



Research  
**Maritime Mobility  
and Peripheral Manhattan**  
Evolution, Trend and Potential

/  
Design  
**MANHATTAN CRUISE TERMINAL**

/  
Complex Projects Studio  
Li Zhang  
**P5.0**

**COMPLEX PROJECTS**  
NEW YORK MIDTOWN  
JULY 2020

**TUTORS**  
**OLINDO CASO**  
**JOS LAFEVER**

---



MANHATTAN  
CRUISE  
TERMINAL



IMPLEMENTATION



INTRODUCTION



RESEARCH



CONCEPT



OPERATION



DEVELOPMENT

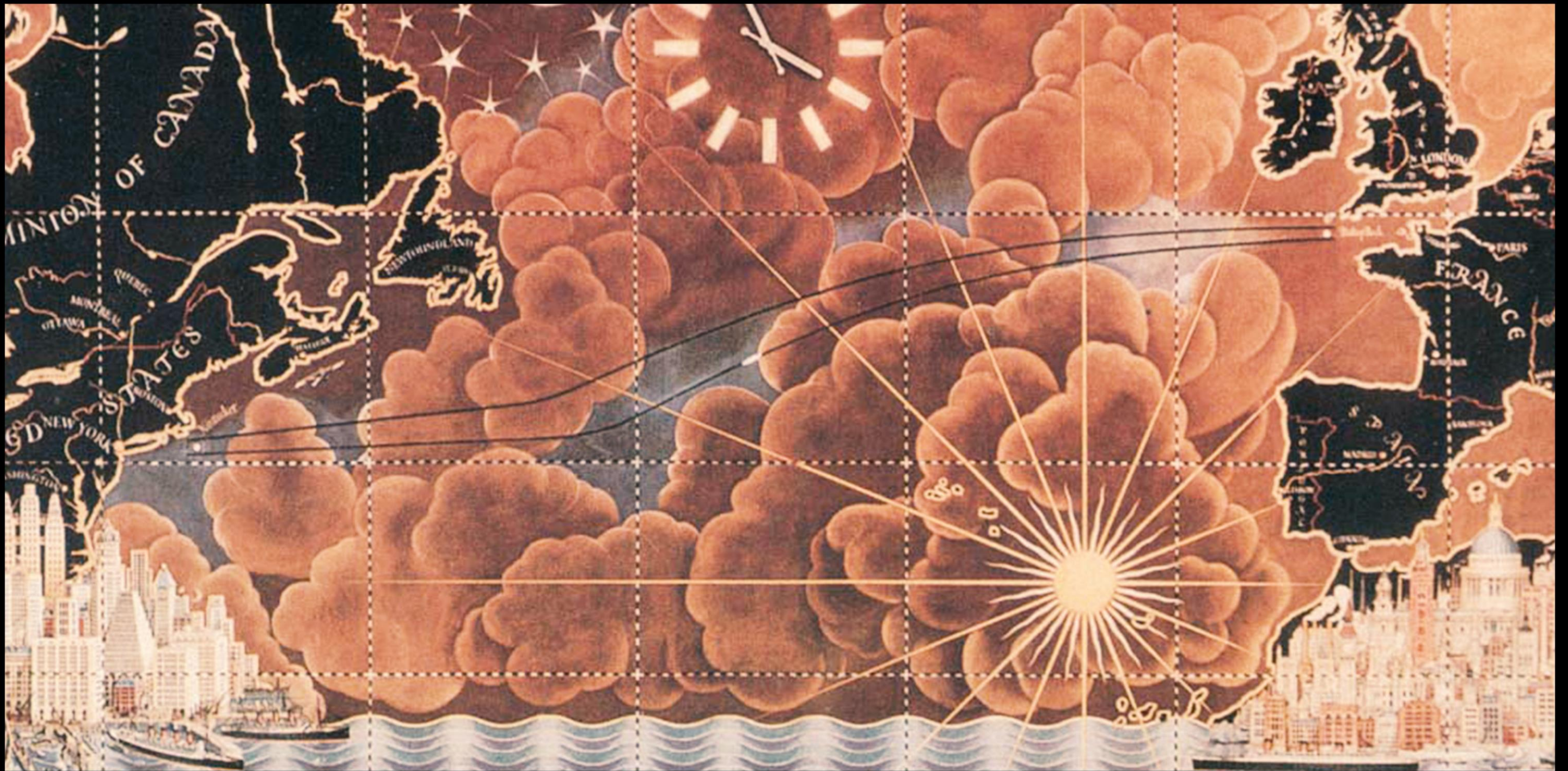


REFLECTION



SPACE

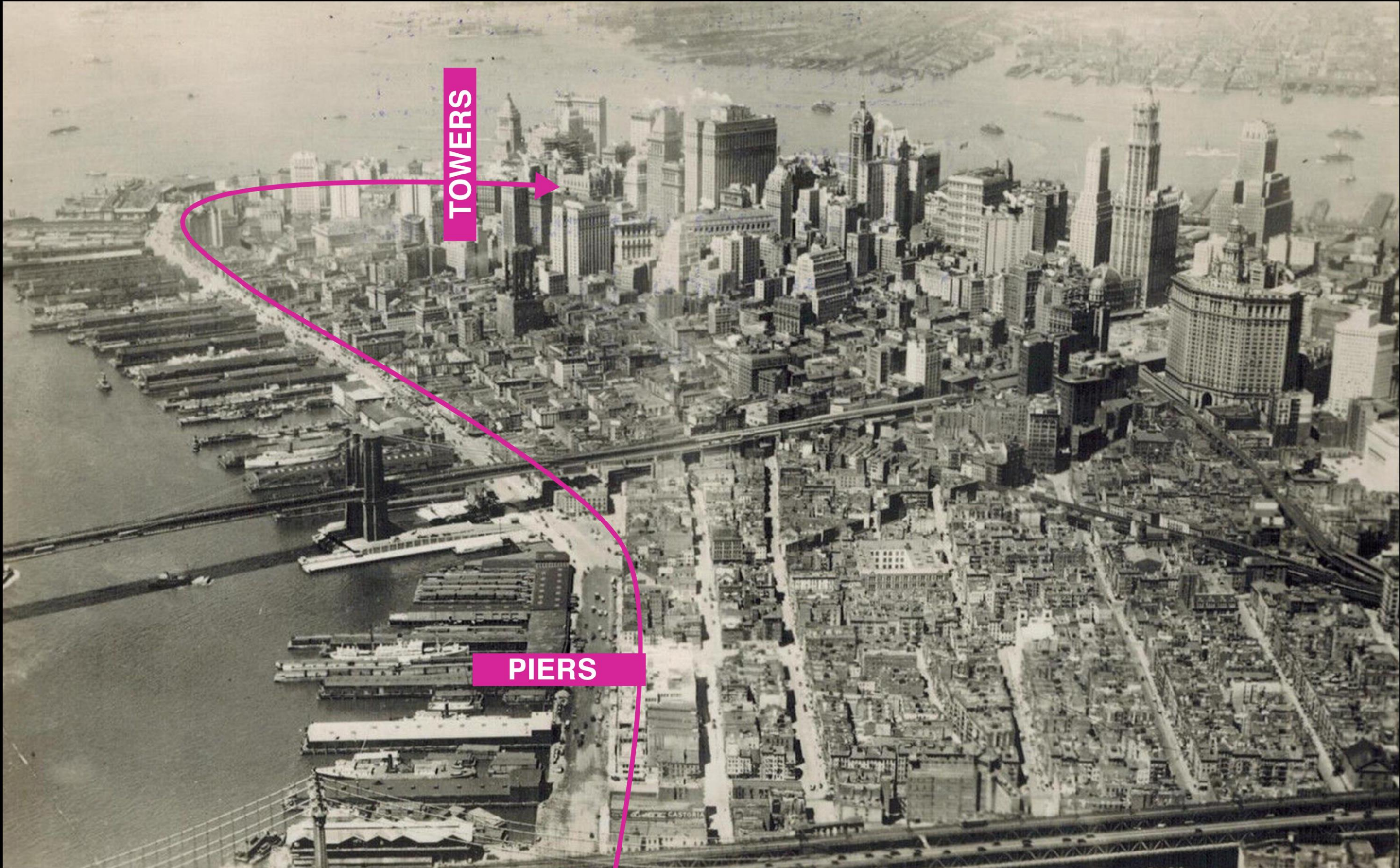




**THE IMAGINATION OF MANHATTAN AS A  
TRANSATLANTIC METROPOLITAN  
IN THE ›GOLDEN AGE OF OCEAN LINERS‹**

Artwork from the dining room of RMS Queen Mary, 1936 (maiden voyage).





TOWERS

PIERS





**SHIFT OF PURPOSE**

← EXIT - DUANE ST.









RECONSIDERING THE PERIPHERY:  
MOBILITY MATTERS



**PROBLEM STATEMENT**  
{PAST}

**Shift of modes of mobility during the 20th century transformed Manhattan from a peripheral city to a centric city.**  
This caused a loss in spatial quality, perceptual image and cultural identity in both the waterfront and the entire city.

**RESEARCH QUESTION**  
{FUTURE}

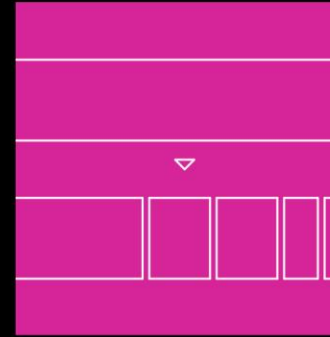
**How maritime mobility could assist the post-industrial transformation of Manhattan waterfront?**

RESEARCH CONCLUSION

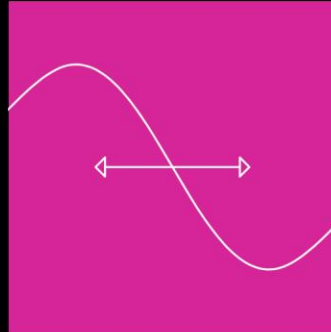
SPATIAL  
MARITIME  
METROPOLITAN  
[01]



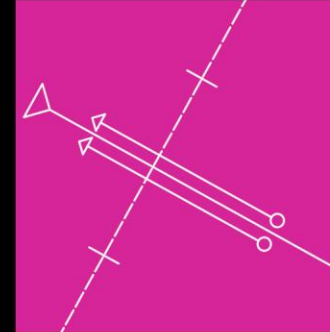
PROGRAMMATIC  
HORIZONTAL CITY  
[02]



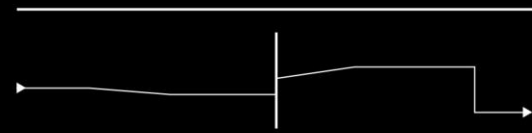
TEMPORAL  
SEASONAL SHIFT  
[03]



URBAN  
INTEGRATED SCALES  
[04]







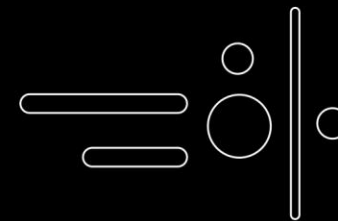
MOVEMENT & MONUMENTALITY



DISPLAY OF ACTIVITIES



PLUG & PLAY



INTEGRATION OF PUBLIC SPACES



## Key Features

[FUNCTION]

**SHIP TERMINAL+TV STUDIOS**

**WATERFRONT TERRACE+COMMERCIAL SPACES**

[MODES OF MOBILITY]

**CRUISE SHIP [2 BERTHS]**

**FERRY**

**AUTOMOBILE**

**METRO**

**PEDESTRIAN+BIKE**

[DIMENSIONS]

**+28m Above the Deck**

**176m Along the Water**

[FLOOR AREA]

**≈34,000 m<sup>2</sup>**





PERSPECTIVE



• CRUISE SHIP AT BERTH 1



PERSPECTIVE



SITE  
CLINTON PIERS  
MANHATTAN CRUISE TERMINAL  
88/90/92/94









MANHATTAN  
CRUISE  
TERMINAL



IMPLEMENTATION



INTRODUCTION



RESEARCH



CONCEPT



OPERATION



DEVELOPMENT



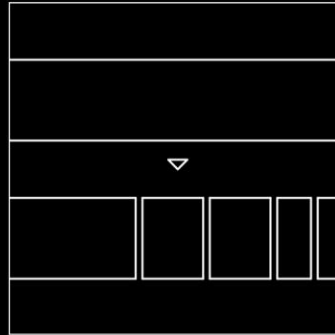
REFLECTION



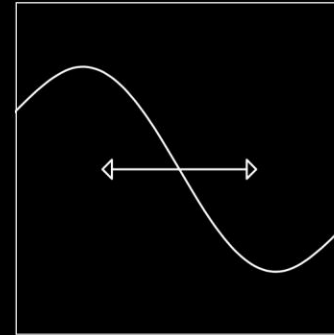
SPACE



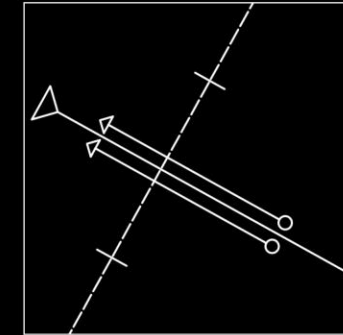
SPATIAL  
MARITIME METRO-  
POLITAN  
[01]



PROGRAMMATIC  
HORIZONTAL CITY  
[02]



TEMPORAL  
SEASONAL SHIFT  
[03]



URBAN  
INTEGRATED SCALES  
[04]

RESEARCH CONCLUSION



# RMS Queens Mary in New York

20 June 1945

Southampton ↔ Manhattan





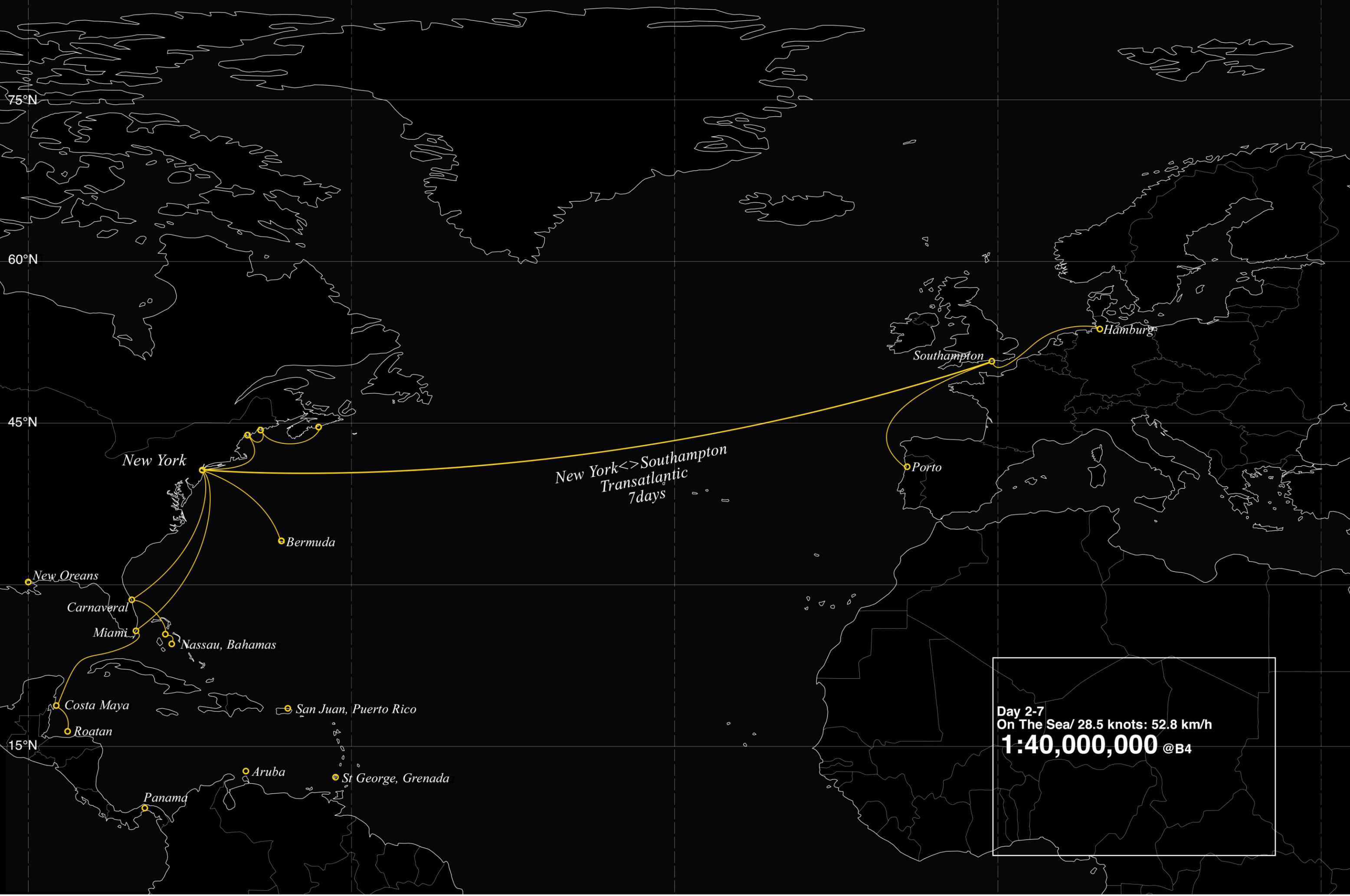
90°W 60°W 30°W 0° -30°E

75°N

60°N

45°N

15°N



New York

Bermuda

New Orleans

Carnaval

Miami

Nassau, Bahamas

Costa Maya

Roatan

Panama

Aruba

St George, Grenada

San Juan, Puerto Rico

New York <-> Southampton  
Transatlantic  
7 days

Southampton

Porto

Hamburg

Day 2-7  
 On The Sea/ 28.5 knots: 52.8 km/h  
**1:40,000,000** @B4

Day 8  
Entering the Harbour  
**1:200,000** @B4

Ambrose Channel

The Narrows  
& Verrazzano-Narrows Bridge

Breezy Point





Day 8  
Approaching Manhattan  
**1:100,000** @B4



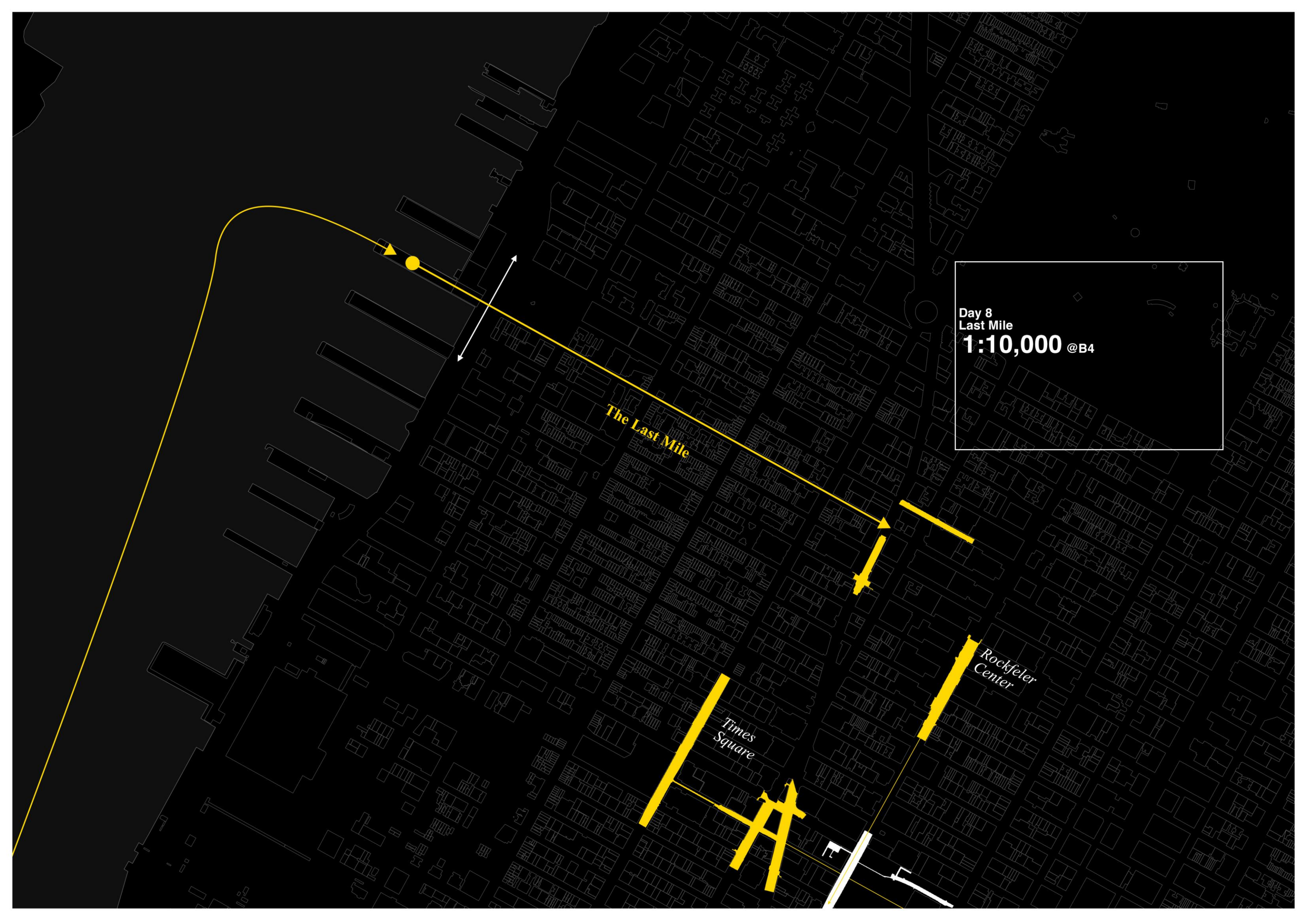


Day 8  
Last Mile  
**1:10,000** @B4

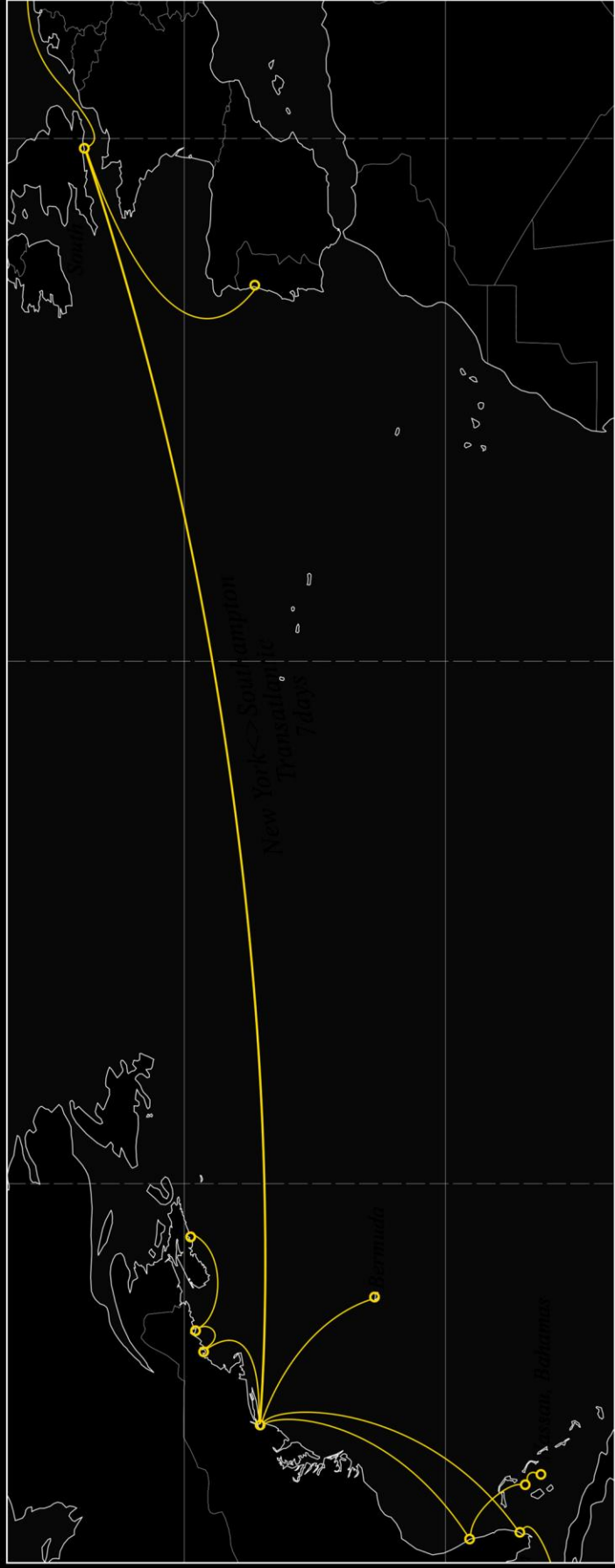
*The Last Mile*

*Times Square*

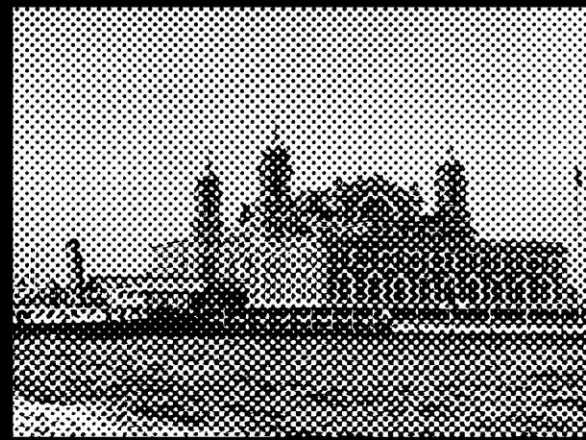
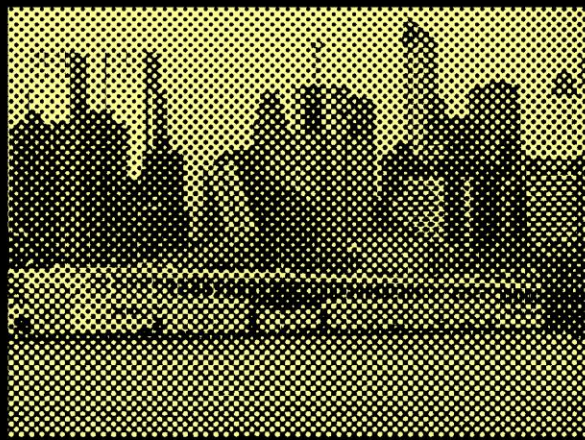
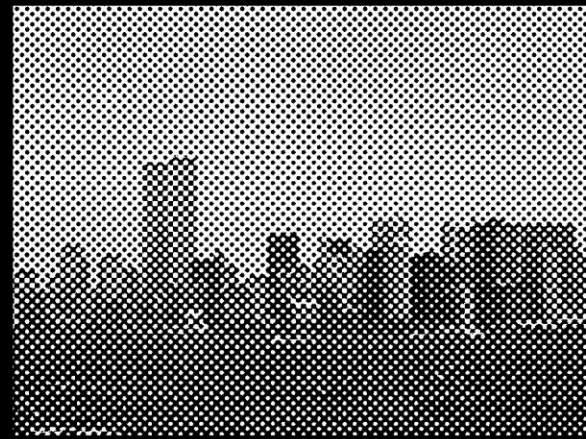
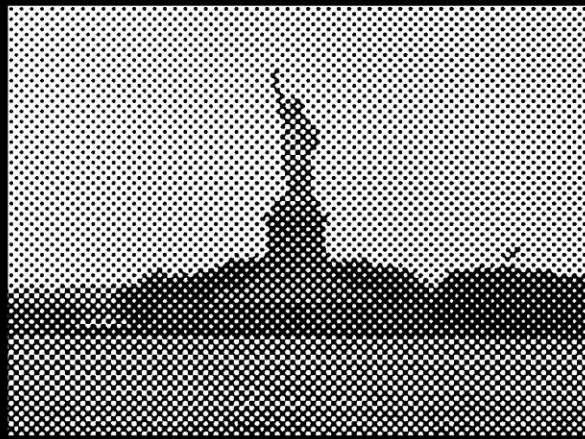
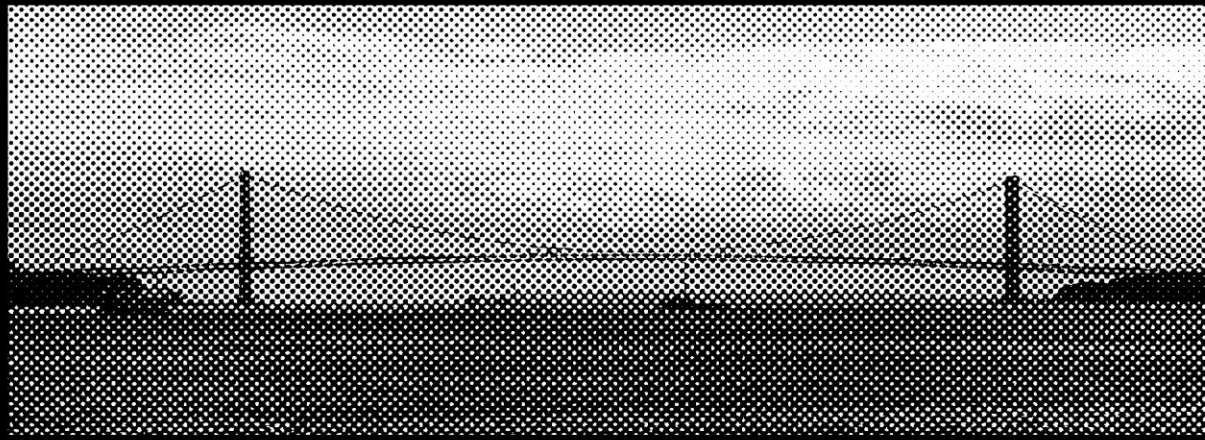
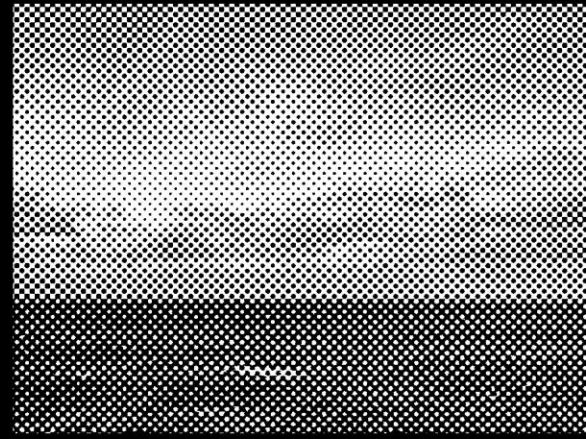
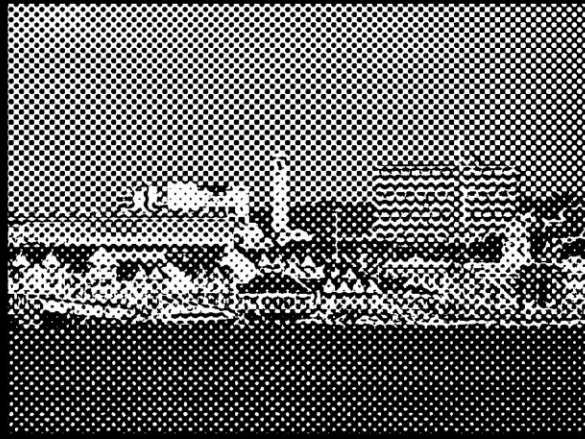
*Rockefeller Center*







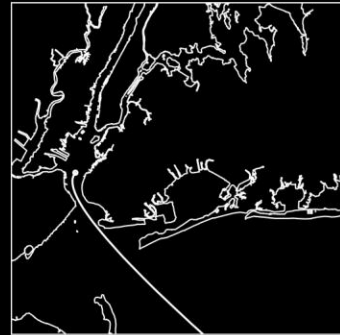






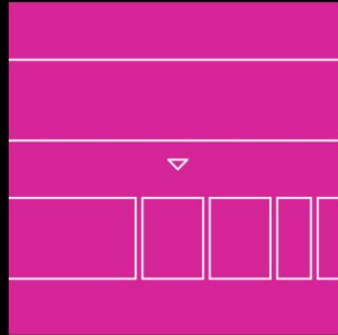






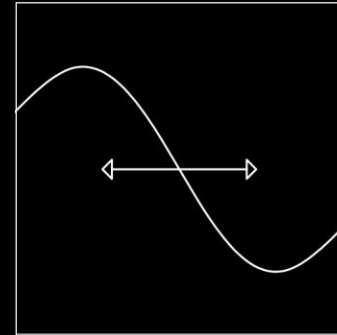
SPATIAL

MARITIME METRO-  
POLITAN  
[01]



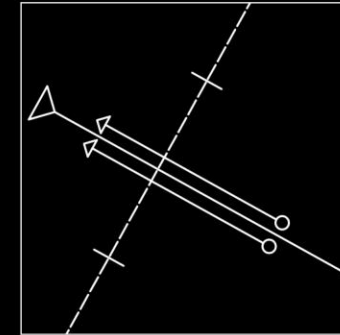
PROGRAMMATIC

HORIZONTAL CITY  
[02]



TEMPORAL

SEASONAL SHIFT  
[03]

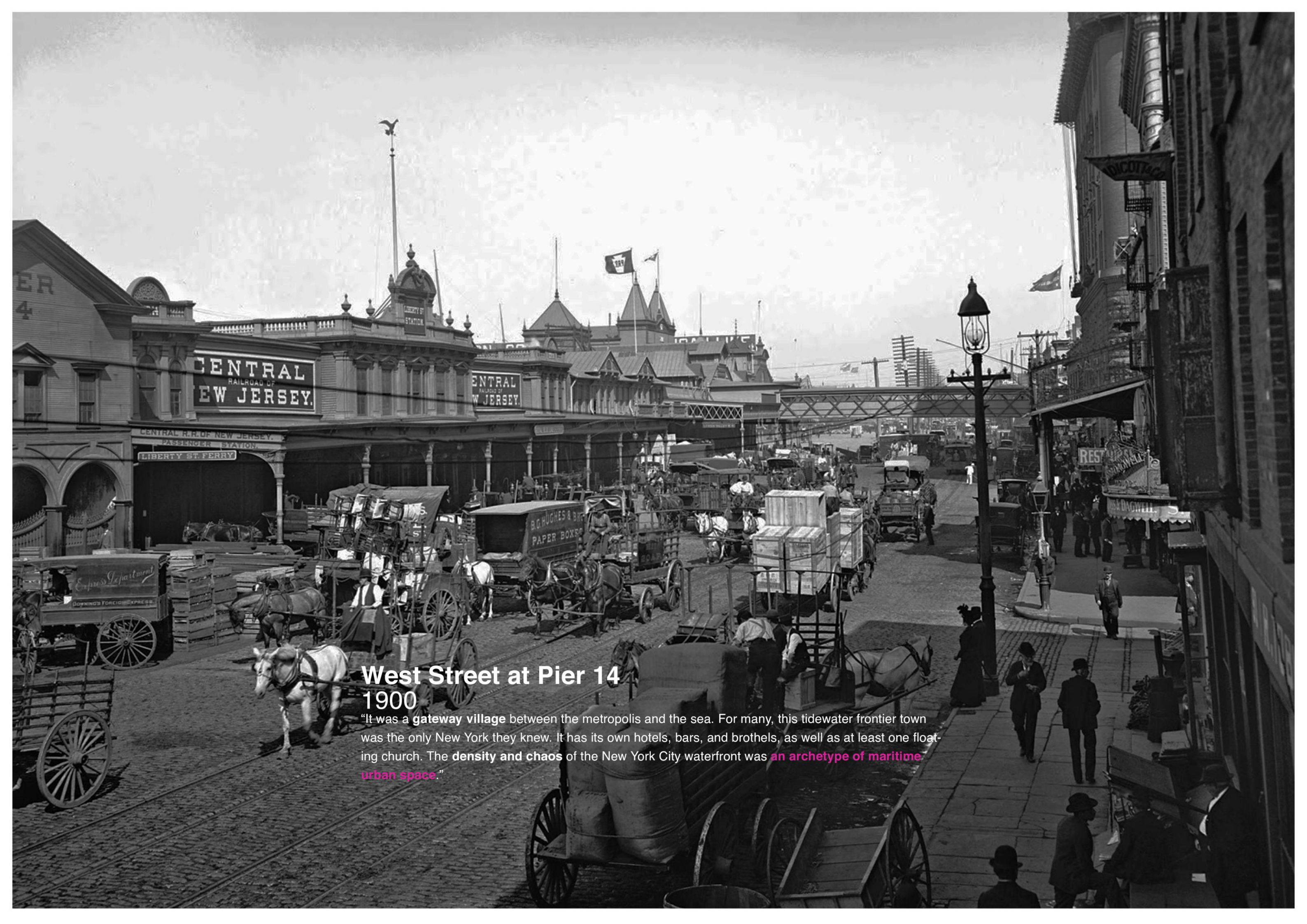


URBAN

INTEGRATED SCALES  
[04]

RESEARCH CONCLUSION





## West Street at Pier 14 1900

"It was a **gateway village** between the metropolis and the sea. For many, this tidewater frontier town was the only New York they knew. It has its own hotels, bars, and brothels, as well as at least one floating church. The **density and chaos** of the New York City waterfront was **an archetype of maritime urban space**."



**POST-MARITIME  
POST-INDUSTRIAL  
POST-MODERN**  
TRANSFORMATION OF WATERFRONT

USAGE OF SPACE

1870s-1930s  
**A GATEWAY TOWN/STREET**

1970S  
**WESTWAY**

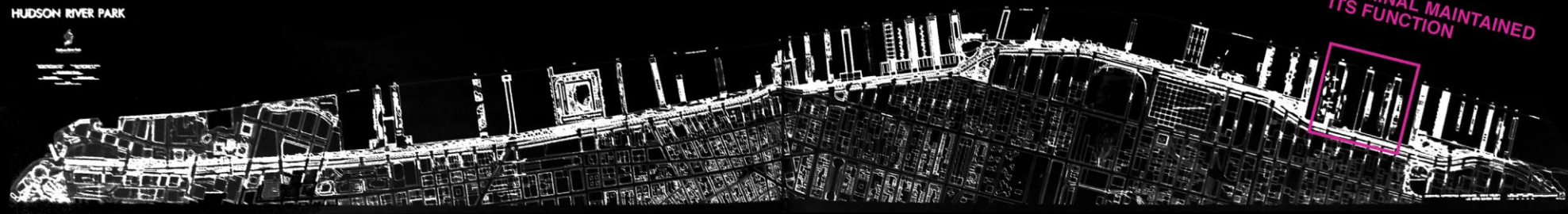
1980S  
**HUDSON RIVER PARK**

1990S  
**COMPREHENSIVE WATERFRONT PLAN**

2020S  
?  
Diverse & highly engaged urban space?

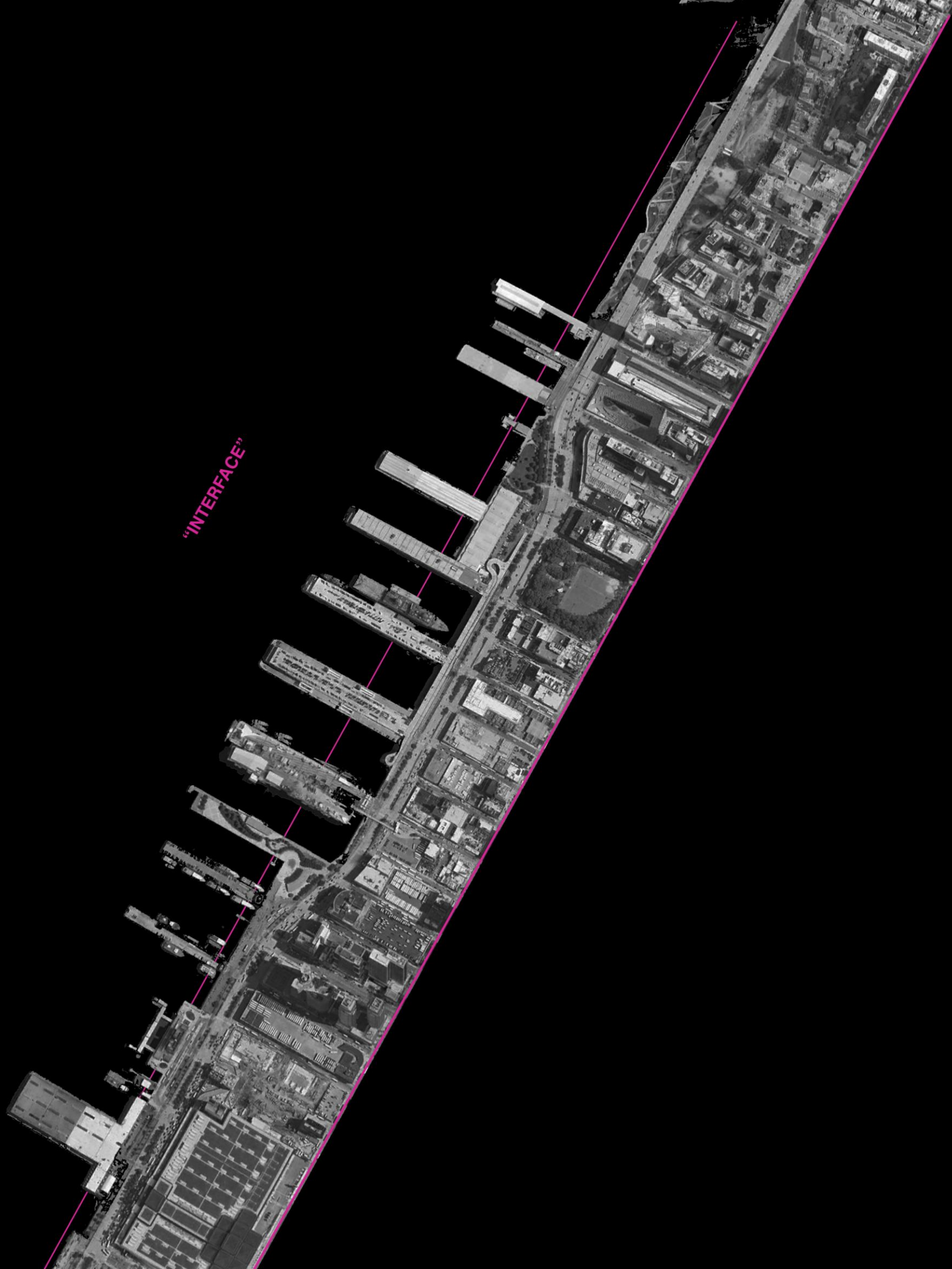
“Parks are volatile places. They tend to run to extremes of popularity and unpopularity. Their behavior is far from simple.” -Jane Jacobs

HUDSON RIVER PARK



CRUISE TERMINAL MAINTAINED  
ITS FUNCTION

HUDSON RIVER PARK 1995 PROPOSAL  
QUENNEL ROTHSCHILD ASSOCIATES







## the Luxury Liner Row 1952

From left to right: **Pier 92, Pier 90, Pier 88, Pier 86, Pier 84.**

Ocean Liners:

**Media** [Cunard]

**Mauretania**

**Queen Elizabeth**

**Georgic**

**Liberte** [French]

**United States** [USA]

**Conte Biancamano** [Italian]

This air view was made from a patrolling Coast Guard helicopter.

Economic Impact of  
Manhattan Cruise Terminal



Economic impact of  
NYC's cruise industry [2017]  
**x228 Million**



Passenger[2016]  
**x1,025,534**



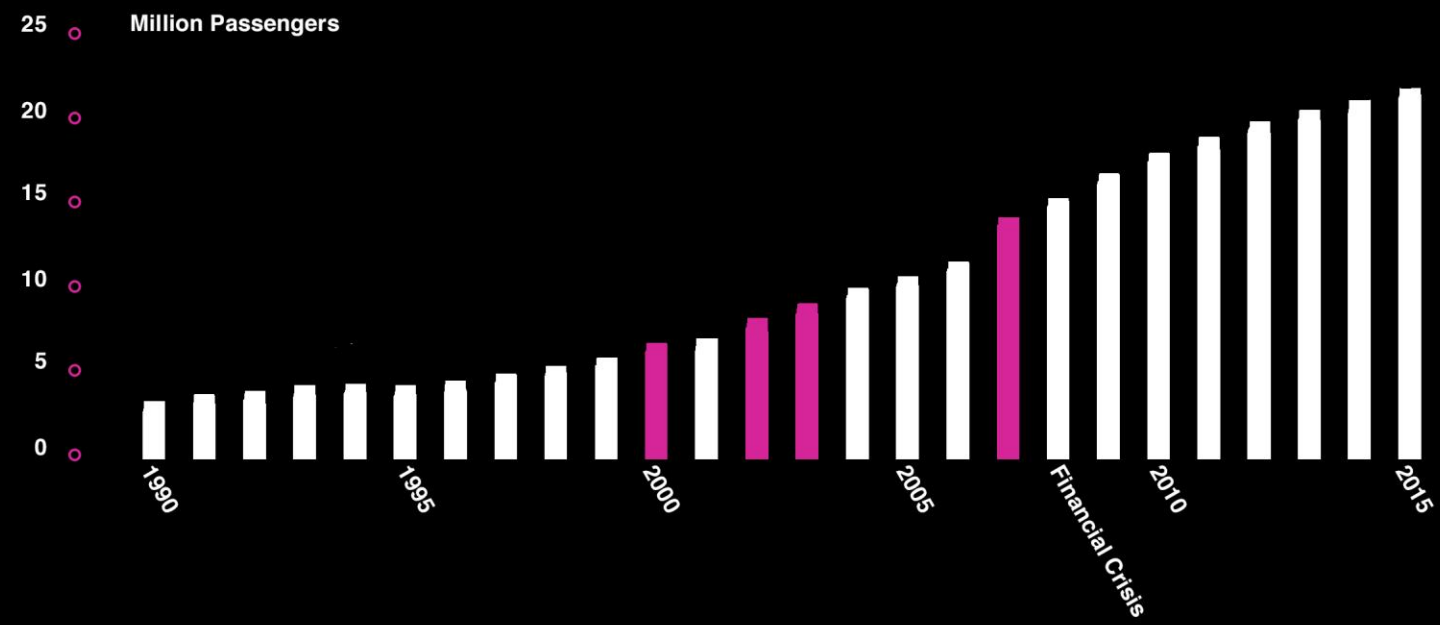
Major Ships  
**Norwegian Breakaway**  
Capacity: 4000+  
**Carnival Splendor**  
Capacity: 3000+



Passengers that did pre or post night stay  
**x46%**

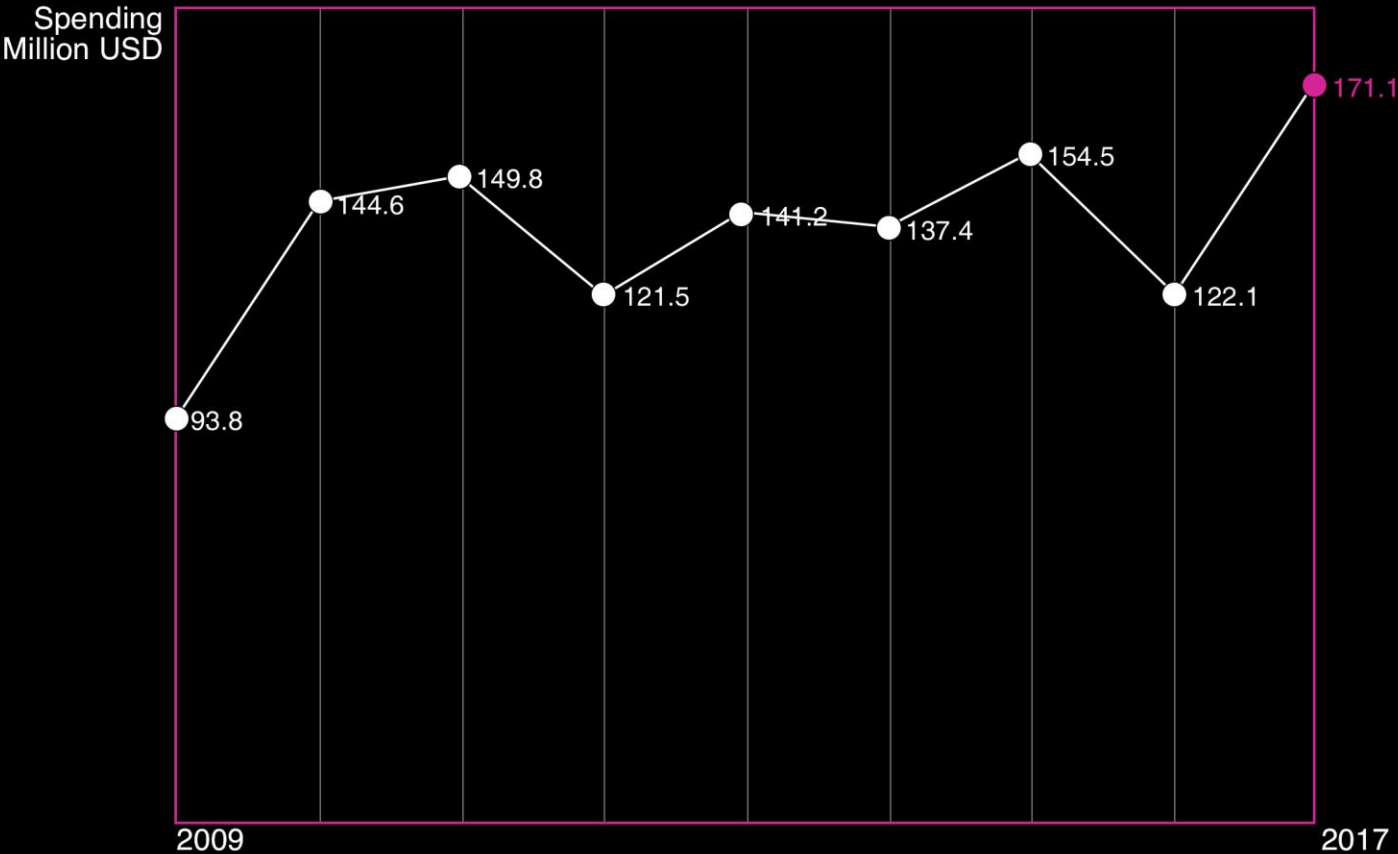


Global Cruise Industry  
By Passengers  
A **fourfold** increase from 2000 to Now  
Source: Cruise Market Watch





Passengers and Crew Spending  
2009-2017

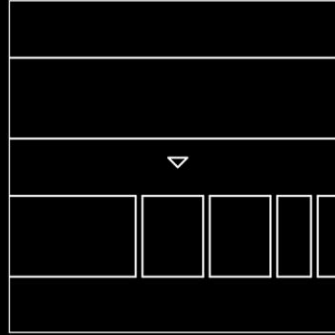


Passenger Spending 2017: 142.8 Million USD  
INCLUDING  
Accommodation: 79 Million  
F&B at Restaurants & Bar: 20 Million



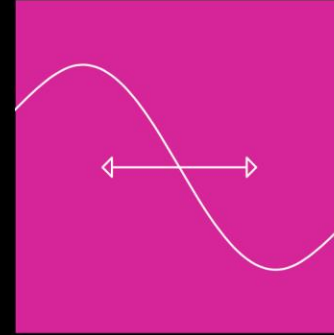
SPATIAL

MARITIME METRO-  
POLITAN  
[01]



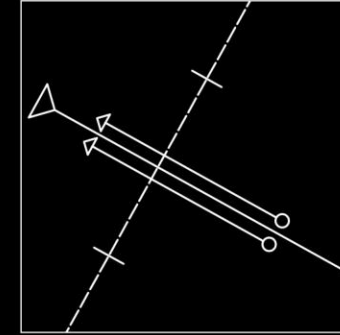
PROGRAMMATIC

HORIZONTAL CITY  
[02]



TEMPORAL

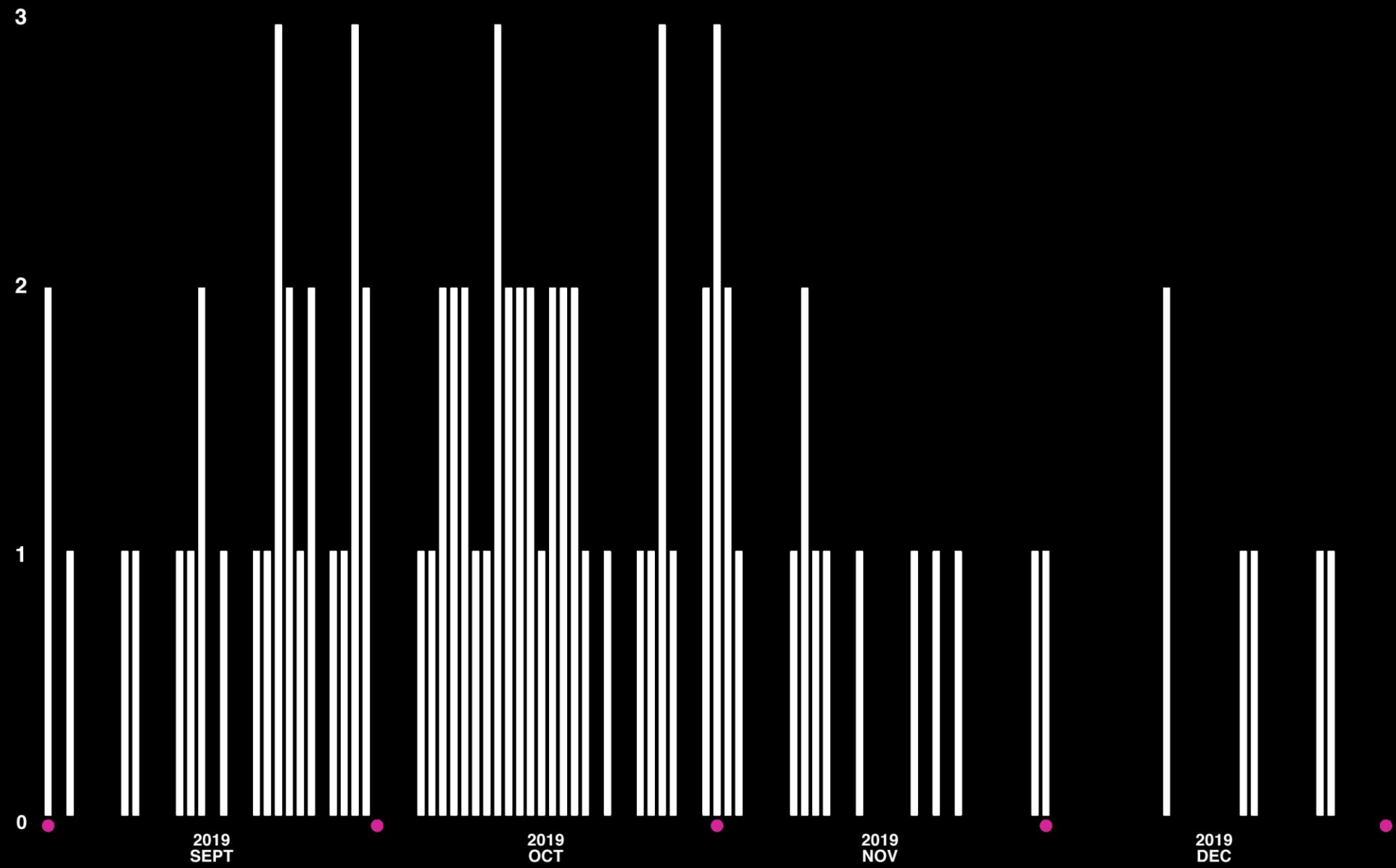
SEASONAL SHIFT  
[03]



URBAN

INTEGRATED SCALES  
[04]

RESEARCH CONCLUSION



SCHEDULE OF MANHATTAN CRUISE TERMINAL  
 NUMBERS OF SHIPS PER DAY





**REDISCOVERING MANHATTAN'S TYPOLOGY**  
**TRANSPORT+MEDIA**





**REDISCOVERING MANHATTAN'S TYPOLOGY**  
**TRANSPORT+MEDIA**





**REDISCOVERING MANHATTAN'S TYPOLOGY**  
**TRANSPORT+MEDIA**



## TRANSPORT

- 1 Big **space**  
for passengers processing
- 2 Operate according to the **schedule**  
of ships/trains
- 3 Exchange of people  
between **local and the world**

## MEDIA/EVENT VENUE

- 1 Big **space**  
for production and audience
- 2 Operate according to the **schedule**  
of events/programmes
- 3 Exchange of information  
between **local and the world**



**NCL** NORWEGIAN  
CRUISE LINE®



 Disney  
CRUISE LINE



**X**

*Regent*  
SEVEN SEAS CRUISES



 **AIDA**







PIER 94

NEW STUDIO

EVENTSPACE 51

THE GARAGE

COMEDY CENTRAL

OGILVY EVENTS

STAGE 48

METROPOLITAN WEST

CBS

CNV'S

PENTHOUSE 45

NBC

JAVITS CENTER

E!K

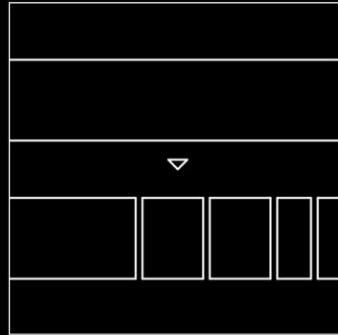
MTV

ABC



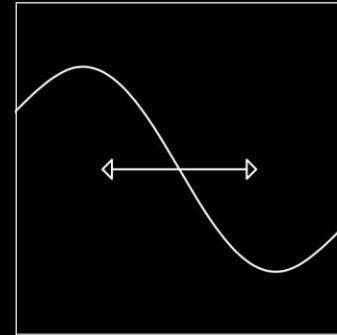
SPATIAL

MARITIME METRO-  
POLITAN  
[01]



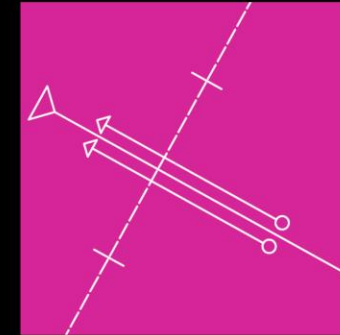
PROGRAMMATIC

HORIZONTAL CITY  
[02]



TEMPORAL

SEASONAL SHIFT  
[03]



URBAN

INTEGRATED SCALES  
[04]

RESEARCH CONCLUSION

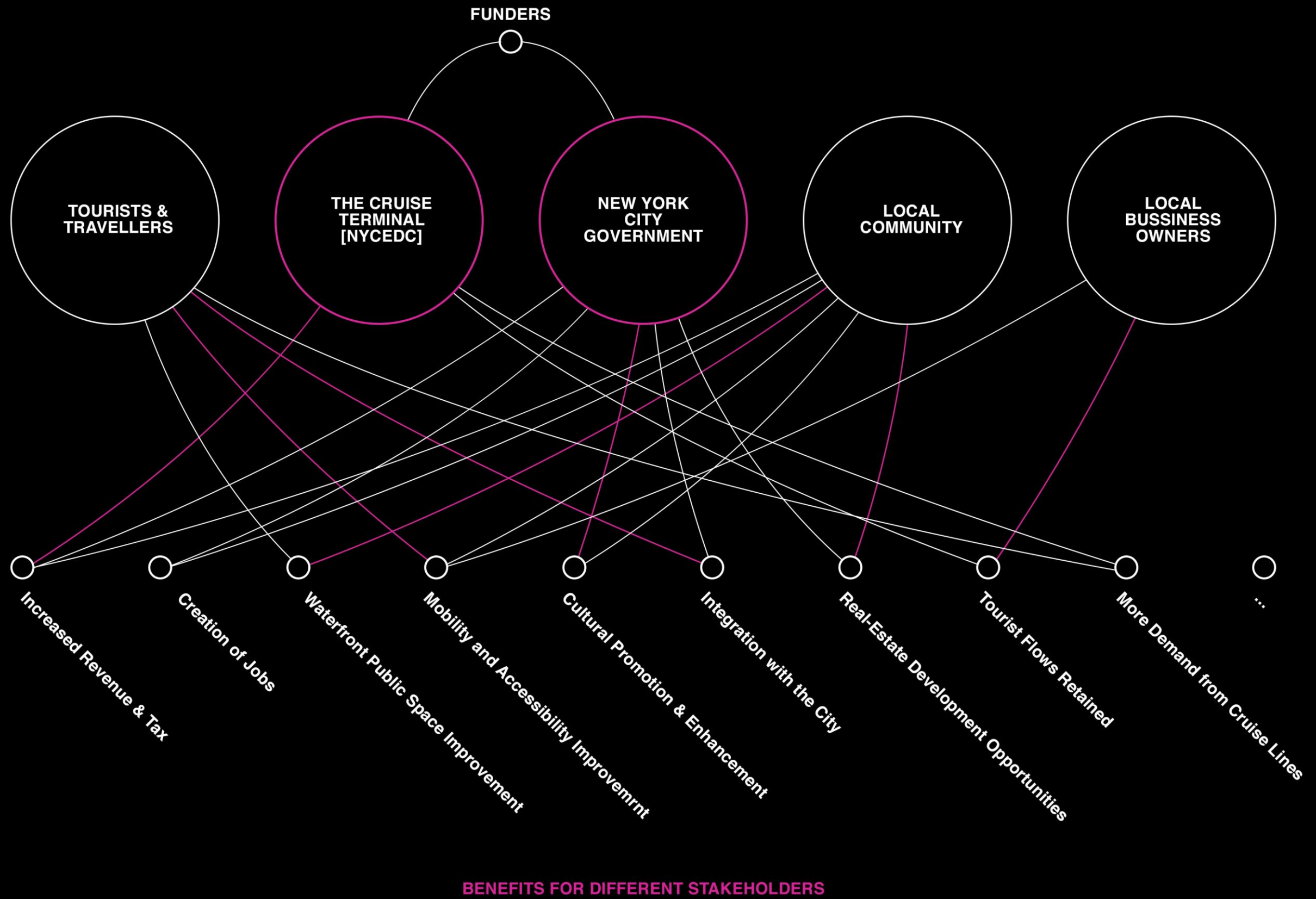


DEMAND:  
TRAVELLERS  
SIGHTSEEING, SPENDING

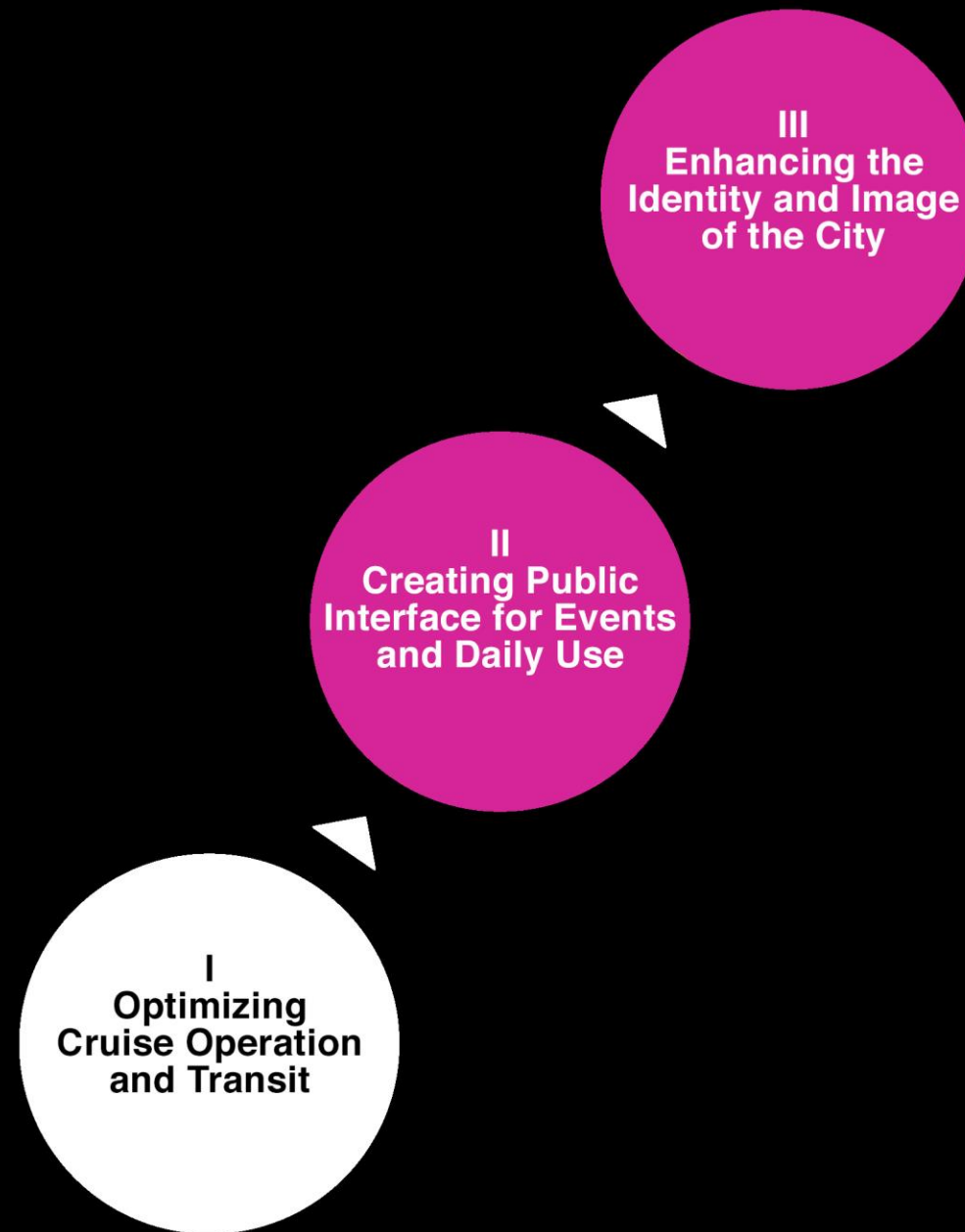
The image is a grayscale aerial photograph of a city waterfront. A prominent white line runs diagonally from the top left towards the bottom right. Two pink curved arrows originate from a central point on this line. One arrow points towards a park area on the left, and the other points towards a large industrial building on the right. Text labels are placed near these arrows. The background shows a dense urban landscape with various buildings, a river, and a large ship docked at a pier.

