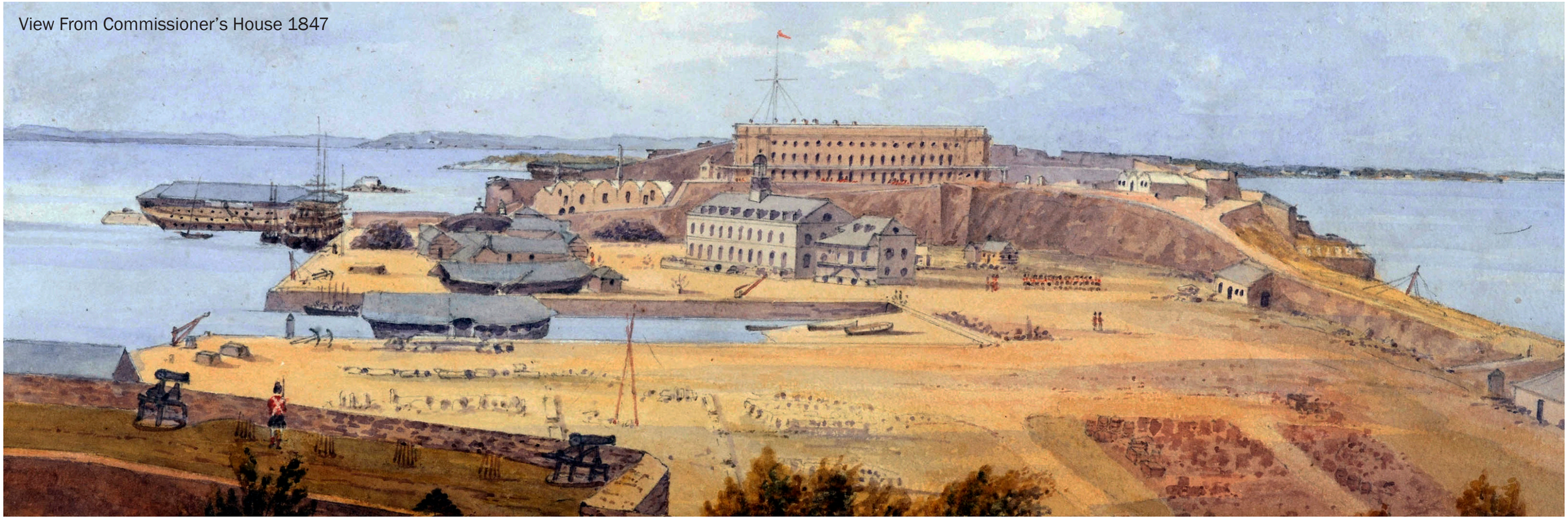
1850's Introduction of steam driven propeller

Royal Naval Dockyard, 1828

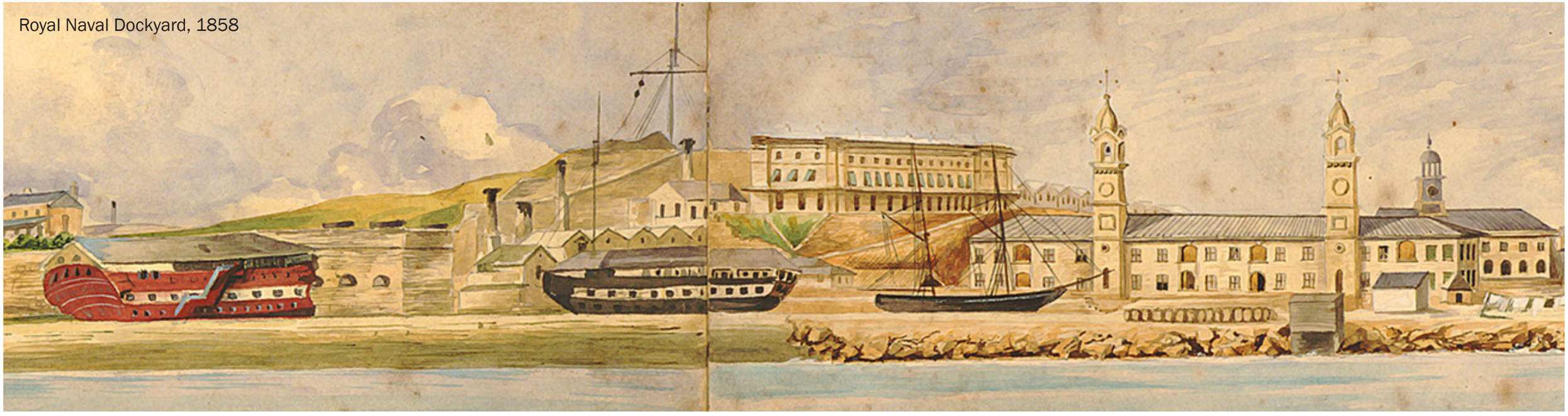
Royal Naval Dockyard, 1838



View From Commissioner’s House 1847



Royal Naval Dockyard, 1858



Royal Naval Dockyard, 1895

DOCKYARD DURING WORLD WAR TWO

During World War Two the naval base organized trans-Atlantic convoys. Ships would arrive singular at the dockyard, be assembled into a fleet and sail under guard patrol to Nova Scotia, where the convey size would increase and sail across the Atlantic to the allied forces in Europe.

With the need of major warships needing to be used in Europe the Royal Navy pulled its warships from Bermuda and placed them in the waters around the United Kingdom and Europe. This left the protection of the Island to the United States.

After World War Two, the United State and NATO's global dominance, the naval base diminished in importance to the Admiralty. With the United States becoming the dominant world power and its strong ties to the United Kingdom the importance of Bermuda's location lowered to the Royal Navy. This lead to the closure of the dockyard in 1958, at that time ownership was transferred from he Royal Navy to the local Bermuda government.

NATIONAL MUSEUM OF BERMUDA

In 1951 the British forces began to leave the Dockyard, this was complete in 1958. From 1958 until 1974 the Keep was left to decay. In 1974 the Bermuda Maritime Museum and takes control of the Keep and began a 25 year restoration process on the Commissioners house. This is completed in 2000.

The Bermuda Maritime Museum is officially opened by Her Majesty Queen Elizabeth II in 1975. The museum with the addition of the old Casemates prison becomes the National Museum of Bermuda in 2010.

Key to map (right)
1. Queen's Exhibition Hall
2. Shifting House
3. Shifting Office
4. Shell House
5. Forster Cooper Building
6. Boatloft
7. Restrooms
8. Dolphin Quest
9. Dainty Exhibit/Westminster Palace Stone
10. Artifact Conservation Laboratory
11. Commissioner's House / Restrooms
12. High Cave and Magazine
A- G Bastions A to G and Magazines

CASEMATES

Casemates was built as a barracks for members of the Royal Navy stationed at the Royal Naval Dockyard. Construction began in 1838 and completed in 1840. Designed to be bombproof the building was designed with two main floors, the second of which was a series of barrel vaults with a false third story of stone and rubble, and a roof designed for rainwater collection.

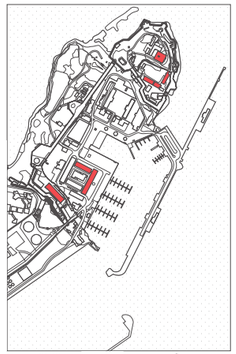
It was used as a barracks and storage facility until 1958 when the Dockyard was closed. During the 1960's the building was transformed into Bermuda's maximum-security prison. It operated as a prison until 1993 when it was closed. In 2010 the ownership of the building transferred to the National Museum of Bermuda, where work to remove the old prison facilities has been ongoing.

A.H. Cooper & Sons Ltd
A.H.Coopers
Trisson
WATER

WEST END YACHTS

FRAMEWORK PLAN

INVENTORY AND ANALYSIS


Building Age 1795-1830

Building Age 1830-1890

Building Age 1890-1950

Building Age 1950-2012

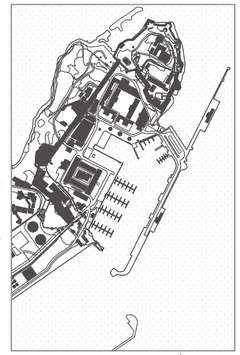
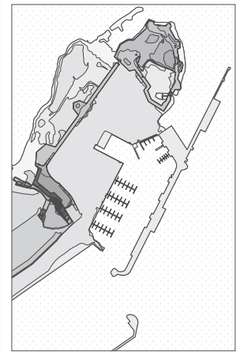
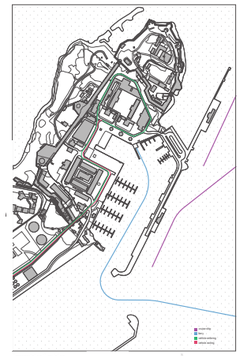
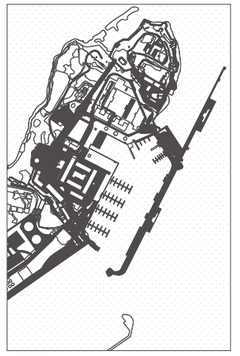


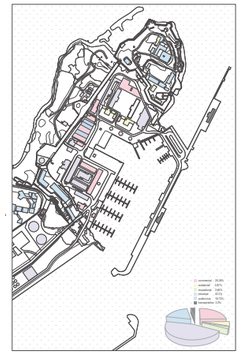
Figure Ground

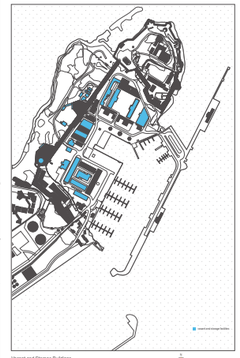

Topography

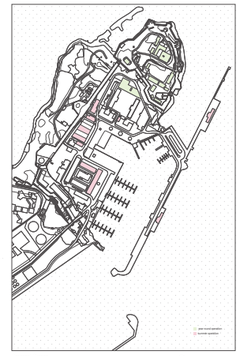
Interior and Exterior Buildings


Transportation Circulation


Hardscape Surfaces


Land Use


Vacant and Storage Buildings

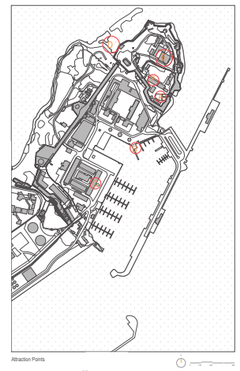

Seasonal Change

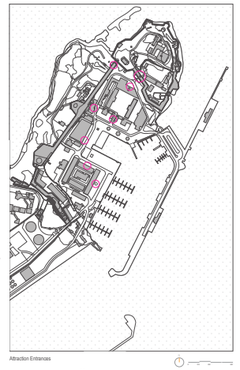
Cruise Ship Passenger Distribution

Passenger Site Interaction

Distribution Without Cruise Ship

Site Entrances


Attraction Points


Attraction Entrances

A

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C

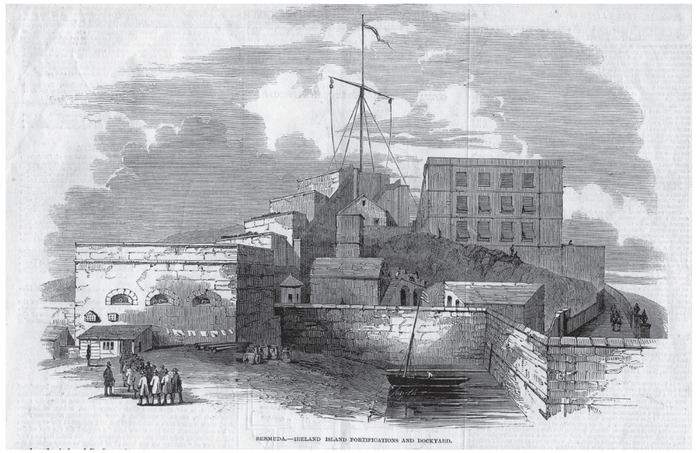
D

E

F

BUILDIG AGE 1795-1830

BUILDIG AGE 1830-1890



BUILDIG AGE 1890-1950

BUILDIG AGE 1950-PRESENT

FIGURE GROUND

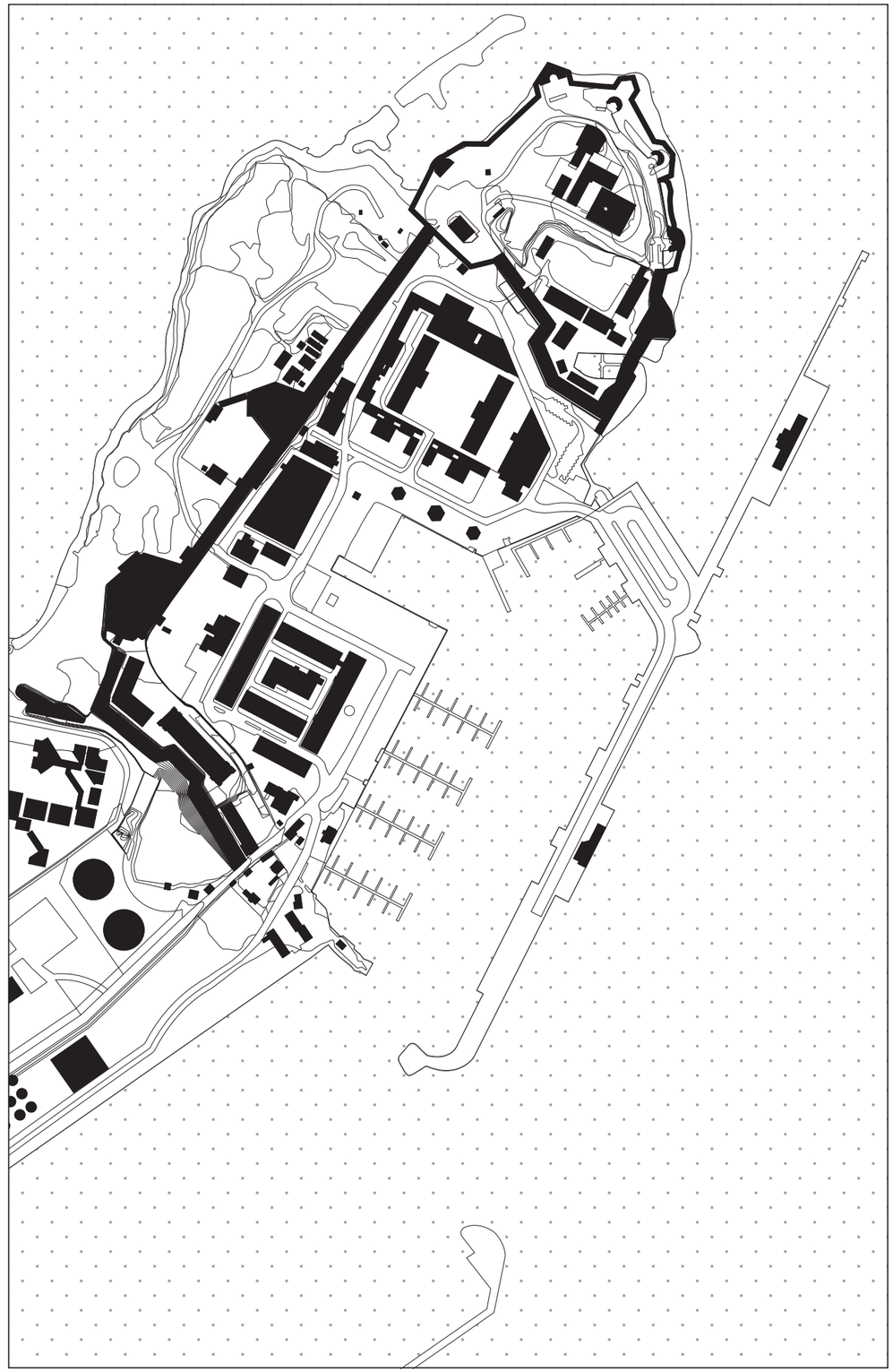
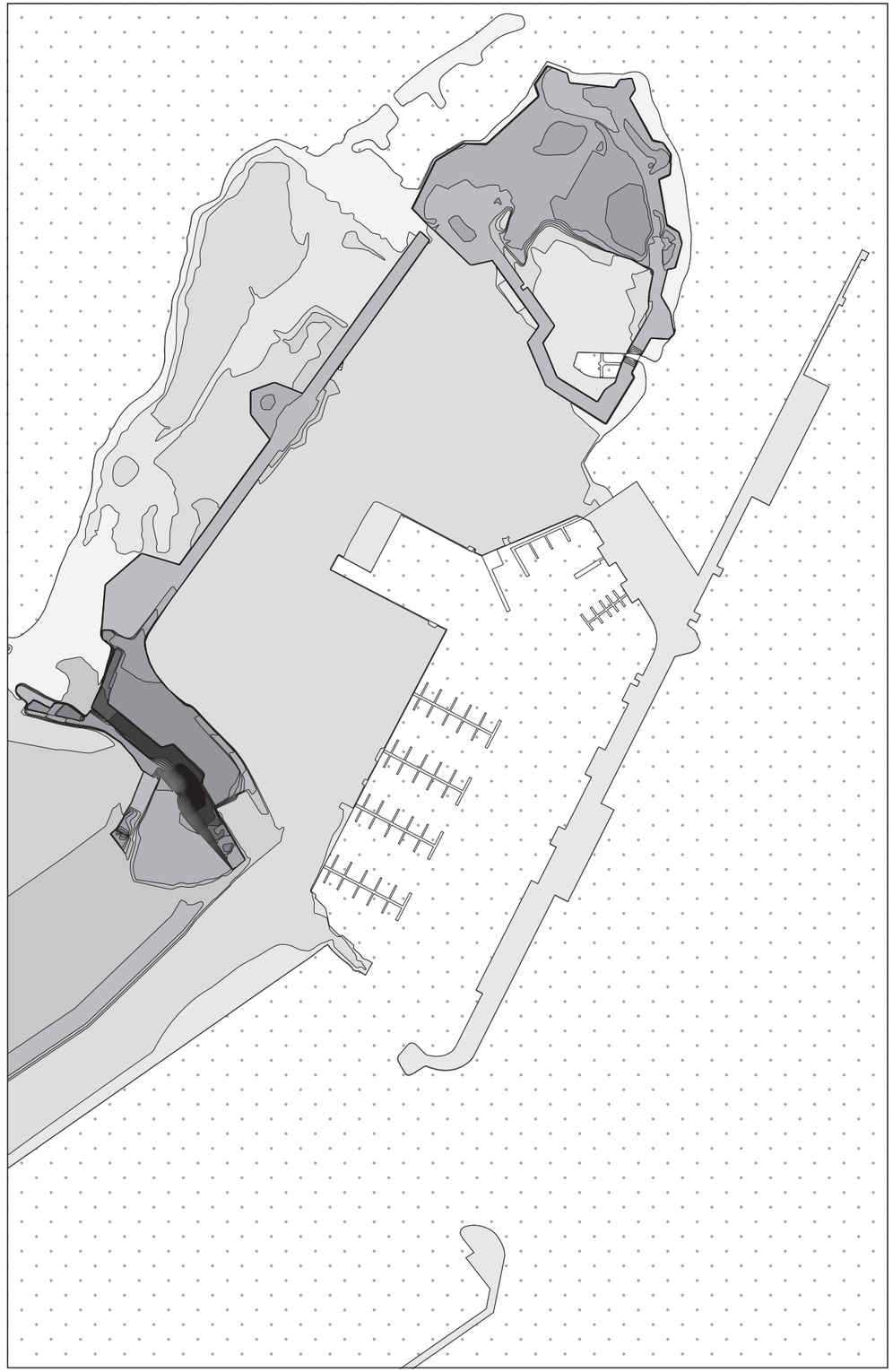


Figure Ground

TOPOGRAPHY



Topography

INTERIOR AND EXTERIOR BUILDINGS

The Royal Naval Dockyard is surrounded by water on the east and north sides. The rampart wall to the west extends from the keep to Casemates and creates a permanent barrier on the western side; the wall protects the site from the elements of the open ocean, the elevated southern section where Casemates offers a promanant fixture throughout the site and is the entrance to the Dockyard.

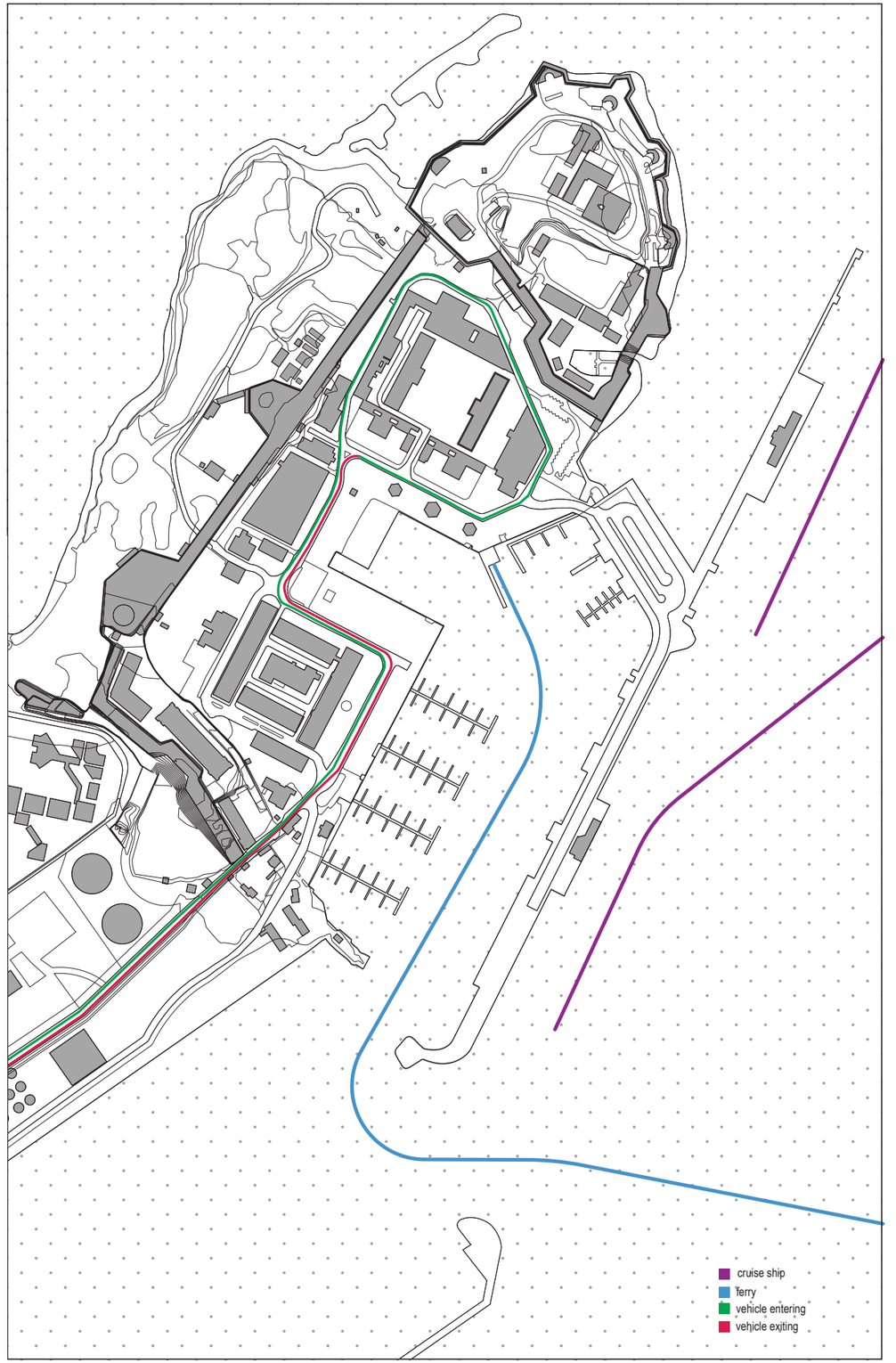
On the diagram to the right, the pink buildings show the Dockyard. These buildings create the interior of the site. Buildings located on the edge of the site, but not considered parts of the Royal Dockyard are shown in brown.

Interior and Exterior Buildings

SITE CIRCULATION

The site offers three forms of circulation into the site; vehicular, with one entrance and exit on the southeast section of the Dockyard; ferry, connecting the site to Hamilton, and St. George; and cruise ships which dock on the eastern edge of the site. This offers the largest amount of visitors at one moment.

