ZHU XINGLU | GSAPP Portfolio

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SELECT WORKS FROM 2019 TO 2020

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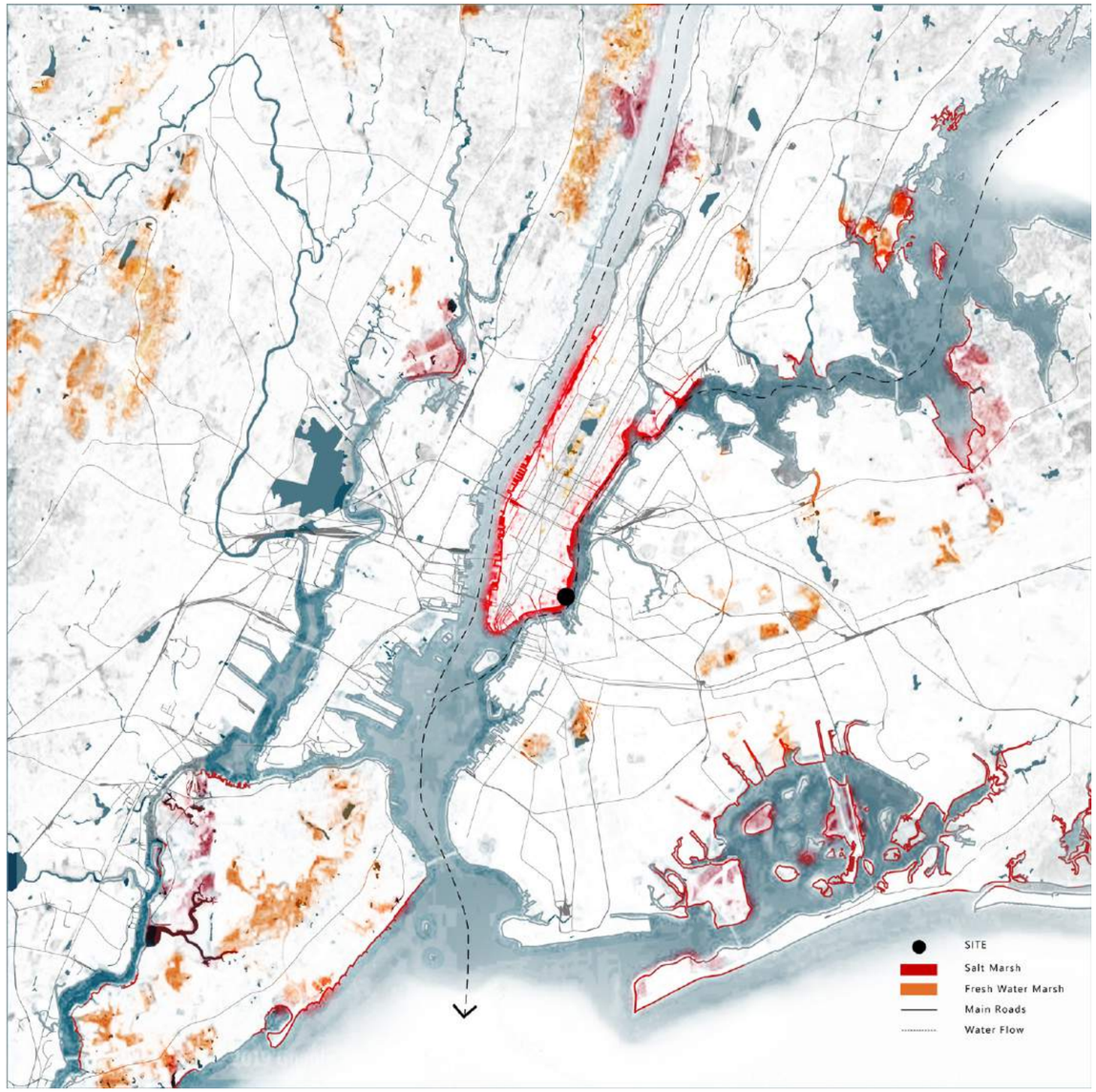
01

2019.06 - 2019.08

BORDERLINE
EXTREME MAKEOVERS

OR
How Nature can be Built Otherwise

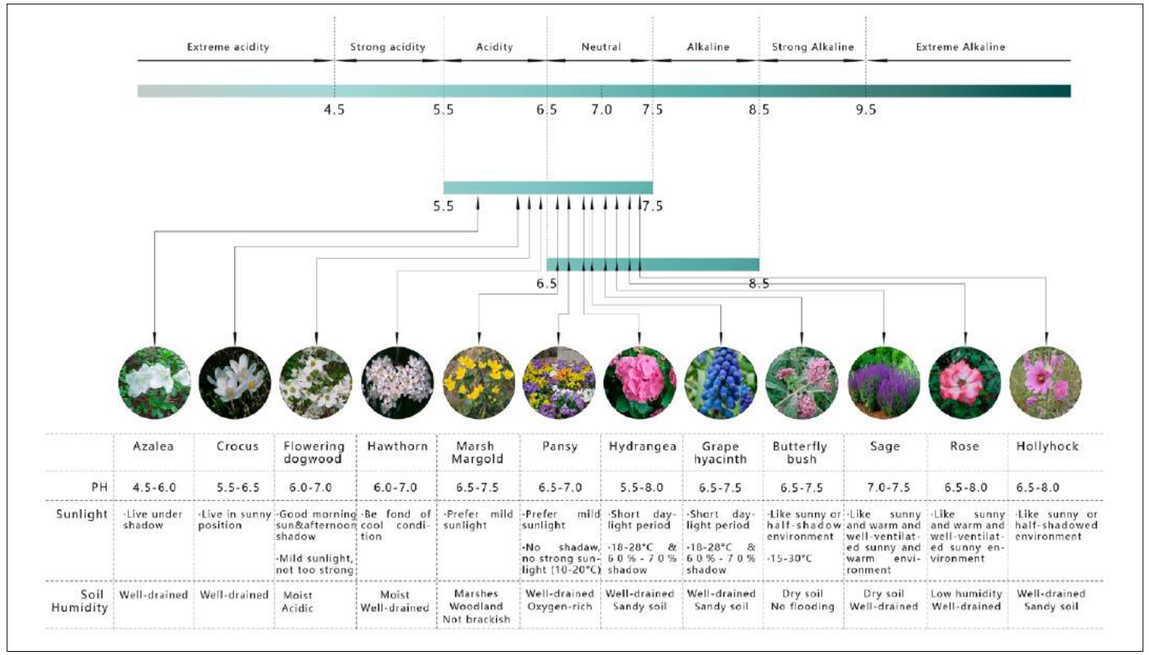
Professor: Nerea Calvillo
Teammate: Luyi Huang
Project Title: Soft Boundary



As global warming and the melting of ice caps, sea level rise is an urgent issue for coastal cities all over the world. The East River Park, in lower aManhattan, is the lowest elevation in the island, and has flooded many times in the past decades.

