

Aquarama –TransErie Terminal

Matthew Hall

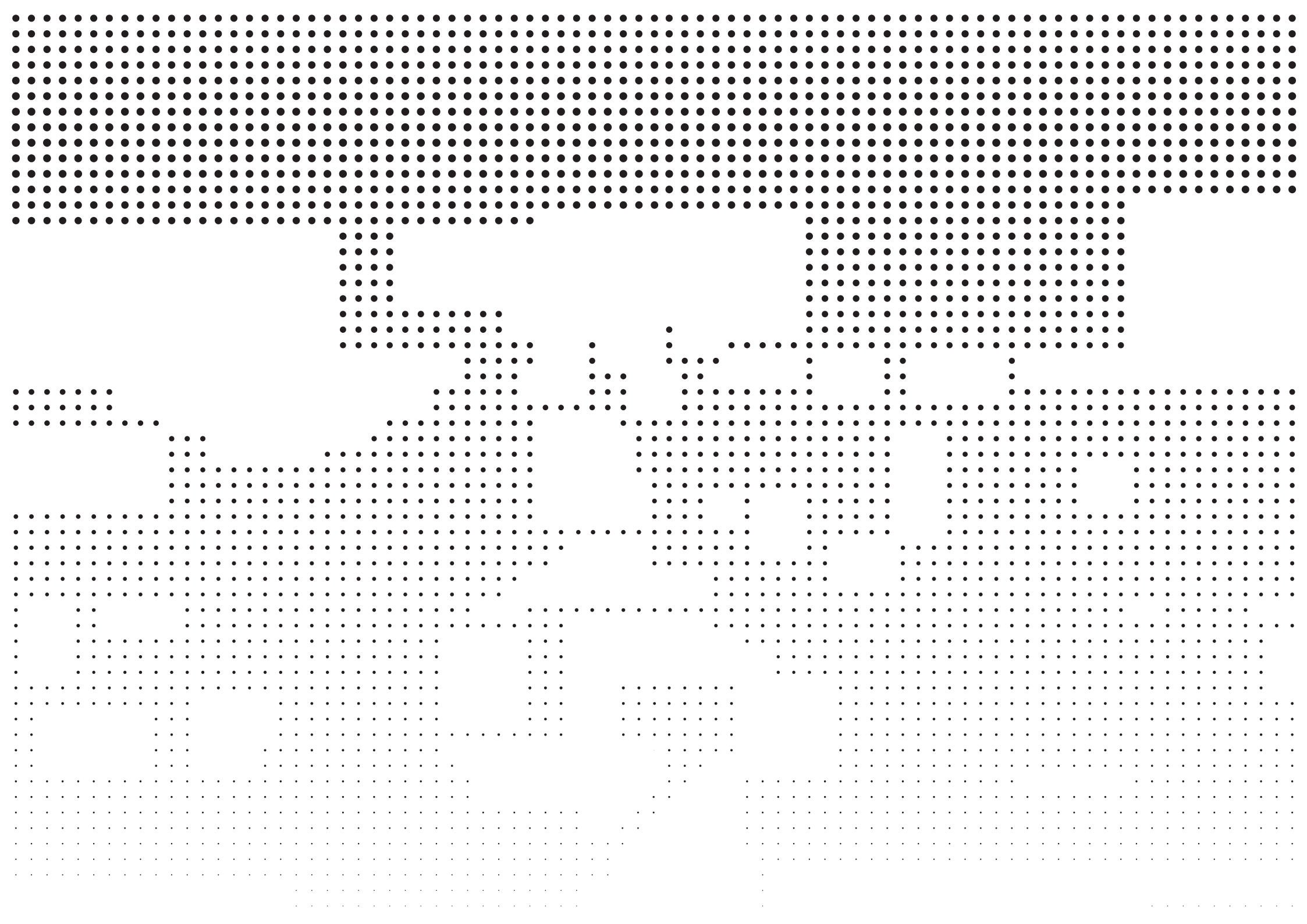
Thesis submitted to the faculty of the Virginia Polytechnic Institute and State University in partial fulfillment
of the requirements for the degree of:

**Master of Architecture
in
Architecture**

Jaan Holt, Committee Chair
Robert Zwirm
Paul F. Emmons

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Alexandria, VA

Keywords: Cleveland, Terminal, Aquarama
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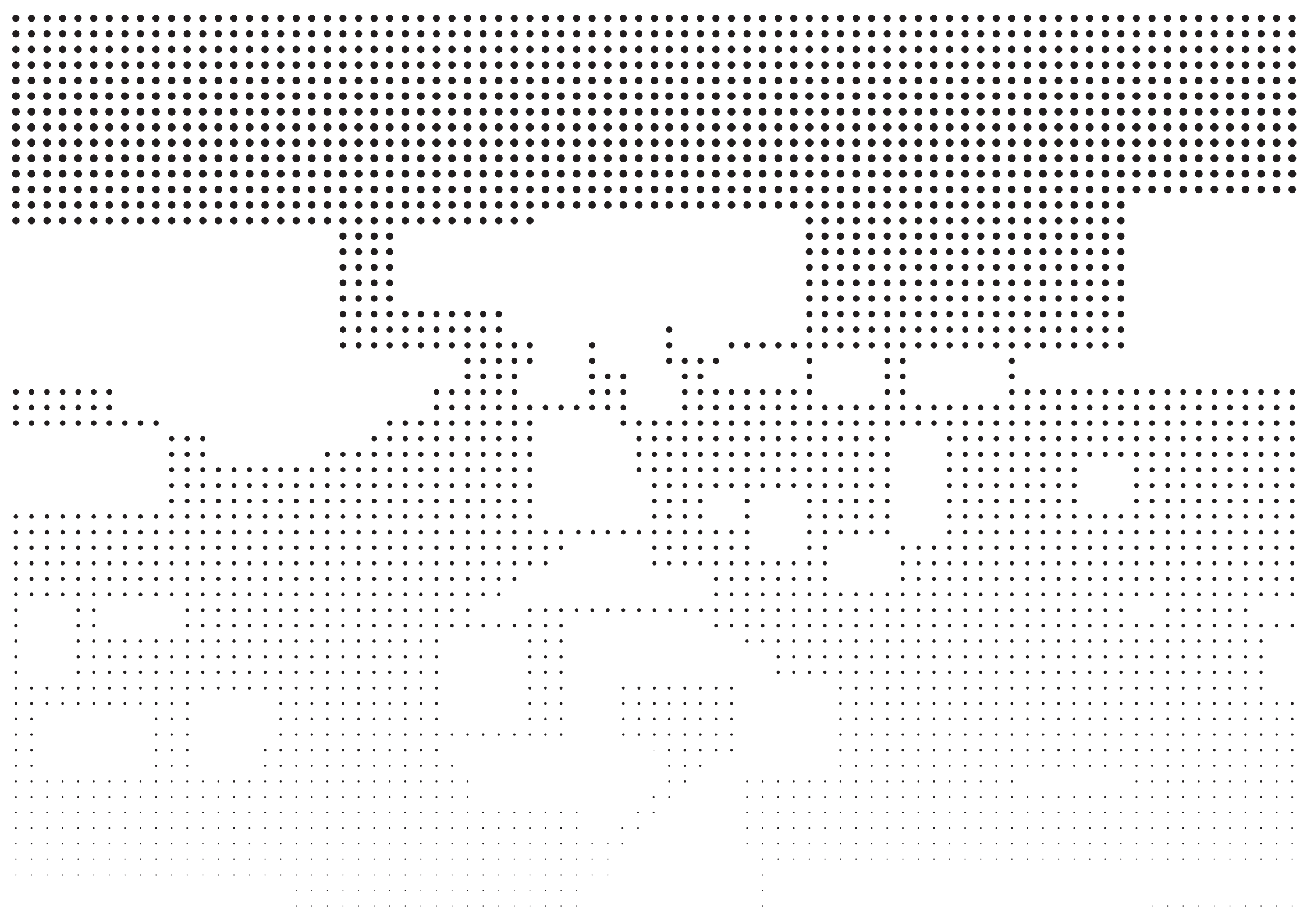
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ABSTRACT

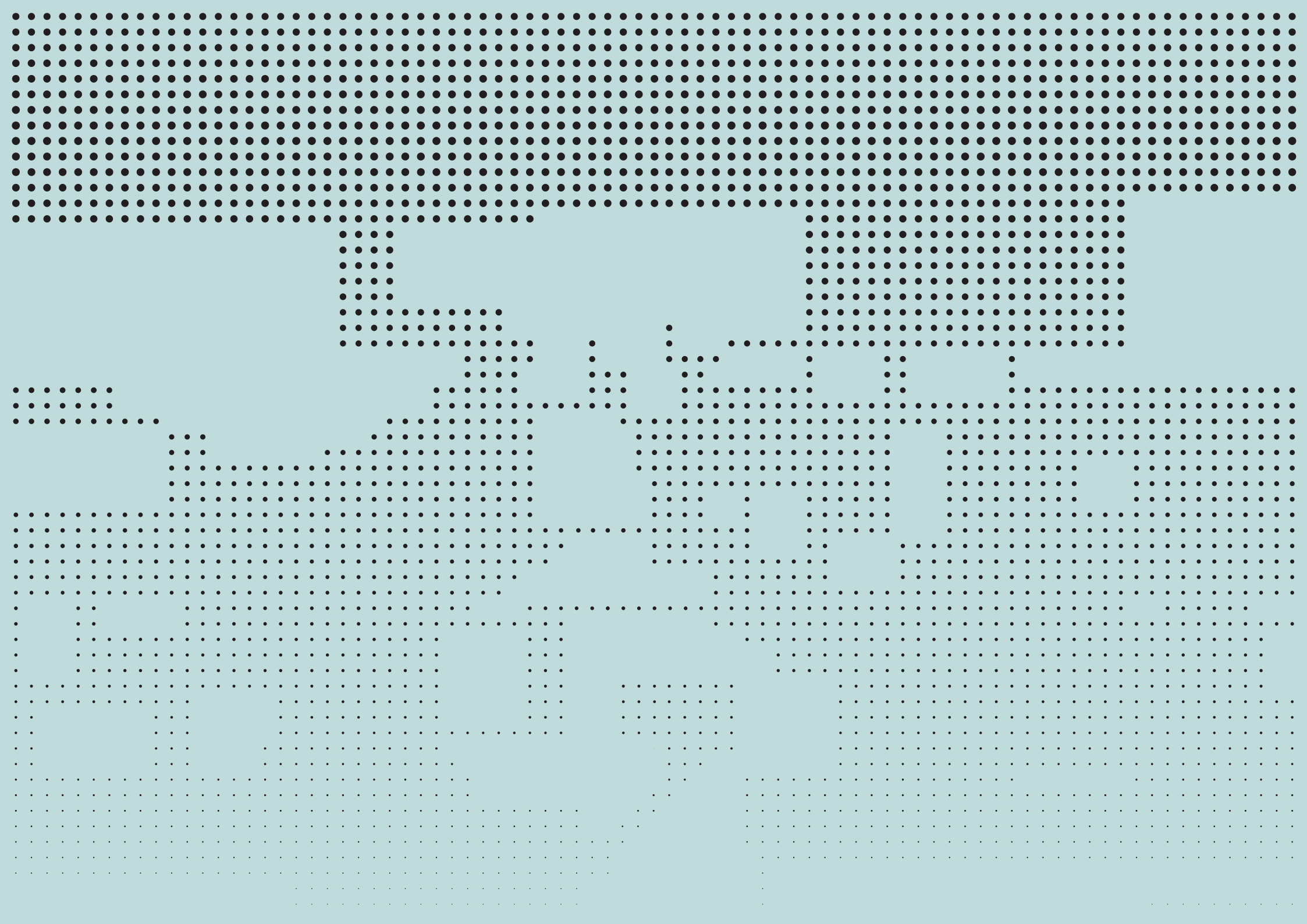
One of the major challenges of the 21st century is the rapid growth of many cities and the decline of others. There are many cities like Cleveland which were built to serve a far greater population than currently inhabits the city. Infrastructure built for 800,000 now services 400,000 leaving creating surplus capacity and derelict spaces; urban voids which have fallen into disuse. Manufacturing and shipping industries occupy valuable waterfront space, highways create rifts and large civic public spaces designed with the best of intentions create vacuums.

Cleveland is not dealing with the issue of growth but with transformation; in its remaking as a place of mixed communities and neighborhoods. Understanding the city spatially is the first part of an exploration into devising interventions that can utilize existing infrastructure, reclaim and re-purpose spaces to generate new uses and new vitality. This thesis is concerned with identifying an opportunity and proposing a programmatic and spatial transformation.



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AQUARAMA

Trans-Erie Terminal/ Cleveland

PART 1



PART 1/ Overview

Regional Overview/

Cleveland sits at the edge of Lake Erie in Cuyahoga County Ohio. Its siting on one of the largest fresh water lakes in the world is an obvious and distinct feature shaping Cleveland character as an industrial port since its founding. The following series of maps looks at some of the macro level natural and man-made infrastructural elements giving shape to the region and Cleveland's position within it.

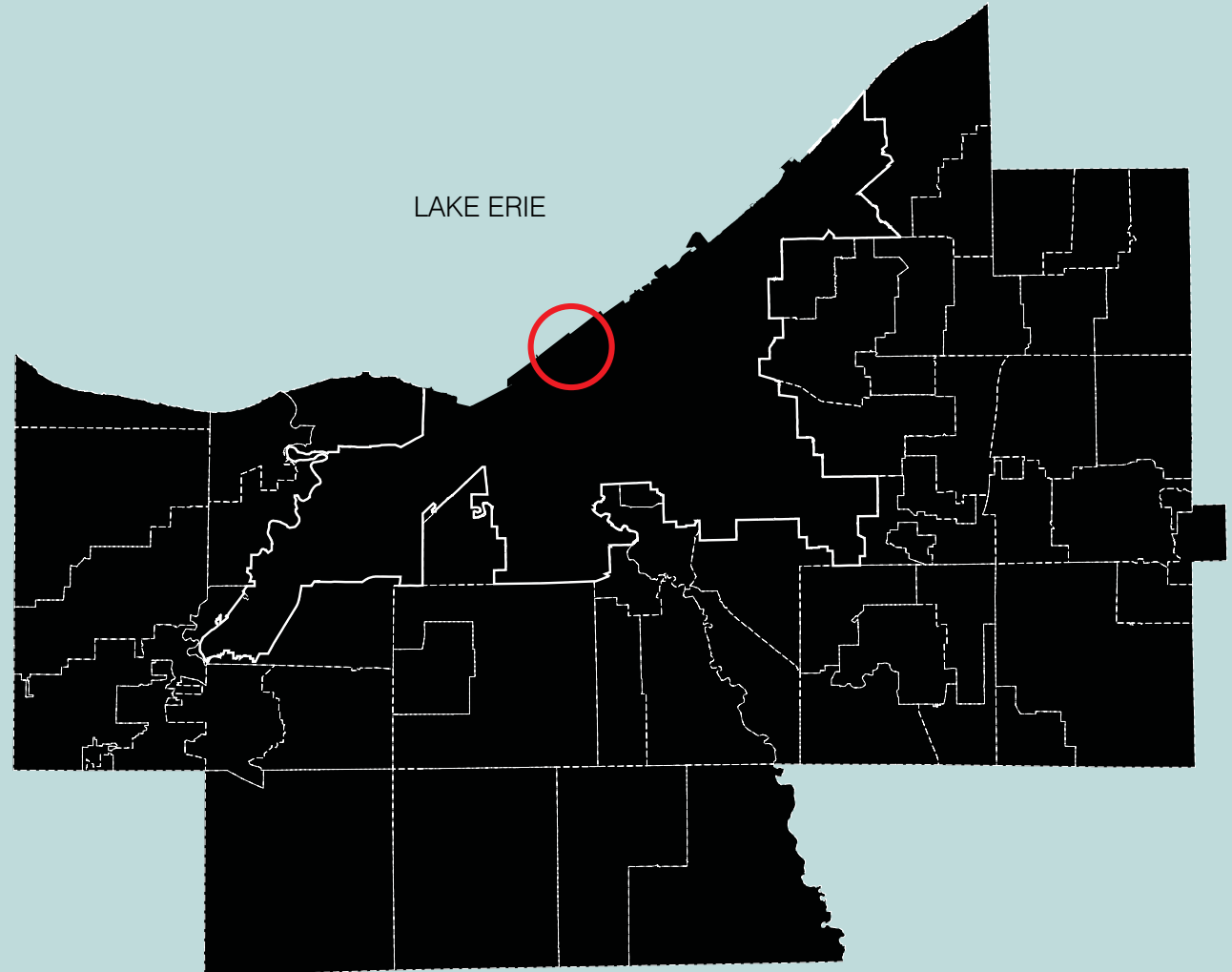
Fig. 1/ Cleveland is located in the center of Cuyahoga County along the coast of Lake Erie. In recent years the population of Cuyahoga and surrounding counties have gained population as the city itself has lost pollution.

Fig. 2/ The Cuyahoga River runs through the center of the city. Downtown Cleveland was settled at the mouth of the river in 1796

Fig. 3/ The Cuyahoga Valley National Parks reclaim generous amount of rural space.

Fig. 4/ There is an extensive freight rail system in the region. Public transportation (Amtrak and RTA) share many of these lines

Fig 5/ The highway and rail systems share the same corridors.



WATER SYSTEMS/

The Cuyahoga River and its tributaries drain 813 square miles of land in portions of six counties. Moses Cleveland, a surveyor charged with exploring the Connecticut Western Reserve, first arrived at the mouth of the Cuyahoga River in 1796, and subsequently decided to locate a settlement there, which became Cleveland, Ohio.

PARKS + GREENSPACE/

Cuyahoga Valley National Park/ preserves and reclaims the rural landscape along the Cuyahoga River between Akron and Cleveland in Northeast Ohio. The 32 sq mi park is the only national park in Ohio.

Group Plan/ European examples of broad public squares and avenues surrounded by buildings in a coordinated architectural style provided the inspiration and guide for the Cleveland Mall and Group Plan of Public Buildings.