DEMAND:  
LOCALS  
RECREATION, GATHERING









MANHATTAN  
CRUISE  
TERMINAL



IMPLEMENTATION



INTRODUCTION



RESEARCH



CONCEPT



OPERATION



DEVELOPMENT



REFLECTION



SPACE

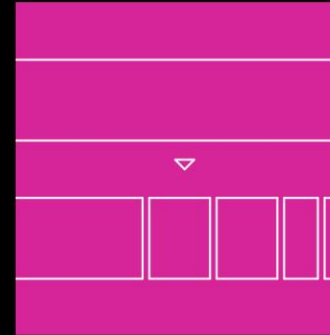


RESEARCH CONCLUSION

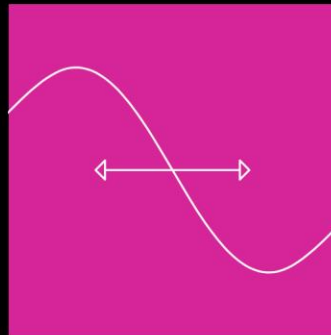
SPATIAL  
MARITIME  
METROPOLITAN  
[01]



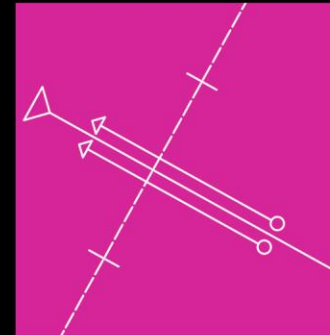
PROGRAMMATIC  
HORIZONTAL CITY  
[02]

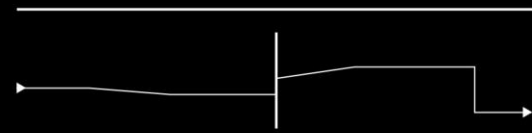


TEMPORAL  
SEASONAL SHIFT  
[03]



URBAN  
INTEGRATED SCALES  
[04]





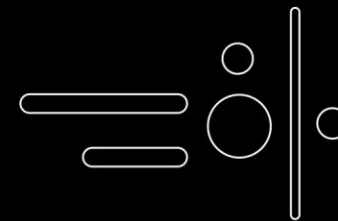
MOVEMENT & MONUMENTALITY



DISPLAY OF ACTIVITIES

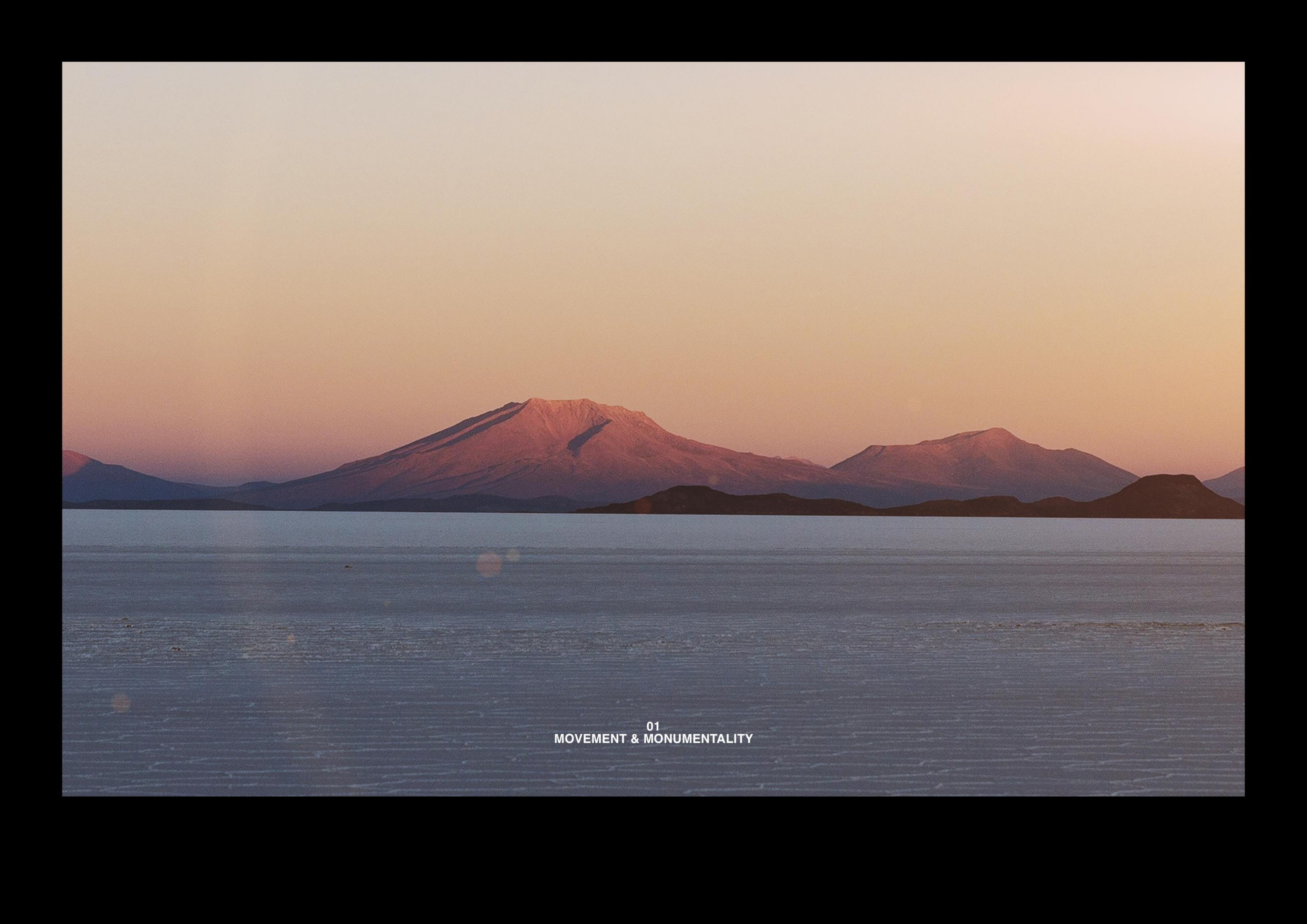


PLUG & PLAY



INTEGRATION OF PUBLIC SPACES





01  
MOVEMENT & MONUMENTALITY





02  
DISPLAY OF ACTIVITIES





03  
PLUG & PLAY

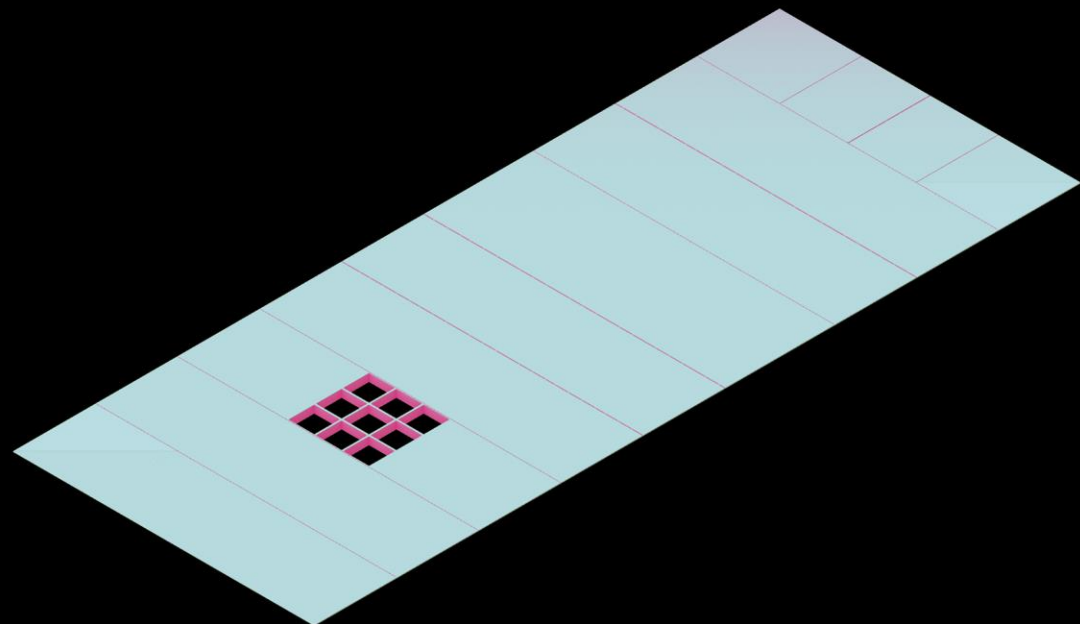




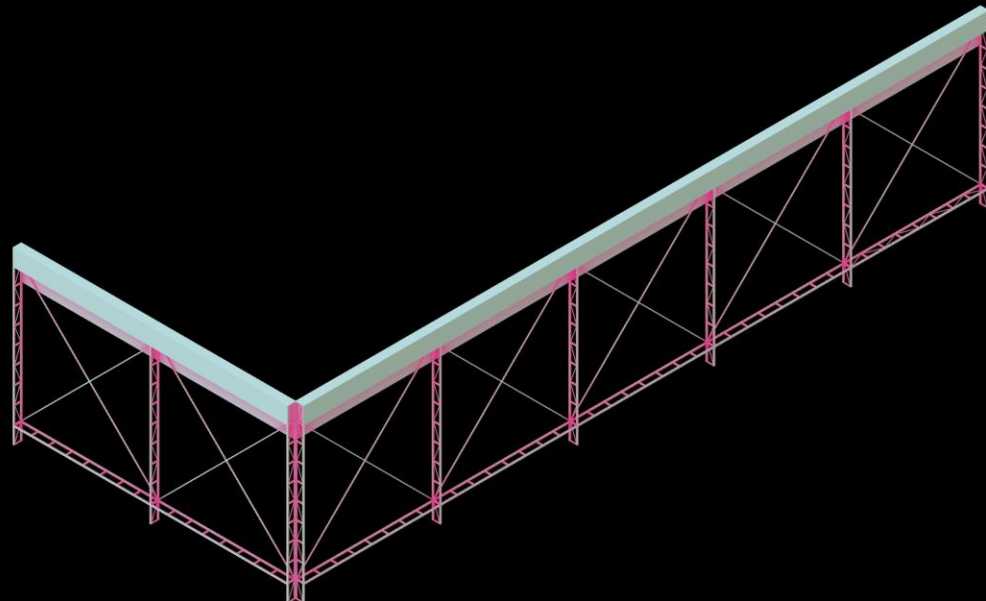
04  
INTEGRATION OF PUBLIC SPACES



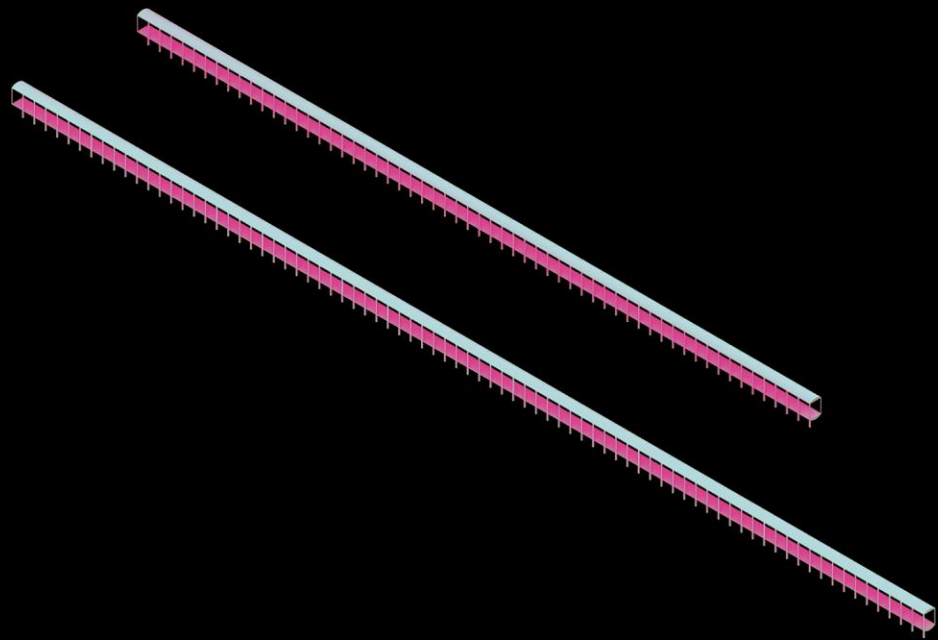
01



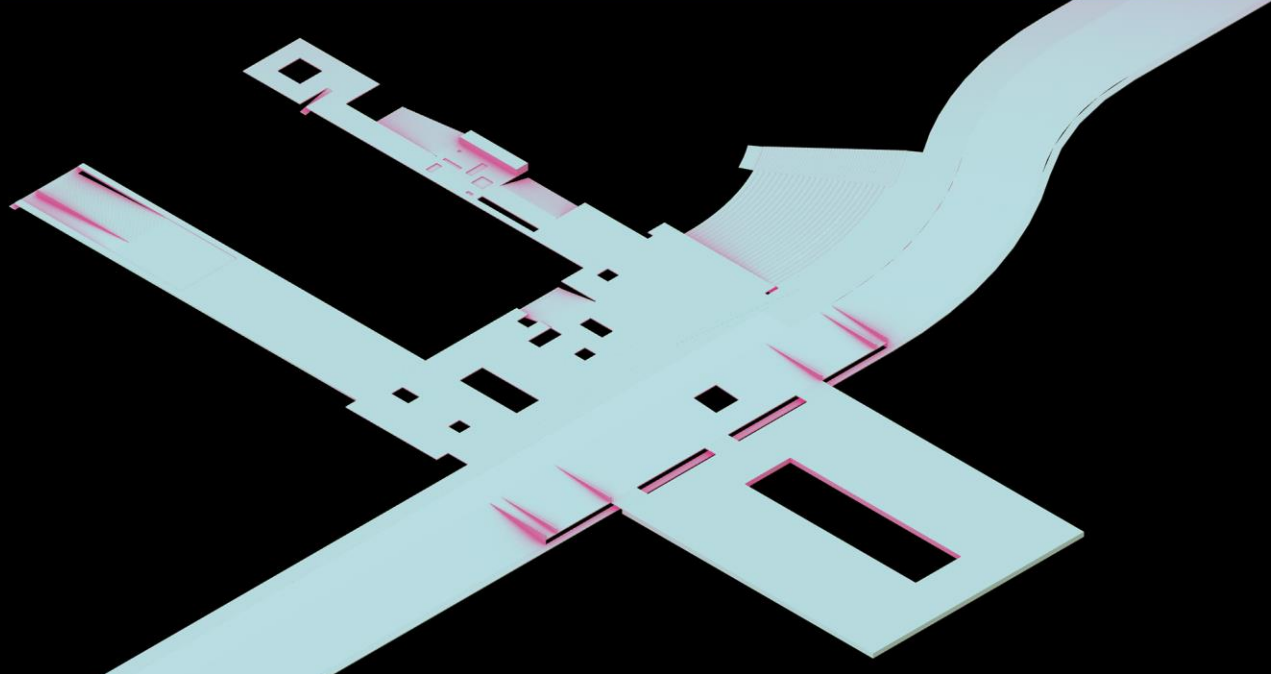
02



03



04



ELEMENTS





01



02

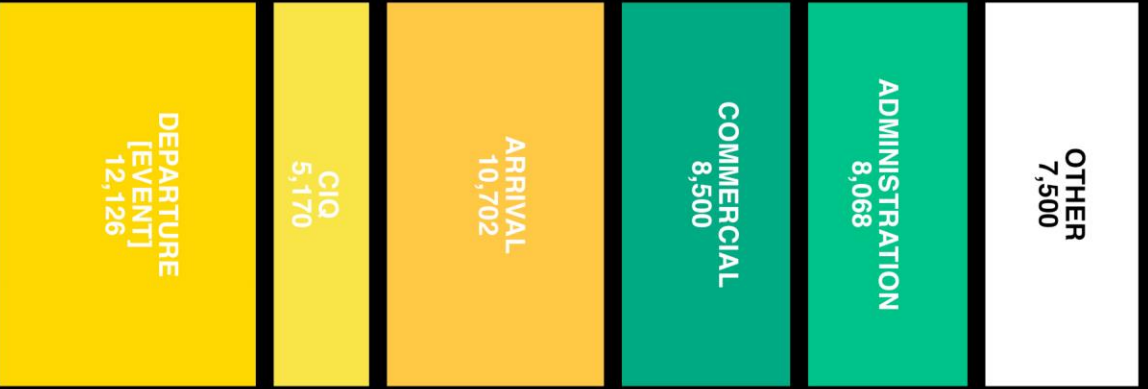


03



04





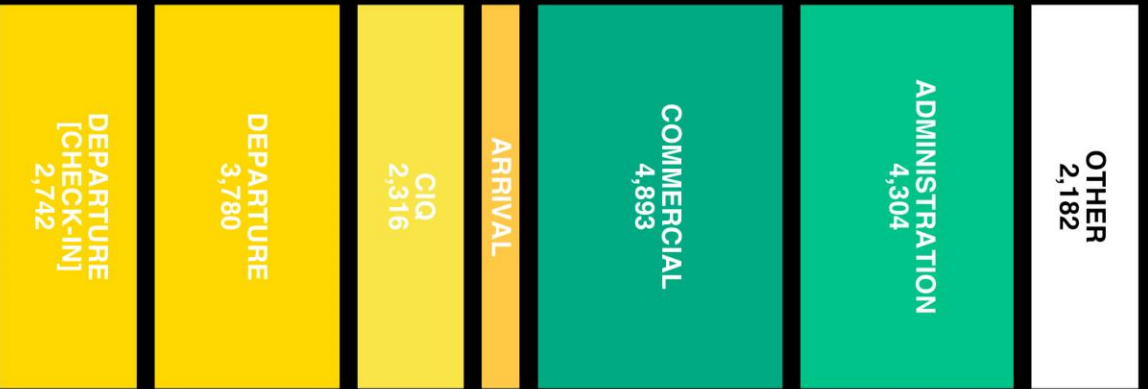
KAI TAK  
CRUISE TERMINAL



YOKOHAMA INTERNATIONAL  
PASSENGER TERMINAL



QINGDAO  
CRUISE TERMINAL



EINDHOEVEN AIRPORT  
TERMINAL



MANHATTAN  
CRUISE  
TERMINAL



IMPLEMENTATION



INTRODUCTION



RESEARCH



CONCEPT



OPERATION



DEVELOPMENT



REFLECTION

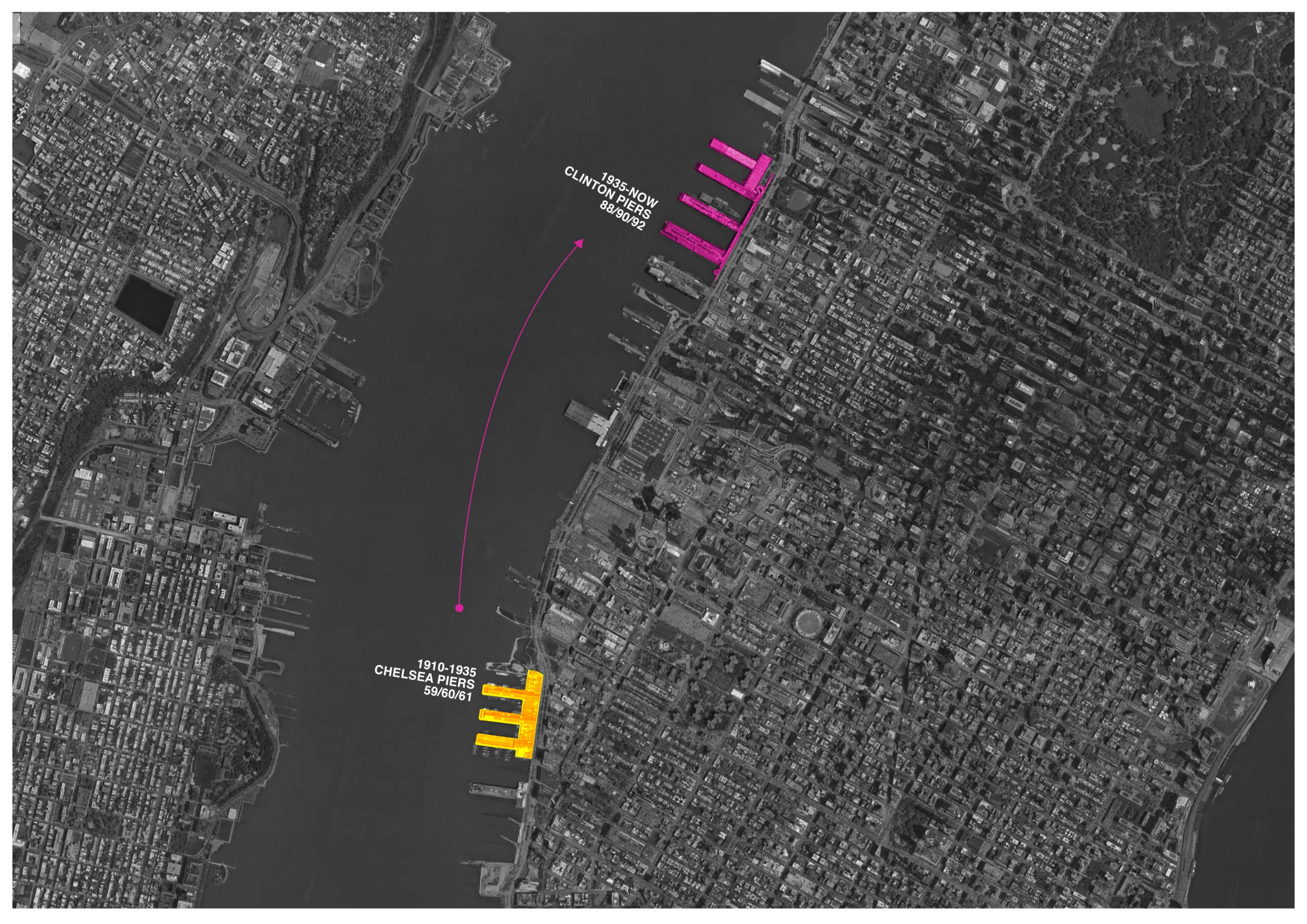


SPACE





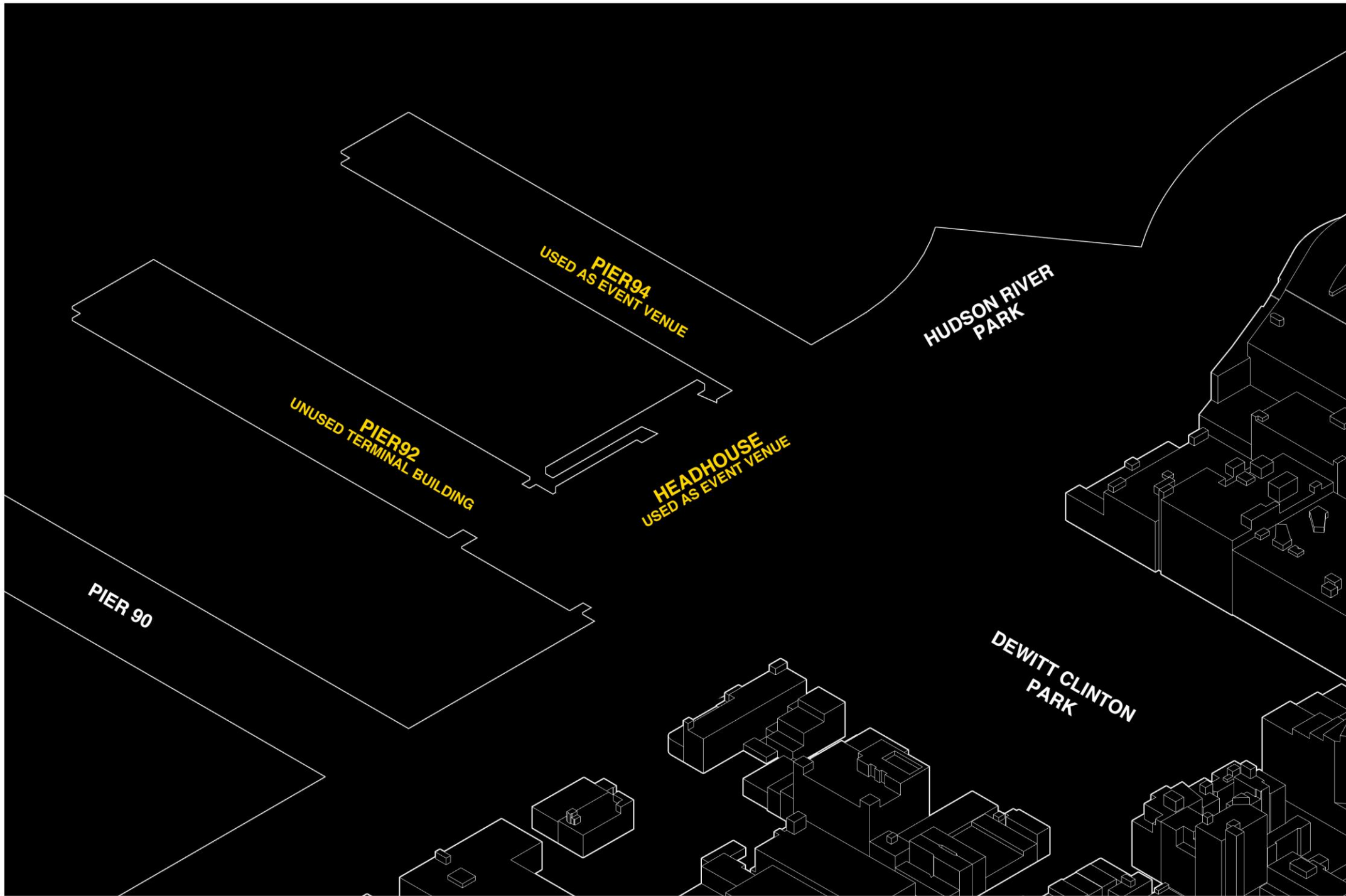




1935-NOW  
CLINTON PIERS  
88/90/92

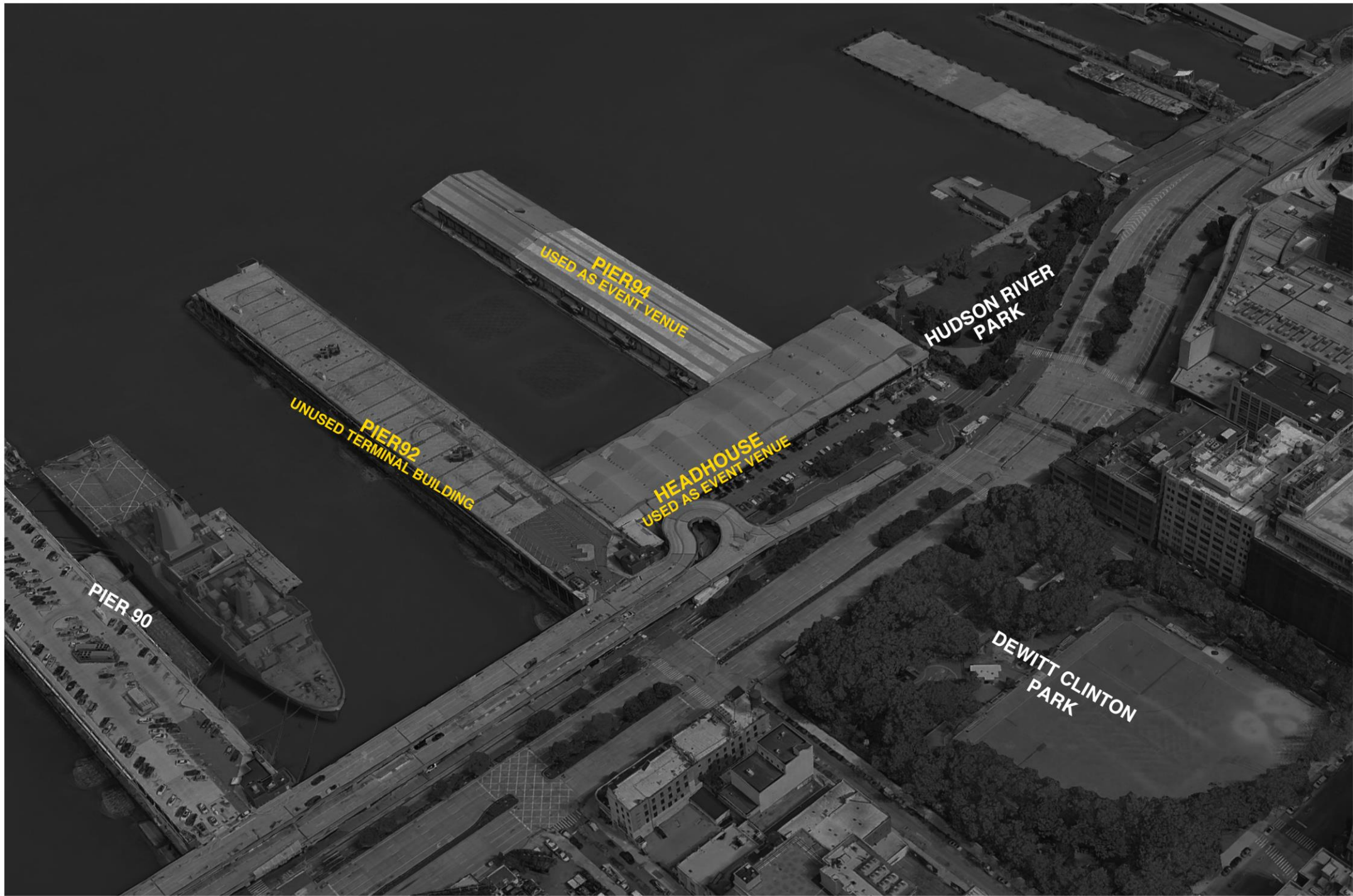
1910-1935  
CHELSEA PIERS  
59/60/61





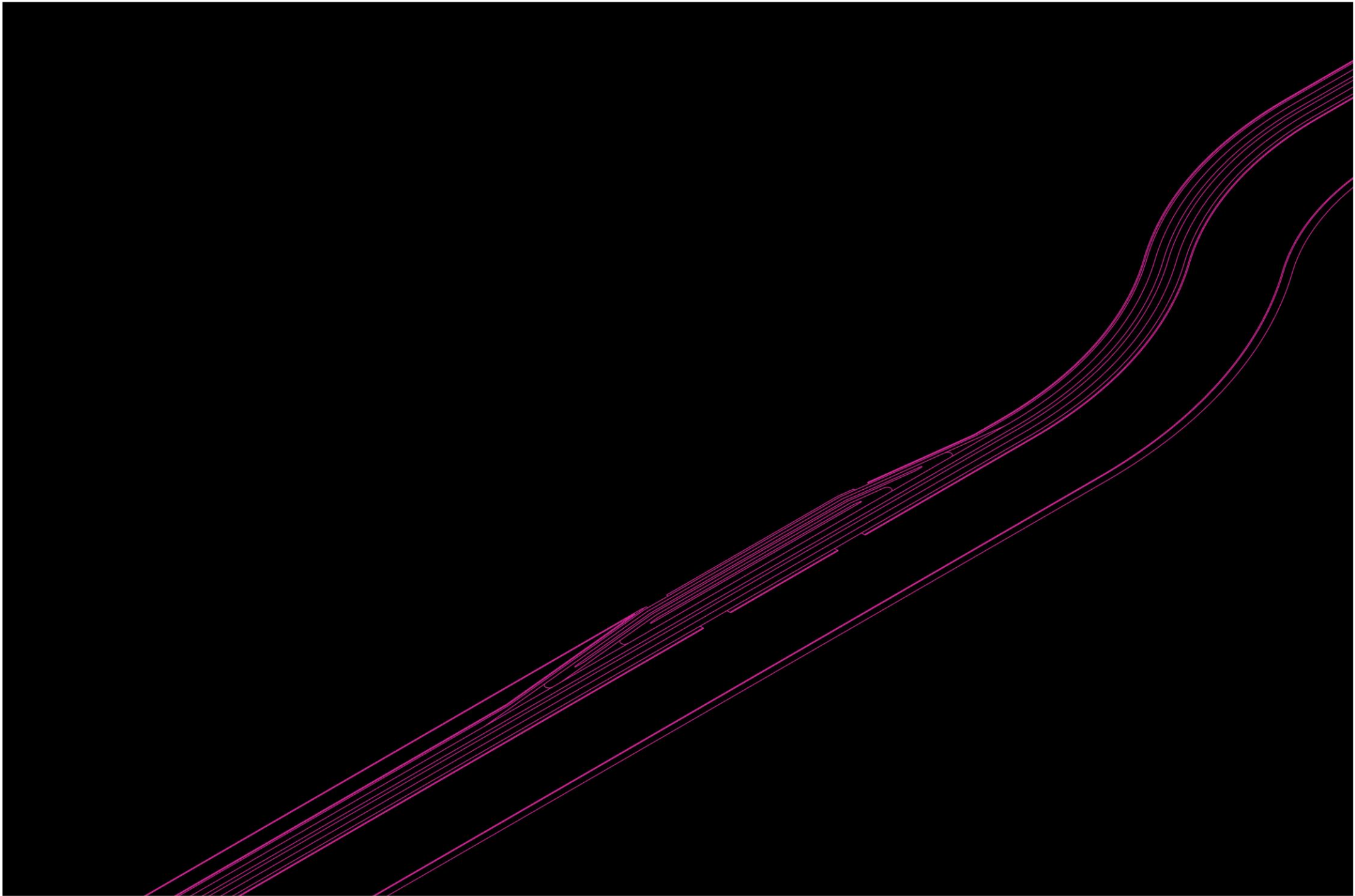
CURRENT SITUATION





CURRENT SITUATION





HIGHWAY: SHRINKING & COVERING

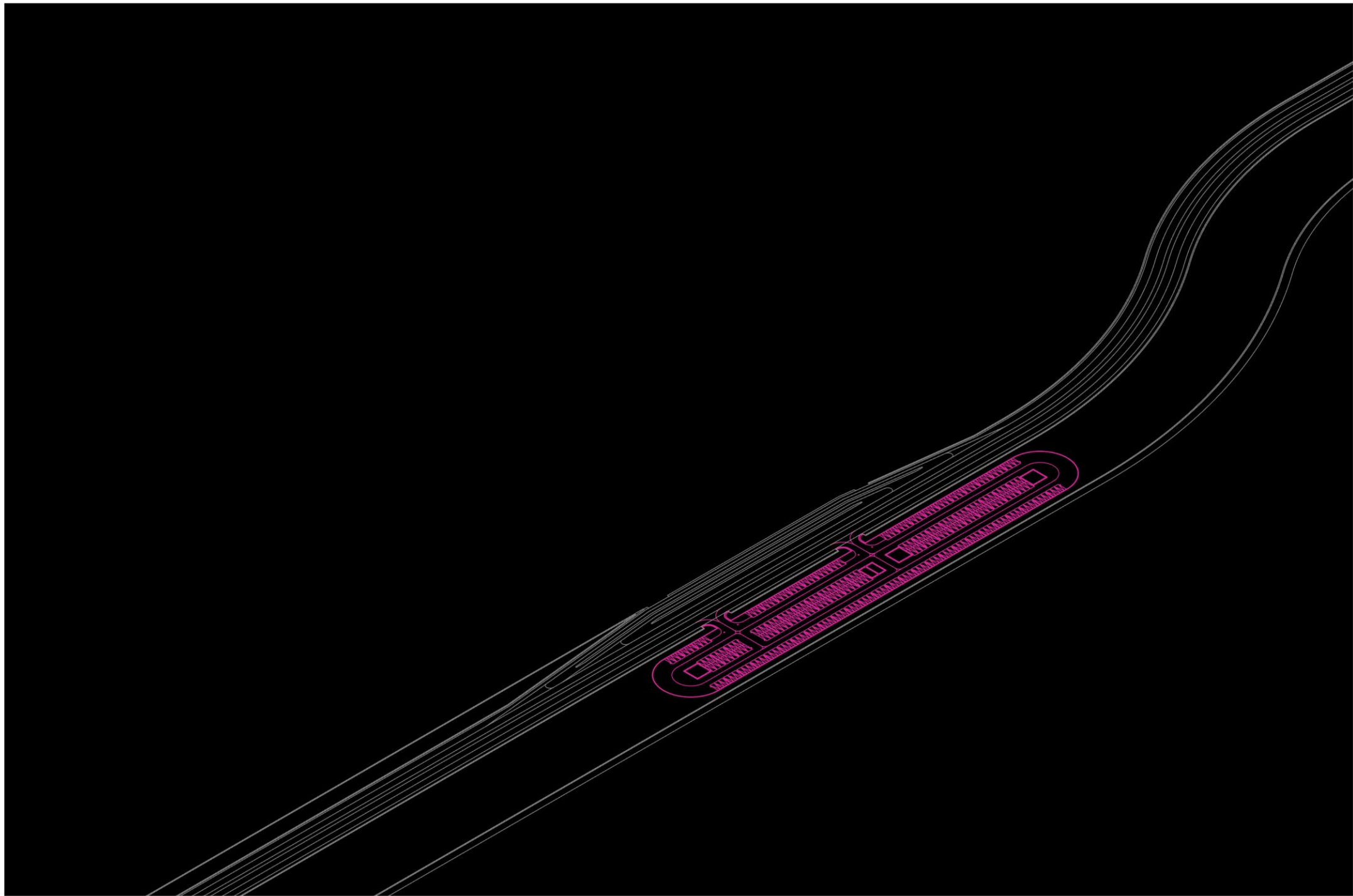




ADDITIONAL LANES FOR DROP-OFF AND PICK-UP

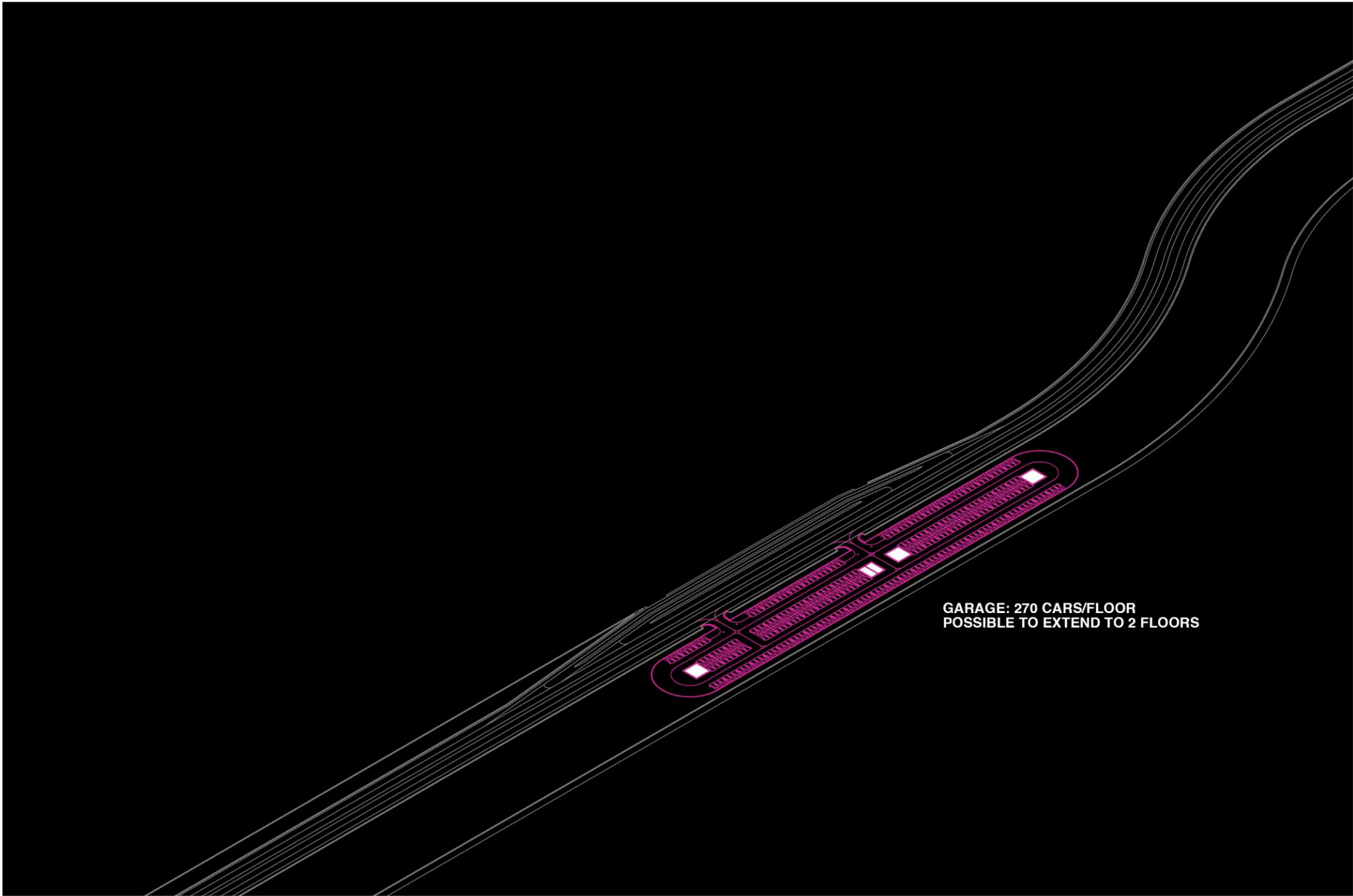
HIGHWAY: SHRINKING & COVERING





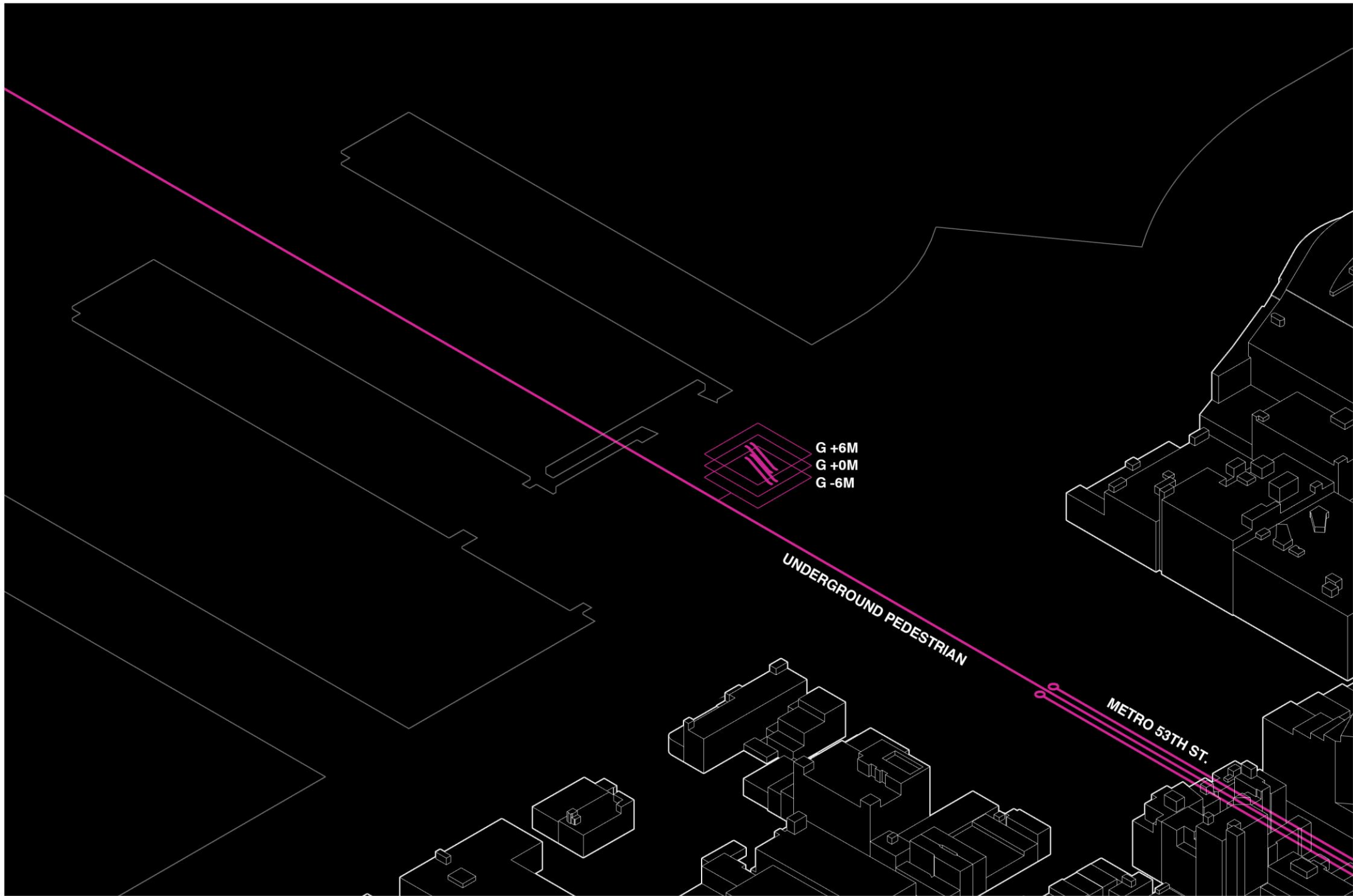
PARKING UNDER THE DECK





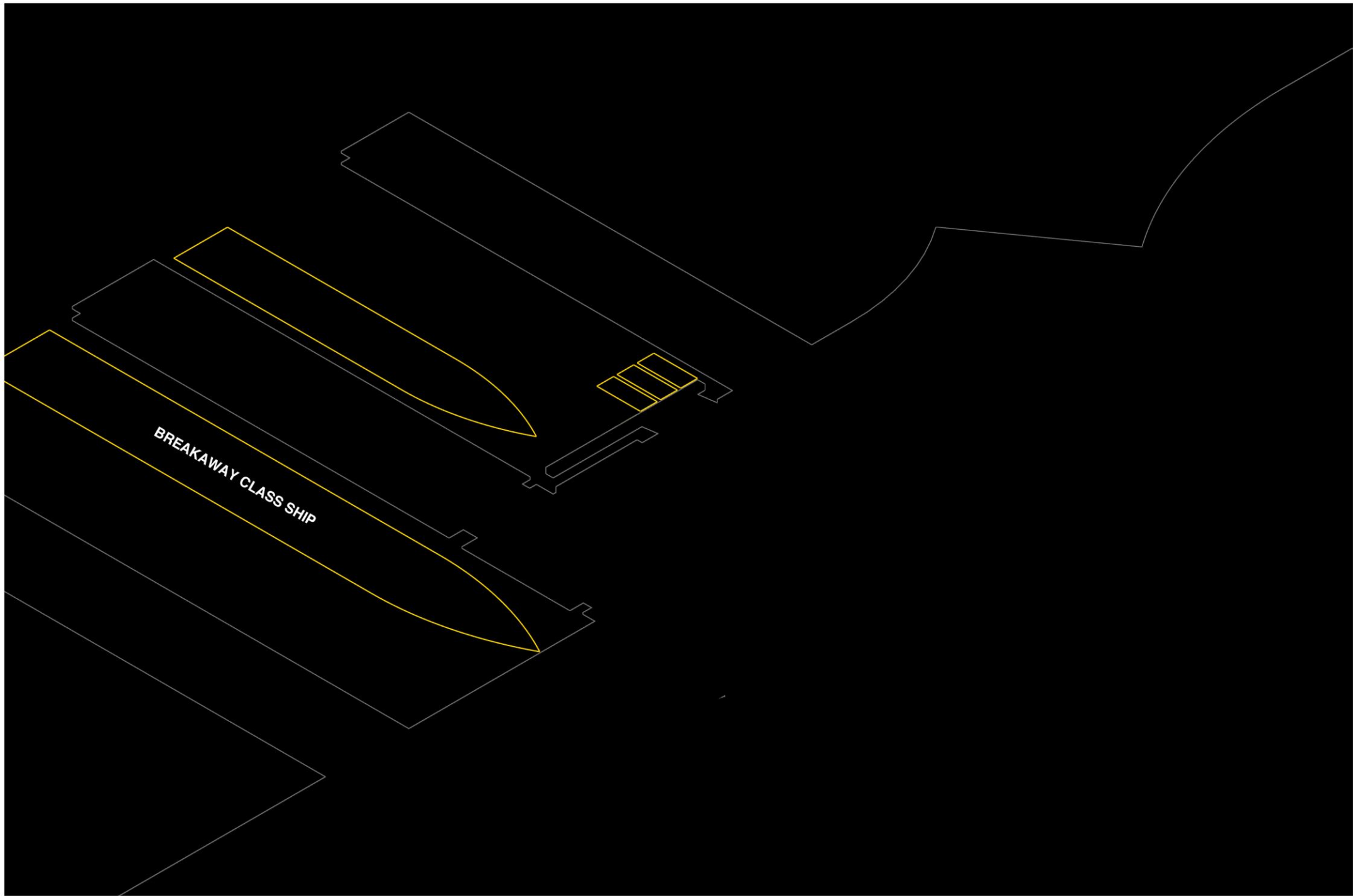
GARAGE: 270 CARS/FLOOR  
POSSIBLE TO EXTEND TO 2 FLOORS