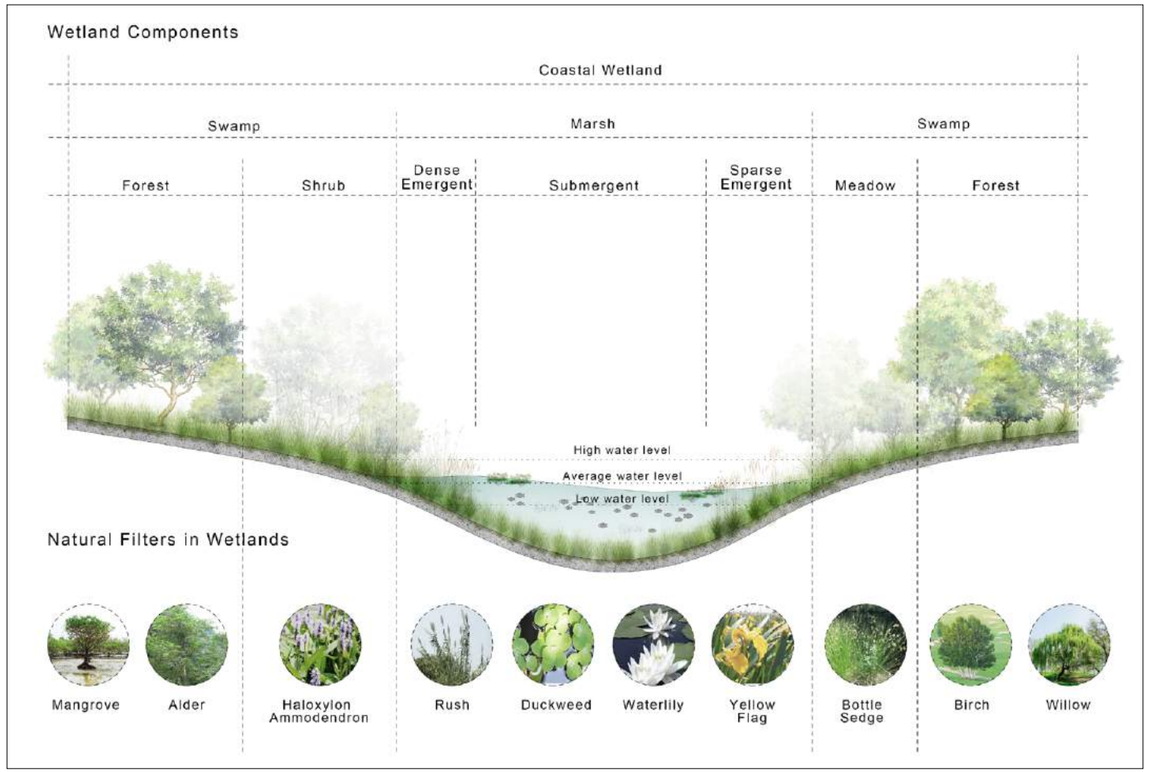
This project is about continuing adding layers of soil, collected as sediment from the river, until a marshland is created, hacking Williamsburg bridge in order to operate the shoreline.

Soft boundary creates a sediment collector to transform the park into a marshland as a response to sea level rise, a process which will be complete by year 2100.

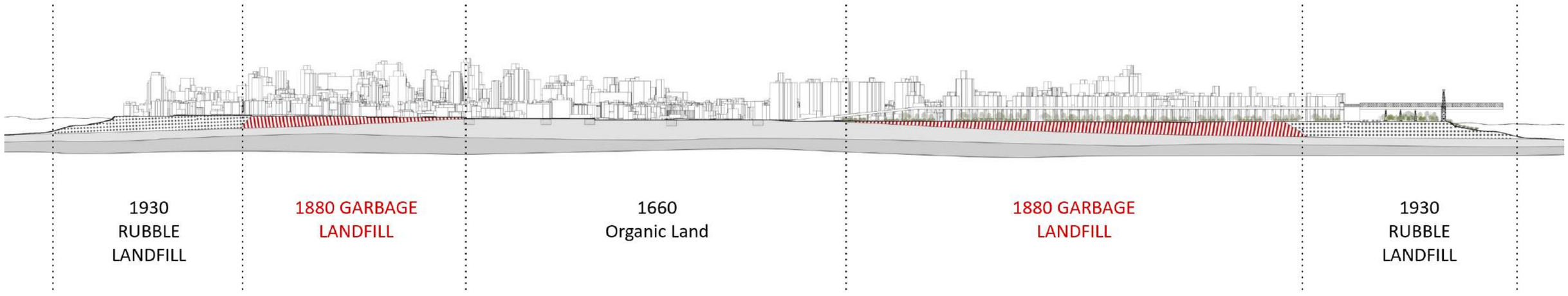


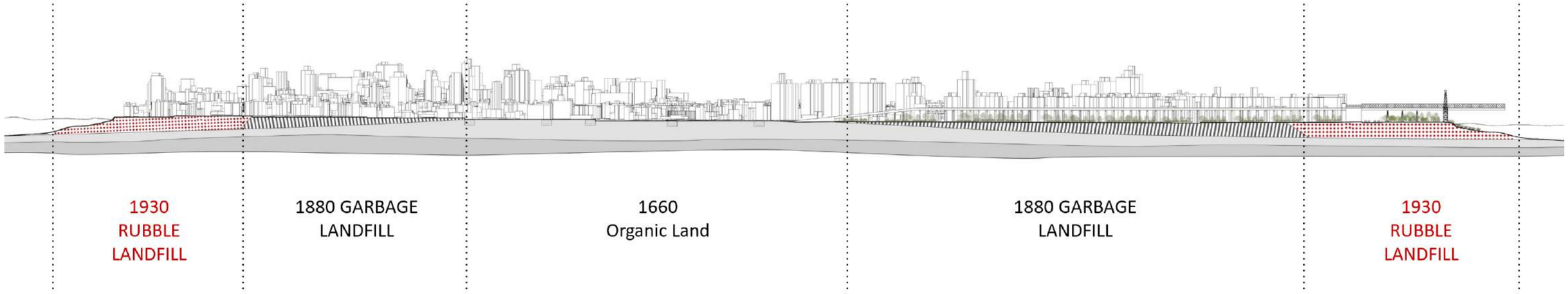
	Azalea	Crocus	Flowering dogwood	Hawthorn	Marsh Margold	Pansy	Hydrangea	Grape hyacinth	Butterfly bush	Sage	Rose	Hollyhock
PH	4.5-6.0	5.5-6.5	6.0-7.0	6.0-7.0	6.5-7.5	6.5-7.0	5.5-8.0	6.5-7.5	6.5-7.5	7.0-7.5	6.5-8.0	6.5-8.0
Sunlight	·Live under shadow	·Live in sunny position	·Good morning sun&afternoon shadow ·Mild sunlight, not too strong	·Be fond of cool condition	·Prefer mild sunlight	·Prefer mild sunlight ·No shadaw, no strong sunlight (10-20°C)	·Short daylight period ·18-28°C & 60%-70% shadow	·Short daylight period ·18-28°C & 60%-70% shadow	·Like sunny or half-shadow environment ·15-30°C	·Like sunny and warm and well-ventilated sunny and warm environment	·Like sunny and warm and well-ventilated sunny environment	·Like sunny or half-shadowed environment
Soil Humidity	Well-drained	Well-drained	Moist Acidic	Moist Well-drained	Marshes Woodland Not brackish	Well-drained Oxygen-rich	Well-drained Sandy soil	Well-drained Sandy soil	Dry soil No flooding	Dry soil Well-drained	Low humidity Well-drained	Well-drained Sandy soil