RAIL SYSTEM/

The Cuyahoga River and its tributaries drain 813 square miles (2,110 km²) of land in portions of six counties. Moses Cleveland, a surveyor charged with exploring the Connecticut Western Reserve, first arrived at the mouth of the Cuyahoga River in 1796, and subsequently decided to locate a settlement there, which became Cleveland, Ohio.

ROAD NETWORK/

Cuyahoga Valley National Park/ preserves and reclaims the rural landscape along the Cuyahoga River between Akron and Cleveland in Northeast Ohio. The 32 sq mi park is the only national park in Ohio.

Group Plan/ European examples of broad public squares and avenues surrounded by buildings in a coordinated architectural style provided the inspiration and guide for the Cleveland Mall and Group Plan of Public Buildings.

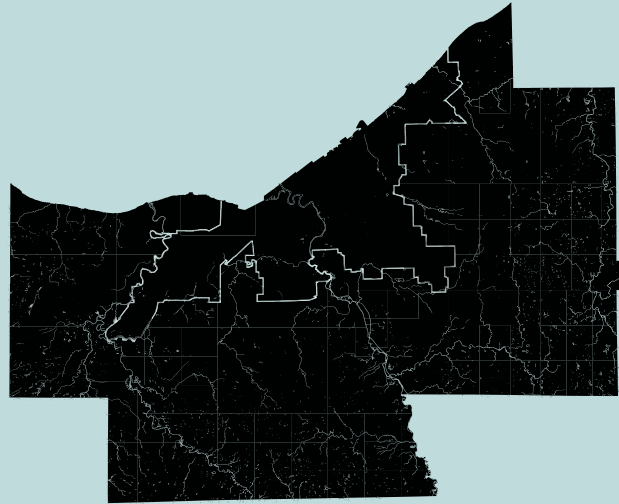


Fig. 1

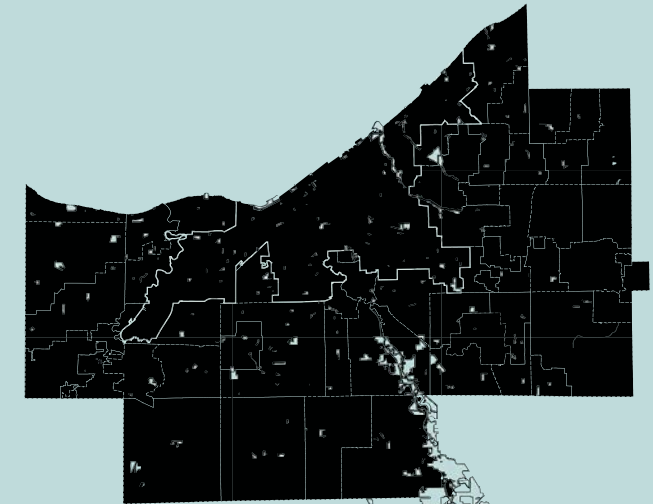


Fig. 2

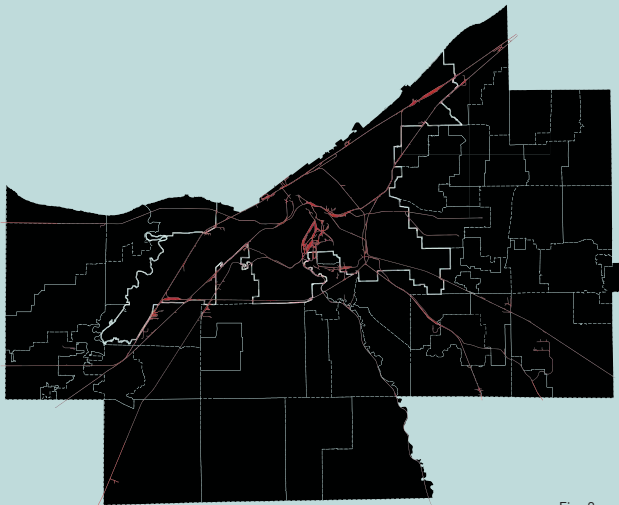


Fig. 3



Fig. 4

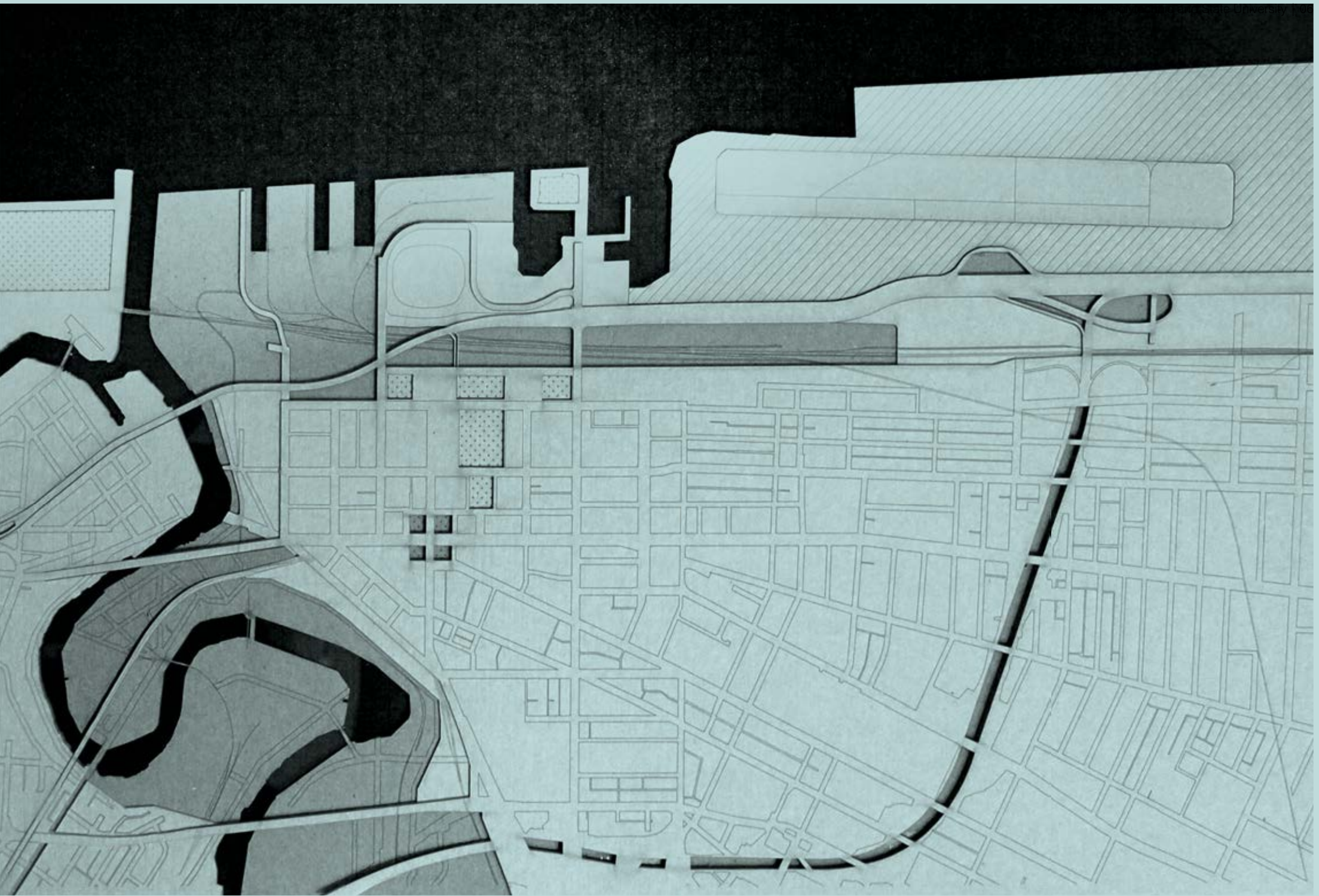
PART 1/ PHYSICAL MAP

Relief Model/ Not to scale

Downtown Cleveland. Current condtions, edges, gaps, voids and connections.

Laser Cut chip board.





PART 1/ ISOLATED LAYERS

HYDRO/

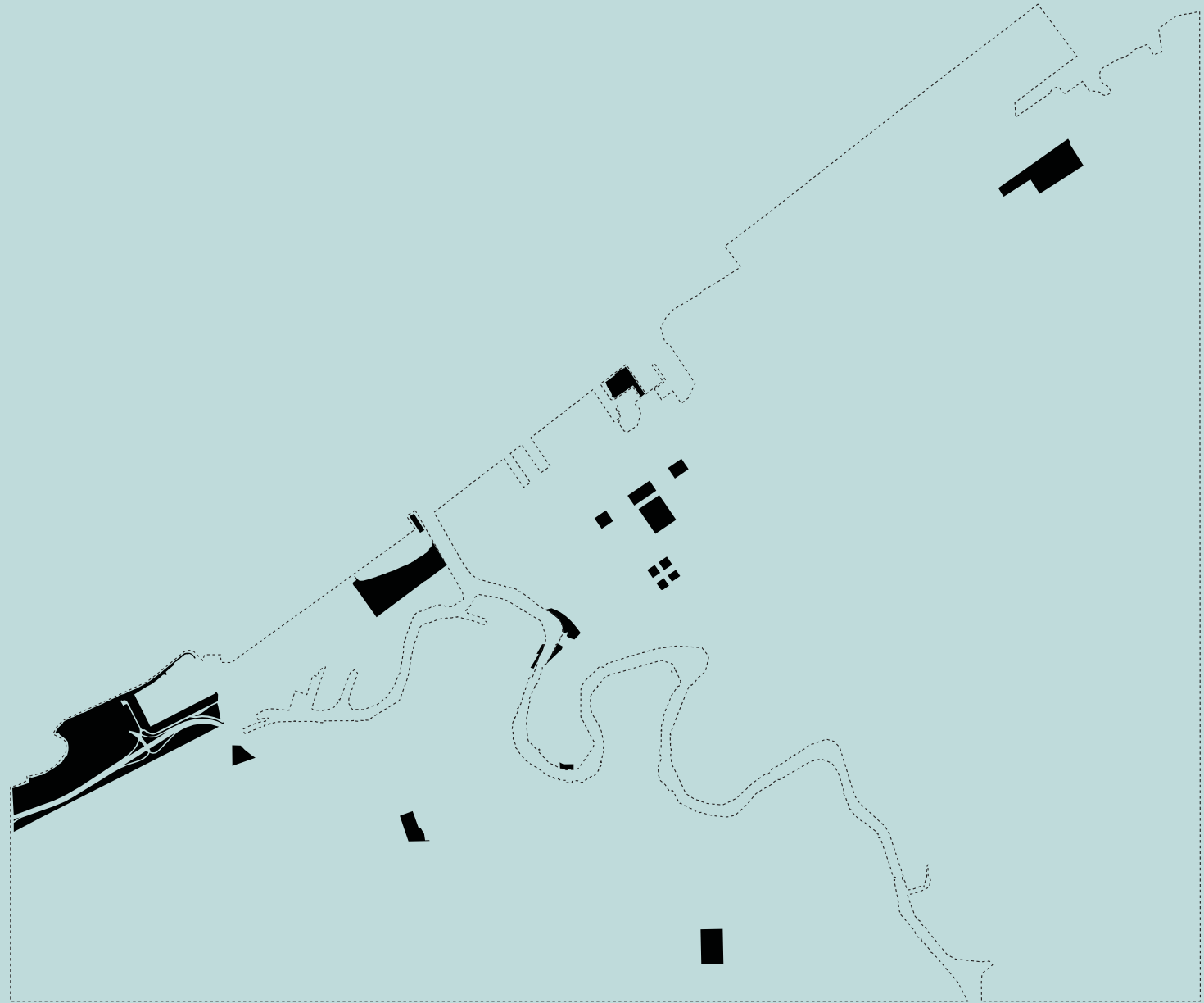
Cleveland's major natural boundaries are defined by two waterways: Lake Erie to the north and the Cuyahoga River. Downtown is situated east of the river. The winding nature of the Cuyahoga creates several inland peninsulas and varied waterfront.



01/

PARKS AND GREENSPACE/

While there are many large rural parks in Cuyahoga County, the urban core of Cleveland is largely bereft of quality public park spaces. The cluster of boxes in the center depicts Public square and the malls from Daniel Burnham's plan for Cleveland. Both are civic spaces with limited value as informal public space. Most striking is the separation of greenspace from the water.



02/

MAJOR BUILDINGS/

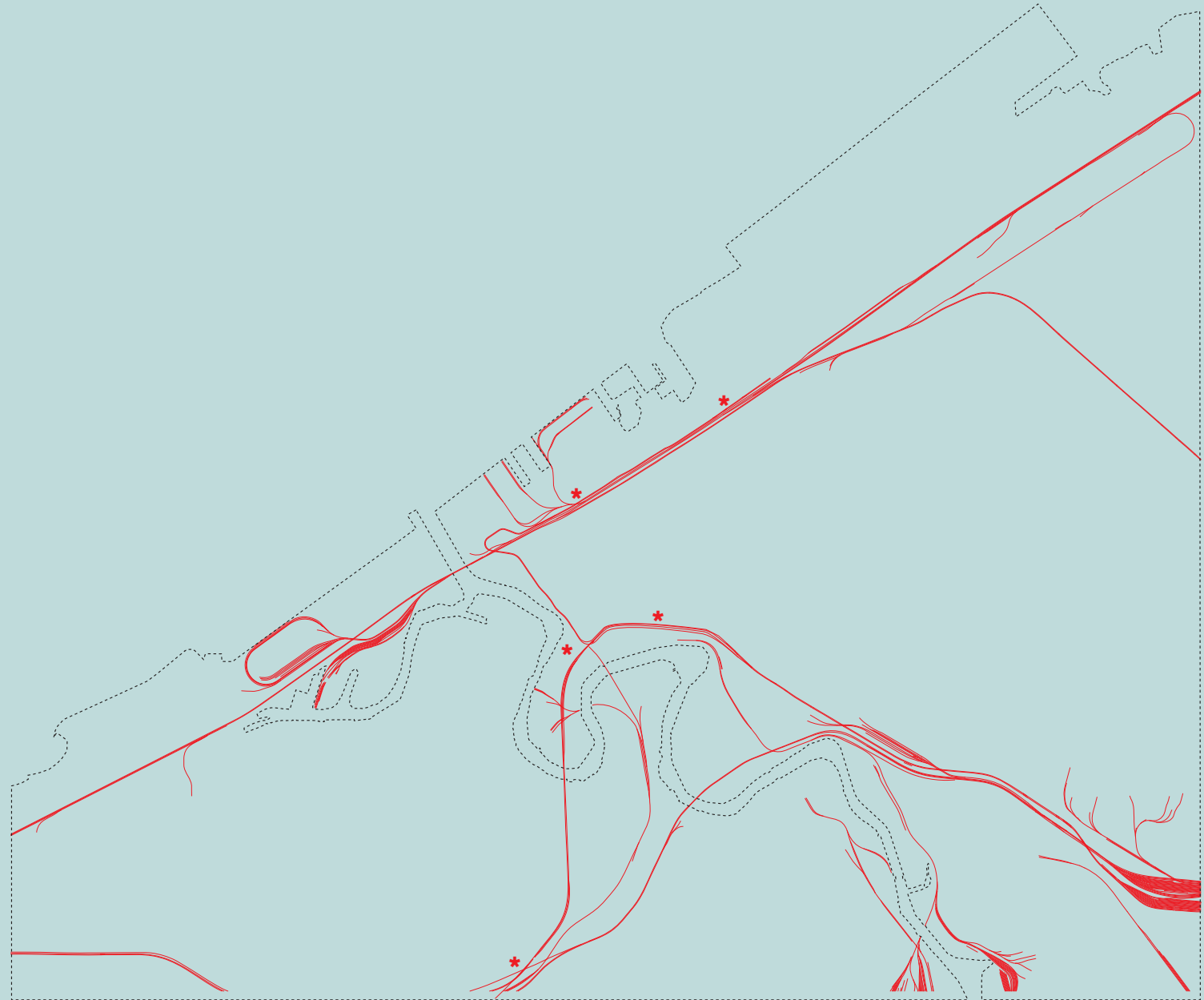
The distribution of buildings is notable for the distinct radial pattern oriented east but not west as the river disrupts the urban grid. There is also a clear separation of buildings from the lakefront and riverfront. Downtown an off-grade highway and at grade railroad create a series of edges between the city and the Lake Erie waterfront



03/

RAIL NETWORK/

There is a strong East West rail corridor on grade below the elevated highway along the lakefront. This is the greatest contributor to the separation of downtown from the lakefront. The Cleveland Regional Transit Authority (RTA) shares tracks with freight rail. Unlike other cities facing Cleveland's transformation dilemma, public passenger rail infrastructure actually exists. Sharing space with commercial freight is not ideal and separating these functions is desirable if public transit and public spaces are to bear a stronger relationship.



04/

BRIDGES/

The bridge conditions that stand out clearly can be categorized as two distinct typologies: Spline and Seam. The curve of short bridges creates a seam over the sunken highway creating continuity in the urban fabric. Urban life around these bridges is often characterized residual areas inside the turning radius of on-ramps and off-ramps. The Long splines are the diverse long span bridges the span the Cuyahoga. The valley below is a mix of uses and functionality. Some areas provide life and connection to the city and waterfront, other areas vacuous and foreboding.