PARKING UNDER THE DECK

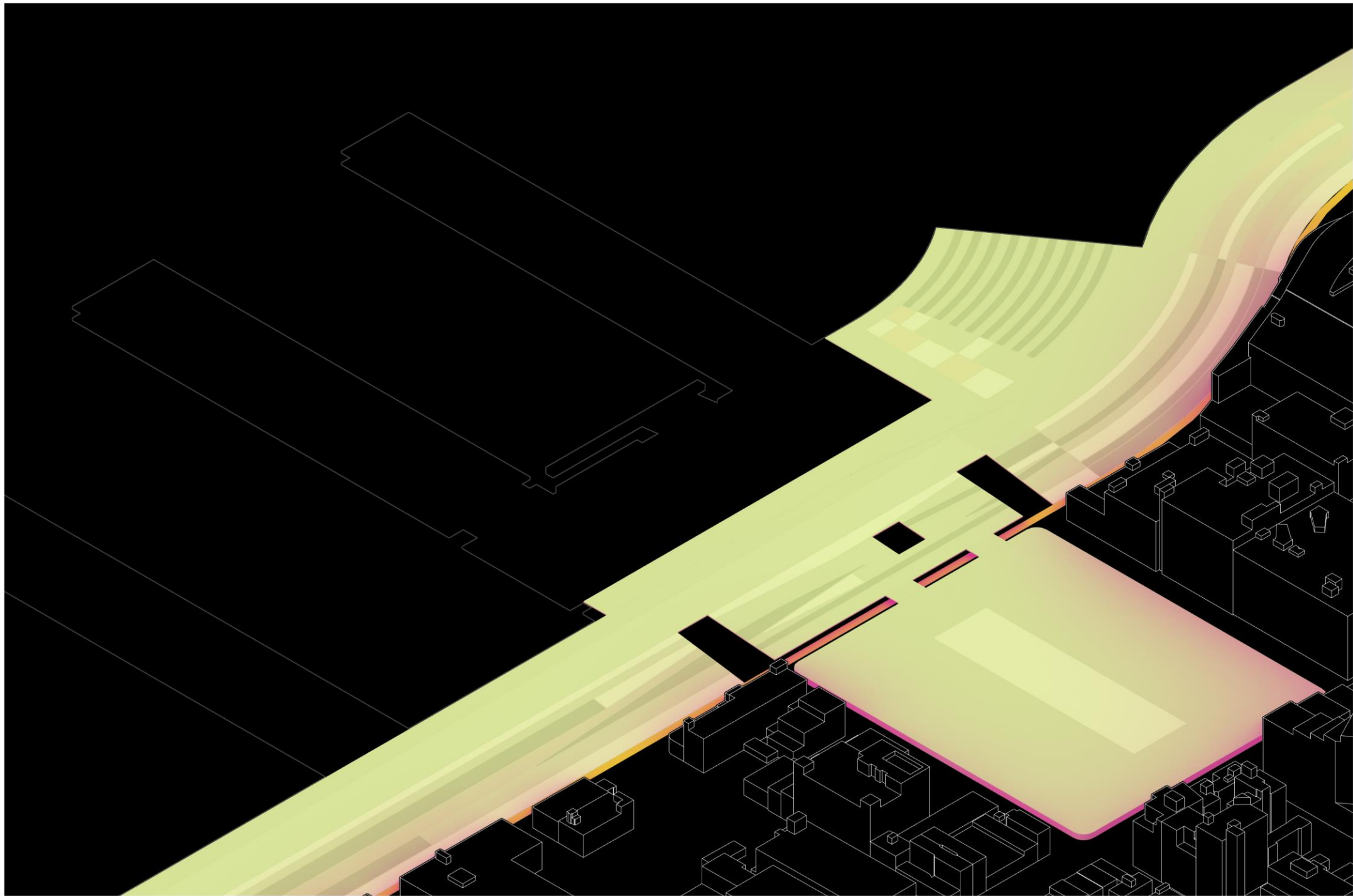


UNDERGROUND PEDESTRIAN ROAD / METRO



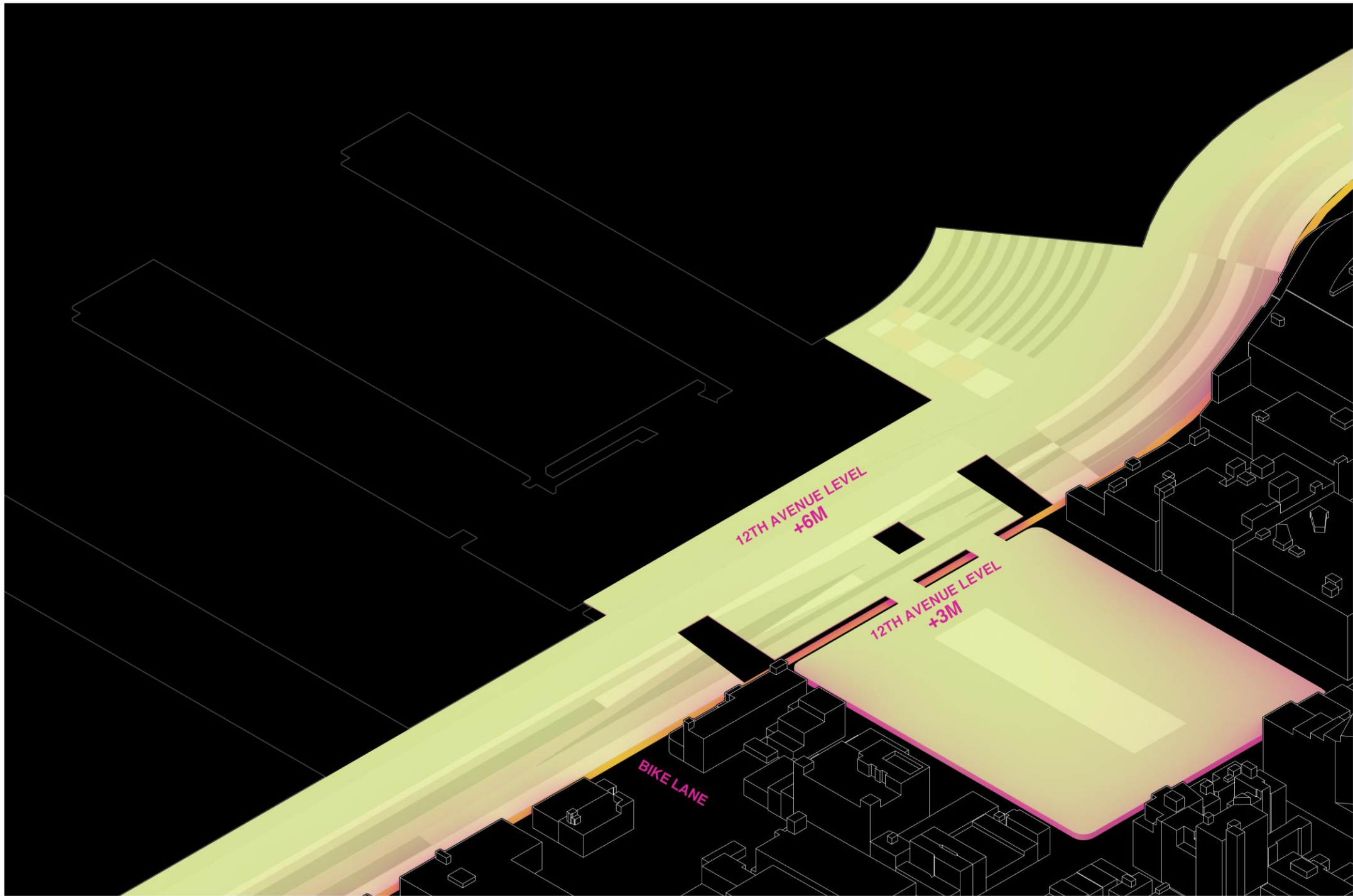


WATER TRANSPORT

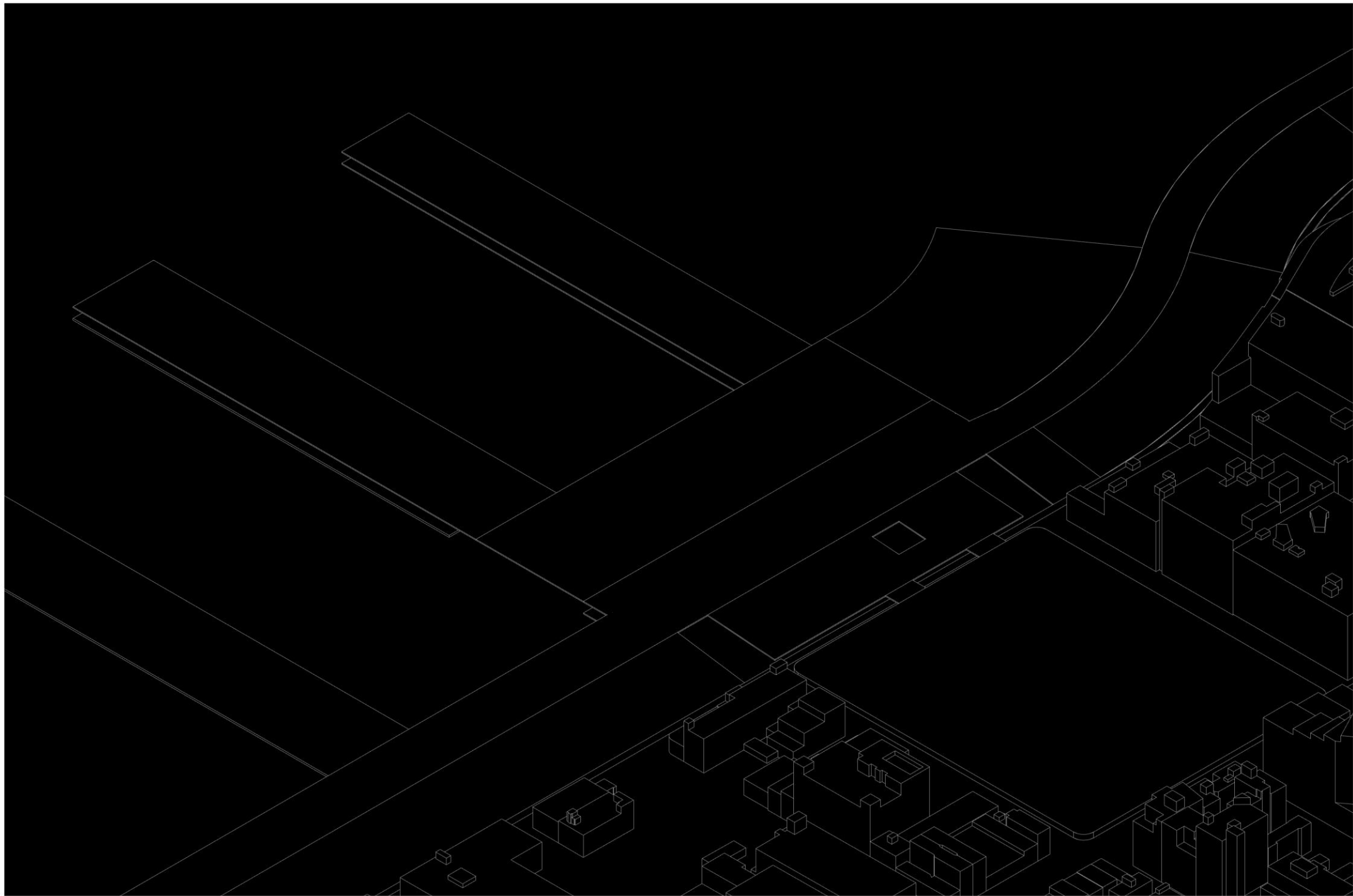


DECK  
COVERING THE ROAD



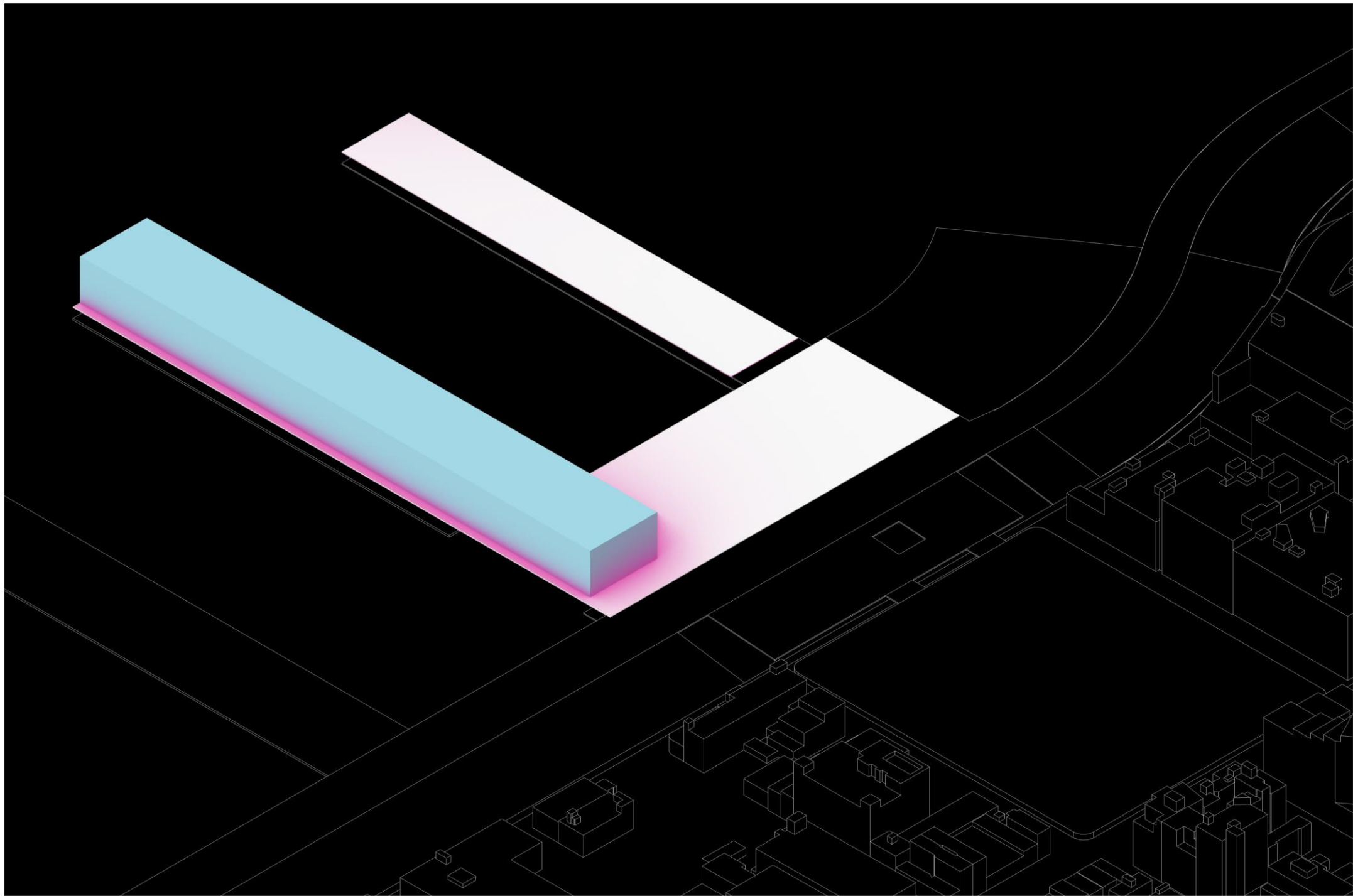


DECK  
COVERING THE ROAD

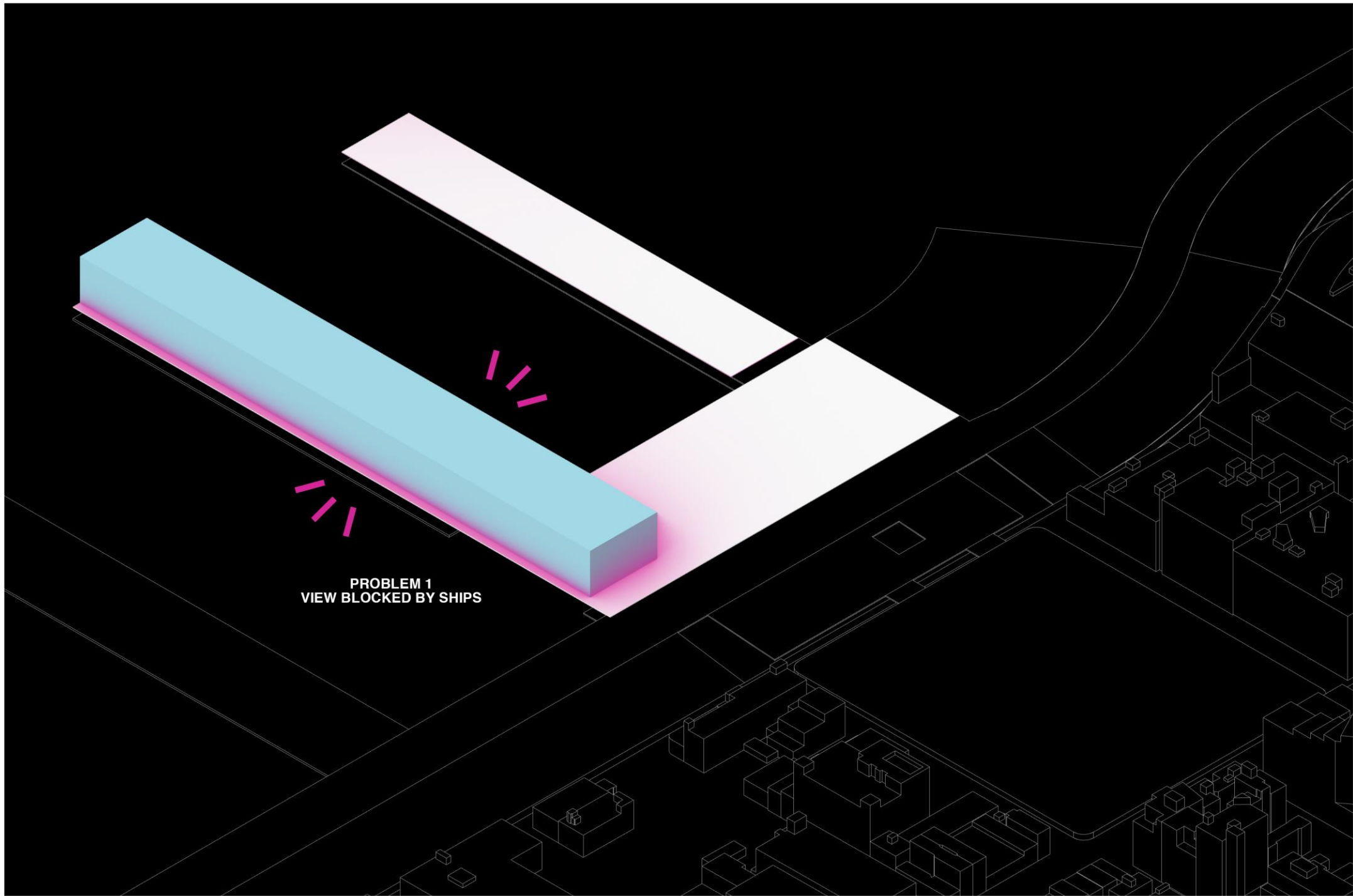


MASSING





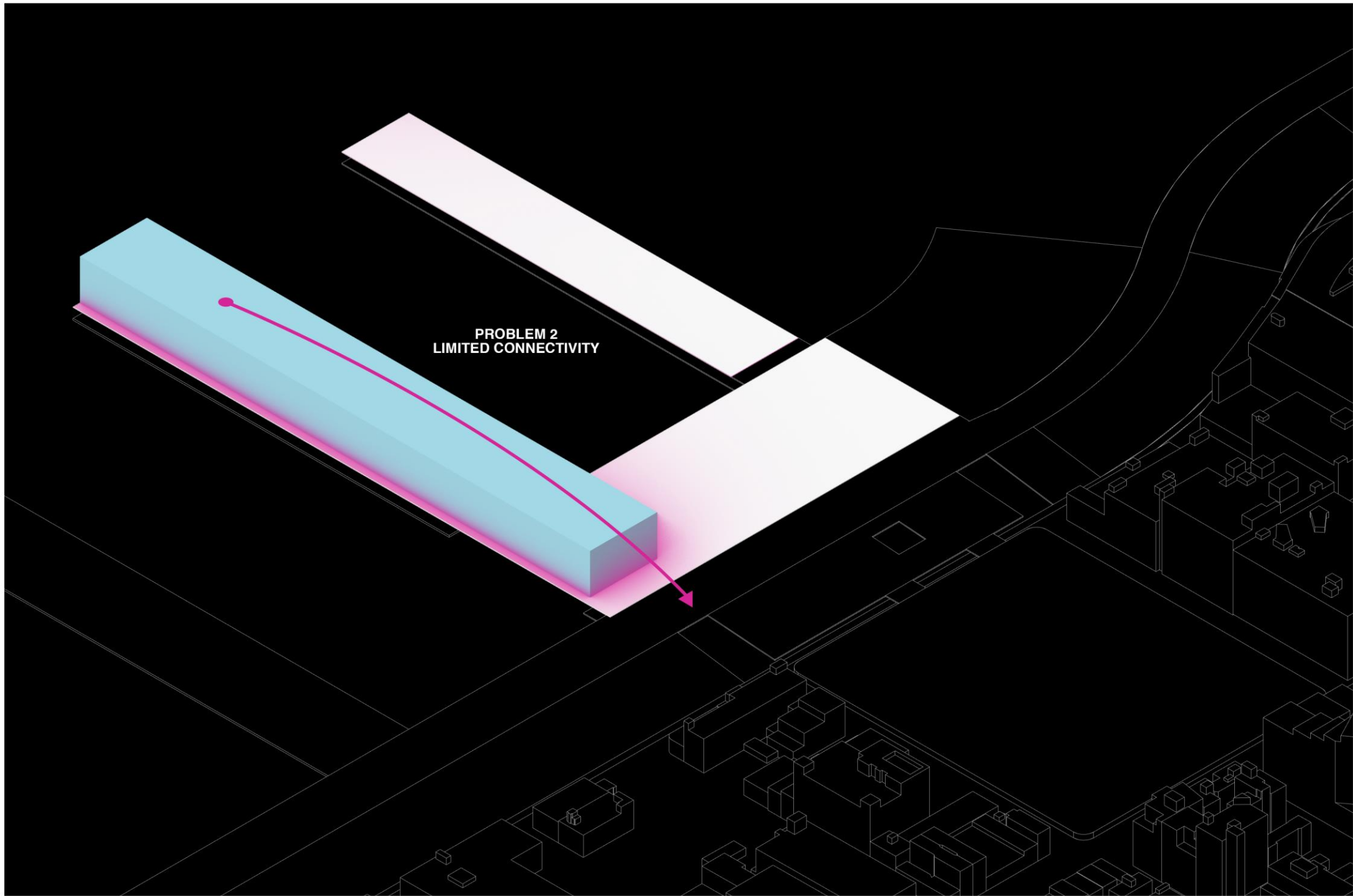
MASSING



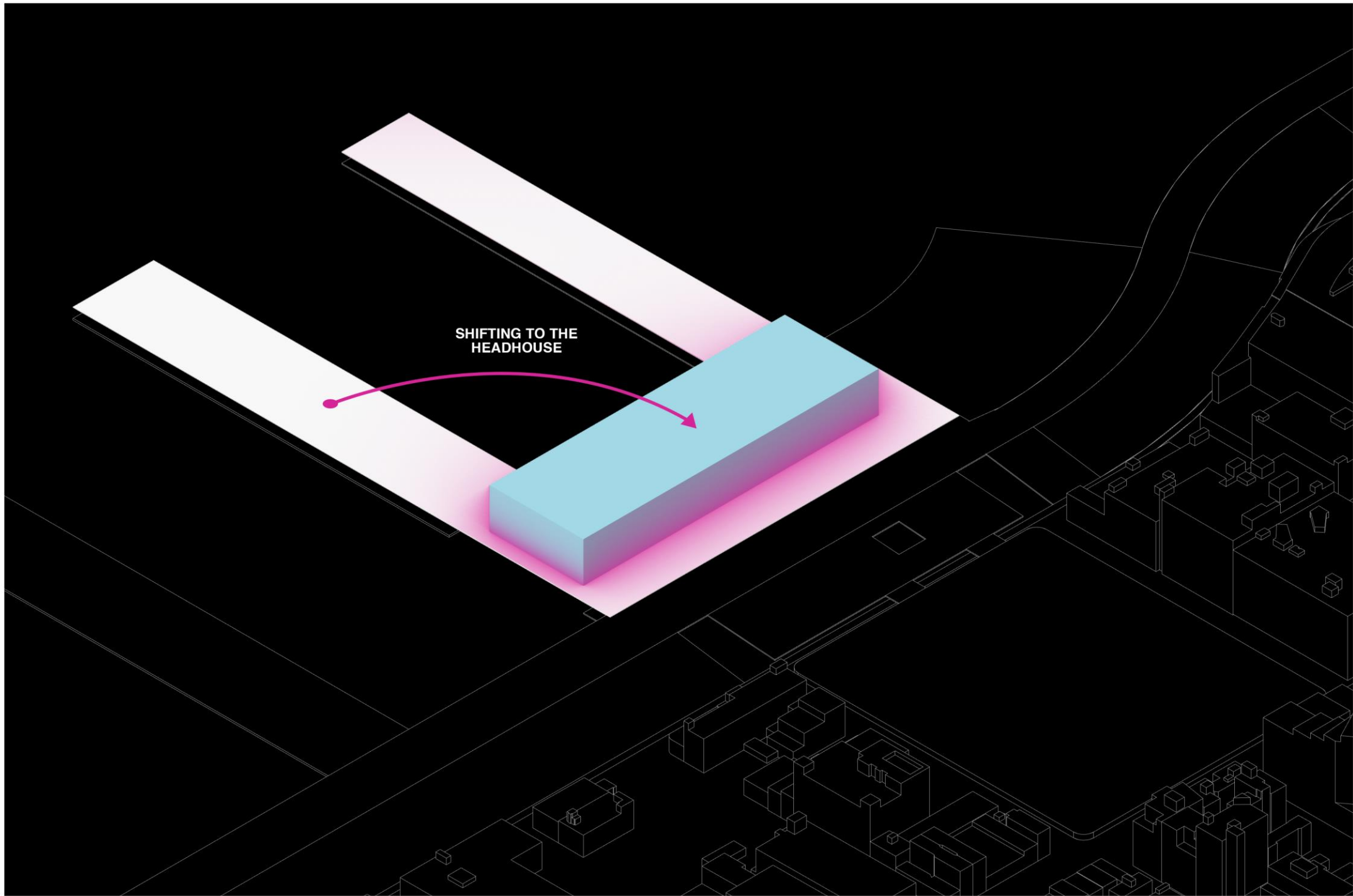
PROBLEM 1  
VIEW BLOCKED BY SHIPS

MASSING





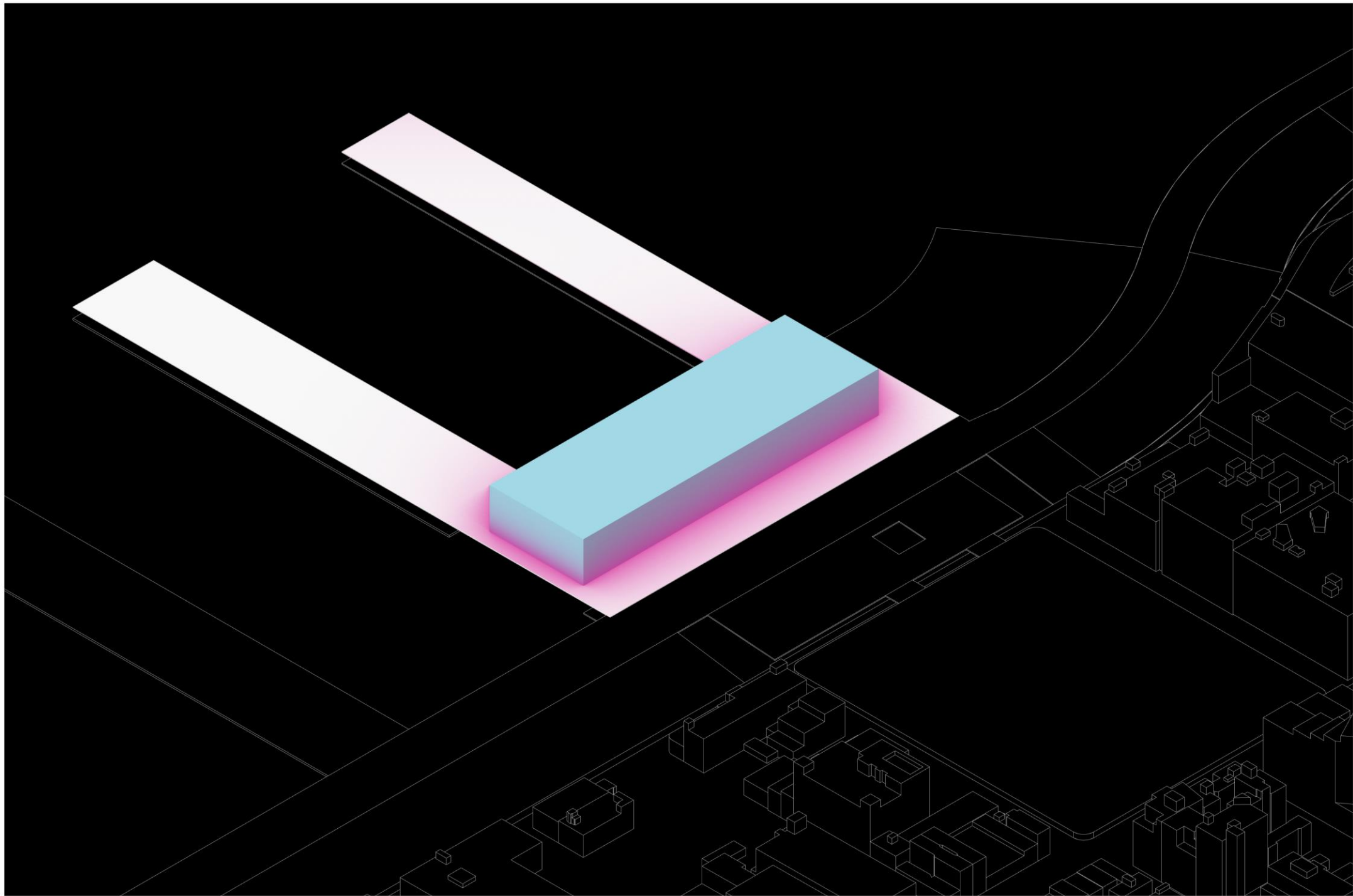
MASSING



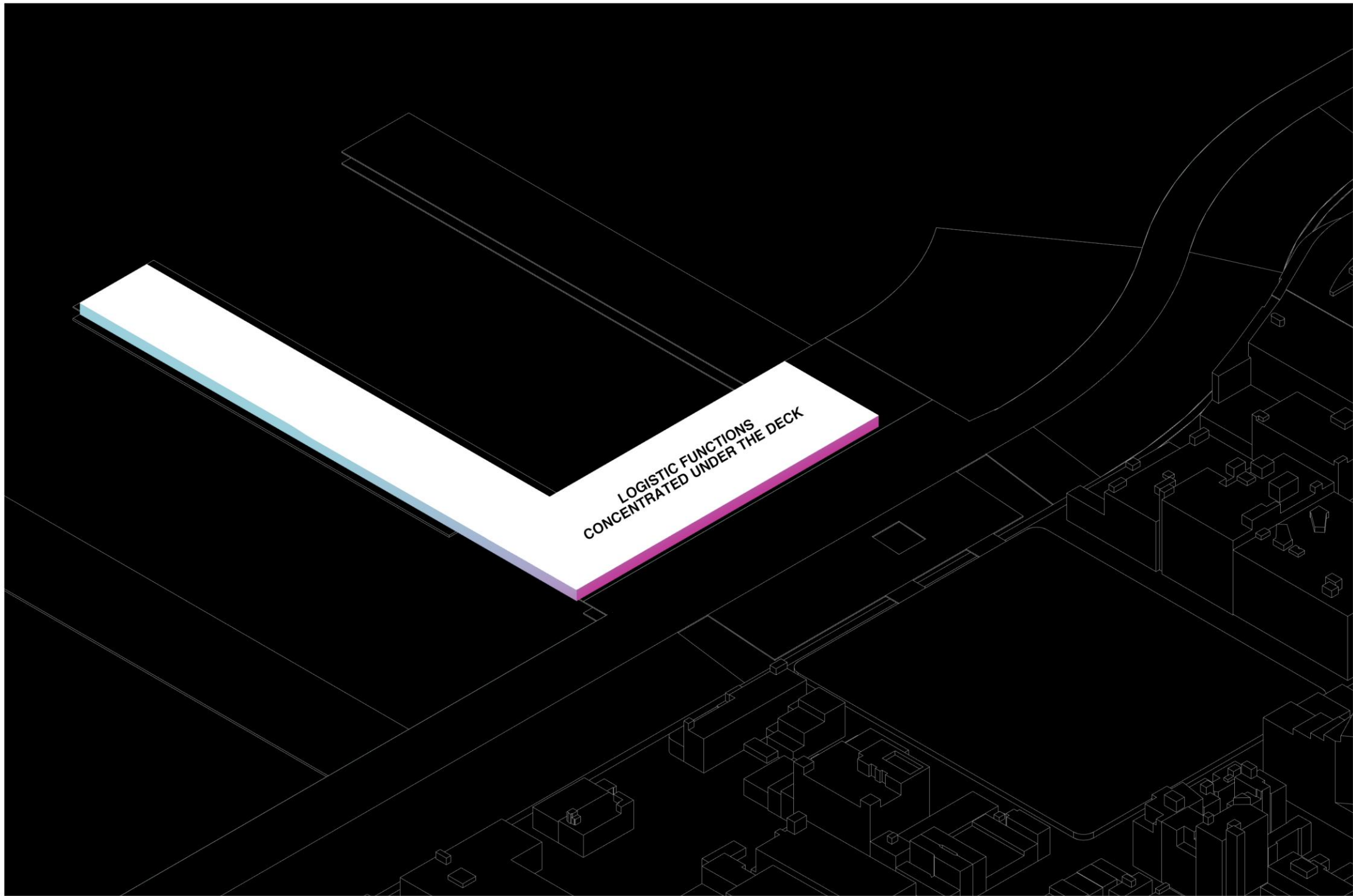
SHIFTING TO THE  
HEADHOUSE

MASSING





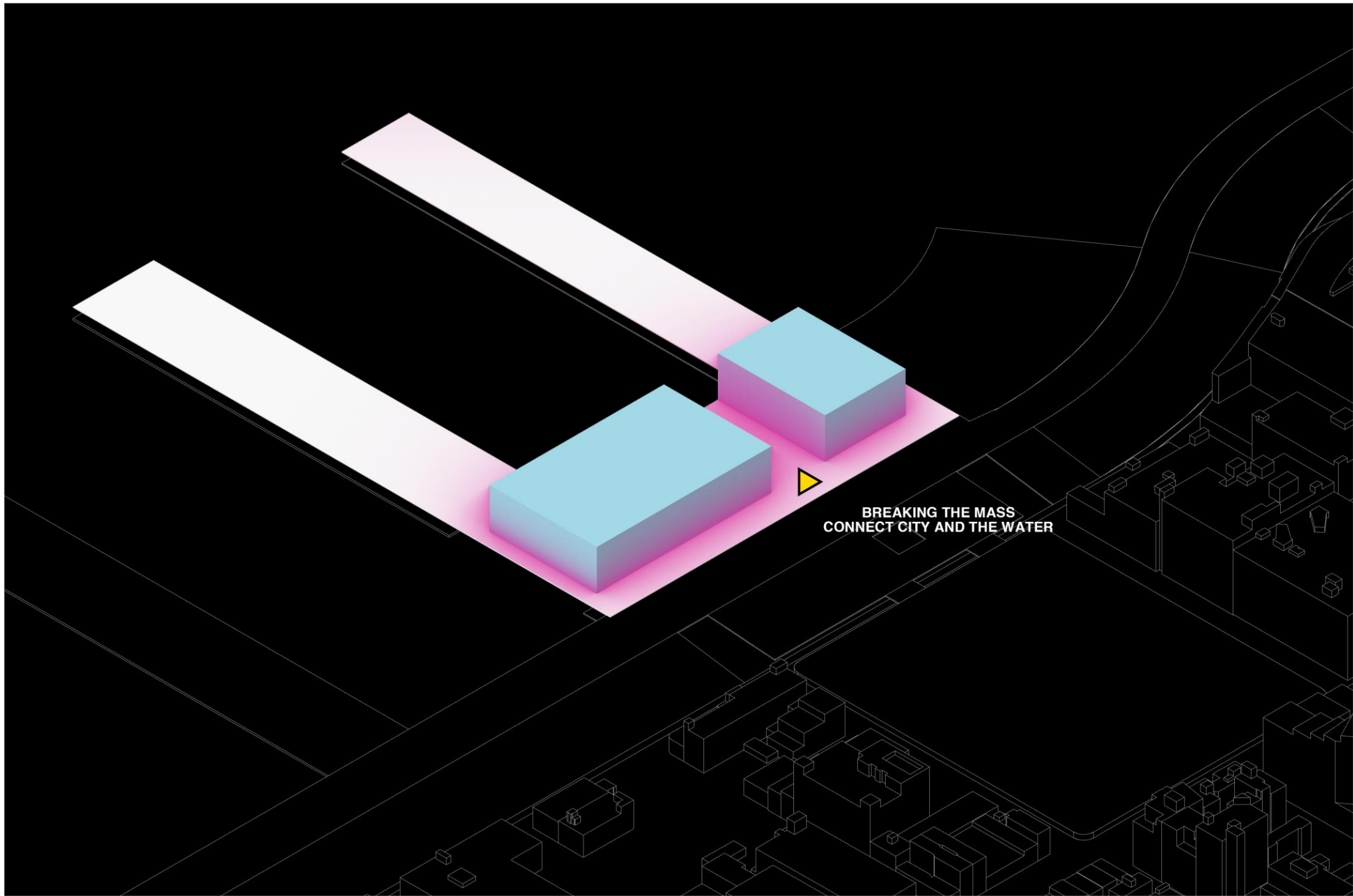
MASSING



LOGISTIC FUNCTIONS  
CONCENTRATED UNDER THE DECK

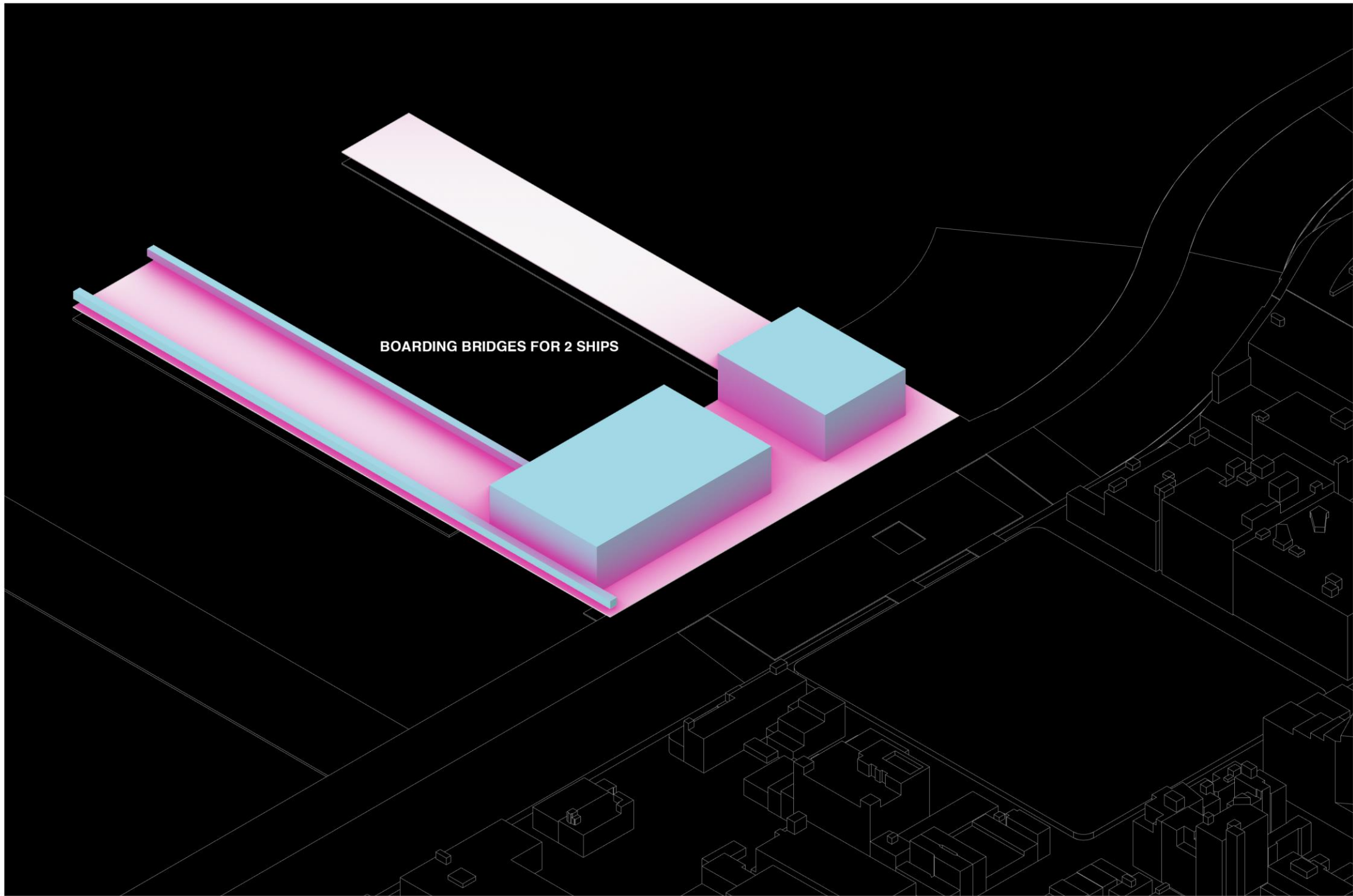
MASSING





BREAKING THE MASS  
CONNECT CITY AND THE WATER

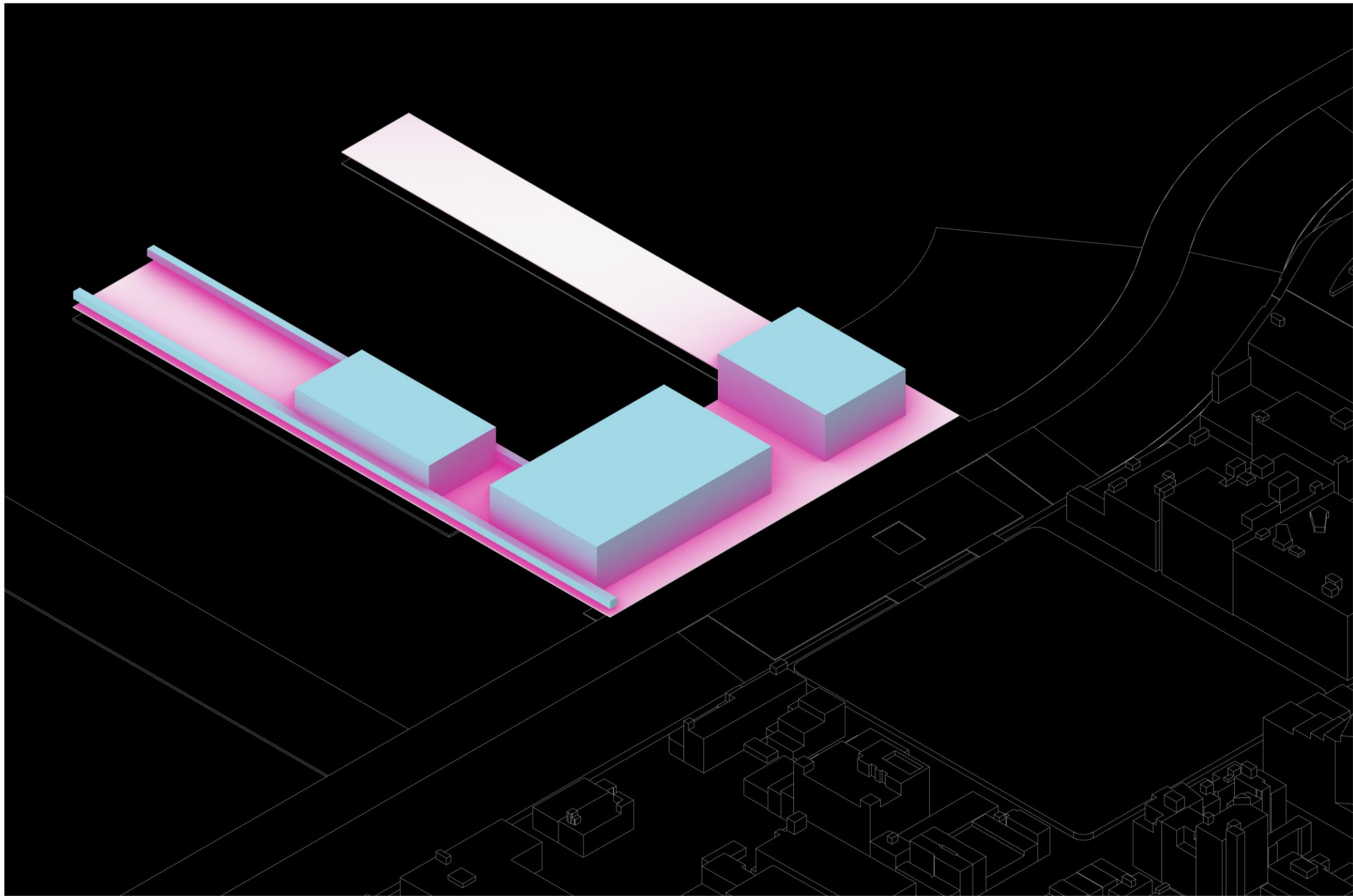
MASSING



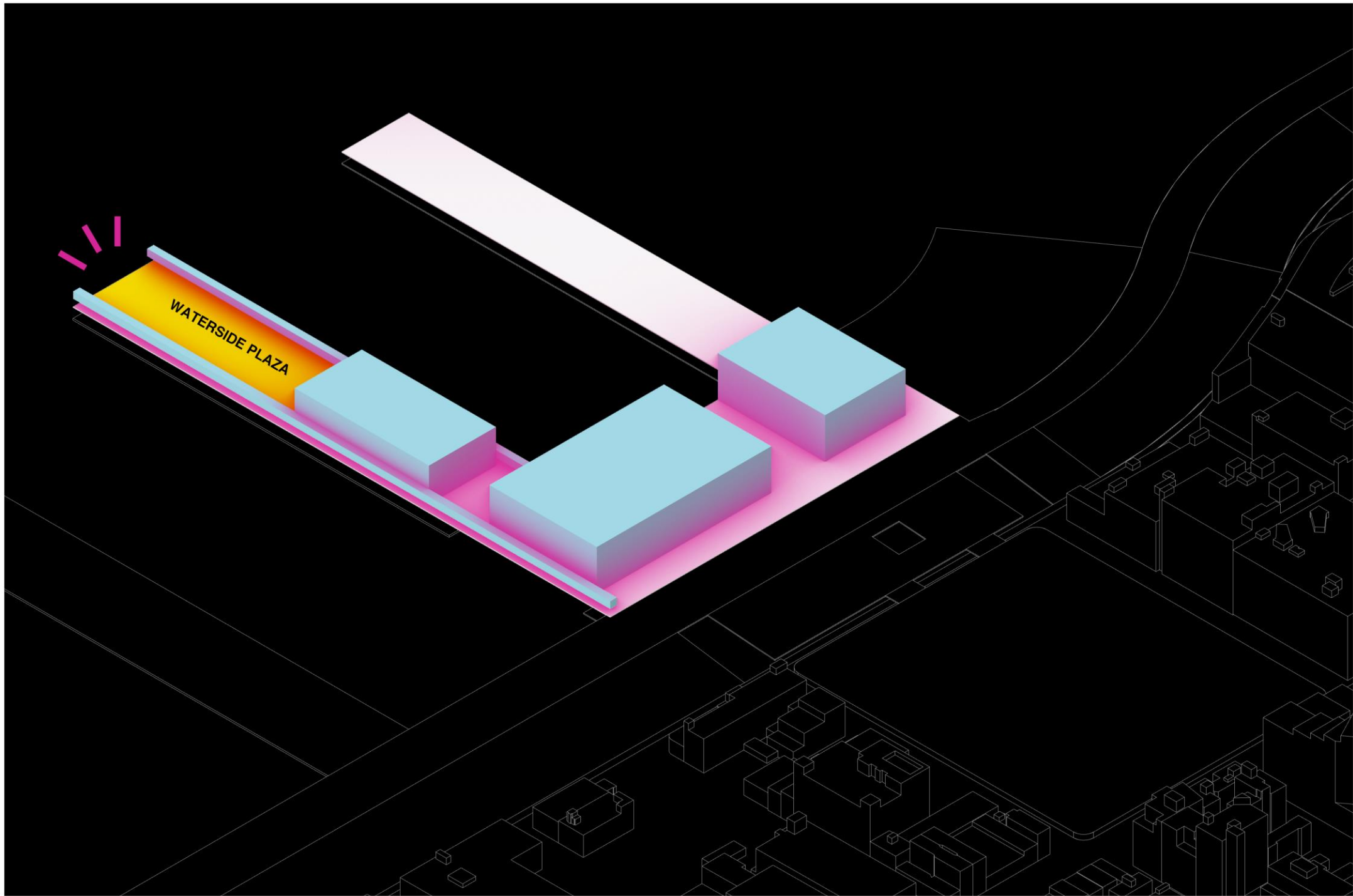
BOARDING BRIDGES FOR 2 SHIPS

MASSING



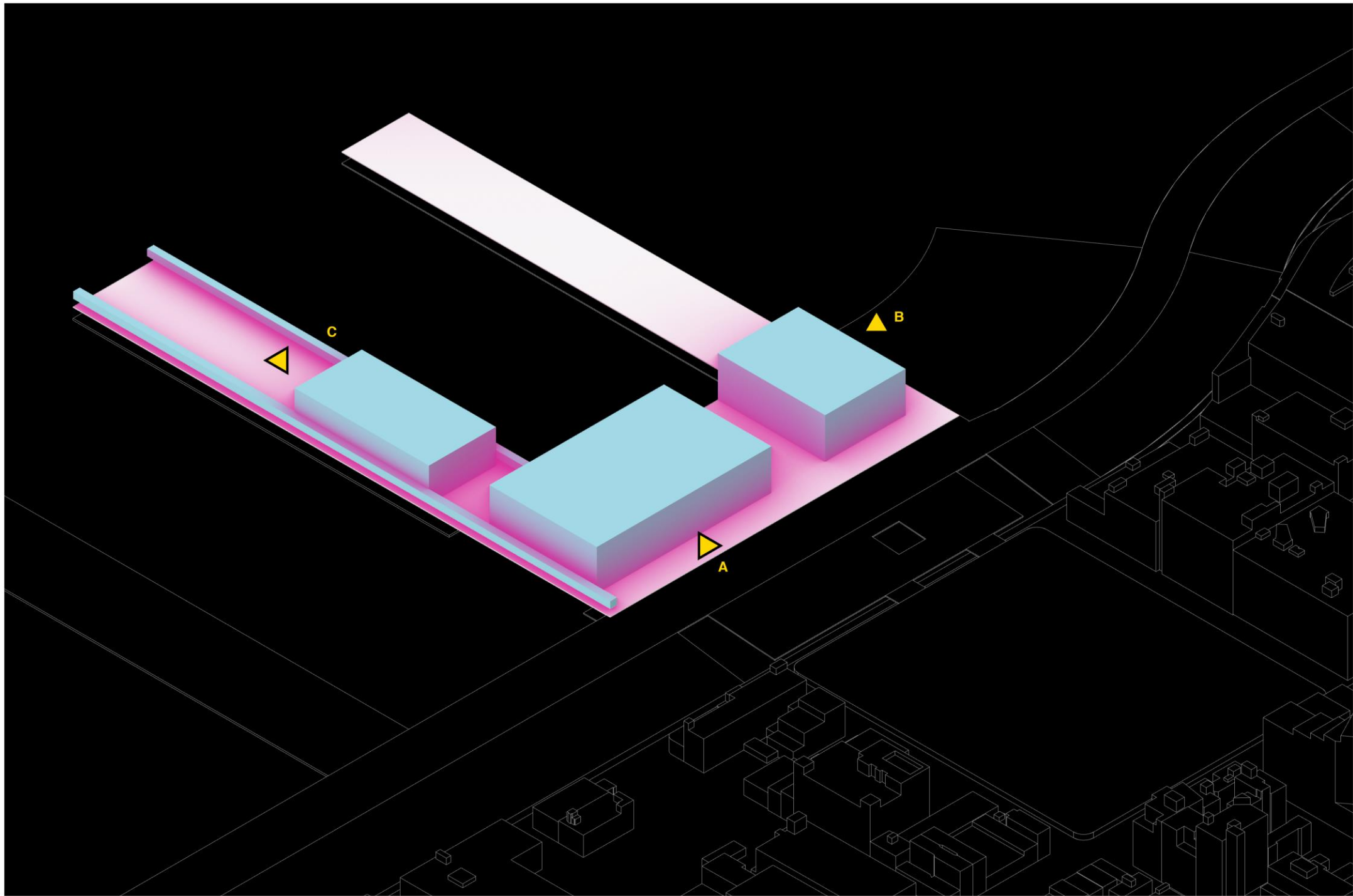


MASSING

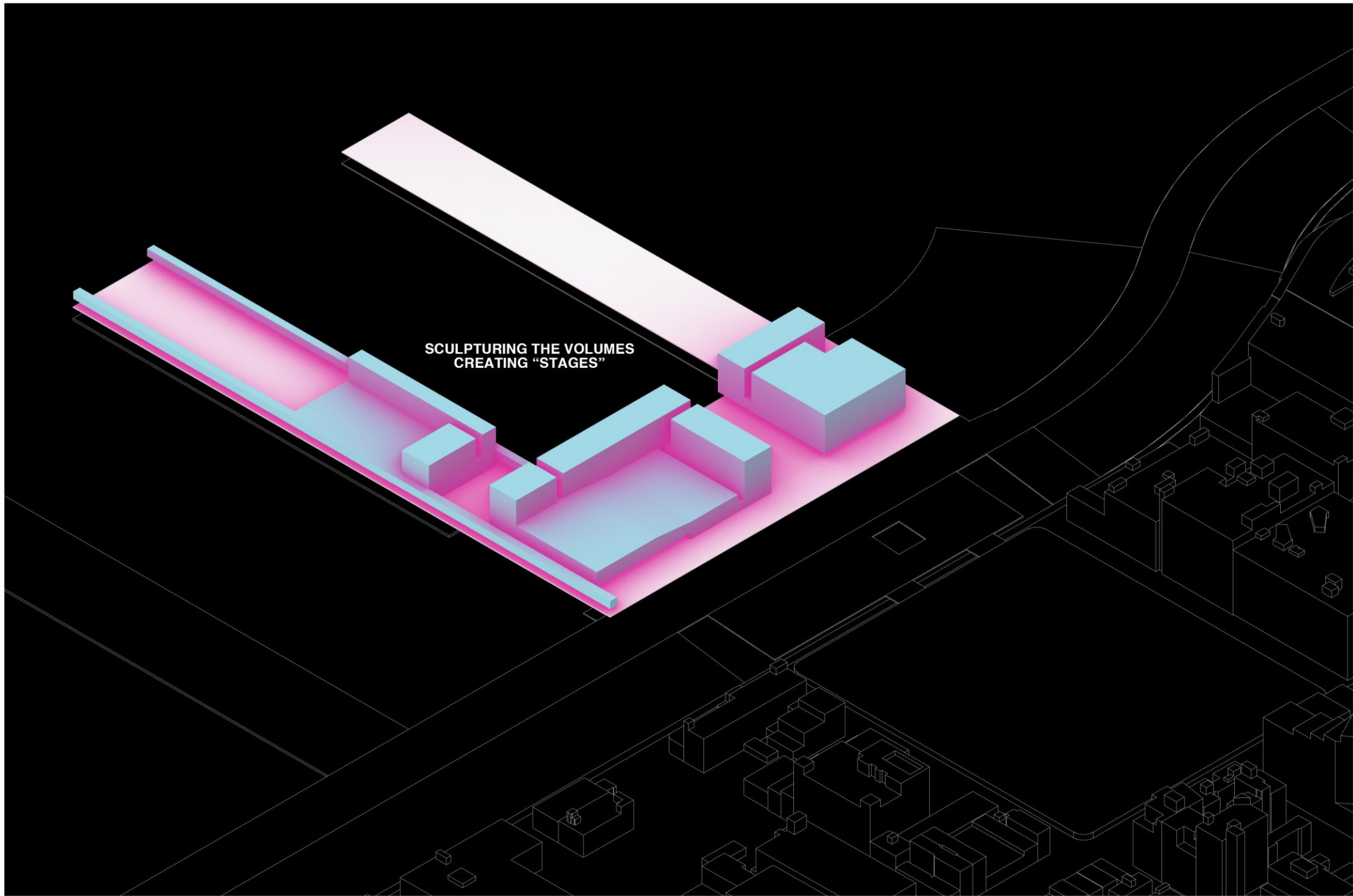


MASSING





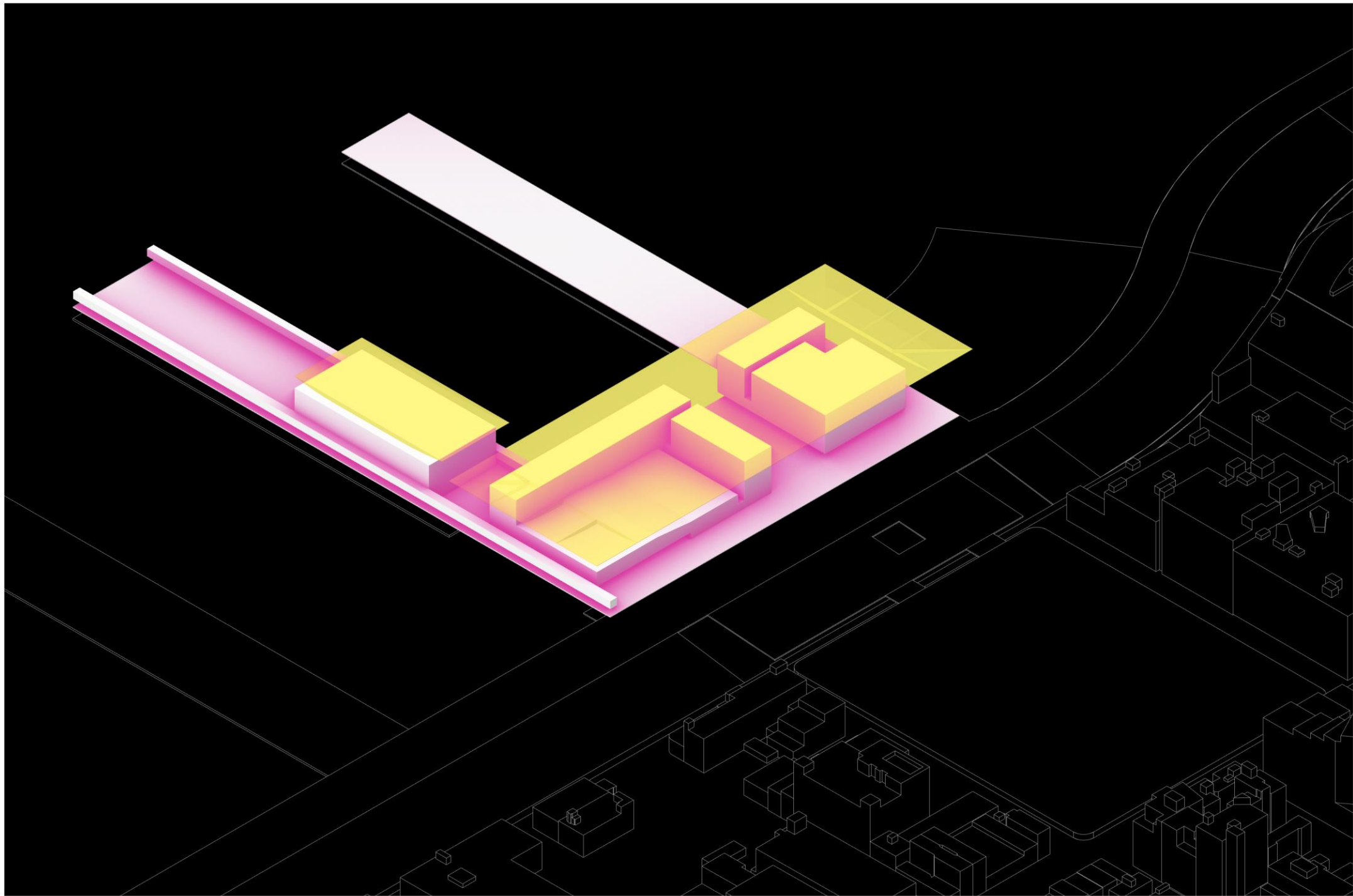
MASSING



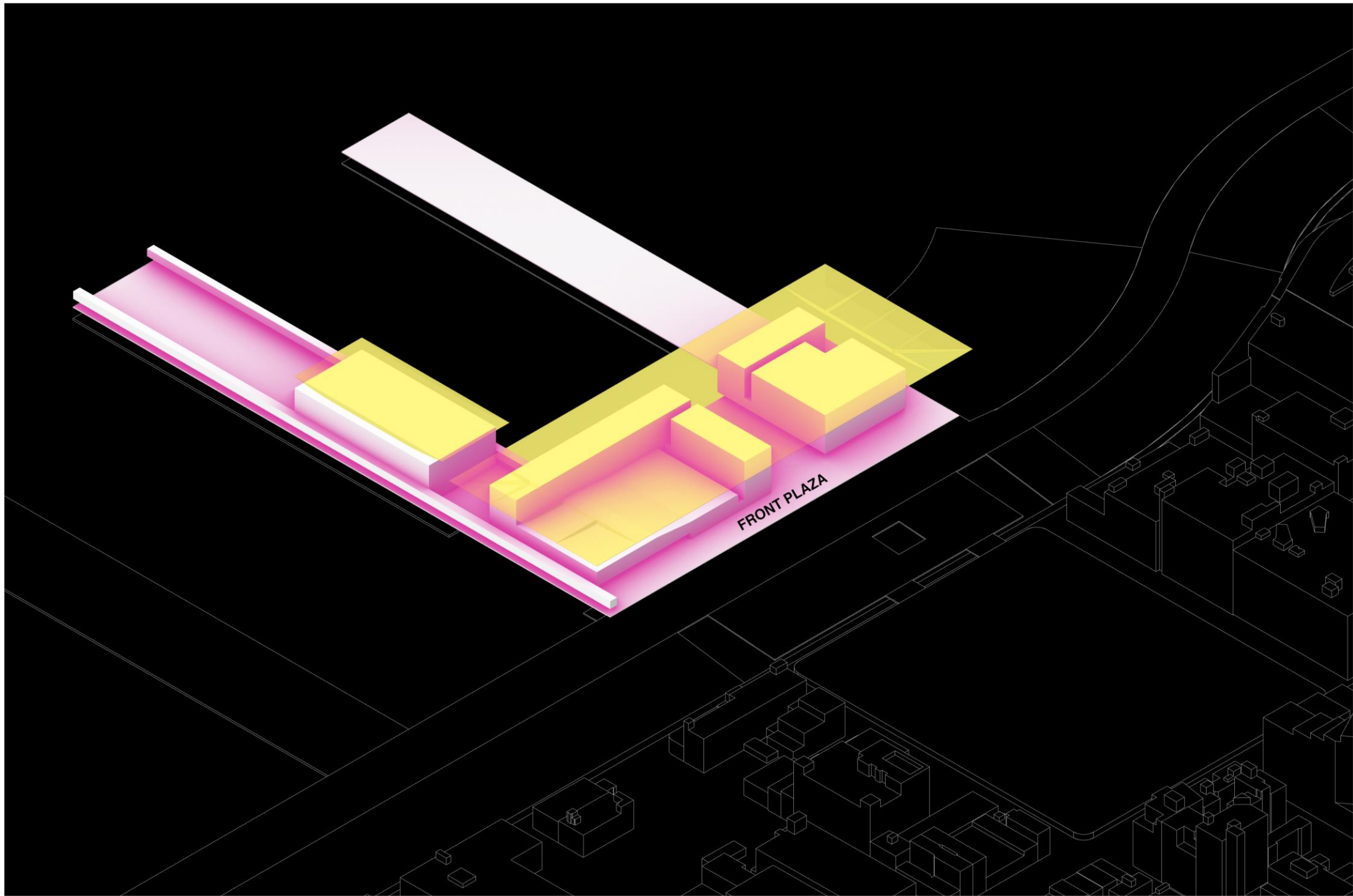
SCULPTURING THE VOLUMES  
CREATING "STAGES"

MASSING





MASSING



MASSING





PERSPECTIVE



• CRUISE SHIP AT BERTH 1



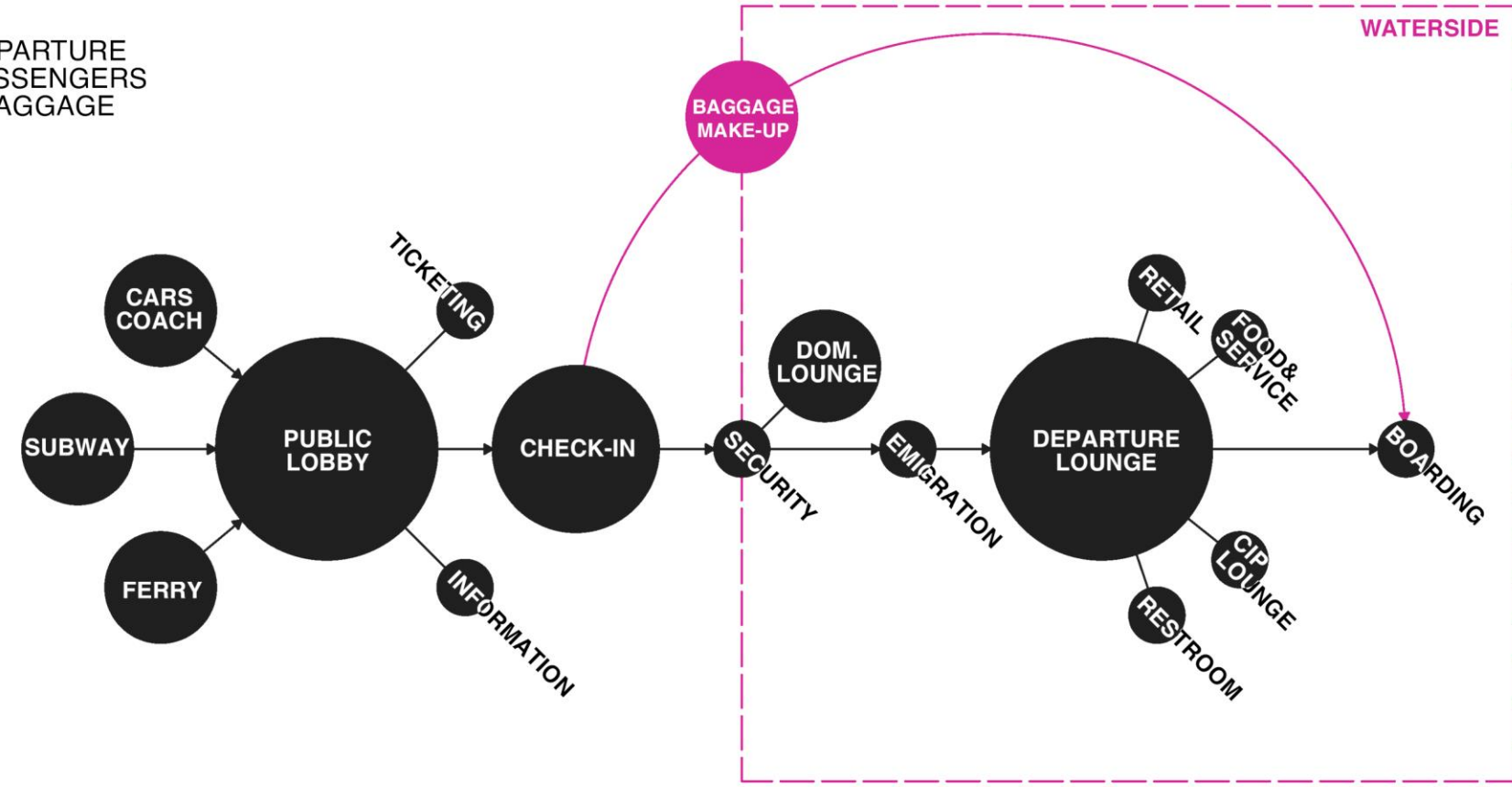
TERMINAL CRUISE

MEDIA  
PARK

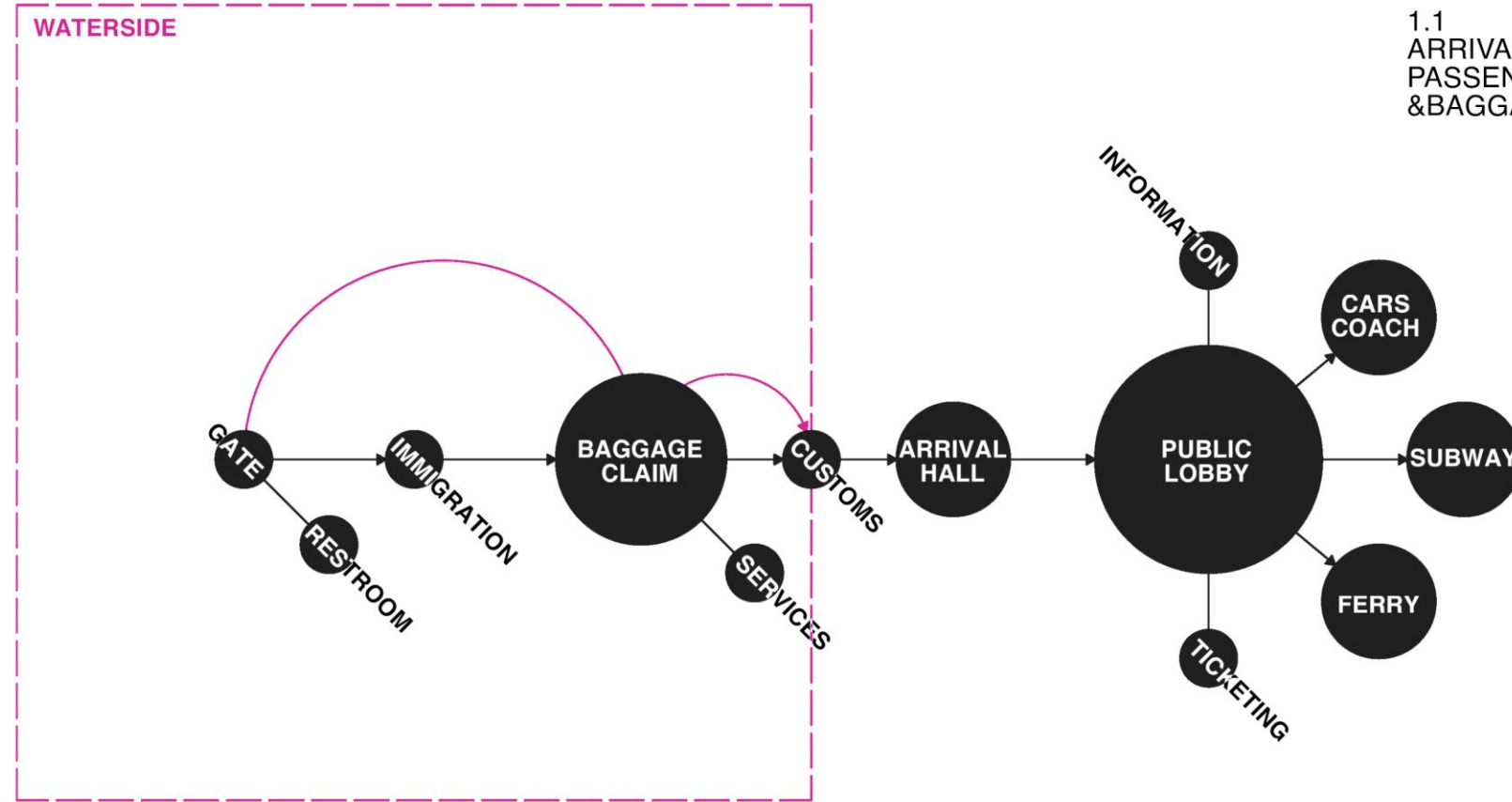
PERSPECTIVE



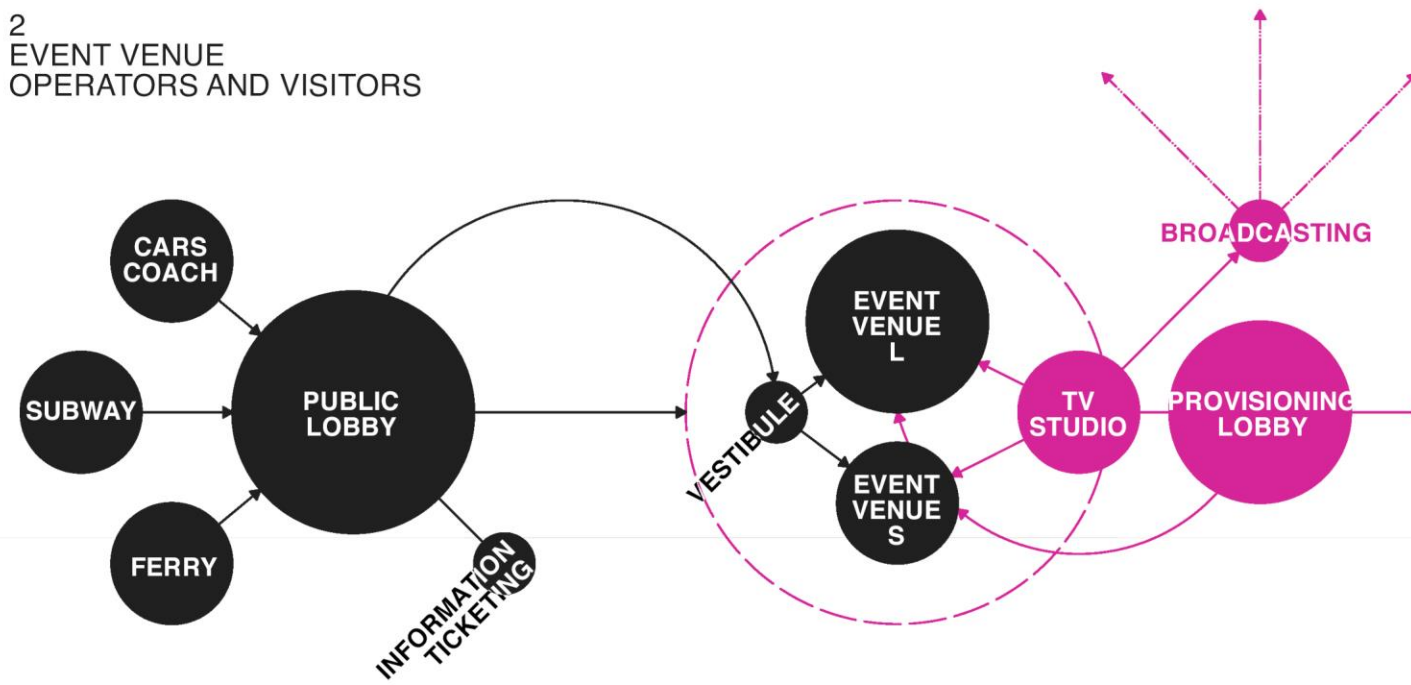
1.2  
DEPARTURE  
PASSENGERS  
&BAGGAGE



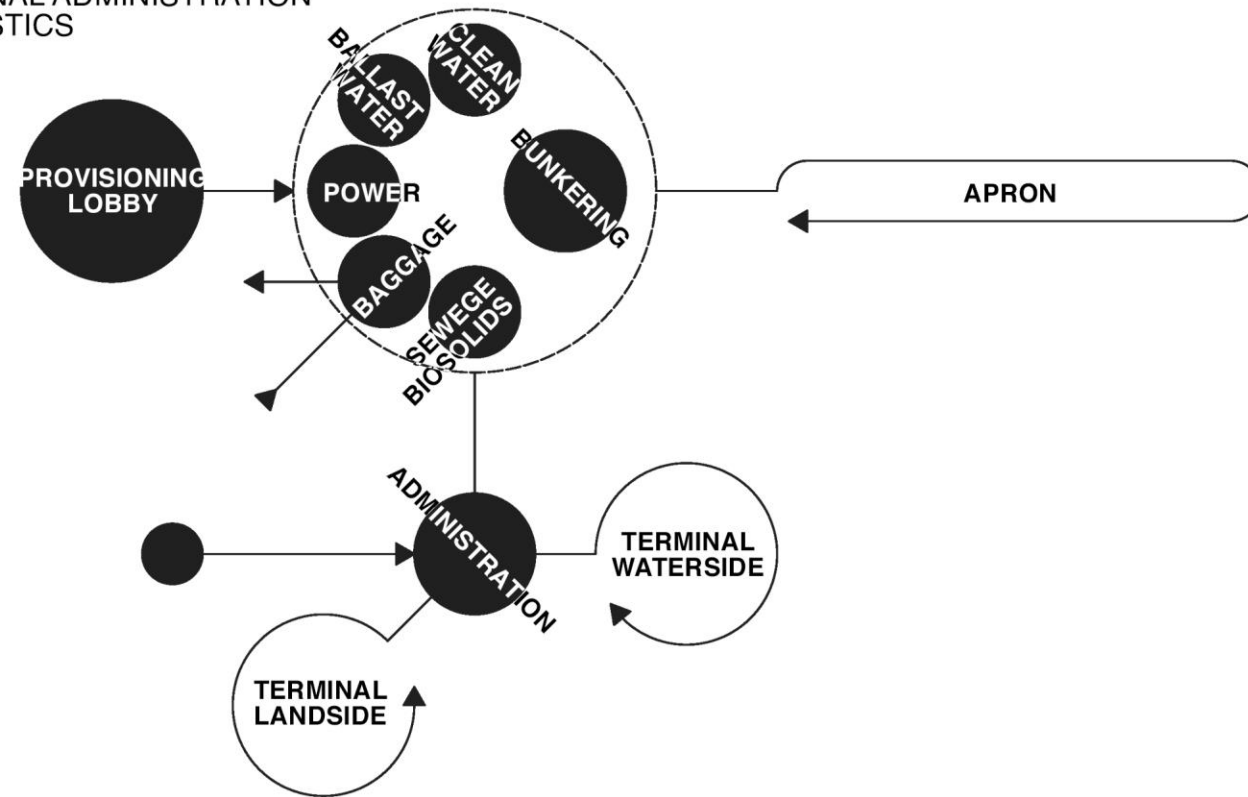
1.1  
ARRIVAL  
PASSENGERS  
&BAGGAGE



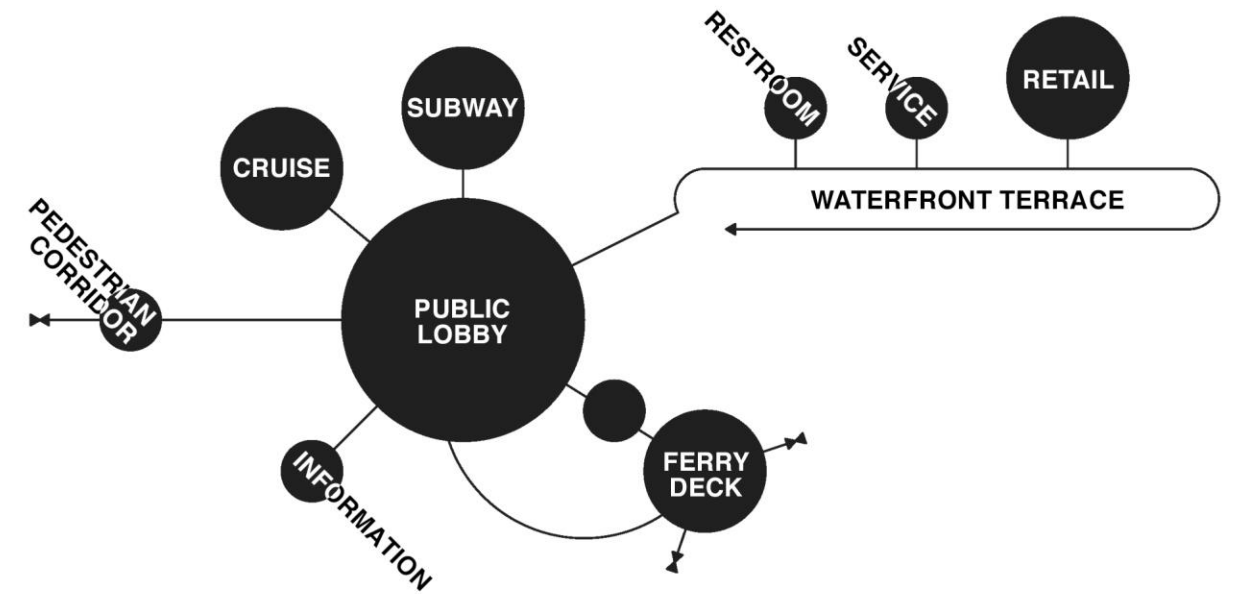
2  
EVENT VENUE  
OPERATORS AND VISITORS



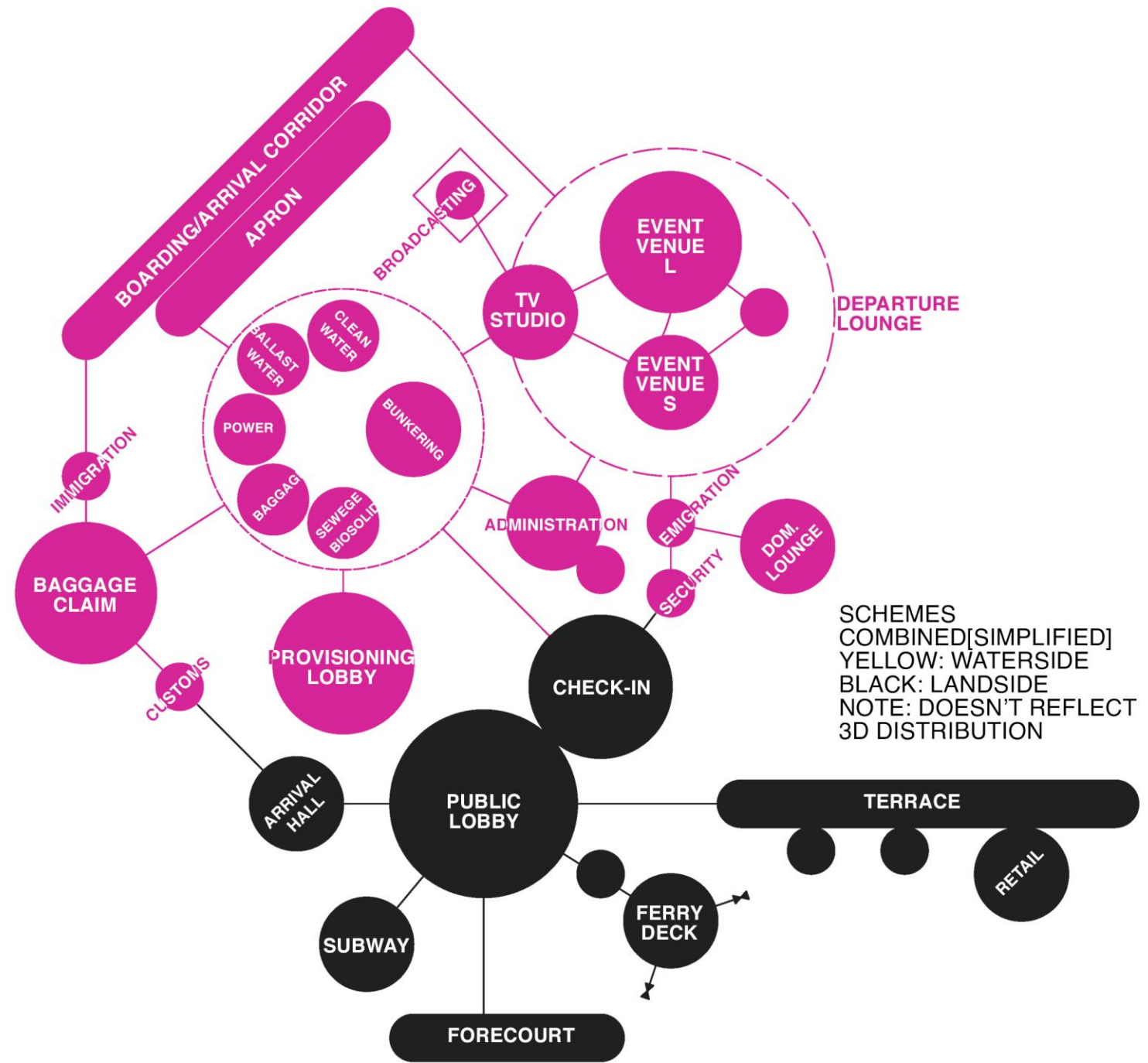
4  
TERMINAL ADMINISTRATION  
& LOGISTICS