Plants Diversity

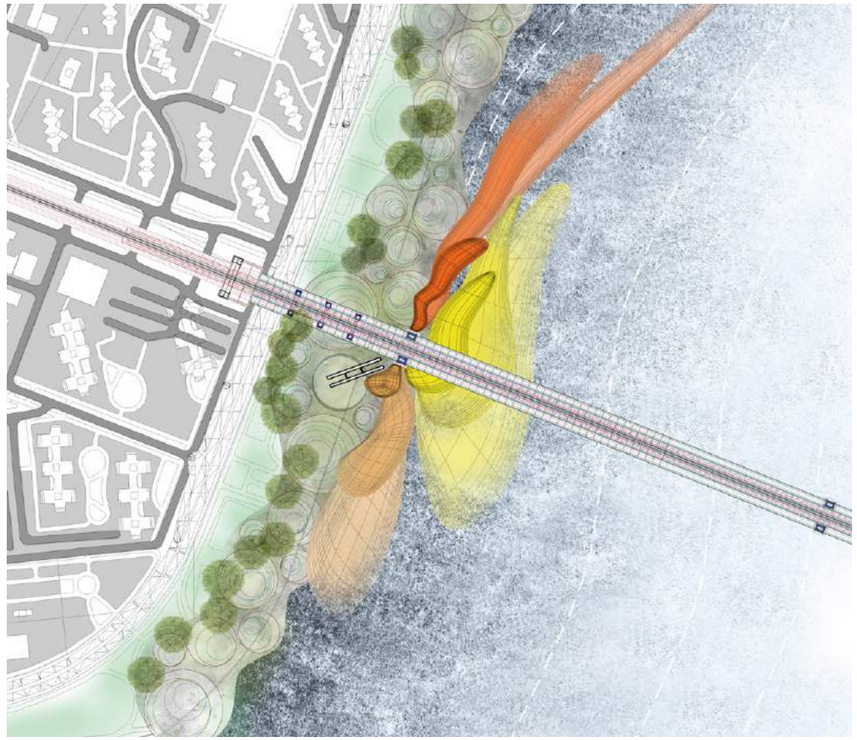


Plants Diversity

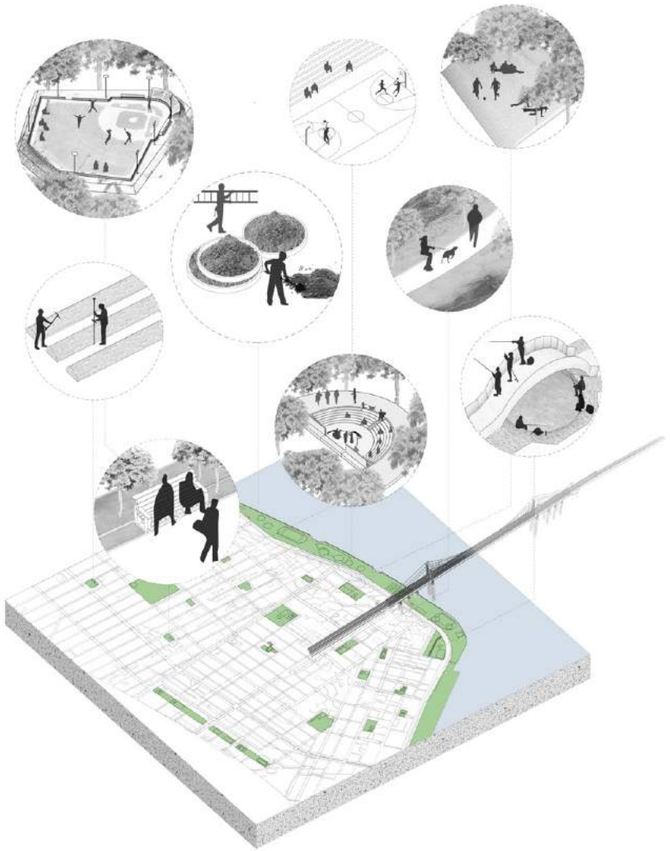




Manhattan Landfill History

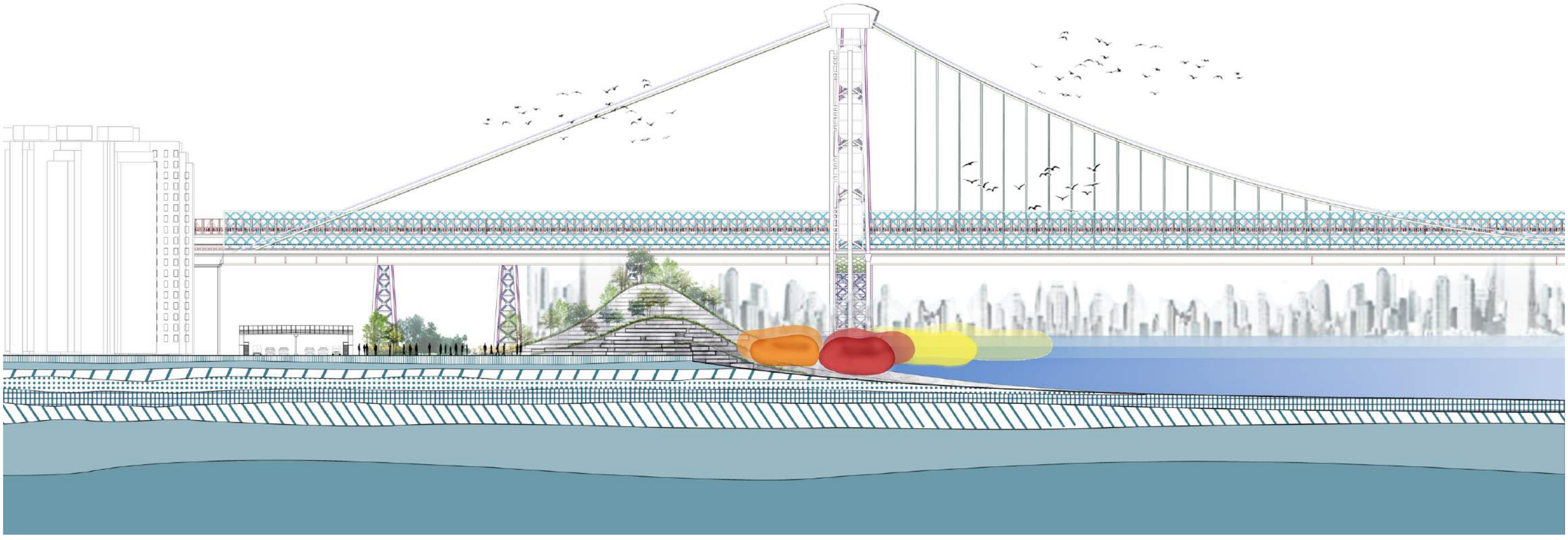


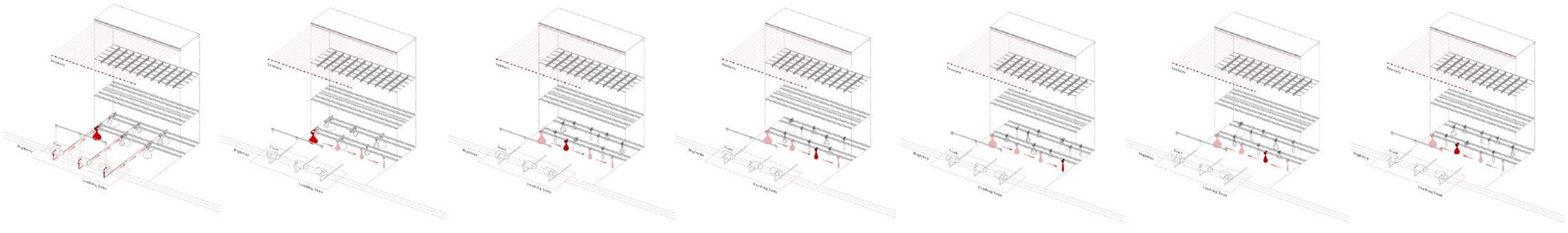
Site Plan



Human Activities

Surrounding Community Gardens





Seed Spread System

Phrase 1 - 2019

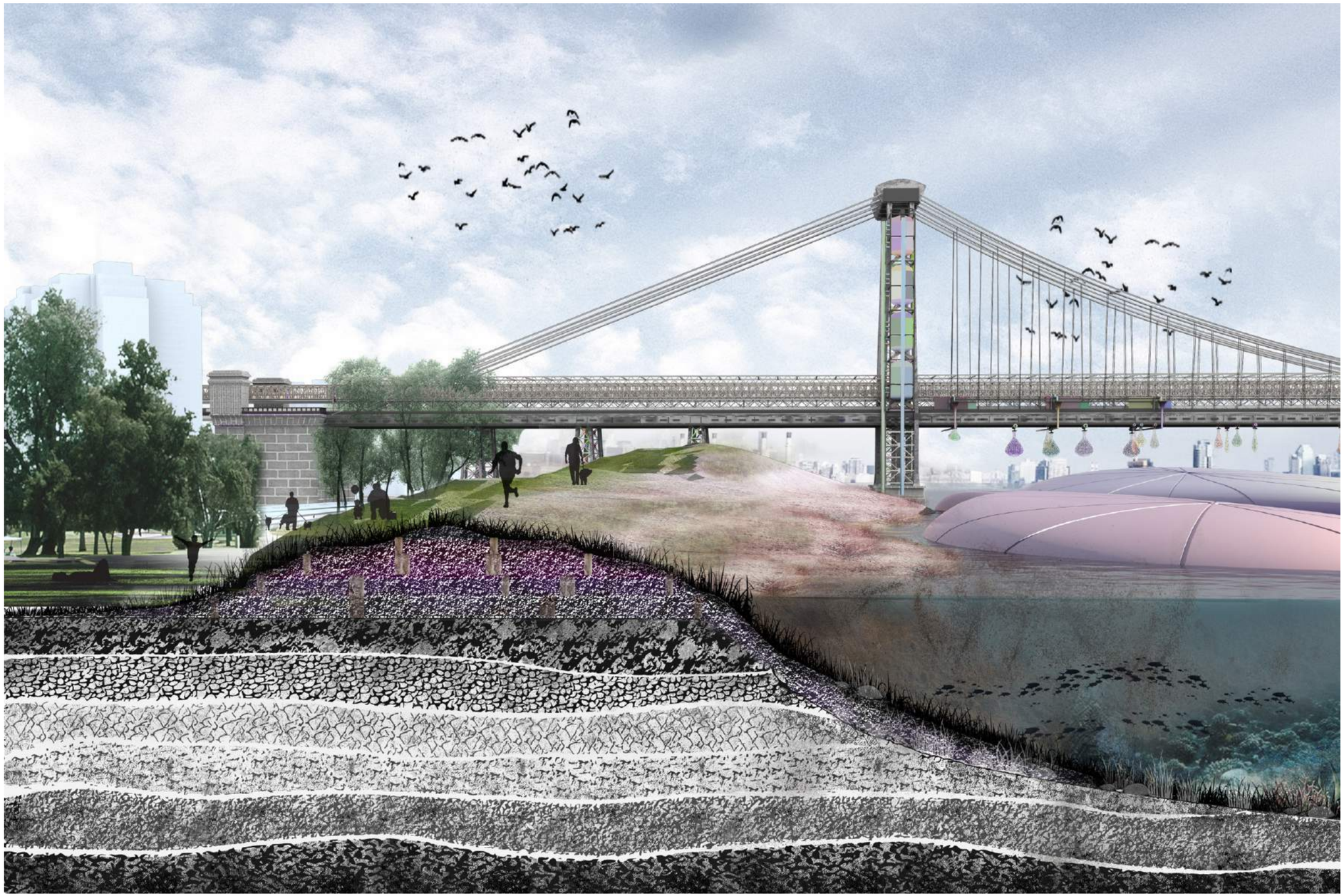
Current Proposal: The goverment planned to close the park for 3 years to build up a sea wall.