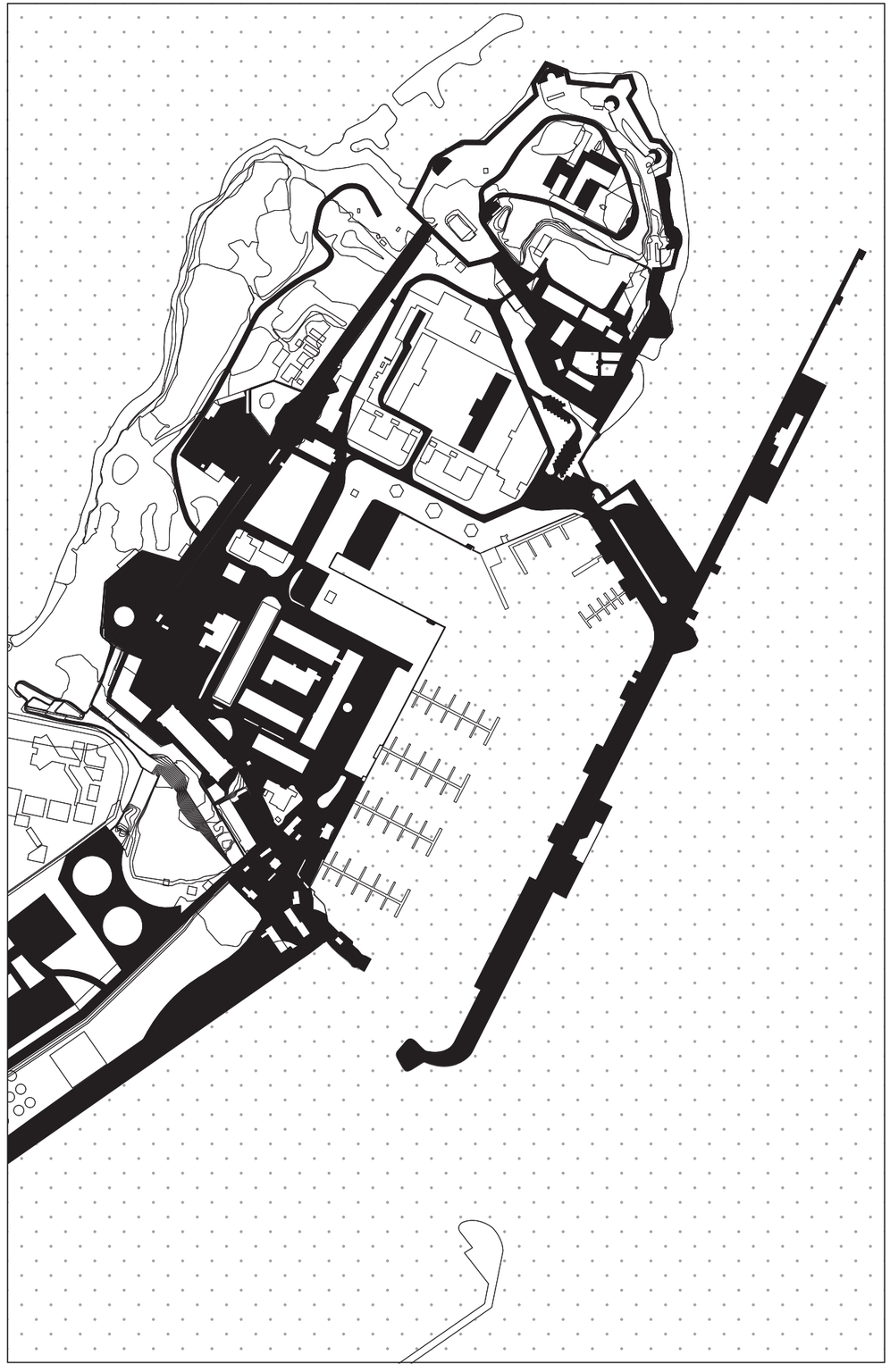
With limited parking spaces in the Dockyard public transportation is offered in the form of Bus that go form the site to Hamilton, and high speed ferry that connects the Royal Navy Dockyard to Hamilton in 10 to 15 minutes.



Transportation Circulation

HARDSCAPE SURFACE

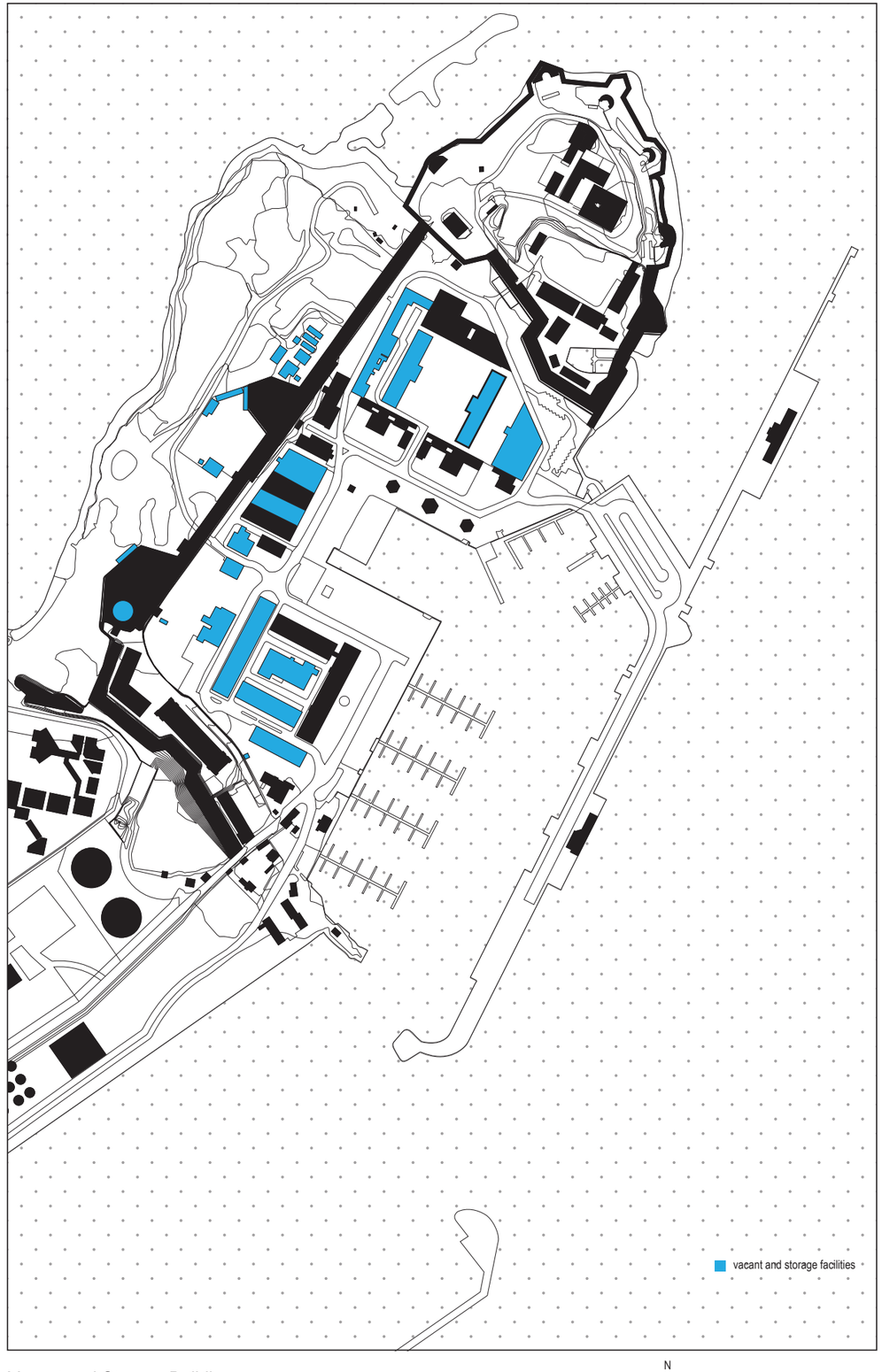
The large majority of the site is hardscape and little green space. This is shown on the diagram to the right. The heavy black space represents spaces that are paved.



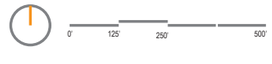
Hardscape Surfaces

VACANT AND STORAGE

The largest portion of the Royal Naval Dockyard are vacant or buildings used for storage, with large amounts of land used as boat storage. The diagram on the right shows vacant and storage buildings located throughout the site in blue. This accounts for 40.6 percent of buildings on the site.



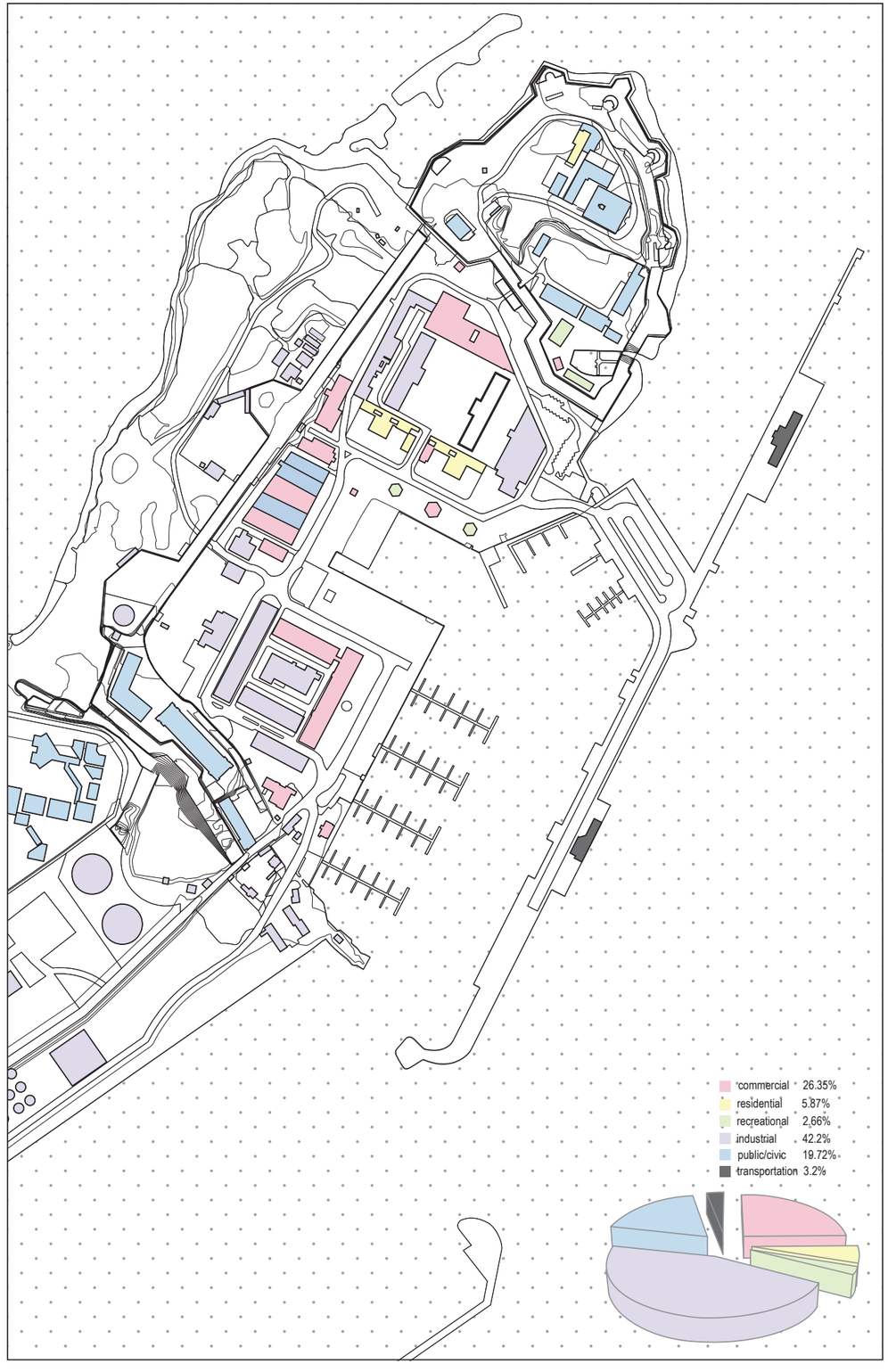
Vacant and Storage Buildings



CURRENT LAND USE

Currently a large mix of land use is located on the site, this includes commercial, residential apartments, recreational, Industrial civic, and transportation services.

The commercial sector of the site is for the use of tourist and not locals. This is evident in the selection of business that operate in the Dockyard, most being souvenirs. This is tailored to the cruise ship tourist and not the high-end land based tourist. Boat storage and vacant buildings dominate the remainder of the site. The largest attraction is the National Museum of Bermuda located at the north of the site. The site also offers a small amount of residential apartments.



Land Use

CRUISE SHIP CAPACITY

Norwegian Star
Passengers Capacity: 2,348

Explorer of the Seas
Passengers Capacity: 3,114

Combined Passengers Capacity: 5,462

Norwegian Dawn
Passengers Capacity: 2,224

Enchantment of the Seas
Passengers Capacity: 2,446

Compined Passengers Capacity: 4,670

CRUISE SHIP PASSENGER DISTRIBUTION

When the cruise ships are at port the occupancy of the Dockyard increases in large numbers the amount of passengers on the two ships range from 4,700 to 5,400. This offers the local attraction to benefit form each ships arrival. On the diagram to the right shows the disruption of the oppucancy of the site. Locals in the form of labor are shown in red and site visitors in blue.

Cruise Ship Passenger Distribution

PASSENGER SITE INTERACTION

On the diagram to the right a cruise ships passenger interaction with the site is shown. The blue represents the passenger's exploration of the site. He disembarked the ship and explored the dockyard and the National Museum of Bermuda along with the shops; he then went to the ferry to be transported to other parts of the island. Speculation can be made that upon his return he returned to the ship, this is shown in red.

Passanger Site Interaction

DISTRIBUTION WITHOUT CRUISE SHIPS

The diagram to the right shows the occupancy of the site when the cruise ships are not at port. The interaction with the site is locals with limited numbers of land based tourists.

Distribution Without Cruise Ship

SEASONAL CHANGE

The cruise season runs from mid-April to late September. When the last cruise ships leave port the site has a seasonal change. Several of the occupied buildings close for the season and reopen with the return of the cruise passengers. The diagram on the right shows business that close for the season in pink and green operate year round.

Seasonal Change

SITE ENTRANCES

The Dockyard offers three site entrances, the cruise ship terminals, the ferry terminal and the vehicular traffic entrance to the south.

Site Entrances

SITE ATTRACTION POINTS

Royal Naval Dockyard offers several attraction points. This includes Dolphin Quest, The ferry terminal, Clocktower Mall, beach and night club, National Museum of Bermuda, including the Commissioner's House and Queen's Exhibition Hall.

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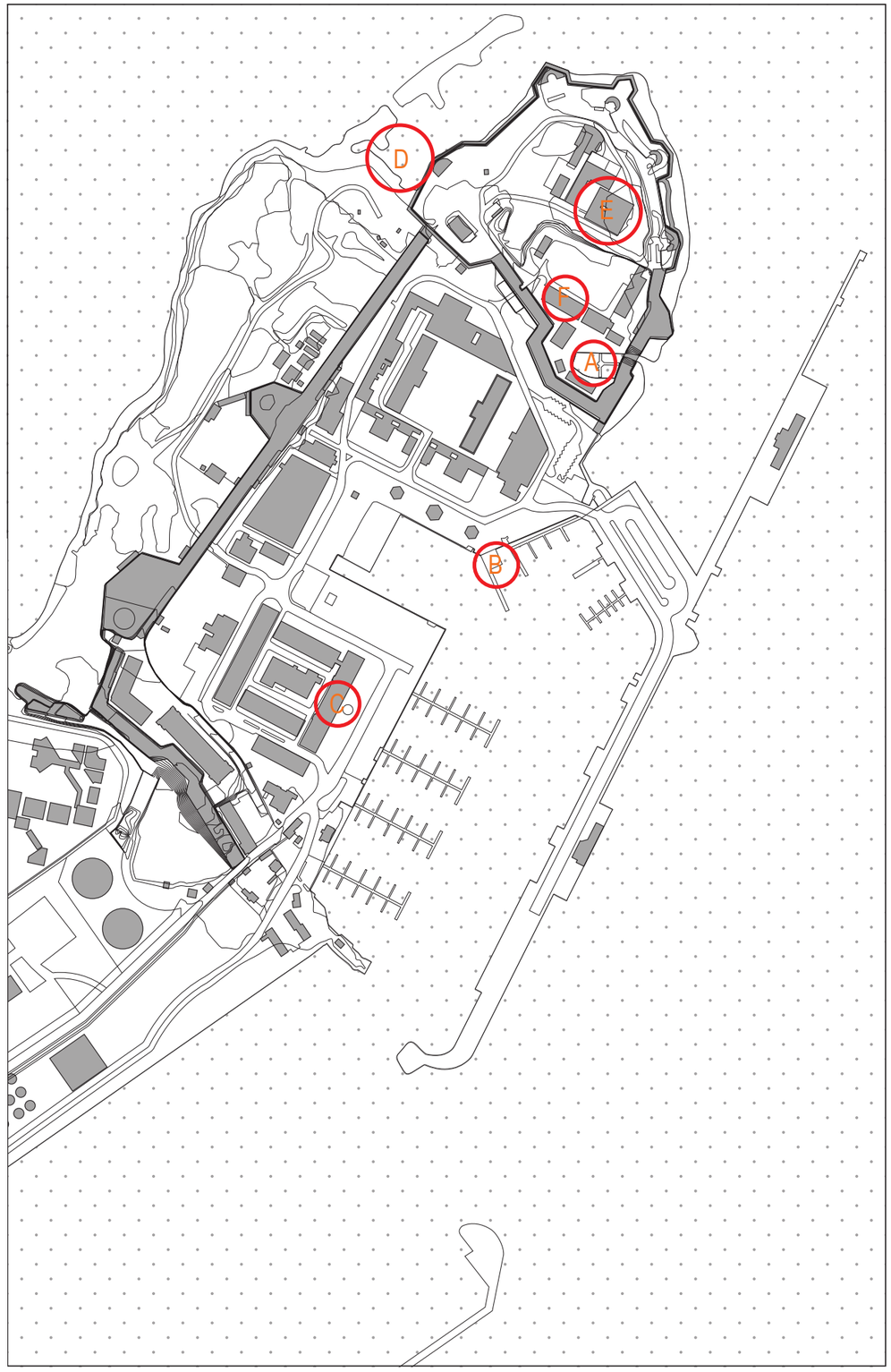
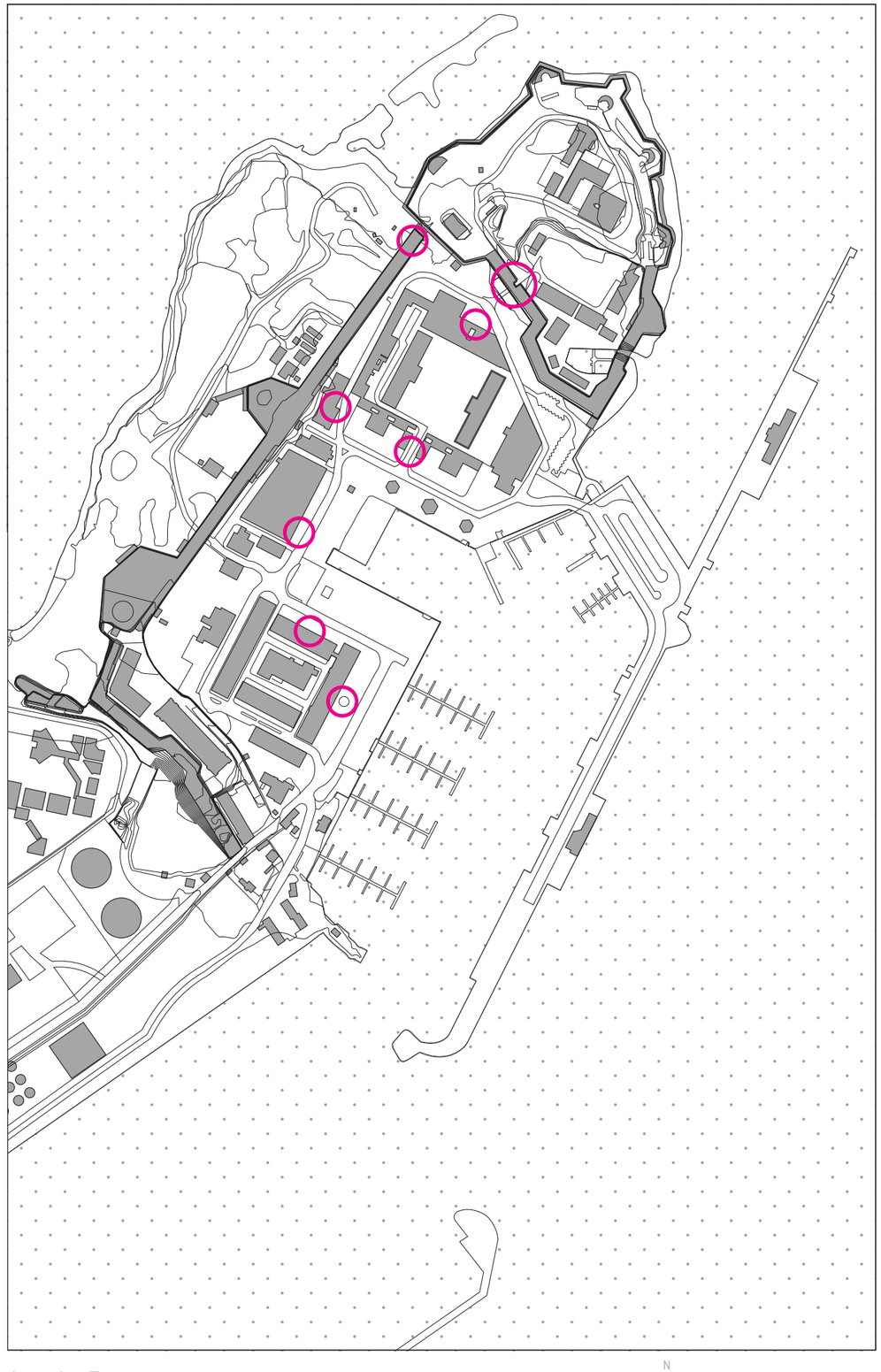
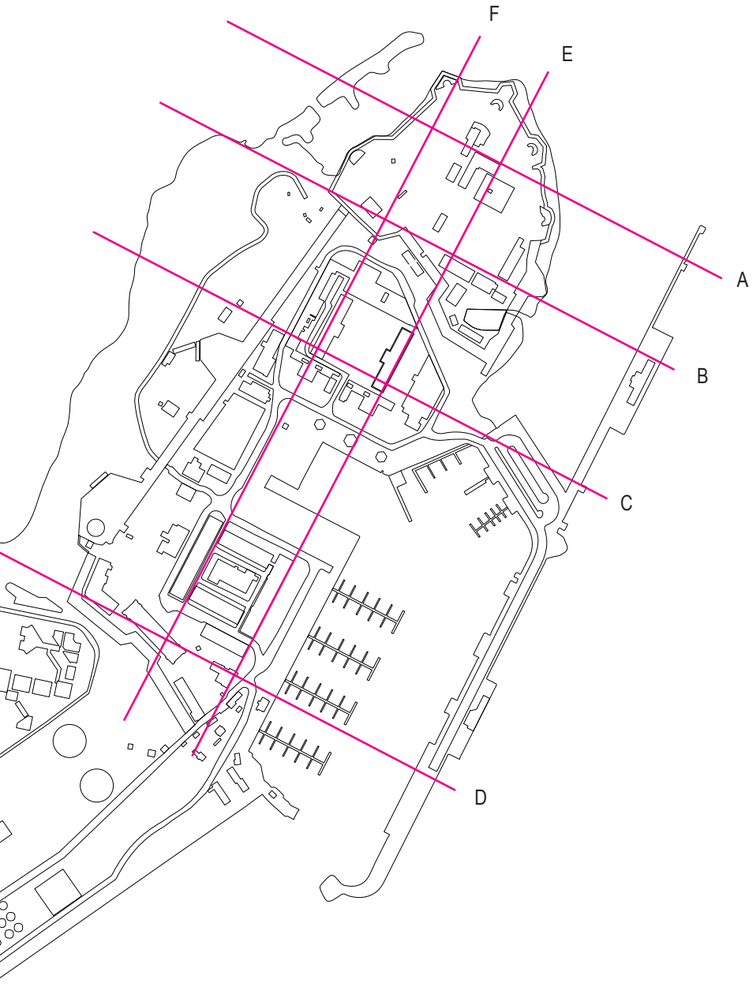