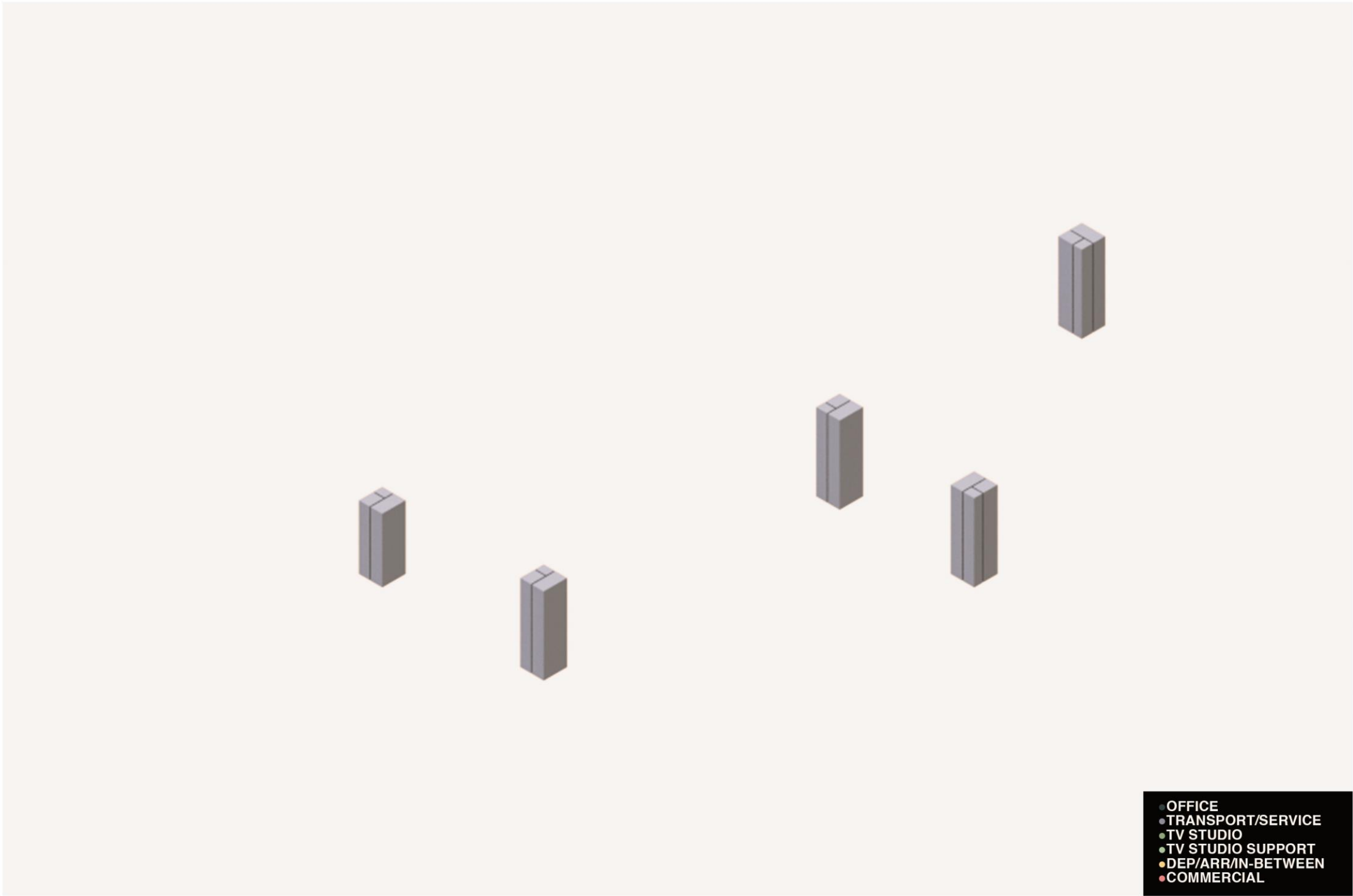


3  
FERRY PASSENGERS  
DEPARTURE AND ARRIVAL  
& VISITORS



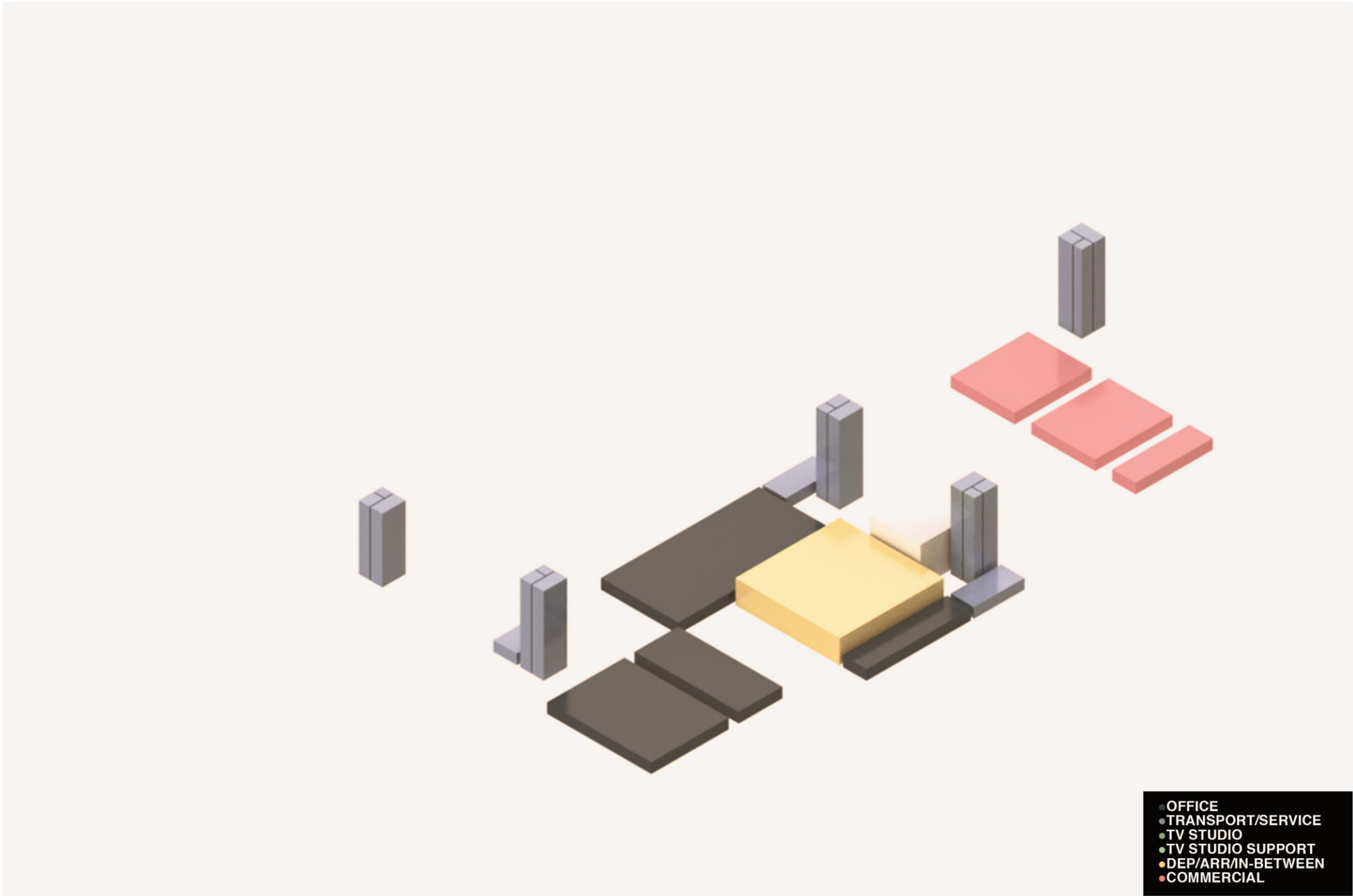






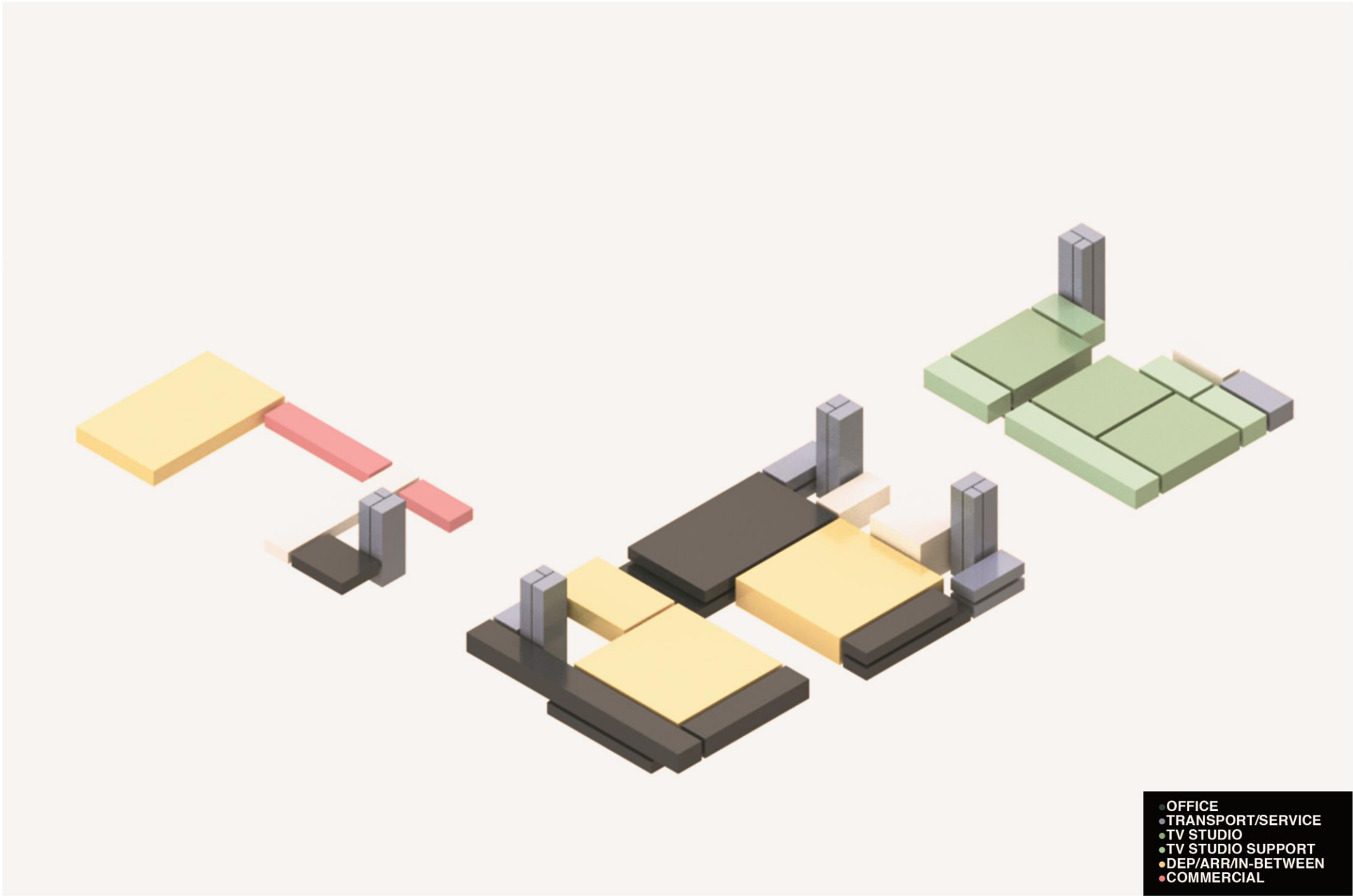
FUNCTION





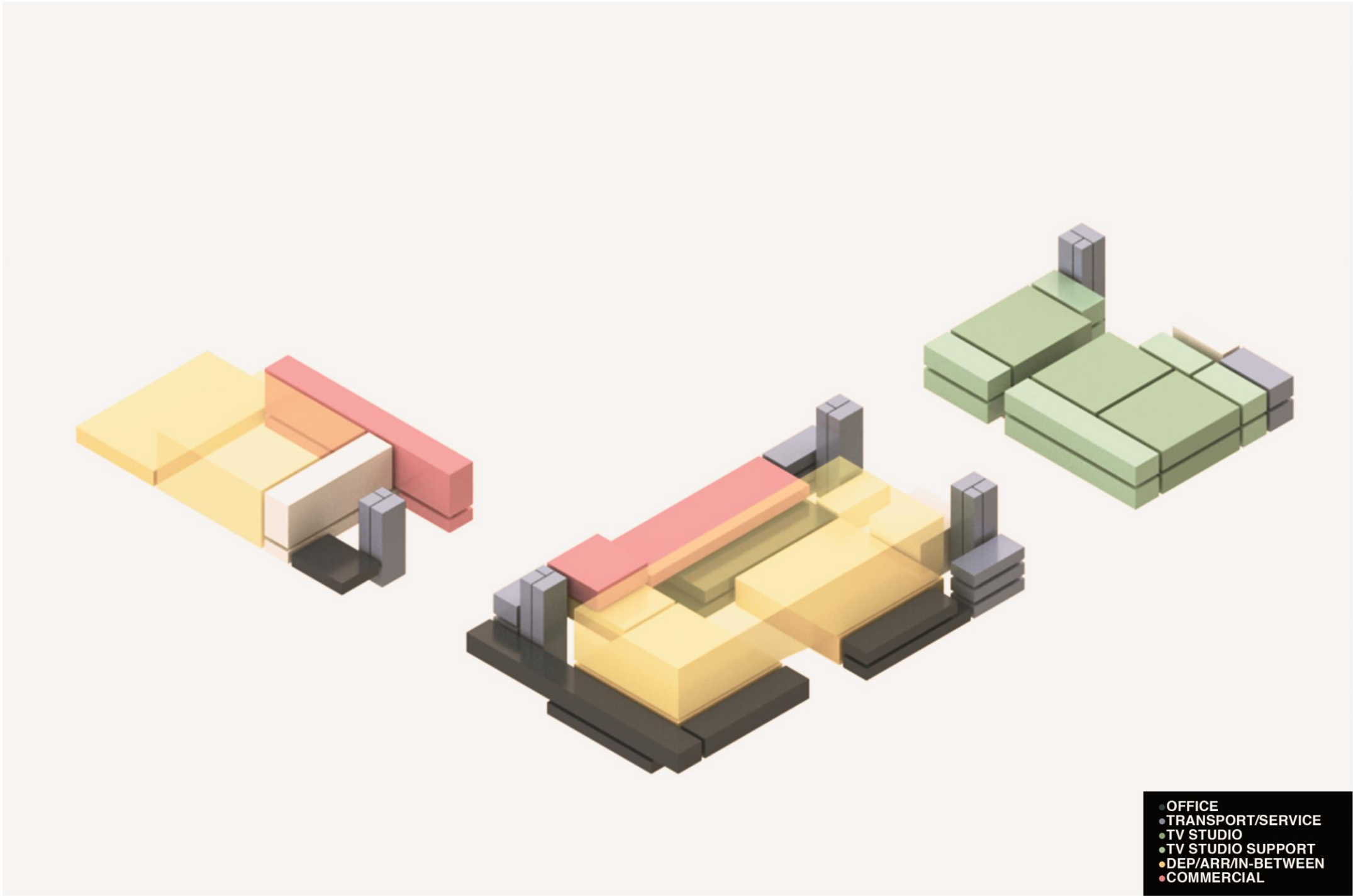
FUNCTION

- OFFICE
- TRANSPORT/SERVICE
- TV STUDIO
- TV STUDIO SUPPORT
- DEP/ARR/IN-BETWEEN
- COMMERCIAL

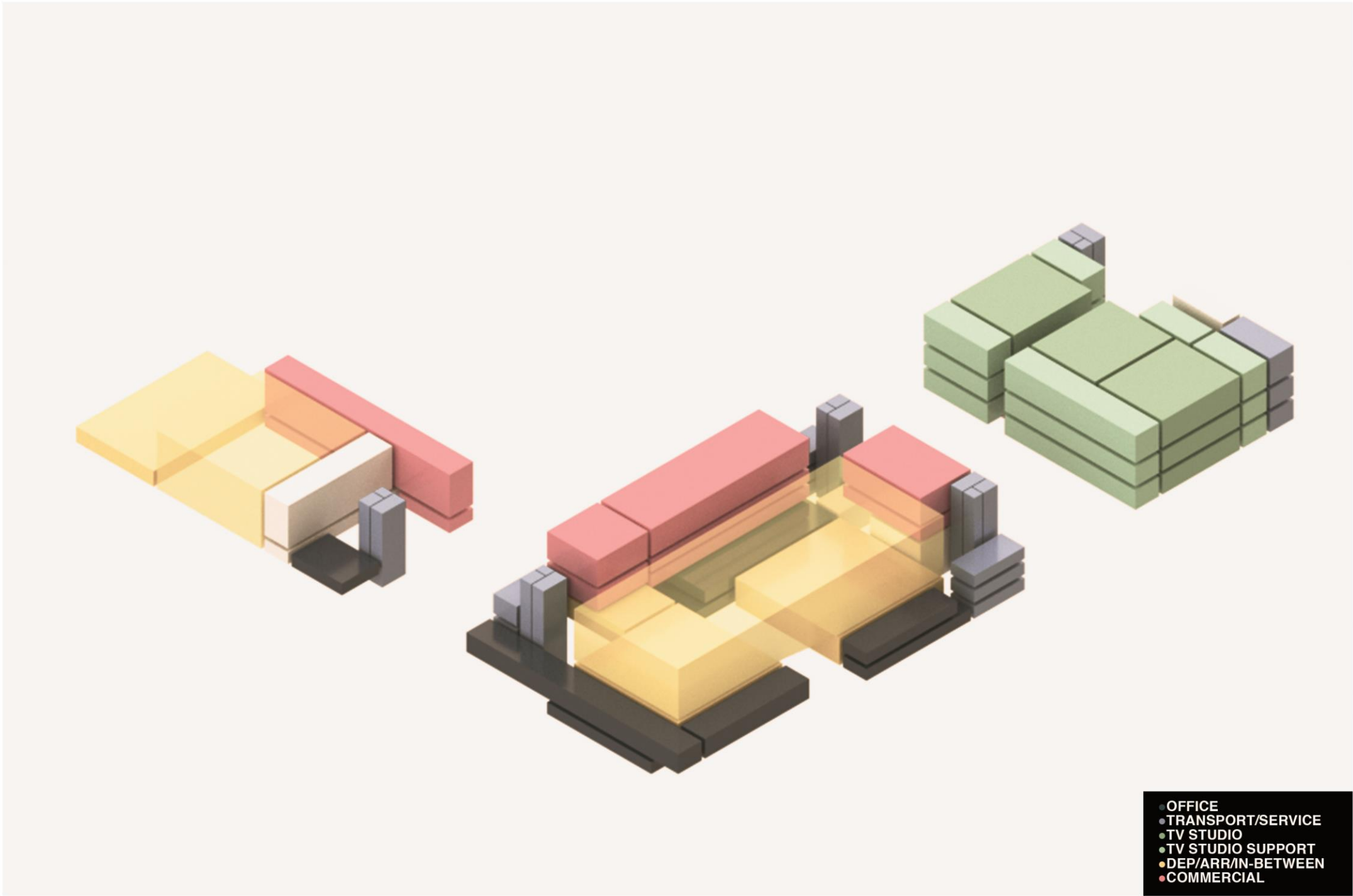


FUNCTION





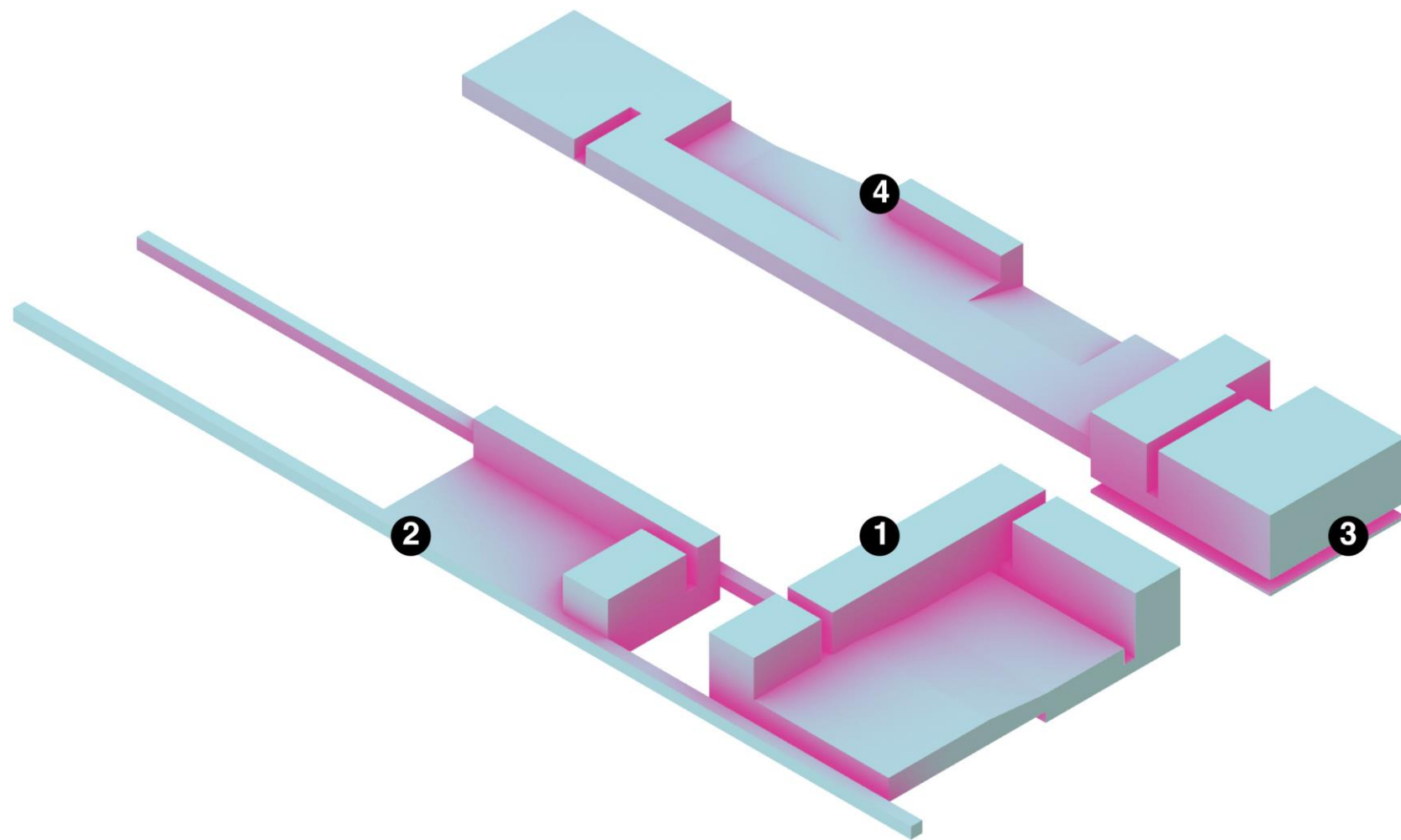
FUNCTION



- OFFICE
- TRANSPORT/SERVICE
- TV STUDIO
- TV STUDIO SUPPORT
- DEP/ARR/IN-BETWEEN
- COMMERCIAL

FUNCTION

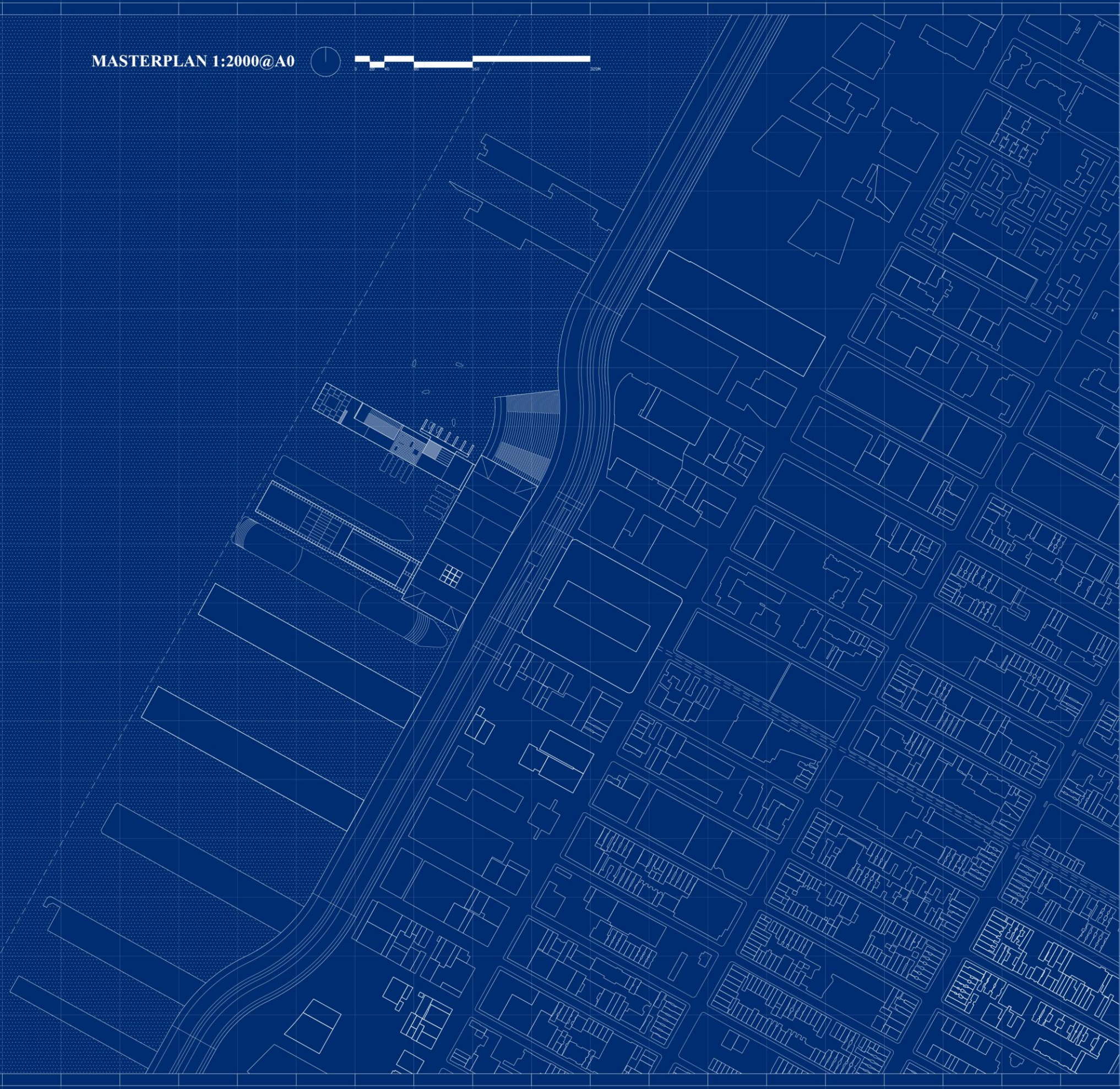




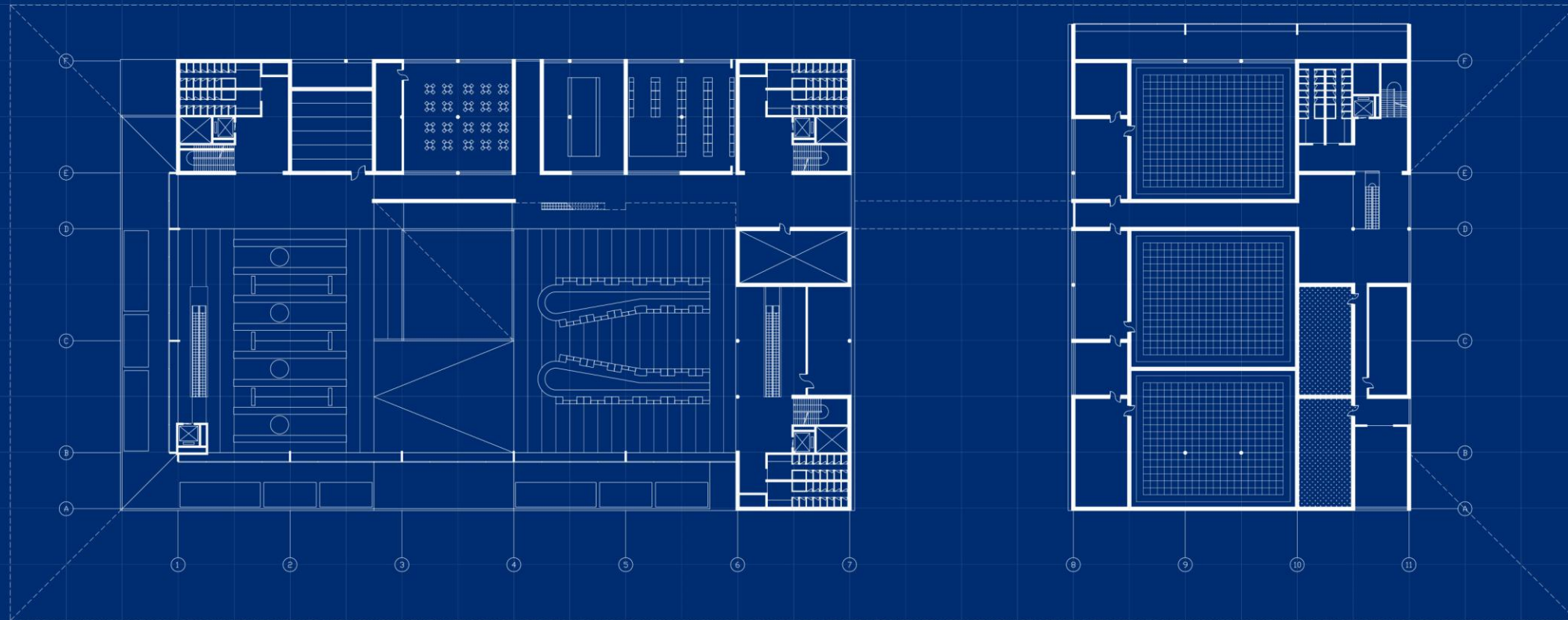
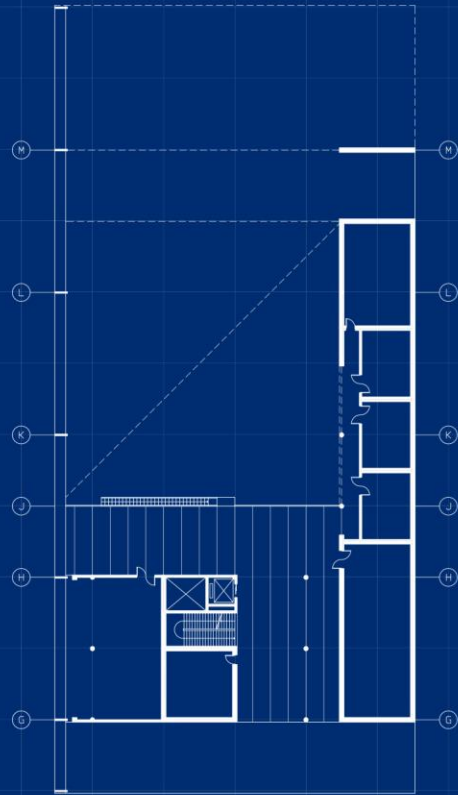
4 PARTS



MASTERPLAN 1:2000@A0

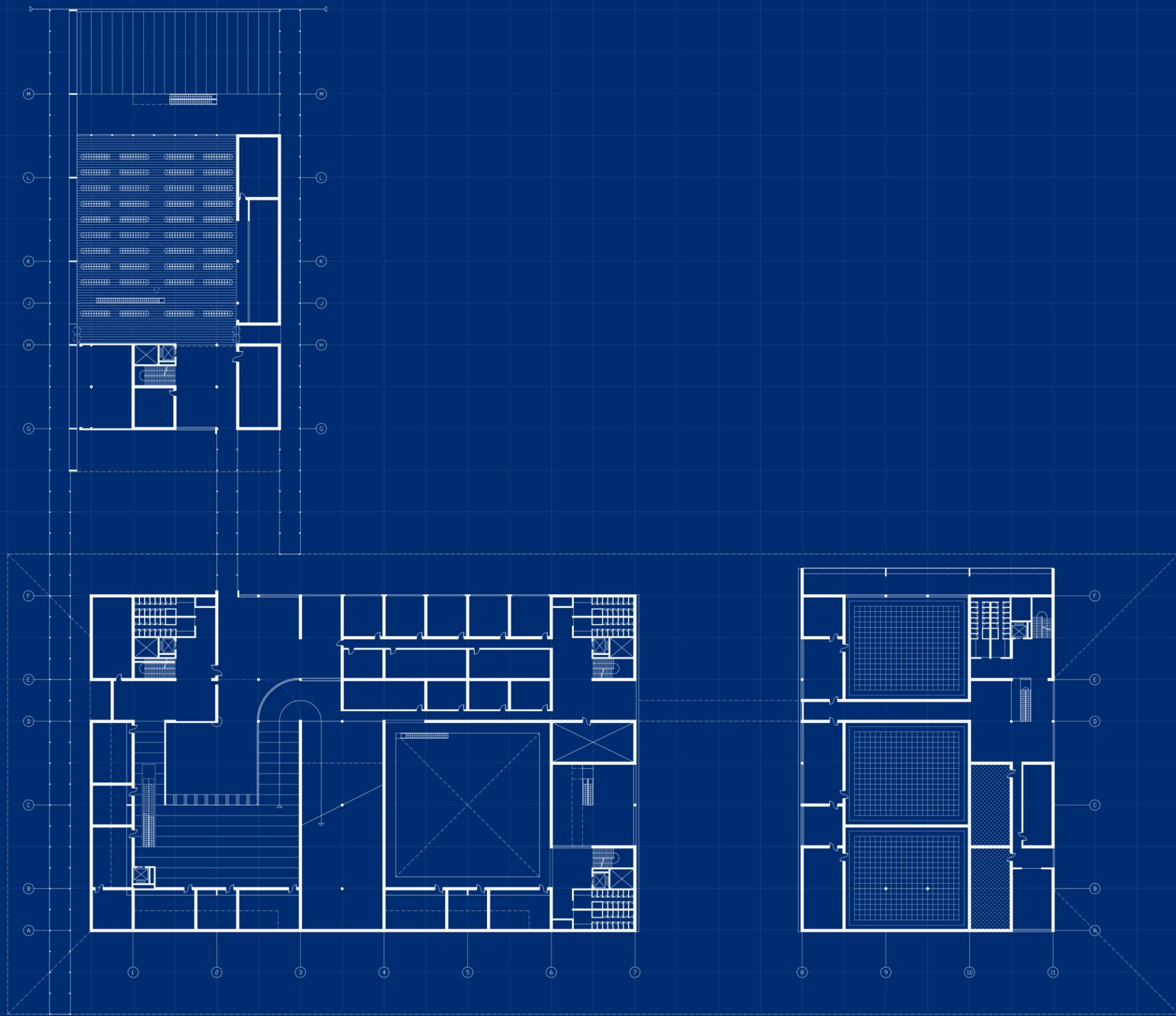






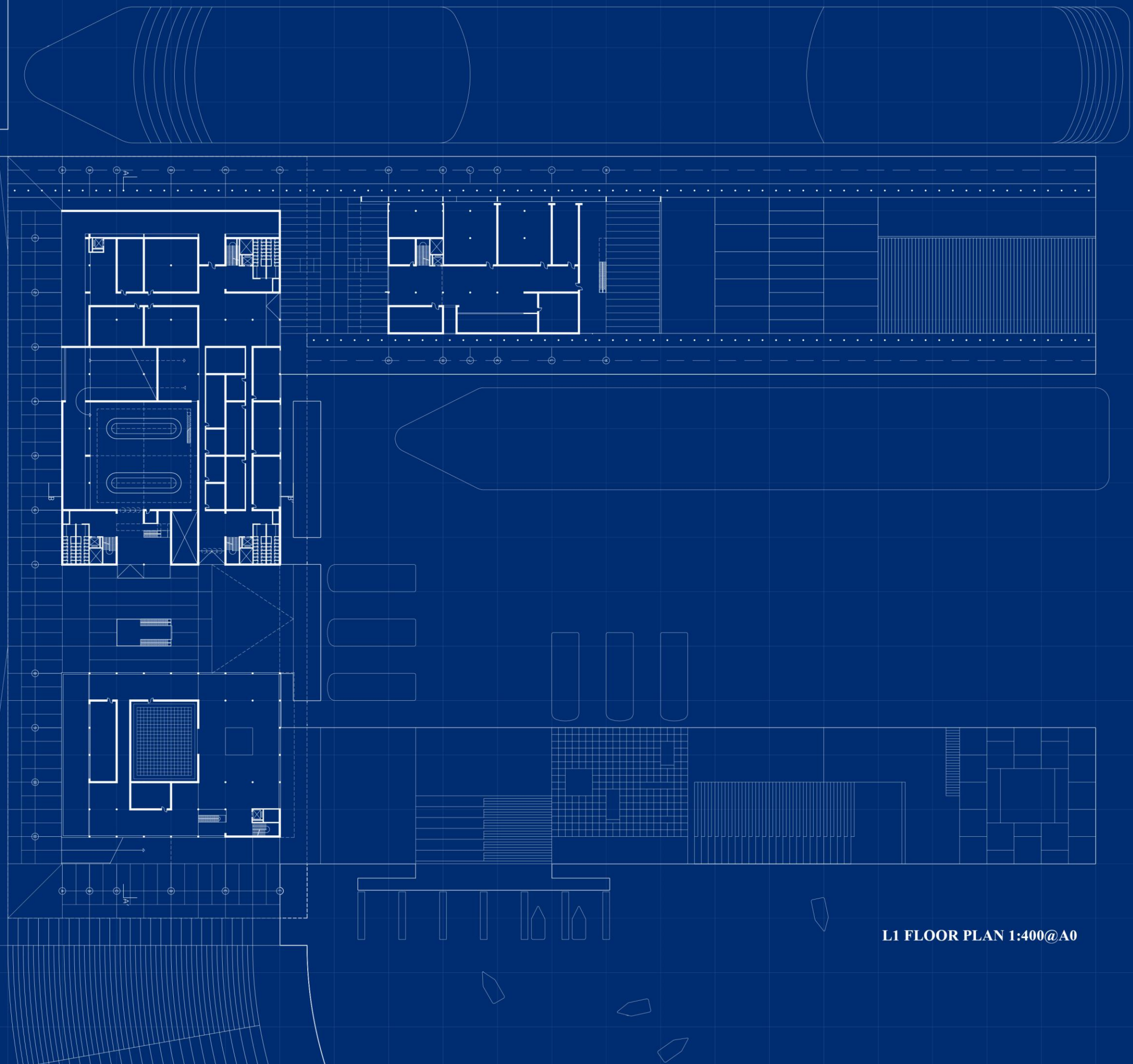
L2 FLOOR PLAN 1:300@A0





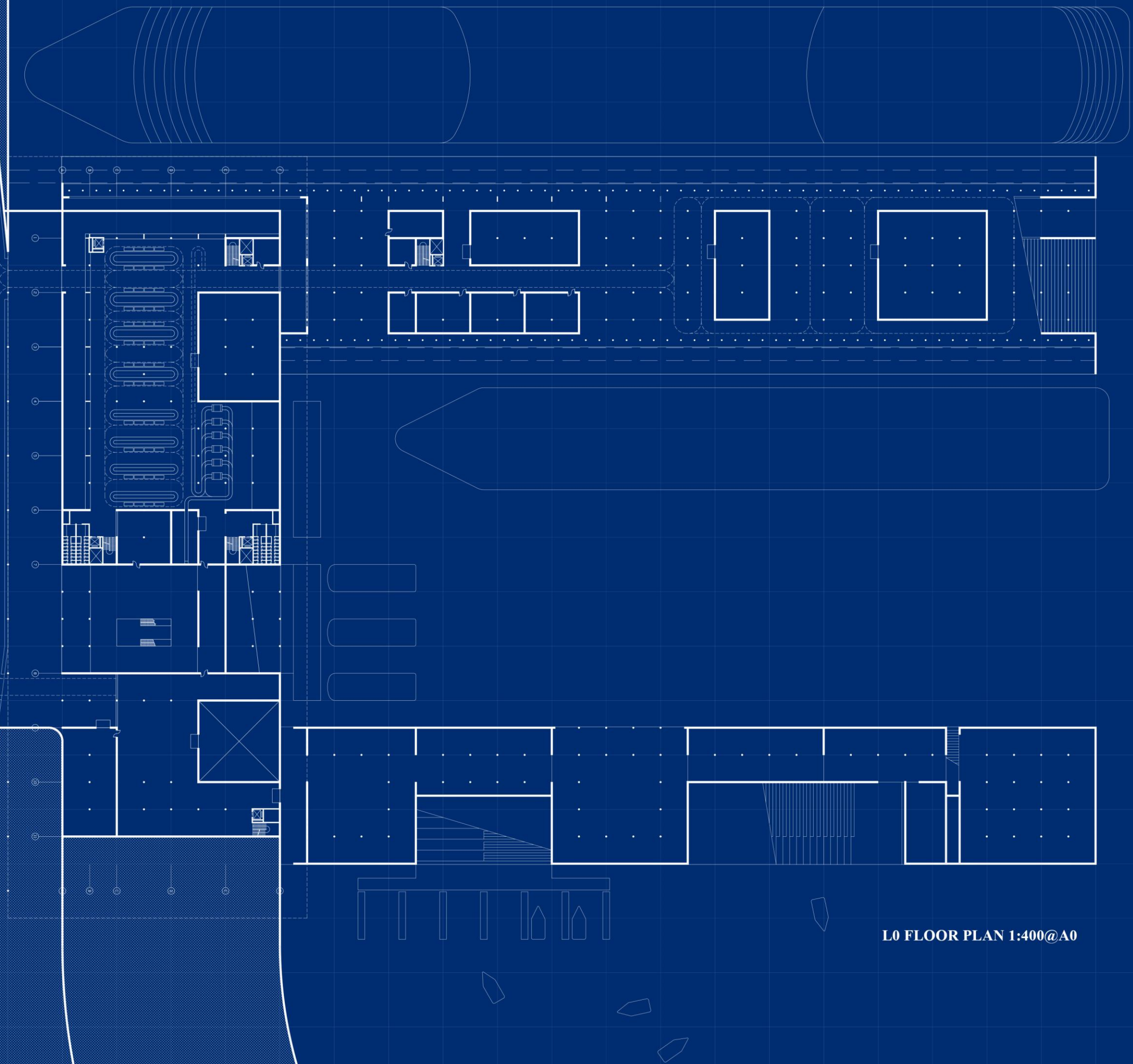
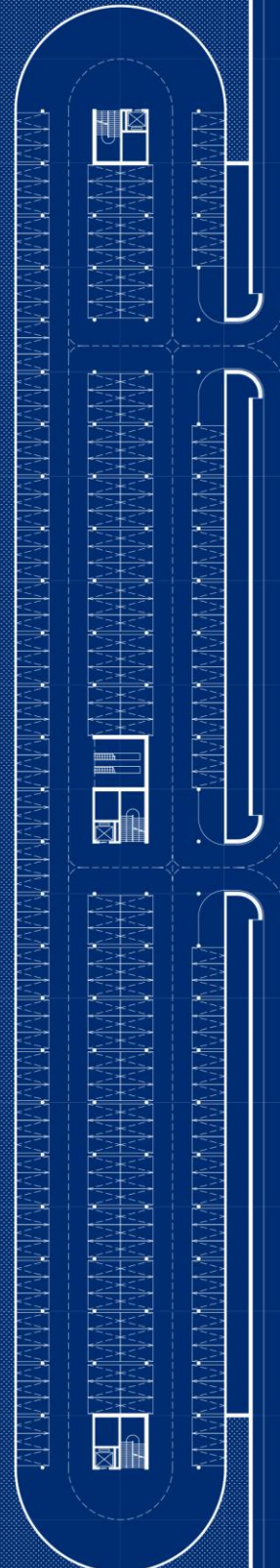
L1.5 FLOOR PLAN 1:300@A0





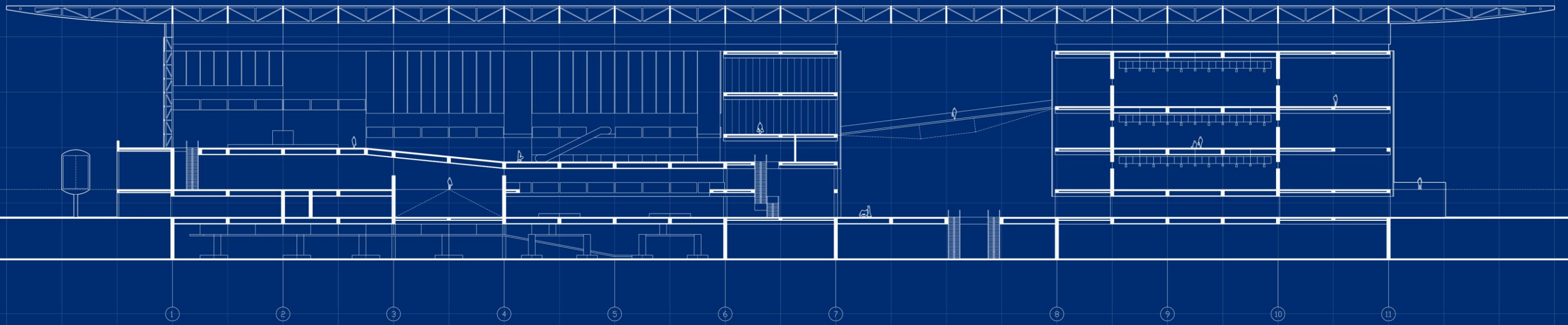
L1 FLOOR PLAN 1:400@A0



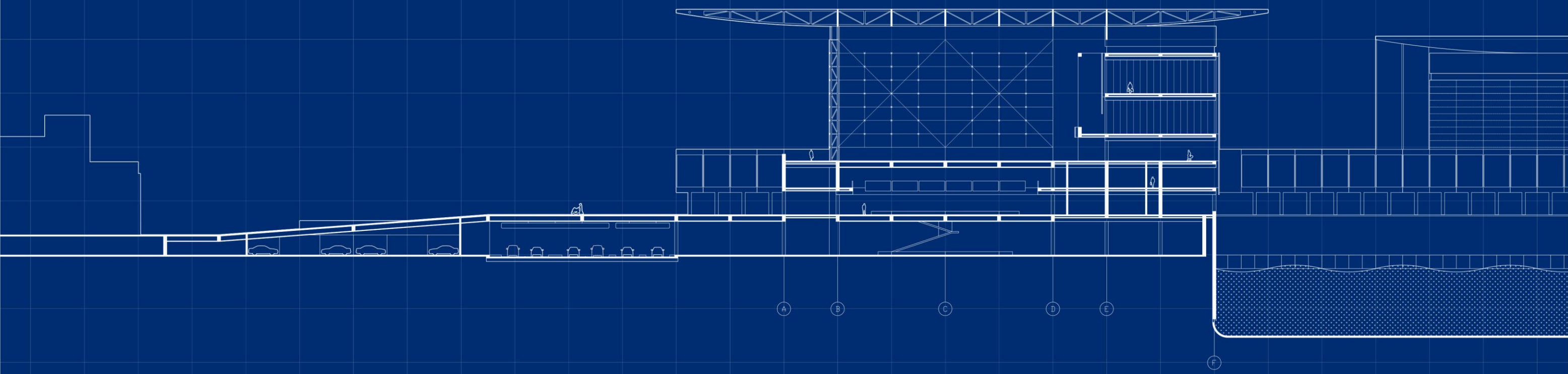


L0 FLOOR PLAN 1:400@A0





SECTION A-A'



**SECTION B-B'**



MANHATTAN  
CRUISE  
TERMINAL



IMPLEMENTATION



INTRODUCTION



RESEARCH



CONCEPT



OPERATION



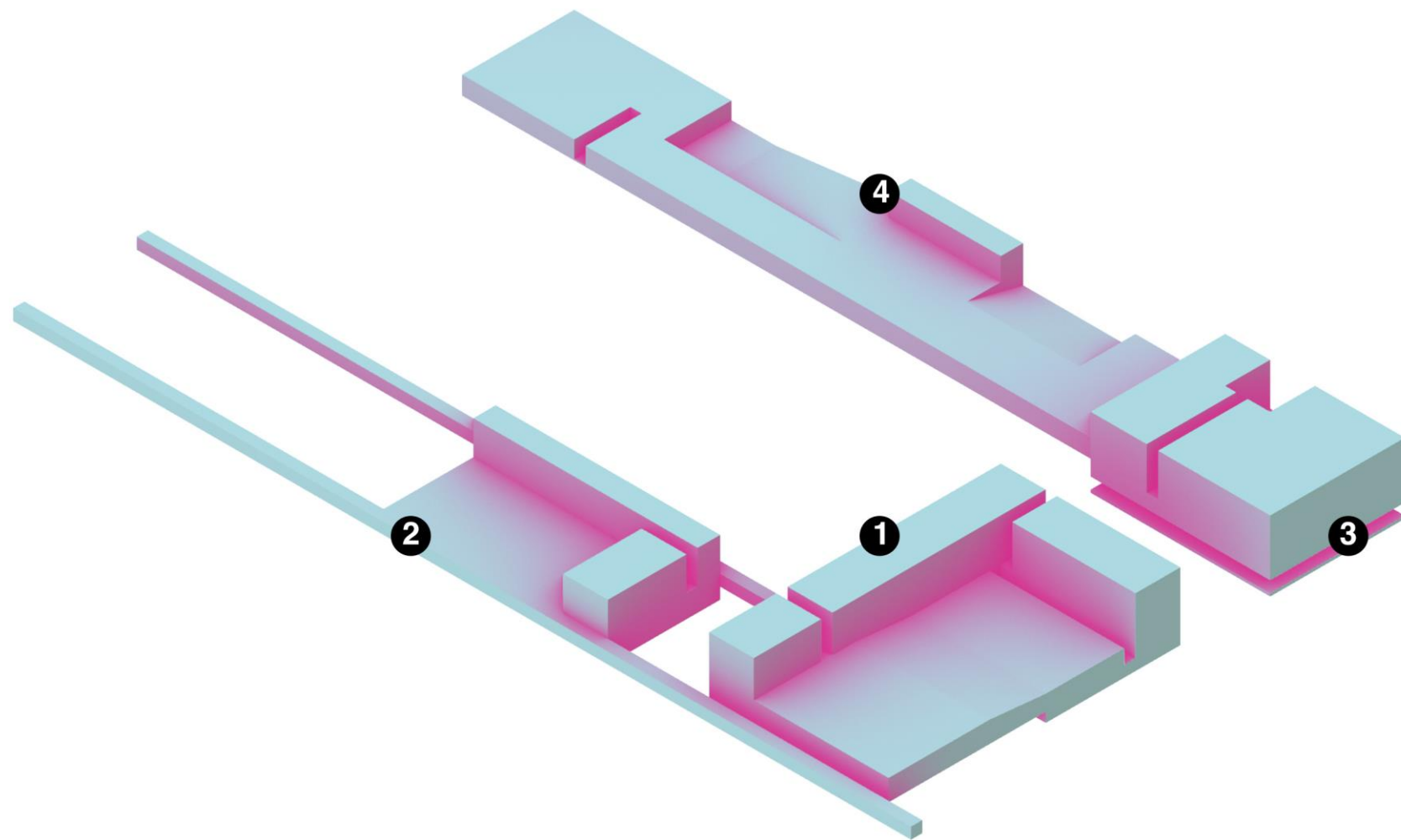
DEVELOPMENT



REFLECTION



SPACE



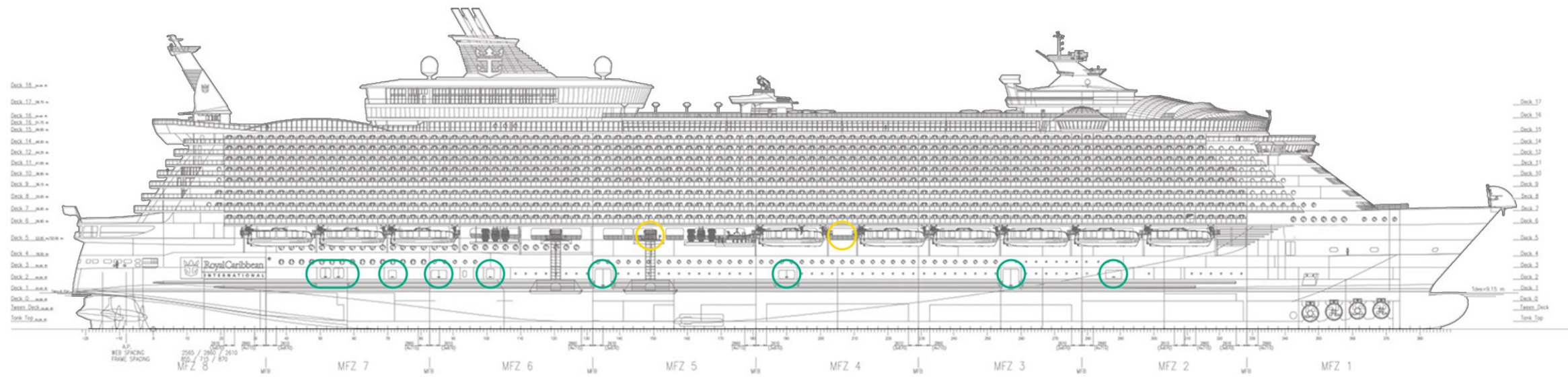
4 PARTS



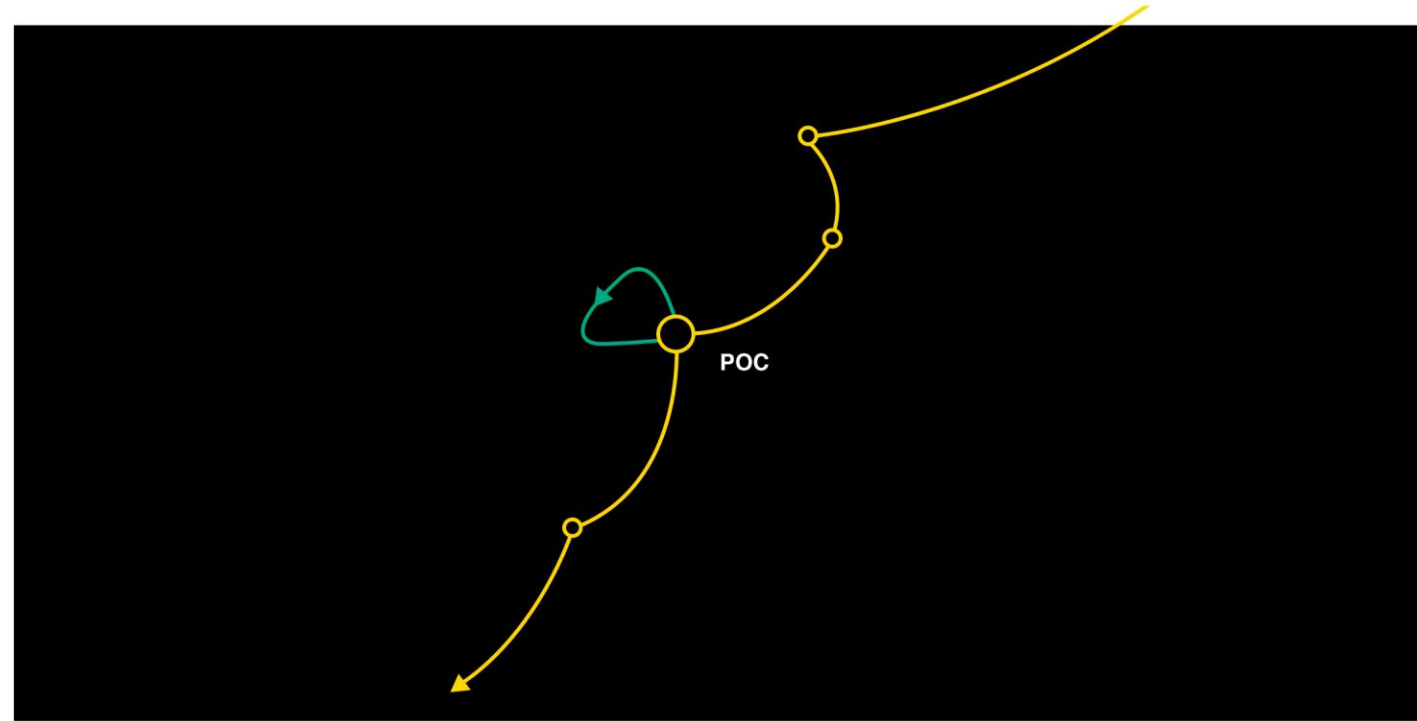
Length of the Pier  
1000 feet / 305 meter



Waterside Design- Oasis Class  
Boarding Doors Luggage/Provisioning/Utility Doors



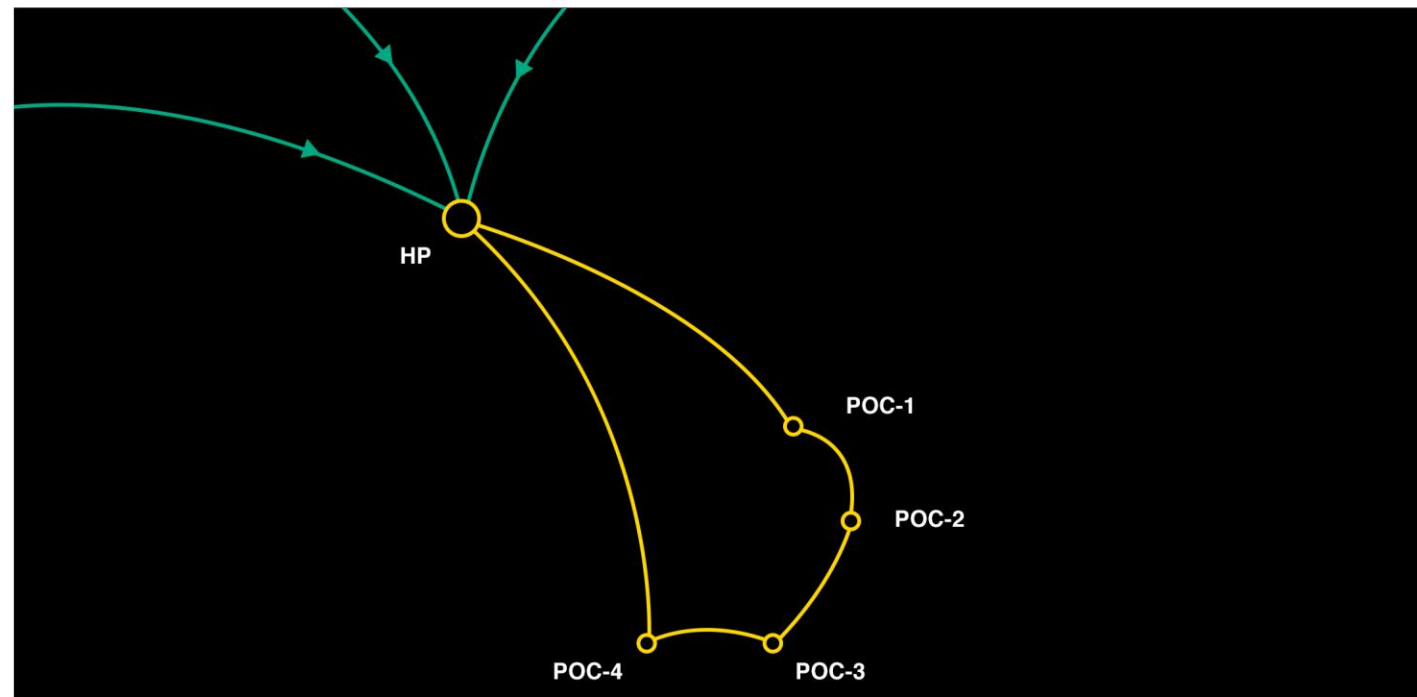




{PORT OF CALL}

### ITINARARY OF A PORT OF CALL A TYPICAL REPOSITIONING TRIP

{HOME PORT}



07:00

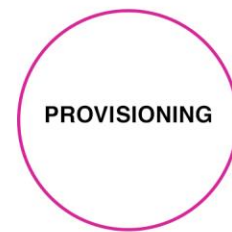
Separated Boarding Groups

17:00



**DEBARK**  
4h  
4000 PAX  
EACH SIDE

**EMBARK**  
5h



**APRON AREA  
PROCESS**



**PAX**  
[Projected Annual PAX]  
**1,500,000**  
[Peak Hour PAX]  
**2,000**

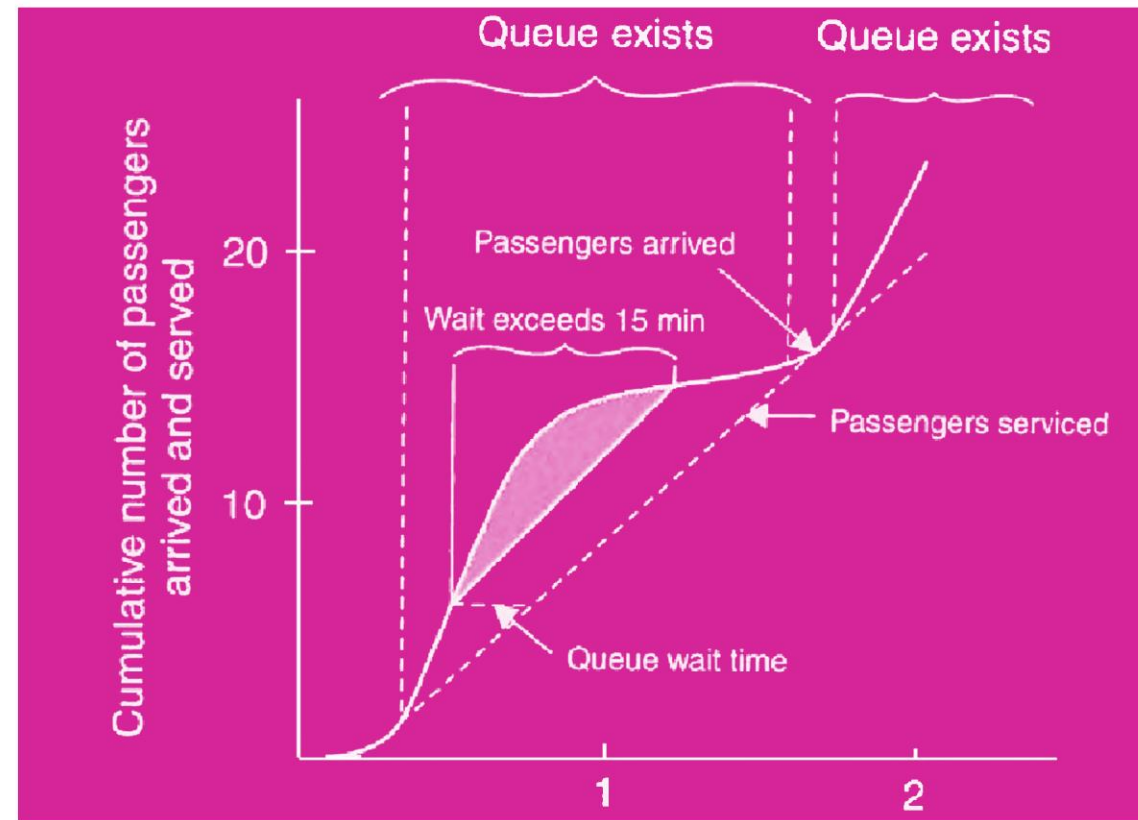
**OPERATIONS**  
[Berth Capacity]  
**1\*1000ft & 1\*750ft**  
Width@140ft / Draught@36ft  
[Annual Ship Calls]  
**250**

**LEVEL OF SERVICE**  
  
**C/Optimum**  
According to IATA-ADRM  
Defining Area & ProceedingTime

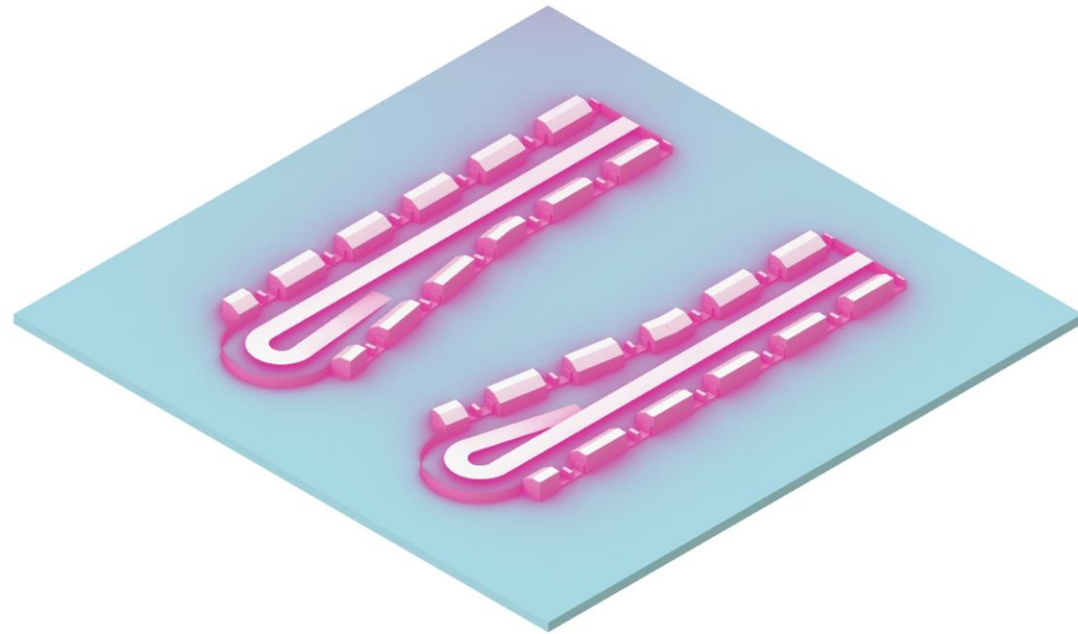
**PROCESS**  
[Debarkation Process]  
4 hours  
[Embarkation Process]  
5 hours

**Cruise Terminal Design Specification**  
Planning Horizon 2030

### Mapping Demand vs. Capacity





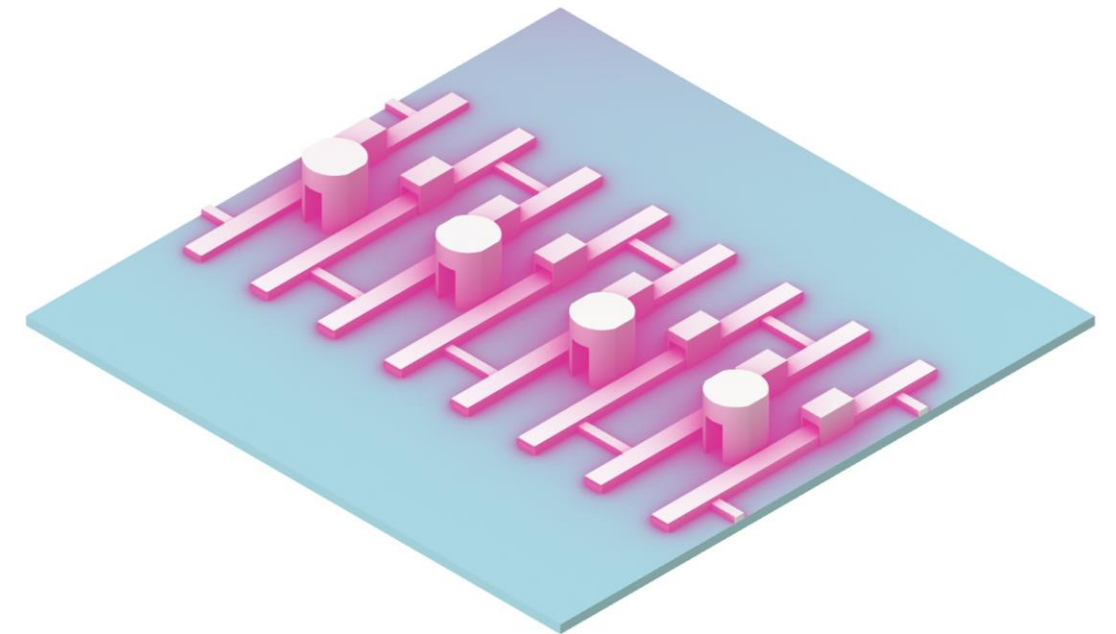


CHECK-IN/  
BAGGAGE DROP-OFF  
COUNTERS

**40**

SECURITY CONTROL  
LINES

**8**

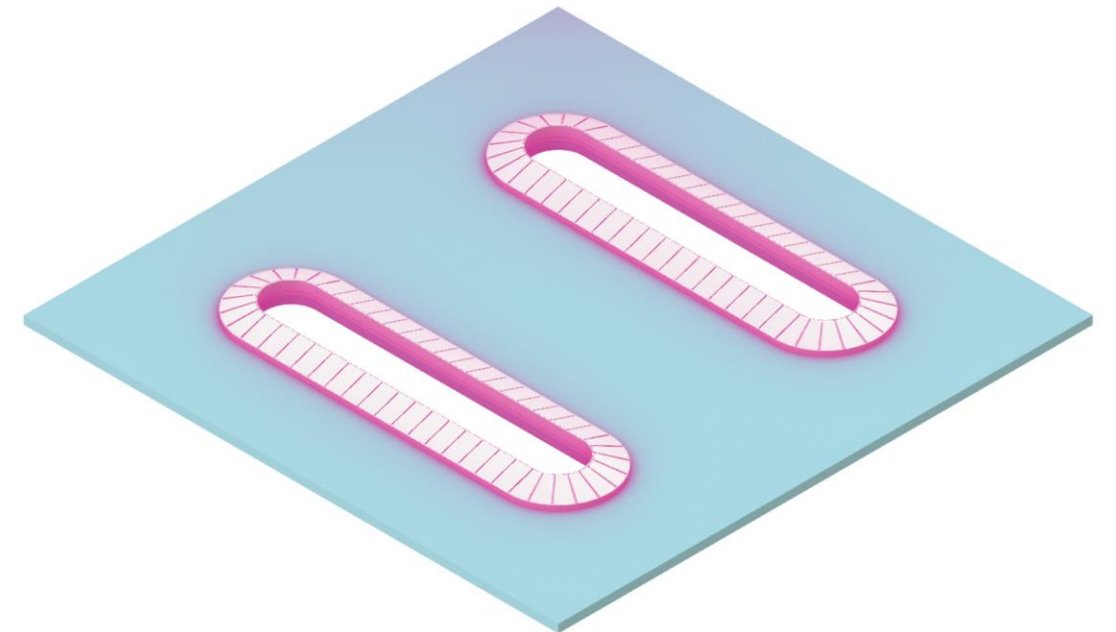
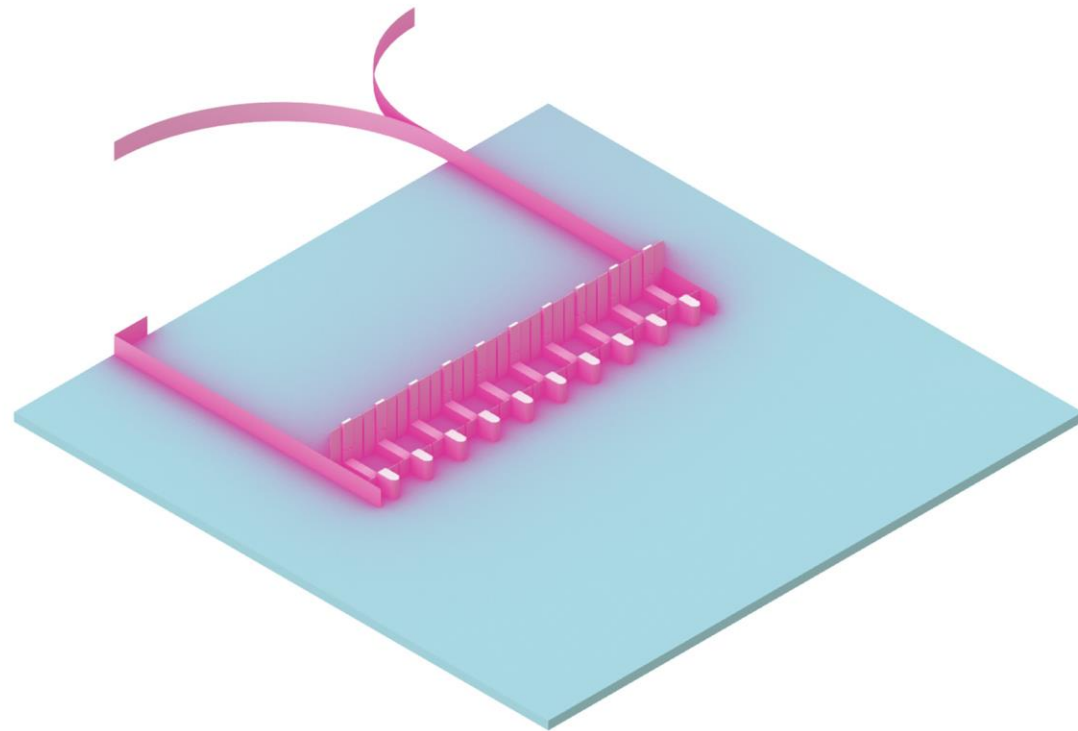