Phrase 2 - 2020

Build up inflatable infrastructure for controling the water flow, then we can collect the sediment.

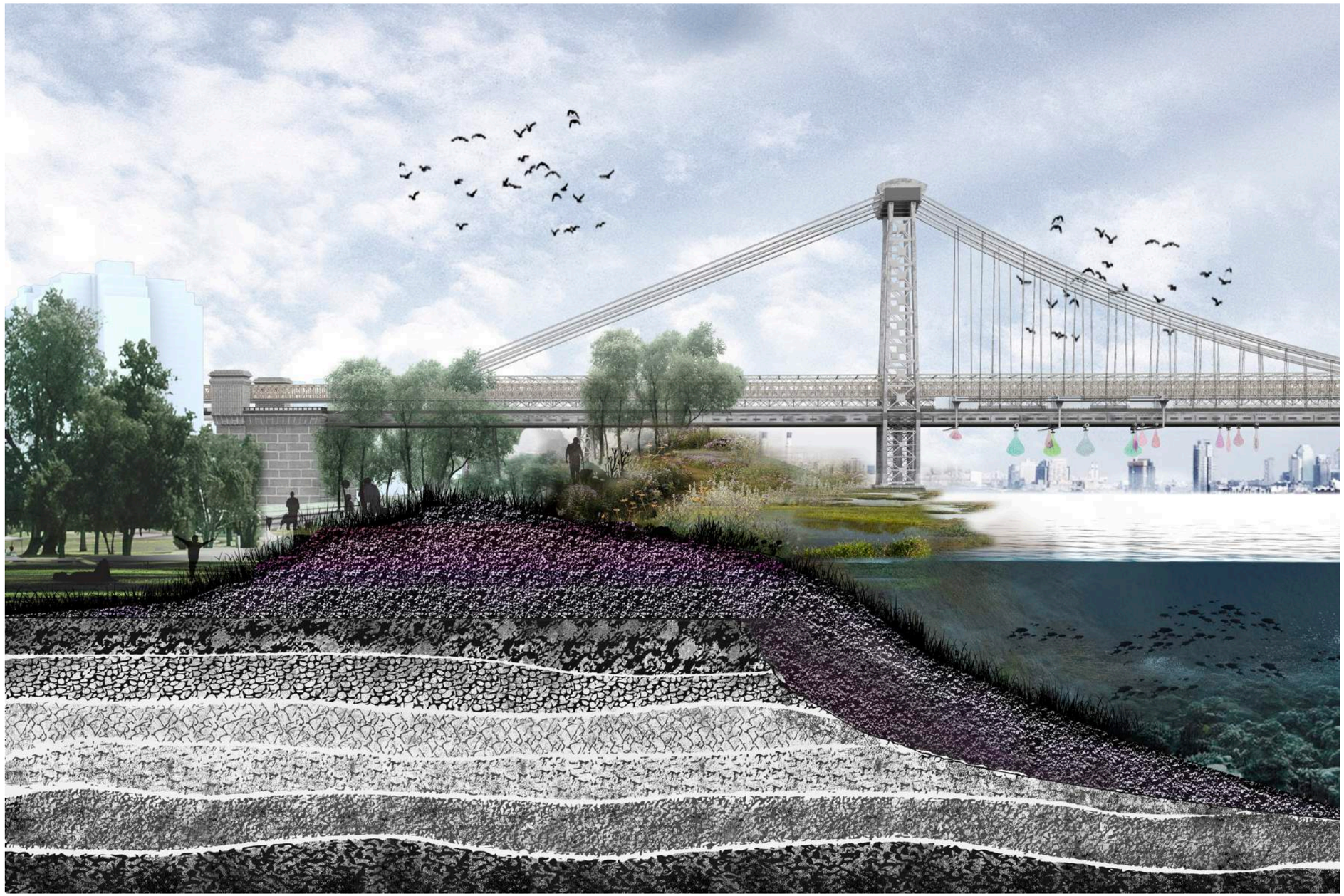
Phrase 3 - 2030

Like one community garden: invite the neighbors from surrounding communities- to help ship sediment into wood rings.



Phrase 4 - 2050

Finish 7 feet topo goal by 2050 for the sea level rise resistance proposal.



Phrase 5 - 2100

Set up seed system under the bridge with wind sensor system, bringing the blooming to the park.

02

2019.09 - 2019.12

DE-FENCING THE MOSQUE

Investigation into Rural Religious Edifices and Settlements of Djerba Island

Professor: Ziad Jamaleddine
Teammate: Chun-chang Tsai
Project Title: New Coastline Framework

INSPIRING
Tunisia
Hotel Regulations

-1 Legislation
Widen the Passage

Djerba
Hotel Zone Regulation

500 Meters Gap

Demolish Hotel Fence
Open the tiny passage

Sidi Zakri Mosque

-2 Cutting the FATs
Relocate Giant Spaces

Pool
Private Pool
Area : 2,584.6 m²

Lobby
Empty Spaces
Area : 1,581.6 m²

Gym
Equipment
Area : 1,077.2 m²

Moving the Fats into Deserted Hotel

Furniture
Door 130 / unit
Wood Skin 454 / unit
Wood Fragment 246 / unit

Furniture
Soft Cushion 200 / unit
Wood Stick 460 / unit
Steel Net 200 / unit

Material
Block 453.6 m³
Benzo Wood

Material
Panel 11,664 m³
Benzo Wood

Furniture
Steel Fram 850 / unit
Glass 130 / unit
Window Fram 130 / unit

Material
Reinforcement Concrete
Fragment of the Hotel Fences
7,257.6 m³

Material
Concrete Fragment
Fragment of the Hotel Fences
5,257.6 m³

Mapping the Pass
500 meters regulations

Tiny Passage
Hotel Fences

Local people could only use the tiny passage to go to the beach, the width of the passage is only 2% of the coastline.

Re-management of the deserted hotel

The hotel in front of the mosque is not in use right now, which gives us the opportunity to re-manage it.

We want to de-fence the abandoned hotel, making the widened passage directly connected with the inland. The hotel space alongside the passage would be transformed into public use.