Attraction Points

SITE ATTRACTION ENTRANCES



Attraction Entrances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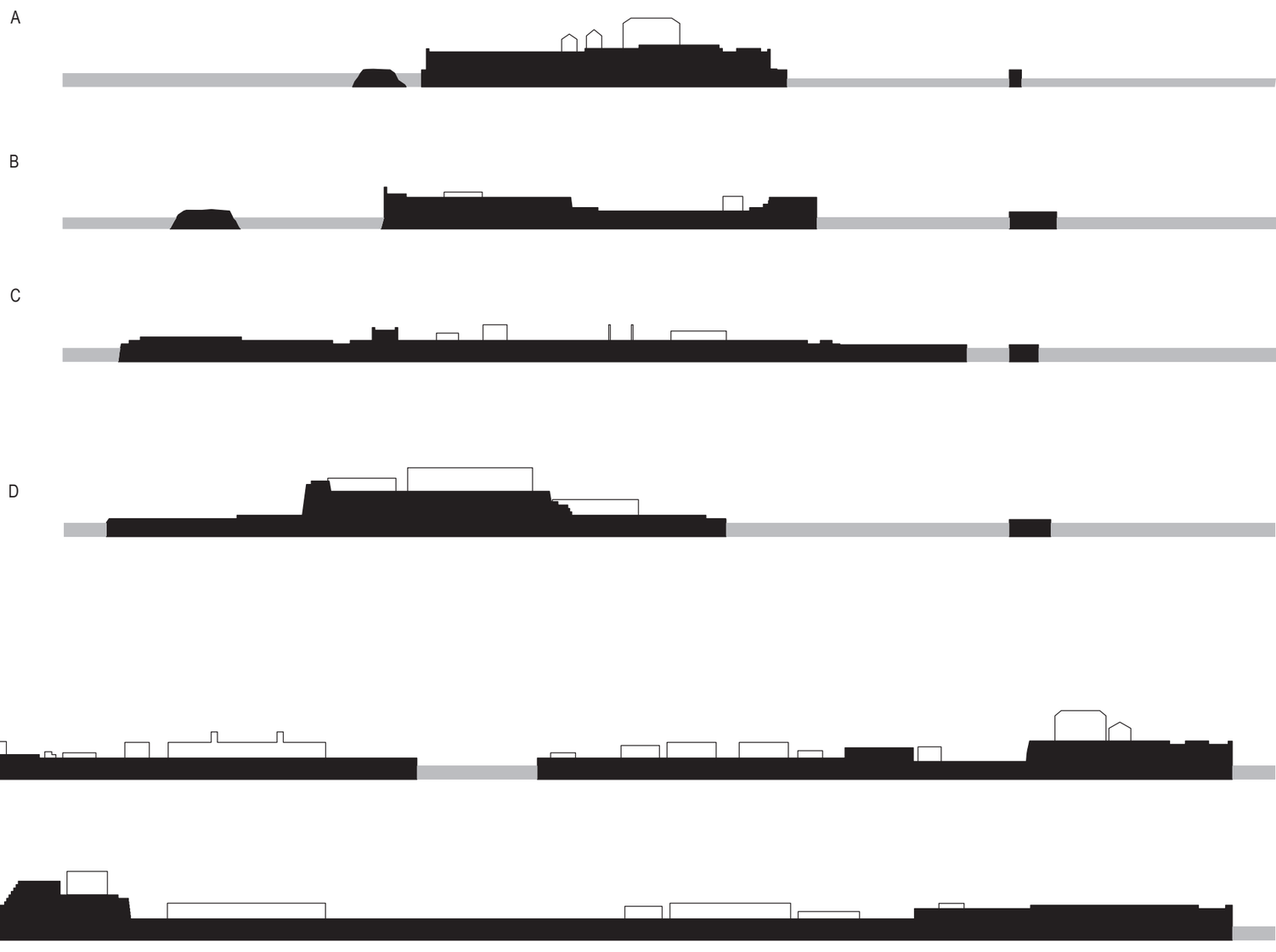
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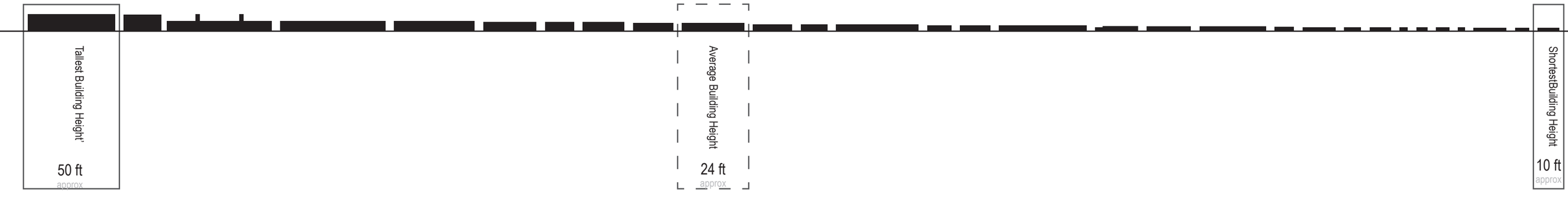
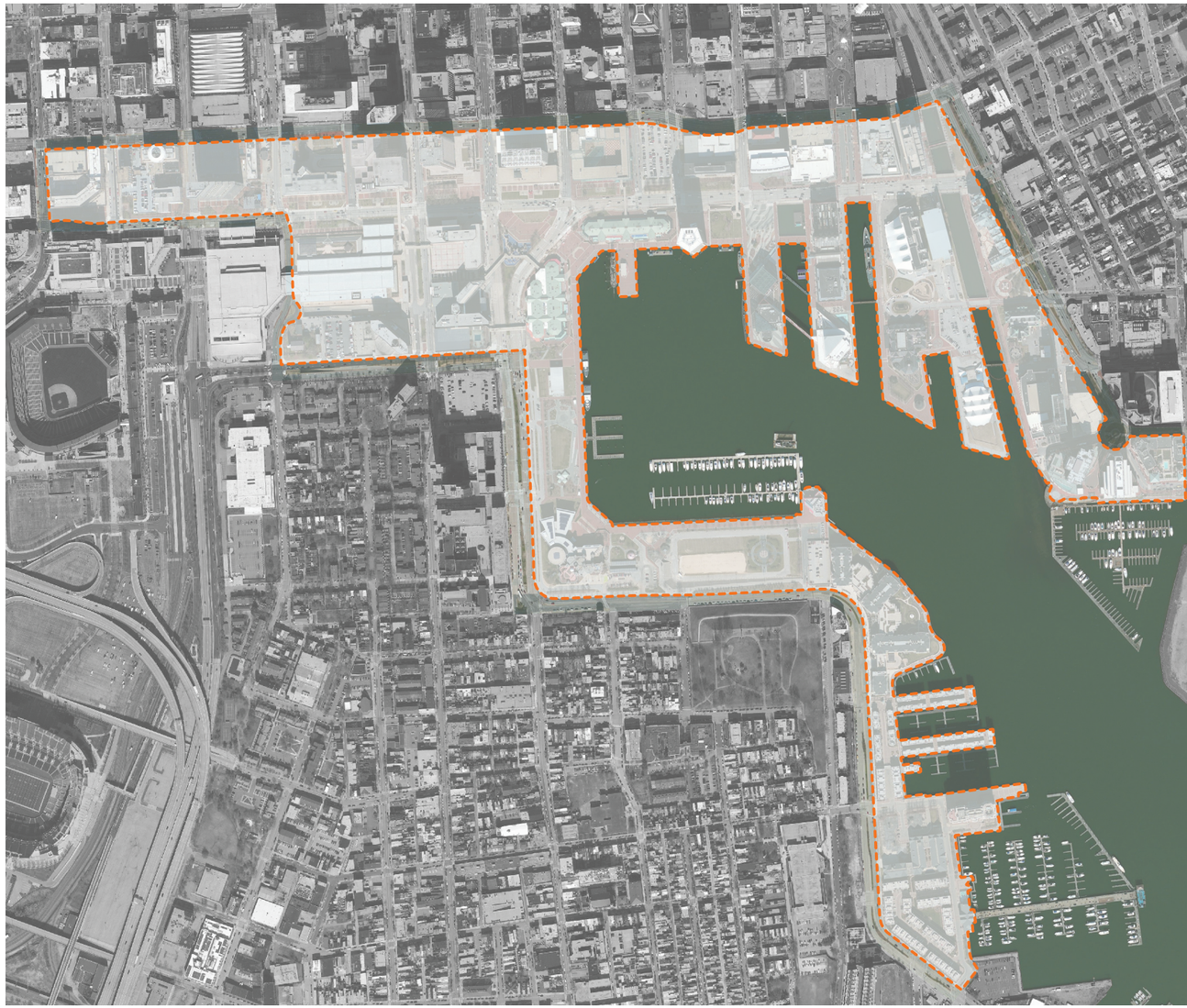

Tallest Building Height'
50 ft
approx
Average Building Height
24 ft
approx
ShortestBuilding Height
10 ft
approx

PRECEDENT CASE STUDIES

INNER HARBOR BALTIMORE

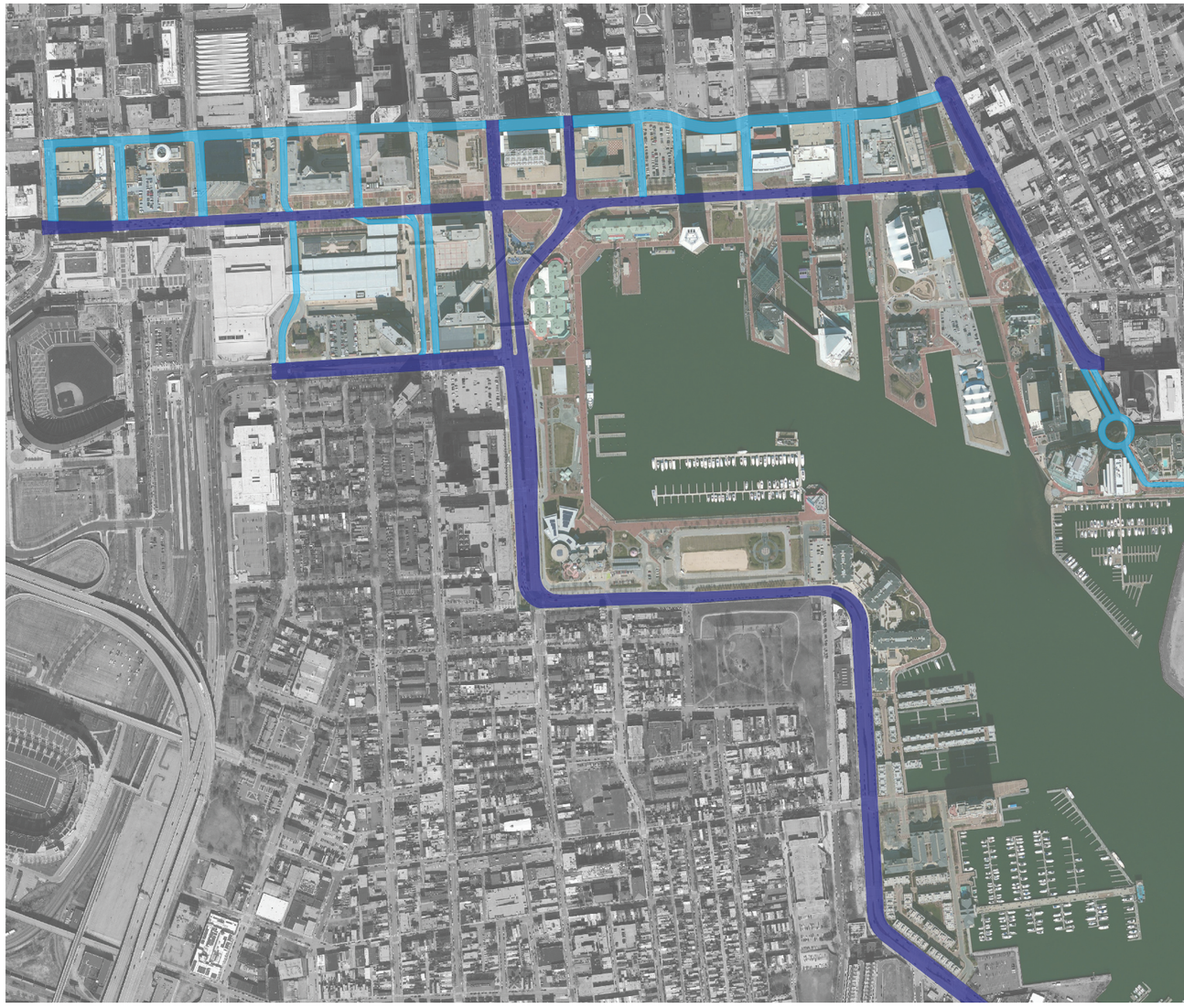
LOCATION

In many cities around the world, harbors, once prized, as assets vital to their economic progress had become liabilities. Major changes in shipping post- World War Two created a need for new shipping ports. As the shipping moved out, the rapid decline of the waterfront took place and became undesirable locations. This detachment between the city and water's edge was reinforced as cities built physical barriers between them. This can be seen in expressways built on the waters edge and the city. The Inner Harbor of Baltimore, Maryland was a historic seaport first used in the 18th century and suffering decline post- World War Two. The waterfront redevelopment began in 1958 with the proposal of Charles Center, a 33-acre site to be transformed from an industrial center into a multi-use commercial, tourist attraction and Baltimore's central business district. In 1963, the project was enlarged to 240 acres, to include the inner harbor business area. The success of the Inner Harbor in the 1970s and 1980s created a renaissance of city waterfronts globally and influenced over 100 cities' redevelopment plans. The project has won over 40 national and international awards and has been described as "the model for post-industrial waterfront redevelopment around the world" by the Urban Land Institute and achieving a citation by the AIA noted as "one of the supreme achievements of large-scale urban design and development in U.S. history."



ROAD NETWORK

The first issue facing the design and development team was to stop the proposed Harbor Route Expressway. This was a bridge cutting across the mouth of the harbor. This action prevented the cutting off of the city and the waterfront, a critical aspect in the redevelopment plans. The current road network is situated with a primary road running along the perimeter of the site on the south and southwest and through the site on the north. This allows for public transportation to access the edge and inner areas of the site and allows for quick removal of traffic through the site. Surrounding the primary roads is a grid pattern of secondary roads supporting the occupants of the site. The road network is designed to allow access to the site but prevents vehicular congestion in the largest section of the site within the harbors edge.

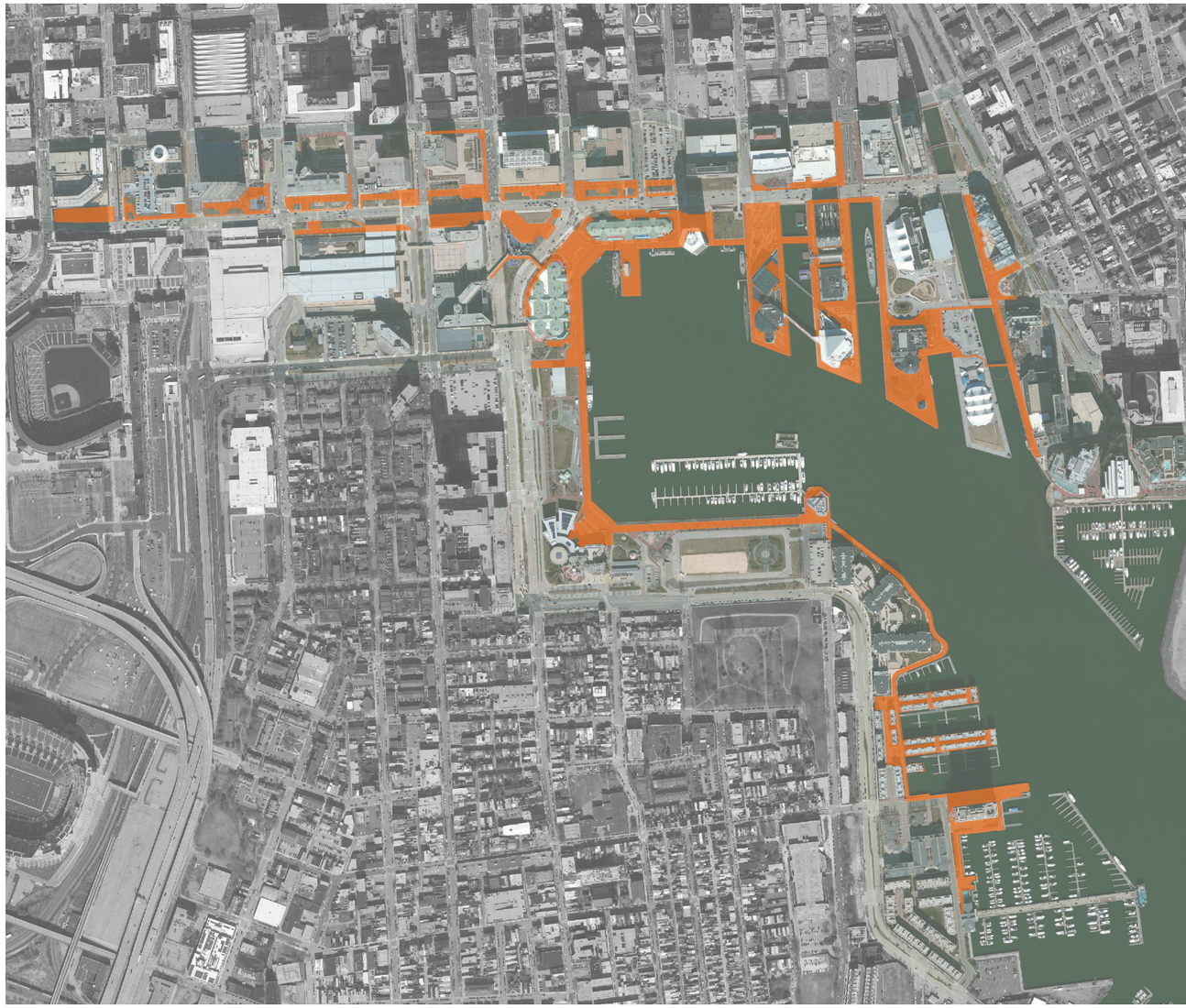


WATER EDGE

Baltimore realized the attraction draws people to waterfronts. The designers created a 30-foot brick promenade around the site and the water's edge. They gave the edge to the pedestrians and not to an office complex or hotels. This created a large public space between the water, commercial space, and multi-use buildings. Occupiers of the site would be able to leisurely walk the water's edge without interruption of a building's mass and the waterfront. To distinguish between the promenade and the commercial zones, the plan called for a raised three-foot section thirty five-feet from the edge to create a raised commercial zone and patio dining, creating an area that would connect the commercial zone to the water by placing a view over the height of the occupants of the promenade.

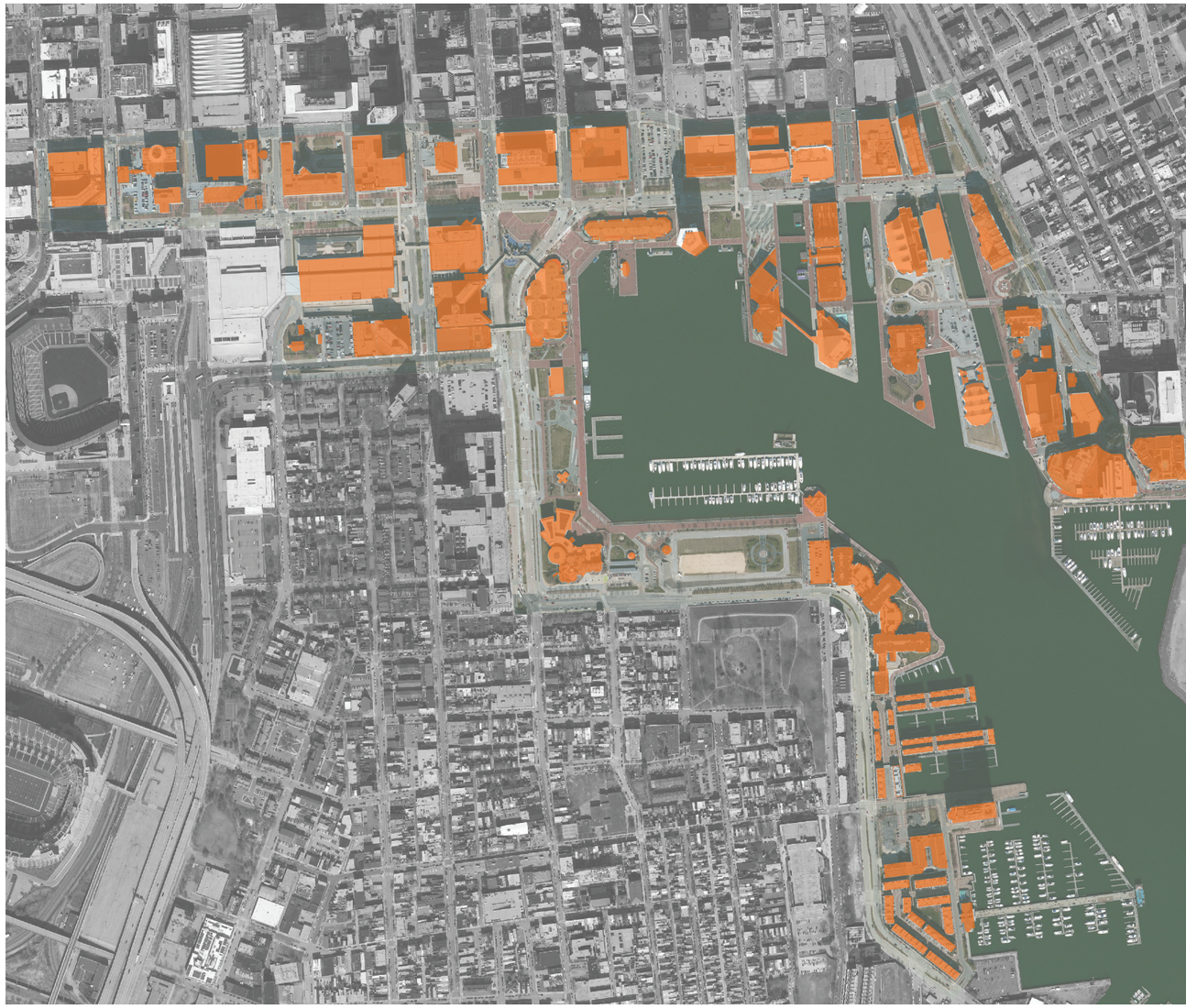
PEDESTRIAN CIRCULATION

Pedestrian circulation became one the most important key features of the redevelopment process. Designating the water as a vital public amenity to be preserved for the public, the design team created a circulation that encompassed all areas of the site. While the water's edge promenade takes prominence as the most important circulation network, connecting all aspects of the harbor, a vital path running west to east creates a connection between the harbor, city and office buildings hugging the edge of the site. The removal of physical barriers between the city and the harbor has been most vital in Inner Harbor, the master plan. This decision created a desire for persons to interact within the site rendering the Inner Harbor as a destination site for the city of Baltimore and a pattern of waterfront redevelopment.



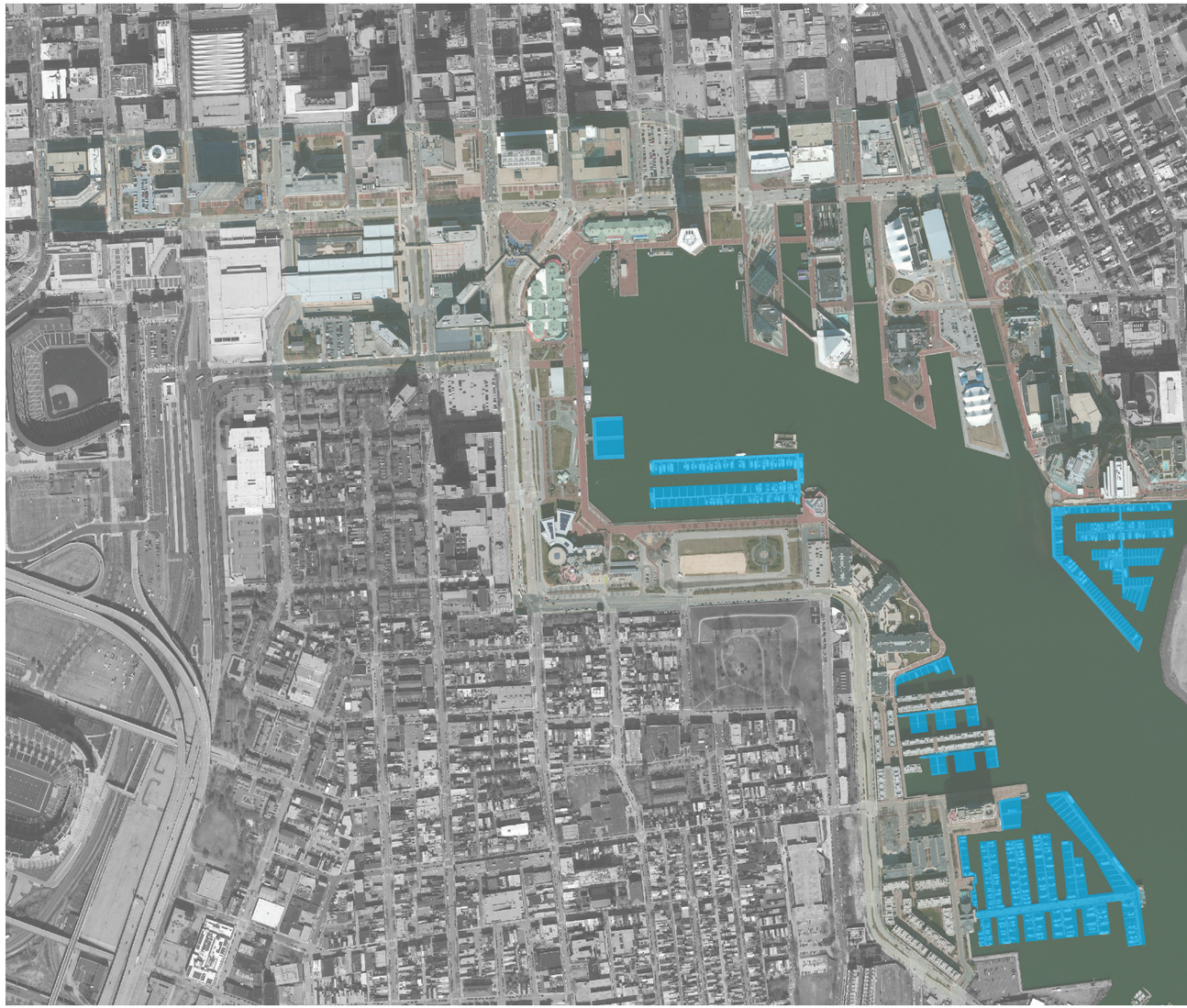
BUILDING LOCATION

For dramatic effect and to frame the harbor, the planners meticulously laid out the location for office buildings and towers. Immediately surrounding the commercial zone of the inner harbor is a continuous line of ten story office buildings, followed by towers kept back from the harbor to give the space an open and welcoming feel, while allowing the towers to use the natural attraction of the water and the views the harbor offers. This rule was intentionally broken with the building of the World Trade Center. Its location directly on the water's edge and distribution of the promenade creates a dramatic effect.



BOAT LOCATION

Still considered revelatory, the addition of a water plank allows for an active water port by small personal watercraft. This aspect has been eliminated from many of the world's waterfront redevelopments. The planners of the original redevelopment of the Inner Harbor attriute this as a main reason for it's success. With an addition of an active waterfront, it creates waterfront activity for onlookers to watch which creates an interaction between the water and its edge and allows for different interaction with the site from water-based transportation to land based activities.