PASSPORT CONTROL  
MACHINES

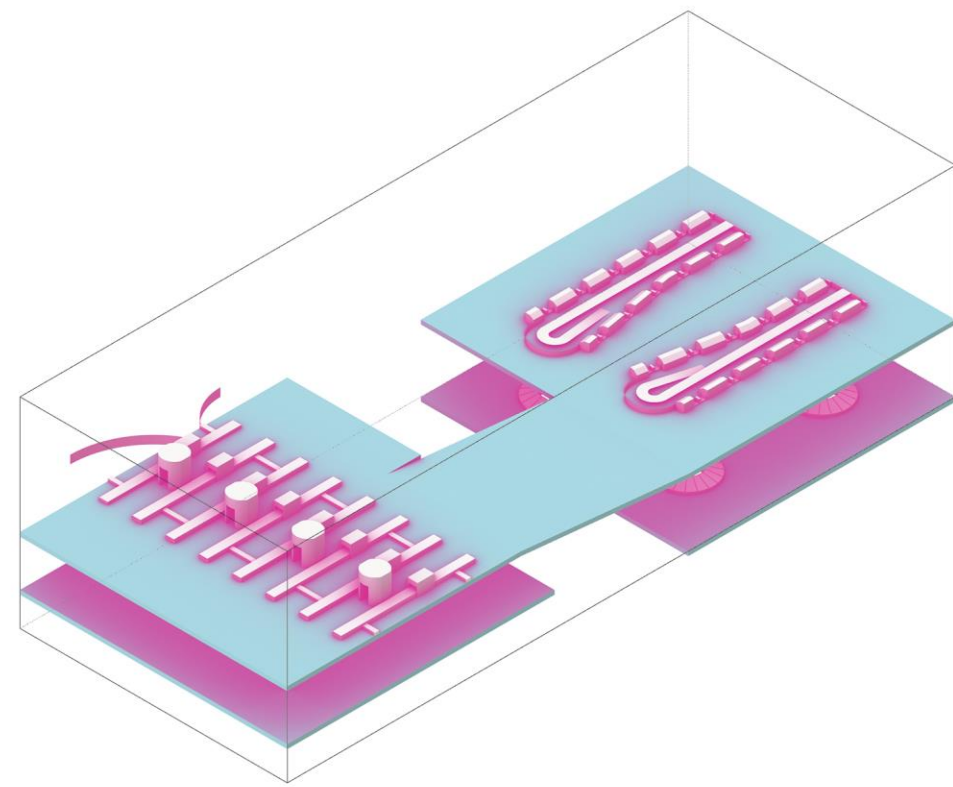
**10**

BAGGAGE CLAIM  
CAROUSELS

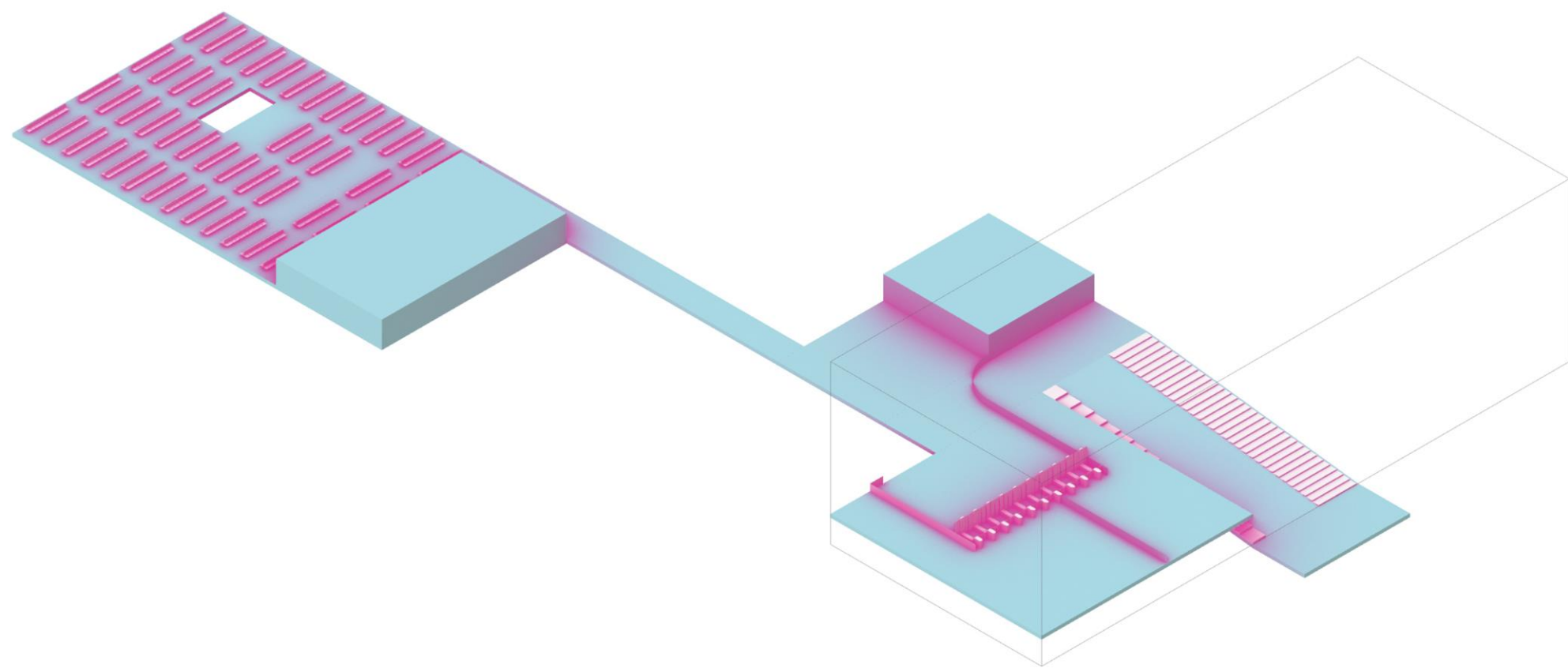
**2**

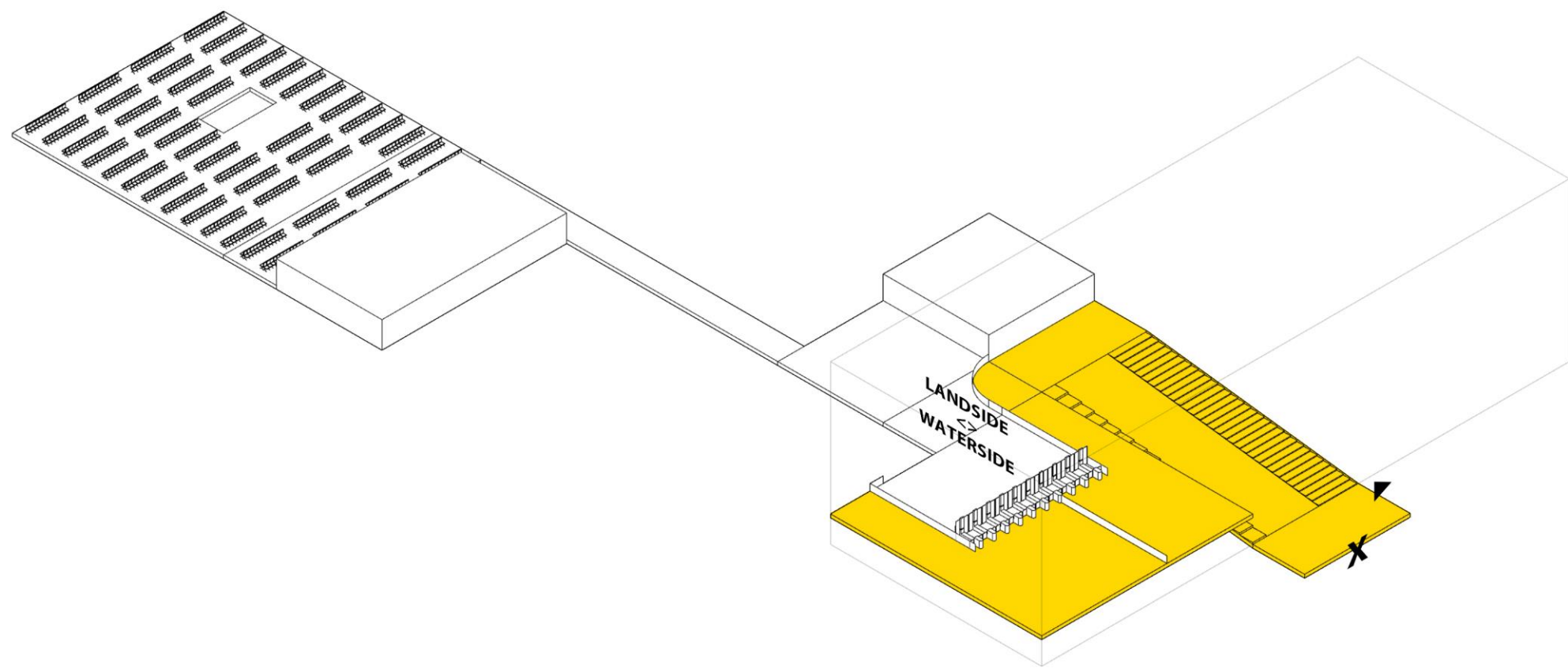


DESIGN SPECIFICS









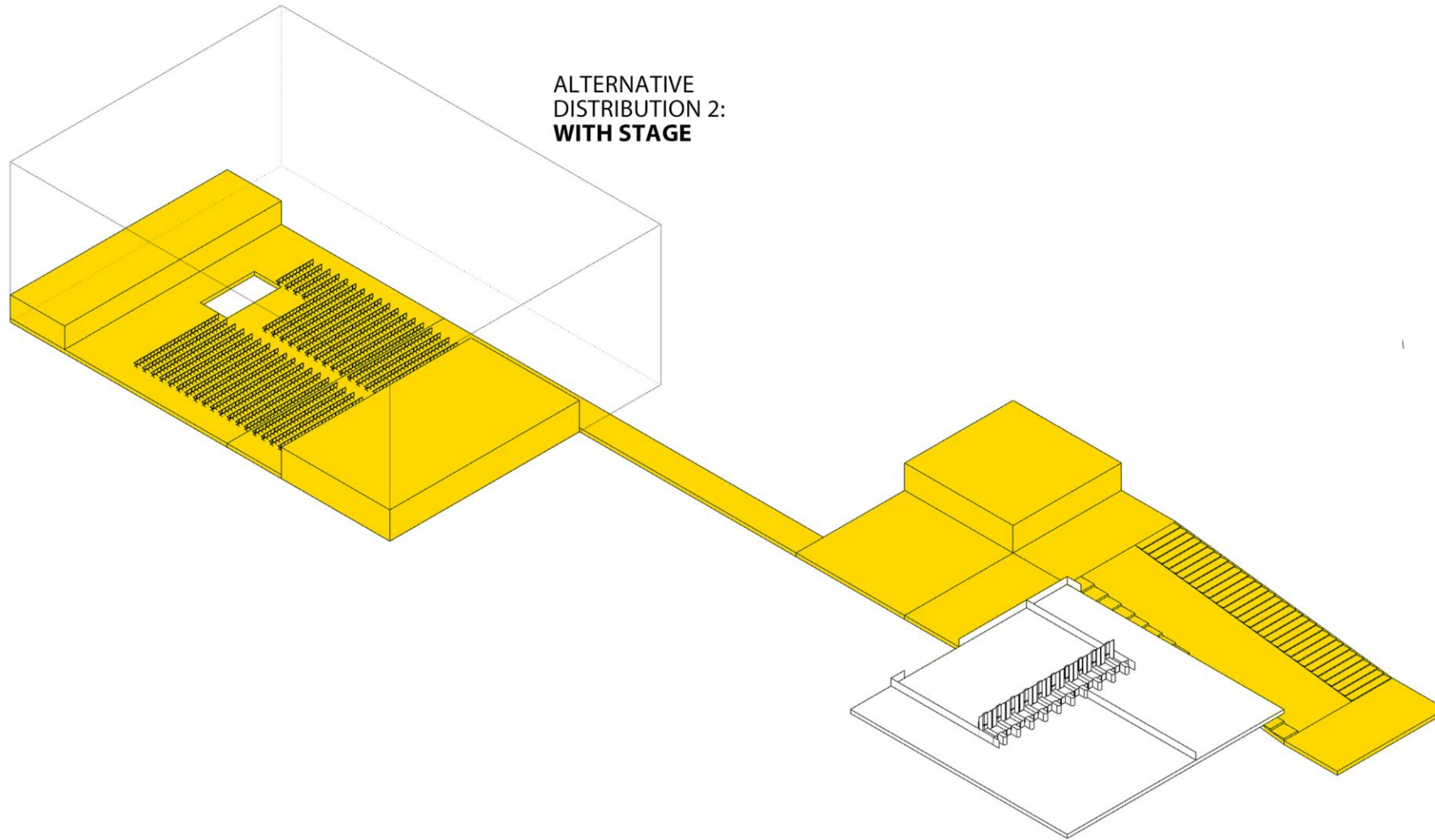


WITH SHIPS  
**HOLDING ROOM**



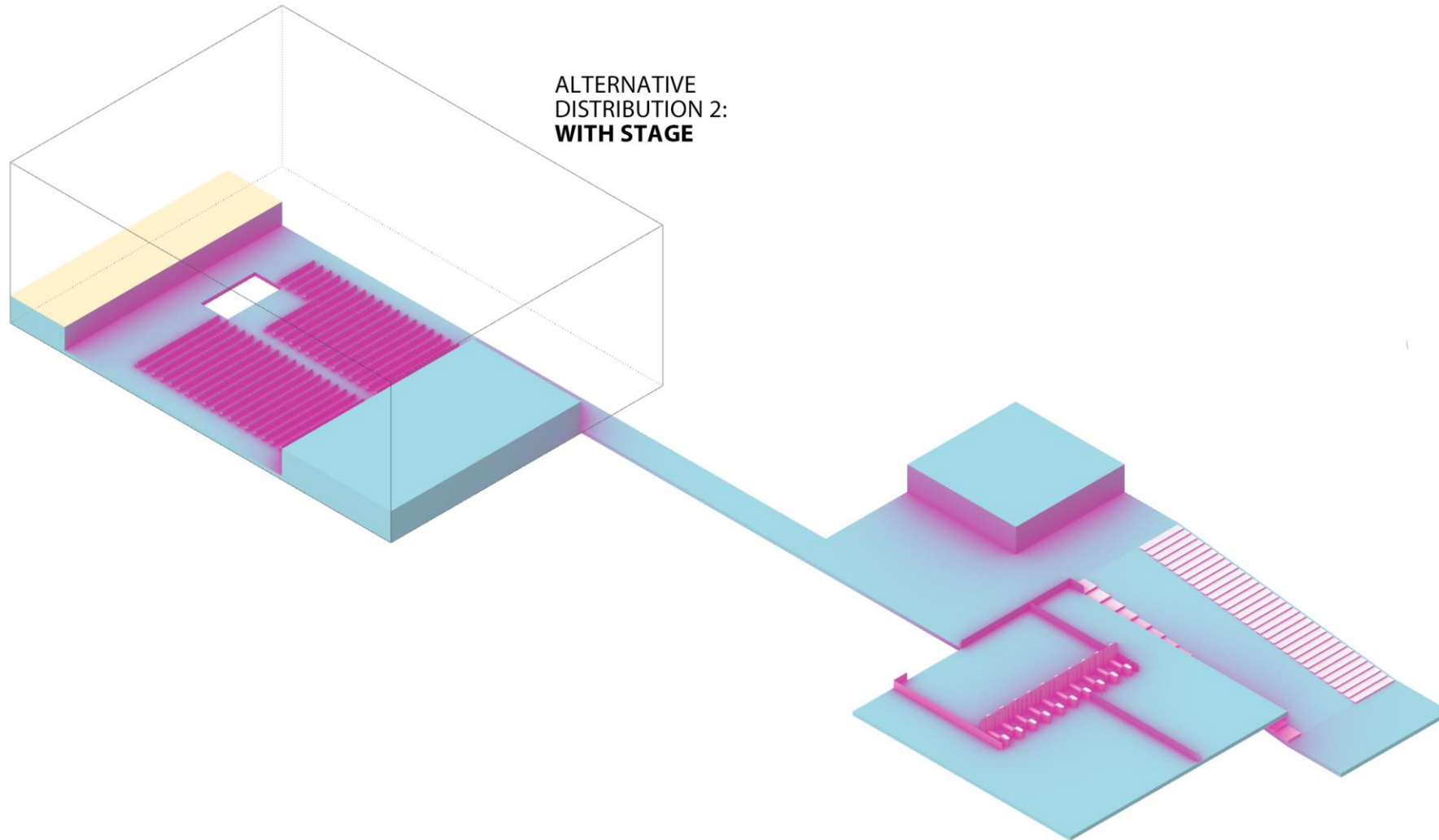
WITH NO SHIPS  
**EVENT VENUE**  
FOR MEDIA EVENTS:  
PRESS CONFERENCE/TV SPECIALS/  
FILM FESTIVAL/AWARD CEREMONY...

ALTERNATIVE  
DISTRIBUTION 2:  
**WITH STAGE**

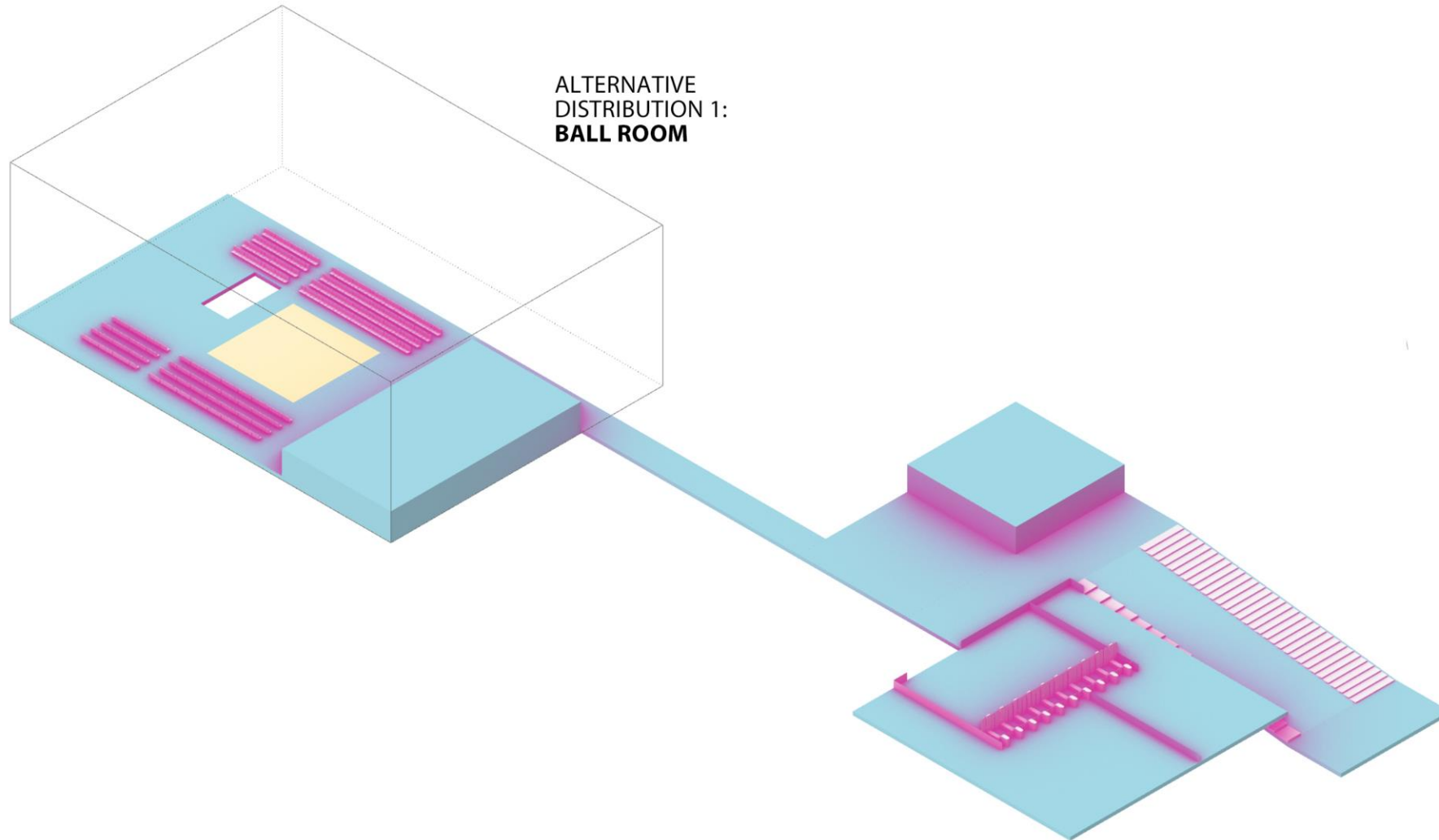




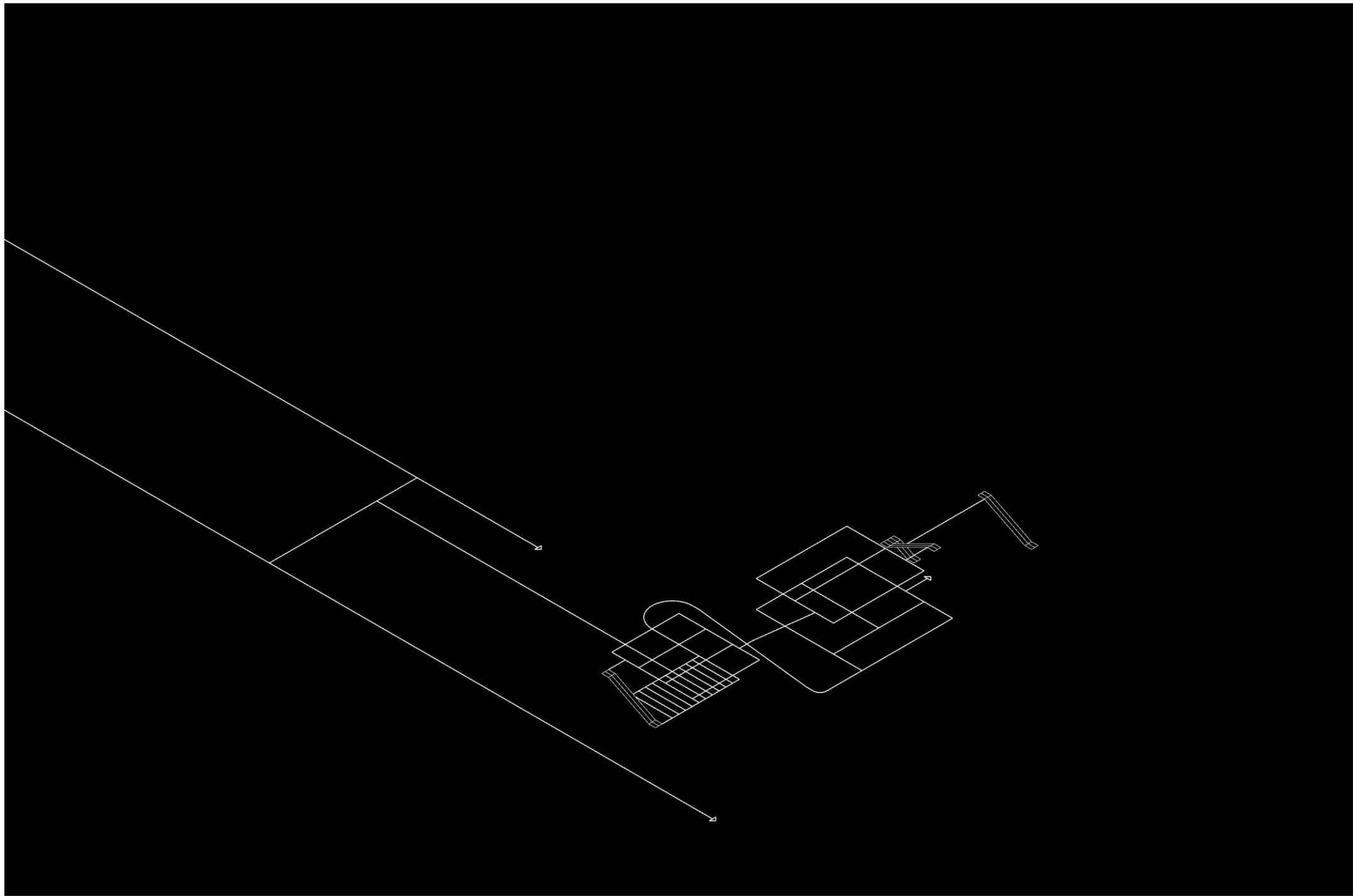
ALTERNATIVE  
DISTRIBUTION 2:  
**WITH STAGE**



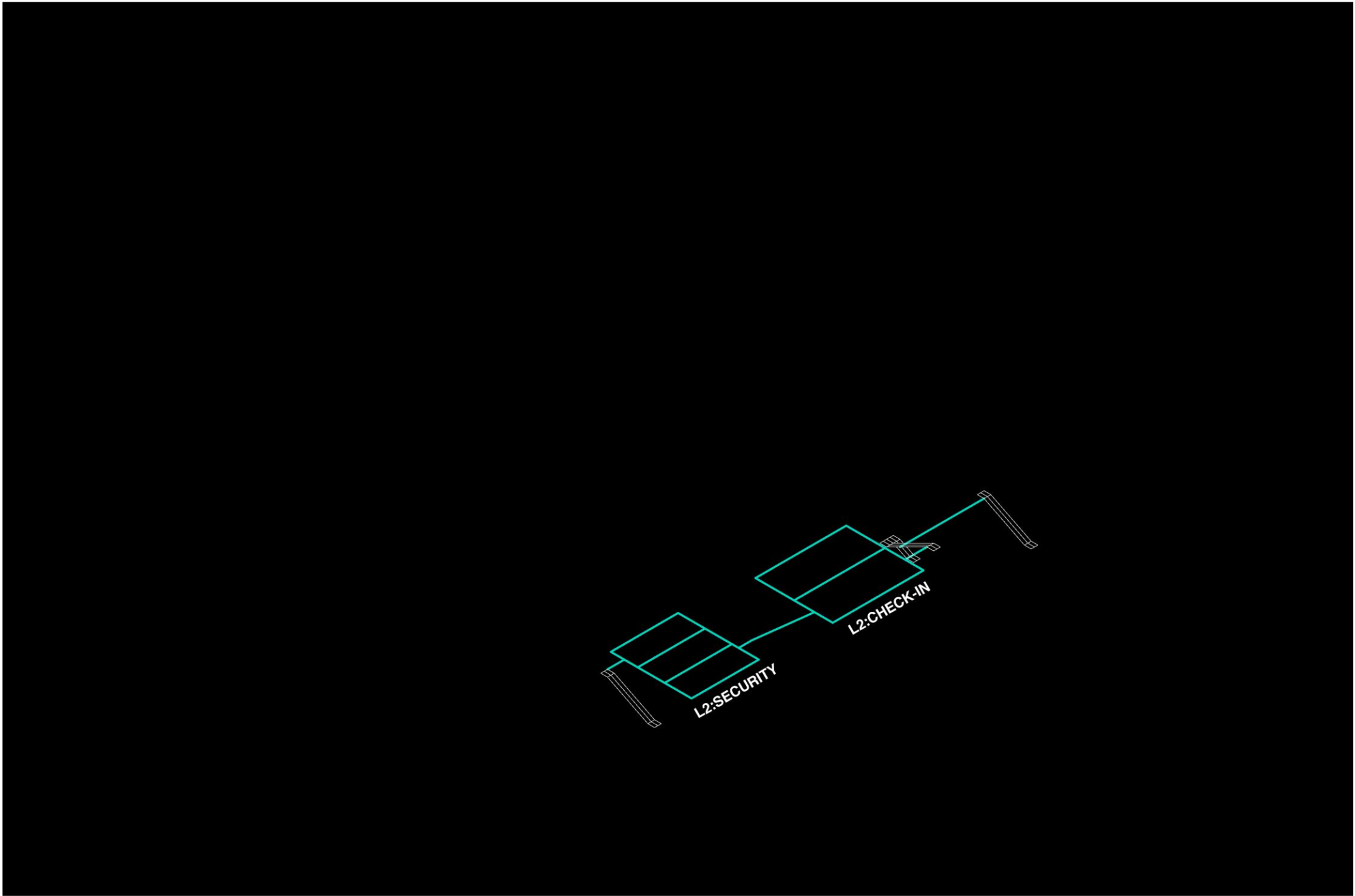
ALTERNATIVE  
DISTRIBUTION 1:  
**BALL ROOM**





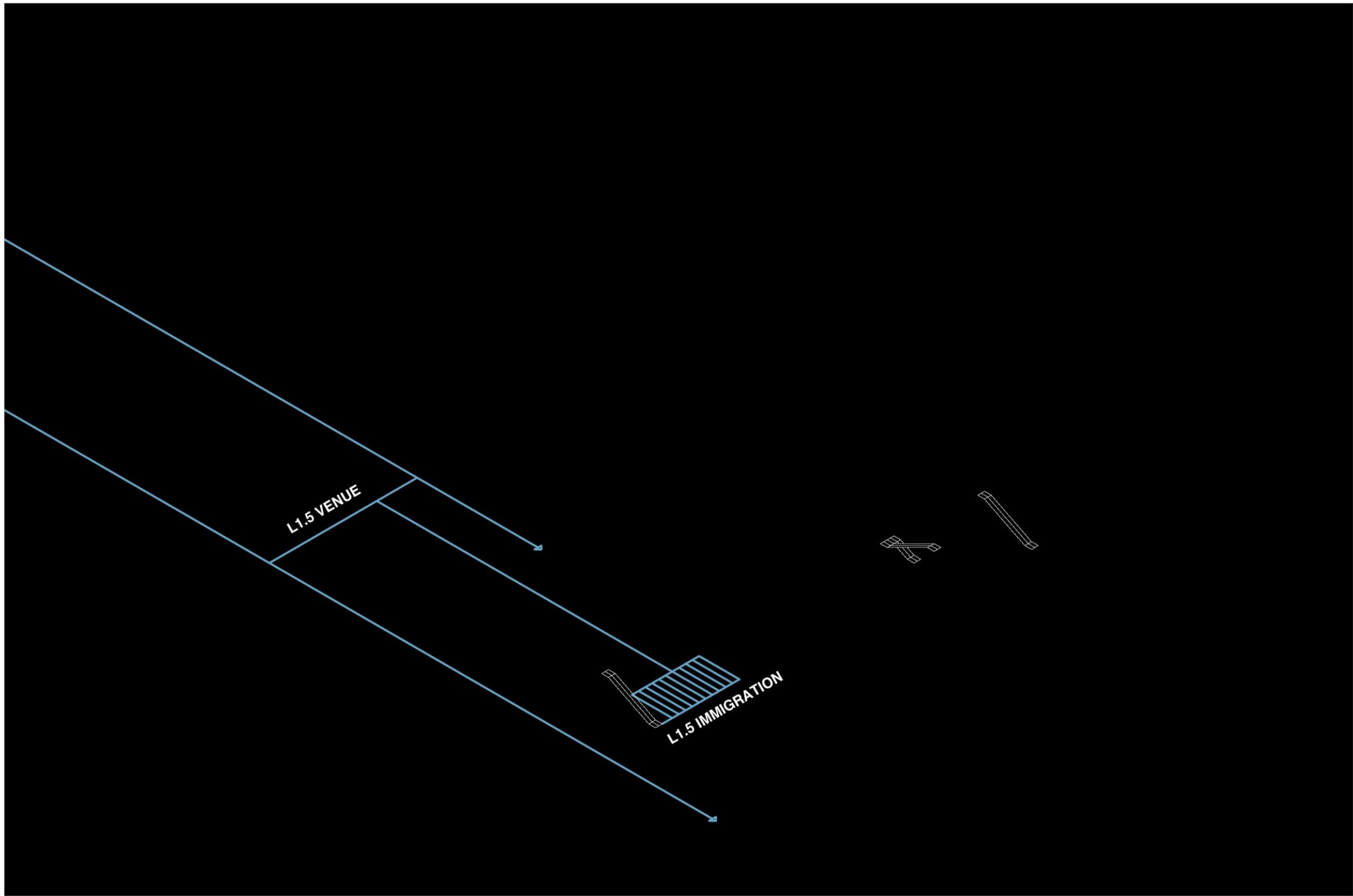


**ROUTING**  
CRUISE TERMINAL DEP./ARR.

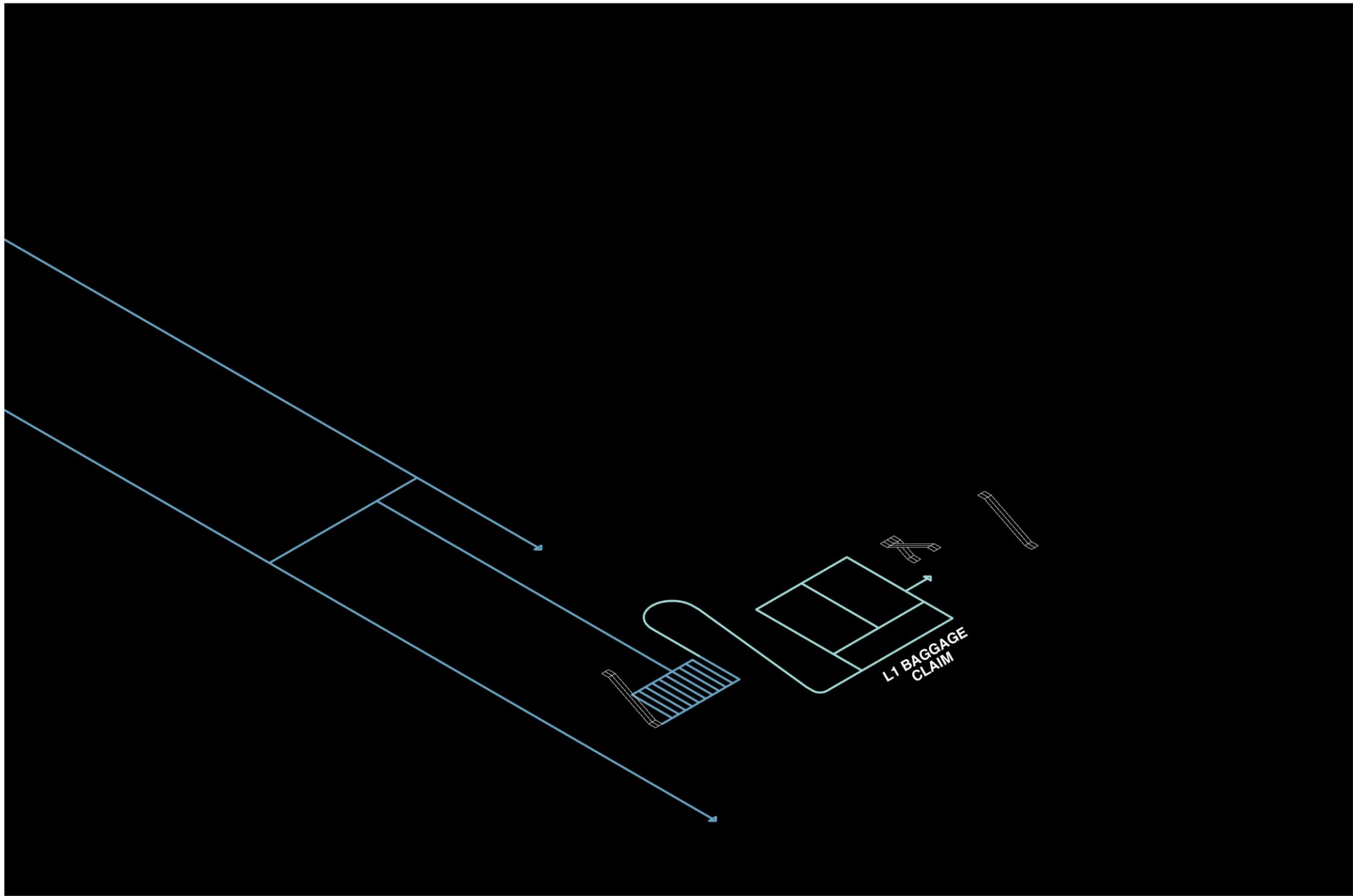


**ROUTING**  
CRUISE TERMINAL DEP/ARR.



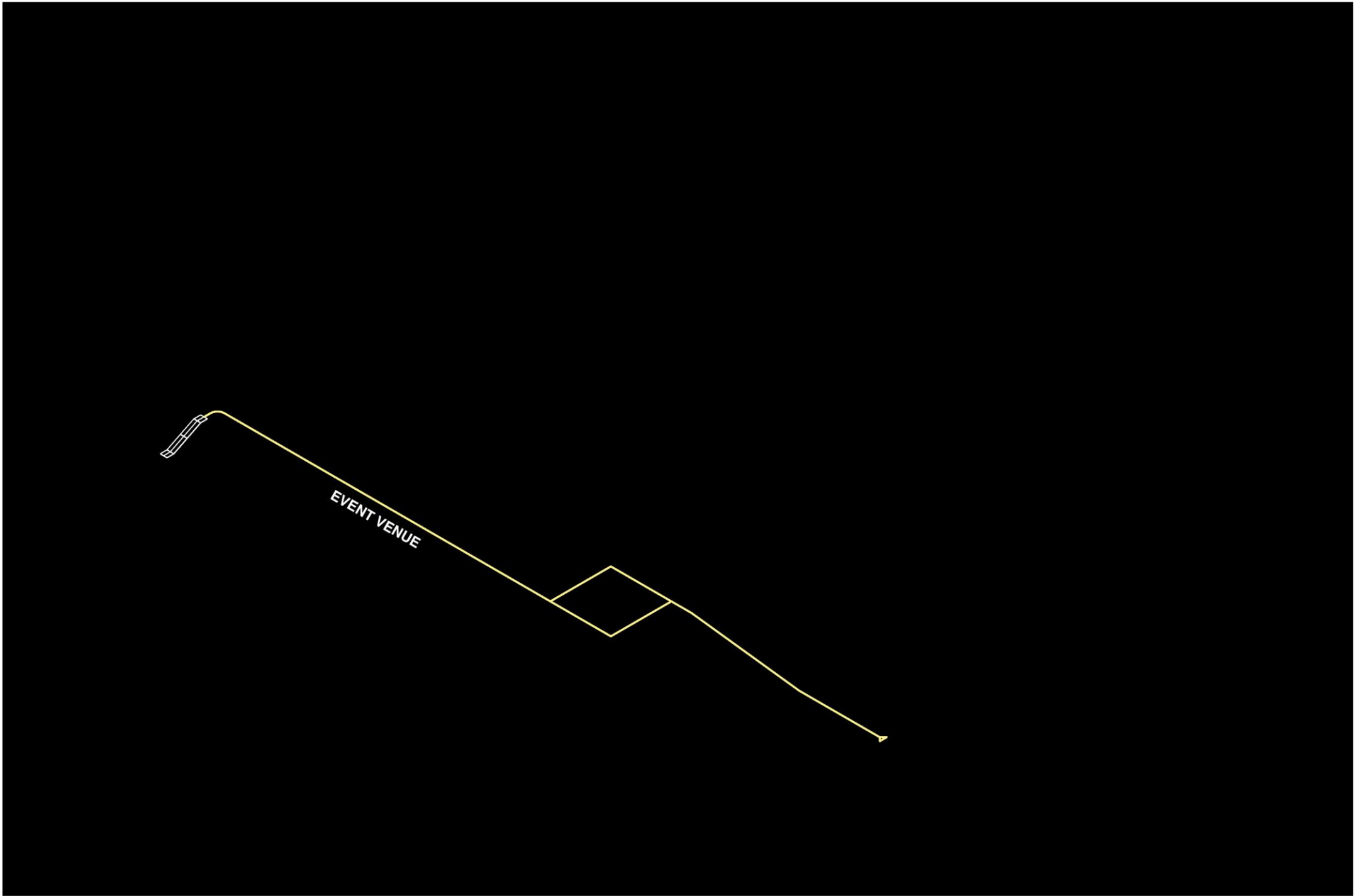


**ROUTING**  
CRUISE TERMINAL DEP./ARR.

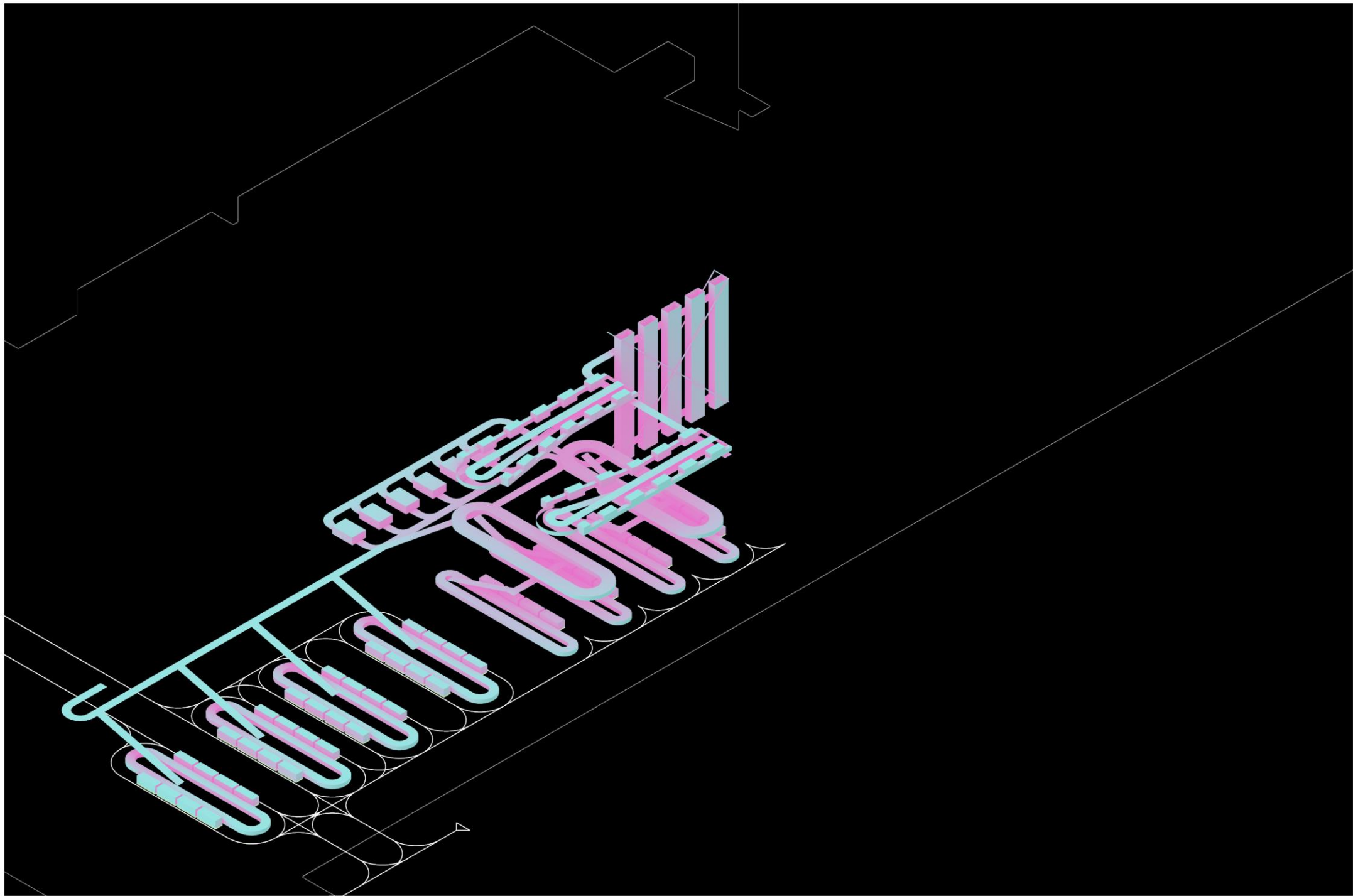


**ROUTING**  
CRUISE TERMINAL DEP/ARR.



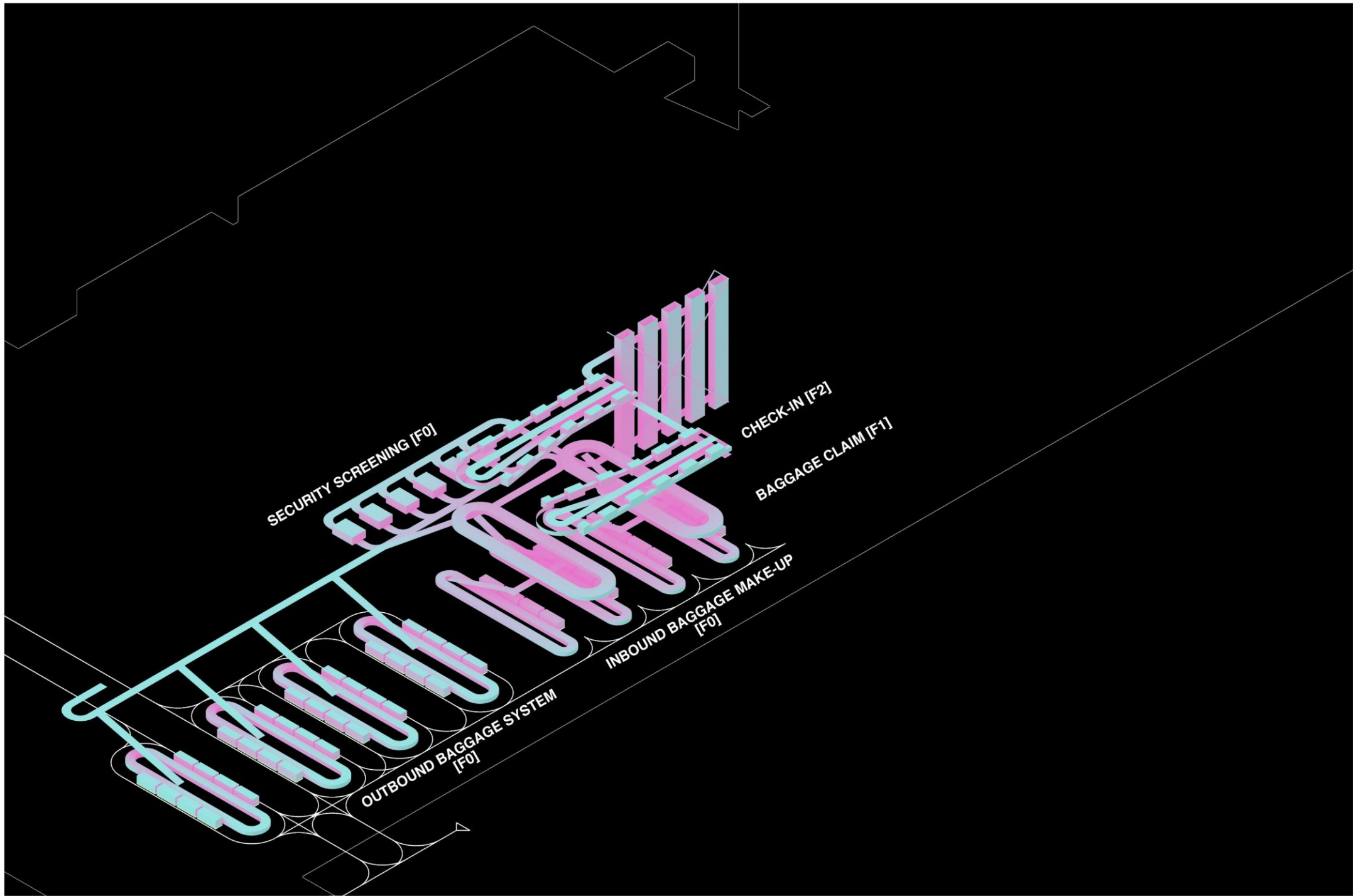


**ROUTING**  
EVENT VENUE



LOGISTIC SYSTEM





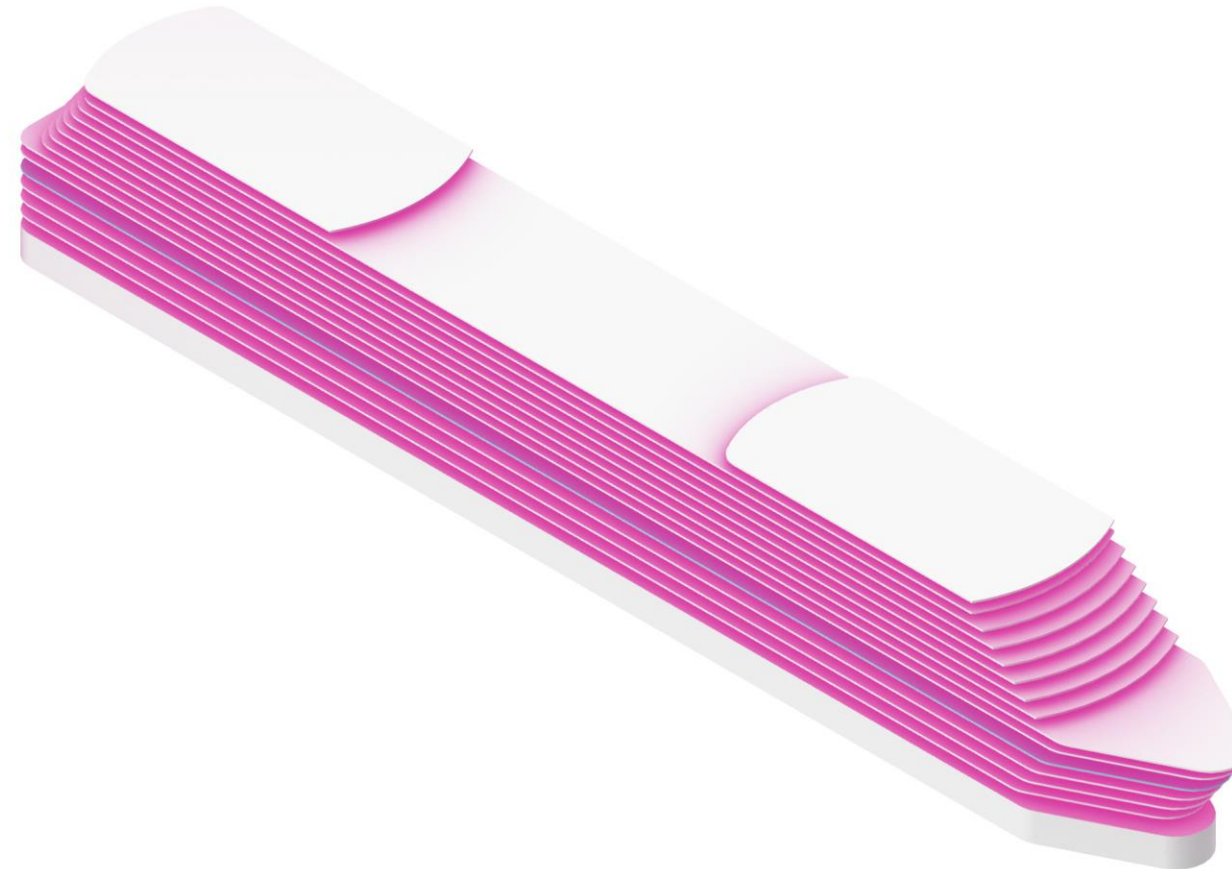
LOGISTIC SYSTEM

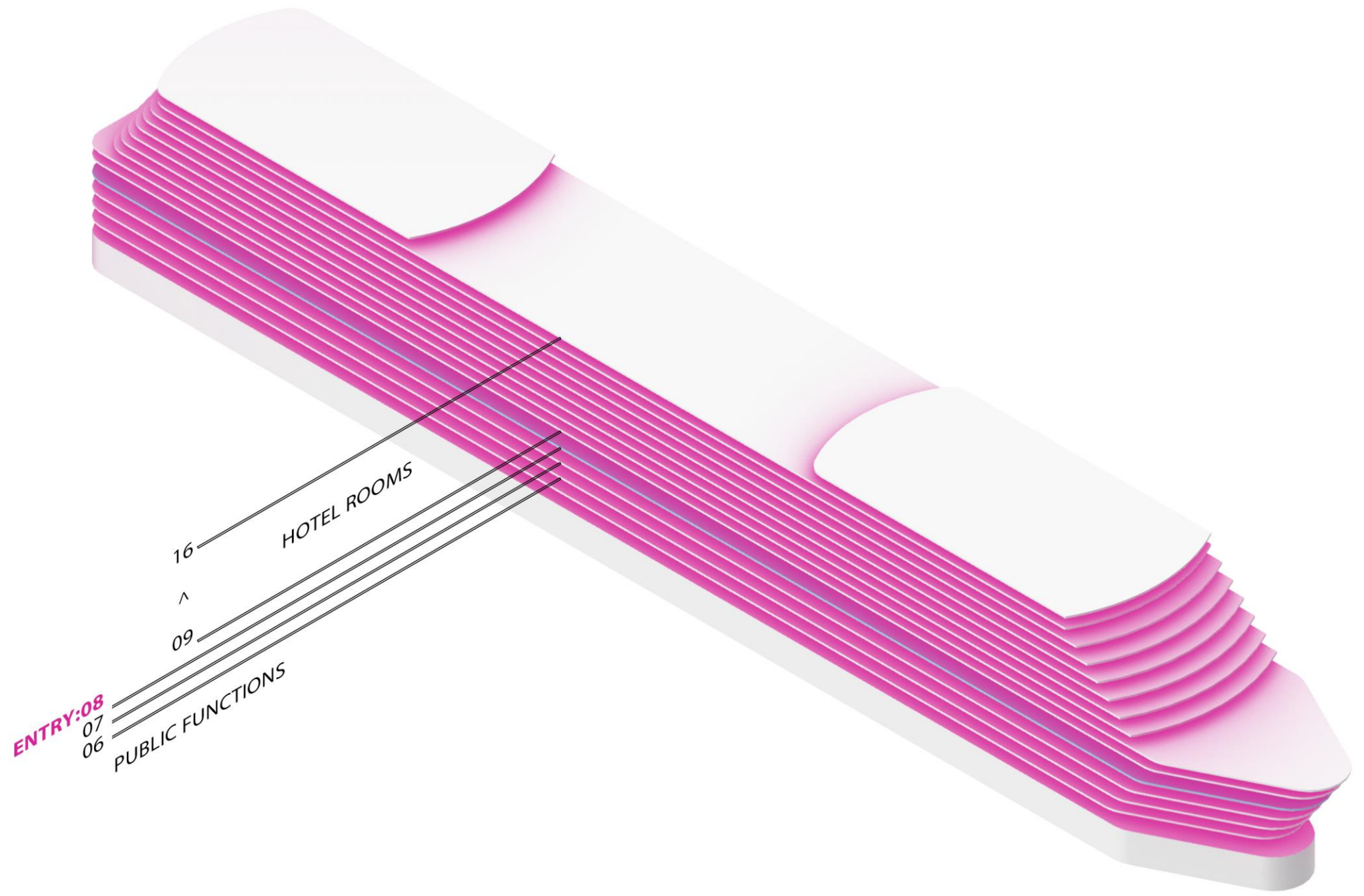
GROSS TONNAGE	GUEST CAPACITY	LENGTH	BEAM[AT DWL]
<b>145,655</b>	<b>3,963</b>	<b>326m</b>	<b>40m</b>
HOMEPORTING VESSEL AT BERTH 1	NUMBER OF DECKS	DRAUGHT	HEIGHT[ABOVE DWL]
<b>NORWEGIAN BREAKAWAY</b>	<b>18</b>	<b>8.6m</b>	<b>55m</b>





GROSS TONNAGE	GUEST CAPACITY	LENGTH	BEAM[AT DWL]
<b>145,655</b>	<b>3,963</b>	<b>326m</b>	<b>40m</b>
HOMEPORTING VESSEL AT BERTH 1	NUMBER OF DECKS	DRAUGHT	HEIGHT[ABOVE DWL]
<b>NORWEGIAN BREAKAWAY</b>	<b>18</b>	<b>8.6m</b>	<b>55m</b>





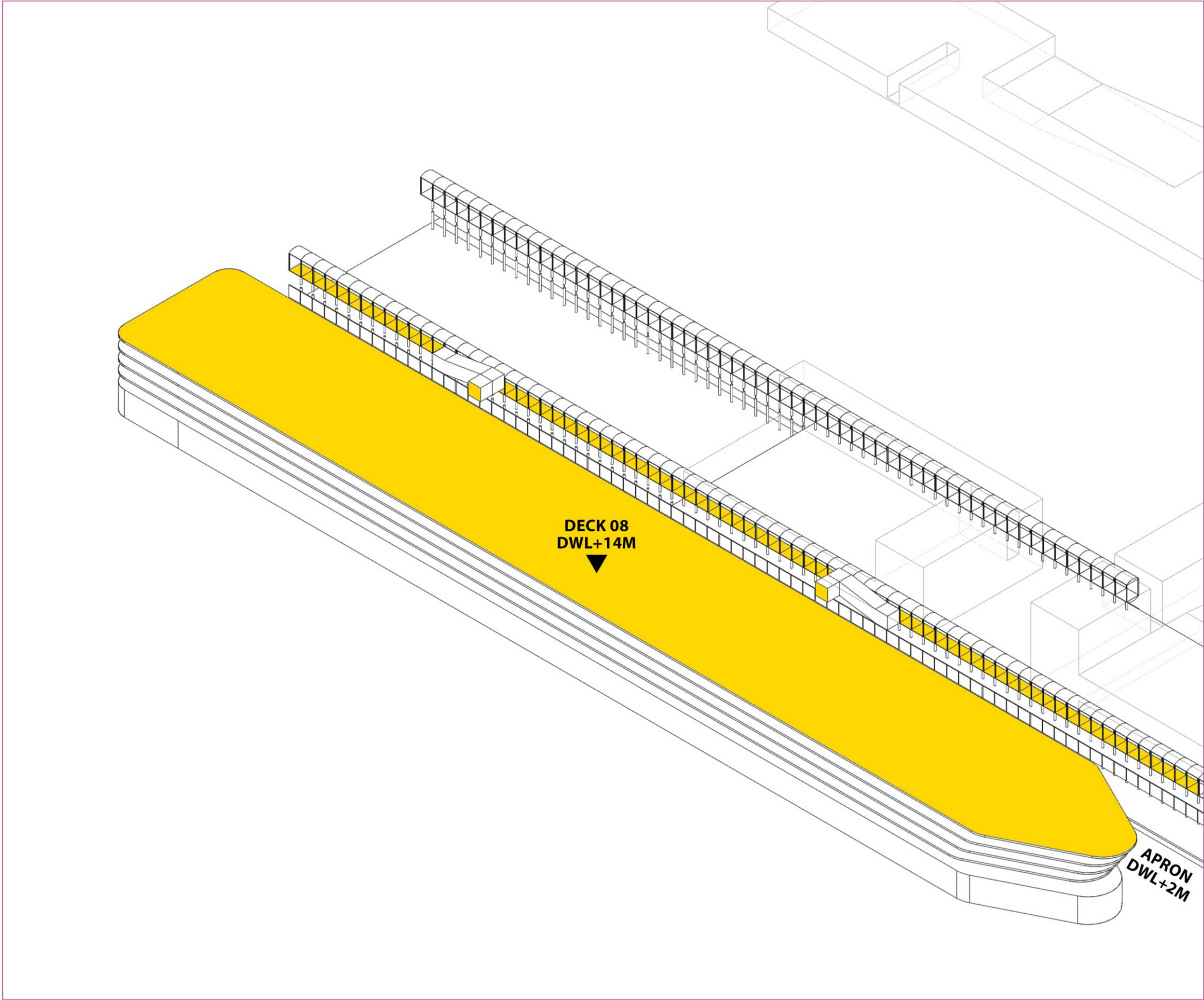
16 — HOTEL ROOMS

^  
09

07 — PUBLIC FUNCTIONS  
06

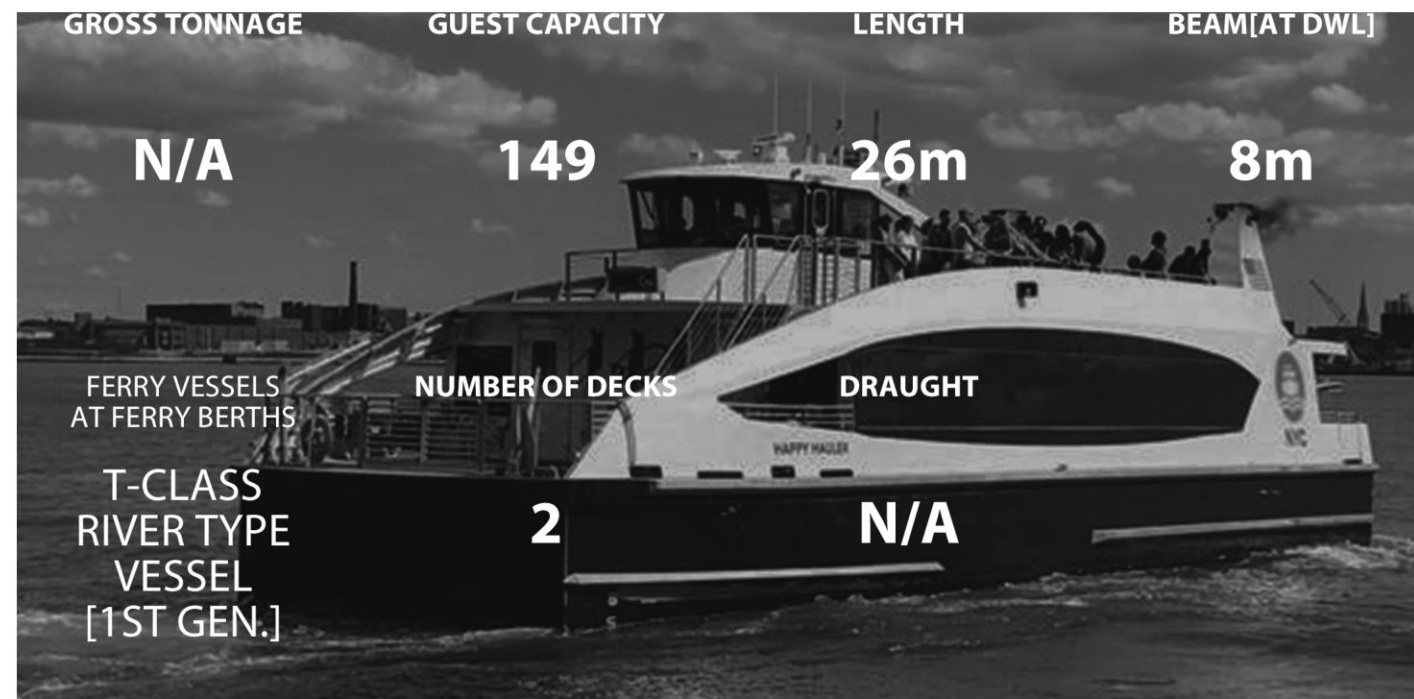
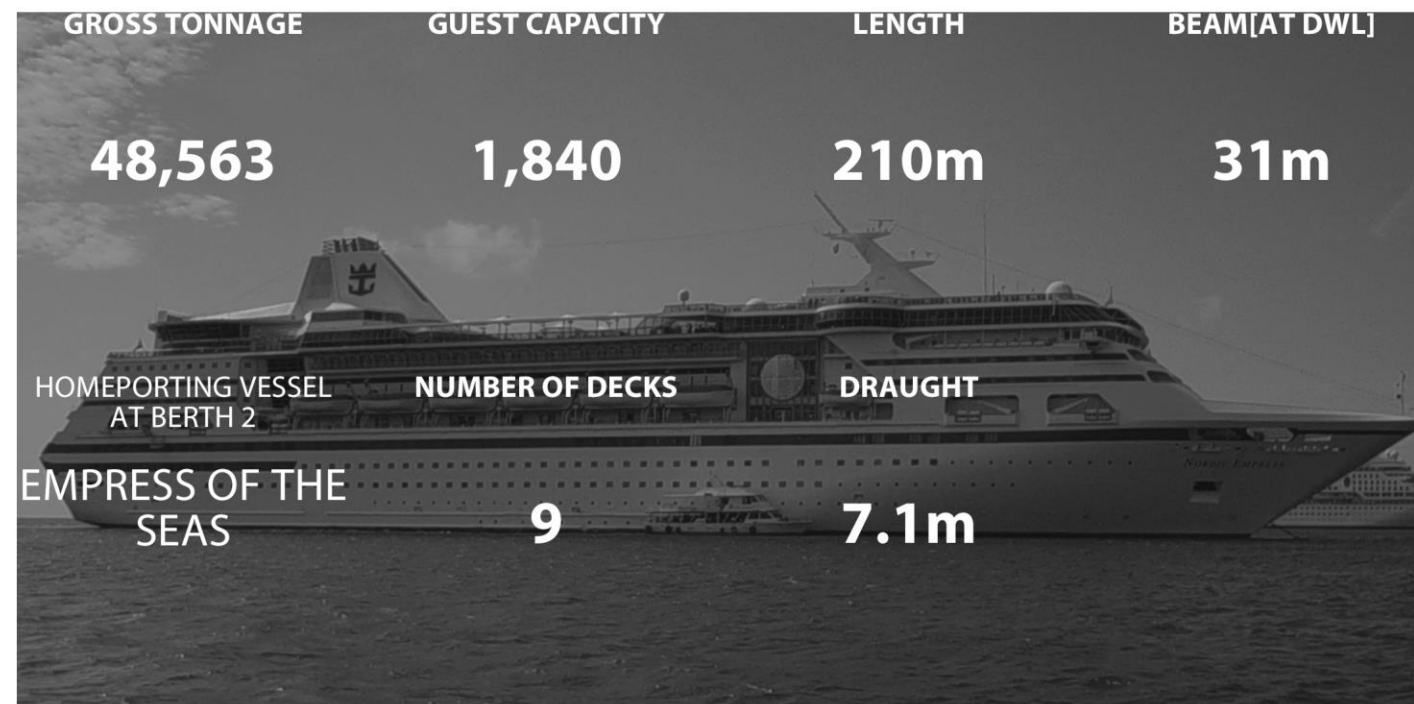
ENTRY:08