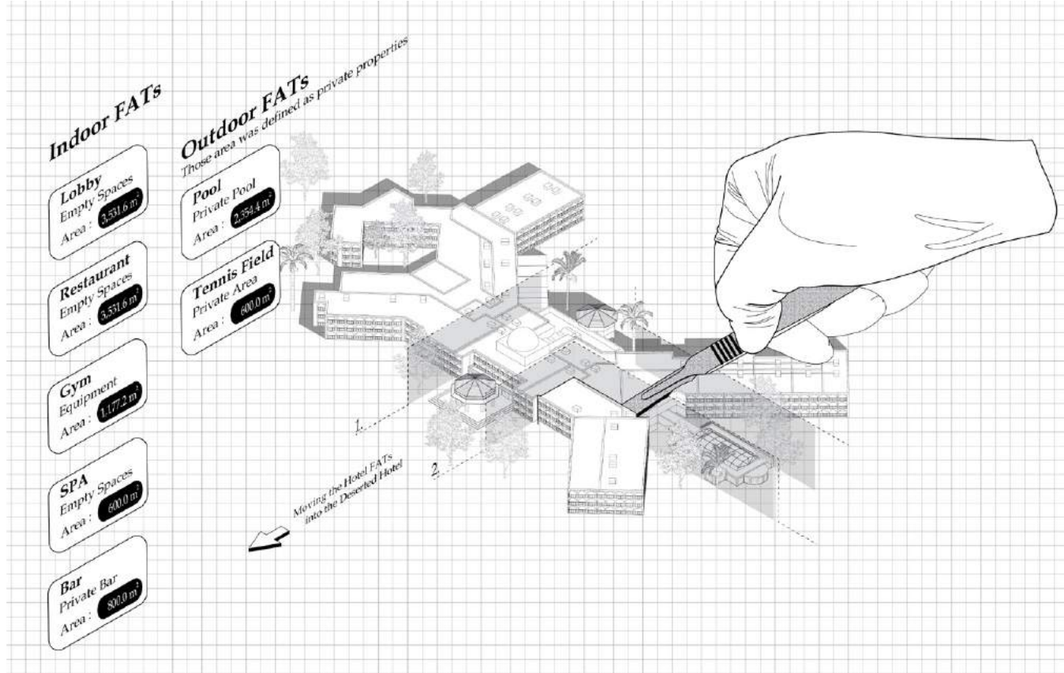
By adding this function into the rest part of the abandoned hotel, we believe that under these systems, farmlands will be better developed, tourists who used to stay at the beach will also be attracted to experience local agriculture.

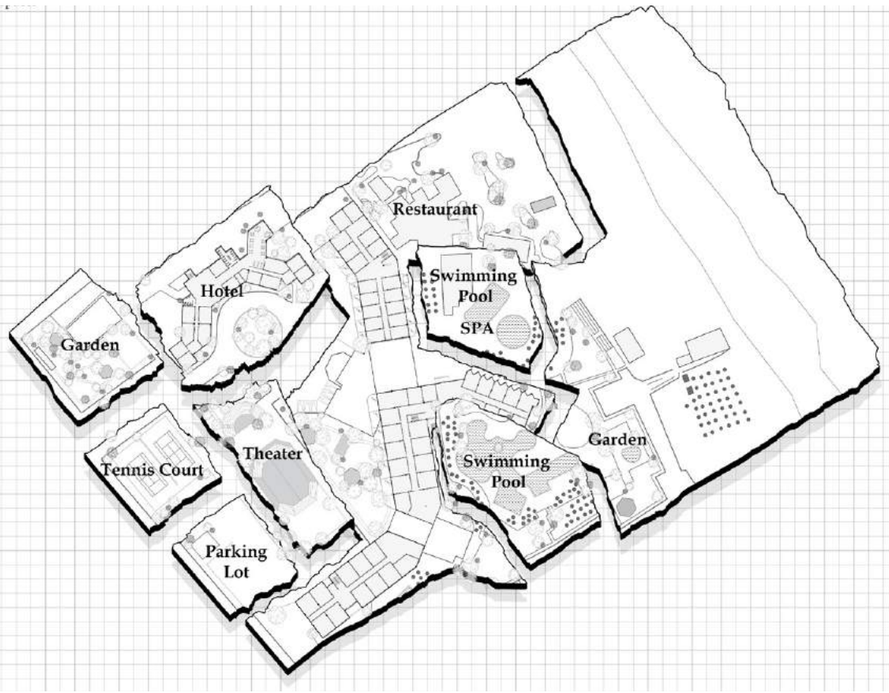
When the locals (hotel staff, farmers, etc.) are reaggregated in this area, the original function of the mosque comes into being.