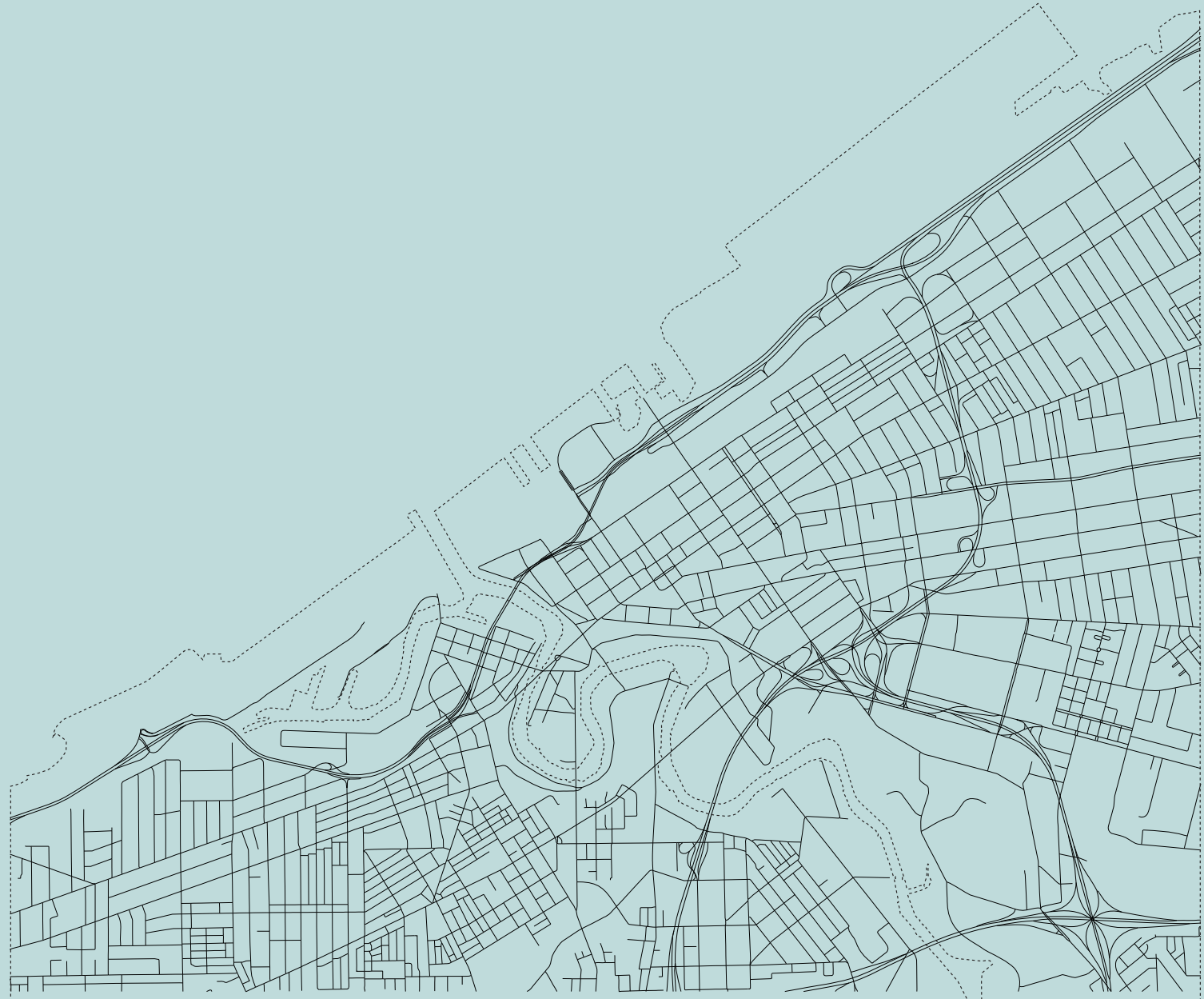


05/

HIGHWAYS, MAJOR & SECONDARY ROADS/

In some parts of the city the streets are suspended. In other parts they are buried in the ground. The downtown is nearly enveloped by highways creating a distinct separation from the lakefront.

The eastward radial pattern emerges again. The geometry of the radial grid breaks down entirely when it meets the river. Milwaukee and Portland have demolished their free-ways that separated the waterfront from the downtown and the city and unleashed a new wave of private investment and public amenities.



06/

TOPOGRAPHY/

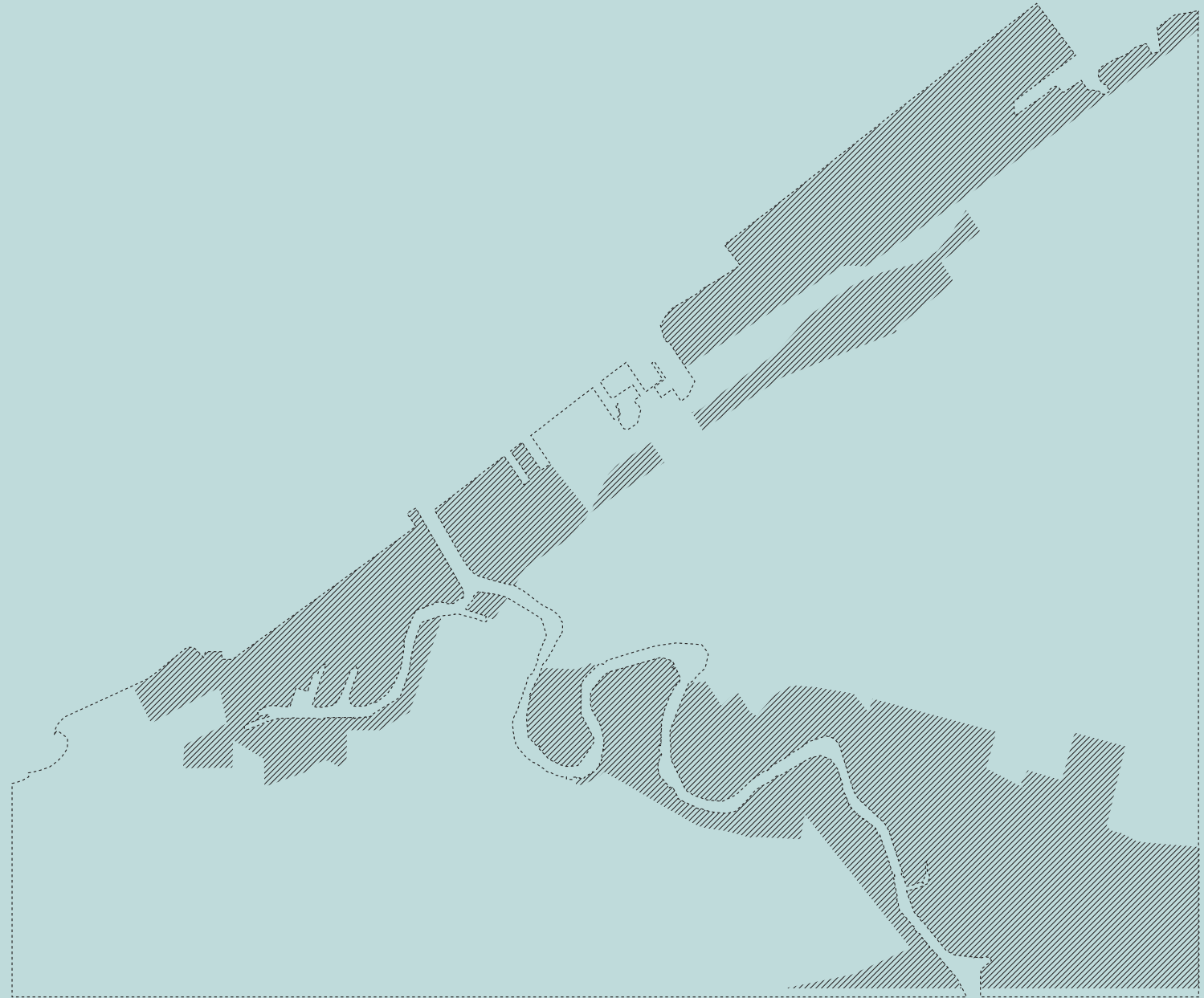
This map is notable mainly for the visual reinforcement of downtown as an island penned by highways and railroads as well as the steep grade change that occurs at the banks of the Cuyahoga.



07/

INFRASTRUCTURE/

Once all the elements are stripped away we can see what has been becoming obvious. Cleveland suffers critically from a separation from its waterfronts. There are only a couple of small points in which the greater urban space is able to touch the waterfront in any meaningful way. The rest of the map depicts the interstitial areas occupied by infrastructure, industry or otherwise unoccupied urban spaces. The fact the waterfront is severed so completely from the greater urban milieu is the clearest problem illustrated by this series of maps.



08/ COMPLETE LAYERS

DOWNTOWN RESIDENTIAL/

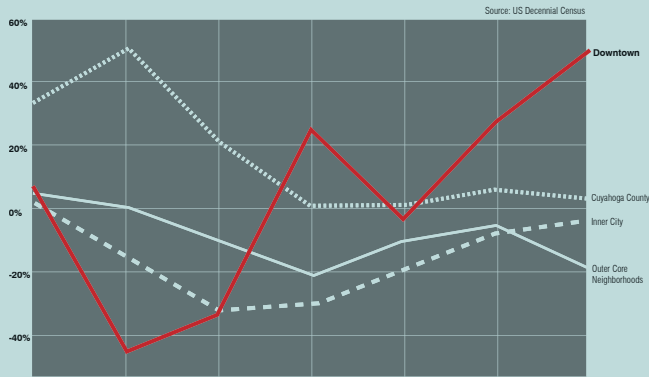
As far as revitalization efforts go, downtown areas are compelling places to start. Physically downtowns are equipped to take on a wide range of uses, activities and functions and have the ability to absorb large increases in population. A strategy to increase population downtown would be strengthened by a concerted effort to bolster public transit services, create usable dynamic public spaces, attract businesses, retail and restaurant and crucially, a greater connection to the greatest natural resource giving shape identity to the metropolitan area: waterfronts.



09/ DOWNTOWN RESIDENTIAL

WAREHOUSE DISTRICT/

Since 1990 this neighborhoods has grown by 96%. The following chart is based on US census information.



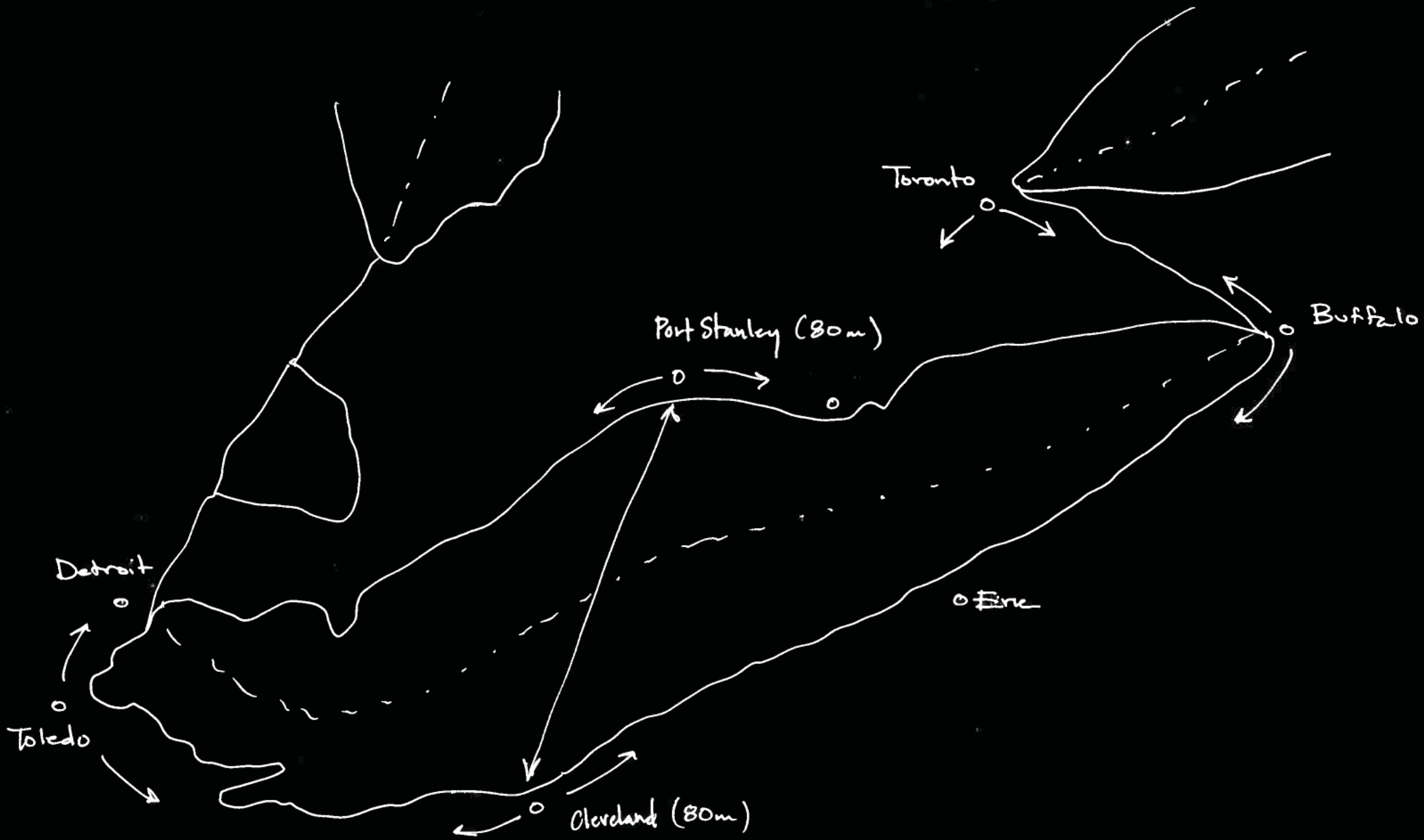
10

Site Selection

GET PEOPLE TO THE WATERFRONT!

Many American cities owe their location and initial functionality to their proximity to water, rivers, lakes and oceans. Waterfronts enable cities to manufacture, warehouse and ship goods and products. Infrastructure was built and zoning was aligned to carry out these purposes. In an increasingly knowledge intensive economy cities like Cleveland are finding that the function of their waterfronts has dramatically changed from one with the primary function of supporting industry to one that reflects the demand for places of enjoyment, recreation and civic engagement.





AQUARAMA

Trans-Erie Terminal/ Cleveland

PART 2

95,000 square miles of surface fresh water
40% of the freshwater in North America
20% of the world's freshwater

City Edges
County/Municipal Boundaries
State Boundaries
US/Canada Border
Fluid/Maritime Borders
Psychological Borders

PART 2/ Lake Erie Watershed

- HURON-ERIE CORRIDOR
- EAST BASIN
- WEST BASIN
- CENTRAL BASIN
- NIAGARA RIVER BASIN



DETROIT/MI

Area
 City|143 sq mi (370 km²)
 Land|139 sq mi (360 km²)
 Water|4 sq mi (11 km²)
 Urban|1,296 sq mi (3,364 km²)
 Metro|3,913 sq mi (10,134 km²)

Population (2010)
 City|713,777
 Density|5,142/sq mi (1,985/km²)
 Urban|3,663,624
 Metro|4,296,250

TORONTO/ONTARIO

Area
 City|630 km² (243.2 sq mi)
 Urban|1,749 km² (675.3 sq mi)
 Metro|7,125 km² (2,751 sq mi)
 Elevation|76 m (249 ft)

Population
 City|2,503,281
 Density|3,972/km² (10,287/sq mi)
 Urban|4,753,120 (1st)
 Metro|5,113,149 (1st)

BUFFALO/NY

Area
 City|52.5 sq mi (136.0 km²)
 Land|40.6 sq mi (105.2 km²)
 Water|11.9 sq mi (30.8 km²)
 Elevation|600 ft (183 m)

Population
 City|291,310 (70th in U.S.)
 Density|6,666.2/sq mi (2,598.6/km²)
 Urban|676,703 (39th in U.S.)
 Metro|1,136,509 (47th in U.S.)

PORT STANLEY, ONTARIO

NIAGRA FALLS/NY

Area
 City|17 sq mi (43.5 km²)
 Land|14 sq mi (36 km²)
 Water|2.8 sq mi (7.3 km²)
 Urban|357 sq mi (929 km²)
 Elevation|1,043 ft (318 m)

Population
 City|50,763
 Density|3,059/sq mi (1,227/km²)
 Urban|919,713 (Ranked 30th)
 Metro|1,254,165

TOLEDO/OH

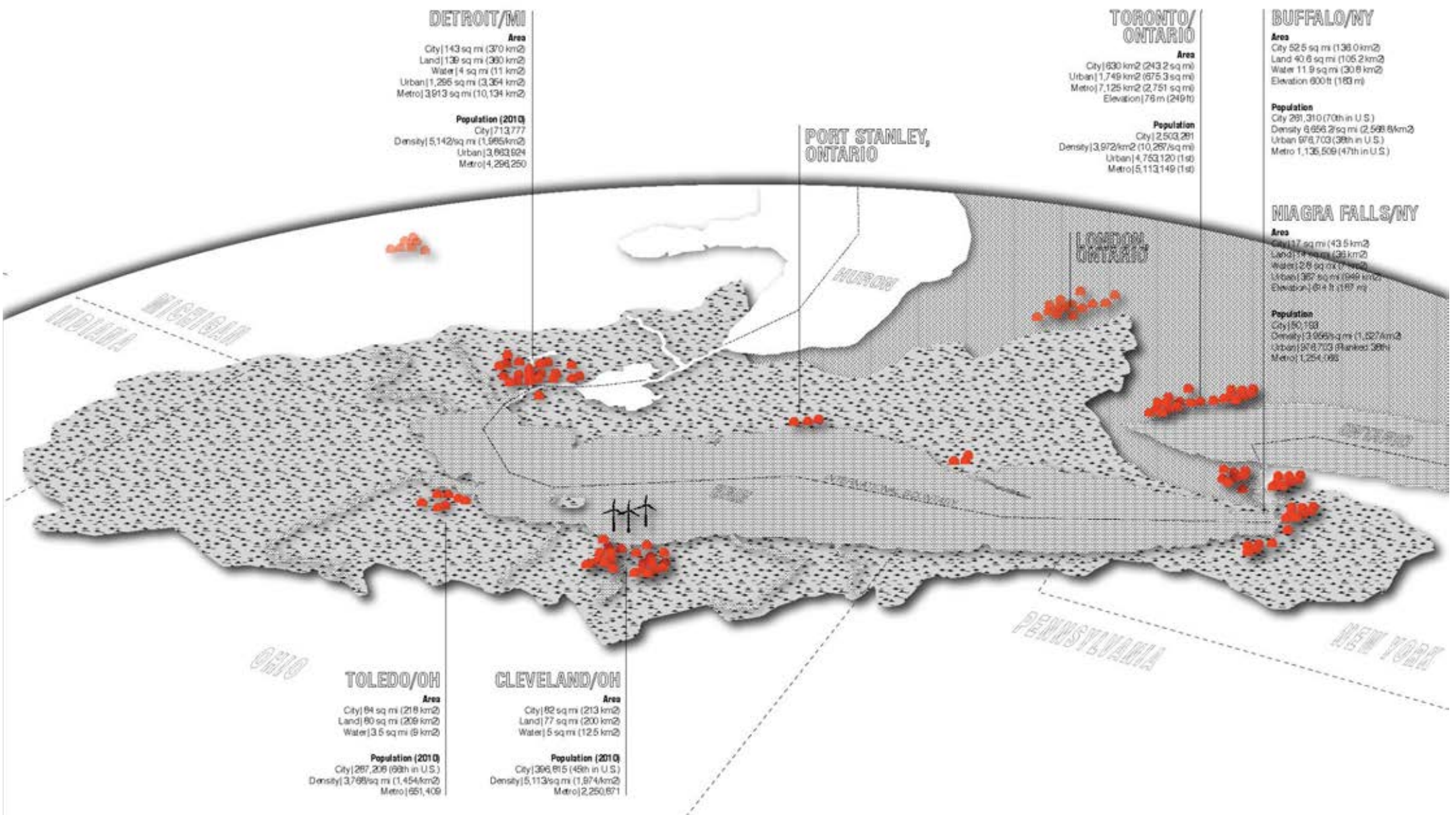
Area
 City|84 sq mi (218 km²)
 Land|80 sq mi (209 km²)
 Water|3.5 sq mi (9 km²)

Population (2010)
 City|287,236 (93th in U.S.)
 Density|3,799/sq mi (1,454/km²)
 Metro|651,409

CLEVELAND/OH

Area
 City|82 sq mi (213 km²)
 Land|77 sq mi (200 km²)
 Water|5 sq mi (12.5 km²)

Population (2010)
 City|396,815 (49th in U.S.)
 Density|5,113/sq mi (1,974/km²)
 Metro|2,250,871



PART 2/ S.S. Aquarama

The SS Aquarama was a World War II troop ship for the United States Navy. In 1952, it was converted into the largest passenger ship ever to operate in the Great Lakes.