LAND USE

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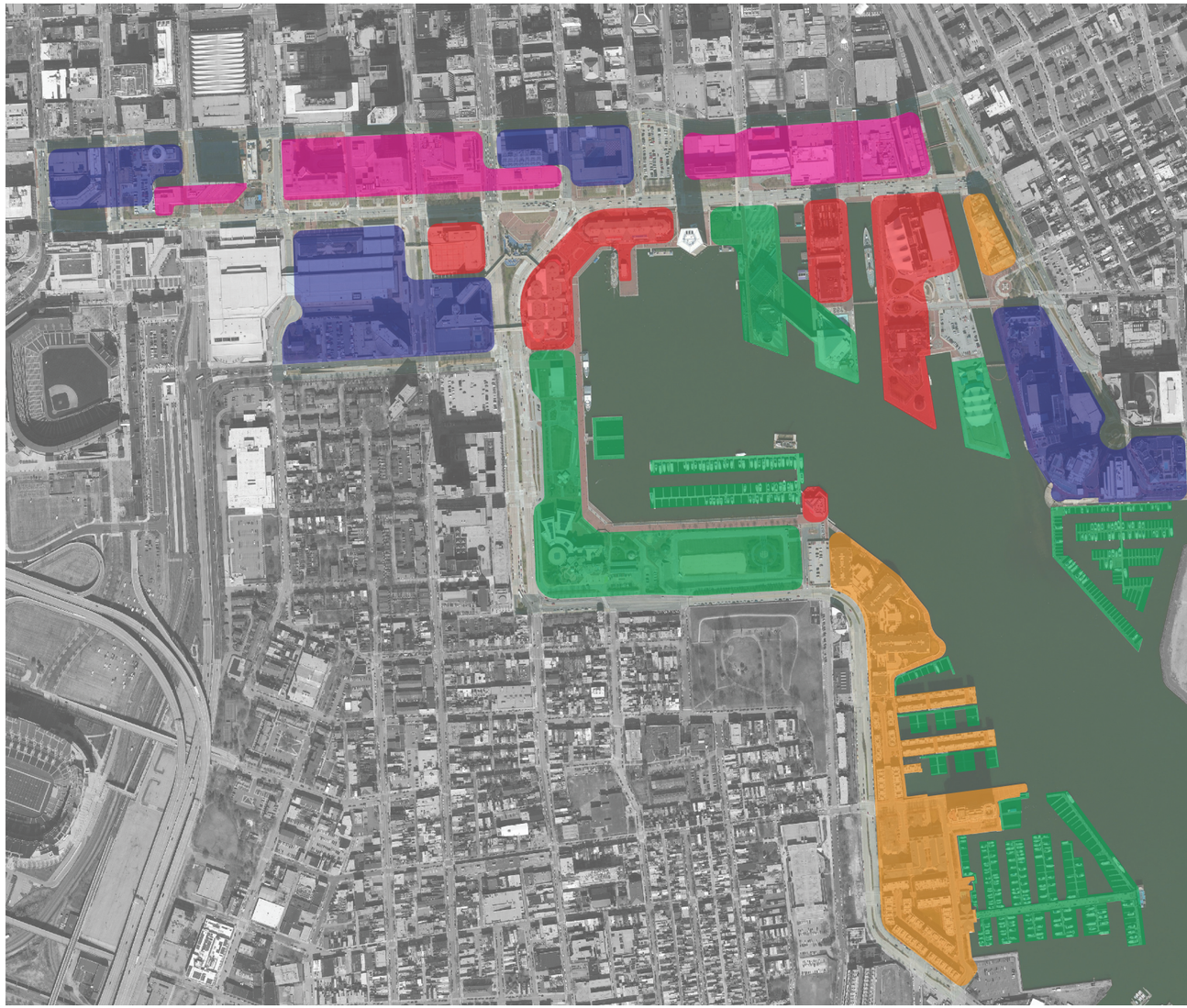
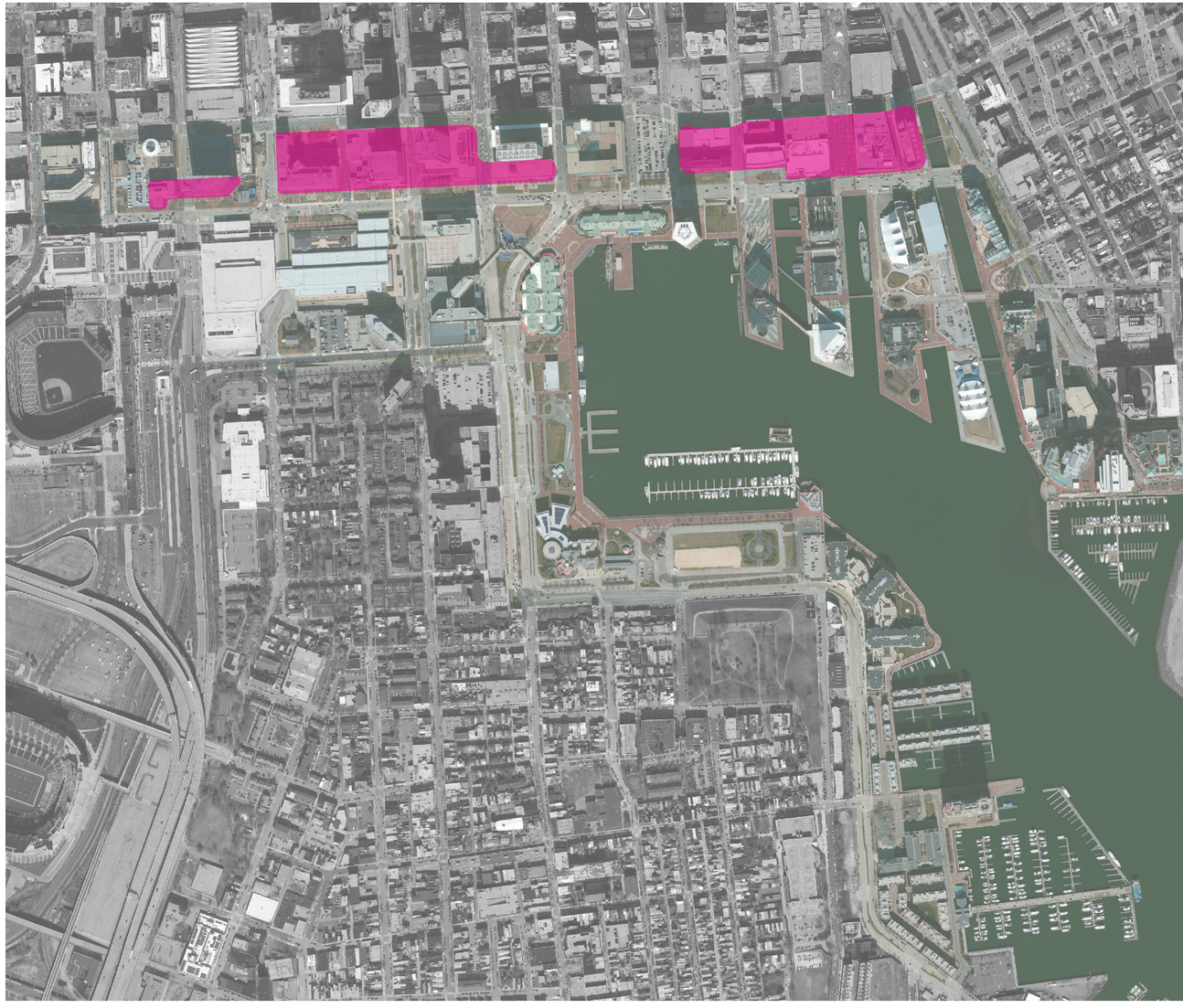


OFFICE LOCATIONS

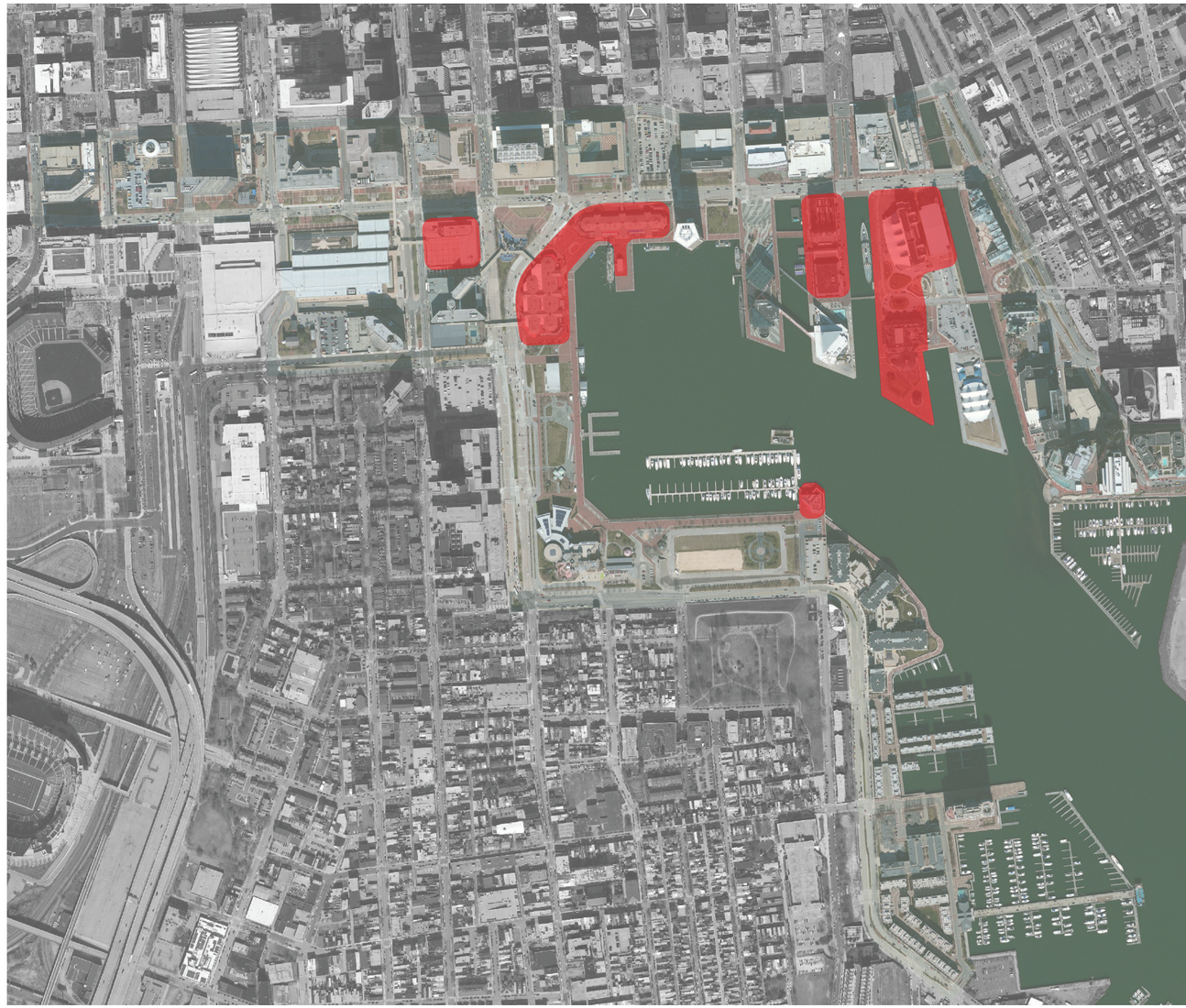
The location of taller buildings and towers were strategically placed to create a frame effect of the harbor, both within the site and on the water. Inner Harbor's northern edge is lined with a continuous array of ten story office buildings followed by taller office towers. This allows for the desired framing effect, views from the buildings to the harbor and an interaction of the site with the occupants of the buildings. The presence of a white-collar economic force creates a site used all seasons of the year, and not solely for the tourist season. The original design plan was for the site to act as a driver for office development and the relocation of the central business distract and not as a tourist destination. The offices and the attractions on site have successfully created a multiseasonal use site and program.



COMMERCIAL LOCATIONS

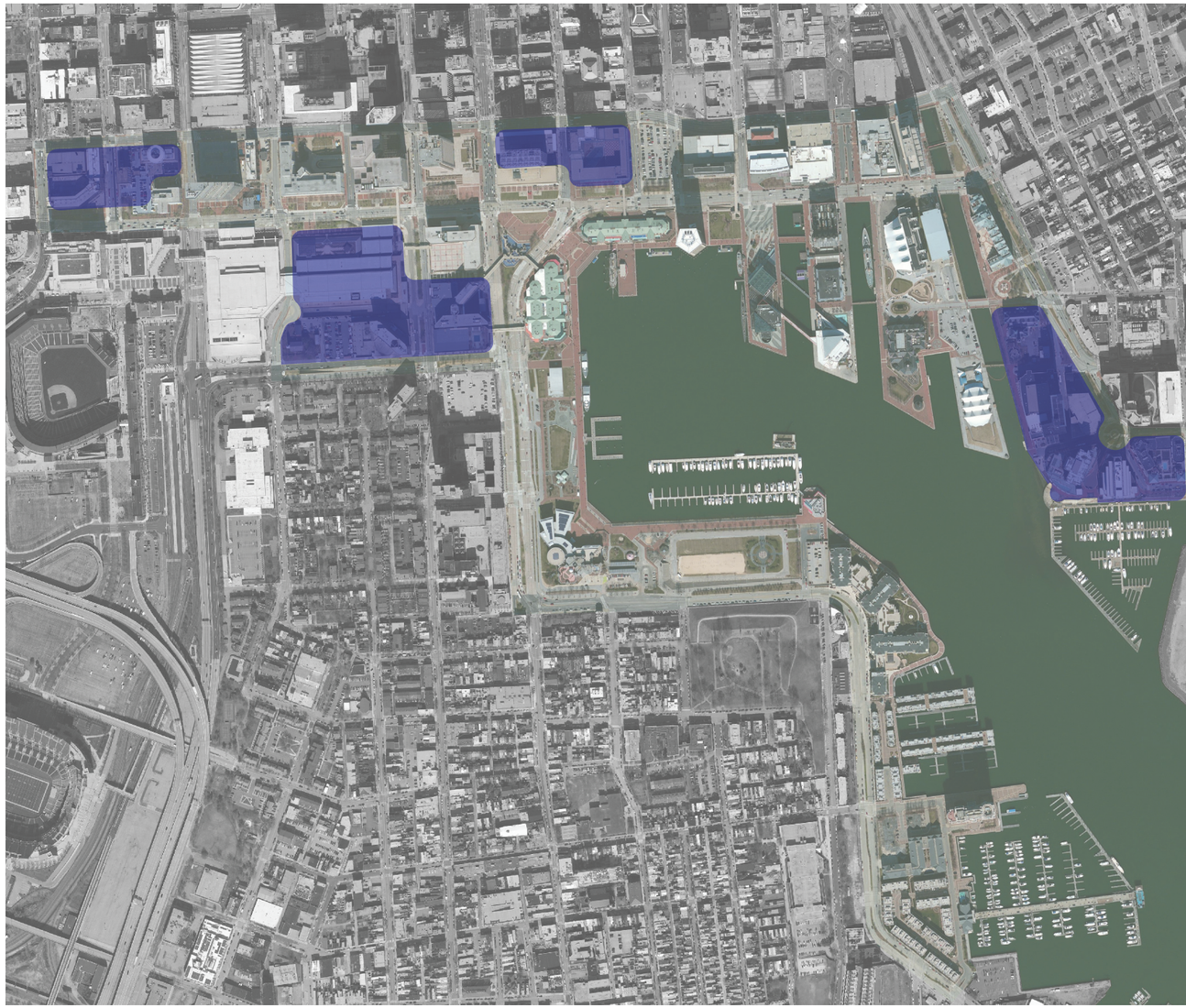
Harbor Place introduction to the site in July 1980 created the successful addition of commercial space to the Inner Harbor. Its success was instant and created a main attraction for non-museum goers and helped place Baltimore on the cover of New York magazine as the best place to spend a vacation.

The plan for a commercial space was the brainchild of developer James Rouse, who had transformed poor American inner cities as shopping locations. Harbor Place was modeled after Boston's Faneuil Hall Marketplace, the invention of Rouse. The building of the commercial space required the removal of a harbor park. The plan was meet with challenges and would eventually go to a city vote, and pass. The creation of two pavilions created a successful commercial zone in the harbor.



HOTEL LOCATIONS

To attract large hotel chains to invest in the development of the site the planner planned for the construction of a large convention center. The creation of the center attracted all major hotel chains to develop within the site. The location of the hotels falls within the tower section of the office buildings and on either the west or east ends and not in the middle of the site. This allows for the hotels to have a presence on the site but not a prominent visual effect and encourages the economic exchanges of the hotel guests asthey interact with the site that is visible within the hotel rooms and waterfront in the hotel lobbies. The convention center allows for the attraction of large conferences to fill the hotels and create a yearly use site for business and tourist alike.

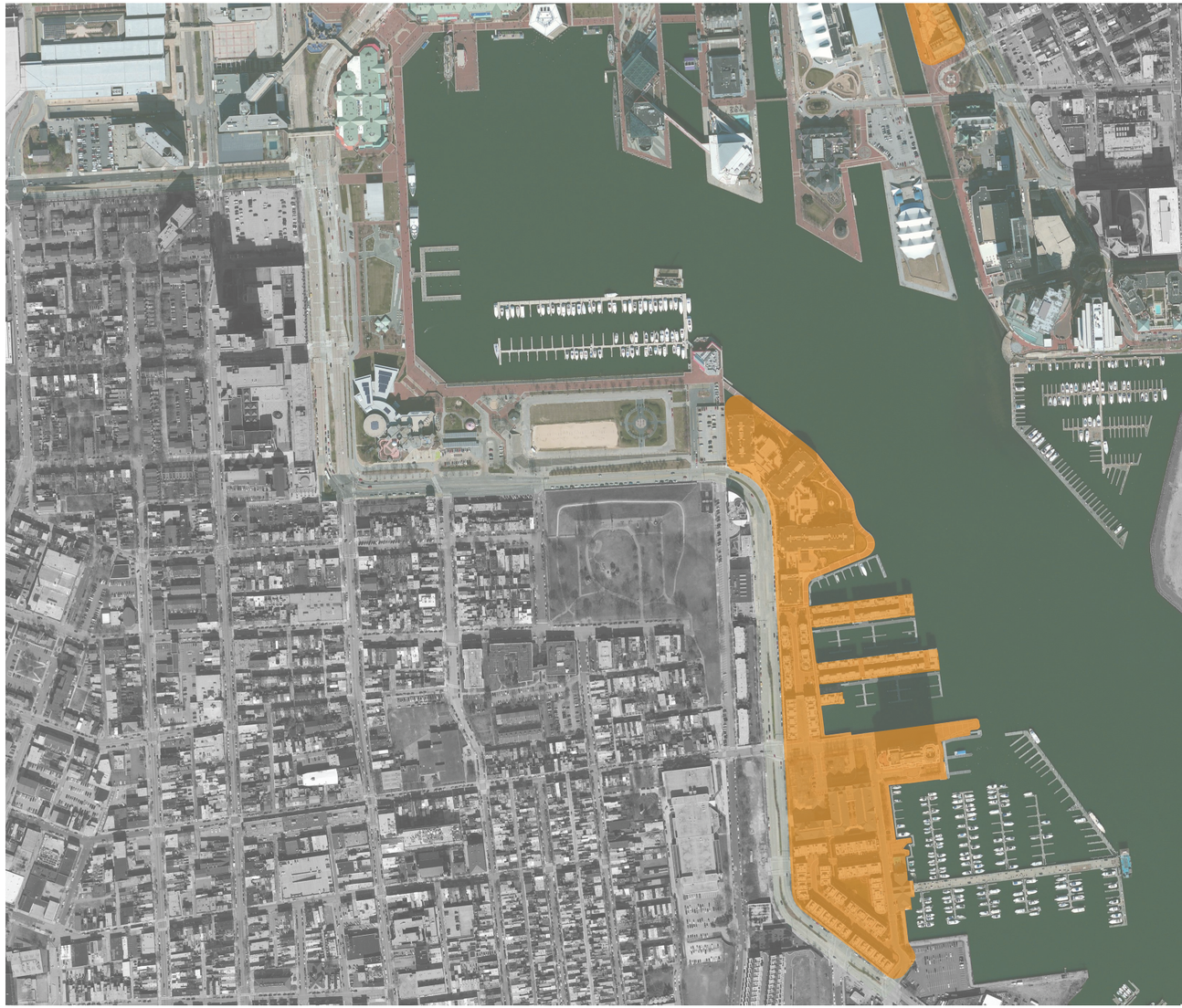


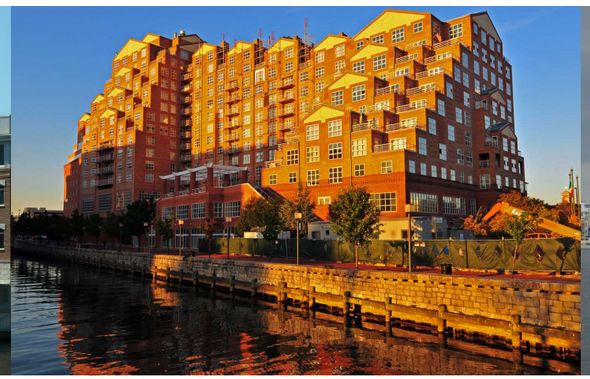
RECREATIONAL LOCATIONS

Conceived as “critical Mass of attractions” the allocation of a recreational program was placed on the sites water edge along the pedestrian promenade with the commercial zone between the two recreational sections. Activities include museums, maritime and ship museums, sport venues, concert halls, The National Aquarium, Maryland Science Center and water and boat activities. This range of dense activities allows for an attraction for all target groups and increases in overall site interaction. While the activities seem more tourist based than for the local population, the planners main objective was to draw the cities population to the waterfront and allow the tourist and locals to interact.

Residential

Goals of creating a permanent population in the inner harbor came before the plan was finished. The city took ten town-homes near the site and offered them in a one-dollar lottery. The winning residents agreed to restore the homes and not sell them for an allotted time. Currently, the site offers approximately around 1400 condos and townhomes ranging from mid six- figures and up. The largest portion of the buildings is located on the southeastern edge along the water. This creates a permanent population to help sustain economic stability and commerce exchange between locals and the commercial occupants and along with the office buildings creates a year round population in need of commerce.





Precdent Takeaway

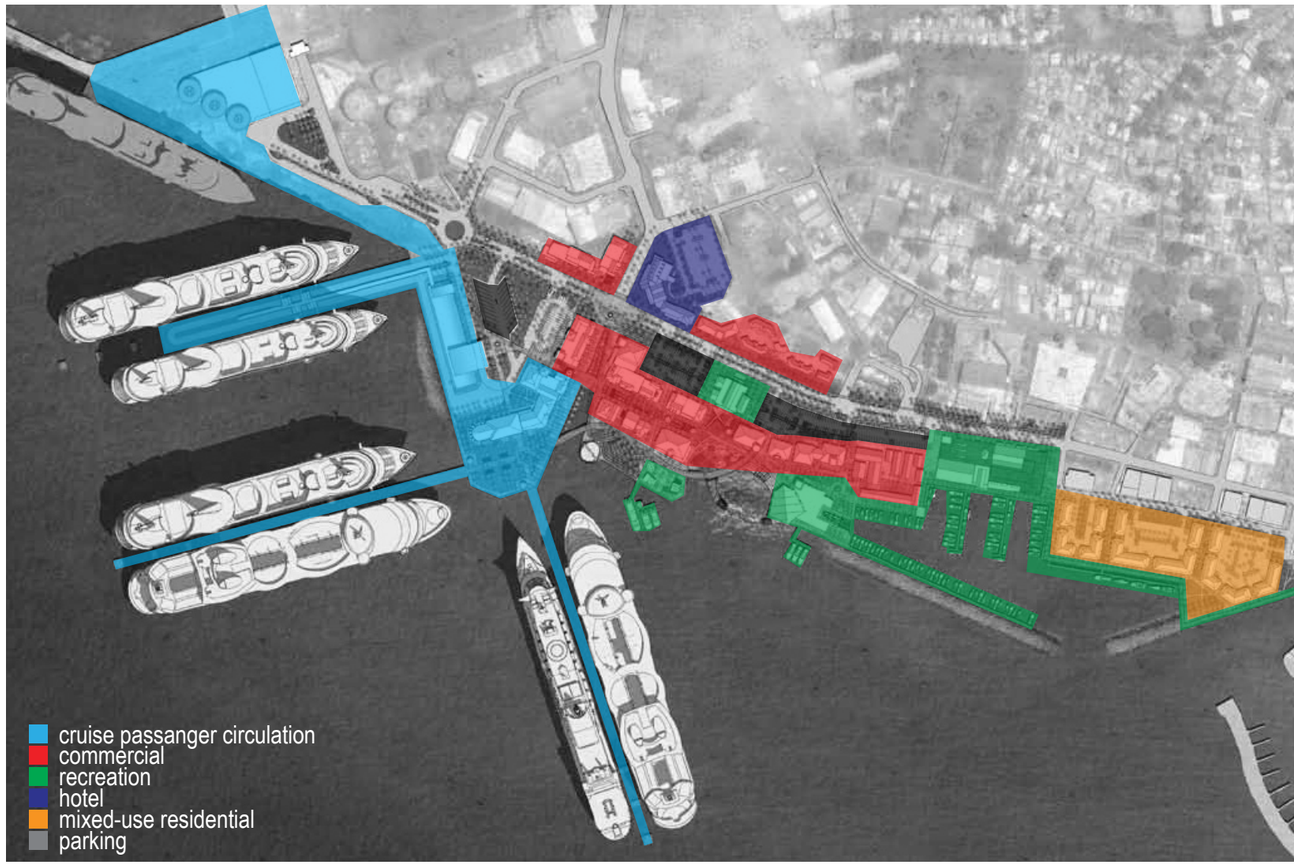
Pedestrian to the Water Edge

Cohabitation

Economic Exchange

Building Setback

SUGAR POINT BARBADOS BRIDGETOWN PORT



SUGAR POINT BARBADOS

Sugar Point designed is a 16-acre mixed-use waterfront redevelopment between the Port of Bridgetown and the city of Bridgetown, Barbados. The selected site located near the largest city in Barbados, Sugar Point will increase the annual cruise tourist capacity and increased capacity for docked ships from four to seven, while creating a year round site for locals and tourist alike and bridge the gap between the port and the city. Designed by the firm Land Use in 2010, construction began in late 2011. Envisioned as the flagship port of call for the Barbados cruise industry, it created an extension between the port and city with an emphasis on the cultural, heritage and the spark for social and economic growth of the island as a whole. The design creates a development designated to invite and encourage land-based guest and local residents to enjoy the newly created commercial zones, residents, entertainment, and cultural attractions.