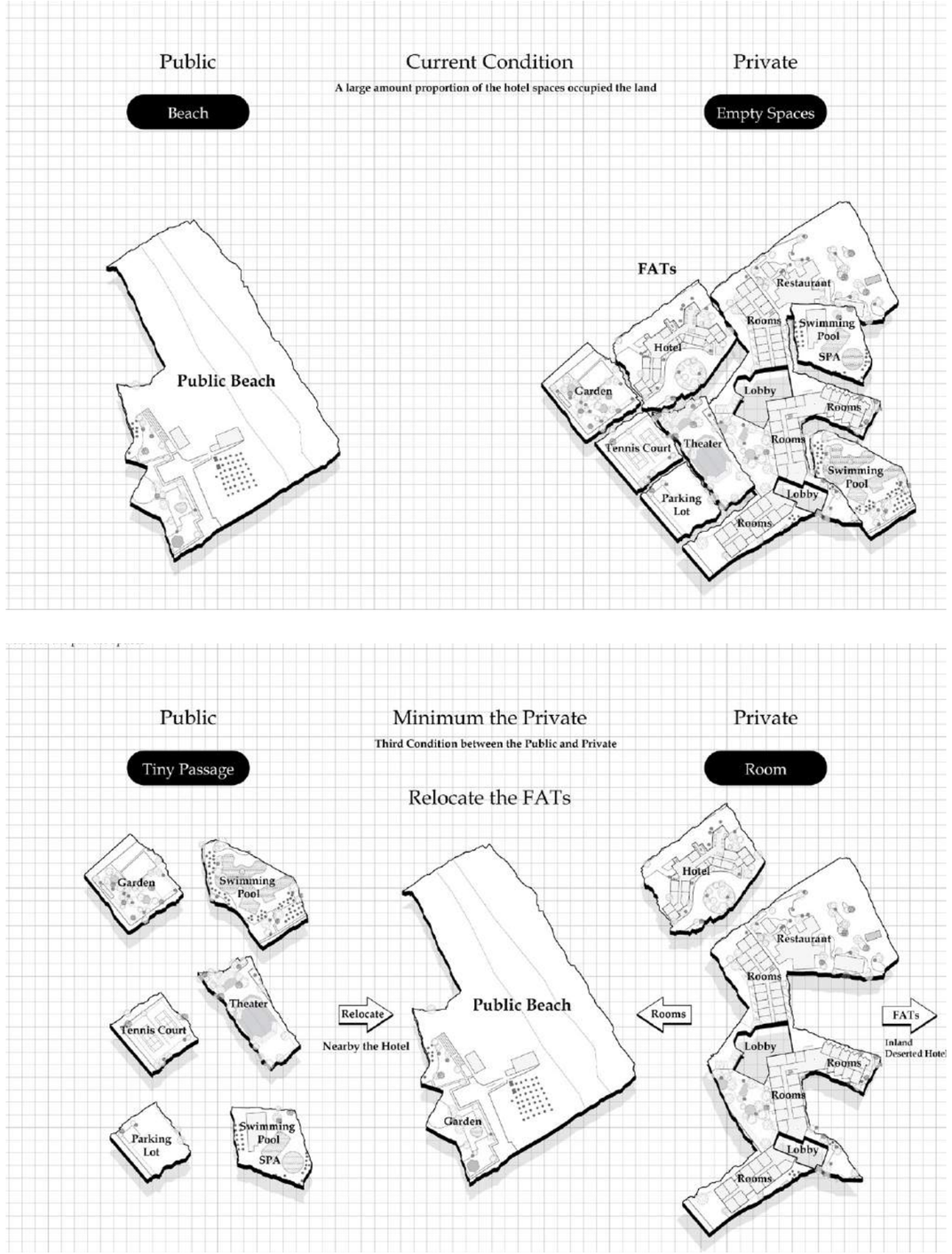
Dormitory
Private Hotel Restaurant

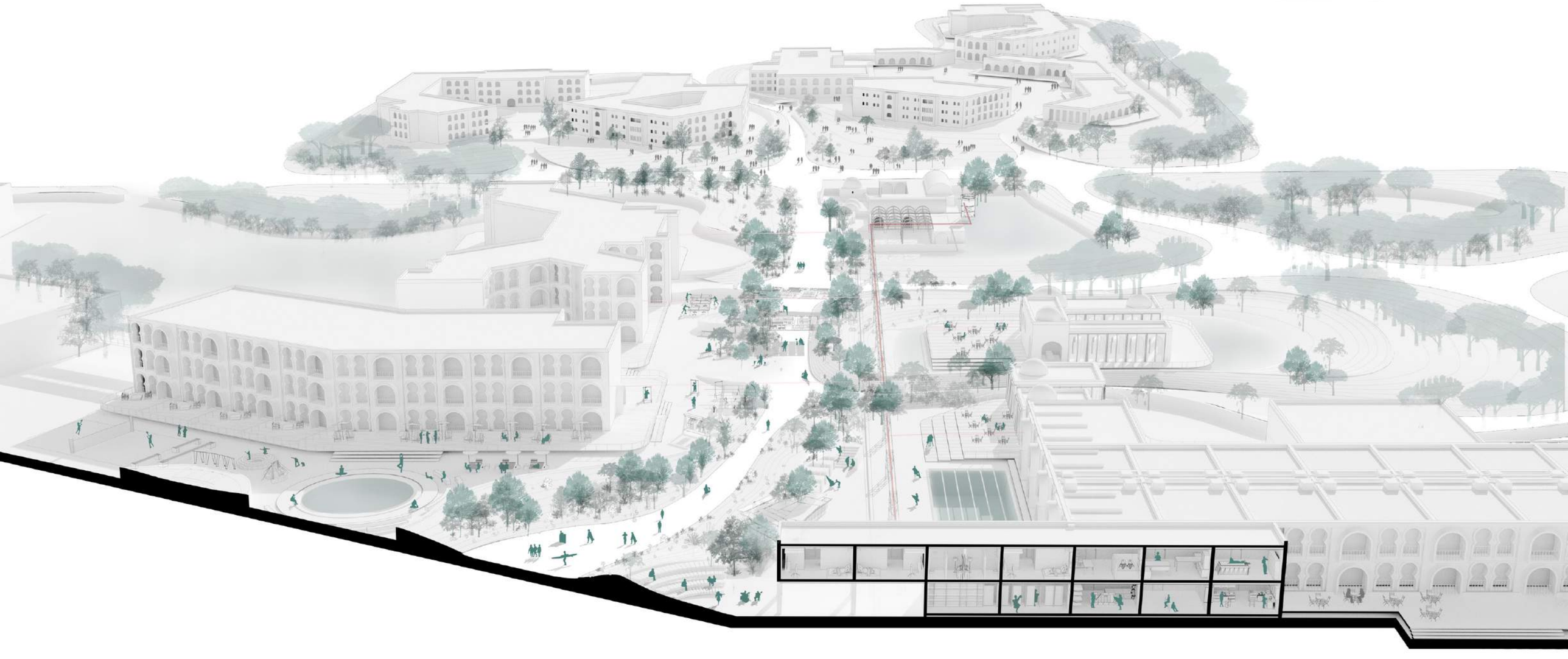
Community Center
Private Hotel Restaurant

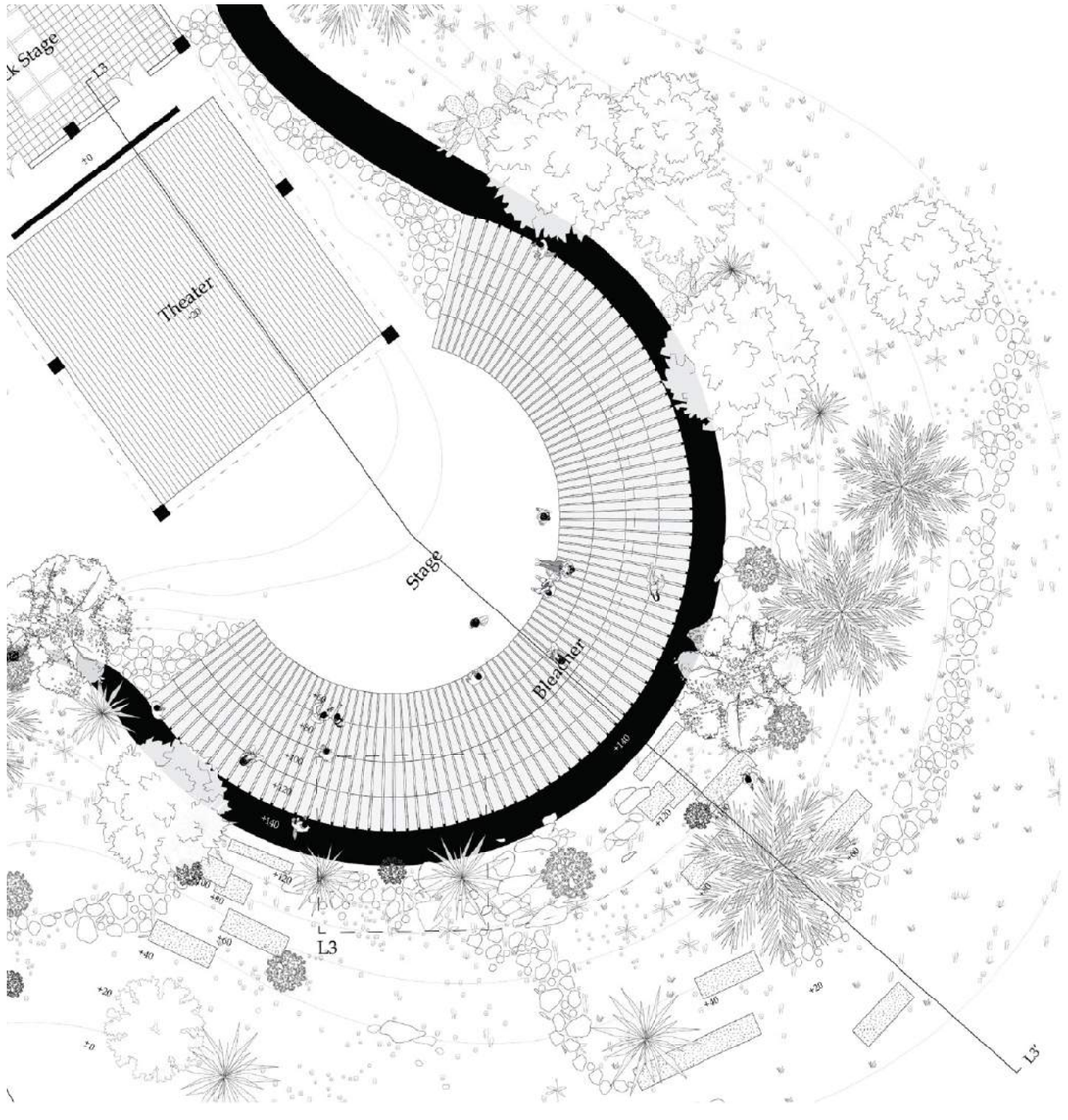
Canteen
Private Hotel Restaurant


Indoor FATs
Lobby
Empty Spaces
Area : 3,531.6 m²
Restaurant
Empty Spaces
Area : 3,531.6 m²
Gym
Equipment
Area : 1,177.2 m²
SPA
Empty Spaces
Area : 600.0 m²
Bar
Private Bar
Area : 800.0 m²
Outdoor FATs
Those area was defined as private properties
Pool
Private Pool
Area : 2,354.4 m²
Tennis Field
Private Area
Area : 600.0 m²
1
2
Moving the Hotel FATs into the Deserted Hotel


Restaurant
Hotel
Swimming Pool
SPA
Garden
Garden
Theater
Swimming Pool
Tennis Court
Parking Lot


Public
Current Condition
Private
A large amount proportion of the hotel spaces occupied the land
Beach
Empty Spaces
Public Beach
FATs
Restaurant
Rooms
Swimming Pool
Hotel
SPA
Garden
Lobby
Rooms
Tennis Court
Theater
Rooms
Swimming Pool
Parking Lot
Lobby
Rooms
Public
Minimum the Private
Private
Third Condition between the Public and Private
Tiny Passage
Relocate the FATs
Room
Garden
Swimming Pool
Hotel
Restaurant
Theater
Relocate
Nearby the Hotel
Public Beach
Rooms
FATs
Inland Deserted Hotel
Tennis Court
Lobby
Rooms
Rooms
Parking Lot
Swimming Pool
SPA
Garden
Lobby
Rooms





Open Air Theater

The open air theater provides a space for gathering and performing, which is also a public lounge for the beach users.