The Aquarama began operation in 1956 by touring various Great Lakes ports including one in Cleveland. In 1957 the Michigan-Ohio Navigation Company, began service from Detroit to Cleveland carrying automobiles and passengers. Once in service the ship was able to transport its passengers, as well as their automobiles, from Detroit to Cleveland in under six hours.

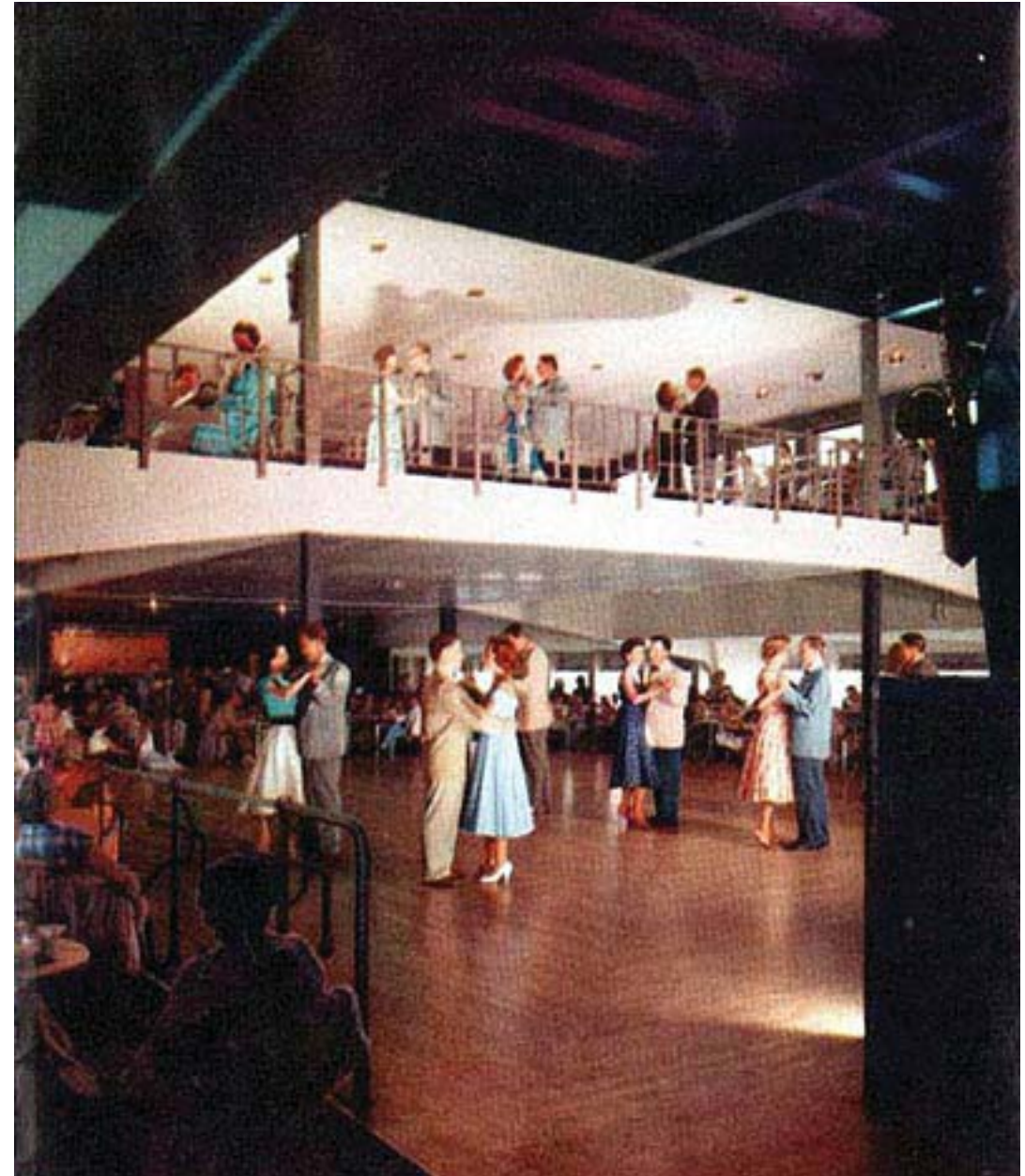
(All Aquarama images are Public Domain. Source: Western New York Heritage Press. Original Images taken from scans by Bjorn Larsson)

(http://wnyheritagepress.org/photos_week_2005/aquarama/aquarama.htm)





PART 2/ S.S. Aquarama on deck



(All Aquarama images are Public Domain. Source: Western New York Heritage Press. Original Images taken from scans by Bjorn Larsson)

(http://wnyheritagepress.org/photos_week_2005/aquarama/aquarama.htm)

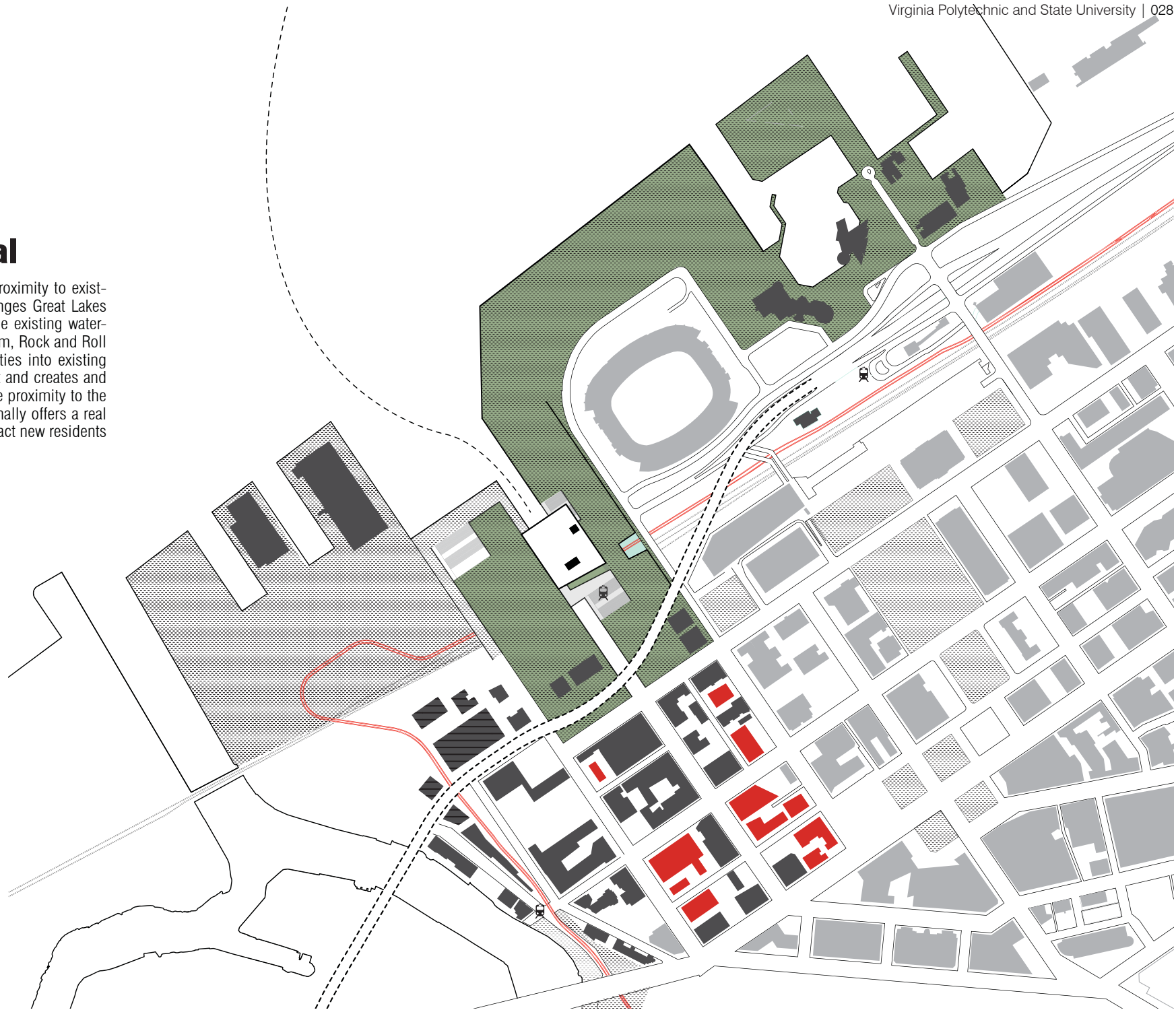


PART 2/ Site Selection



PART 2/ Locating a Terminal

This location was chosen because of its proximity to existing urban elements. The location encourages Great Lakes tourism to Cleveland and expands upon the existing waterfront amenities at Cleveland Browns Stadium, Rock and Roll HOF and Science Museum. The Terminal ties into existing RTA train lines to incorporate public transit and creates and new public park with waterfront access. The proximity to the residential *Warehouse District* downtown finally offers a real public greenspace to residents that will attract new residents and visitors from other parts of the city.





AQUARAMA

Trans-Erie Terminal/ Cleveland

PART 3



PART 3/ Ferry Boarding Platform

AQUARAMA TERMINAL DESIGN

The Terminal sits in a new public park on a public pier overlooking the lake. The area around Aquarama Terminal is public and adaptable for formal and informal uses. It conceived as a public good, not a private entity. The view back shows the large gallery space which frames views back to the city and out to the lake.

Left - View back from Boarding Platform at Exhibition Hall.

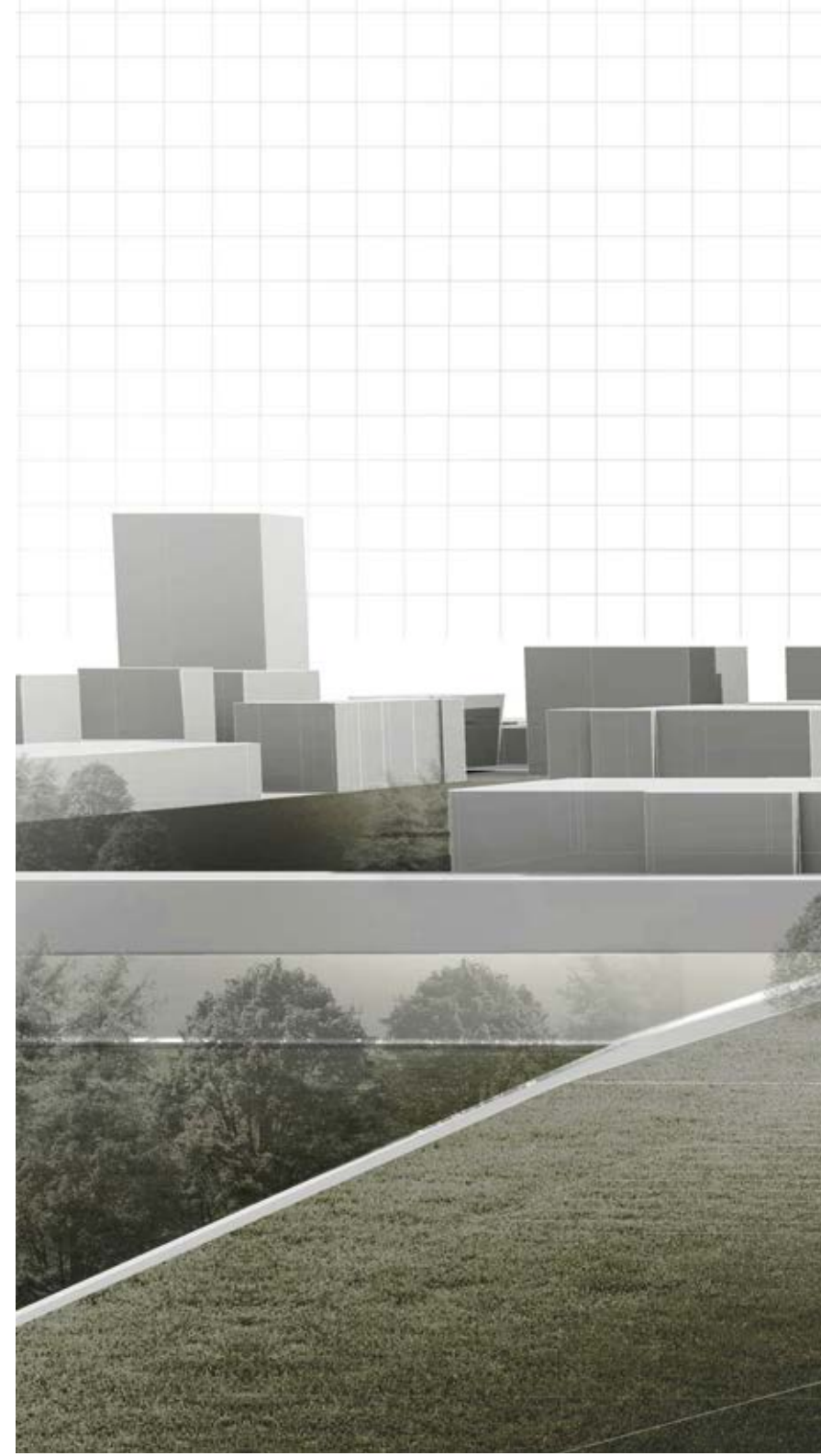
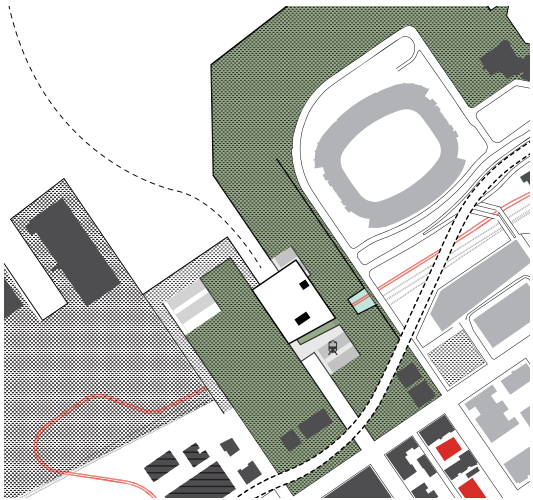


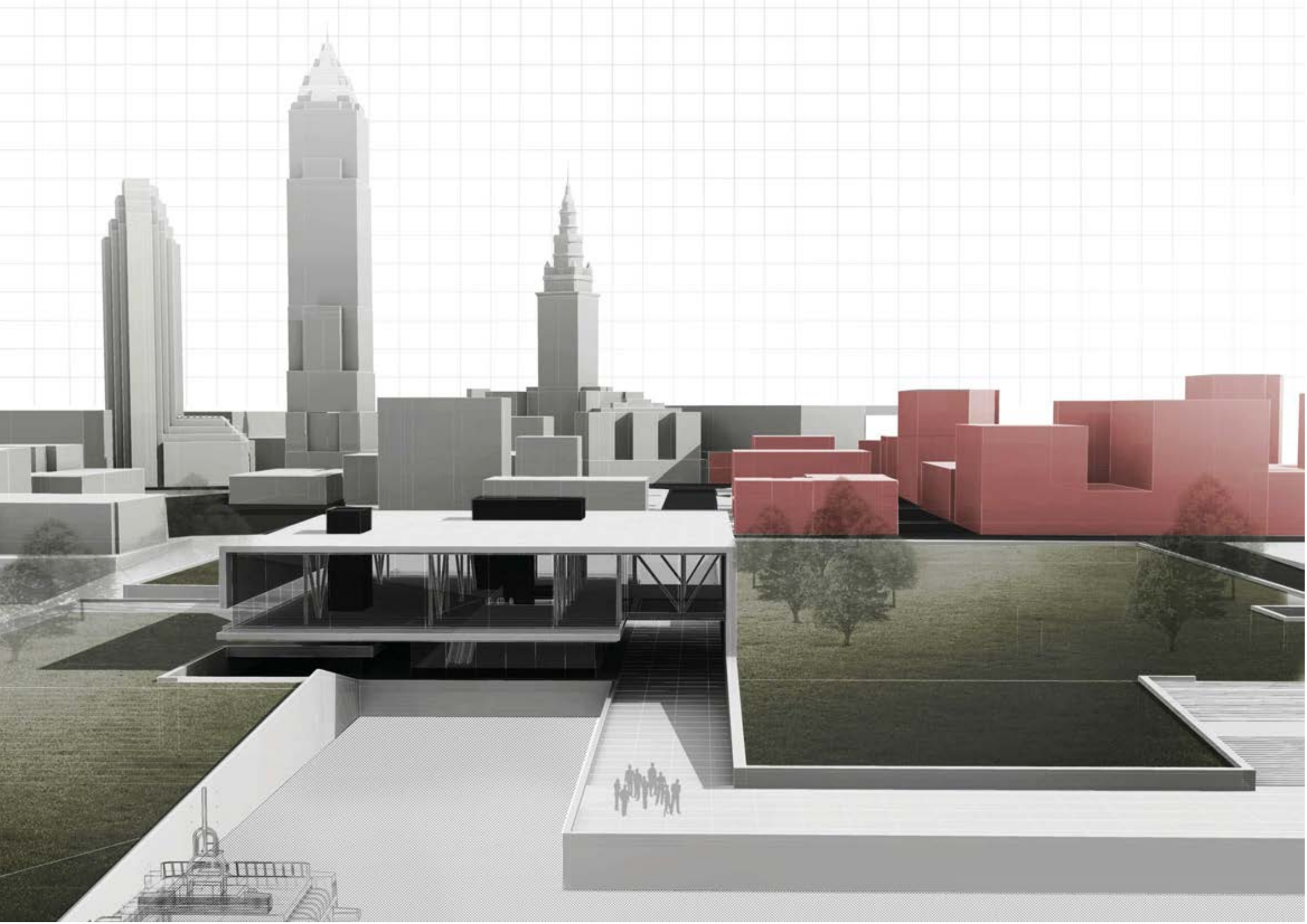


PART 2/ View of Arriving Ship

Public Park Aquarama Terminal Warehouse District

The arrival view shows the relationship of the terminal to the waterfront, the parkspace and the axial connection from the residential district downtown. This terminal is not meant to function only as a space for processing arrivals and departures like an airport. It encourages public engagement and activity of all kinds. It is a generator of urban activity.