The main objective of the design was to establish independent existing port operations and cruise ship industry. Used as the first image of Barbados the site strives to create interest in other parts of the county's tourist activities. Using cruise ship passengers as the driving force the design team strived to establish an encouraging environment for land based tourists and the local population of the island. Offering year round activates and employment, this insures a financially viable self-supportive site, creating business opportunities for the indigenous population of Barbados.

The master plan for the waterfront development of Sugar Point asks for inclusion of several uses to create a diversified site allowing for economic gain and interaction between locals and tourist, both by land and sea.

Cruise Arrivals Plaza

Creation of a zone allowing for the disbursement of passengers and acts as the first image of the island,Tthis area is located on the southeastern section of the site, the blue highlighted area in the image above.

Recreational Activities

The recreational activates include the use of the water, the addition of entertainment venues for concerts and musical events, and experiences unique to Barbados, and a museum, highlighted in green in image above.

Commercial Zones

Offering several areas for commerce to take place, the addition of international and local retailer and restaurants guarantees an influx of local and land based tourists. Located in the center of the site offering easy access to other aspects of the site, highlighted in red in image above.

Mixed-Use Residential

On the eastern edge of the site, the location creates a connection to the city of Bridgetown connecting it to the remainder of the site and encouraging interaction between the city and the new development, and creating a new permanent population within the site, highlighted in orange in image above.

Hotel

To encourage land based tourist occupation of the site a hotel was located in the central northern boarder of the site near commercial activates of restaurants and shopping, highlighted in purple in image above.

Cruise Arrivals Plaza

Arrival experience is critical and the quality of the cruise arrival is the dominating factor. This perception of the island is first experienced at the port as the cruise ship docks. The designers control this image with the addition of four new docks with an ability to dock seven ships.

Canal District

Adjacent to the Cruise Arrivals Plaza is the Clock Tower Building and Canal District, a commercial zone primary a shopping destination with a series of waterfront basins and landscaped green spaces. By using a series of different pavers the designers allow guest to distinguish the commercial zones for the other areas of the site.

Harbor Walk and Entertainment Area

Acting as the main food and entertainment corridor, this area is lined with gathering spots for locals and visitors. Offering outdoor stages and amphitheater overlooking the water allows for new entertainment activities at the site, along with the museums along the Harbor Walk path.

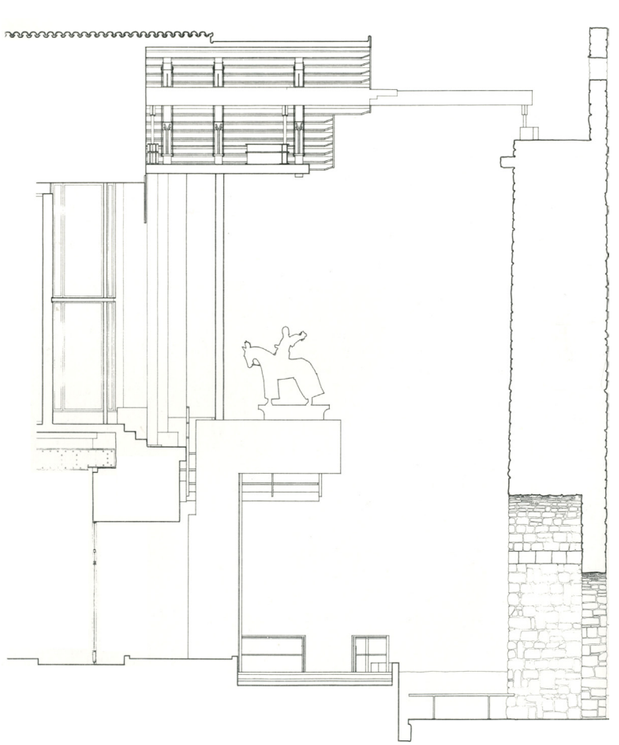
CASTELVECCHIO MUSEUM

carlo scarpa

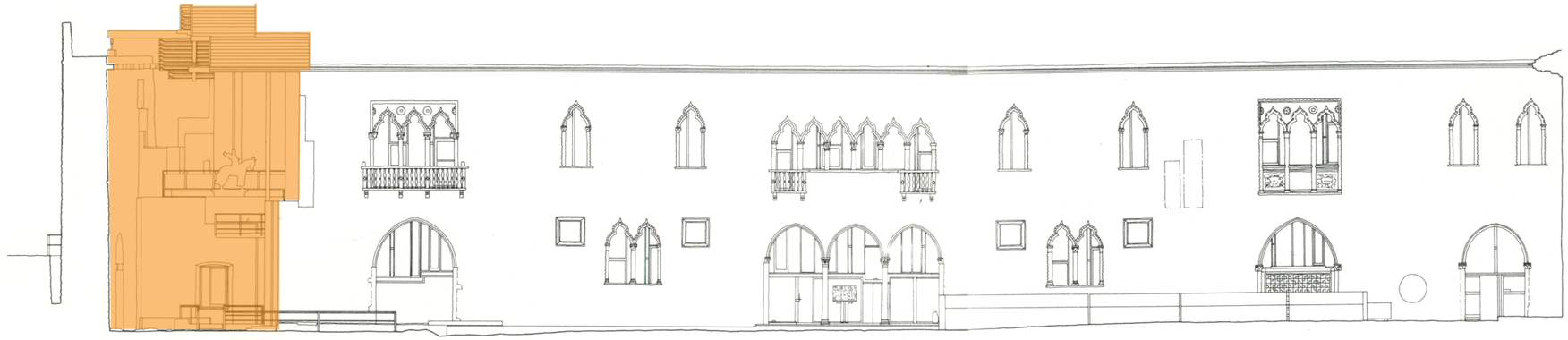
COMMUNE WALL

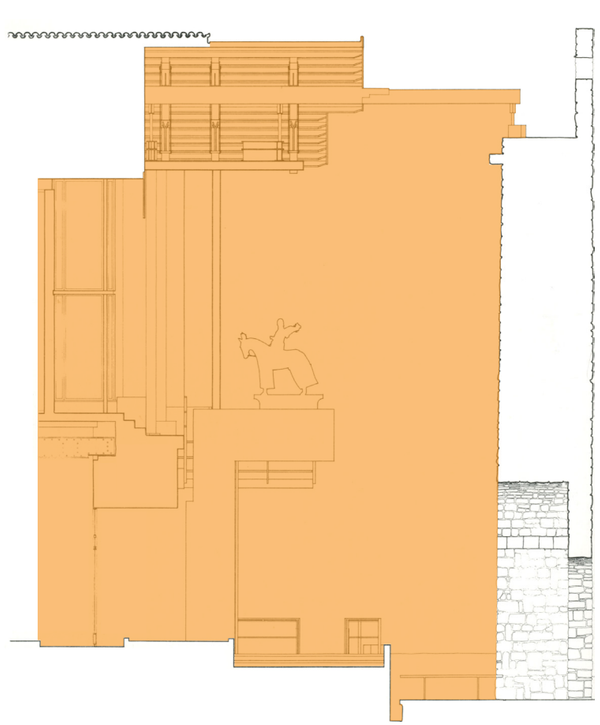
Built in the 19th century the Napoleonic barrack block is a foreign intrusion to the 14th century fortress. Even with its history, Scarpa did not refrain from the purpose of substantial demolitions where he thought appropriate. His idea was to remove the 19th century barrack and establish the original idea of the 14th century courtyard.

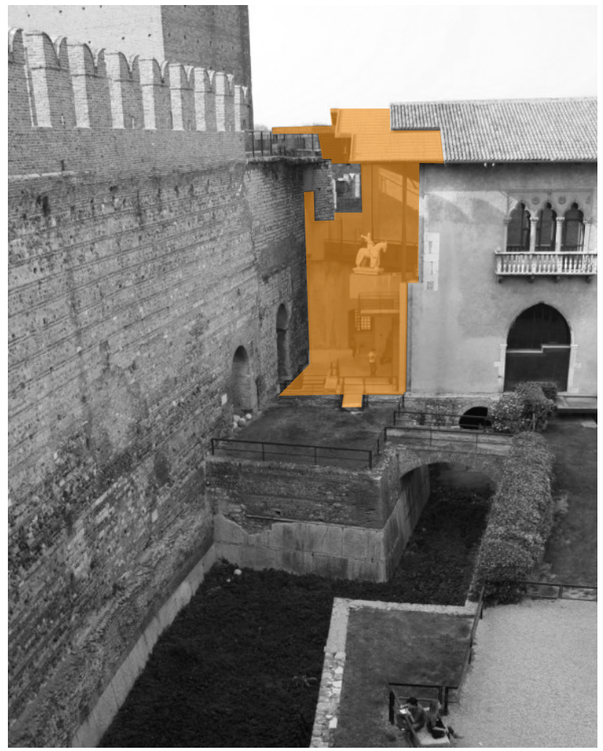
The idea was for an entrance court where Scarpa proposed the separation of the two parts and the creation of a giant entrance court and setting for the Cangrande Statue, thus allowing the historical building to remain historical but create a new life for the section of intervention.



COMMUNE WALL



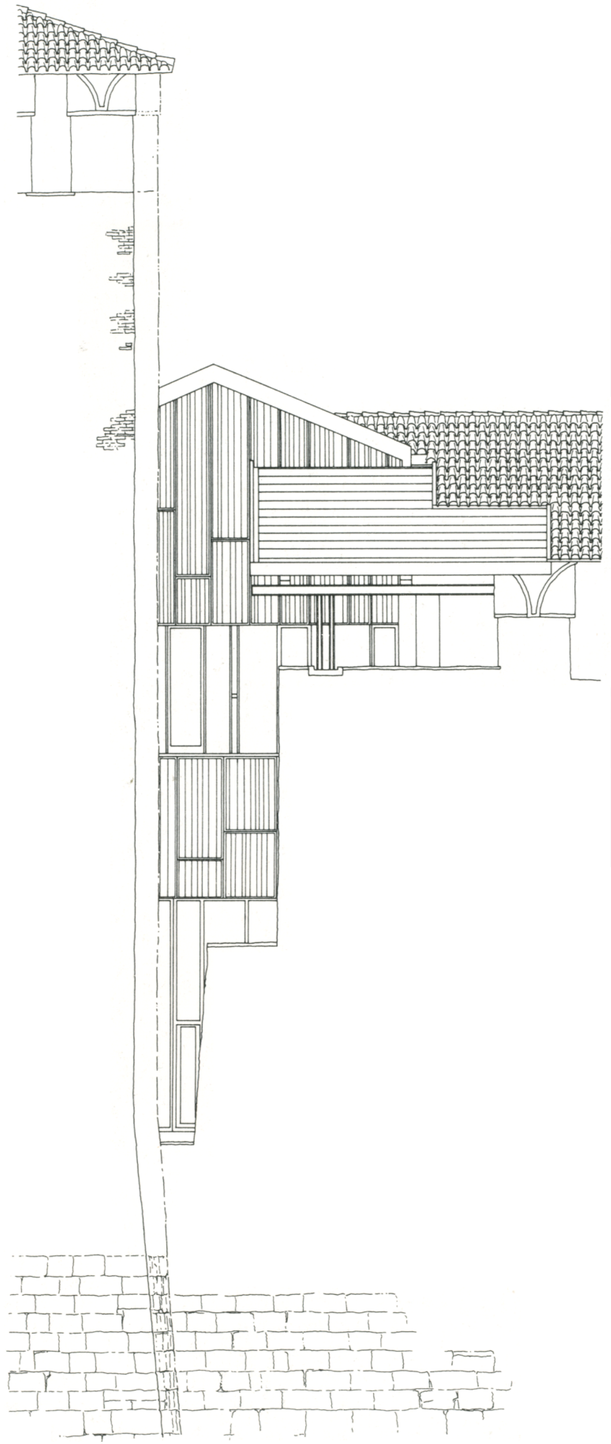




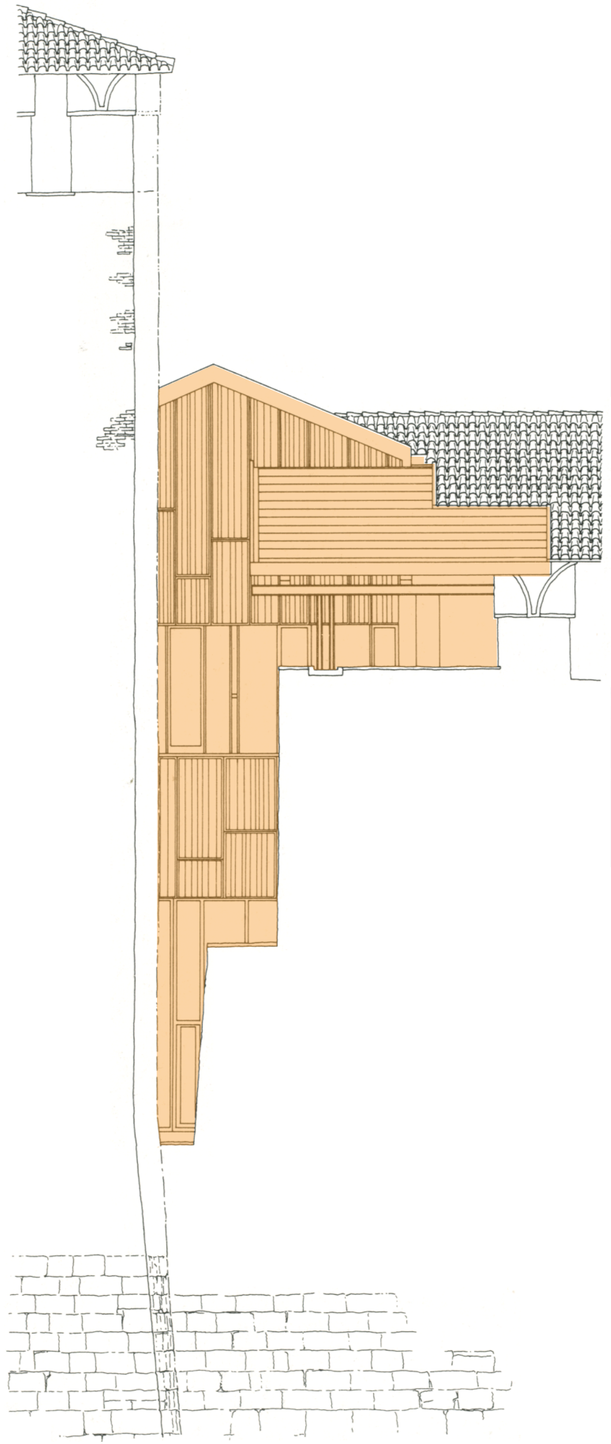
NORTHEAST TOWER AND WALL

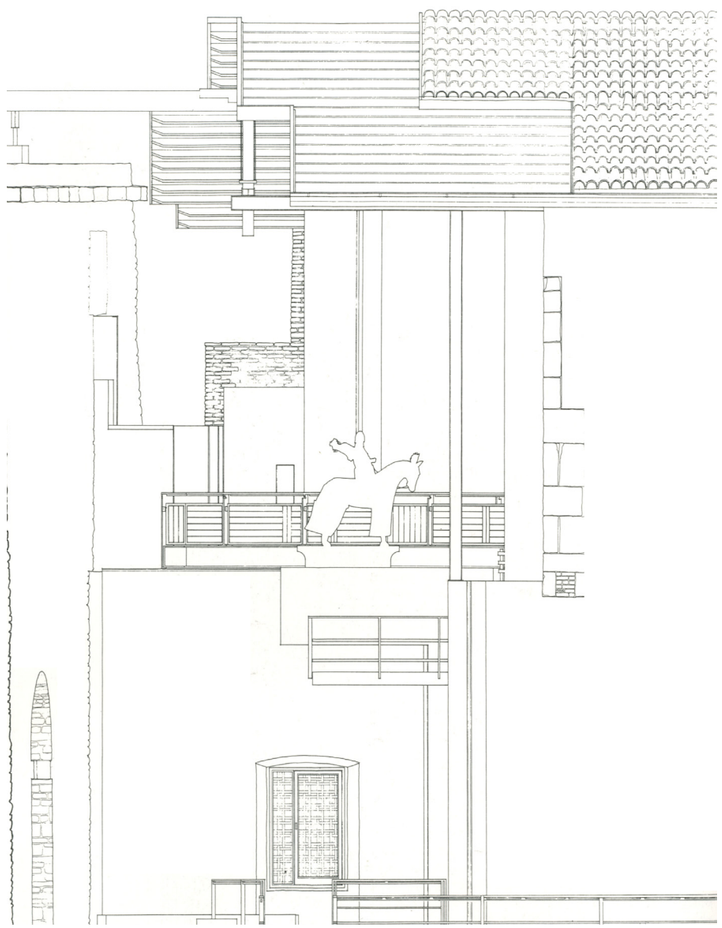
The drawings deal with the progression of the Northeast Tower and Riverside Wall, concerning the area immediately between the tower and existing staircase. This is the evolution of the incision rather than the plan of the library itself. A new screen wall Is superimposed with a section through the tower and library behind.

The incision is not merely two-dimensional, but takes on the form of a three- sided court, allowing light into the exit stairs, the tower, and library. The façade is a three-dimensional screen composition of steel and glass window screens alternating with steel framed pine panels designed in the manner already found in the gable of the Cangrade space. Forming the western and southern elevations of the court and closing the gap between the two separated masses.



NORTHEAST TOWER AND WALL



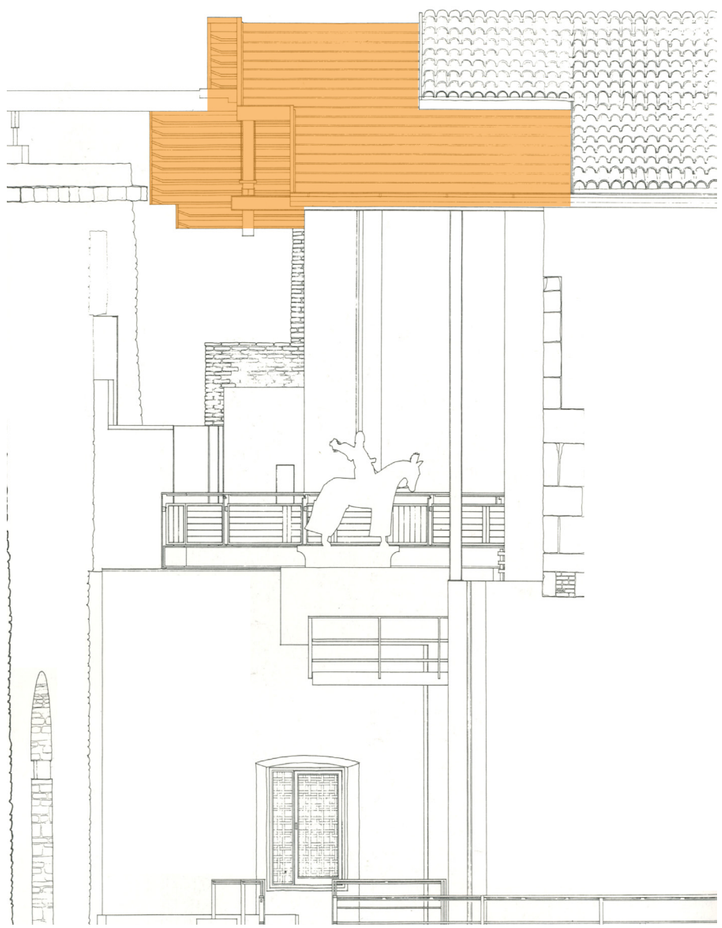


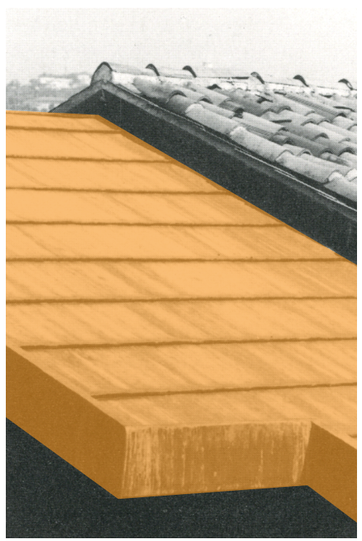
CANGRANDE SPACE: ROOF

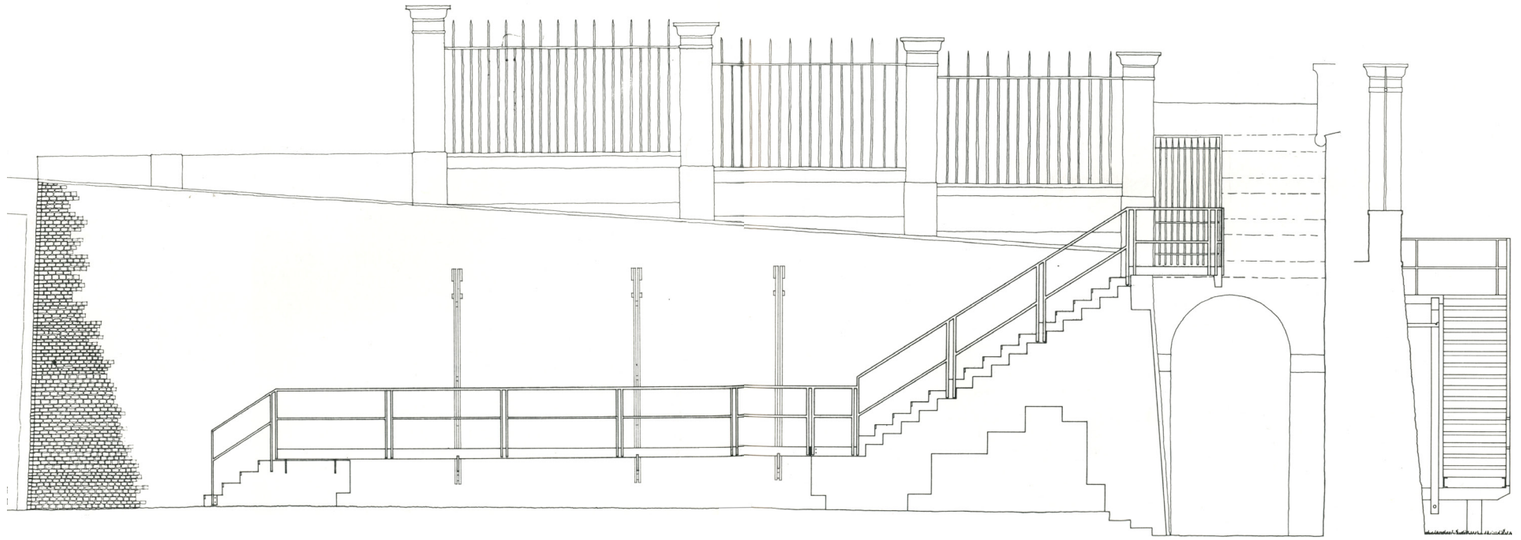
Eventual form delaminates its upper surface of Roman tiles into a copper and exposed structure and cuts it away in an orthogonal but irregular plan opening away from the Commune wall. Two giant ridge beams are the only relics of the former junction as they reach out in a great expression gesture to land on a steel support on the wall's battlements.

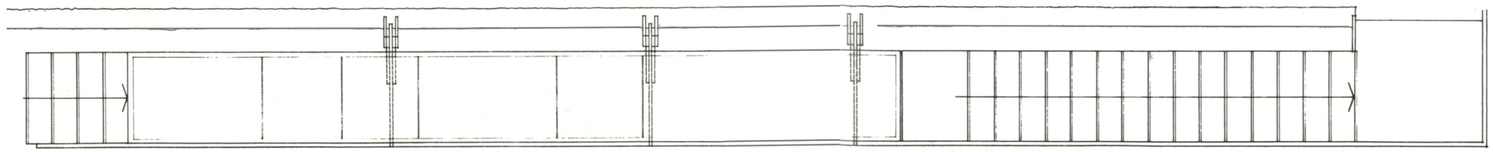
Presumably, it is an expedient solution to the conflict of bringing light into the depth of the space whilst at the same time protecting the statue from the elements. The original Roman tiles and new copper roof show the cohesiveness of the old and new through the careful thought process of Scarpa.