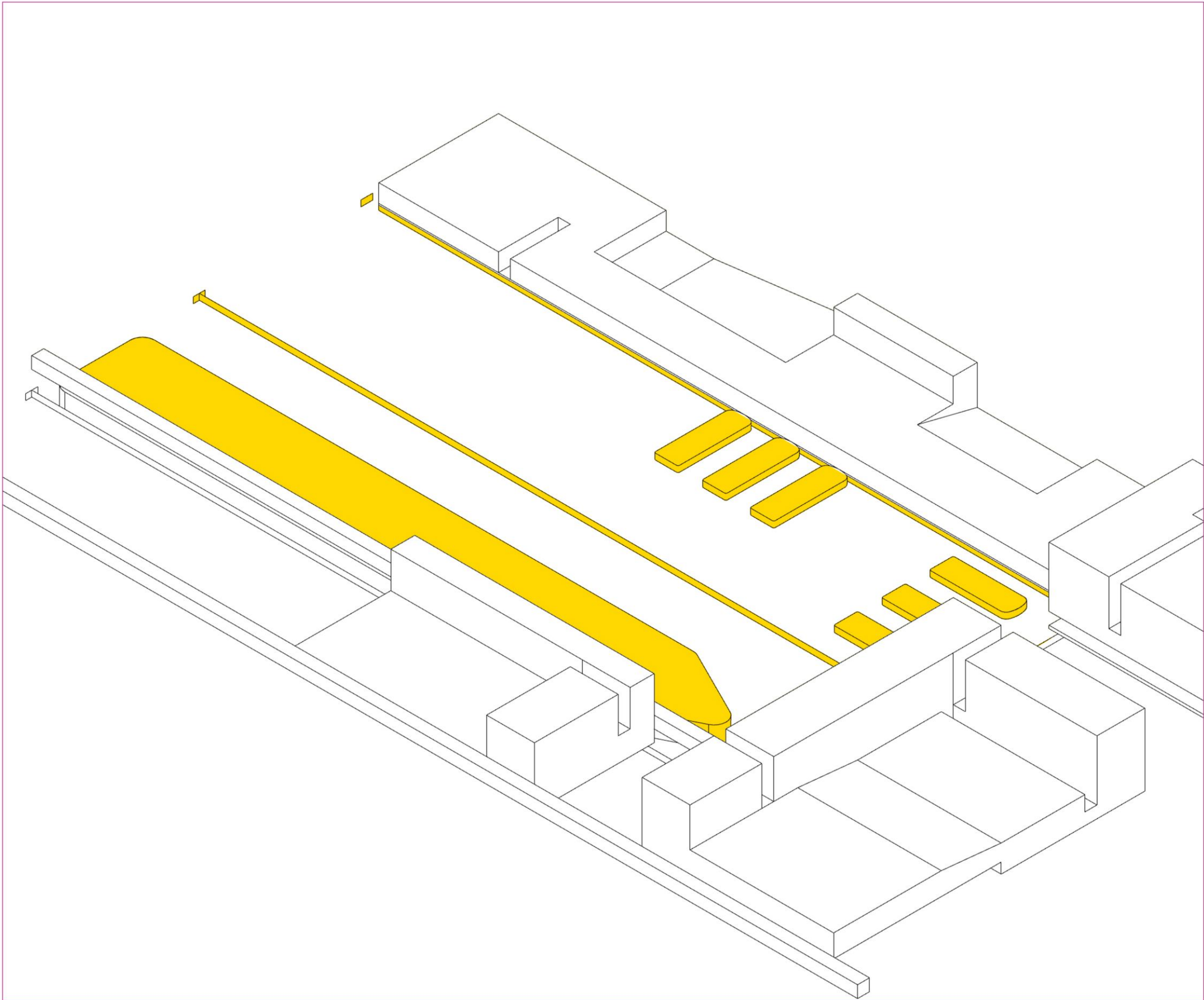




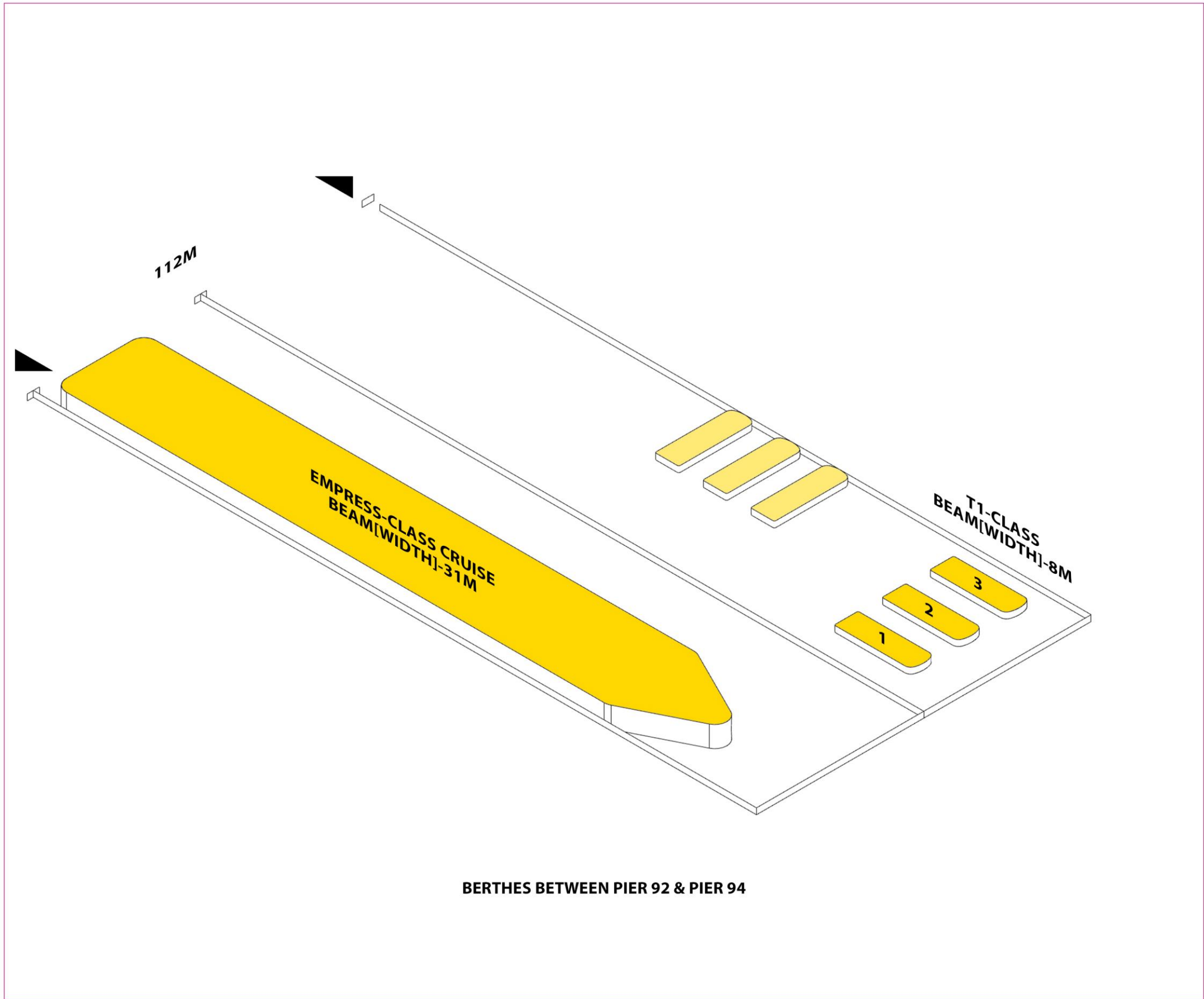


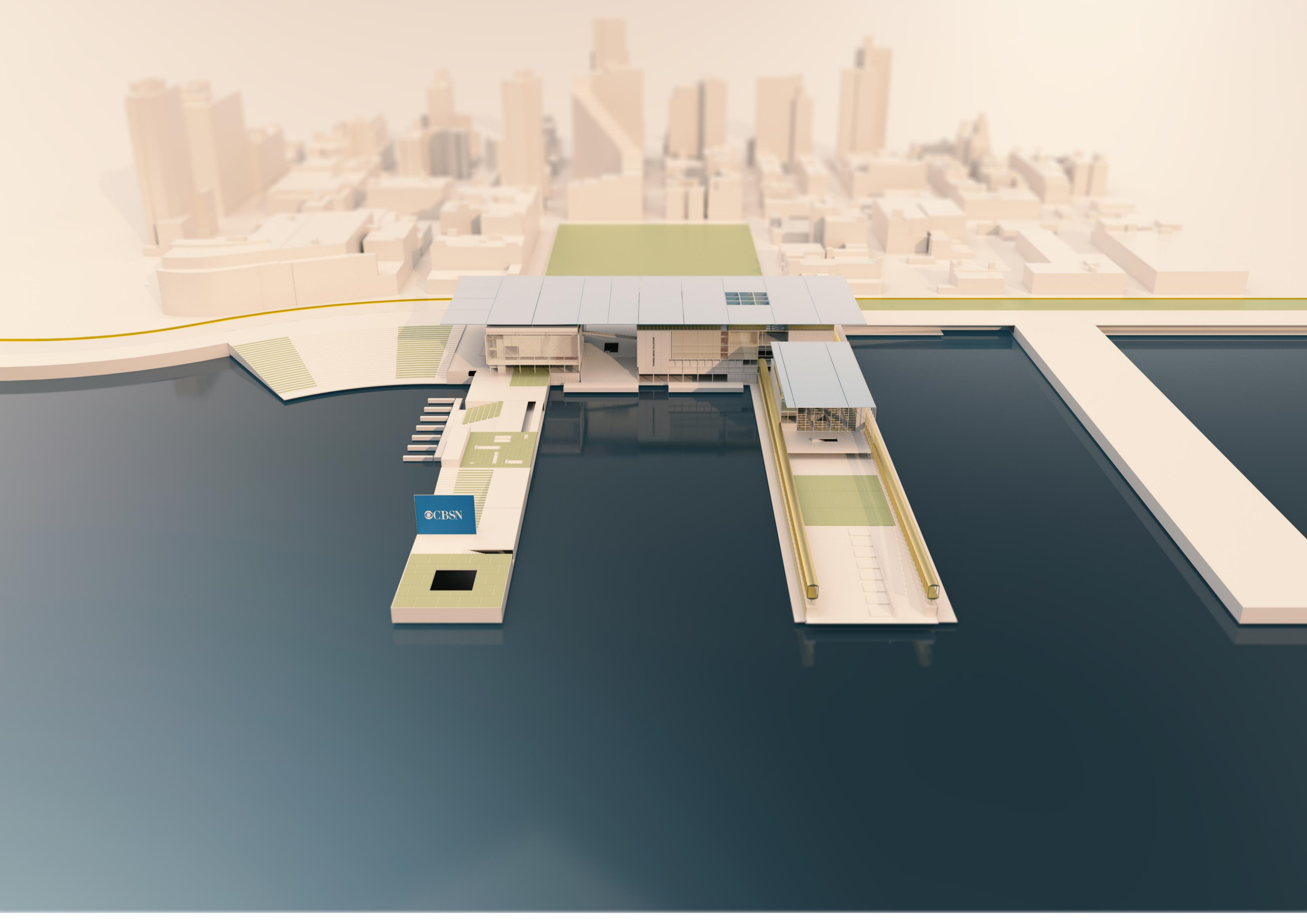




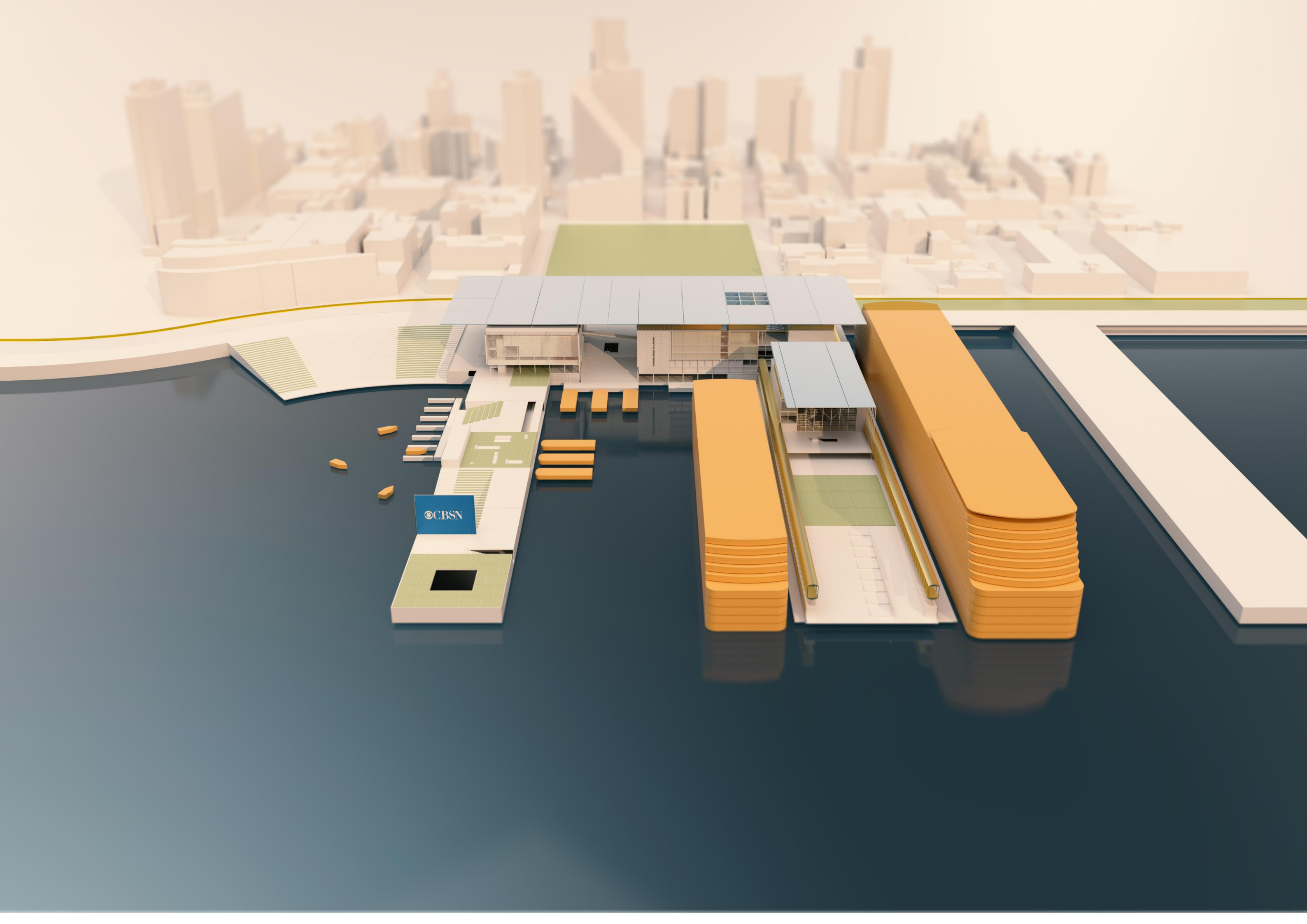


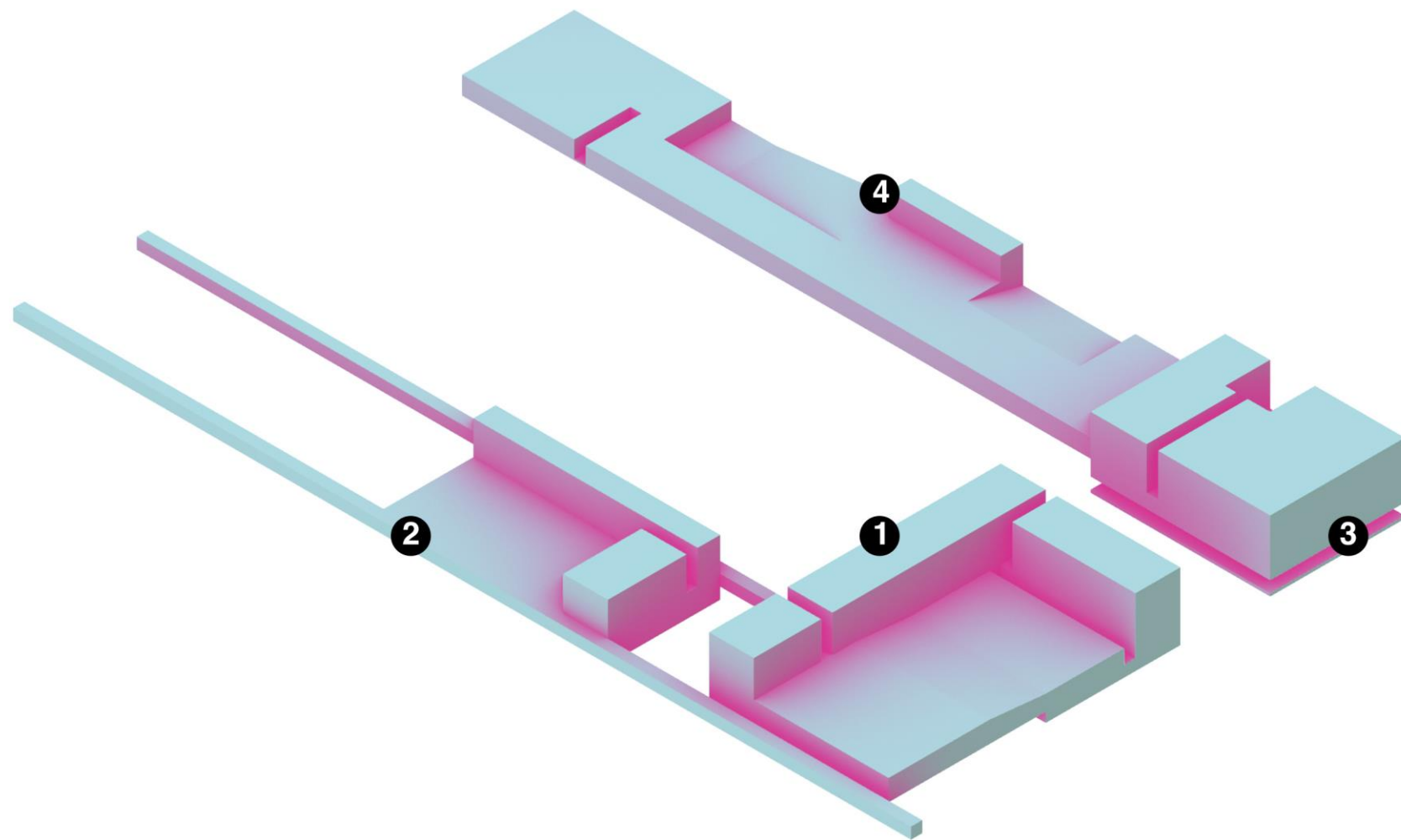






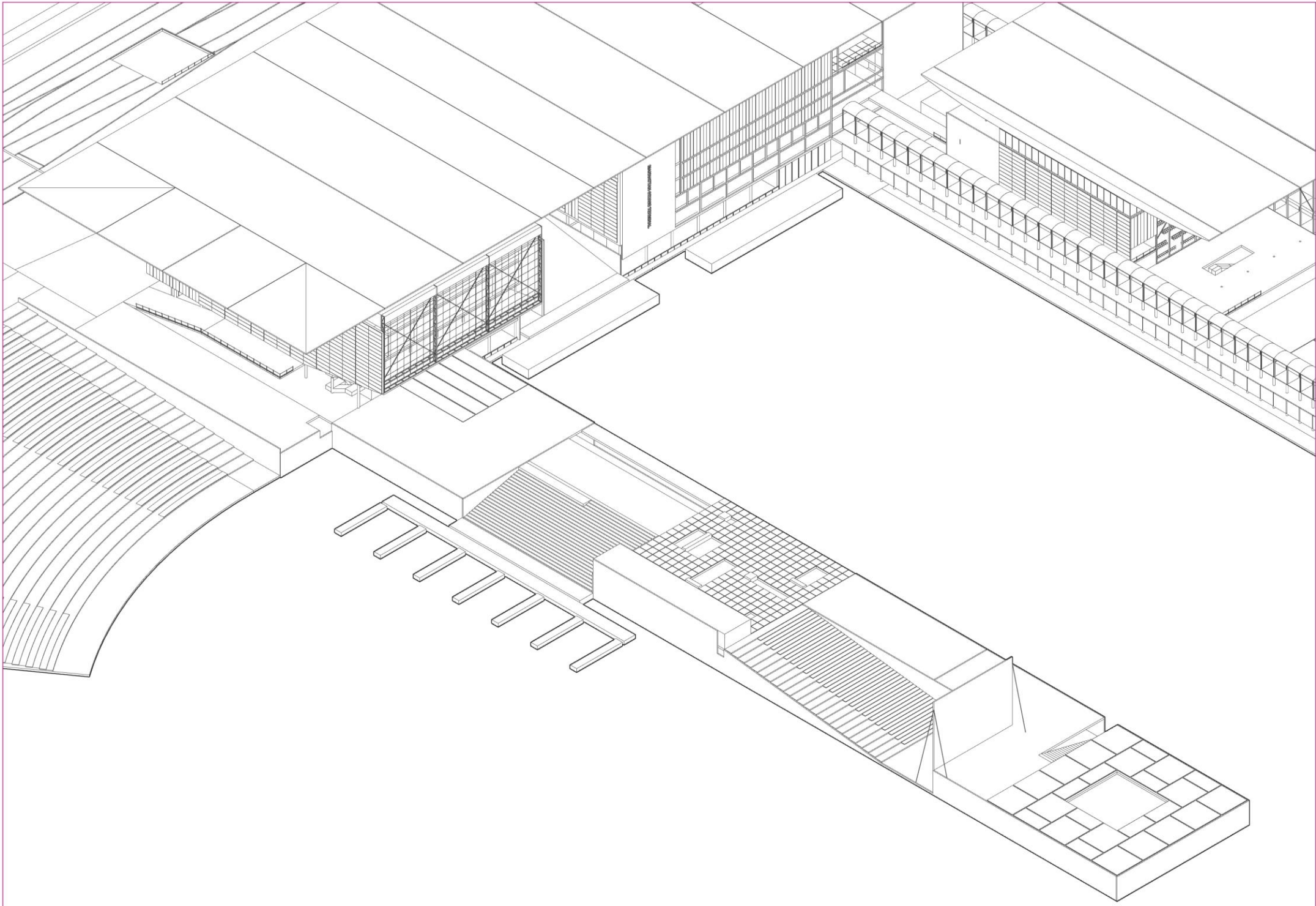




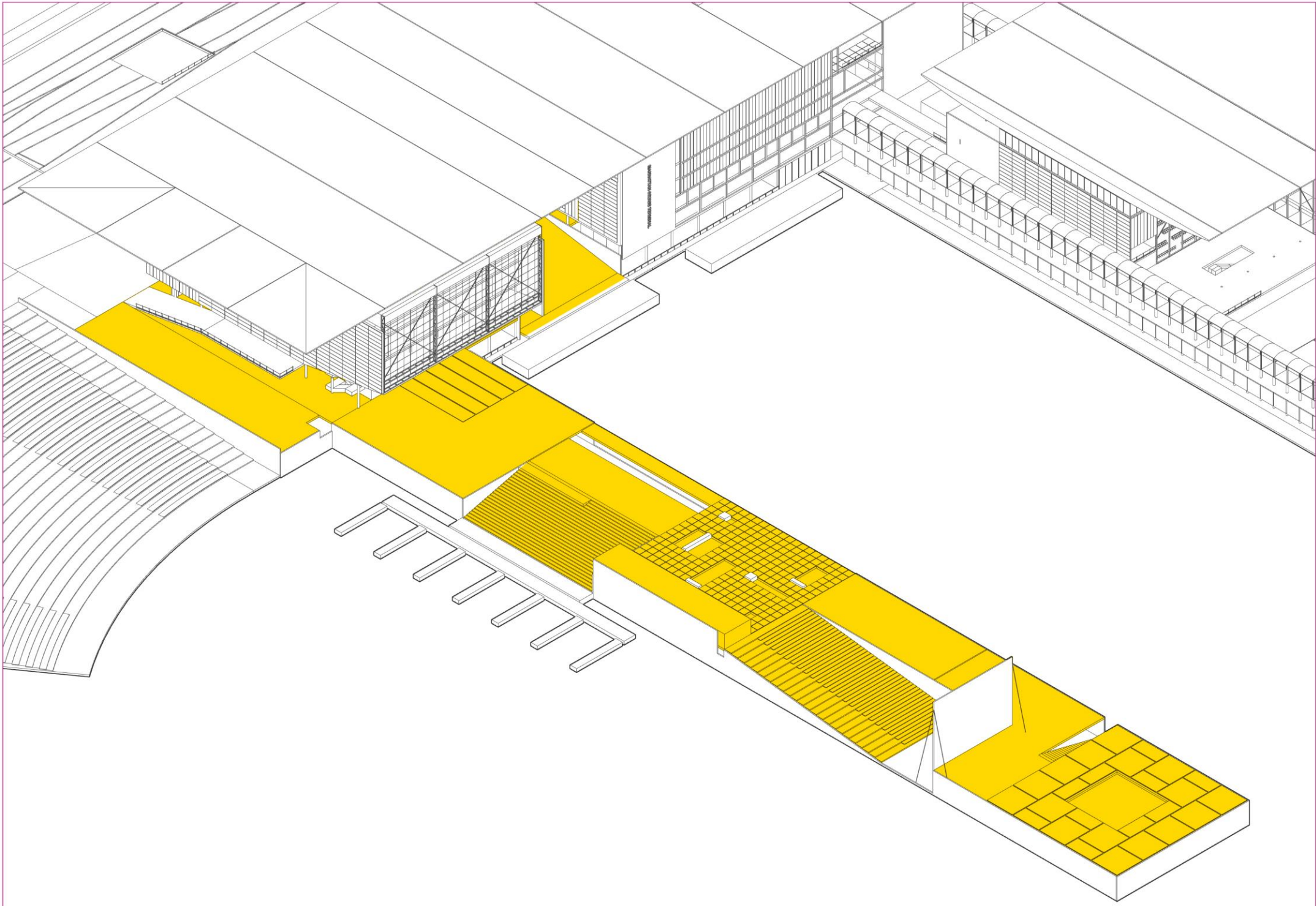


4 PARTS



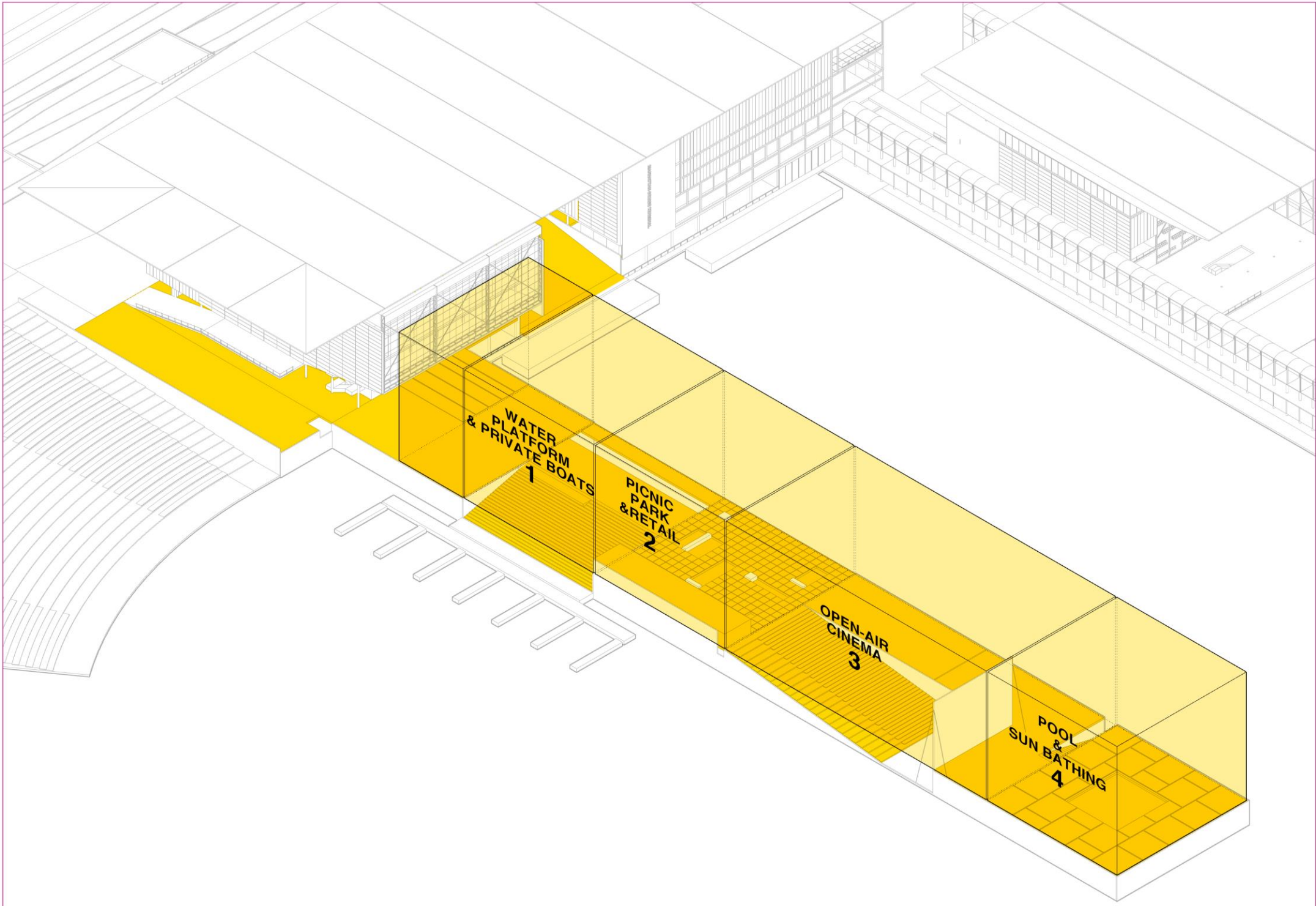


**PIER 94-PLANNING**

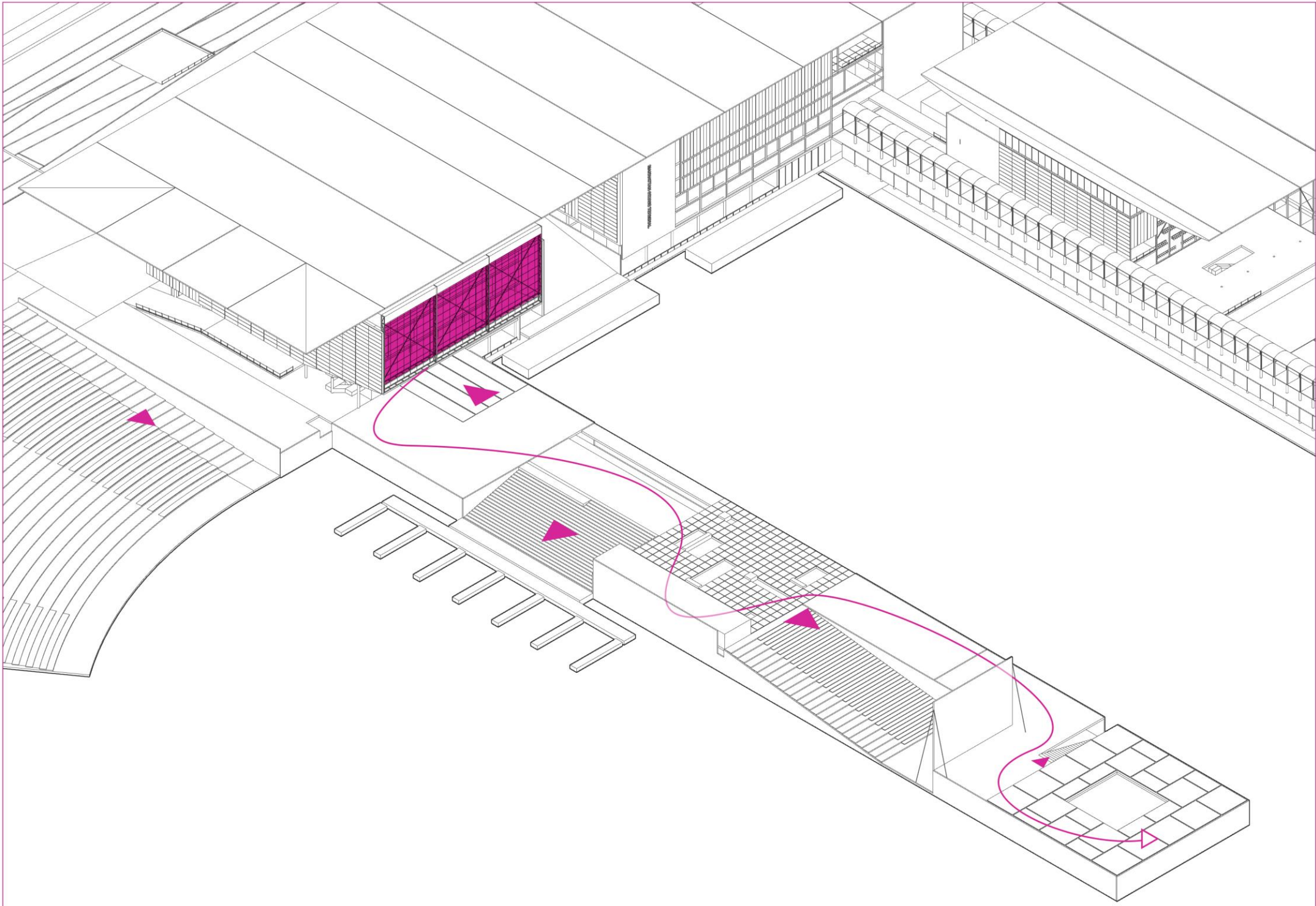


**PIER 94-PLANNING**



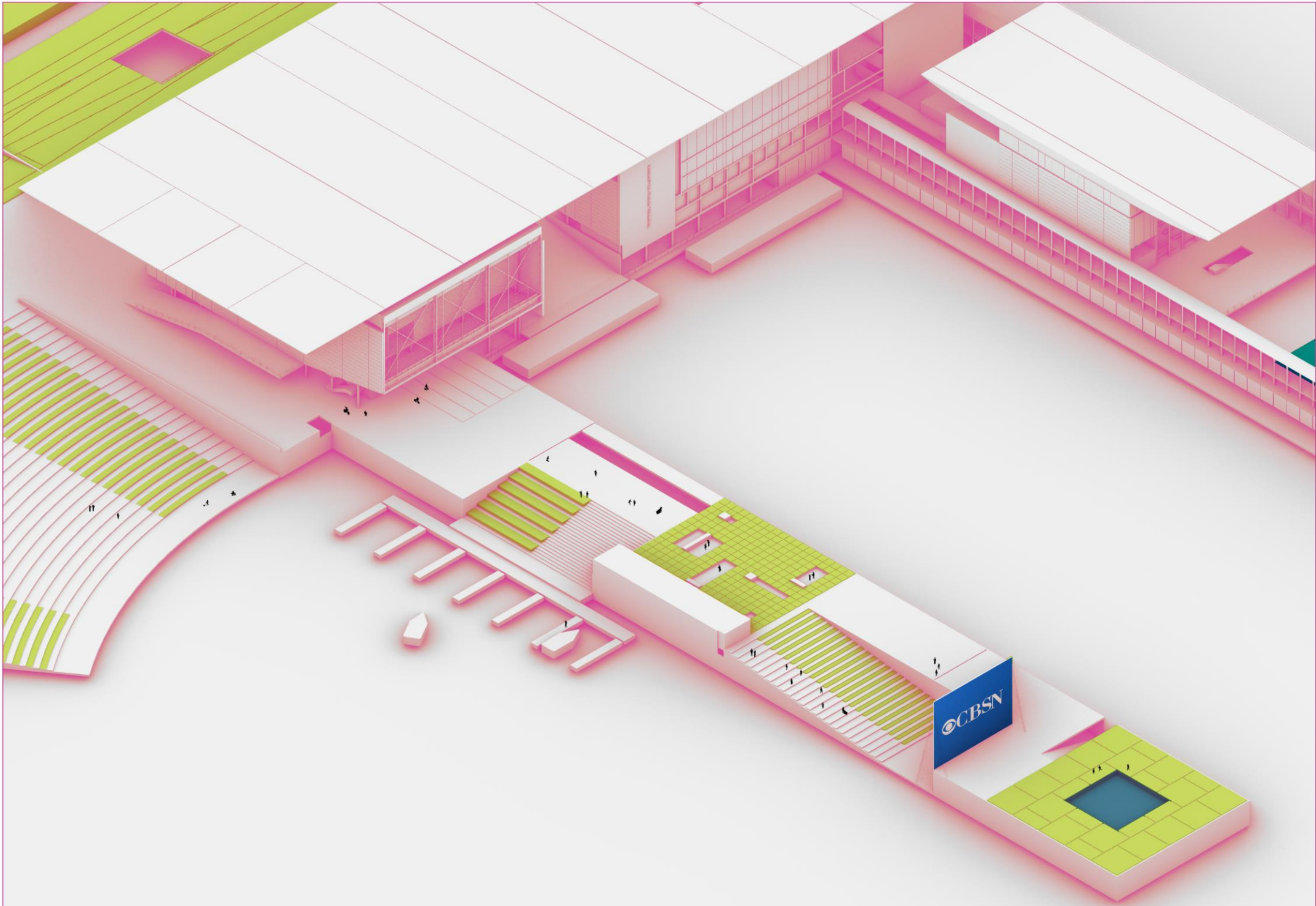


PIER 94-PLANNING



PIER 94-PLANNING





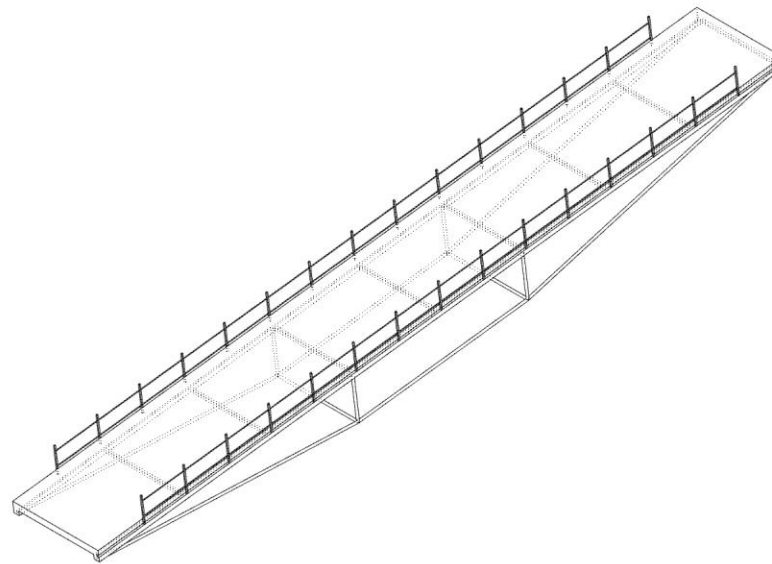
PIER 94-PLANNING

## OVERPASS BRIDGE

1 To Symbolize the Horizontal Movement

2 To Bridge the Public Domains

3 To Connect Building Systems [Pipes & Ducts]



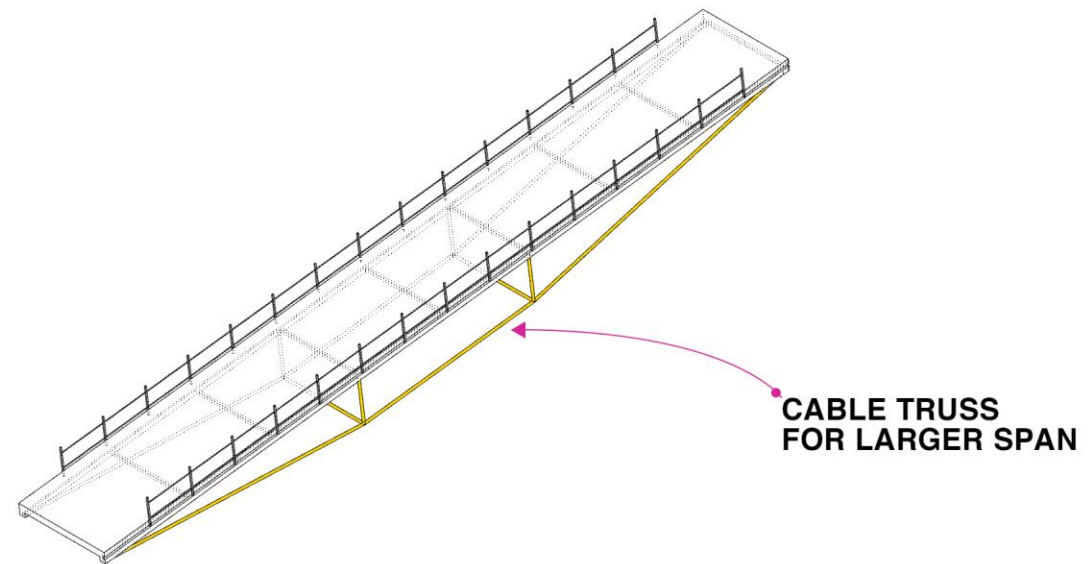


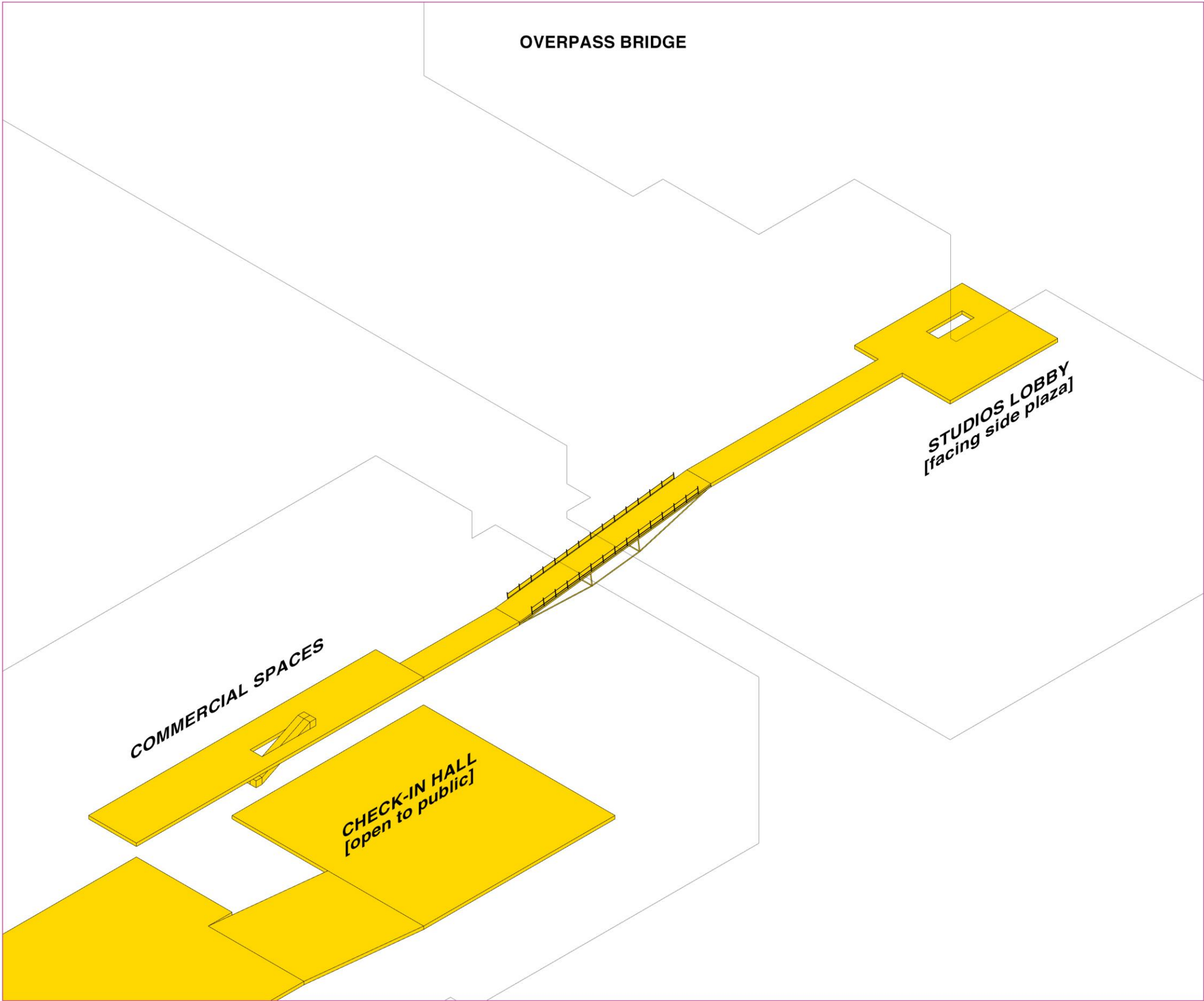
## OVERPASS BRIDGE

1 To Symbolize the Horizontal Movement

2 To Bridge the Public Domains

3 To Connect Building Systems [Pipes & Ducts]





OVERPASS BRIDGE

STUDIOS LOBBY  
[facing side plaza]

COMMERCIAL SPACES

CHECK-IN HALL  
[open to public]



MANHATTAN  
CRUISE  
TERMINAL



IMPLEMENTATION



INTRODUCTION



RESEARCH



CONCEPT



OPERATION



DEVELOPMENT



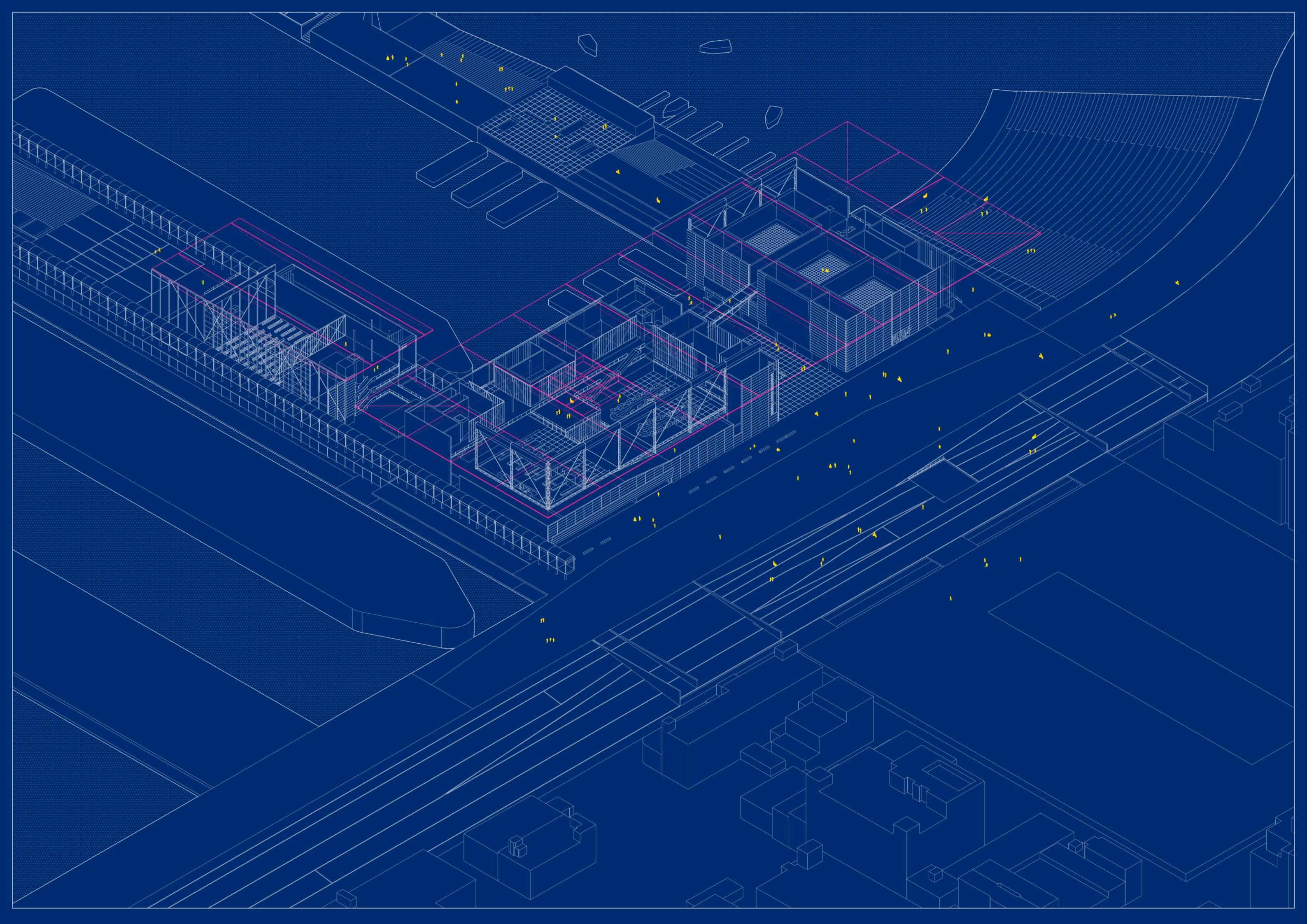
REFLECTION



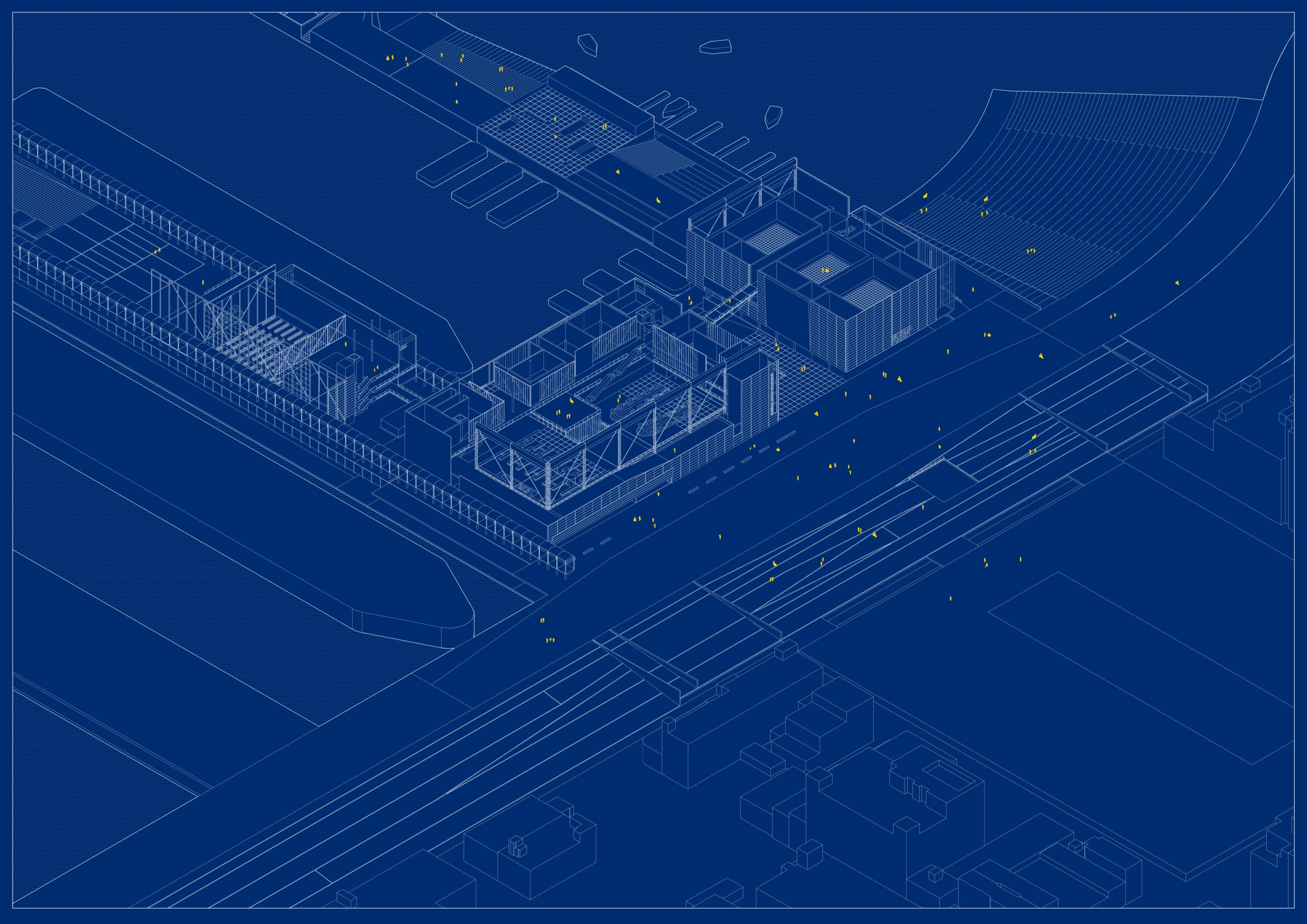
SPACE

CITY < INFRASTRUCTURE < WATER  
MOVEMENT & DISPLAY

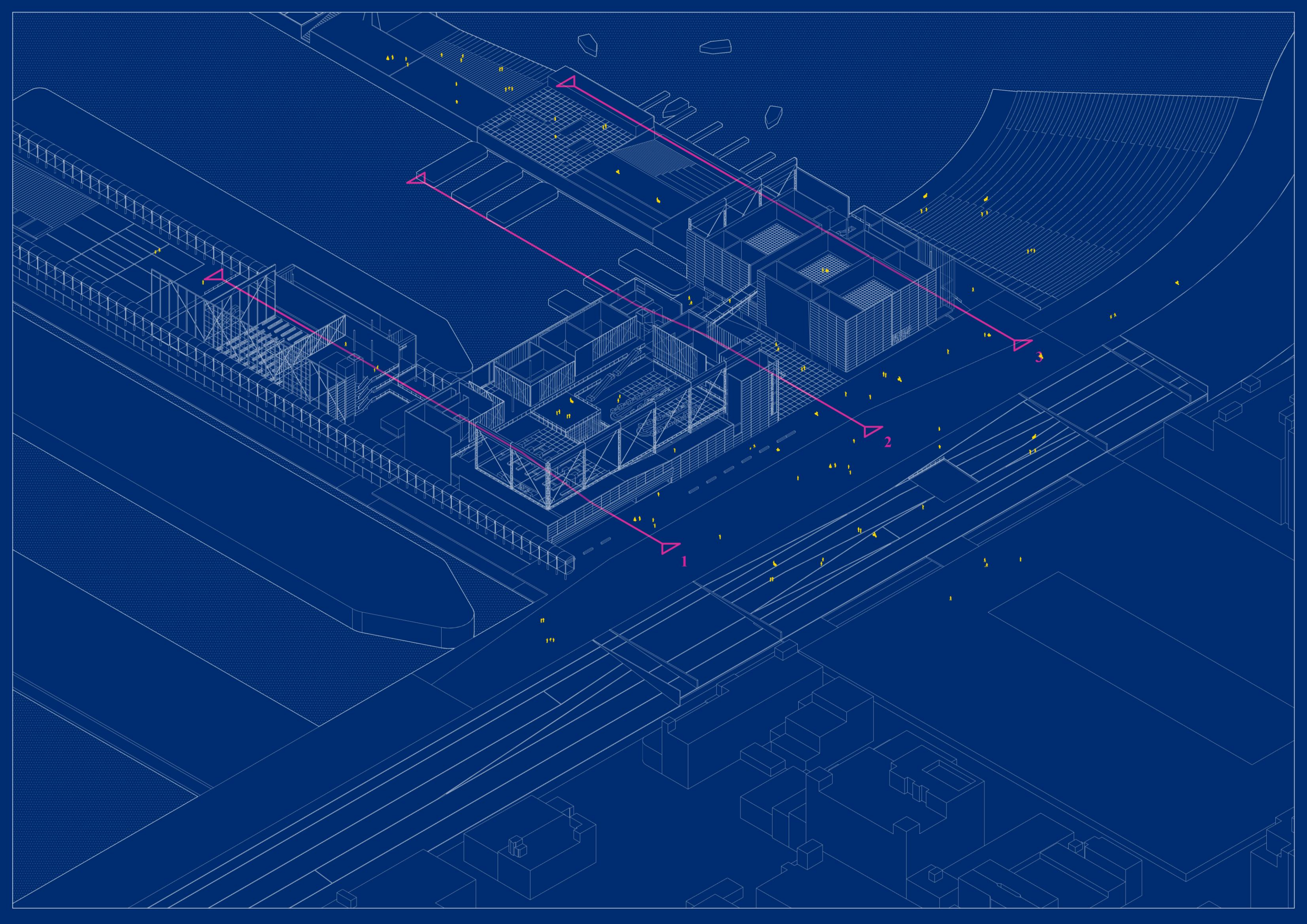




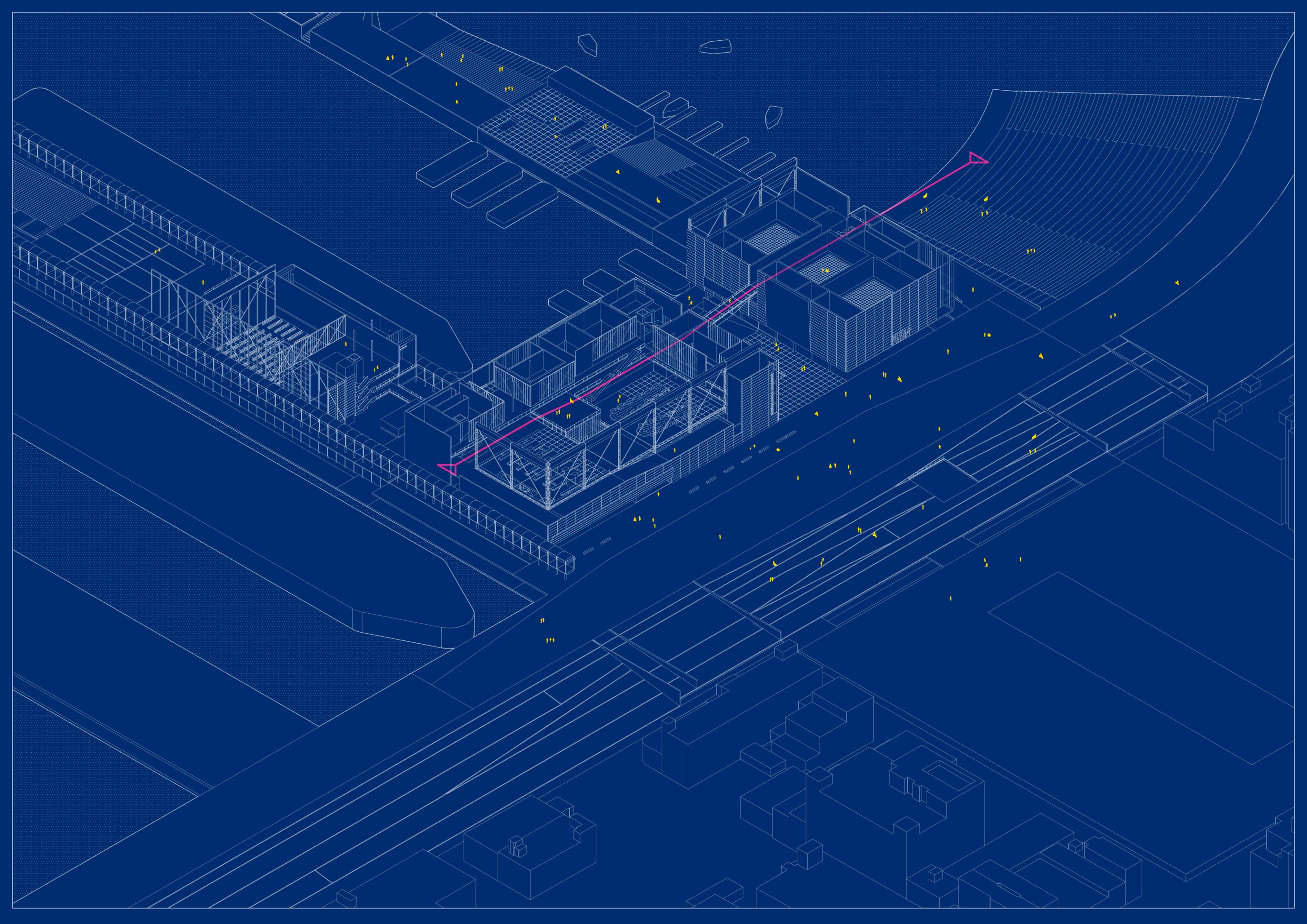




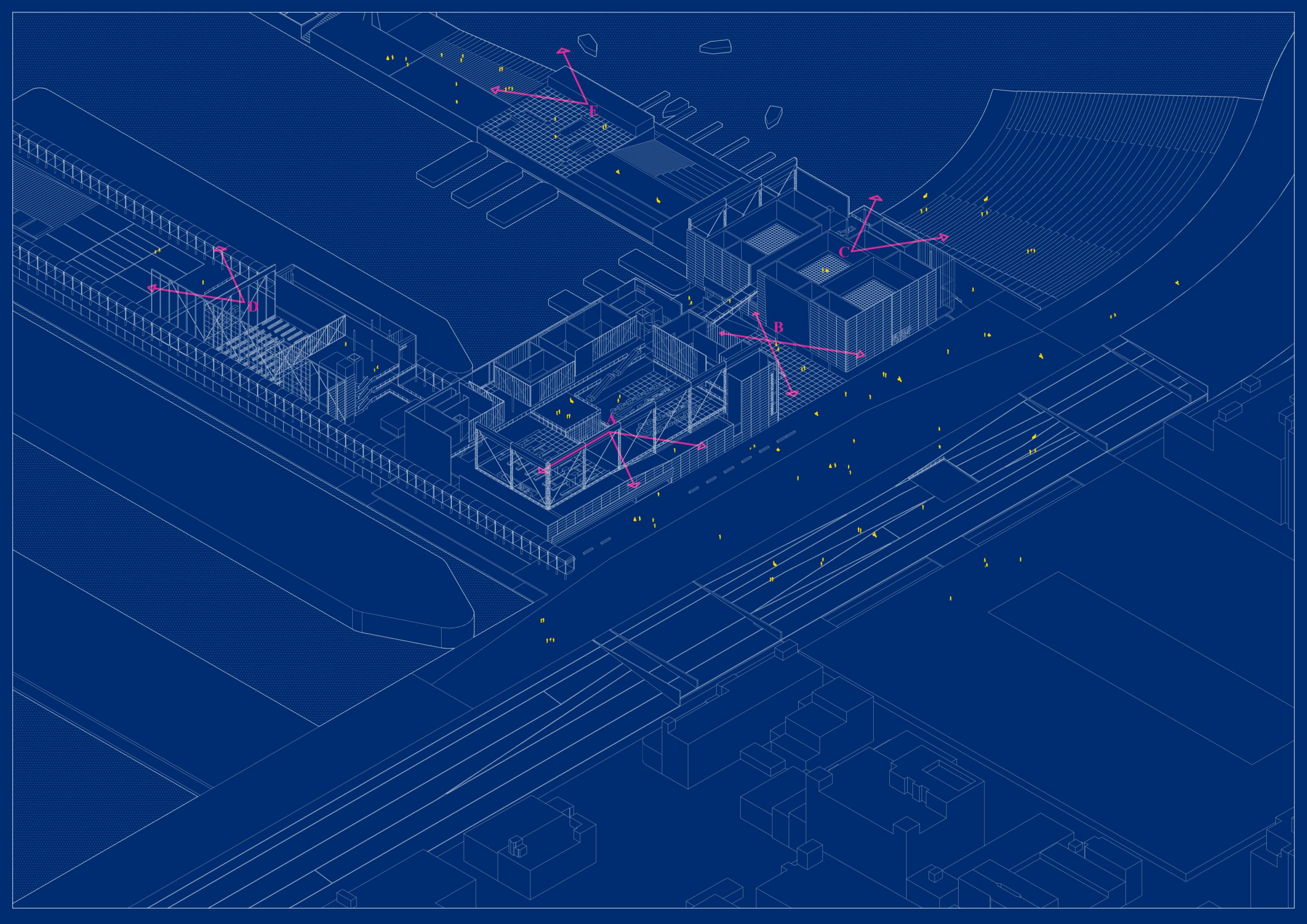








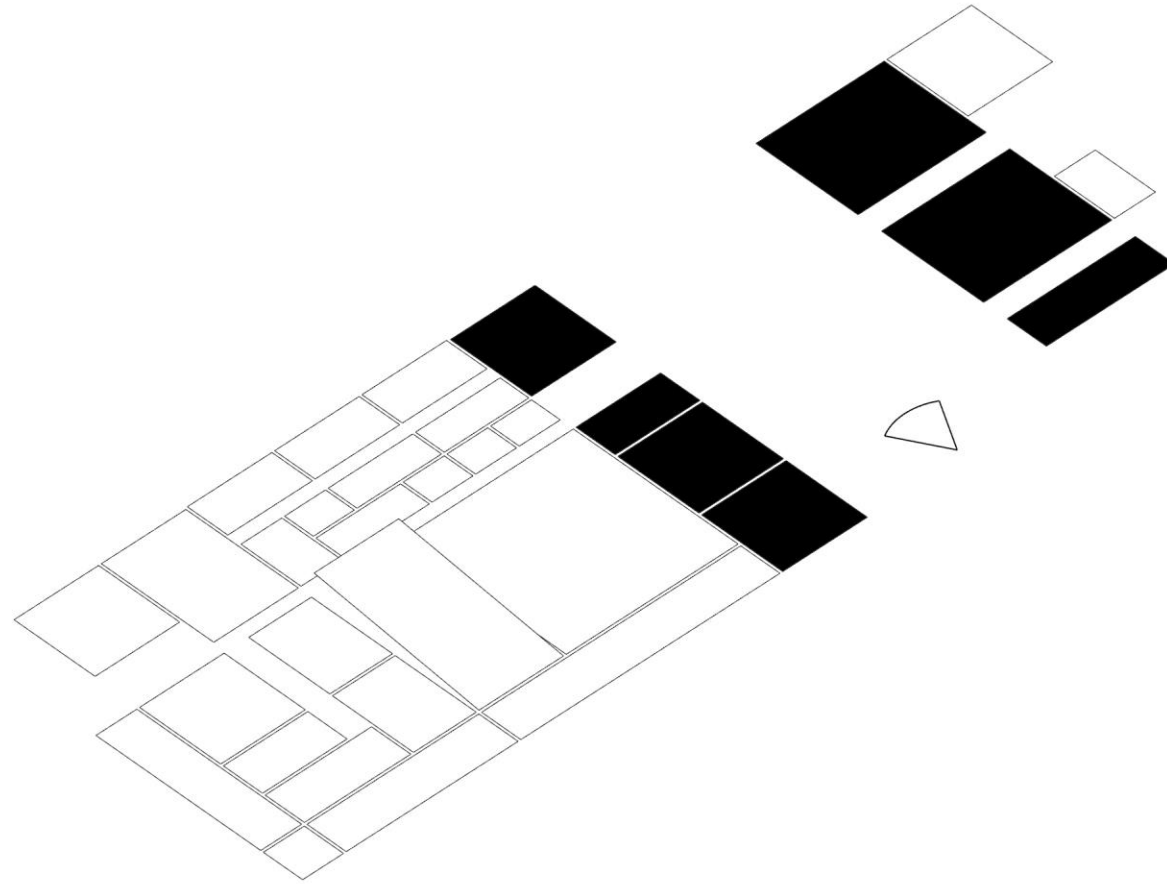
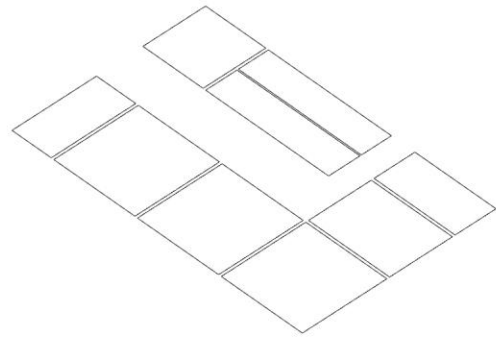


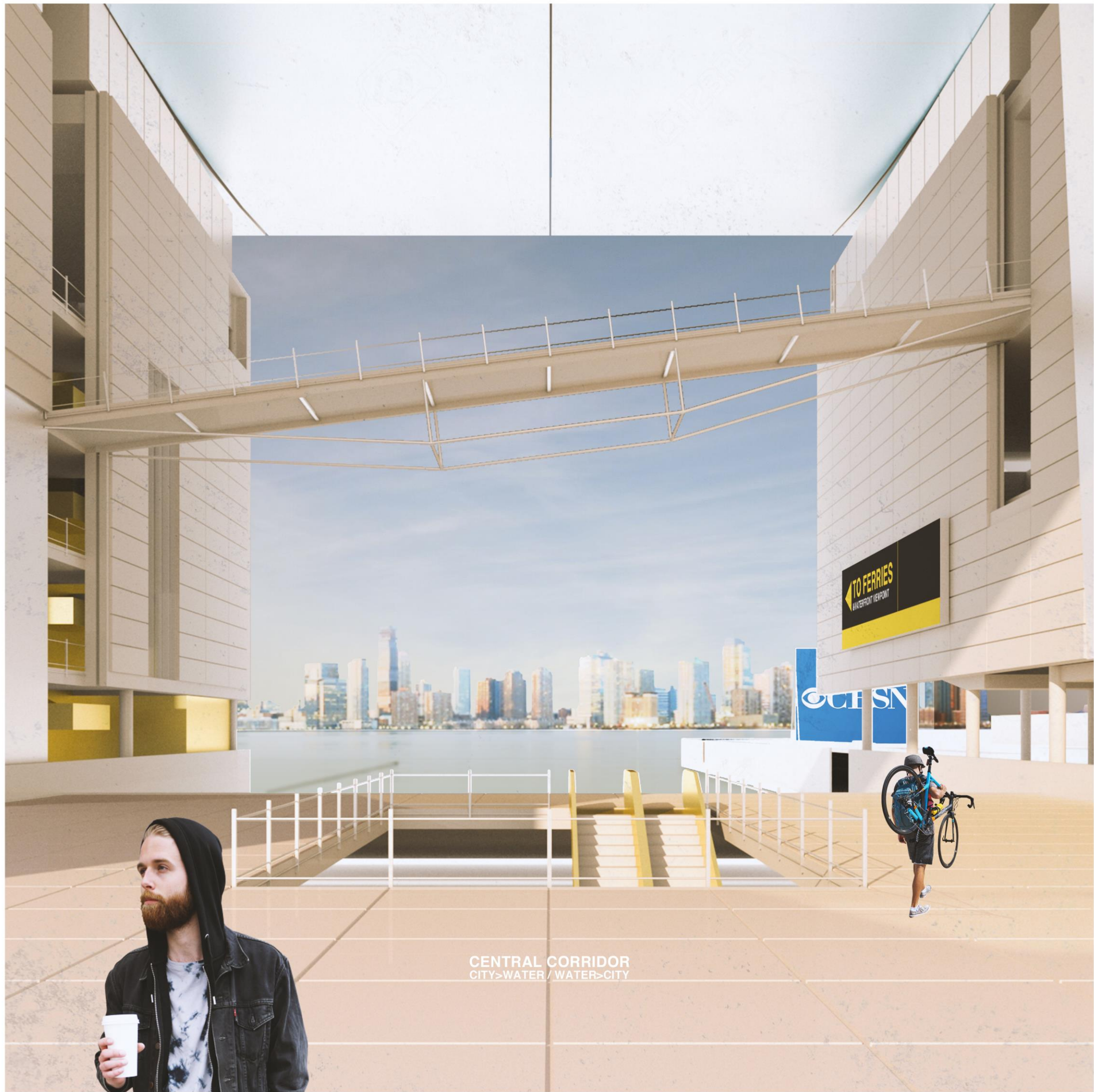






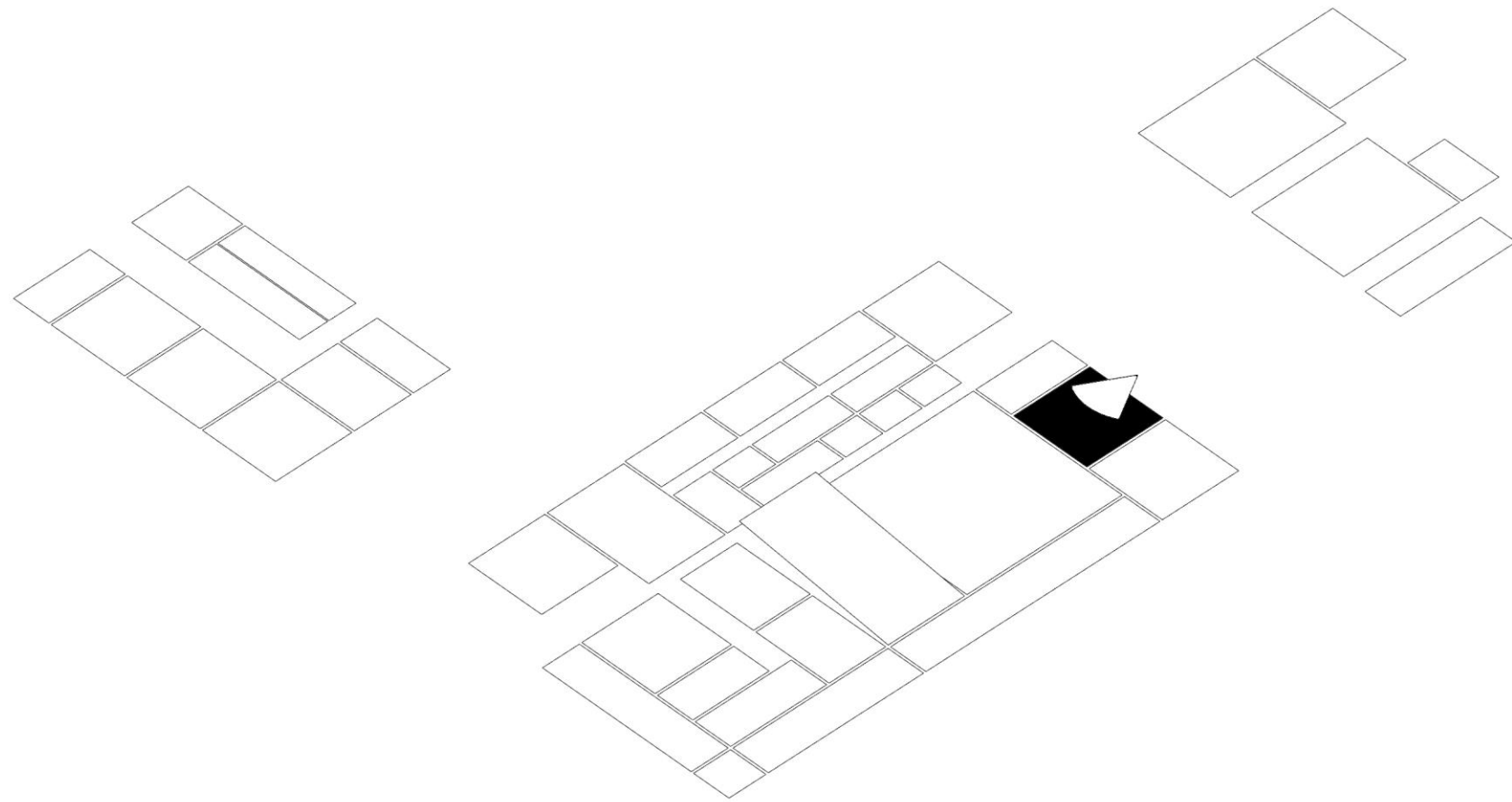






CENTRAL CORRIDOR  
CITY>WATER / WATER>CITY







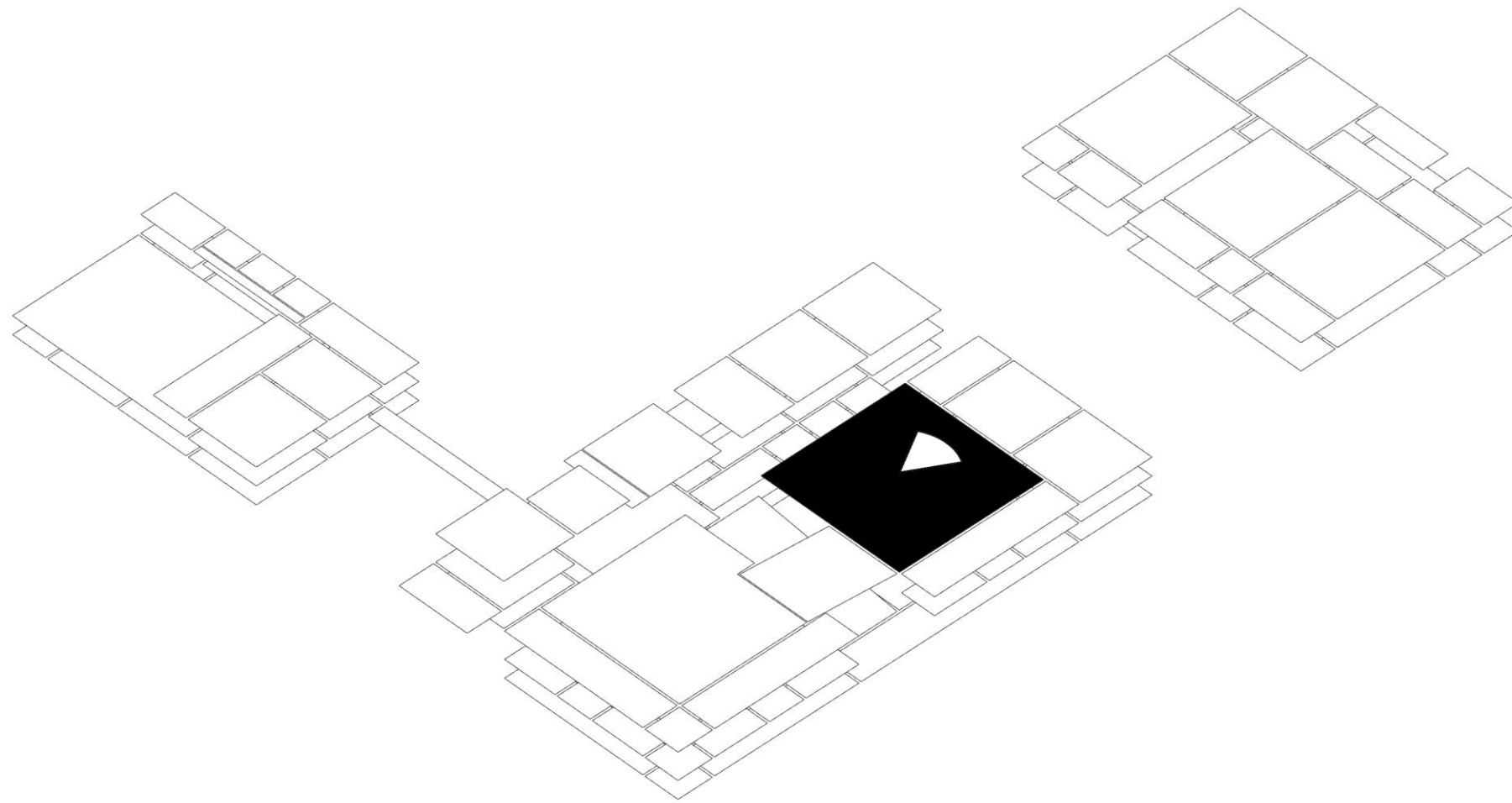
◀ Exit  
◀ W. C.