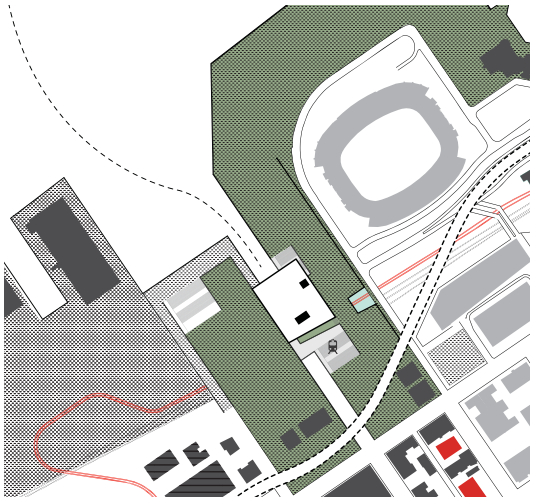




PART 2/ View Across Park

Public Park Aquarama Terminal/

It is not intended to be a private space like an airport which is cut off from the life of the city. Aquarama Terminal is a catalyst for events and public engagement in Cleveland and the Region as a whole. It is situated in a new public park that bridges over parking a freight rail and connects the waterfront with Cleveland's downtown residential District.

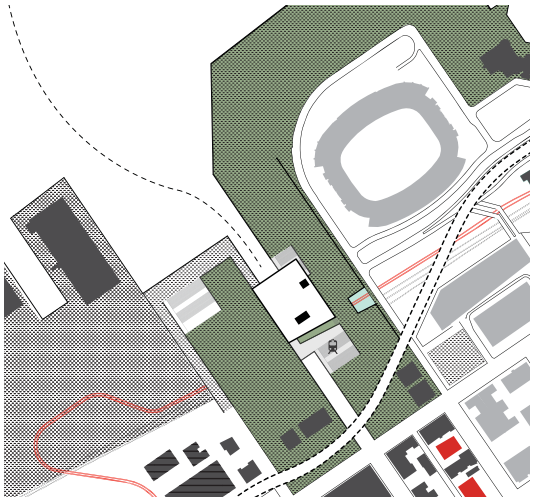


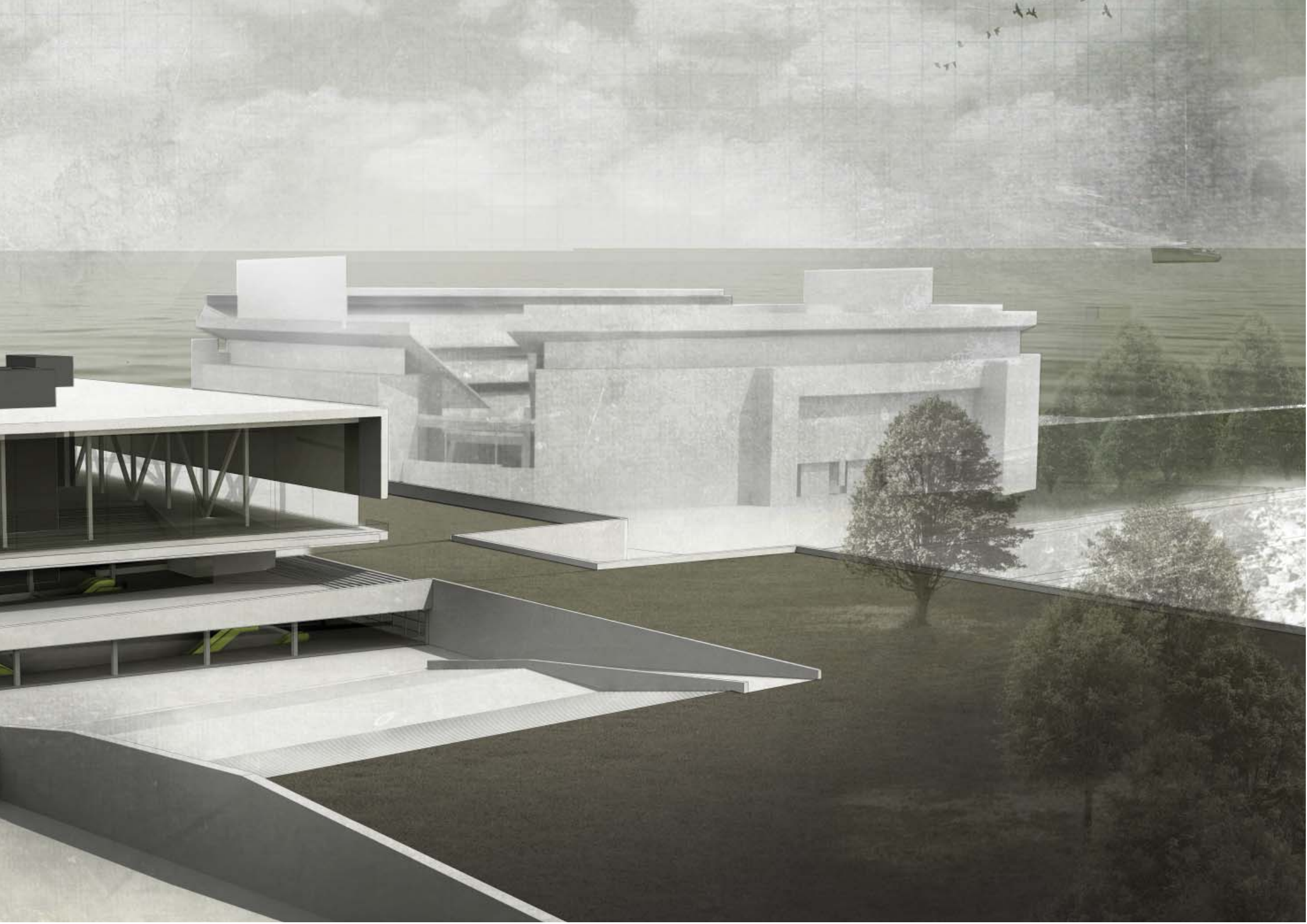


PART 3/ View Out to Water

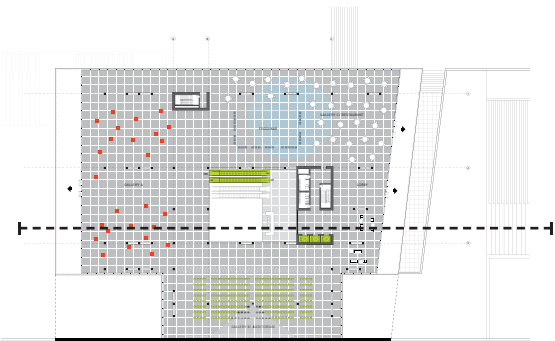
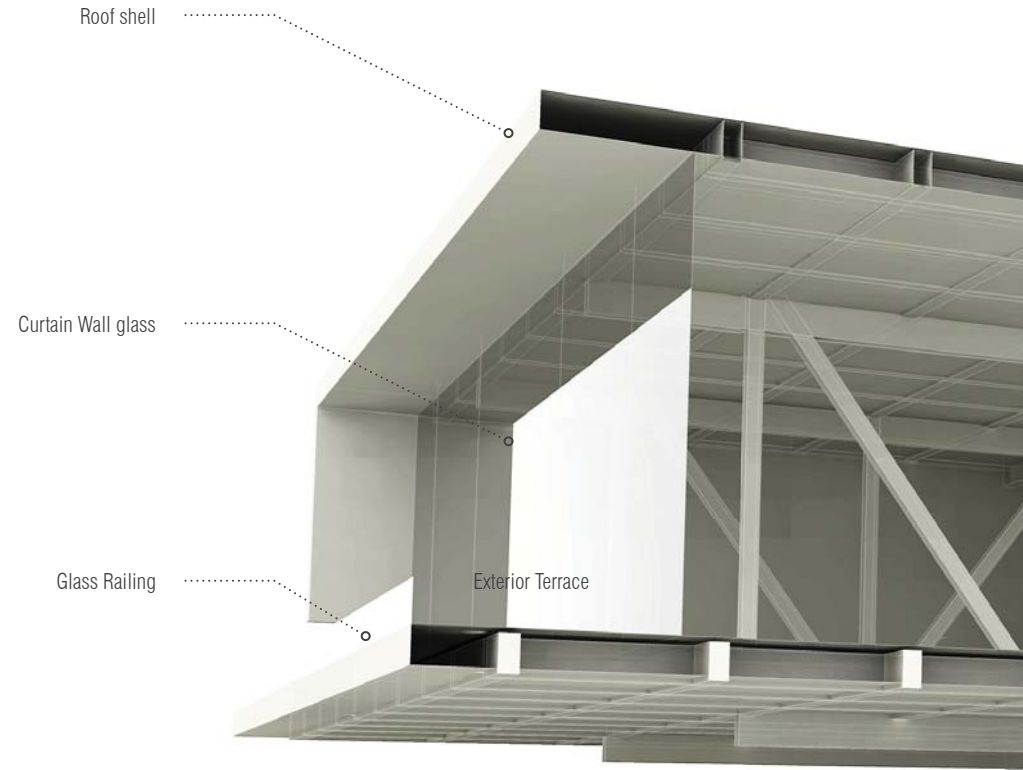
Public Park and Aquarama Terminal/

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Section Perspective





Super Truss

Structural Core

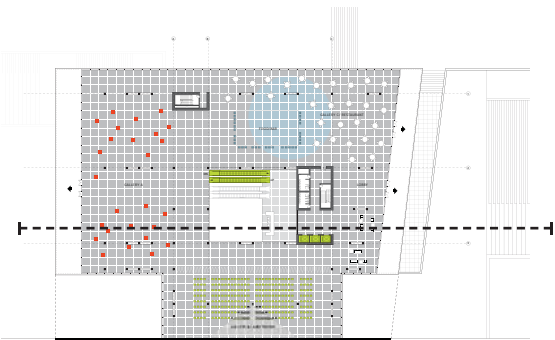
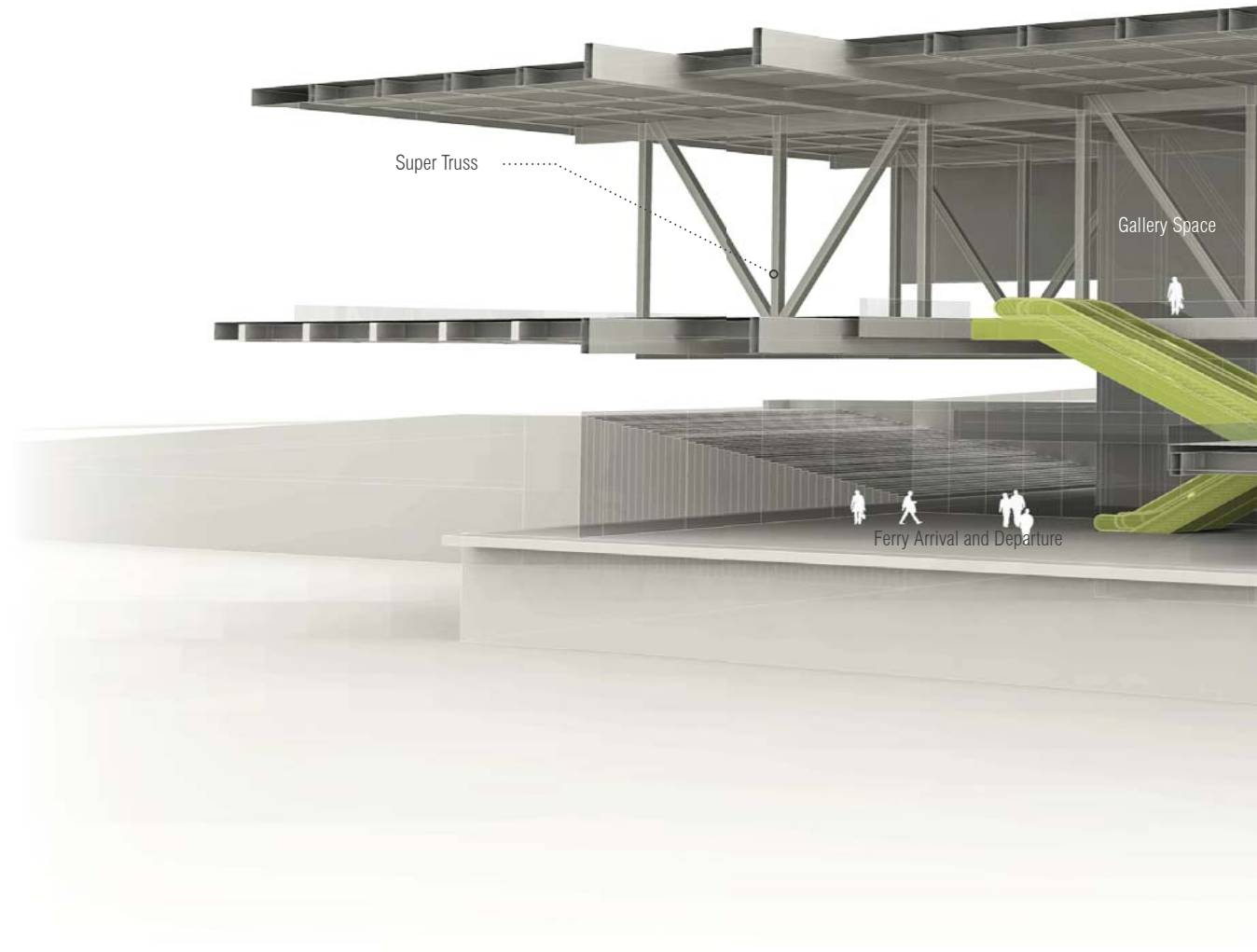
Gallery Space