CANGRANDE SPACE: ROOF



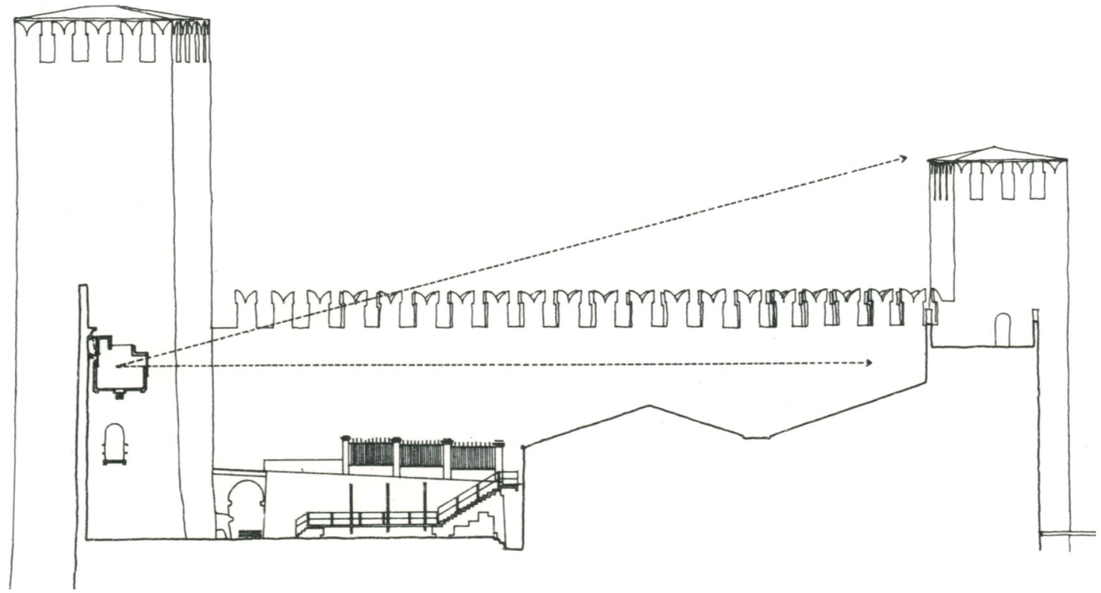


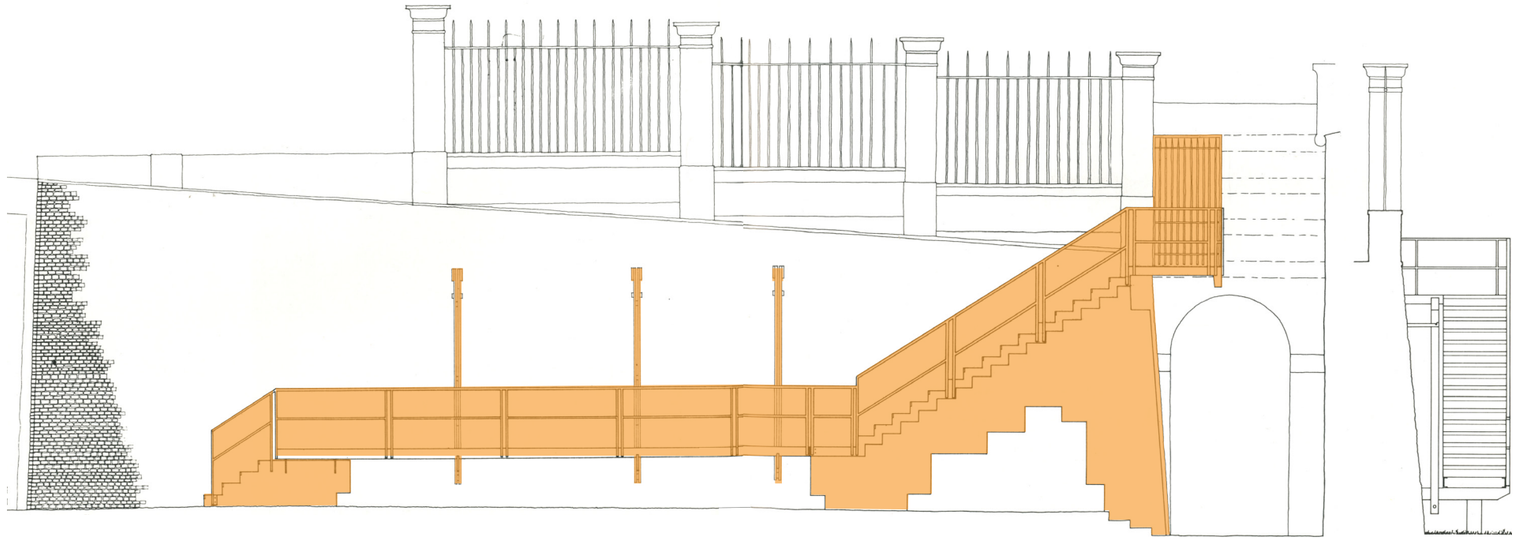




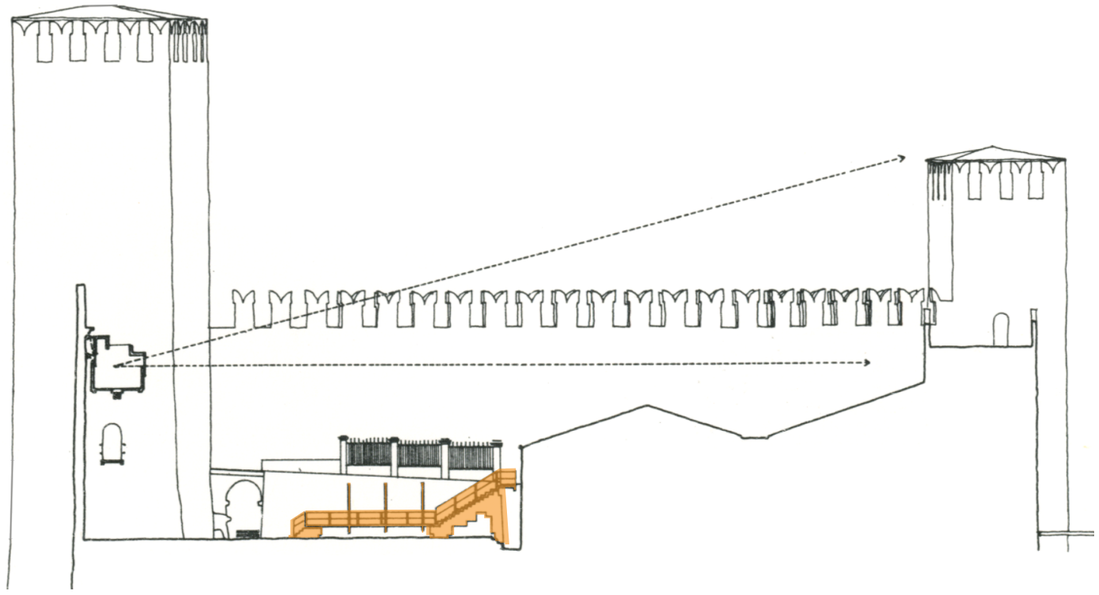
REGGIA COURTYARD STAIRCASE

Along the eastern edge of the courtyard runs a 19th century road, along the full length of the road run a steel and concrete staircase. The necessity of a staircase became a promenade descent into the courtyard from the road above. Scarpa differentiates the two ends and connects them via an extended walkway cantilevering off adjacent brick the wall.





REGGIA COURTYARD STAIRCASE



Precdent Takeaway

Addition

Reinvention

Intervention

FRAMEWORK PLAN ROYAL DOCKYARD, BERMUDA

CURRENT LAND USE AND PROGRAM

National Museum of Bermuda
- 4 Exhibit buildings
- 1 Conservation building
- 1 Office building
- 1 Hostel
- Care takers house
- Dolphin Quest

Transportation
- 2 Cruise ship ports
- 3 Bus stops
- Ferry Station
- Parking lot
- 2 Moped storage faculties

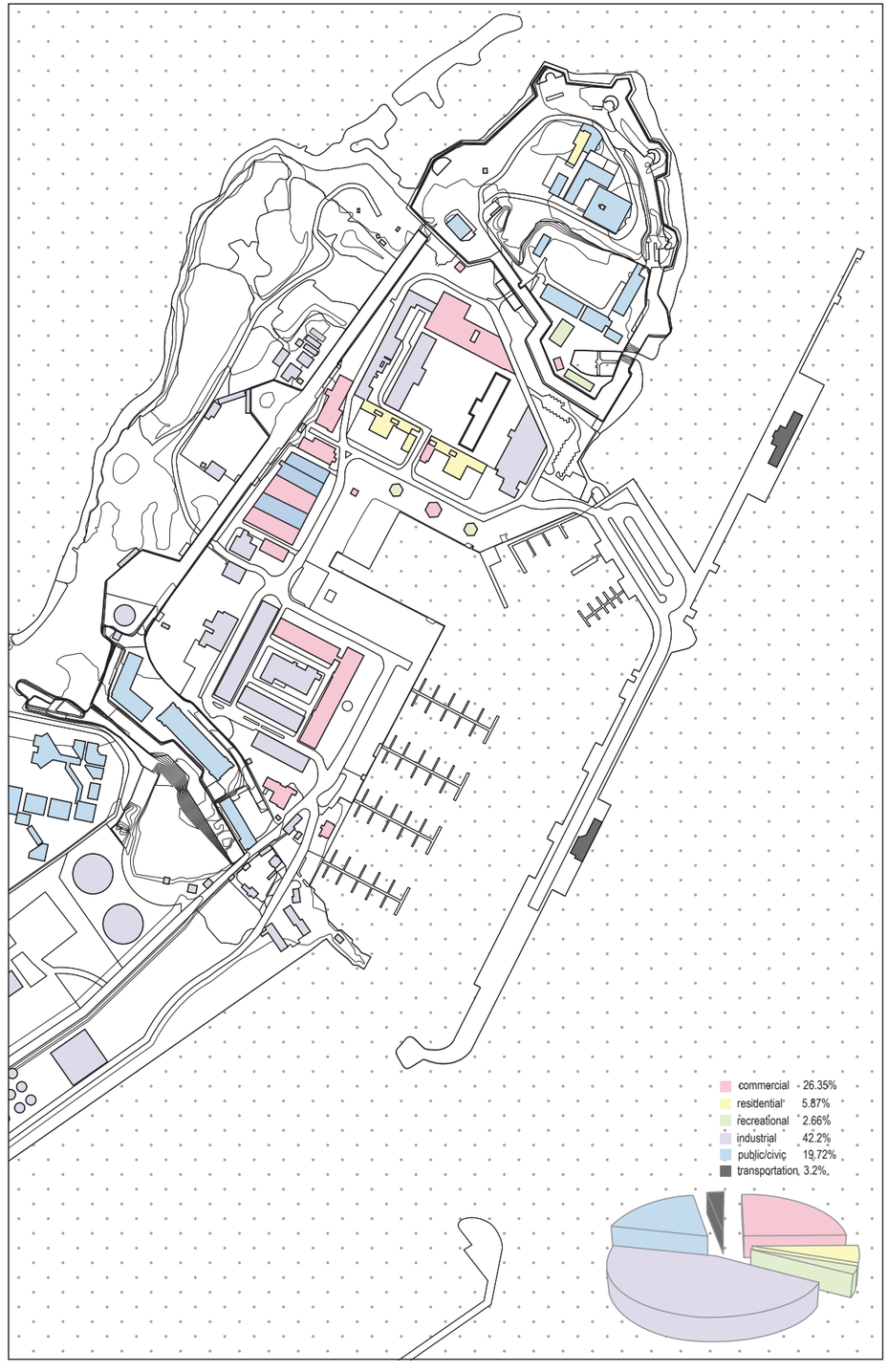
Commercial
- 6 Restaurants or food service providers
- 19 Tourist based retail shops
- 3 Retail Shops
- 2 Bermuda arts & craft shops
- Pharmacy
- Rum Cake Factory
- Bermuda Brewery
- Bermuda Wood Works
- Bermuda Glass Works

Tourist Based
- Segway rental
- Taxi waiting area
- Tour Operation

Recreation
- Night Club and beach
- 2 Bars
- Children's Playground
- Space for 84 docked boats
- 1.98 acres of boat storage (12.5% of site)
- Movie Cinema

Office
- One floor of office space

Residential
- 6 Apartments



Land Use

ADDING OF NEW PROGRAM

Upon completion of the inventory and analysis of the site, the site visit and the research of relevant precedents, I created a list of program the Dockyard was lacking in its ability to become an attraction point for locals and visitors. The list included:

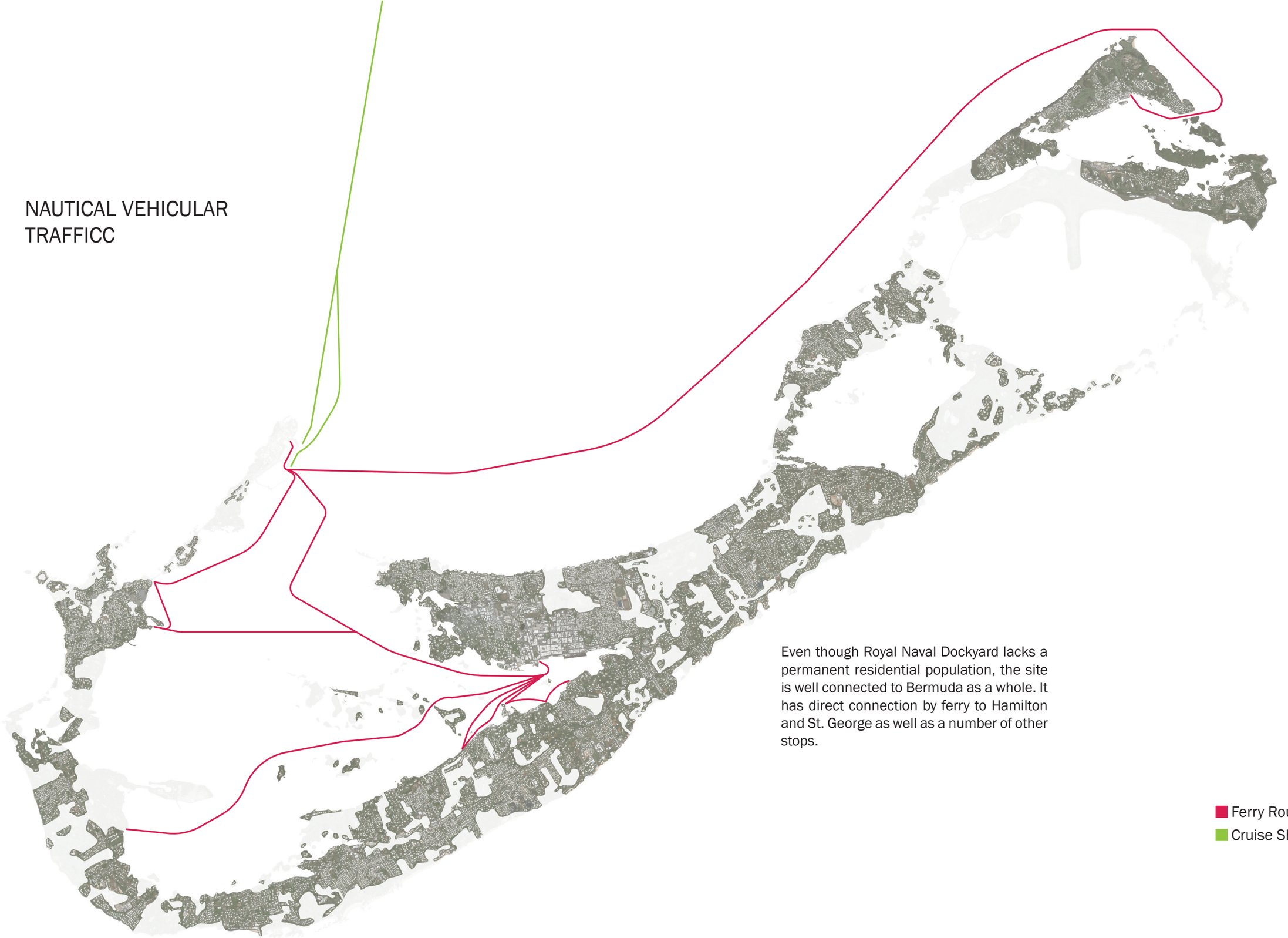
-Hotel
-Office units
-Food market
-Residential units

The addition of these programs would support a permanent population to occupy the site throughout the day. The office space would bring in locals form around the island during operational business hours. This business population would support local commercial interest, including food market addition, restaurant and pharmacy. The addition of residential units would act in the same way as the business but during opposite hours. This would allow for 24-hour cycle of a permanent population to the site.

With the addition of a hotel, the insertion of the land-based visitor would be added. This would allow for year round visitors to the site and not rely on the schedule of the cruise ships.

To further understand if the needs I developed were needed in the Dockyard, I returned to the inventory stage and collected data on the following areas; business location, food market, hotel, and connection of the site to the whole island.

NAUTICAL VEHICULAR TRAFFICC



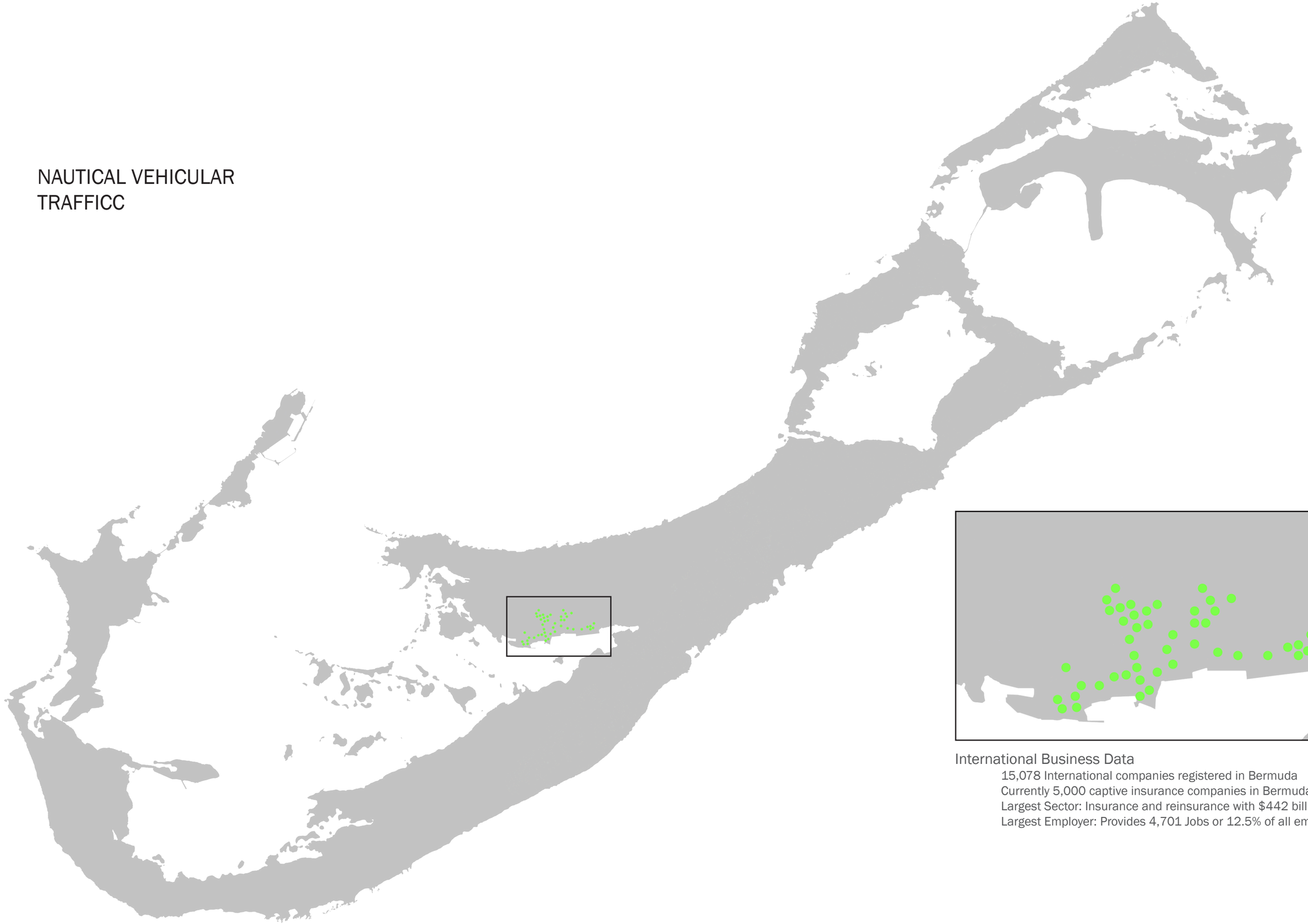
Even though Royal Naval Dockyard lacks a permanent residential population, the site is well connected to Bermuda as a whole. It has direct connection by ferry to Hamilton and St. George as well as a number of other stops.

Ferry Routes

Cruise Ship Routes

N

NAUTICAL VEHICULAR
TRAFFICC

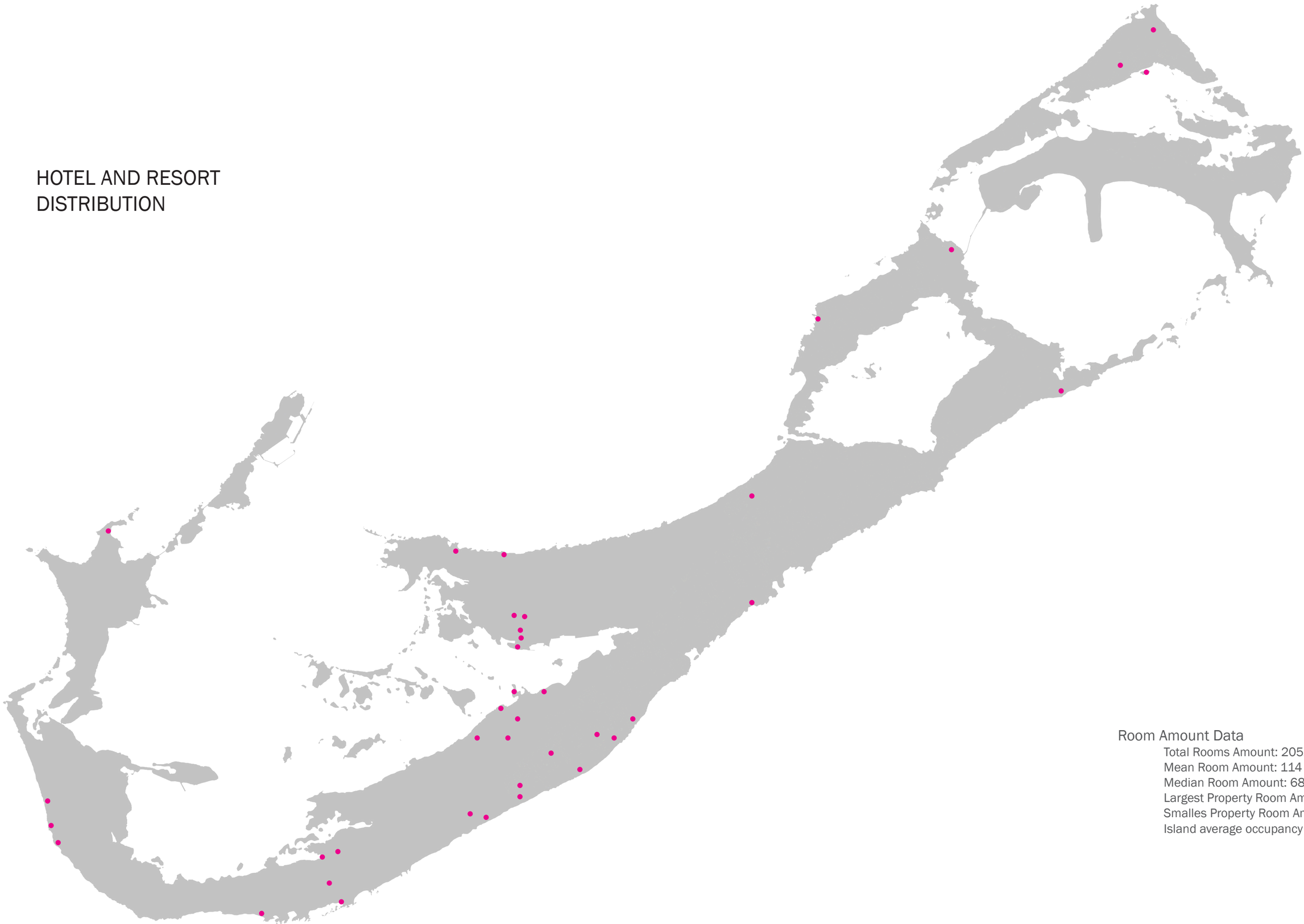


International Business Data

15,078 International companies registered in Bermuda
Currently 5,000 captive insurance companies in Bermuda
Largest Sector: Insurance and reinsurance with $442 billion assets
Largest Employer: Provides 4,701 Jobs or 12.5% of all employment.

N

HOTEL AND RESORT DISTRIBUTION



Room Amount Data

Total Rooms Amount: 2051
Mean Room Amount: 114
Median Room Amount: 68
Largest Property Room Amount : 593
Smalles Property Room Amount: 11
Island average occupancy rate 54%

N

FOOD MARKET DISTRIBUTION

LOCATION OF PURPOSED INTERVENTION

After visiting the site, developing an understanding through the inventory and analysis, researching precedents that are relevant to the Dockyard site I began to create an defendable argument of what this historical site could be.

The site visit gave me personal experience, that developed a feel for the site. I was able to view the interaction of the cruise ships with the local works and notice the lack of locals interacting with locals or land-based tourist. This was very evident in Hamilton but lacked in the Royal Naval Dockyard.

After experiencing the site and the rest of Bermuda it was evident that the Dockyard was not utilizing its location to its benefit. The site is connected to the whole island, has cultural and commercial interest but is lacking a draw for locals. This would need to be addressed to create a Dockyard that would be supported all year and serve both visitors and locals.