**CUSTOMS**  
NOTHING TO DECLARE  
▼

To Check-in Hall ▶

LOBBY  
ENTRANCE/EXIT OF THE TERMINAL







HATTAN CRUISE  
CHECK-IN

Royal Caribbean  
INTERNATIONAL

Royal Caribbean  
INTERNATIONAL

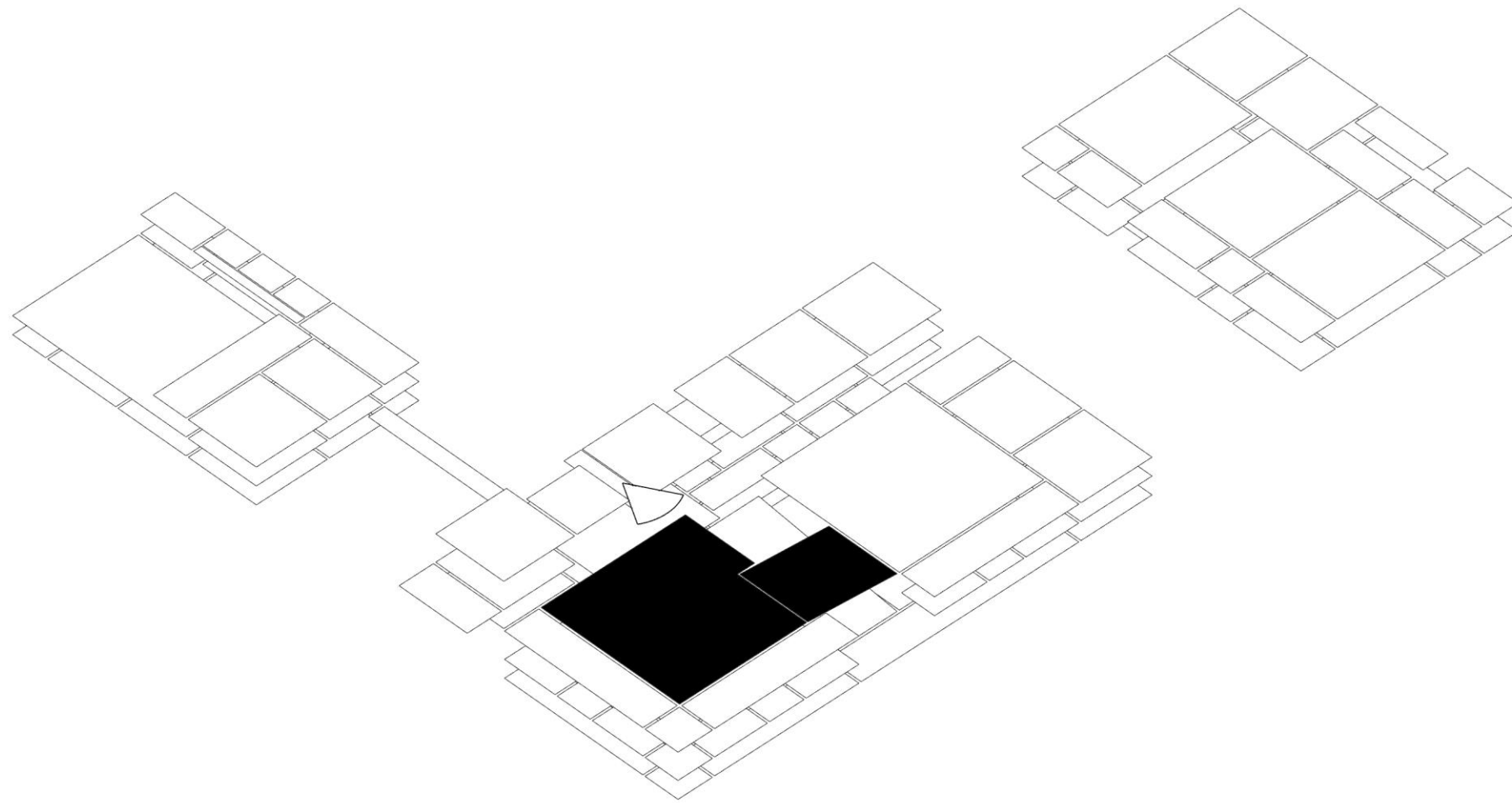
EXIT  
FERRY  
METRO  
PARKING

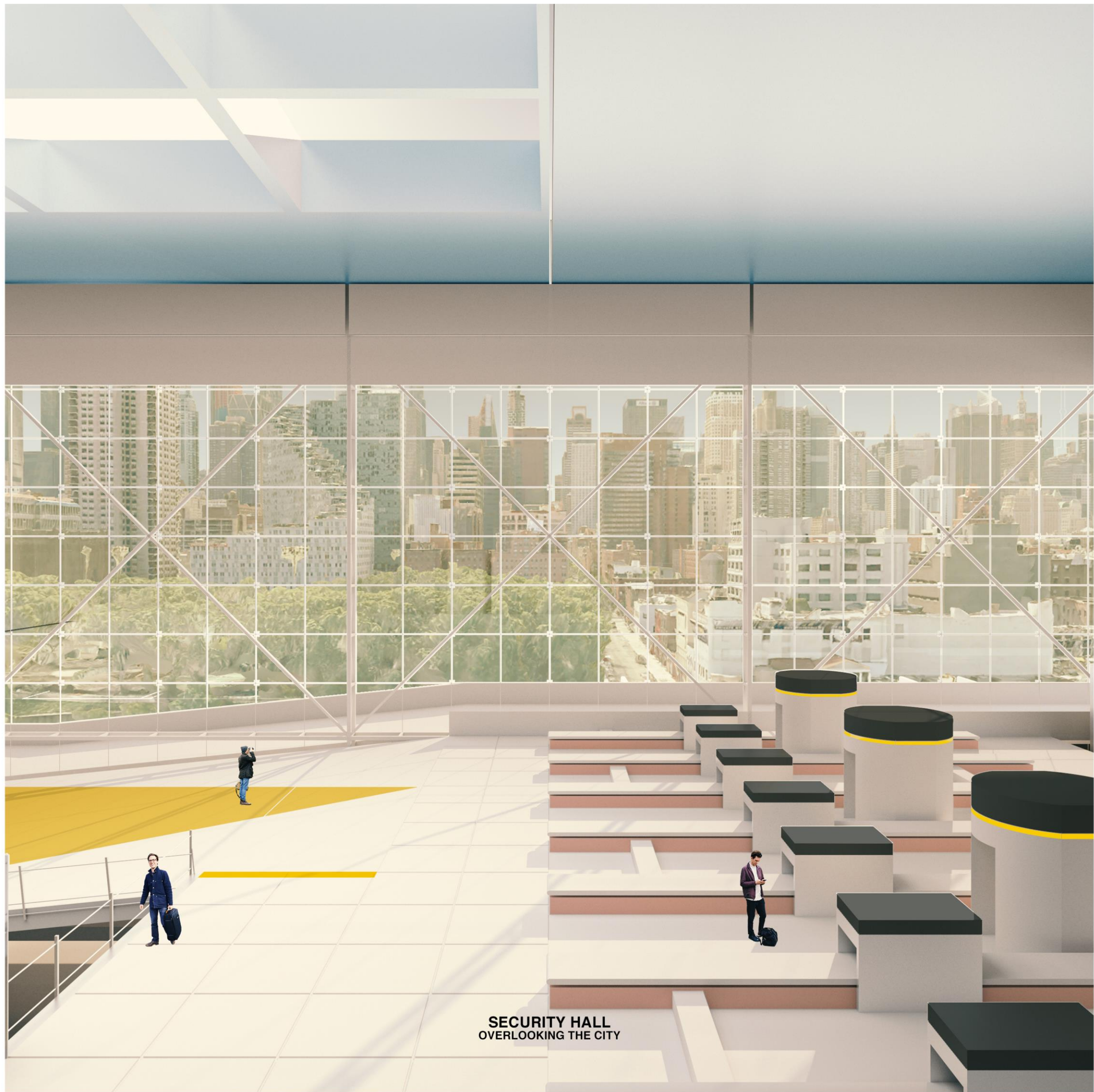
Carnival

Carnival

CHECK-IN HALL  
WITH COMMERCIAL SPACES

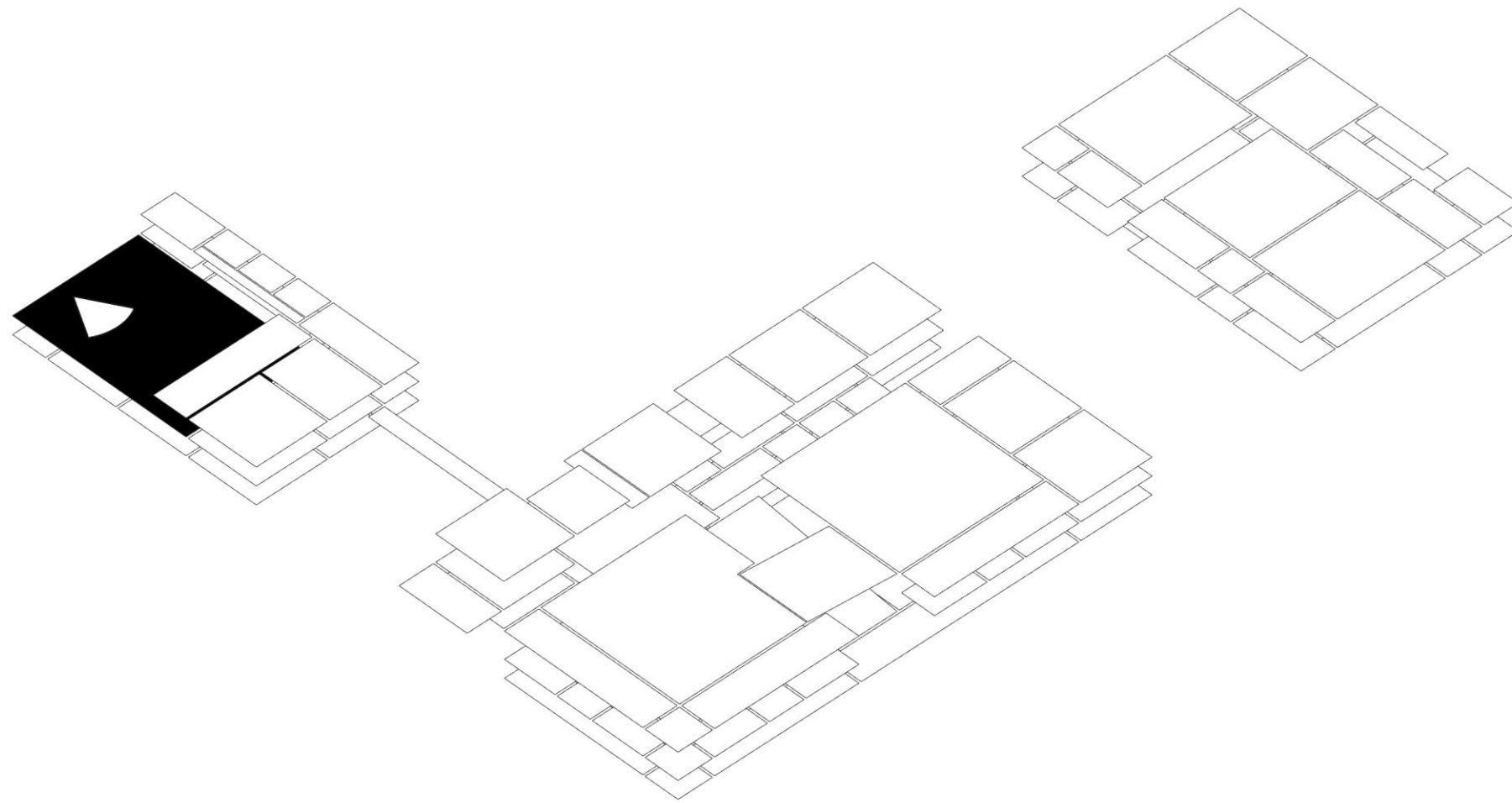






**SECURITY HALL**  
OVERLOOKING THE CITY



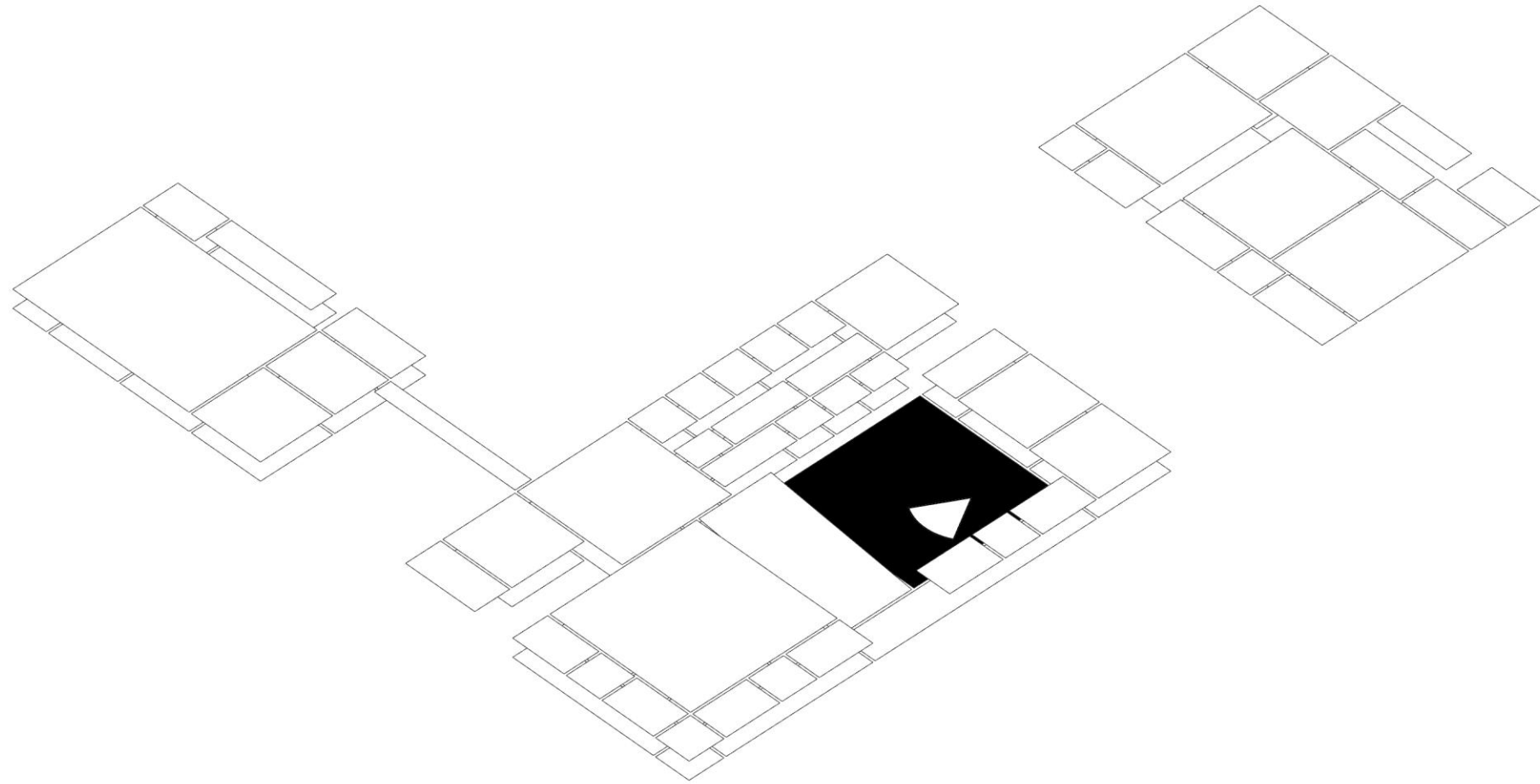




MANHATTAN CRUISE TERMINAL  
HOLDING ROOM

HOLDING ROOM  
WITH SHIPS DOCKING

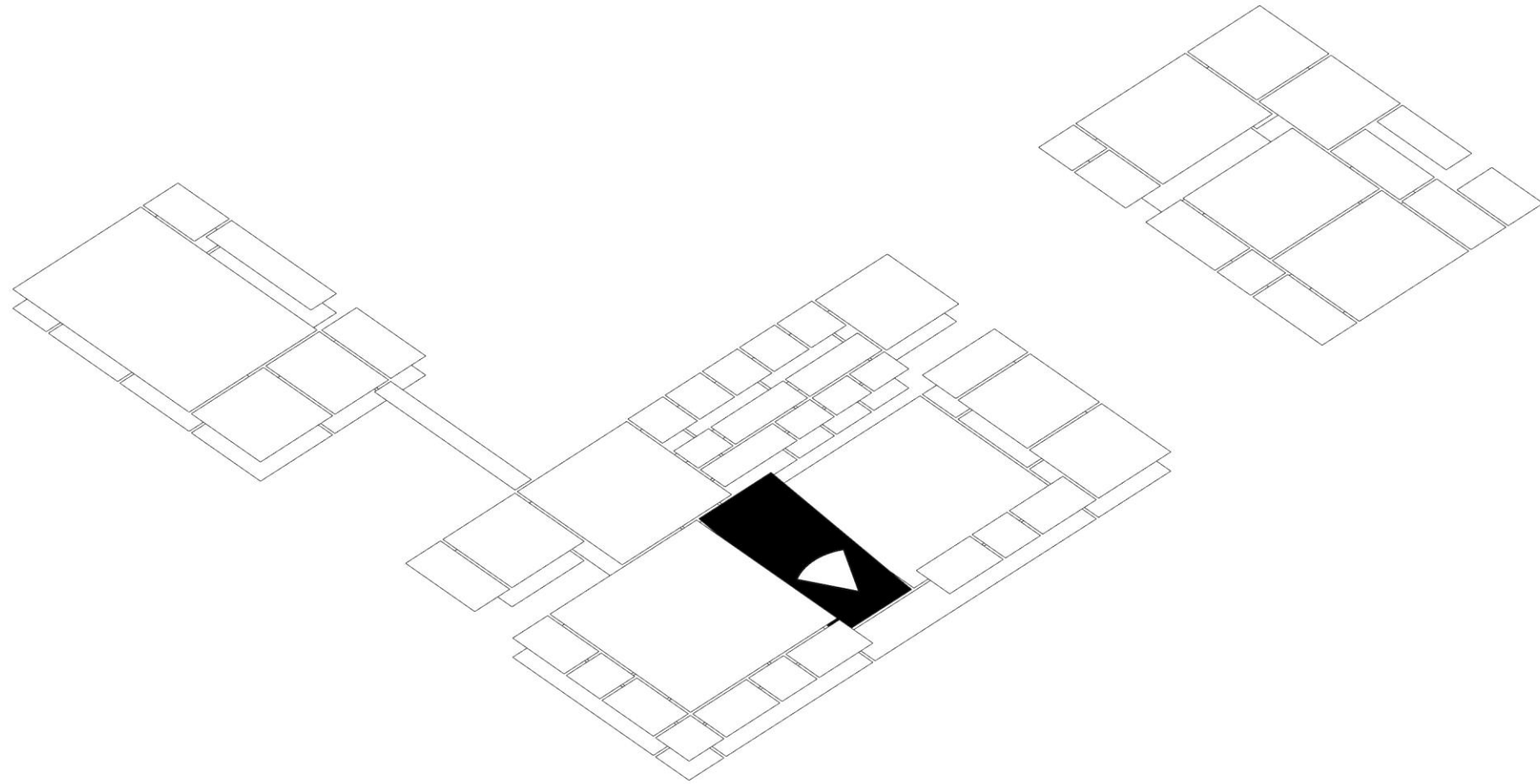






BAGGAGE CLAIM  
LOOKING TOWARDS THE RAMP



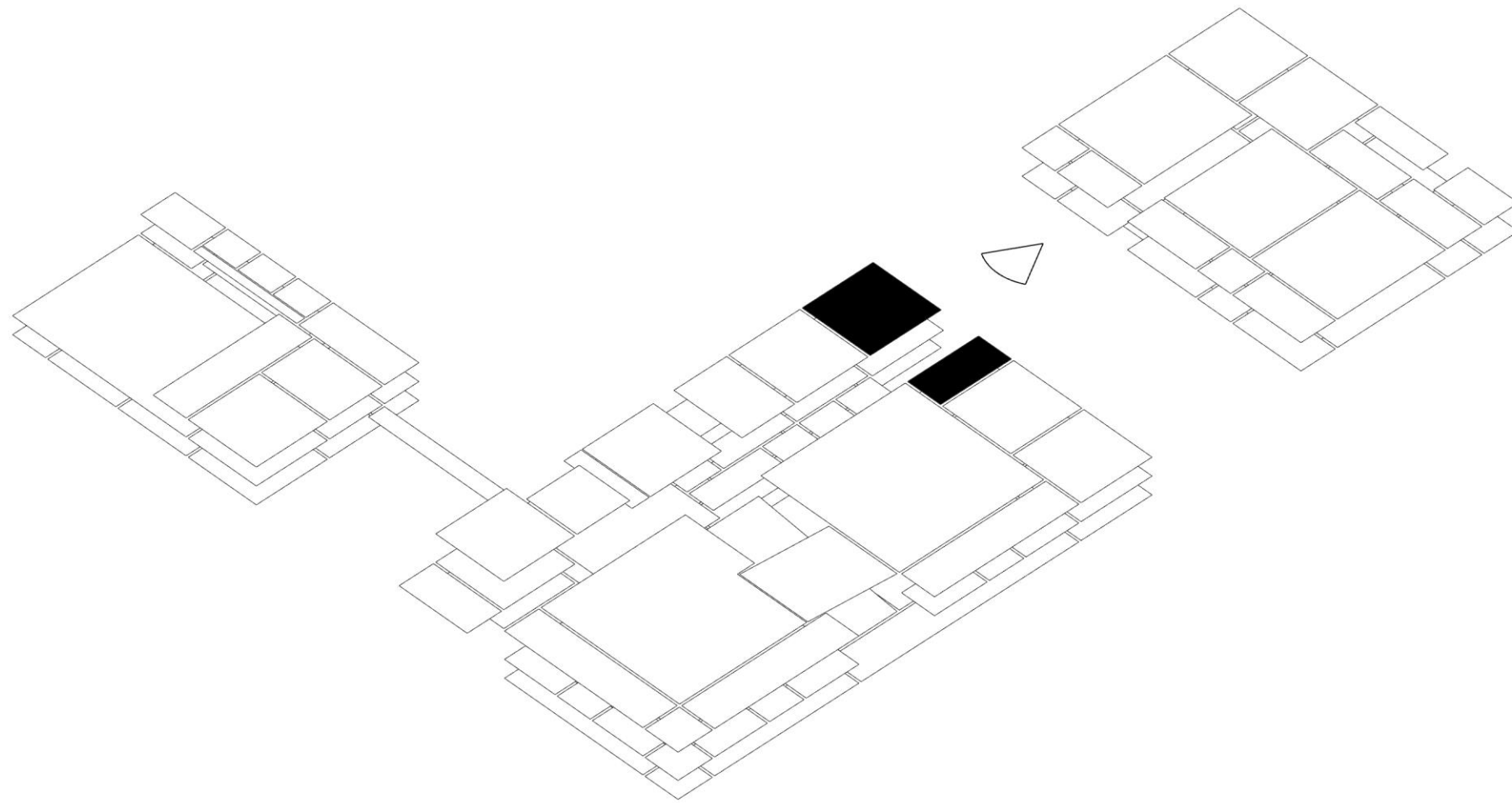




EVENT VENUE  
HOLDING ROOM ▶

RAMP  
TO THE EVENT VENUE







CONNECTION BRIDGE  
CRUISE TERMINAL ↔ STUDIOS



MANHATTAN  
CRUISE  
TERMINAL



IMPLEMENTATION



INTRODUCTION



RESEARCH



CONCEPT



OPERATION



DEVELOPMENT



REFLECTION

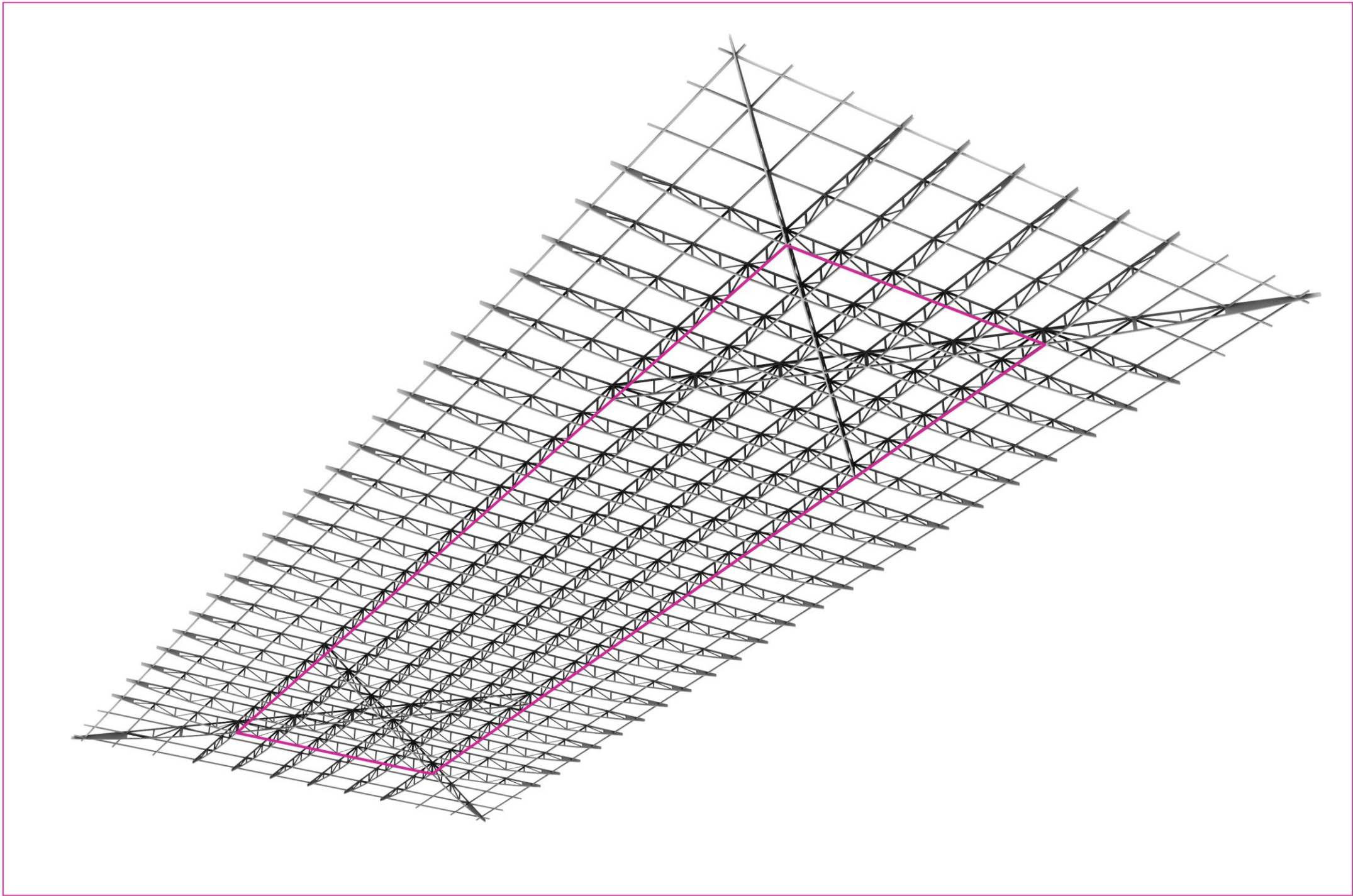


SPACE

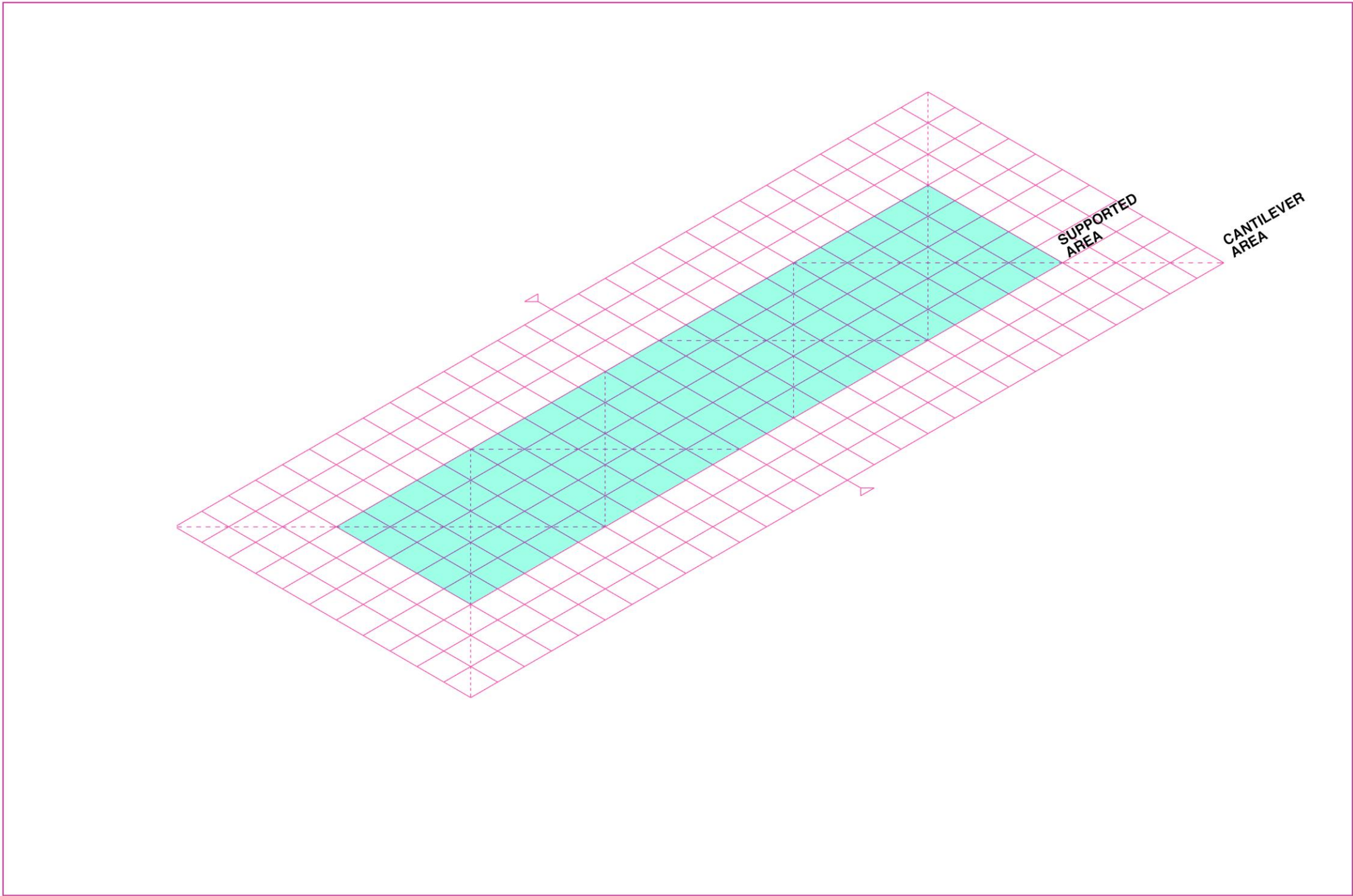


{Construction of Chelsea Piers}





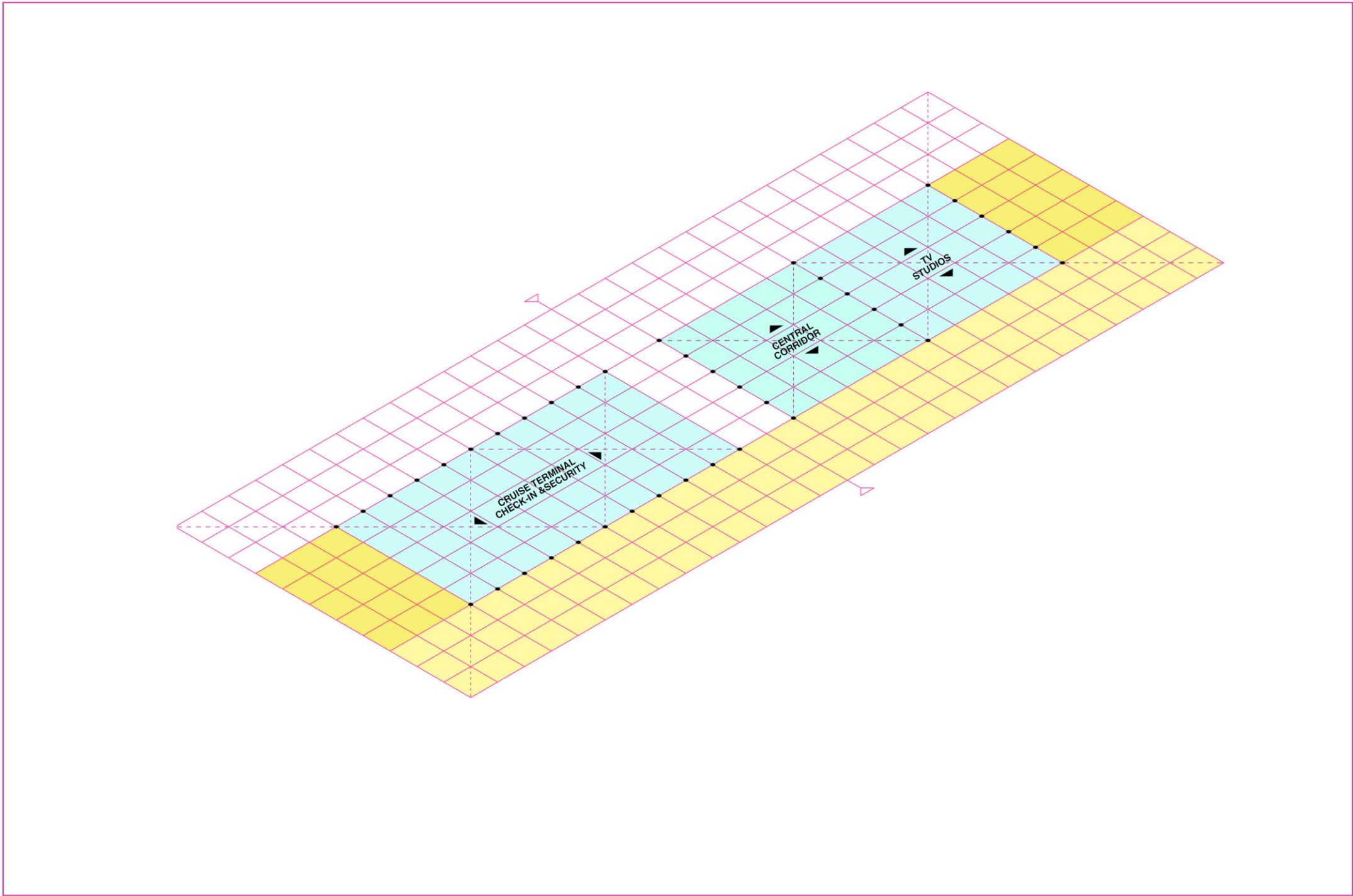
**STRUCTURE:ROOF**  
{PERSPECTIVE FROM BOTTOM}



**CANTILEVER ON 4 EDGES**

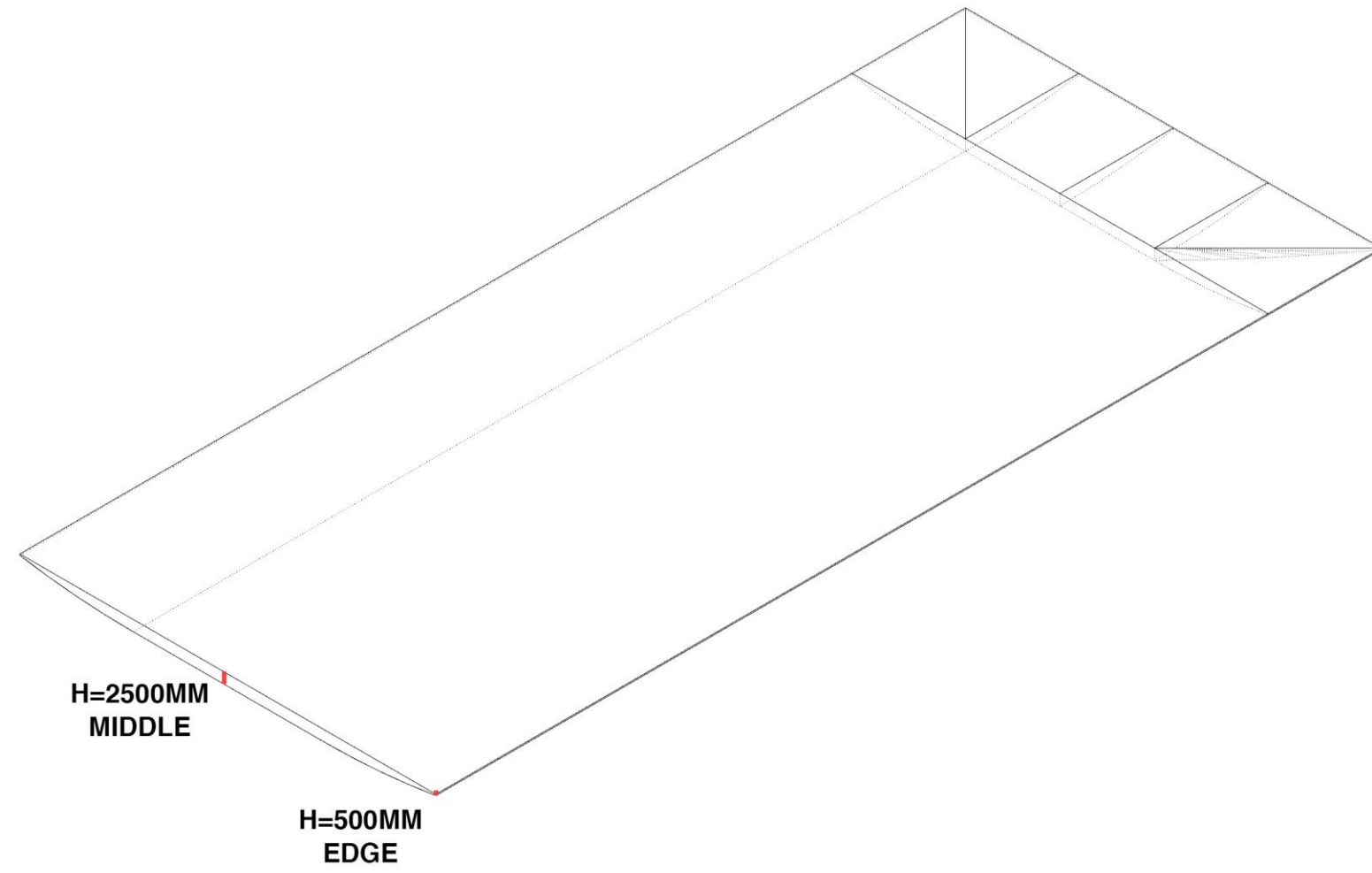
With additional diagonal internal support.





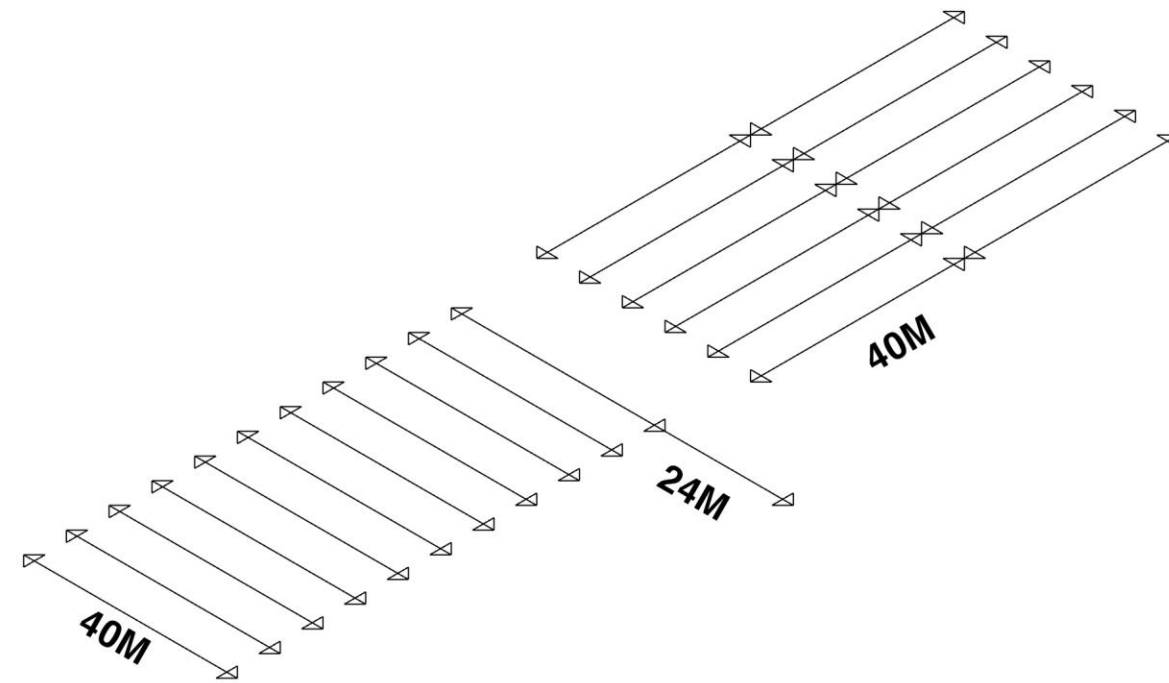
**BIG SPACES-ROOF STRUCTURE**

Cruise terminal, TV studios, central corridor.