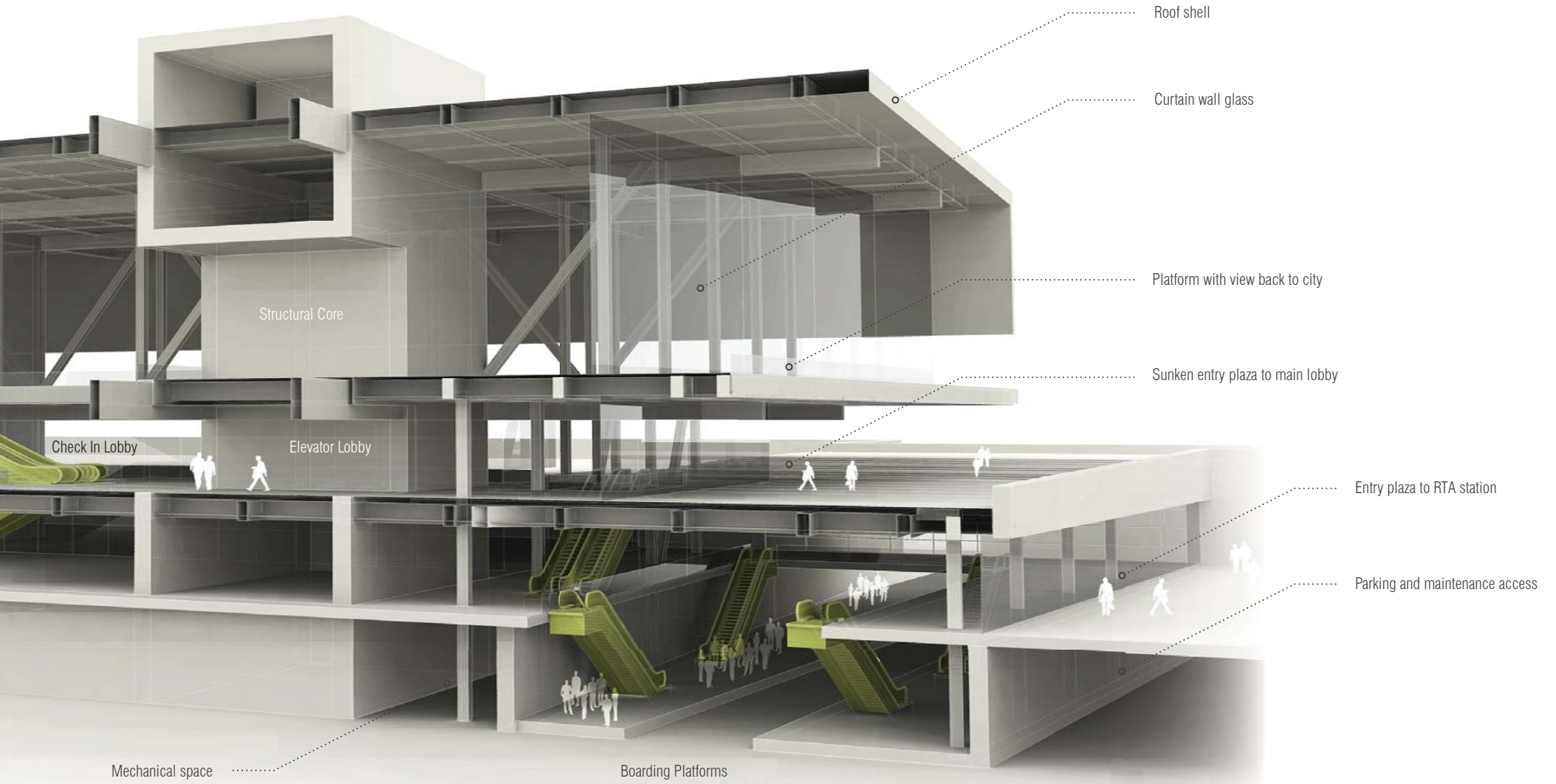
Check In Lobby

Ferry Arrival and Departure

Boarding Platforms

Section Perspective





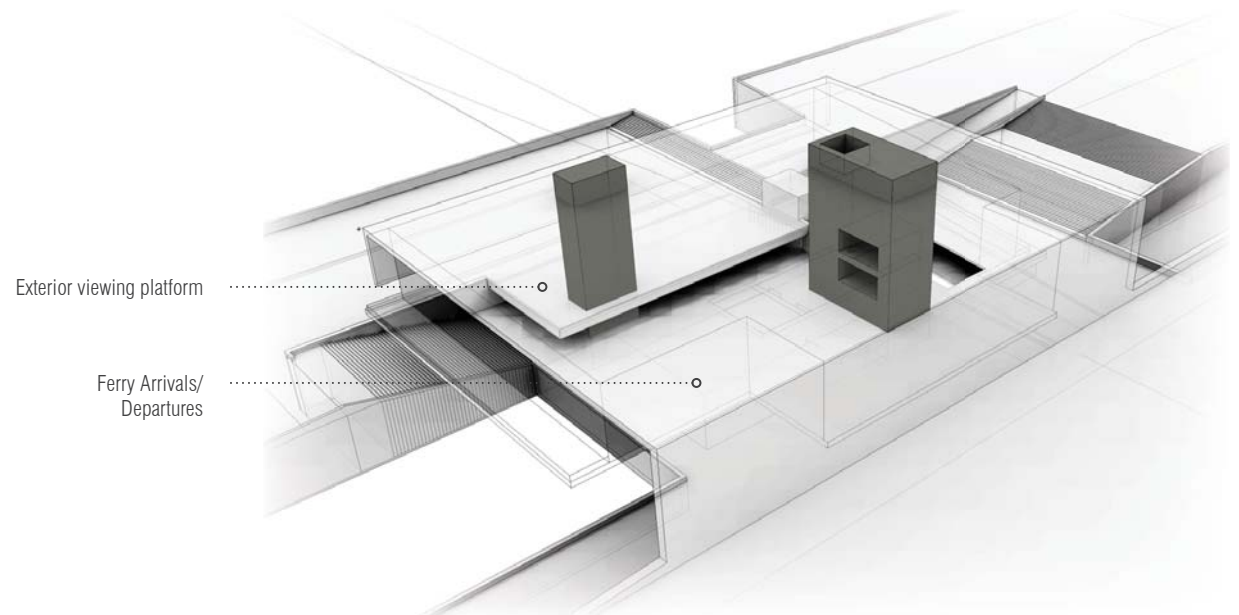
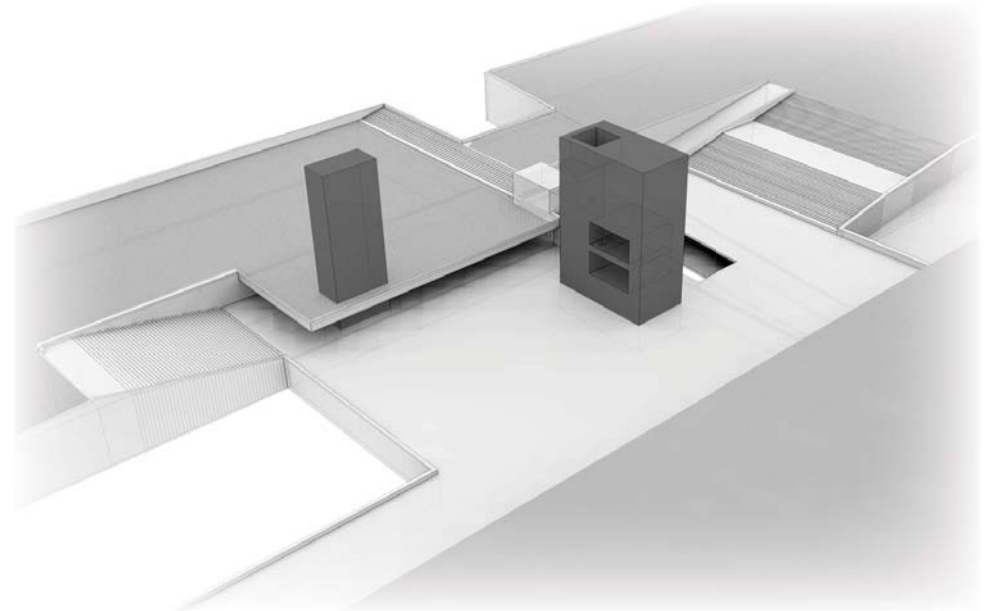
Terminal Level 01 Ferry and RTA Boarding

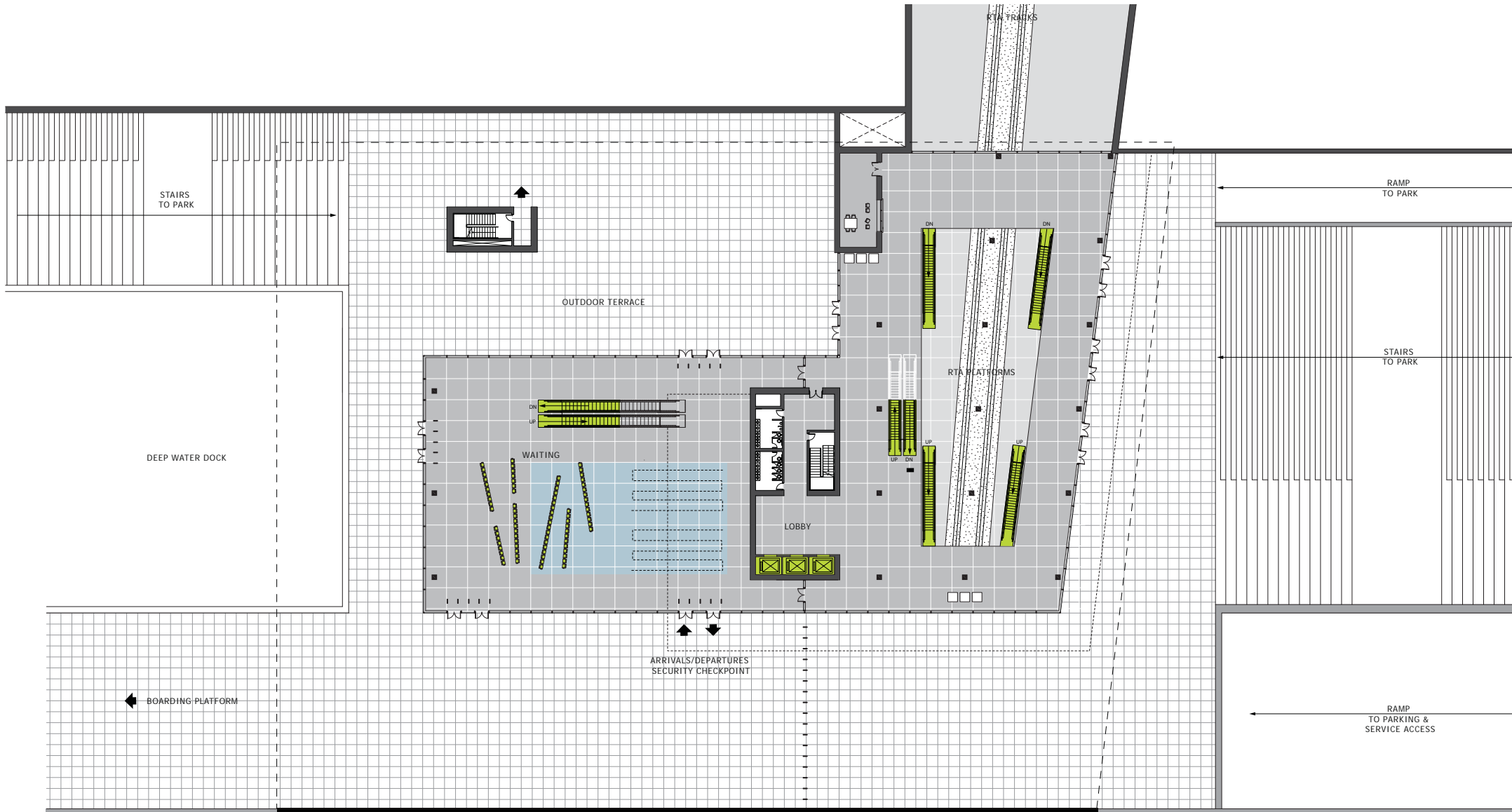
Overall Building Enclosure/ Roof Level/

Complete exterior and partial surrounding context.

Base level/ 01 Arrivals and Departures (Ferry Level)

Structural Core are indicated as well at the landscape staircase that connect the lower level to the Park Level and facilitate access for Trains and Ferry Checking and Boarding.

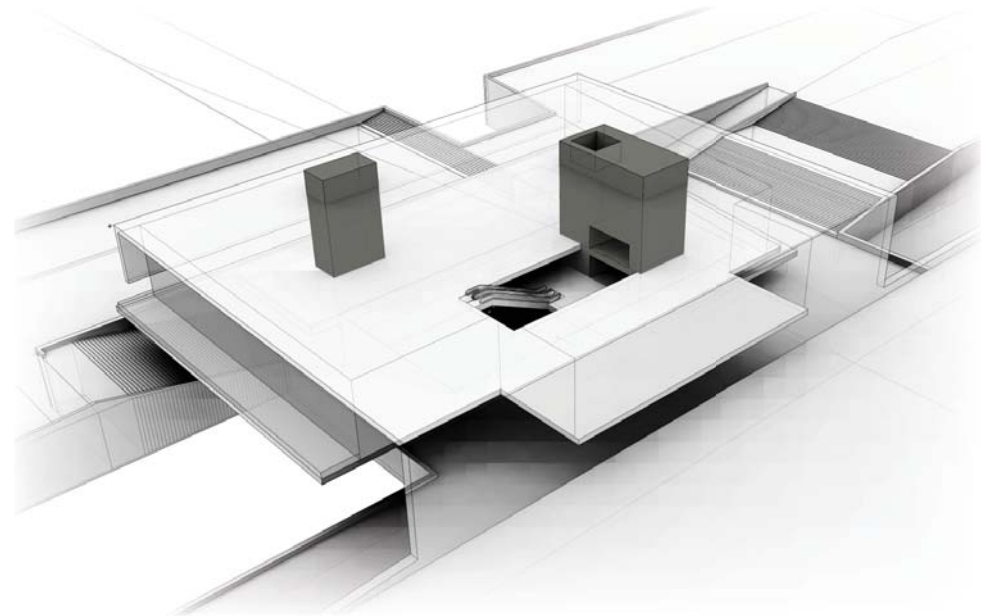
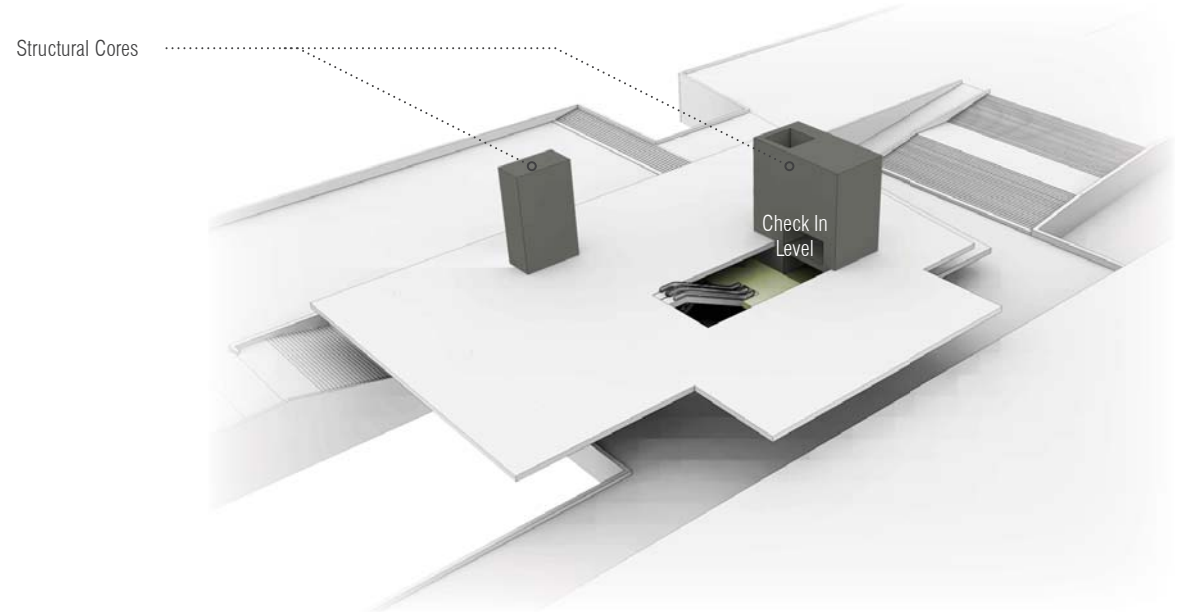


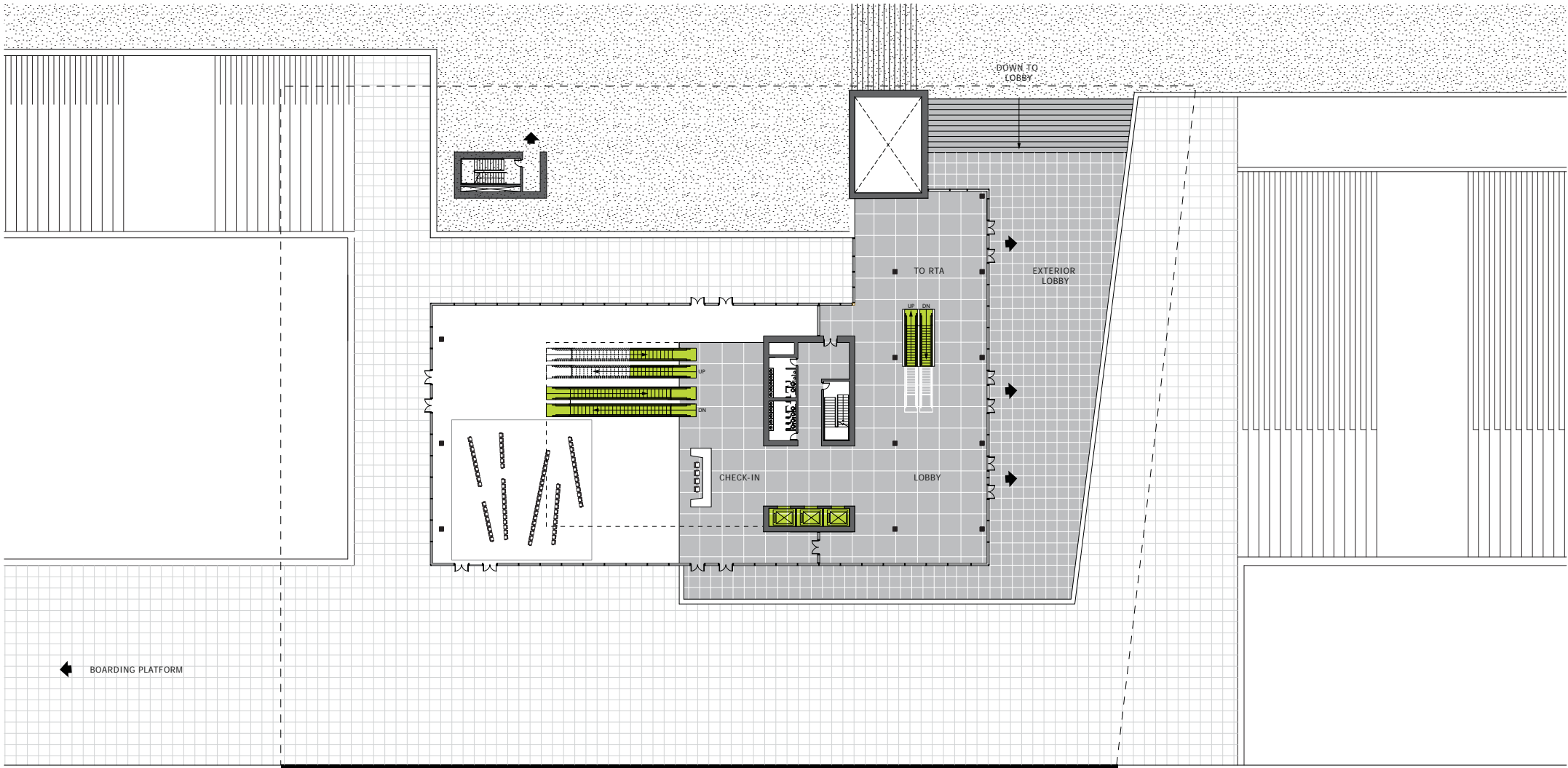


Check-In Level 02 Down to Boarding/Up to Gallery

Check-In Level/

The check-in level is the decision point between going up to the Gallery or down to the Departure Level. There is a waiting area and ticketing and security zone before passengers are able to proceed out to the boarding pier.