After researching precedents, the Inner Harbor is considered the first water front development and one of the most successful. The main points were the insertion of a permanent population through office and residential, along with tourist attraction and the importance of keeping the water's edge to the pedestrian.

After looking at the Inner Harbor I wanted to understand how the principles of the Inner Harbor were being used 40 years latter, in a waterfront development, on an island location, with a cruise terminal, so I used Sugar Point, and looked at the site as the architect did and learn why they did what they did. This lead to Castelvecchio Museum where I studied how Carlo Scarpa took a historic building but was able to insert an new architecture program through development of the historic importance of the building, but not being timid in his intervention, but being mindful and aware of the historic architecture.

Looking at the site on a personal level and through inventory and analysis, the research of precedents and the analysis of the site based on takeaways from the precedents, I started to develop a new development of the Dockyard. I began by looking at the under utilized buildings on site (right) where I began the insertation

LOCATION OF PURPOSED INTERVENTION

of new architectural program and then the evaluation of existing program. The question that need to be answered does this current program support a 24/7 Dockyard, and is it benefit to all to the site.

I wanted to create a Dockyard that had a 24-hour presence that would allow for interaction between locals and visitors, both land and water based. First step I took was to develop a green walkway (shown in green on the diagram on the right) between the water's edge and the Dockyard, this would allow the occupant uninterrupted access to the water's edge, allowing them to walk from one end of the site to the other on the water's edge. This is benefit as human are naturally draw to water and would act as the main form of circulation for the site.

The next step was to make a selection of where new architecture structure and repurposed program would be placed. On the diagram on the right the yellow shows selected location where new architectural structure would be built.

This would include the addition of; an international financial or reinsurance firm; residential units for the creative class of Bermuda, located on the rampart wall and southern location of the site; and the addition of new commercial space for restaurants and high-end shopping for locals and land based tourist.

This would lead to a master plan where the majorty of the site would be redeveloped the only part left unchanged would be the Keep of the National Mesume of Bermuda. The site would have in increase of comercial space, recreation activites, residential, hotel, and financial and reinsurance office space.

With the addition of residential program, the site gains a permanent occupant throughout the whole day. When a resident need a service they are able to go to the Dockyard and not leave the site. This allows for an increase of commercial service that may be lacking with just white collar occupants and the temporary visitors.

During the process a master plan was developed that will lead to what I believe will be a Dockyard operating year round, and not based on the cruise ship schedule.

PROPOSED PROGRAM

National Meseum of Bermuda
- No change to the Main Keep

Commercial
- Removal of majority of tourist based retail in Clock Tower.
- Leaving A.S. Cooper & Sons, Crisson, Calypso, Davison's of Bermuda
- Addition of high-end retail for local population
- Conversion of first floor storage facilities into retail and restaurants
- Addition of a Food Market
- Increase in local skilled trade retail options
- Retention of
  - Bermuda Arts & Craft Shops
  - Pharmacy
  - Rum Cake Factory
  - Bermuda Brewery
  - Bermuda Wood Works
  - Bermuda Glass Works

Recreation
- Addition of greenspace walkway around site and water's edge
- Removal and relocation of 1.98 (12.5% of site) acres of boat storage
- Retention of
  - Night Club and beach
  - 2 Bars
  - Children's Playground
  - Space for 84 docked boats
  - Movie Cinema
  - Dolphin Quest

Office facility
- Addition of office facility in current boat storage locations
- Conversion of second floor storage facilities into office space

Residential
- Conversion of Sail loft into apartments
- Addition of Apartments on Rampart wall
- Addition of Apartment and town homes in southwest of site

Hotel
- Conversion of Casemates site in high-end hotel.
- Hotel amenties to be shared with new resedential location on rampart wall

LOCATION OF PURPOSED INTERVENTION

The top diagram shows the insertion of new architectural program in orange along with the purposed pedestrian walkway. The storage facilities and boat storage have been removed and relocated to other sites on the island. The density increase will allow for the maximum benefit to the site through the addition of residents, white collar workers and land based tourist.

Diagram on the bottom shows the program for the purposed architectural insertion. The south end of the site and above the rampart wall will be the location of the residential units, this is shown in yellow. The addition of office space is present in purple. The commercial space is increased 300 percent and is shown in the red. To draw on the land based tourism the reproposing of the Casemates prison into a hotel is shown in light blue. This plan is on the following pages.

LOCATION OF PURPOSED
INTERVENTION

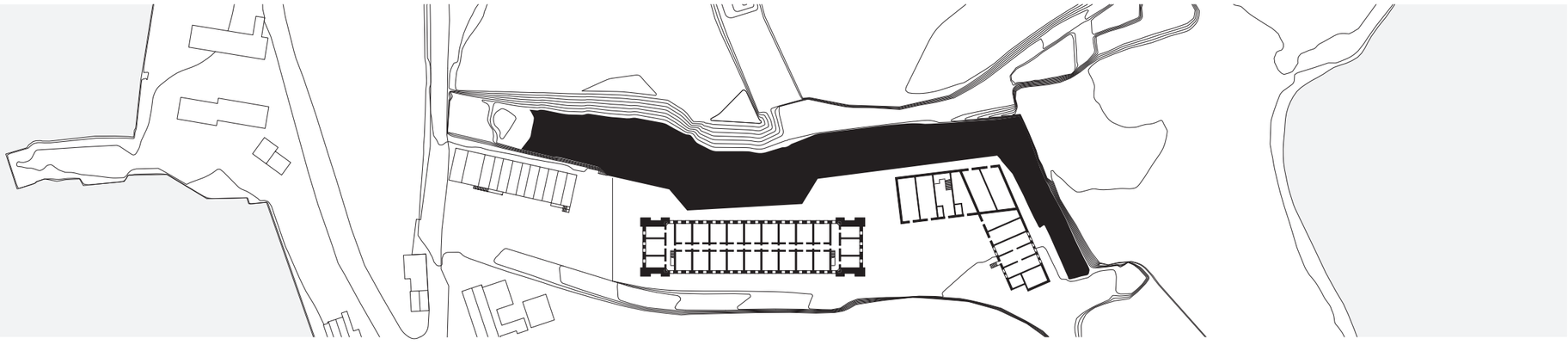
ARCHITECTURAL INTERVENTION

After the development of the master plan, a site section was selected for the focus of development. The site selected went from water edge to water edge, would involve the insertion of architectural program with a current structure addition of new architecture program and intervention with the water edge. The site selection included the Casemates prison. With its prominent location on the site it grabbed my attention and I felt it offered the greatest opportunity for the development of my thesis statement.

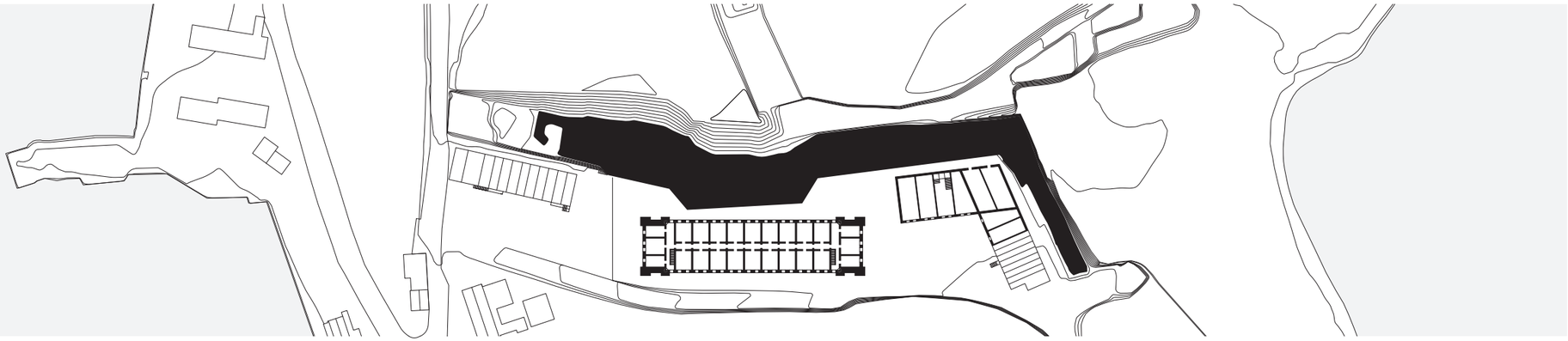
CASEMATES AT THE ROYAL DOCKYARD BERMUDA

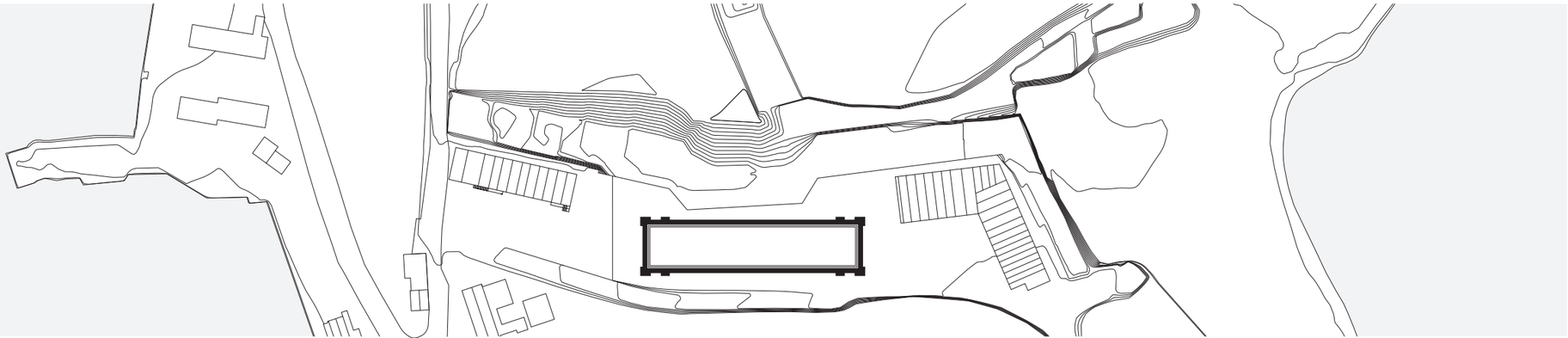
CURRENT CONDITION

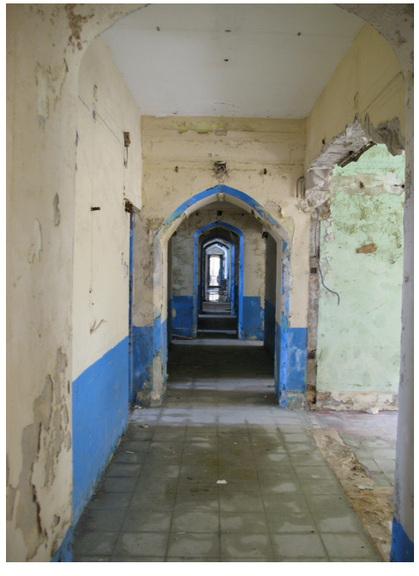
Currently the site is unoccupied and has been since the prison left in 1993. The site consists of three main buildings. The Lower Yard, Casemates, and Upper Yard. The Lower Yard in separated from Casemates and the Upper Yard by a 38 foot sheer cliff. To the west of the buildings is a rampart wall the reaches the second floor of the Casemates building.

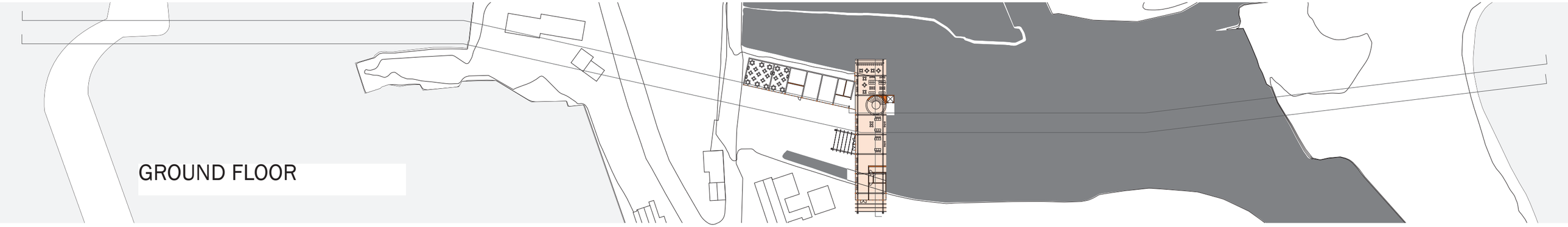


Currently the site is under the ownership of the National Museum of Bermuda that has began the process of returning the site to its preprisson days. This include the volinter work of removal of rubal within the site.









GROUND FLOOR

HOTEL PROGRAM

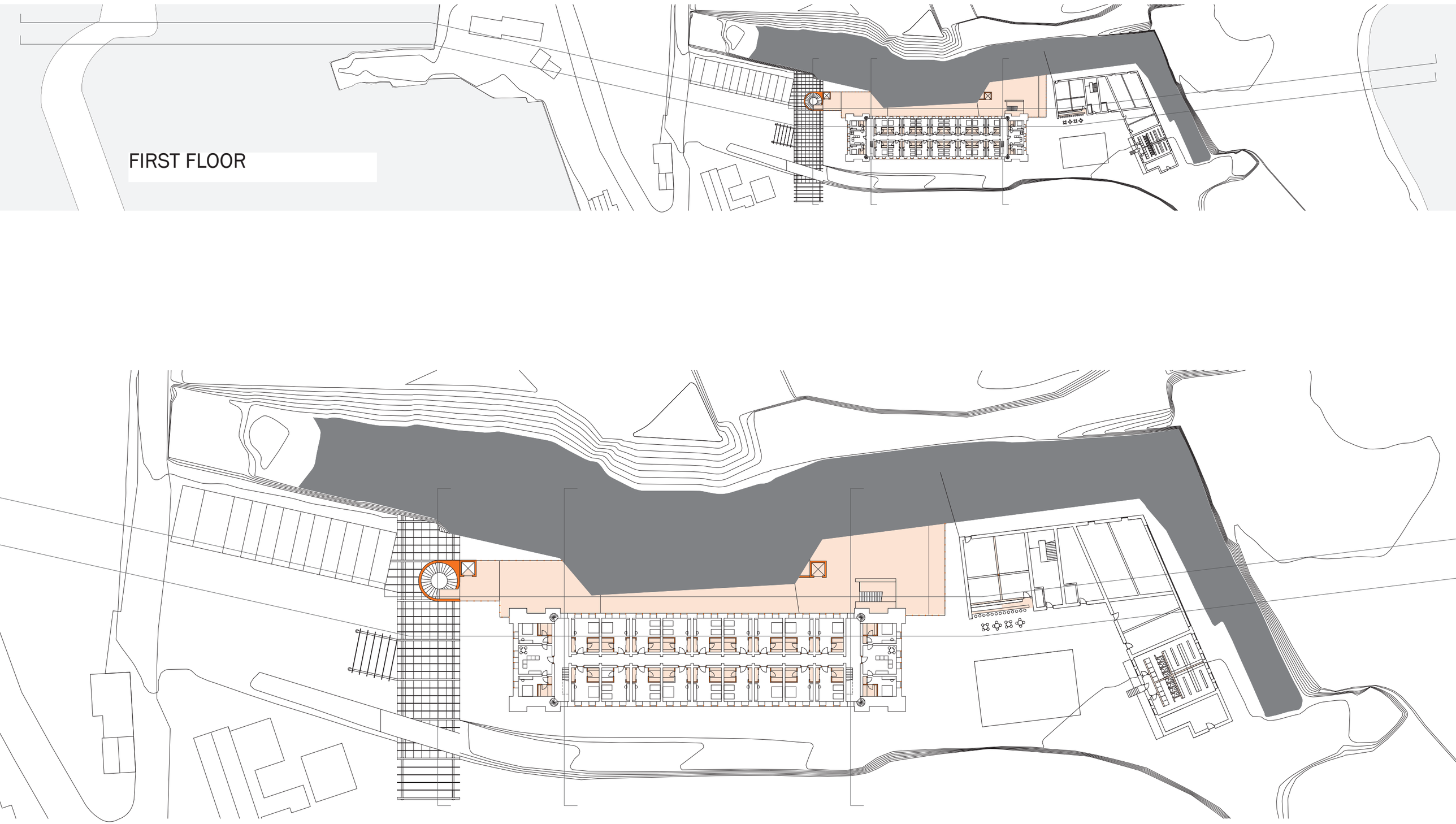
The first floor will be the welcoming center of the hotel, this is where the guest will arrive, check-in and have the option for dinning, shopping, and socializing. The guest would then proceed to the upper section of the hotel that includes the hotel rooms in Casemates and additional activities in the Upper Yard. The guest would proceed to the upper portions via either elevators or a grand staircase offering selected views of the Royal Naval Dockyard and Island of Bermuda.

The remaining program of the hotel will include:

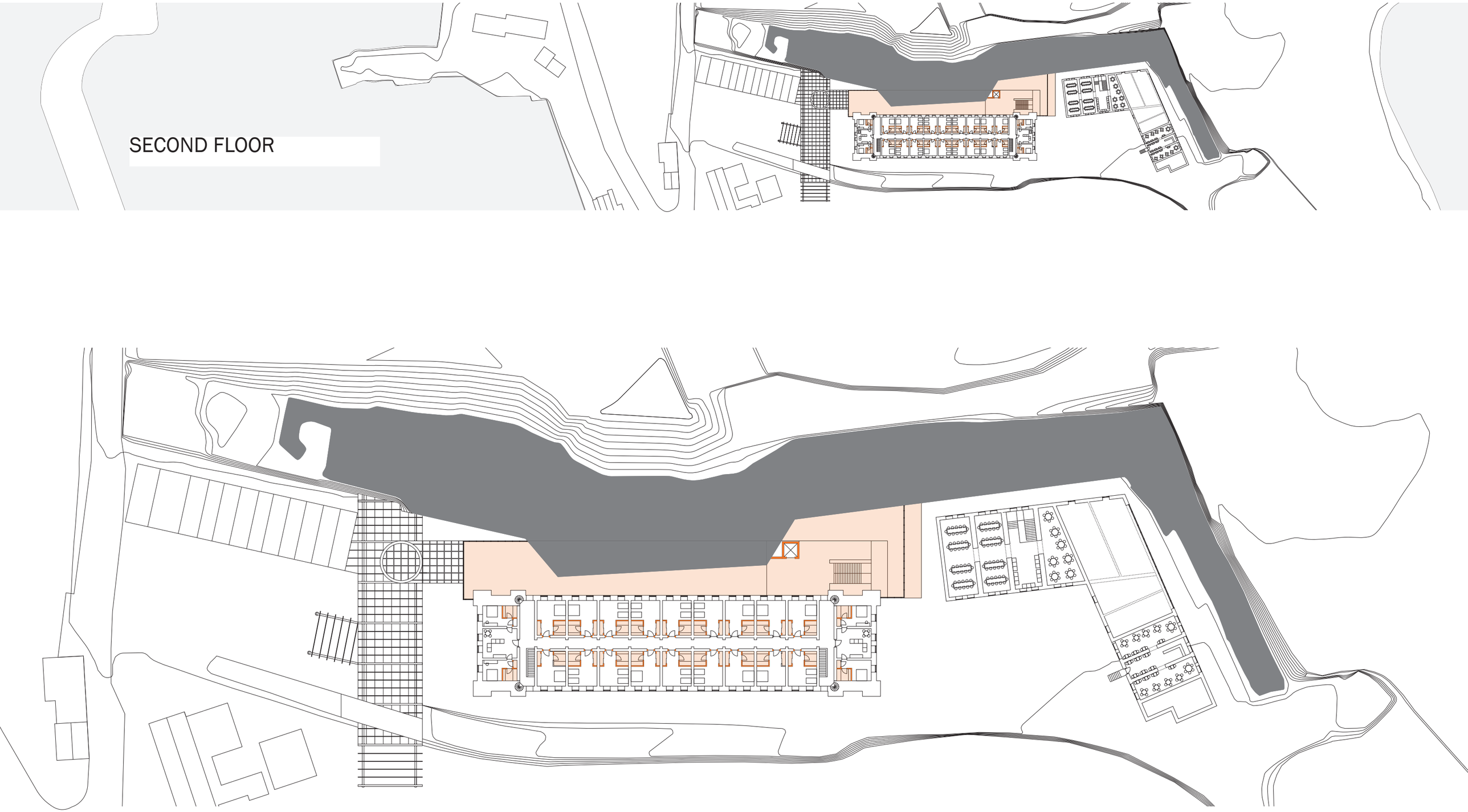
-40 guest rooms
-Two restaurant
-Two bars or pubs
-Commercial space for up to two tenants
-Coffee shop
-Classroom and conference space
-Fitness center
-Rooftop lounge and terrace