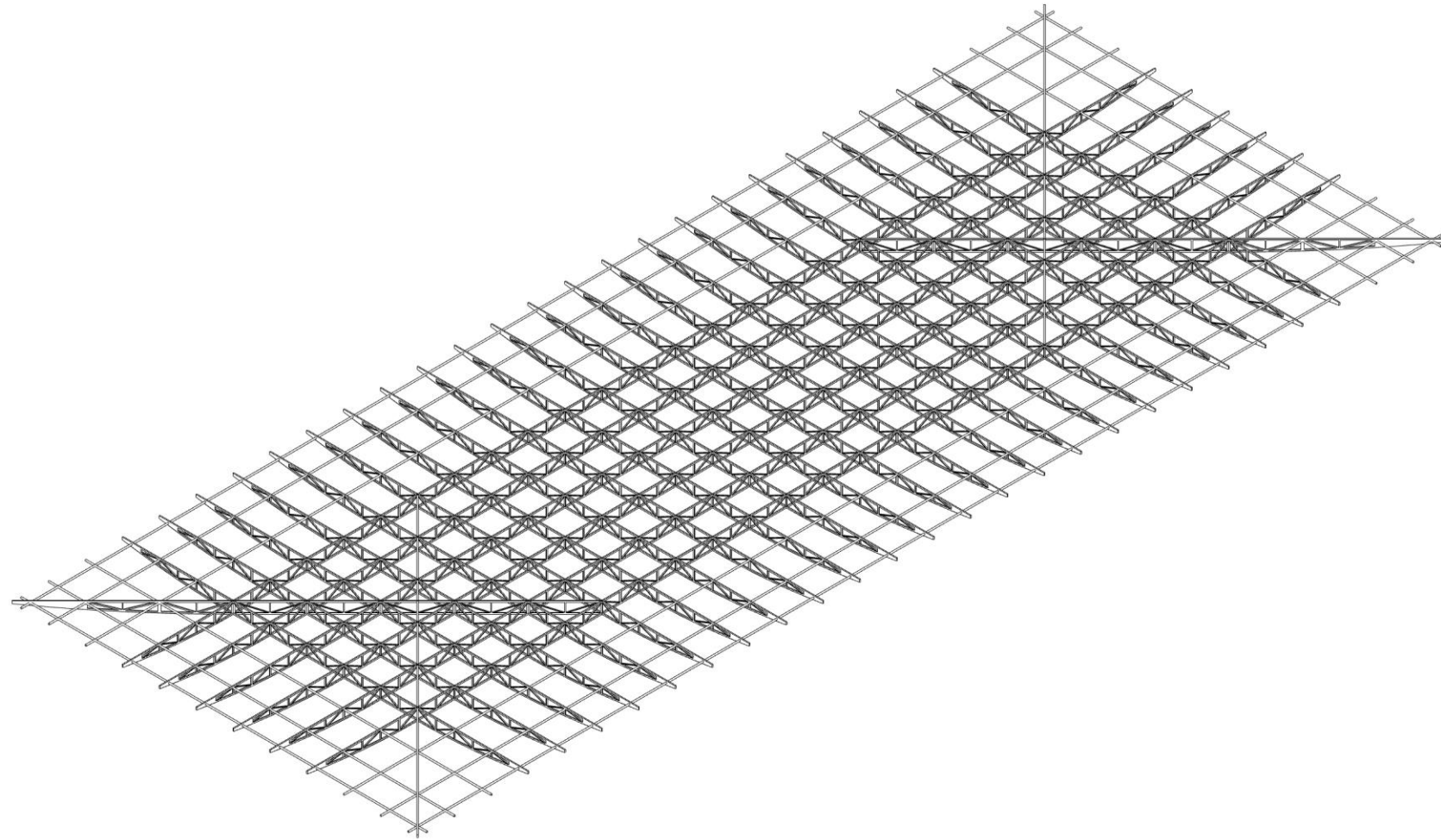


**SECTIONAL HEIGHT**  
2500mm at center, 500mm at edge.



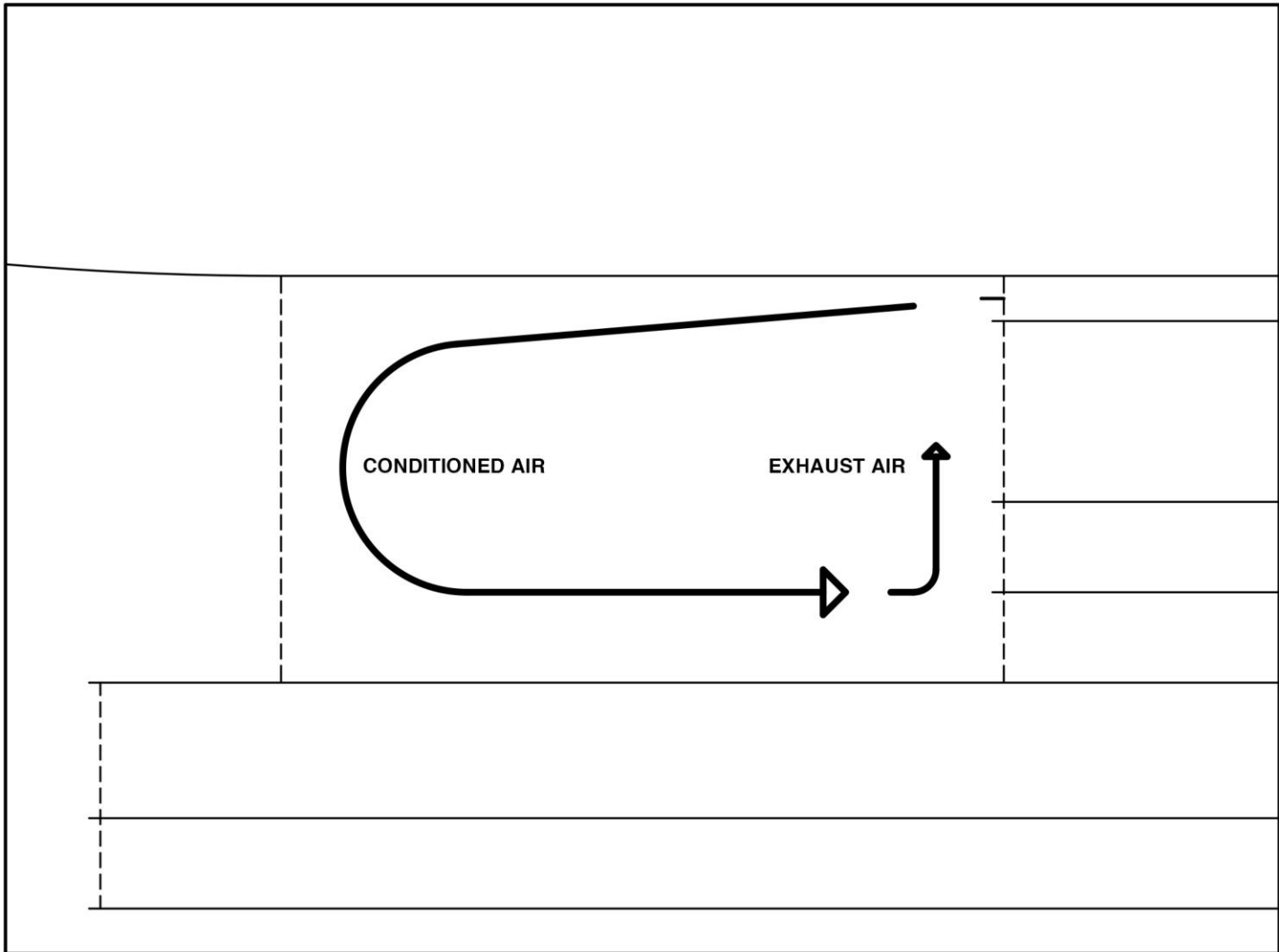


**SPAN/CANTILEVER: SCALE**  
40m span, 24m cantilever.

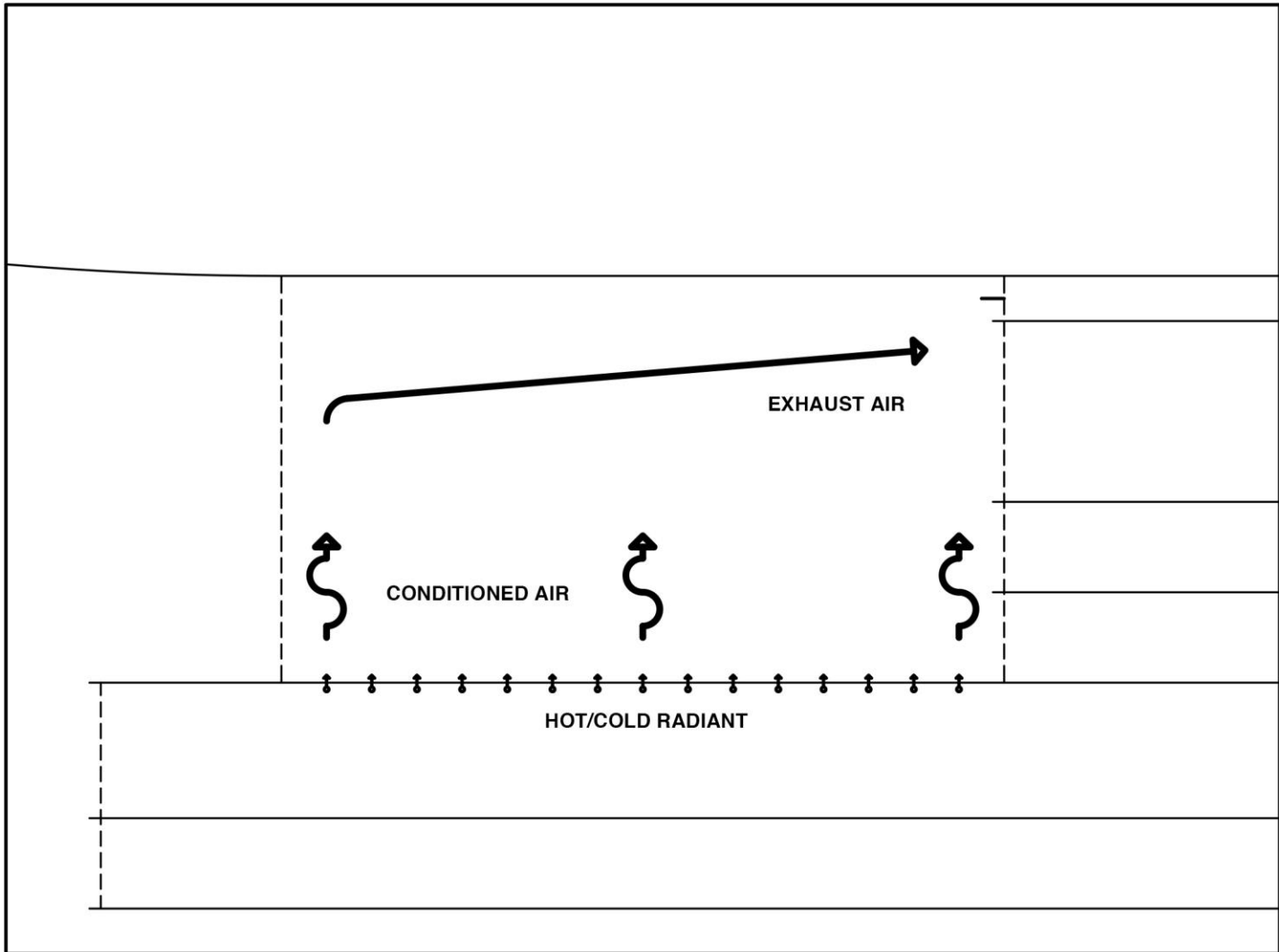


**TRUSS BOX**  
8\*8 meter grid, steel truss.





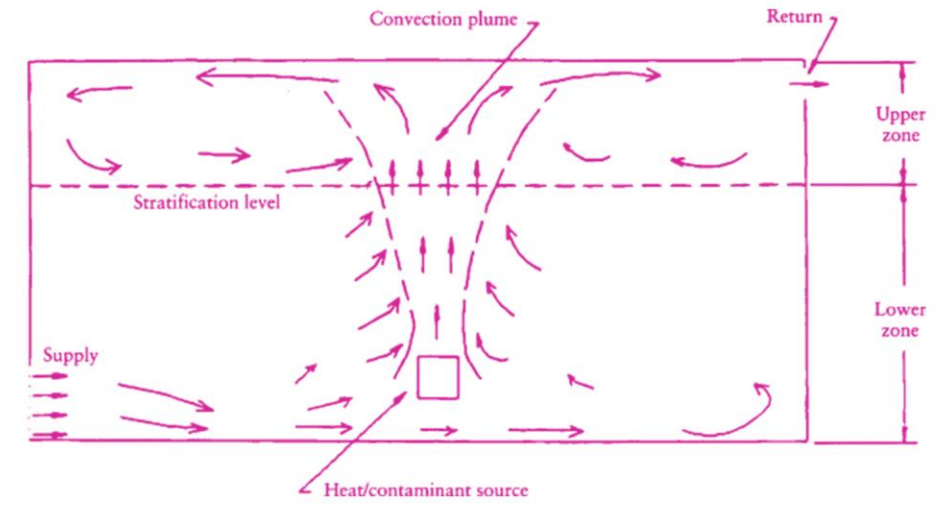
**1-JET NOZZLE**  
FOR VENTILATION, HEATING & COOLING



**2-DISPLACEMENT VENTILATION**  
+  
**RADIANT FLOOR**

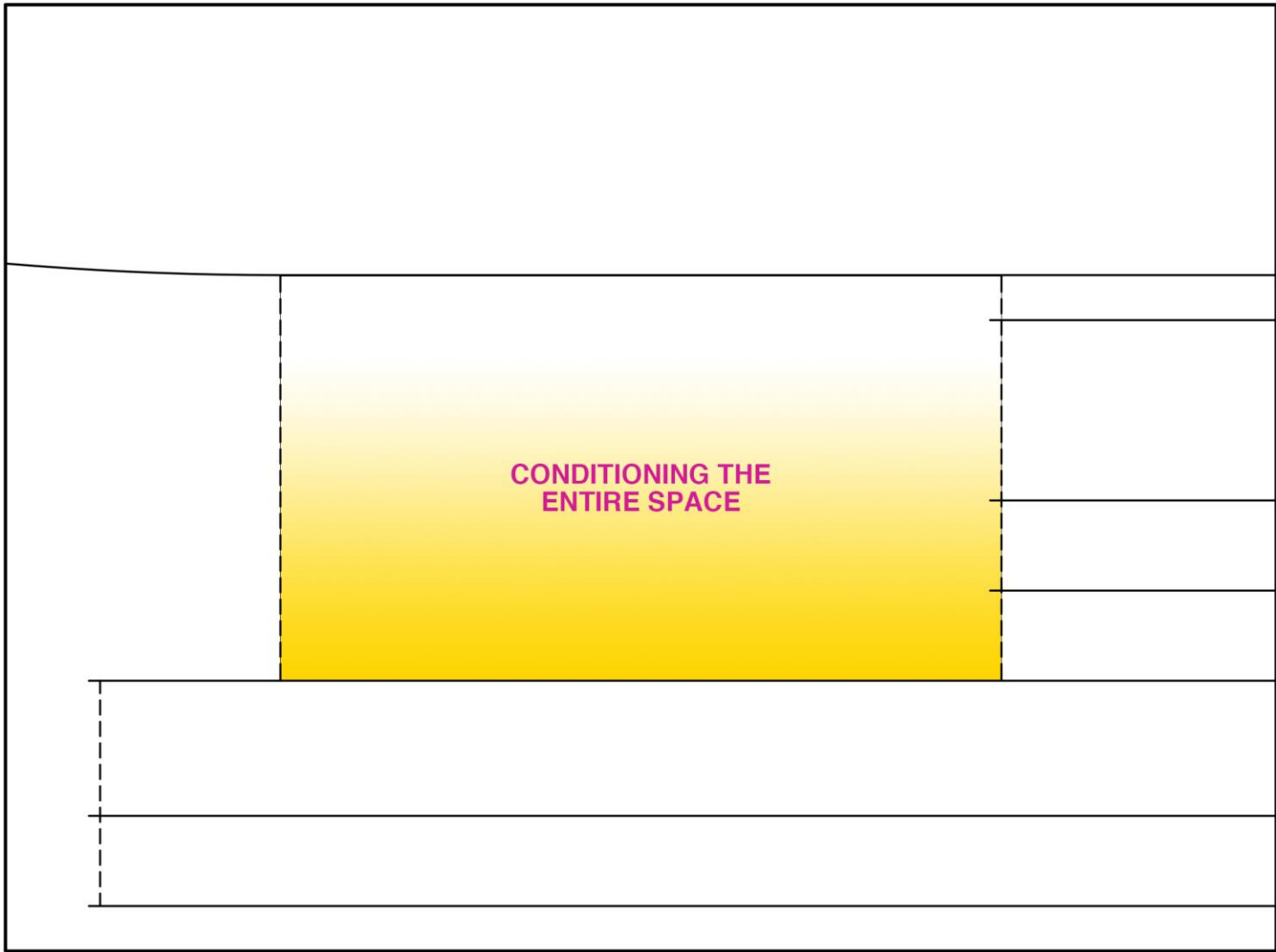


**1-JET NOZZLE**  
FOR VENTILATION, HEATING & COOLING

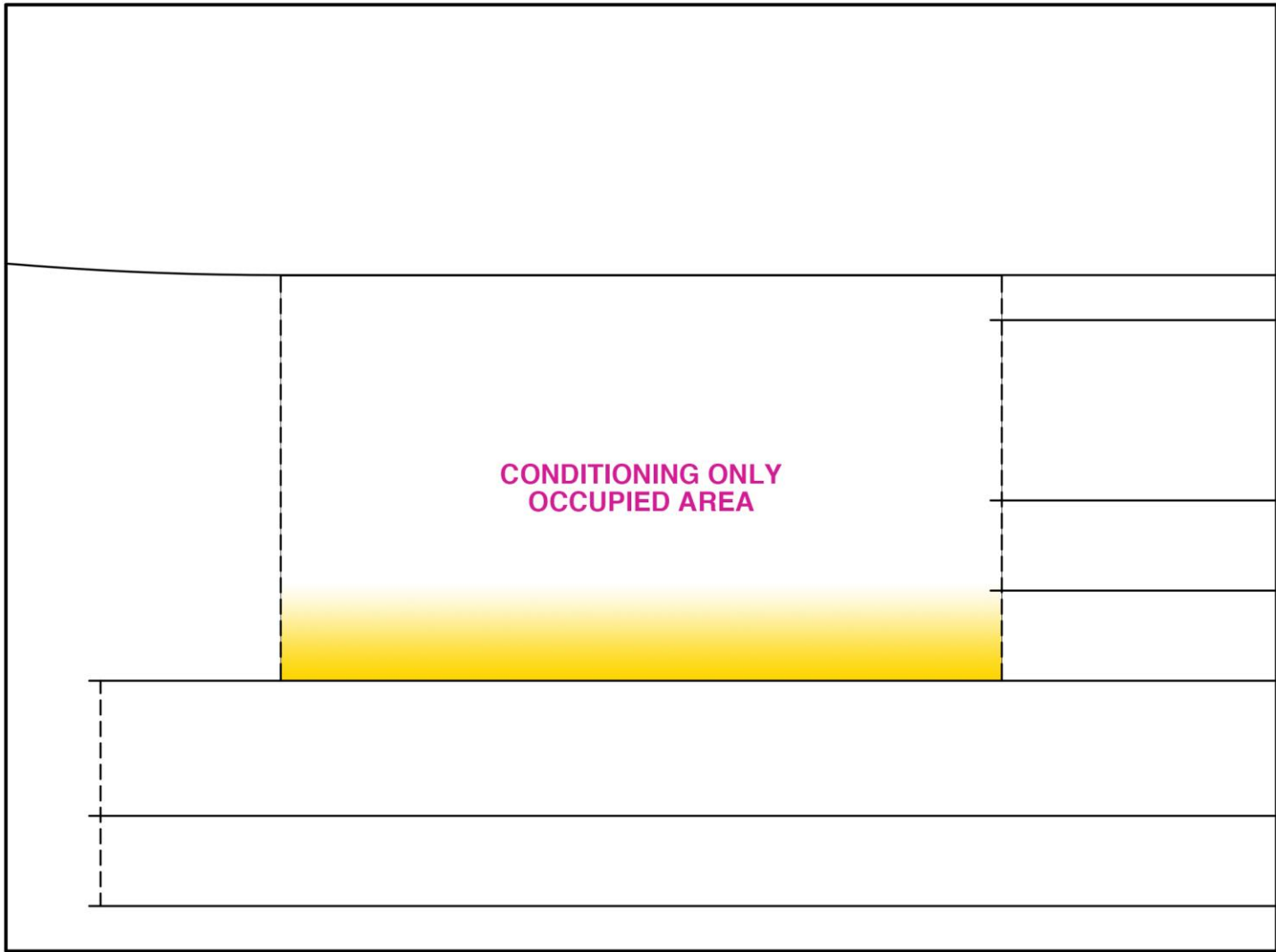


**2-DISPLACEMENT VENTILATION**  
+  
**RADIANT FLOOR**

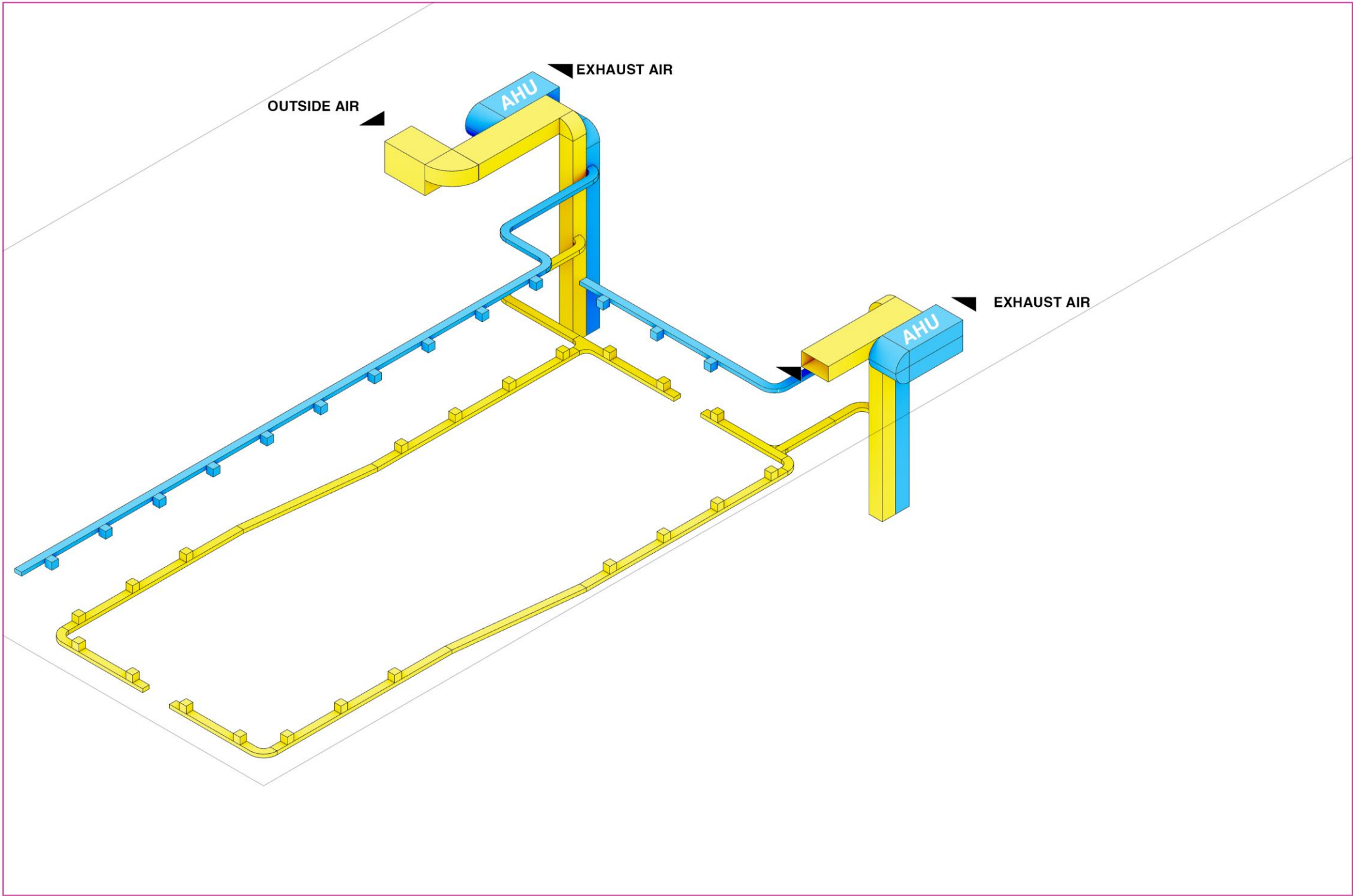




**1-JET NOZZLE**  
FOR VENTILATION, HEATING & COOLING

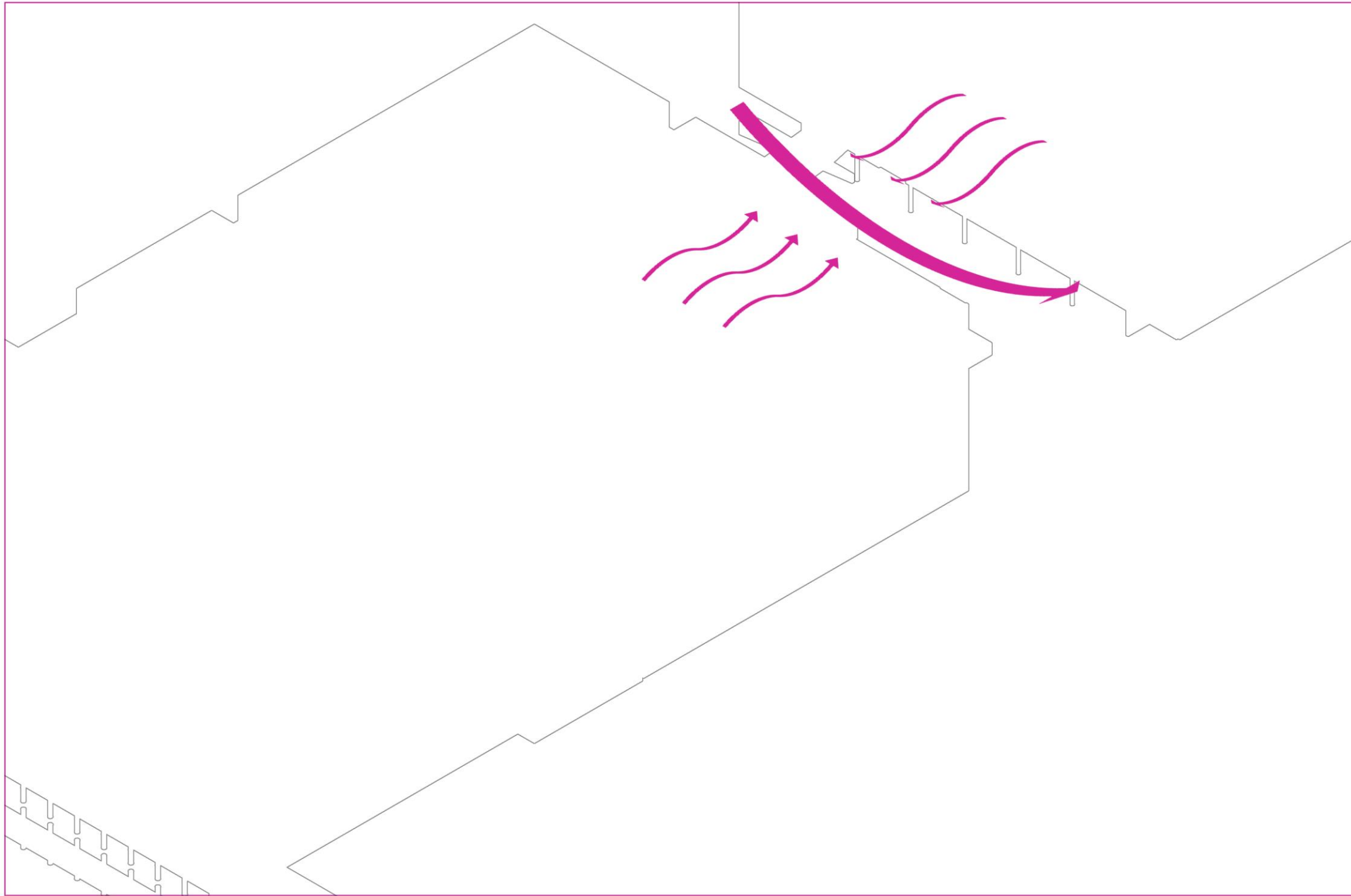


**2-DISPLACEMENT VENTILATION**  
+  
**RADIANT FLOOR**



**AIR CONDITION SYSTEM**  
Air handling units & duct work.  
Cooling/heating supply is not shown in the image.





**PASSIVE VENTILATION**  
Creating vacuum zone.

**INTERSEASONAL  
HVAC SCHEME**  
(COOLING DEMANDS>HEATING DEMANDS)

**SUMMER**

**COLD SOURCE: GEOTHERMAL HEAT PUMP**

COLD WATER SUPPLIED TO  
**1 ROOF SOLAR ENERGY COLLECTING**  
**2 RADIANT FLOOR**  
**3 AIR HANDLING UNITS**

**HEAT IS TRANSFERRED TO THE  
UNDERGROUND COLLECTOR**

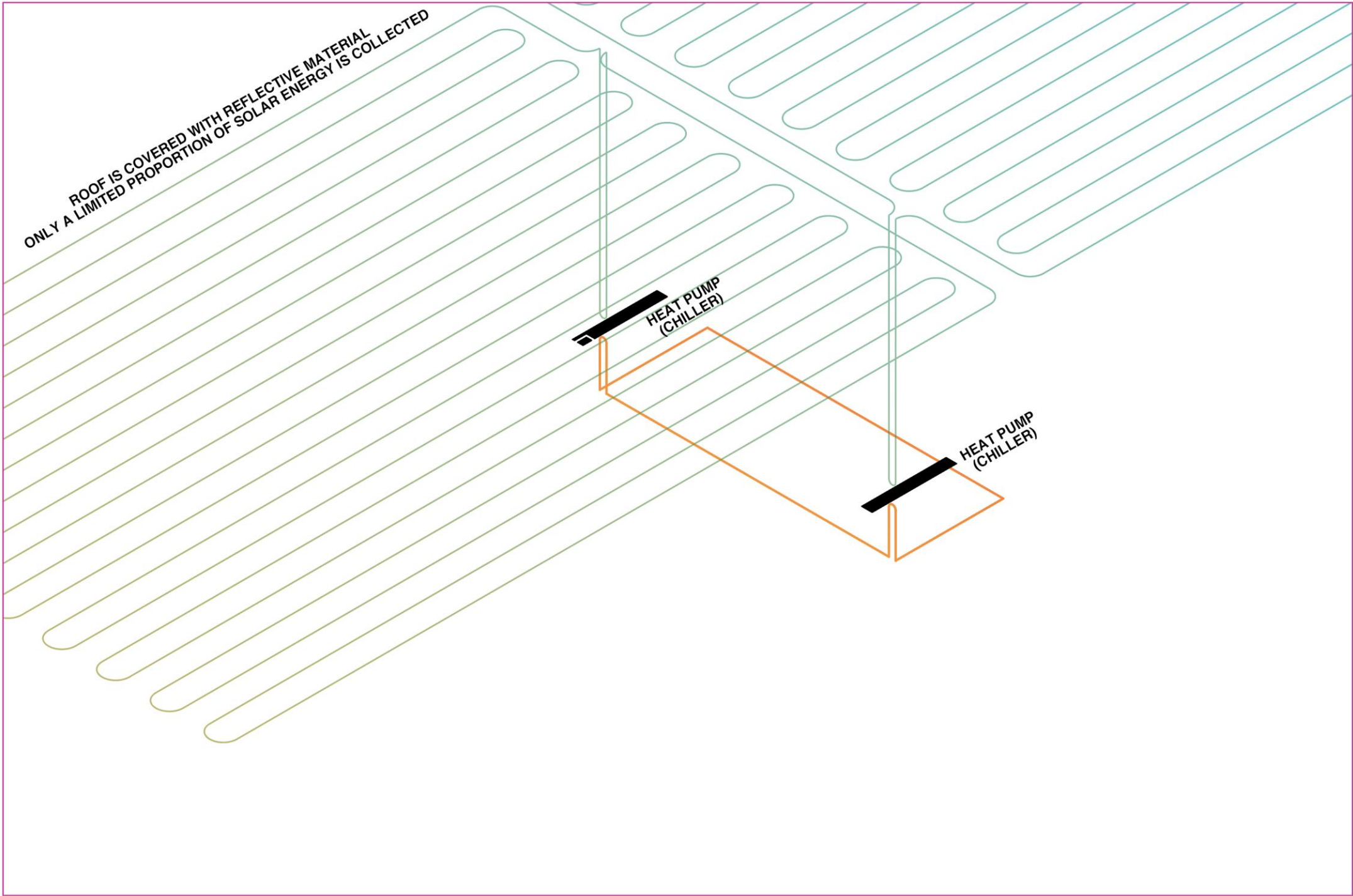
**WINTER**

**HEAT SOURCE: GEOTHERMAL HEAT PUMP  
+ DISTRICT HEATING  
(No Dedicated Boiler)**

HOT WATER SUPPLIED TO  
**1 ROOF SNOW REMOVAL**  
**2 RADIANT FLOOR**  
**3 AIR HANDLING UNITS**

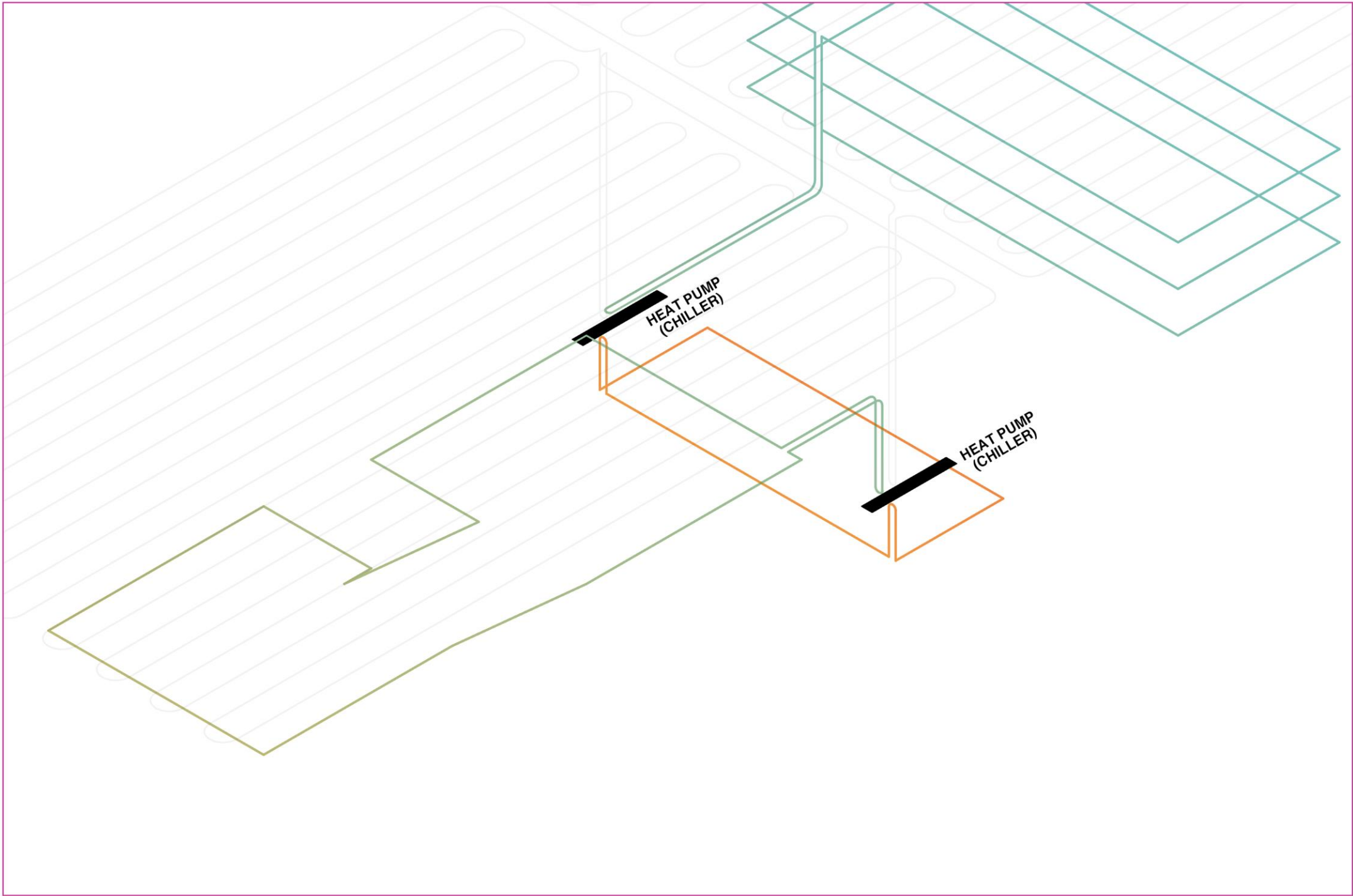
**HEAT IS TRANSFERRED FROM THE  
UNDERGROUND COLLECTOR**





**GEOHERMAL HEAT PUMP + SOLAR ENERGY STORAGE**

SUMMER-COOLING



**GEOHERMAL HEAT PUMP + RADIANT FLOOR**

SUMMER-COOLING





HEADHOUSE OF OLD  
CHELSEA PIERS



<

TRANSLUCENT/TRANSPARENT

>

<

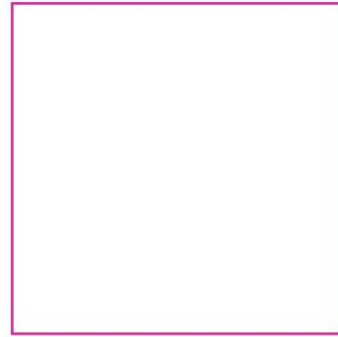
SOLID

>

<

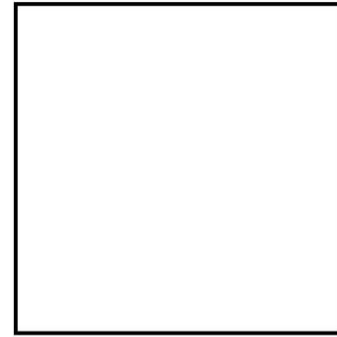
REFLECTIVE

>



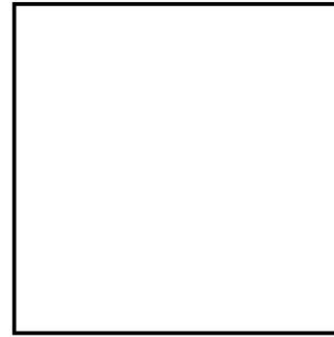
1-1  
CABLE NET  
CURTAIN WALL  
/

/EXTERIOR



1-2  
HIDDEN FRAMING  
CURTAIN WALL  
/

/EXTERIOR



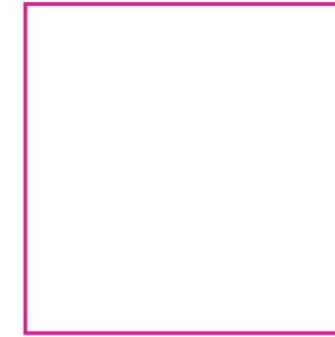
1-2  
CORRUGATED  
PLASTIC PANELS  
/

/INTERIOR



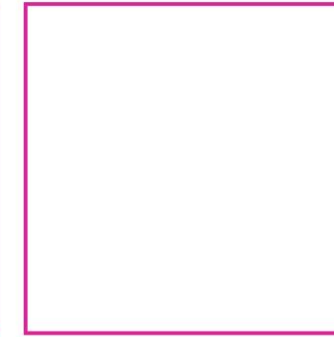
2-1  
CERAMIC PANEL  
/

/EXTERIOR



3-1  
ALUMINIUM PANEL  
[IN BRONZE]  
/

/EXTRIOR  
/INTERIOR  
/BRIDGES

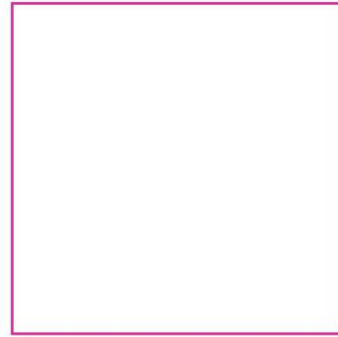


3-2  
ALUMINIUM PANEL  
[IN BLUE]  
/

/ROOF

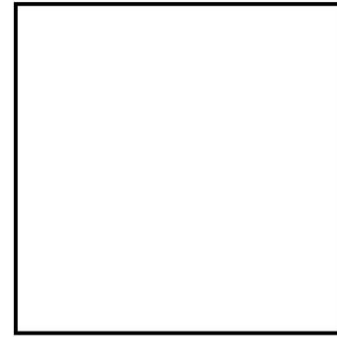


< TRANSLUCENT/TRANSPARENT > < SOLID > < REFLECTIVE >



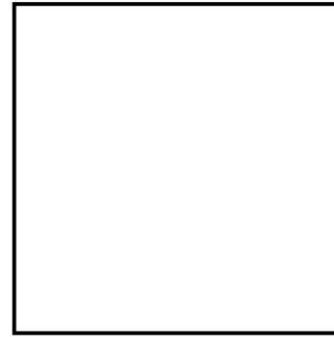
1-1  
CABLE NET  
CURTAIN WALL  
/

/EXTERIOR



1-2  
HIDDEN FRAMING  
CURTAIN WALL  
/

/EXTERIOR



1-2  
CORRUGATED  
PLASTIC PANELS  
/

/INTERIOR



2-1  
CERAMIC PANEL  
/

/EXTERIOR



3-1  
ALUMINIUM PANEL  
[IN BRONZE]  
/

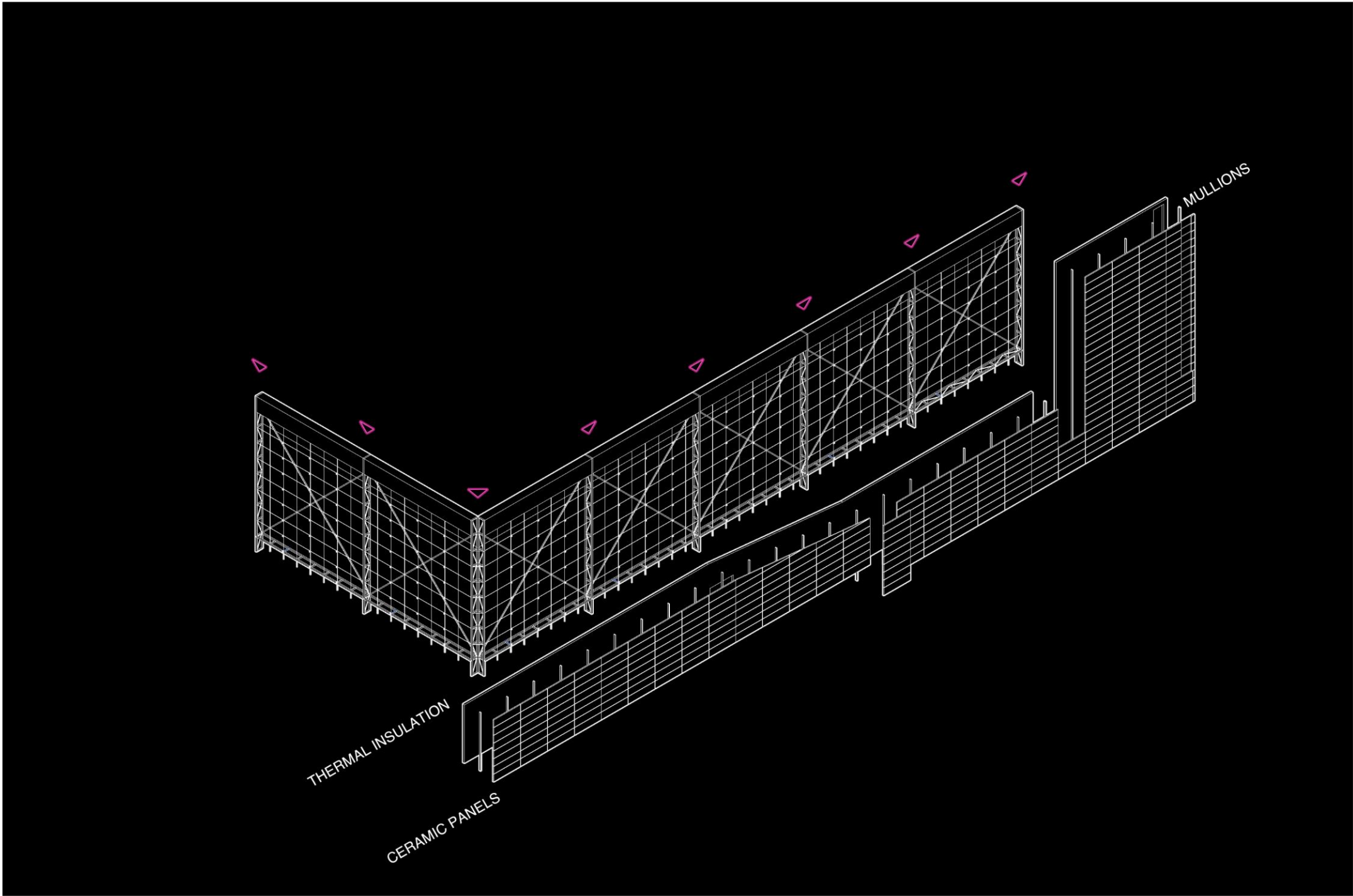
/EXTRIOR  
/INTERIOR  
/BRIDGES



3-2  
ALUMINIUM PANEL  
[IN BLUE]  
/

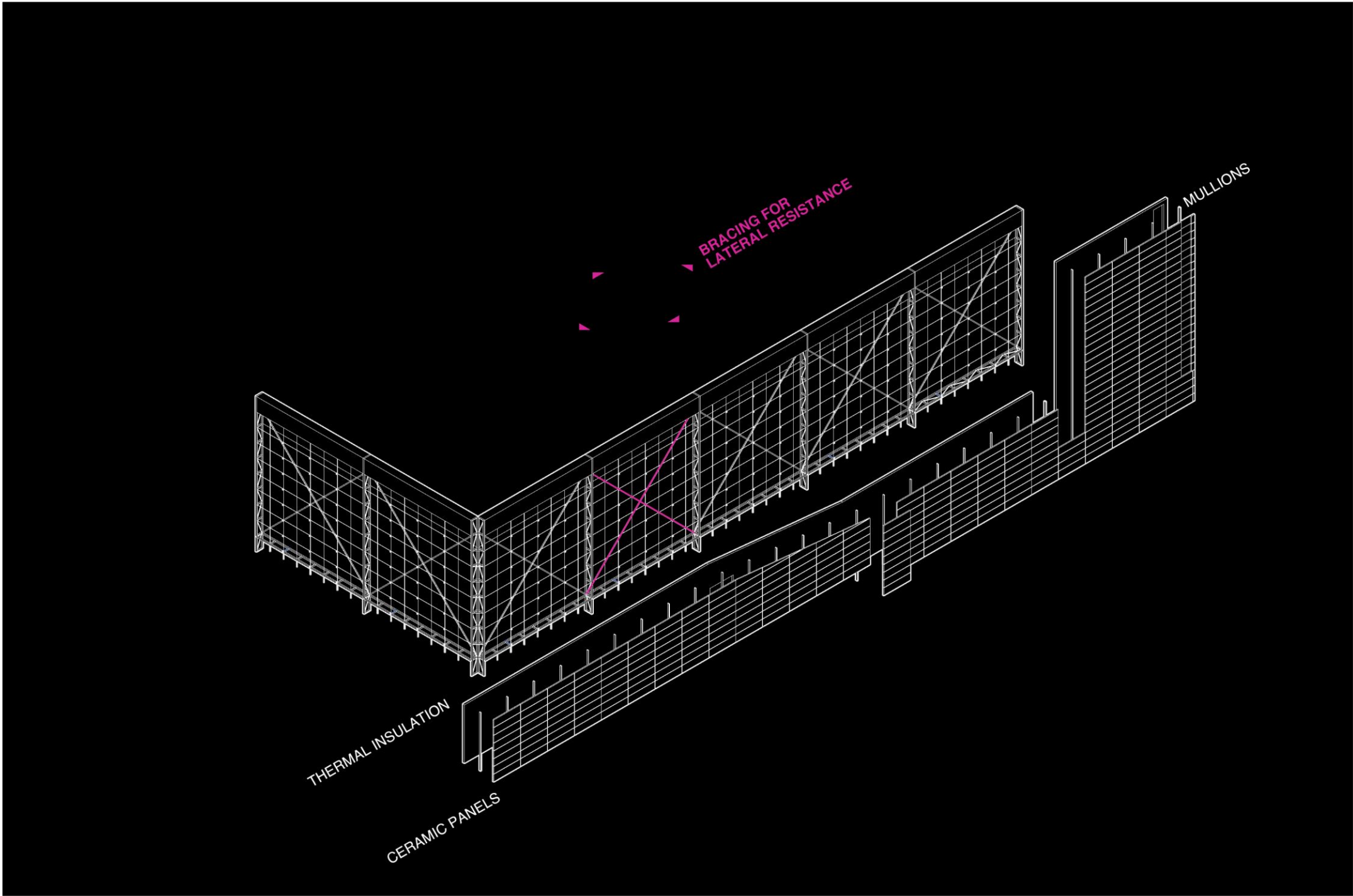
/ROOF



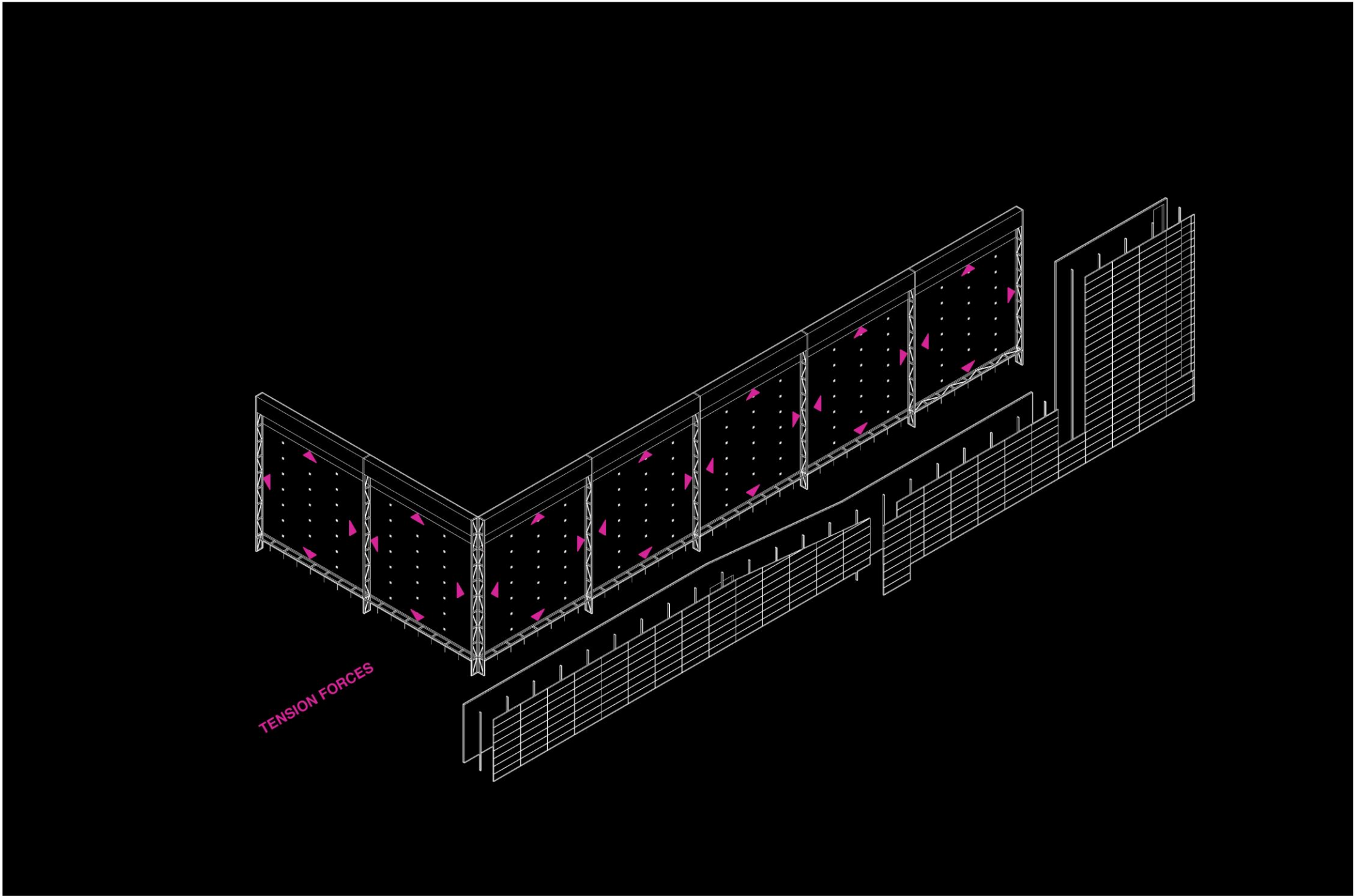


**DETAIL**  
LOAD-BEARING FACADE



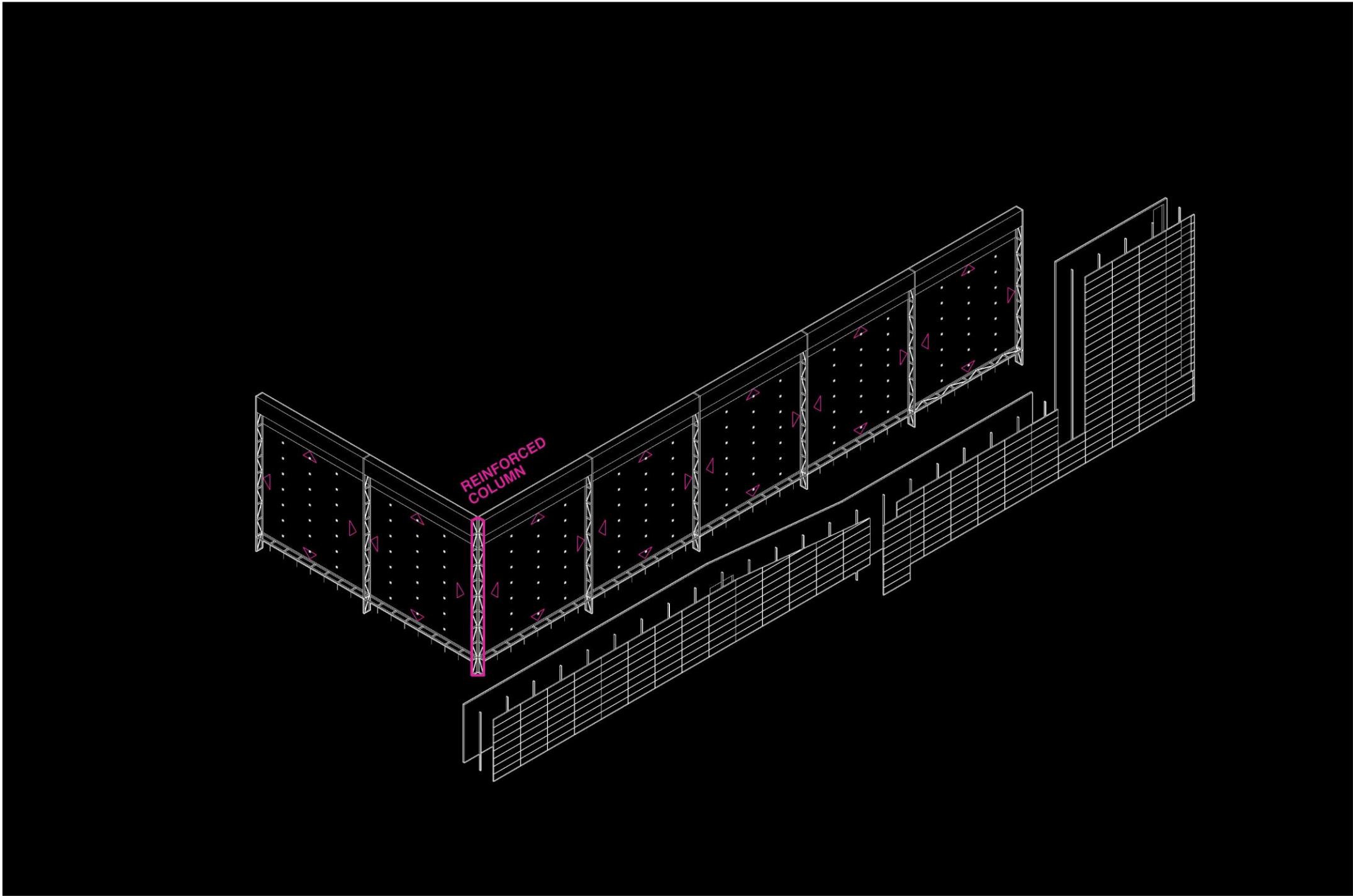


DETAIL  
BRACING

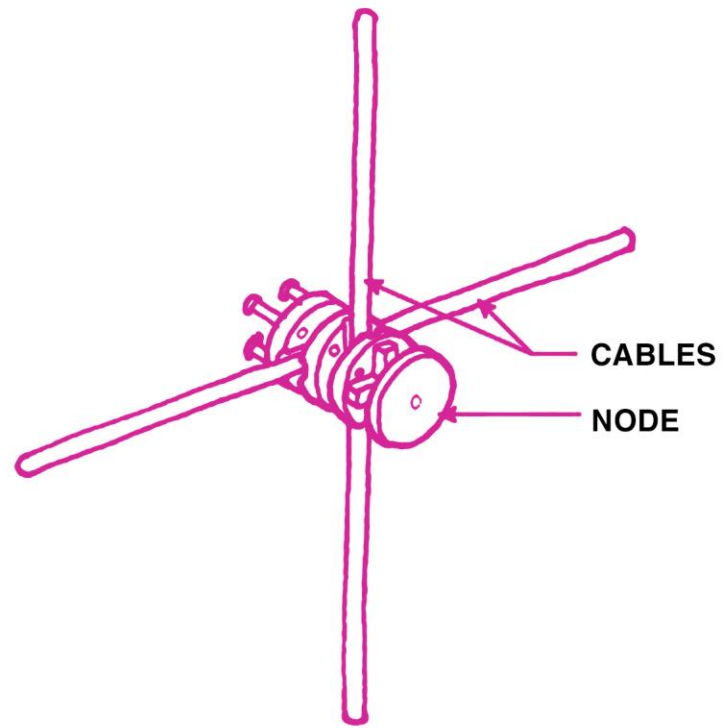


DETAIL  
PRE-TENSIONED CABLES

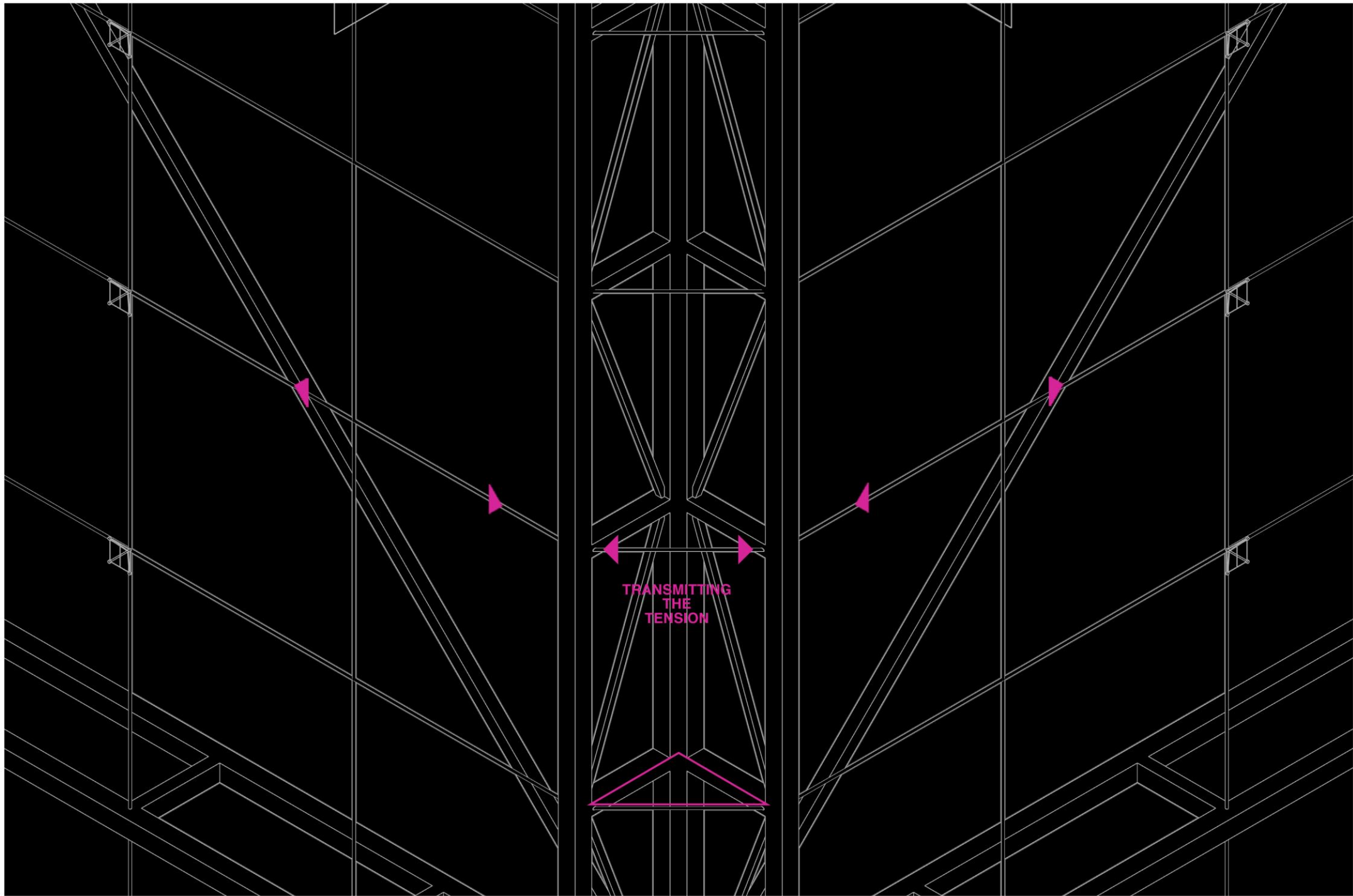




DETAIL  
CORNER REINFORCEMENT



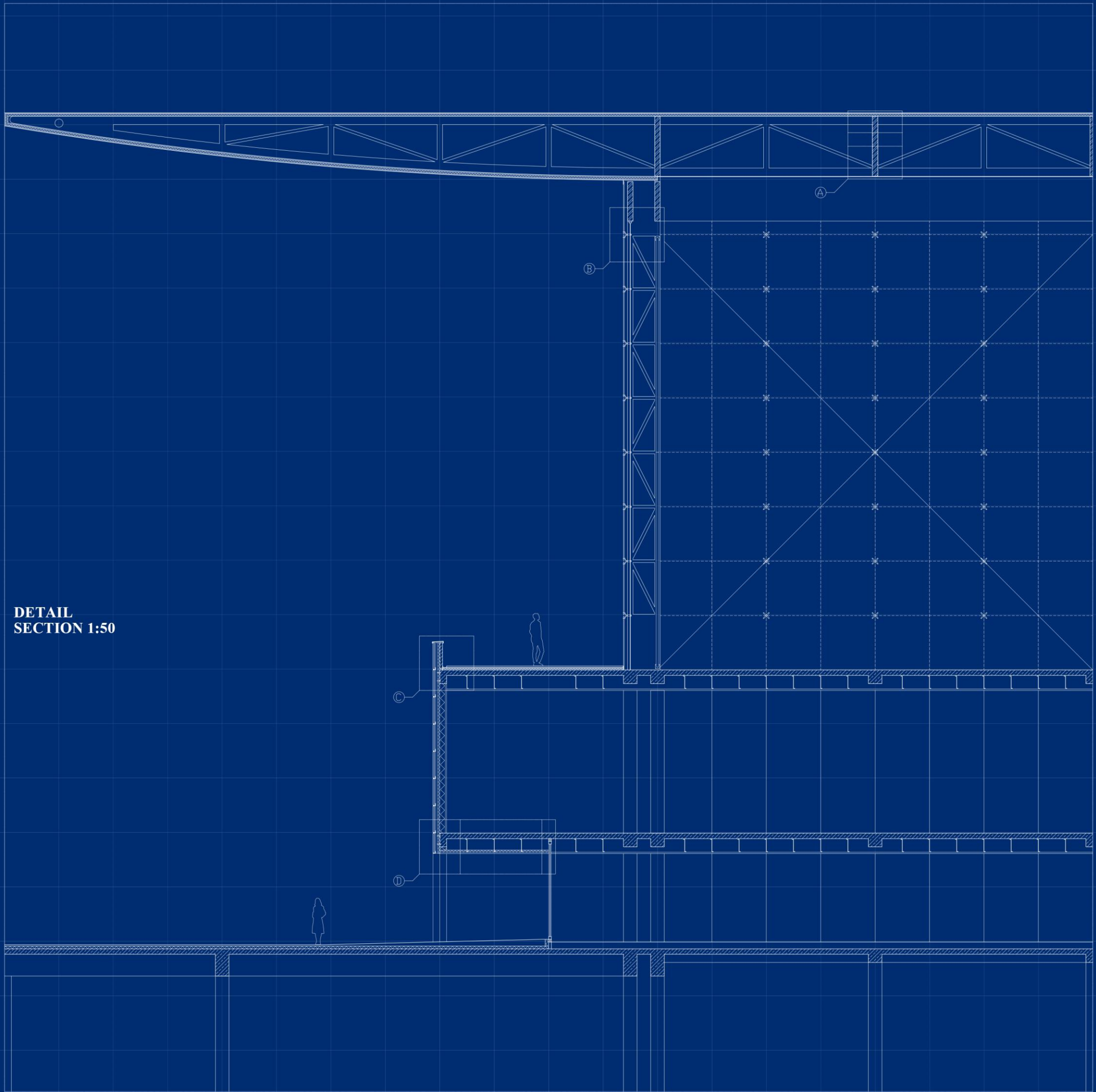




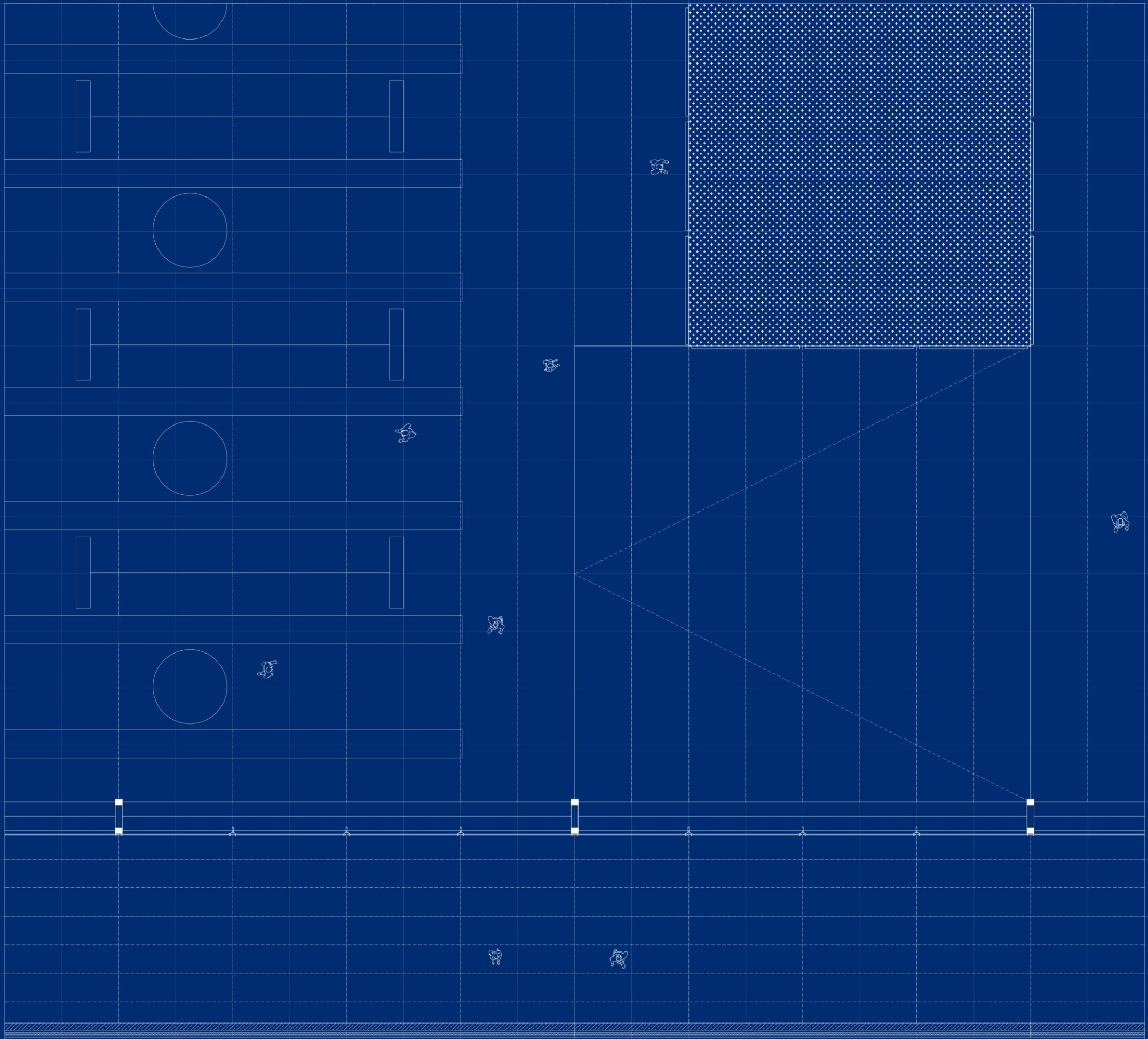
**DETAIL**  
**CORNER REINFORCEMENT**







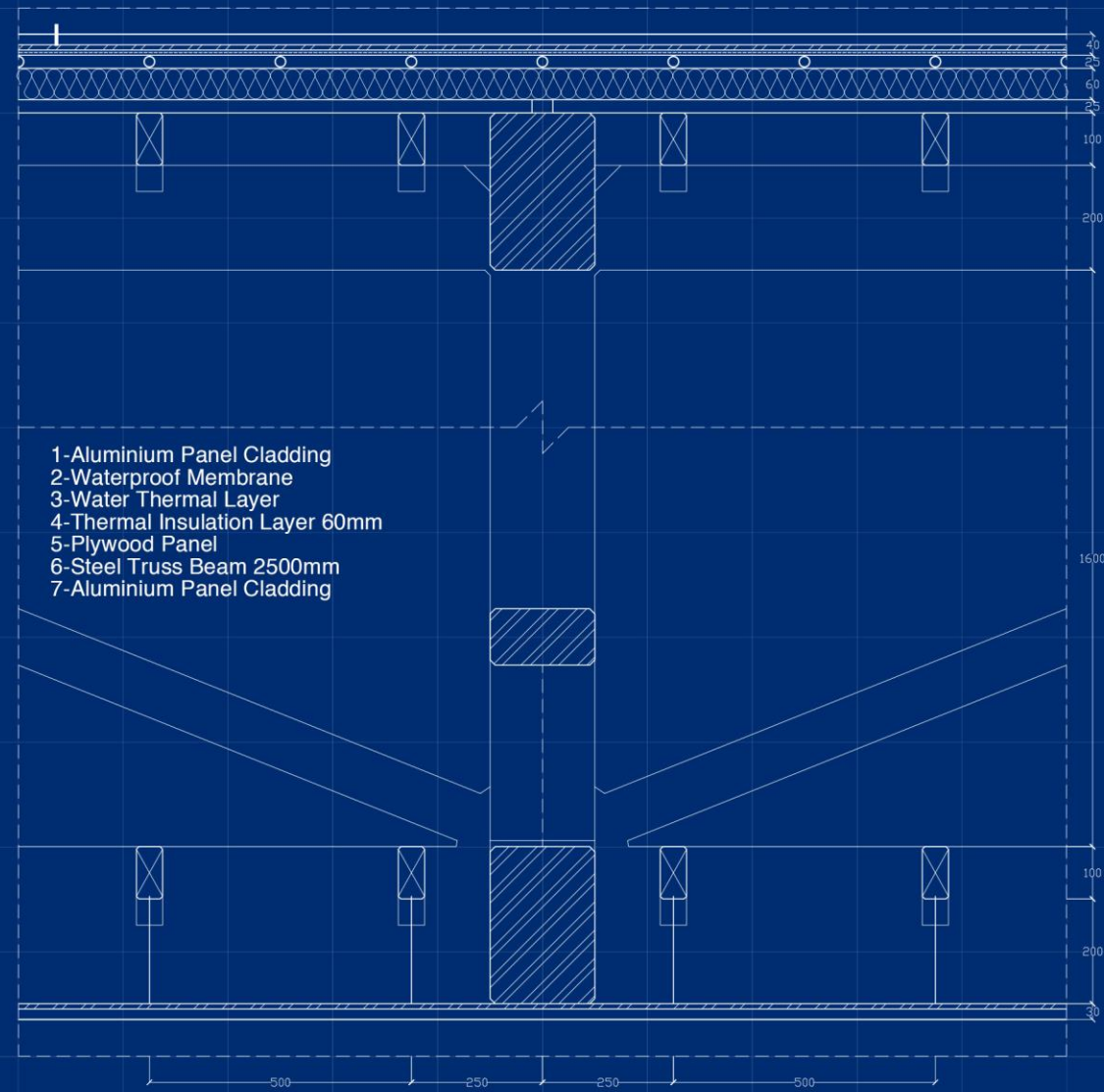
**DETAIL  
SECTION 1:50**



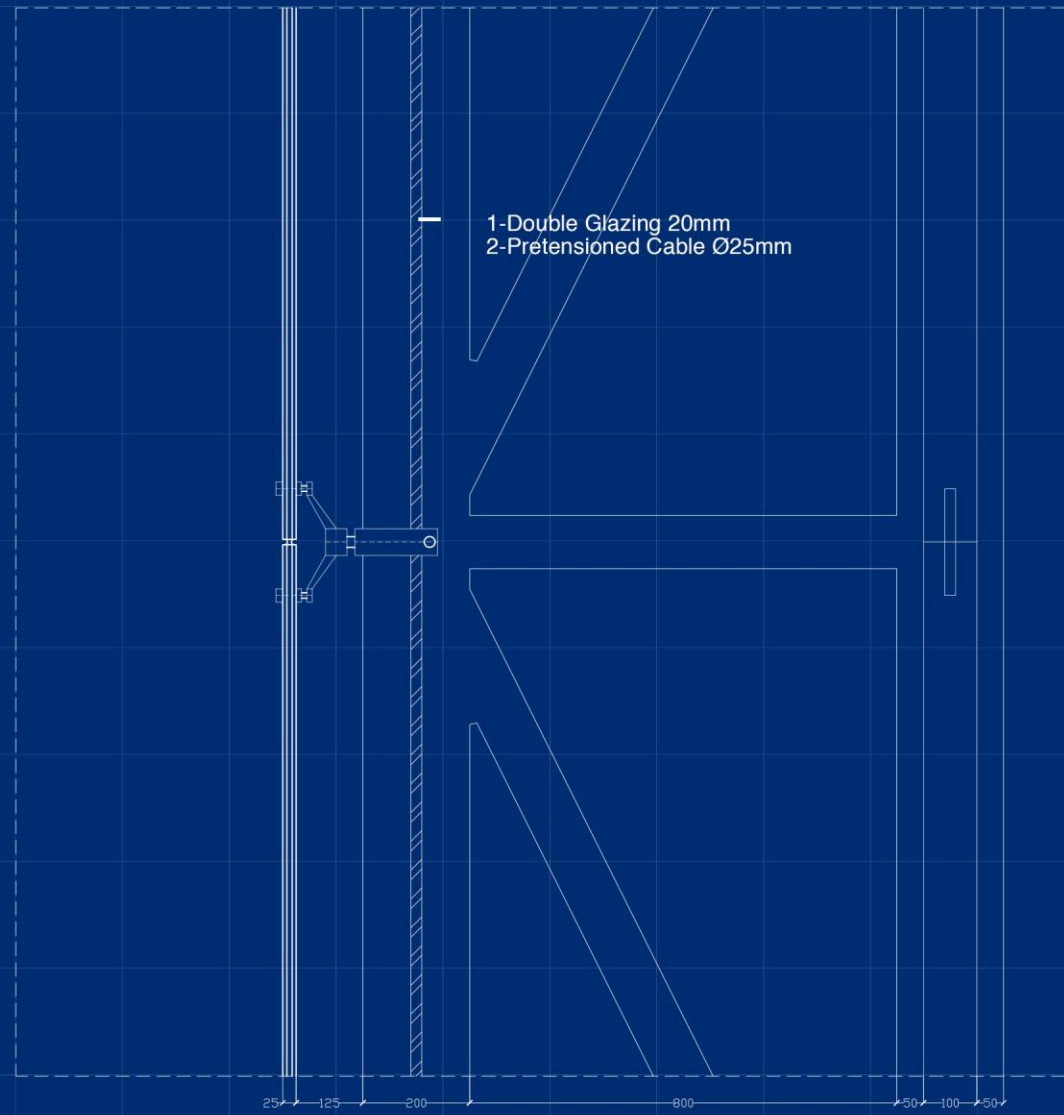
DETAIL PLAN 1:50



**DETAIL A 1:20**

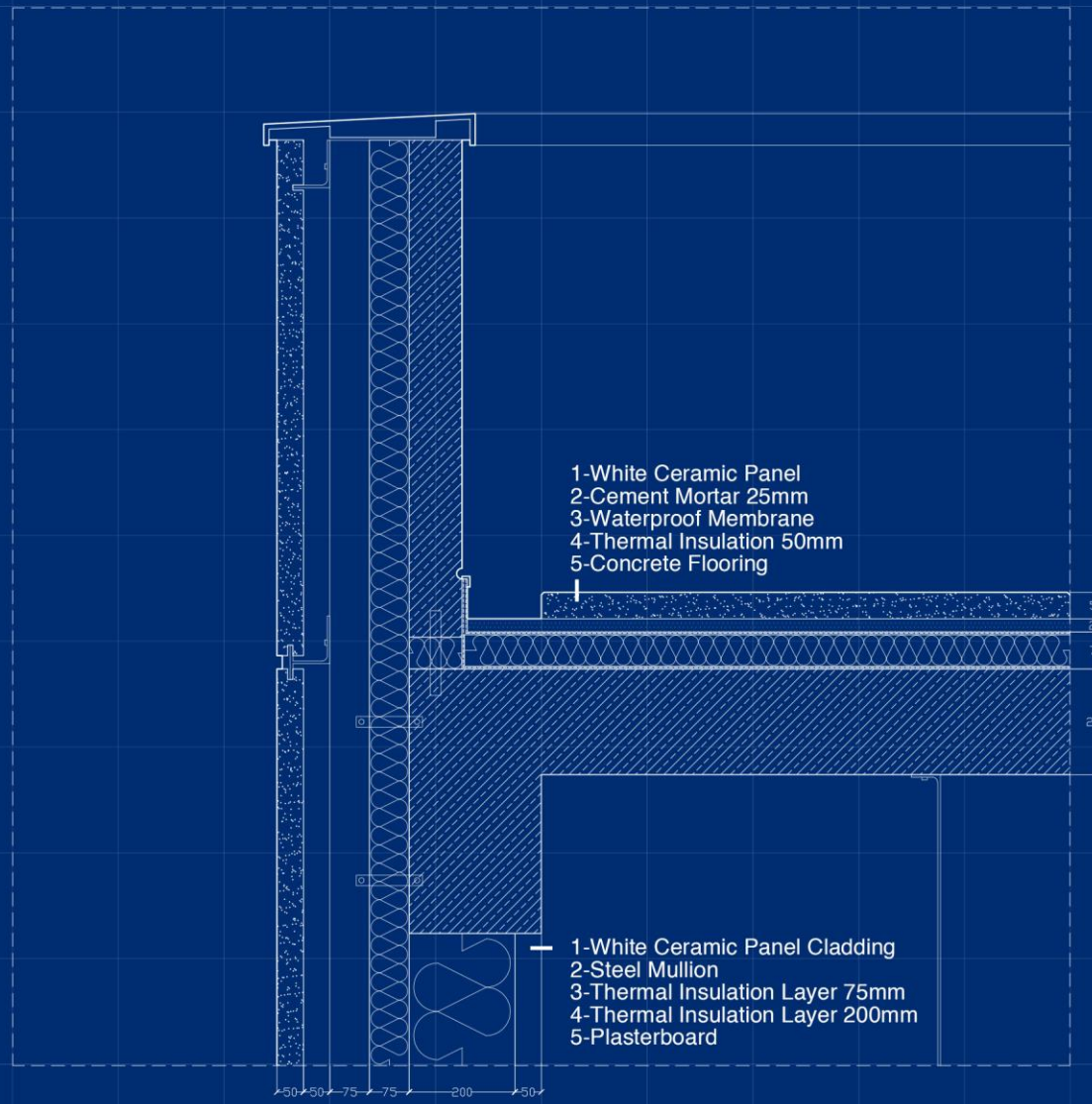


DETAIL B 1:20

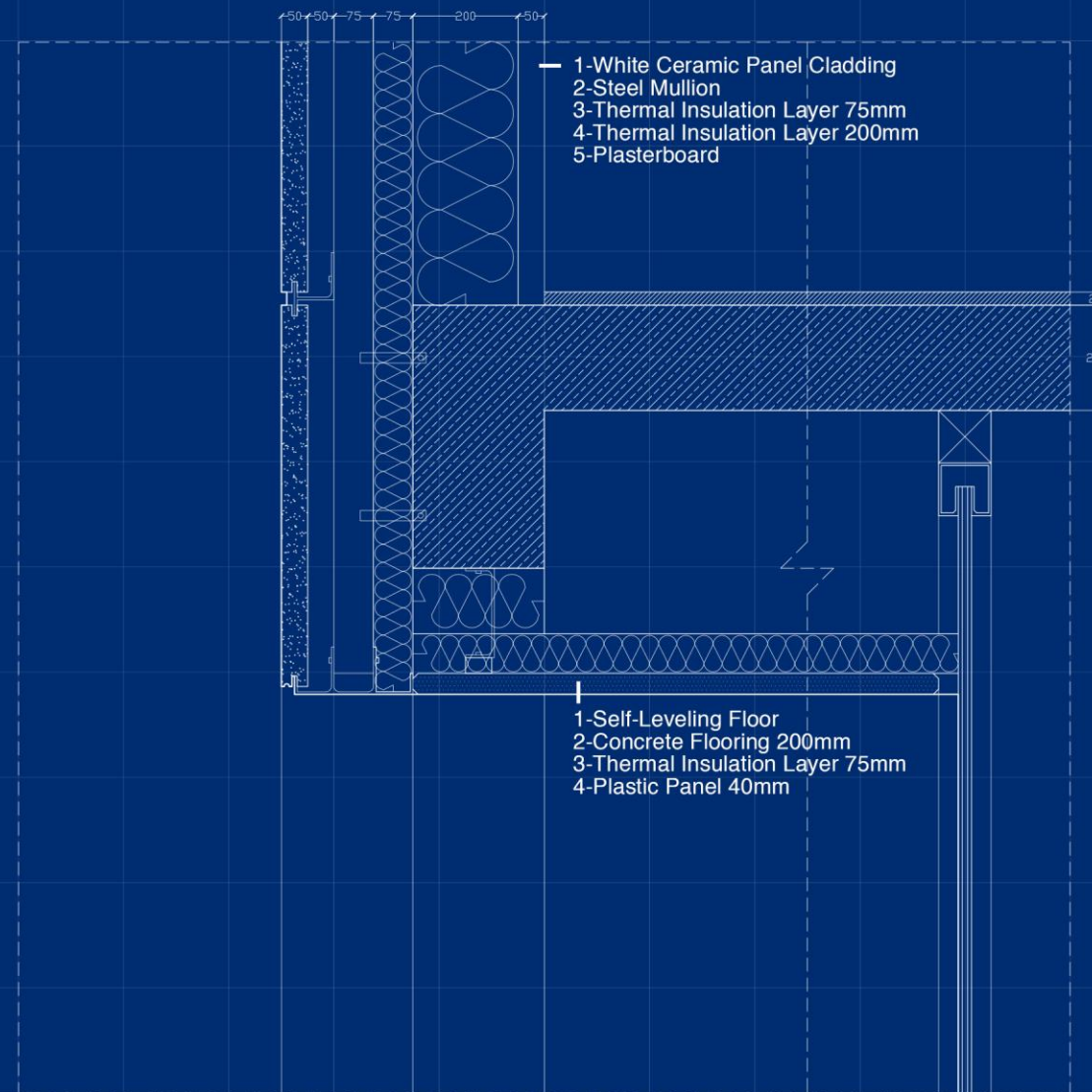




DETAIL C 1:20



**DETAIL D 1:20**





MANHATTAN  
CRUISE  
TERMINAL



IMPLEMENTATION



INTRODUCTION



RESEARCH



CONCEPT



OPERATION



DEVELOPMENT



REFLECTION



SPACE





CHELSEA PIER