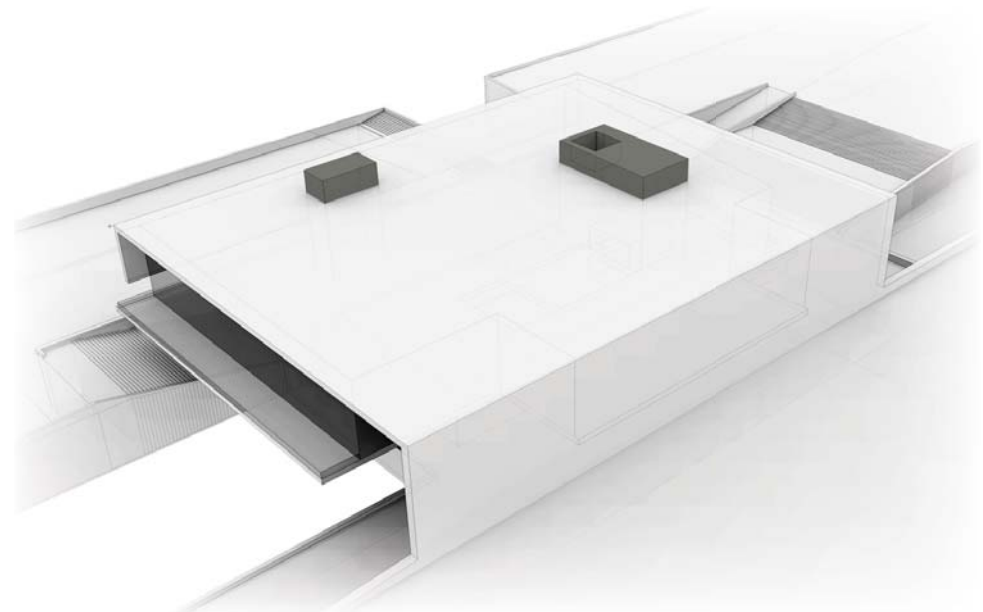
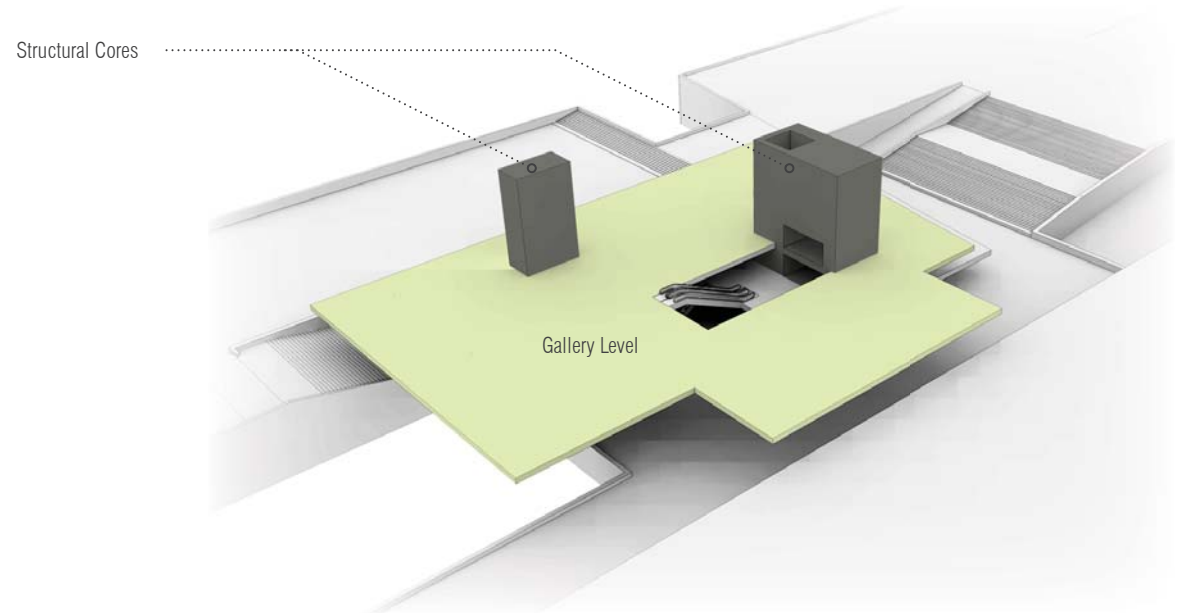


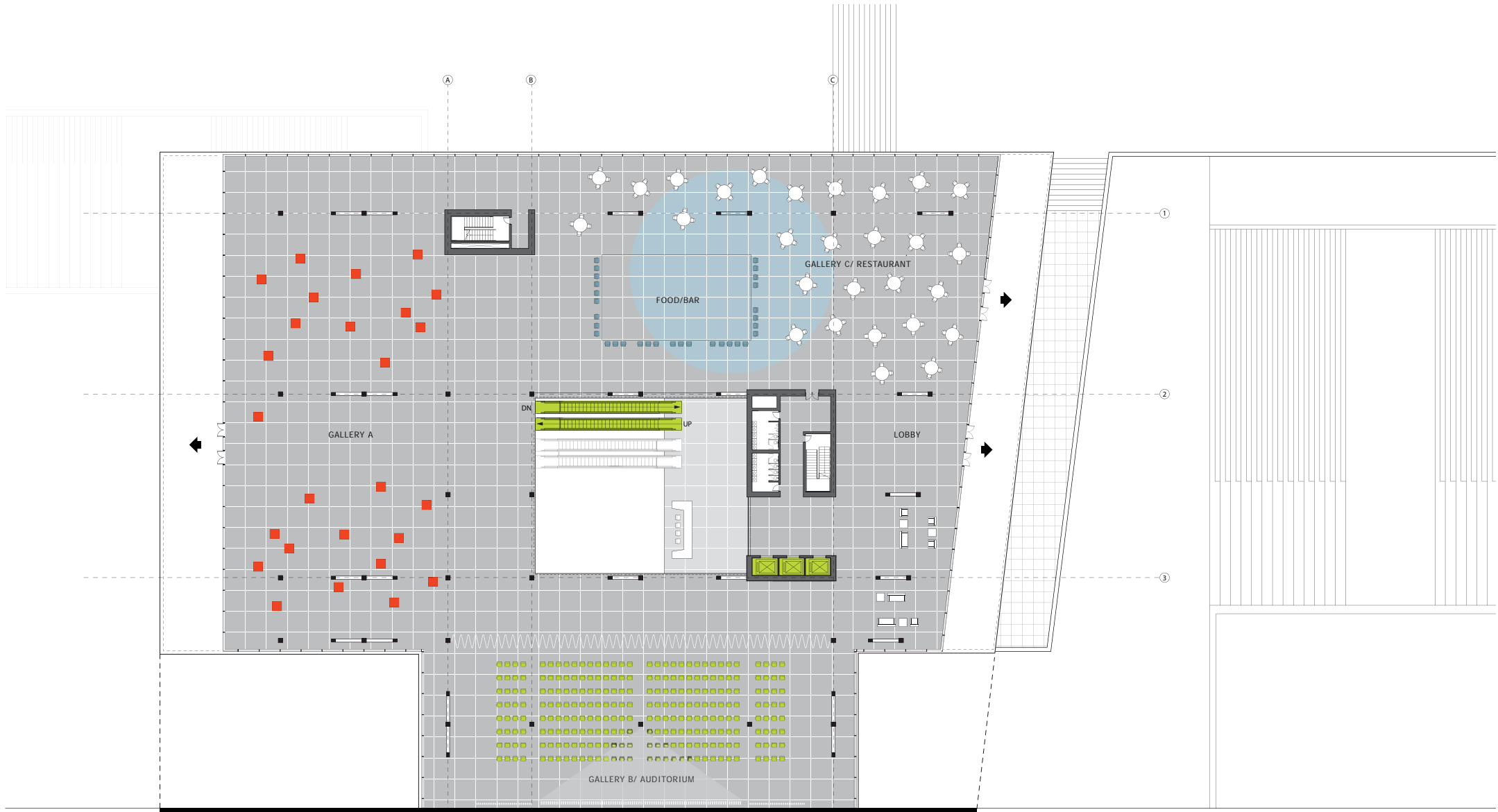
Gallery Level 03 Exhibition + Assembly

Gallery Level and Check-In Level Below/

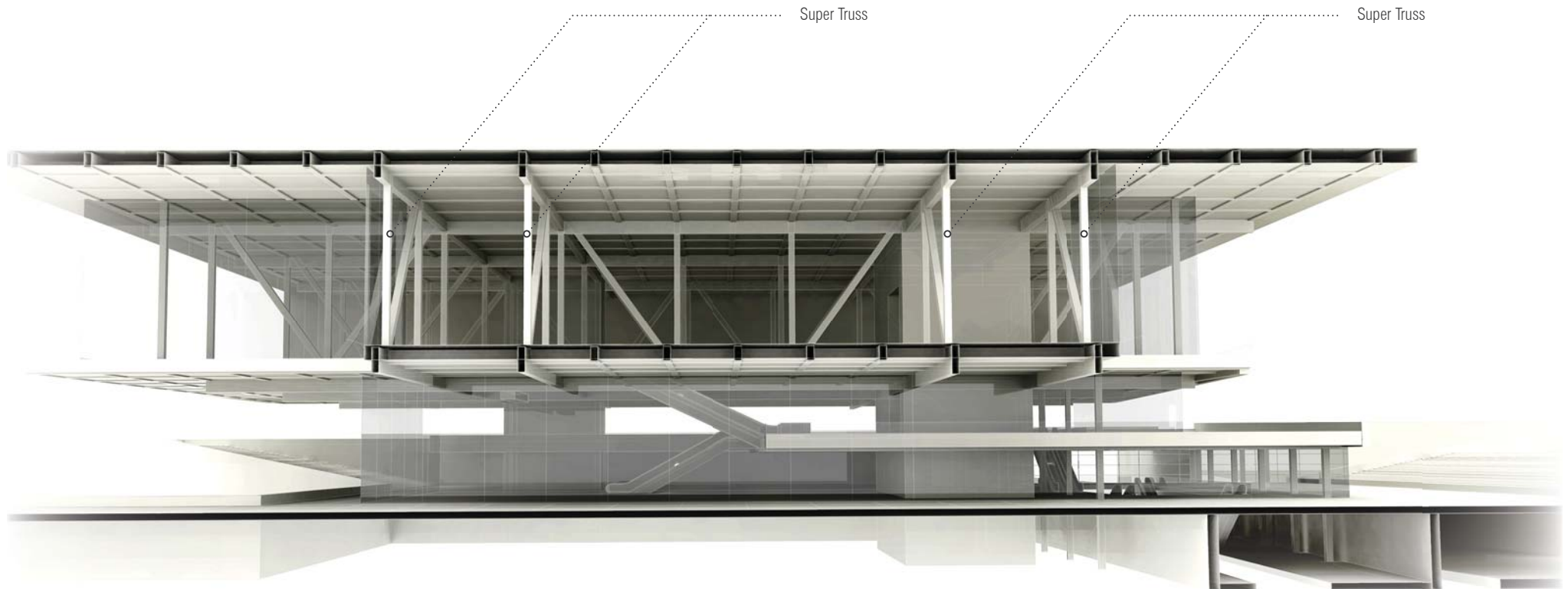
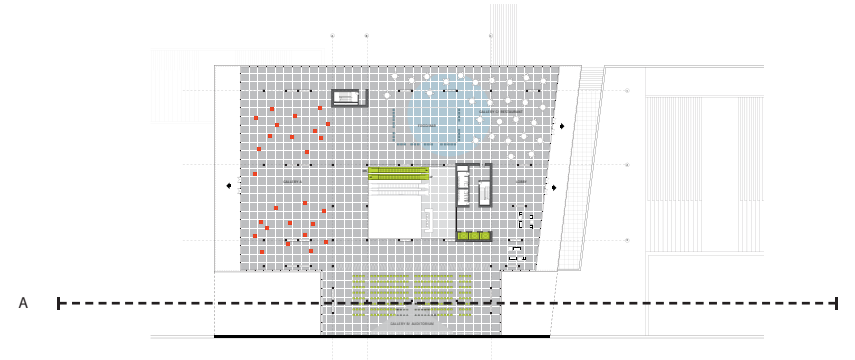
The Gallery Space is mean to function as a flexible platform for a diverse assortment of events. Shows, exhibitions, conferences, weddings and receptions of all kinds can take place in support on Aquarama tourism.

Gallery + Roof/ This view shows the location of the floor plates within the Roof Enclosure.

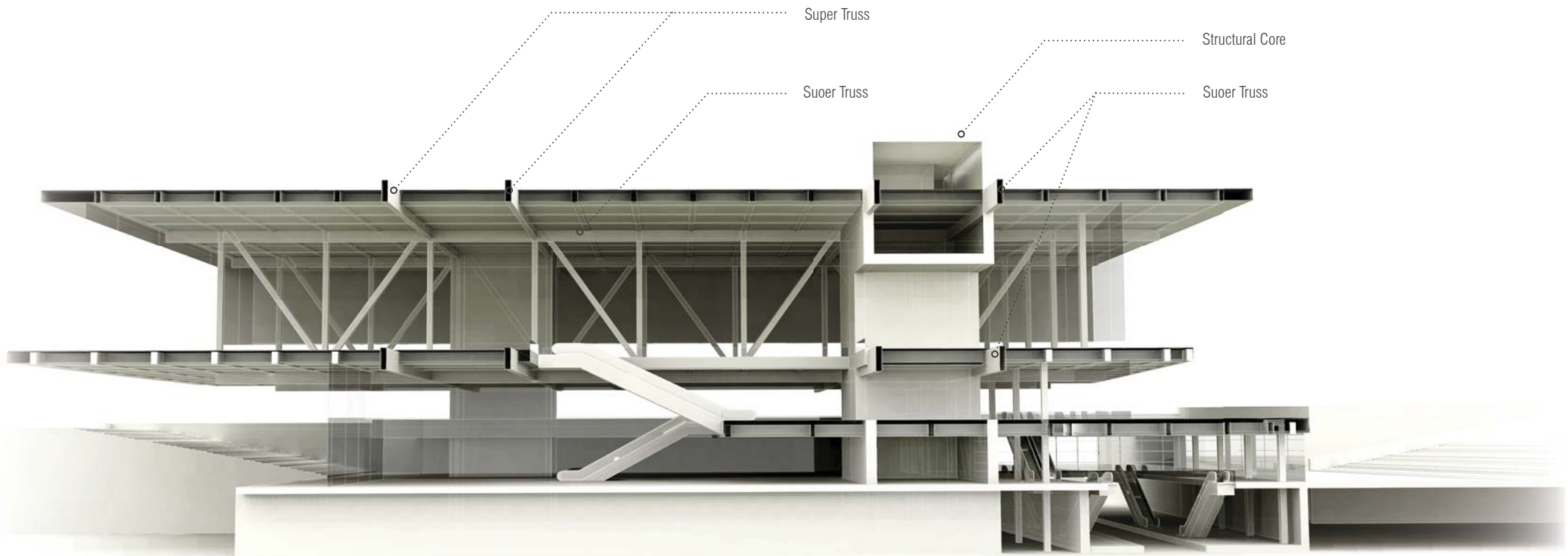
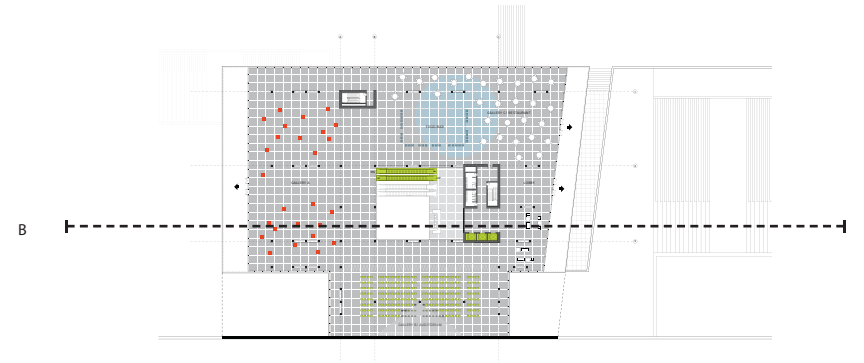