Soft Boundary

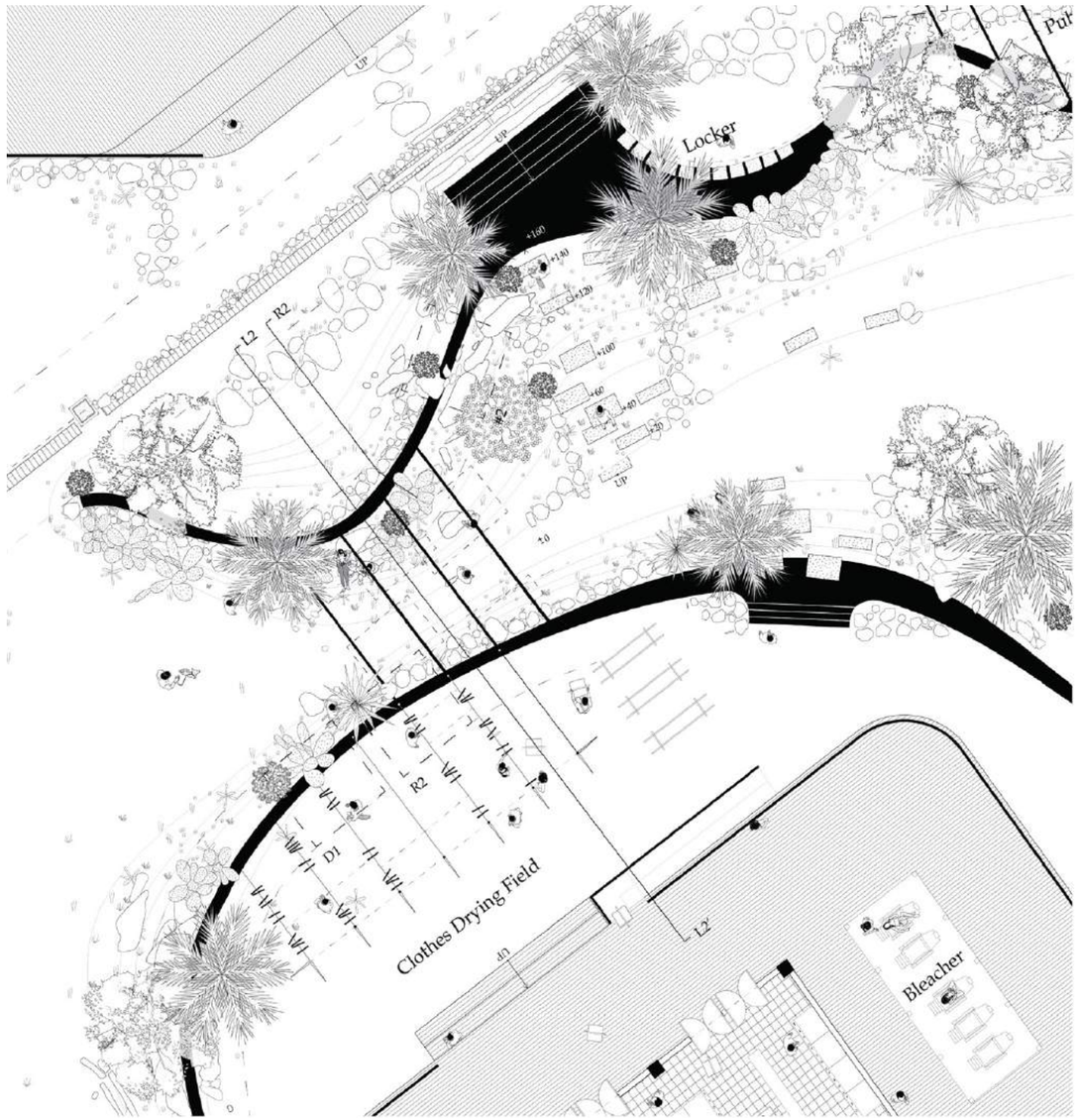
This sector is closed to the coastline, we design the soft boundary between the hotel structure and the beach view.

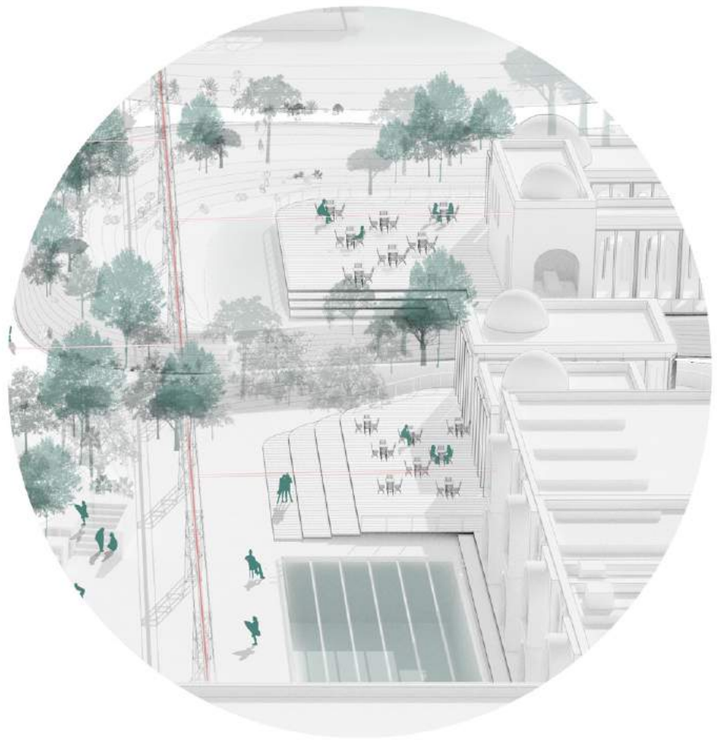
Beach Facilities

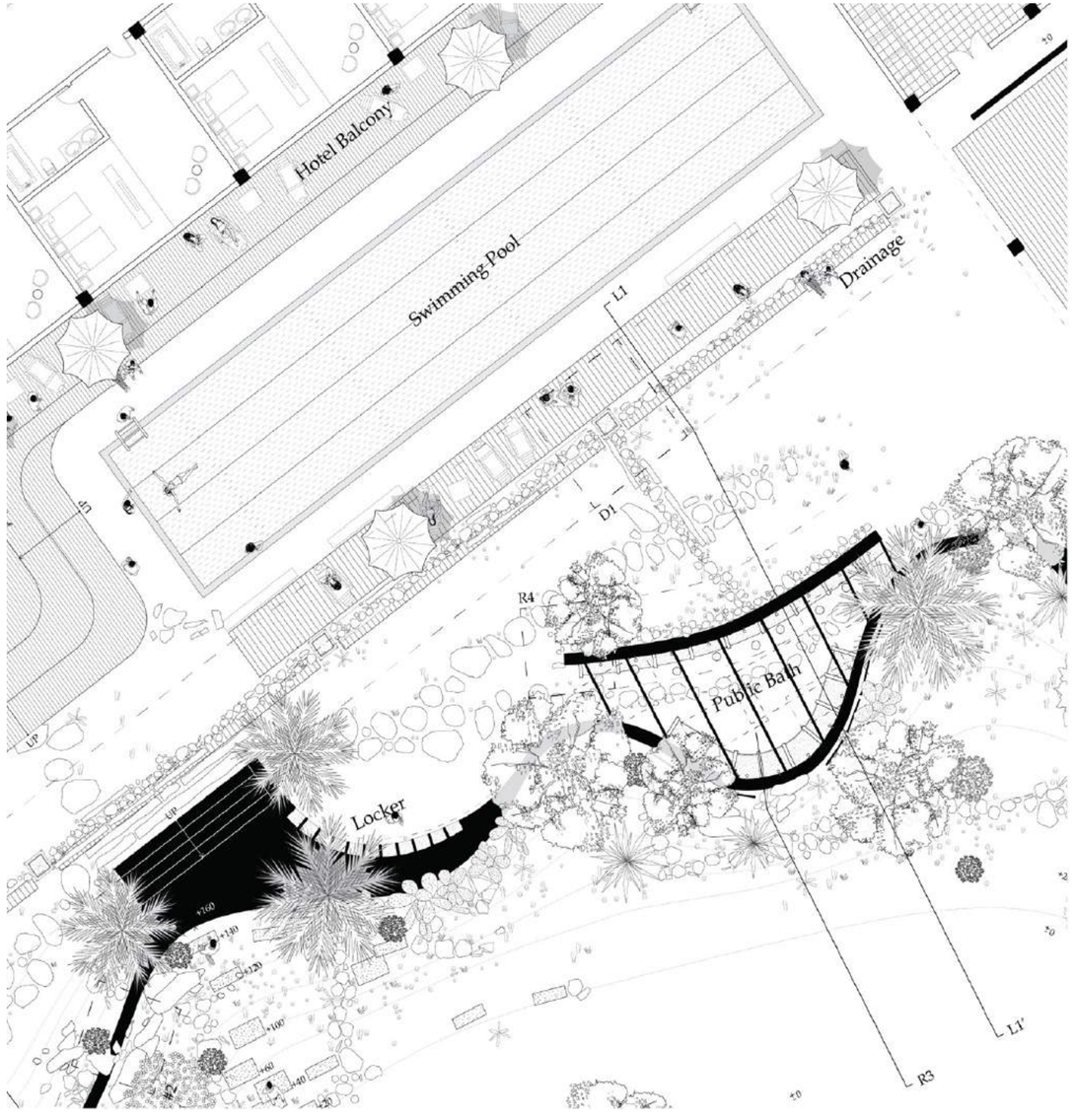
The giant hotel privatizes the public beaches; the public could not use the private facilities. We try to design the public bath and the public locker for local users.