HOTEL CIRCULATION
STAIRCASE VIEWS

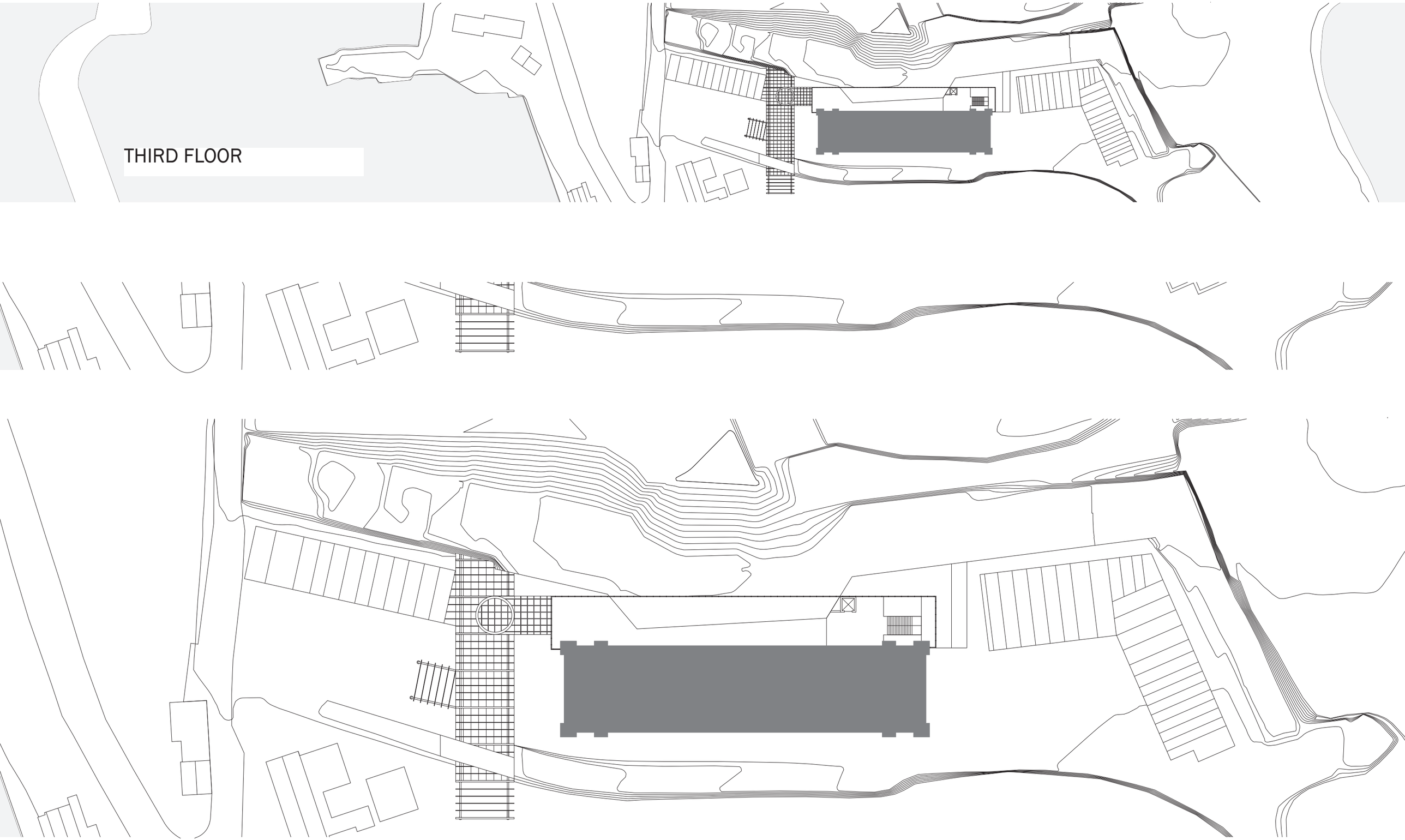
FIRST FLOOR



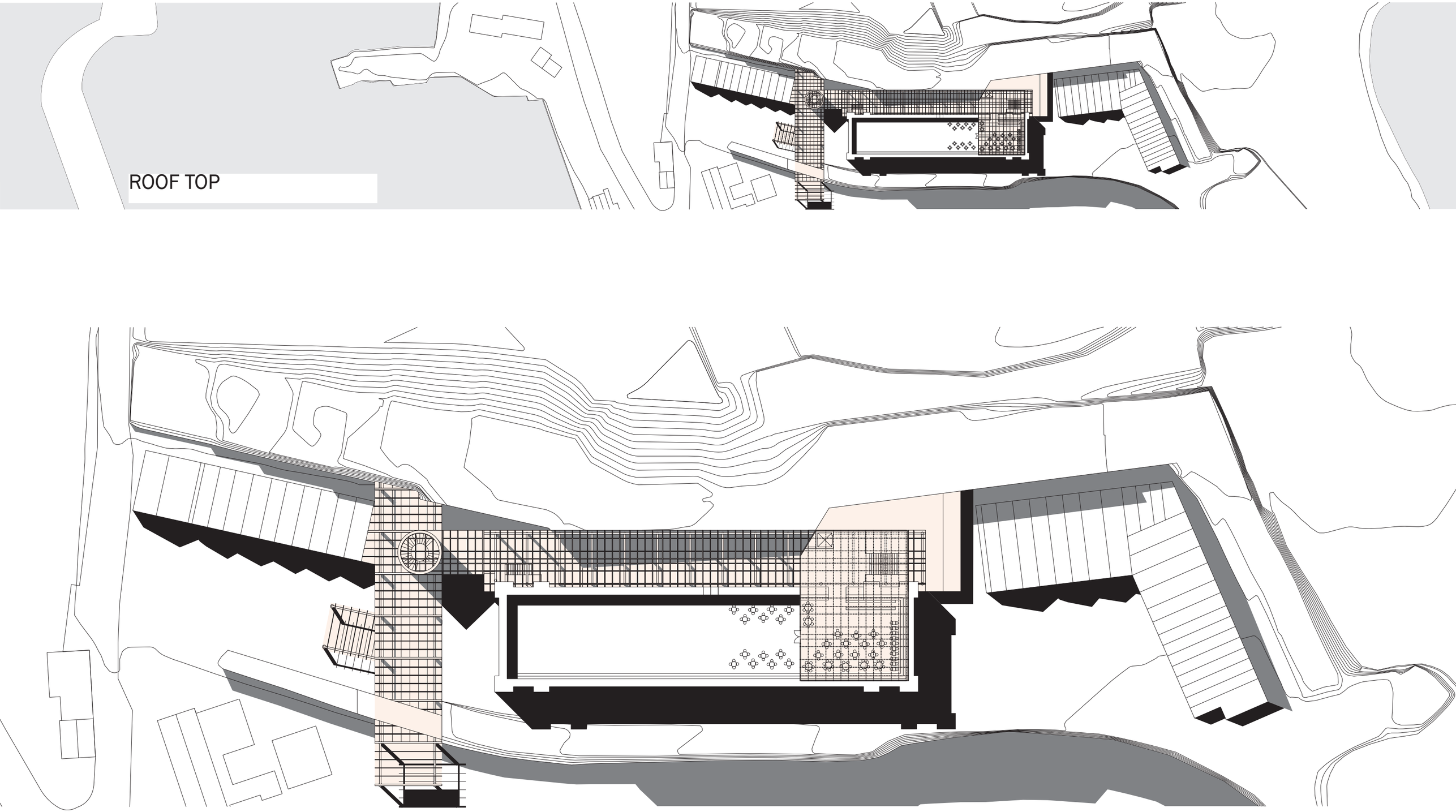
SECOND FLOOR



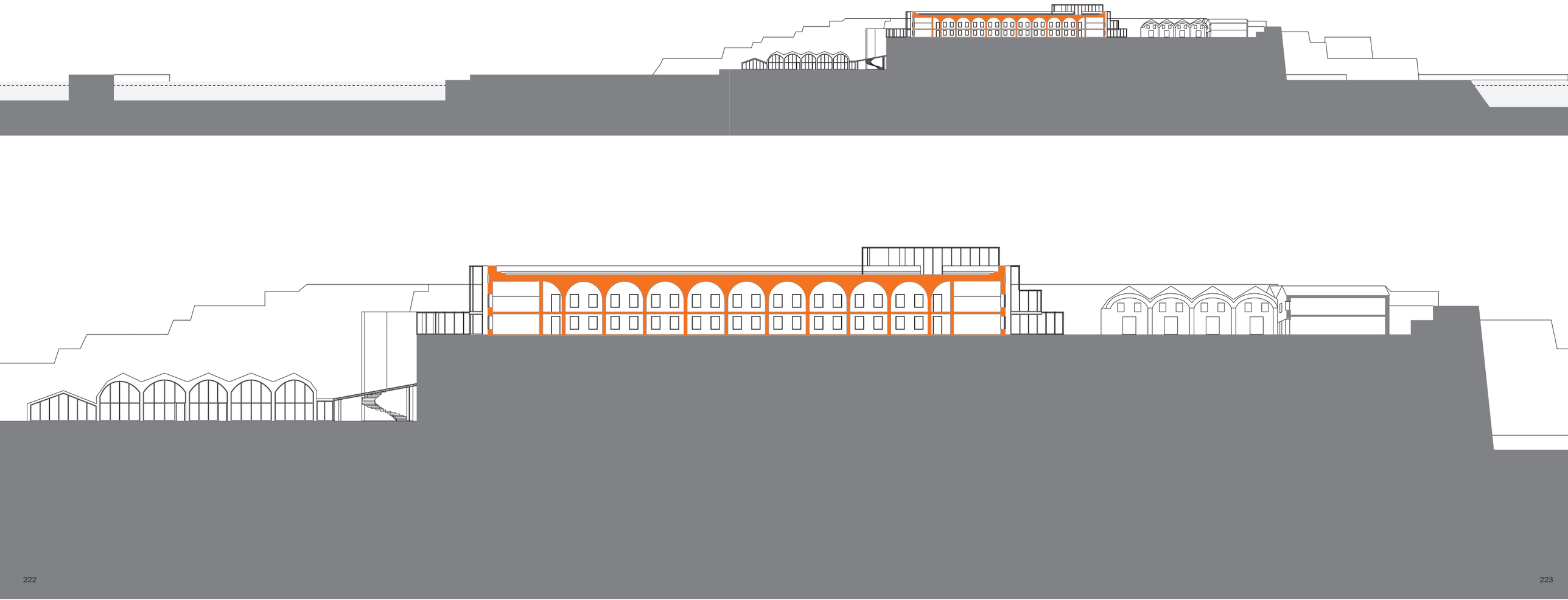
THIRD FLOOR



ROOF TOP



SOUTHEAST TO NORTHEAST SECTION



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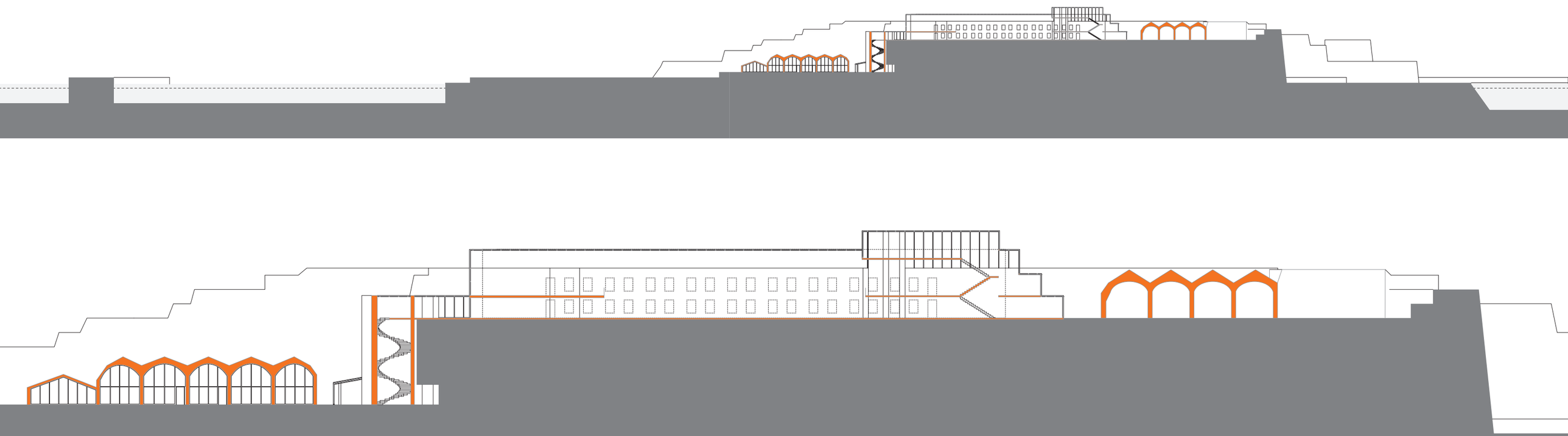
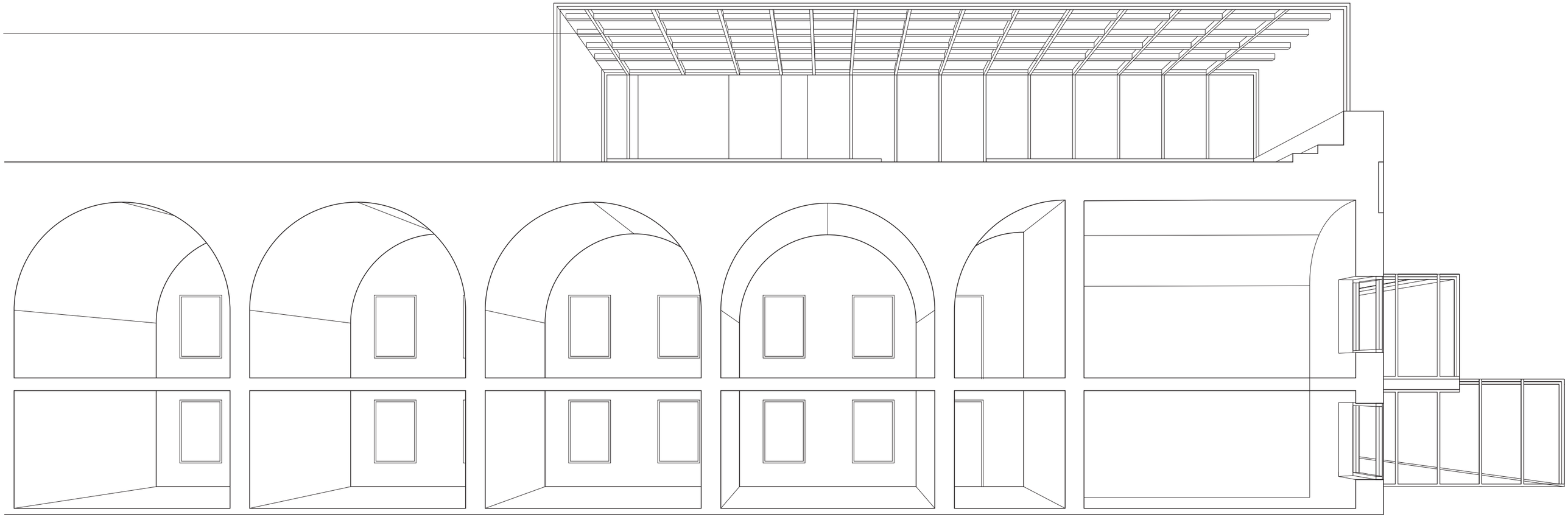


PERSPECTIVE OF CASEMATES INTERIOR



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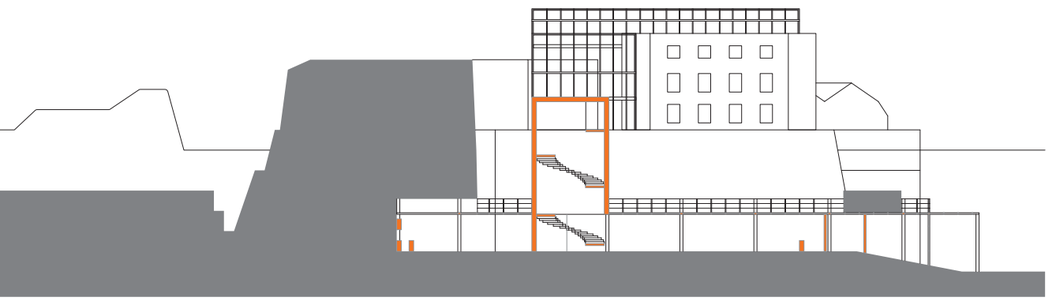
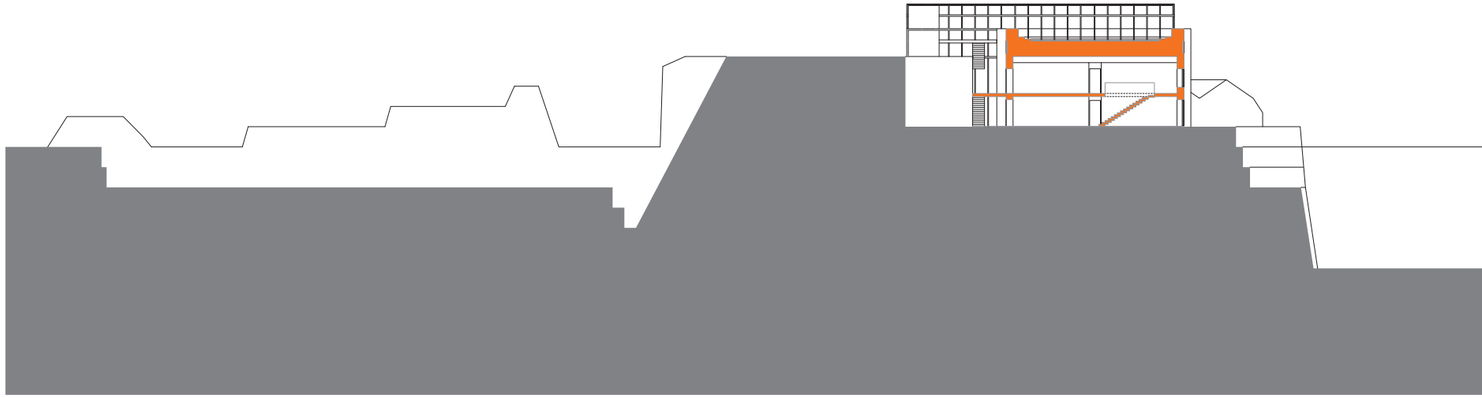
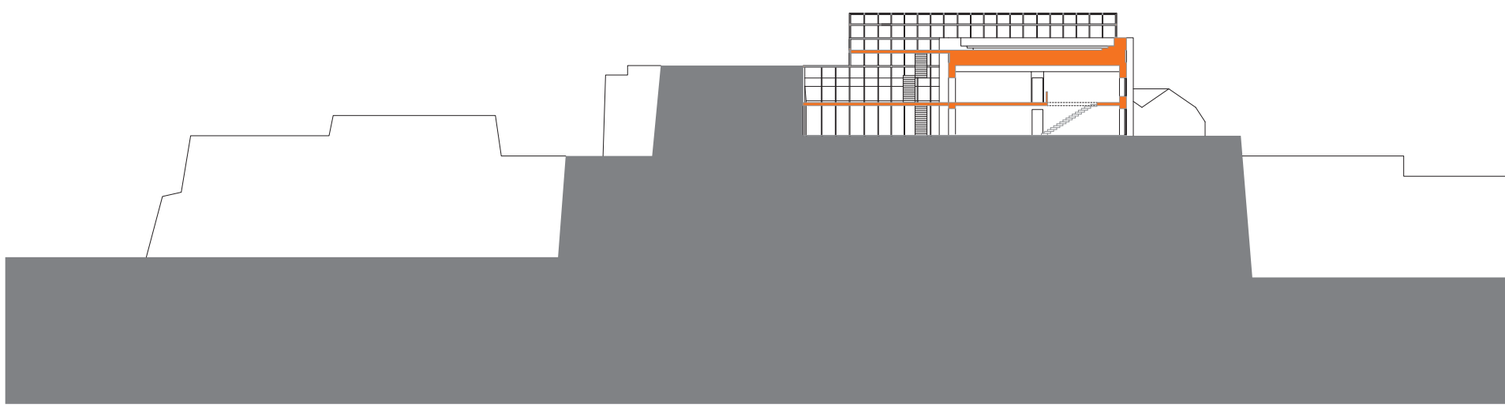
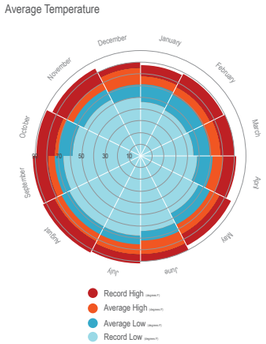
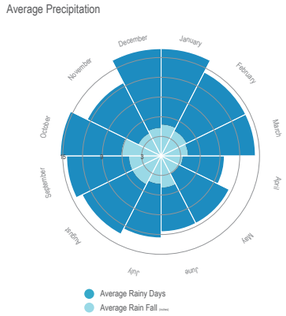


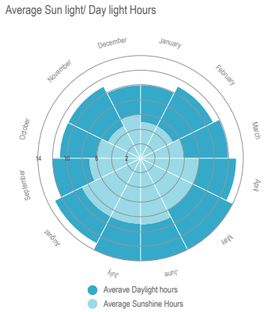


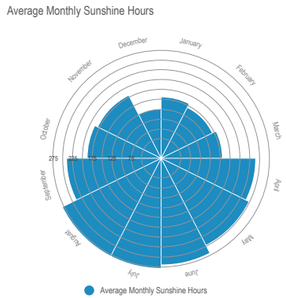


DESIGNING FOR THE CLIMATE







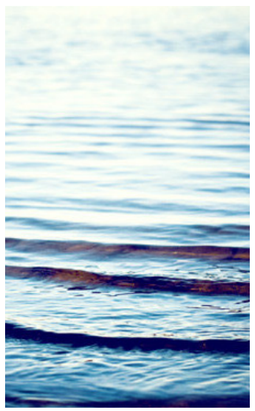


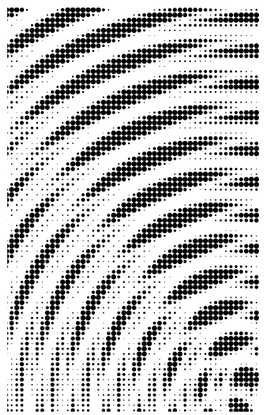
Enameled Glass

Enameled glass, often called 'fritted glass,' is the result of an enamel image being fired into the surface of a glass pane. Commonly used as a light-diffusing element in modern buildings, traditionally it has been used for aesthetic purposes, but it can also be used for energy savings by incorporating it in novel day lighting systems. The opportunities this process offers architects are enormous, including hugely reducing solar gain and glare within a structure and reducing bird collision into the glass.

The Spertus Institute in Chicago uses fritted glass on its eastern façade facing Chicago's Grant Park. The incorporation of enameled glass into the façade reduces unwanted solar gain and bird casualties from striking the glass. The images above show the institute façade, fritted glass detail and an unobstructed view of Grant Park through the fritted glass.

The incorporation of enameled glass will be used within the circulation structure of the new addition to Casemates. The fritted glass will use the ripples of the nearby ocean (right) as inspiration for the glass pattern (far right) using the ripples of the oceans water.

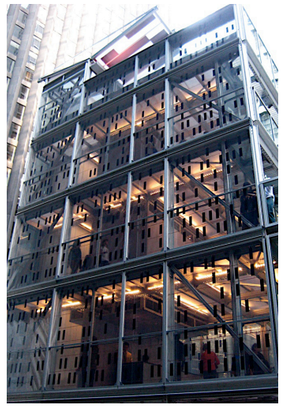




Photovoltaic Cells

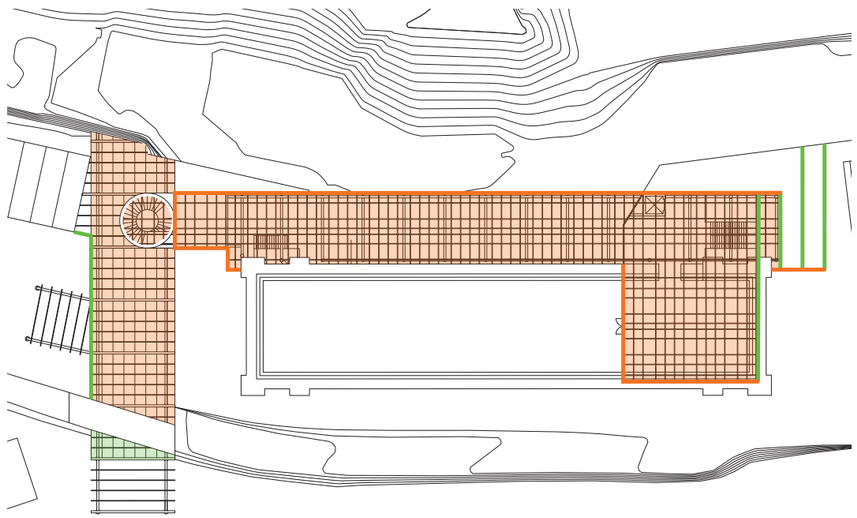
Photovoltaics is a method of generating electrical power by converting solar radiation into direct current electricity. Photovoltaic arrays are often associated with buildings: integrated into them, mounted on them or mounted nearby on the ground. Building-integrated photovoltaics are increasingly being incorporated into new construction as a principal or ancillary source of electrical power. Typically, an array is incorporated into the roof or walls of the building.

Two examples of building incorporated photovoltaic cells is the Heron Tower, by KPF (above) and the Cellophane House by Kieran Timberlake (right). Both structures, located in the Northern Hemisphere, have incorporated the cells within the southern facing facades. This allows the buildings to harvest the sun's energy efficiently. The Heron Tower uses a standardized grid (above center) within each pane of glass for energy harvesting, while the Cellophane House uses a more random application of photovoltaic cells (right). Both designs allow for views of the surrounding area and offer light-diffusing element similar to fritted glass.



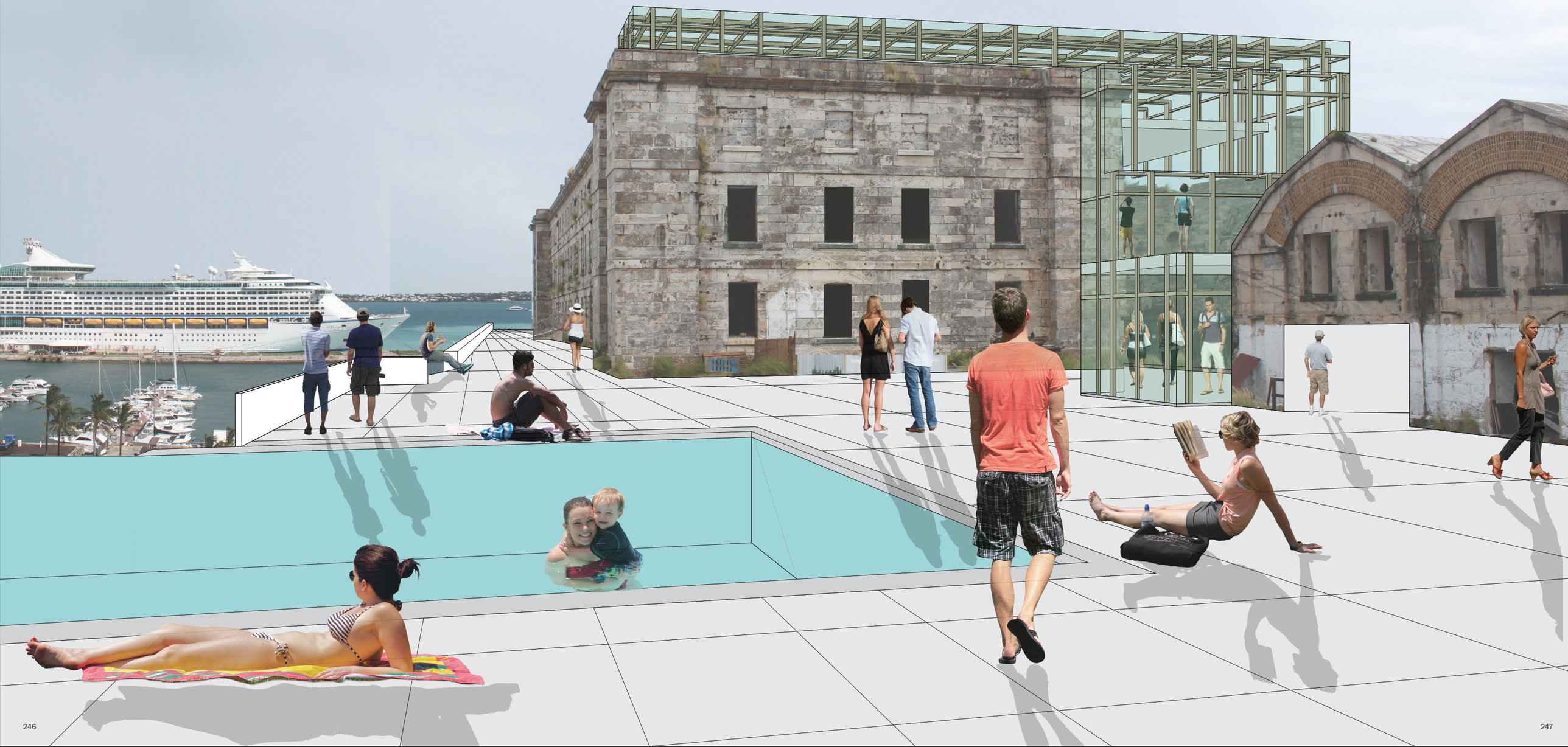
Incorporation Into Design

The use of enameled glass will be used on all glass surfaces within the lobby, circulation core, and rooftop structure, while the hotel rooms will not use enameled glass or photovoltaic cells within the panes of glass Photovoltaic cells will be incorporated within the lobby roof; Casemates roof structure, and all southern facing facades on the circulation core. Due to the structure of the southeast facing orientation, the large majority of each façade will be covered in enameled glass and photovoltaic cells. The diagram on the right shows the location of each. Green shows fritted services and orange shows the incorporation of both fritted and photovoltaic cells.



FINAL RENDERINGS BEFORE AND AFTER

STOP



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CREDITS

Whilst every possible effort has been made to establish and obtain permission from copyright holders to use their material, it may be that, on occasions, an error has occurred. The following people and institutions pictures, maps and diagrams were used:

Peter Hind
Dr. Ed Harris
National Museum of Bermuda

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