Building Section A



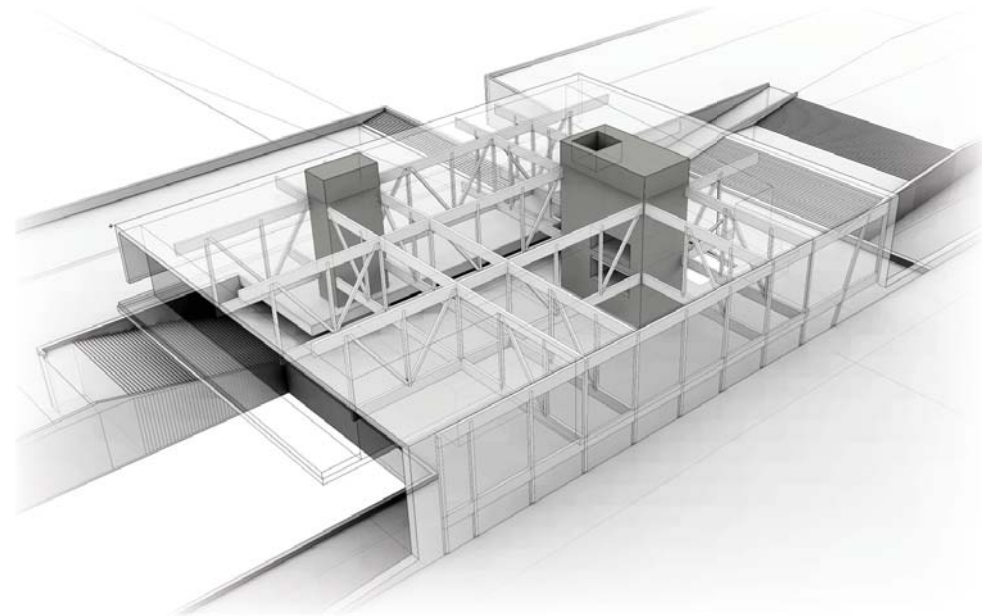
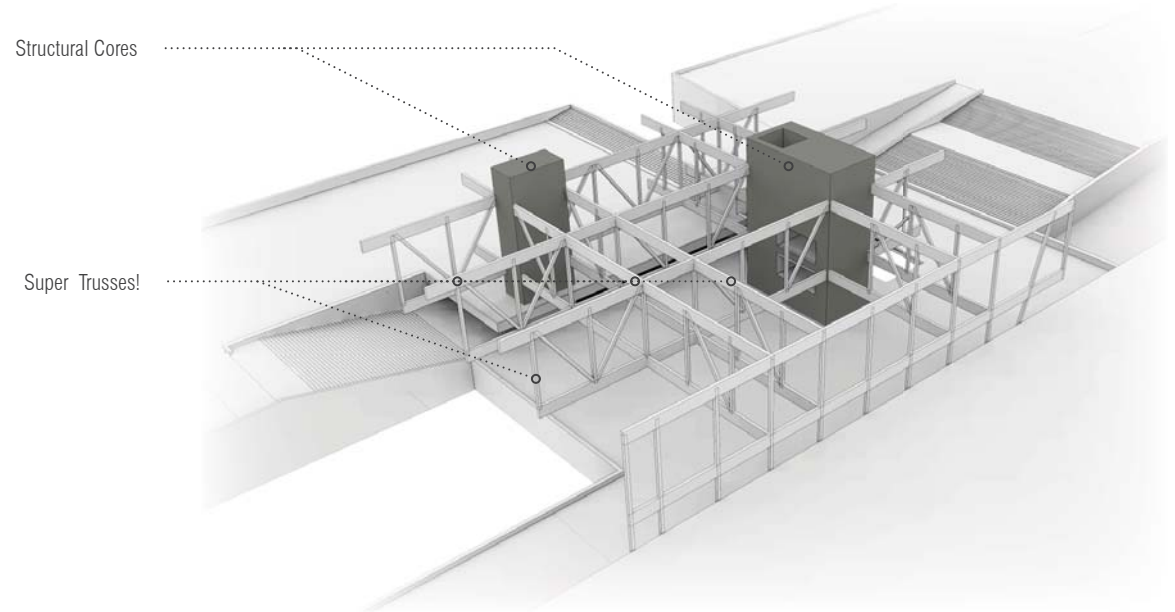
Building Section B



Structural Diagrams

Super-structure/

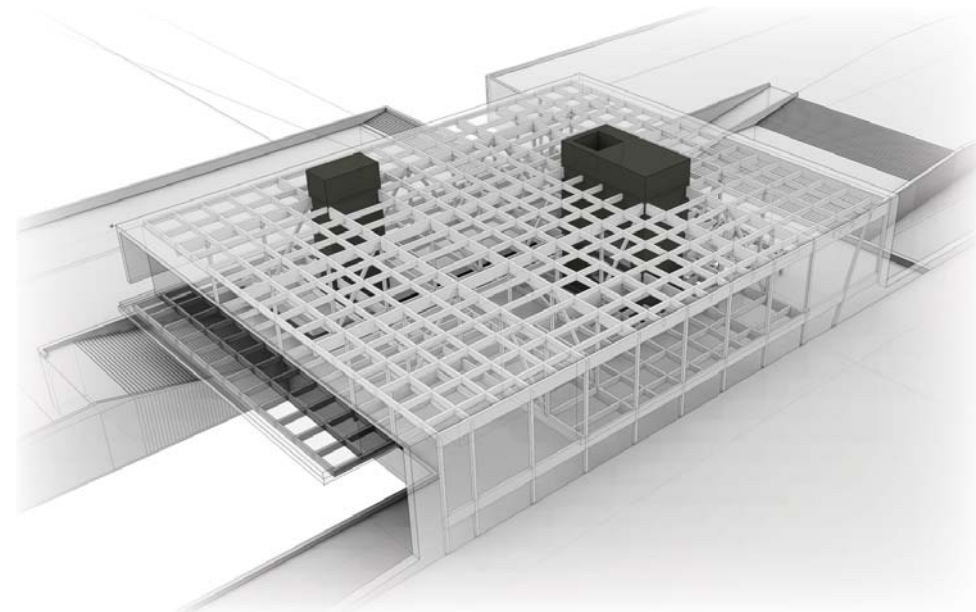
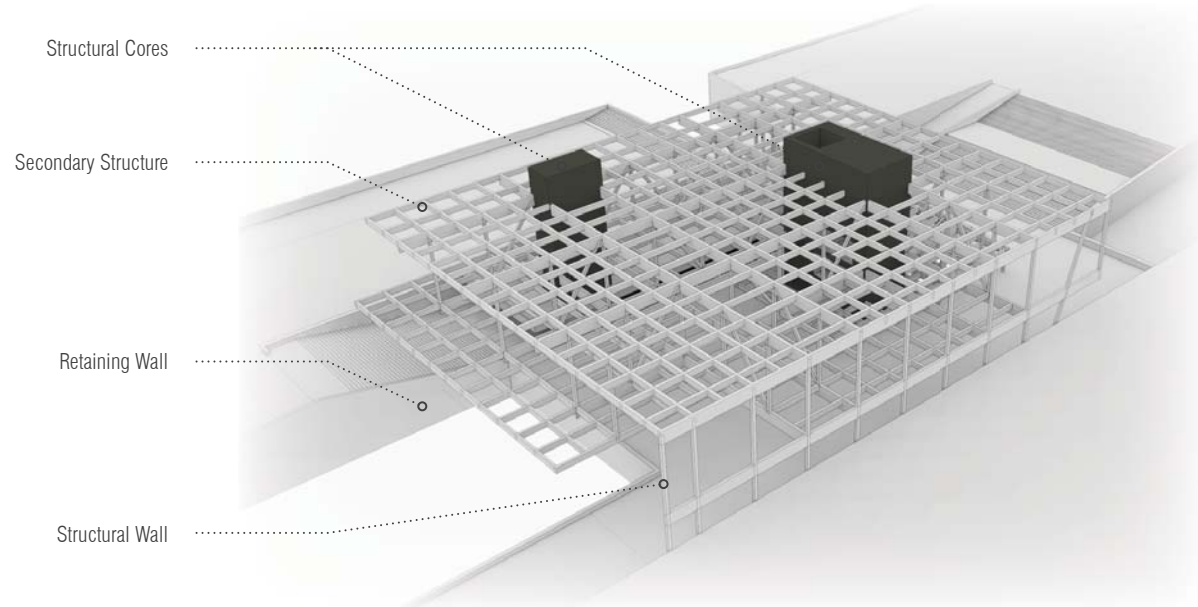
Large Trusses enable a wide plate with minimal columns at Ground Level. The Superstructure mimics Cleveland's rich bridge history and creates a floating effect allowing a free flowing space at ground level as pedestrians access the public waterfront piers and spaces below Aquarama Terminal Gallery Level.

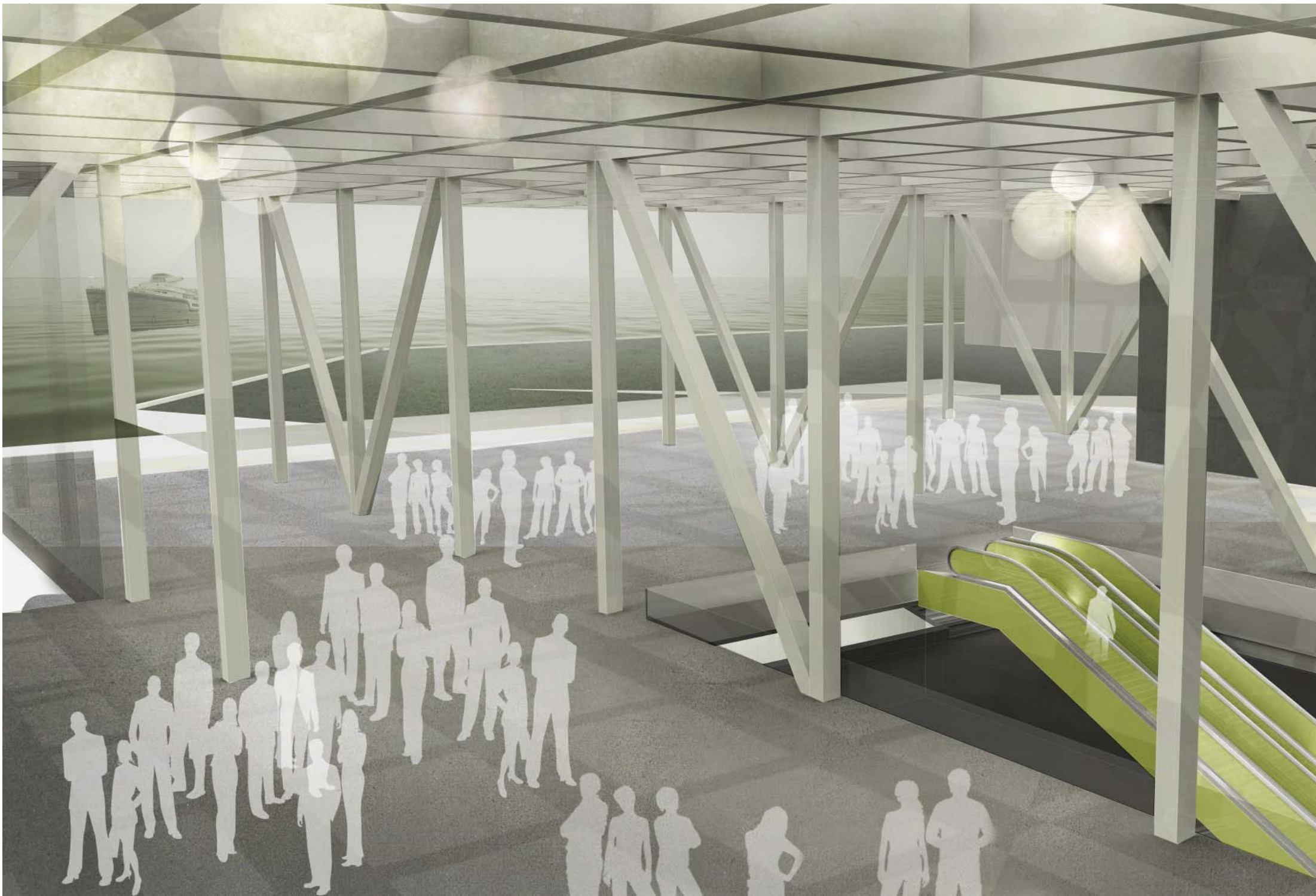


Structural Diagrams

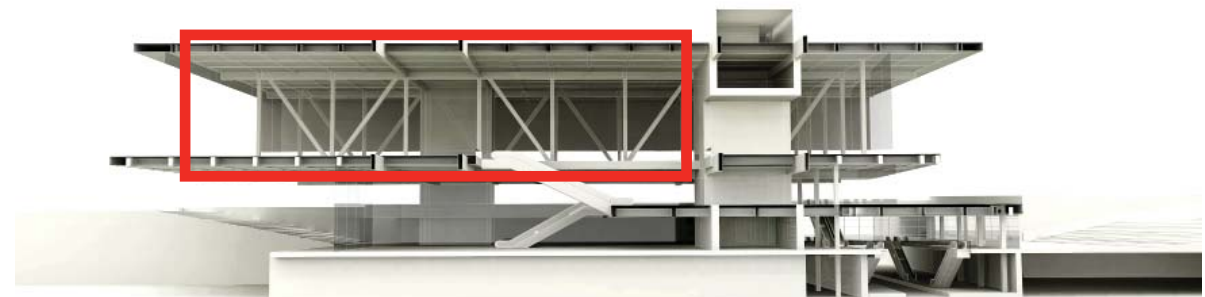
Secondary structure/

Secondary Beams and framing systems complete the structure which is exposed to the interior.



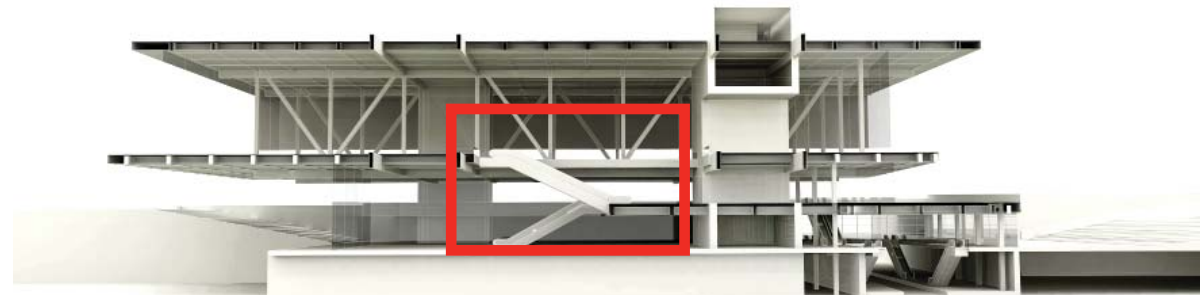


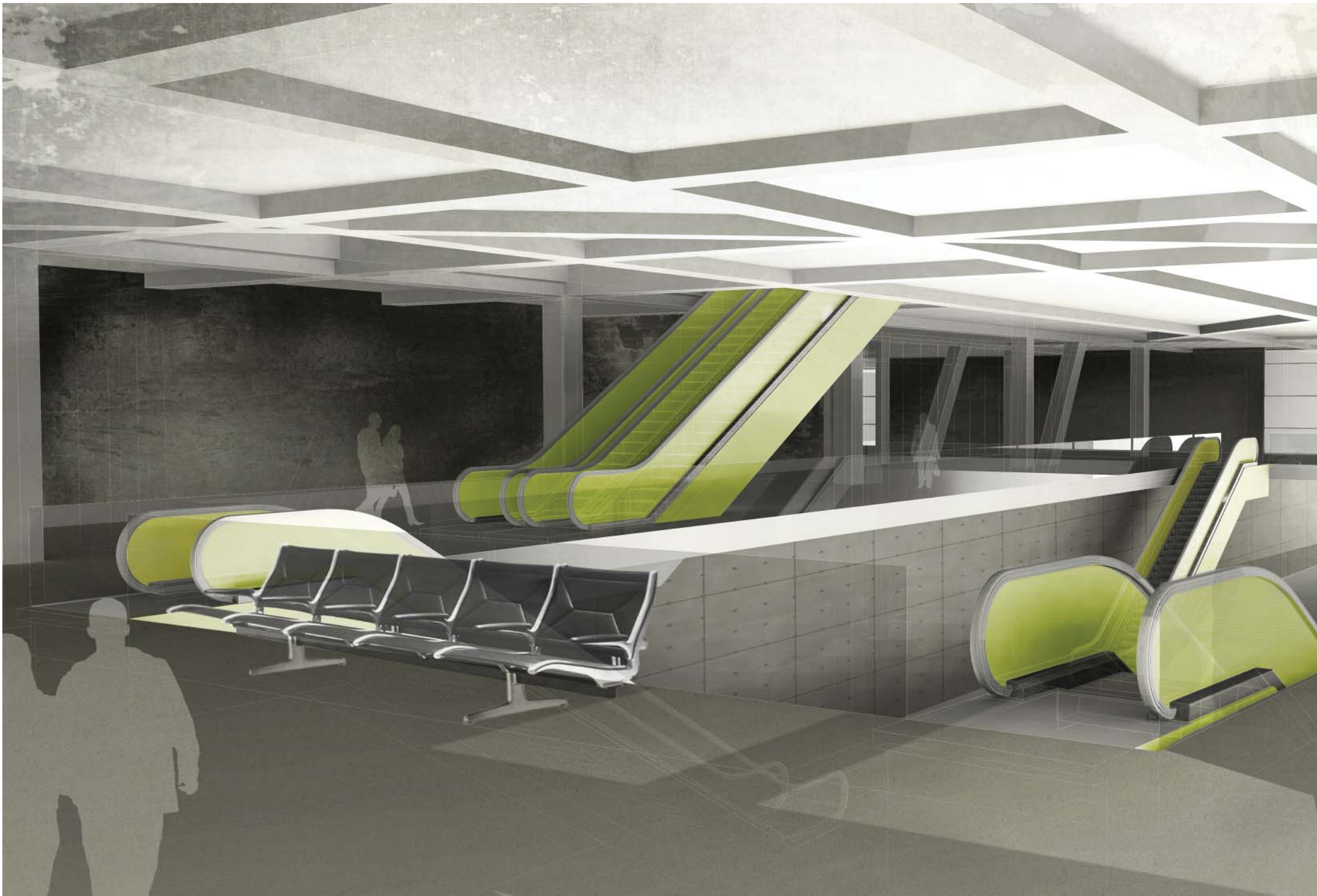
PART 3/ Gallery Perspective





PART 3/ Check-in Lobby Perspective





PART 3/ RTA Lobby Perspective