Laundry Spaces

We define the laundry space as a seasonal space, because in the off-season, the number of visitors is reduced and parts of the hotel room is idle.







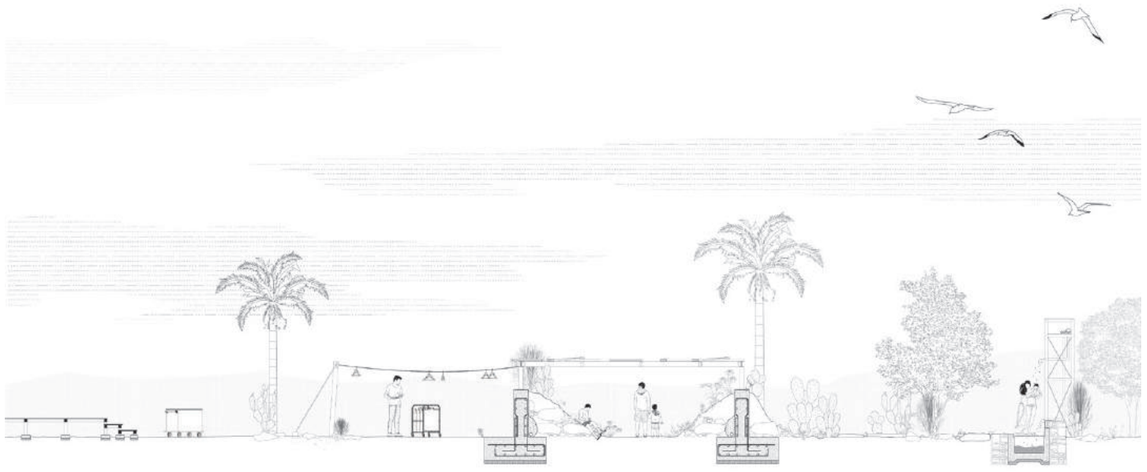
In-between

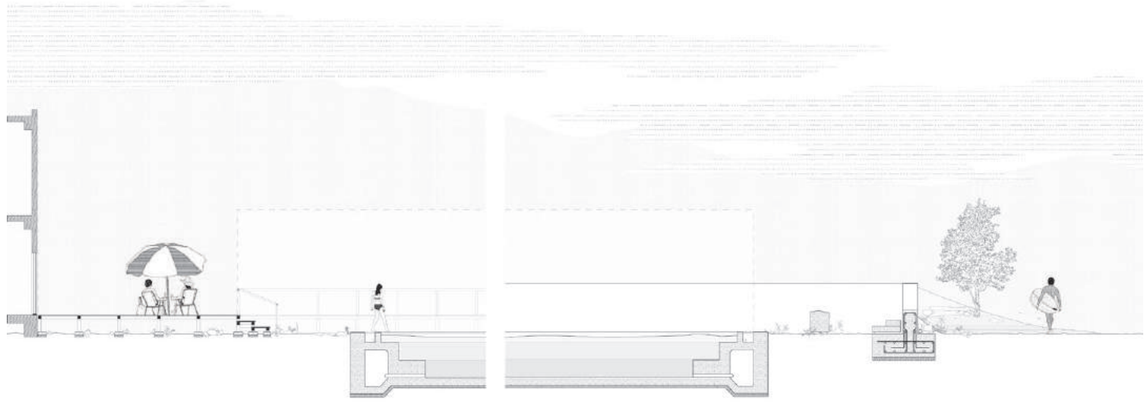
We try to use Tabias to create soft borders and also reconfigure the hotel public facilities. Abuffer created within the tabias and hotel field.

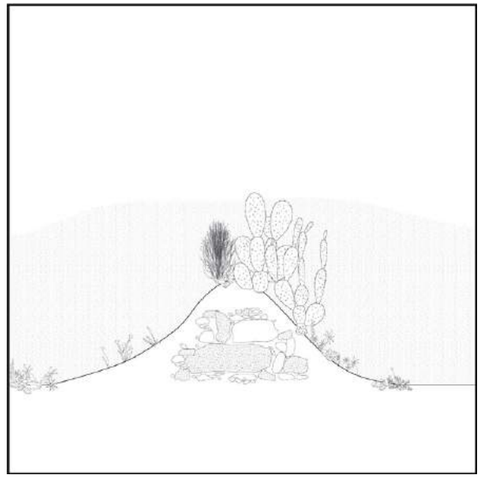
Public Bath Field

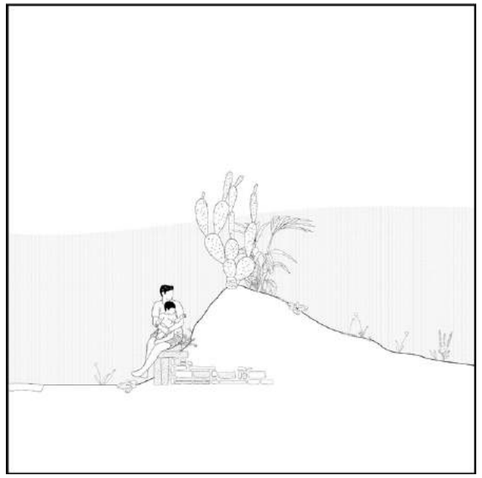
This space provides the basic wash after the beach activities; we created a sector of the enclosed area, which offers the private wash space qualities.

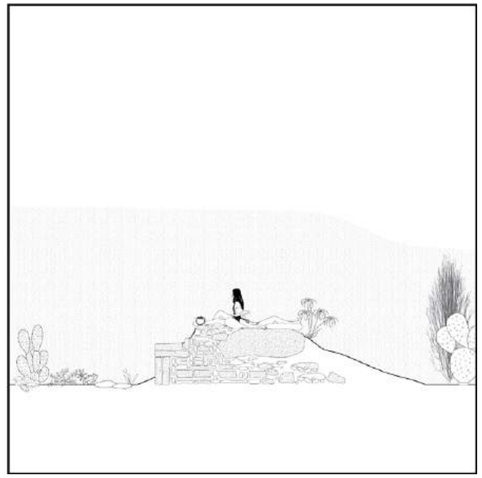

Paivate Hotel
Private Garden
Hotel Balcony
Swimming Pool
Drainage
Back Stage
Theater
Stage
Bleacher
Public Bathroom
Public Bath
Locker
Clothes Drying Field
Laundry Space
Bleacher
Bleacher
Swimming Pool
Rock Climbing
Water Collector
Storehouse
Office
Well
Addition Build
Sidi Zikri Mosque
Tennis Field
Gate
Entrance
Hotel Entrance
Garden
Garden
Restroom
Garden

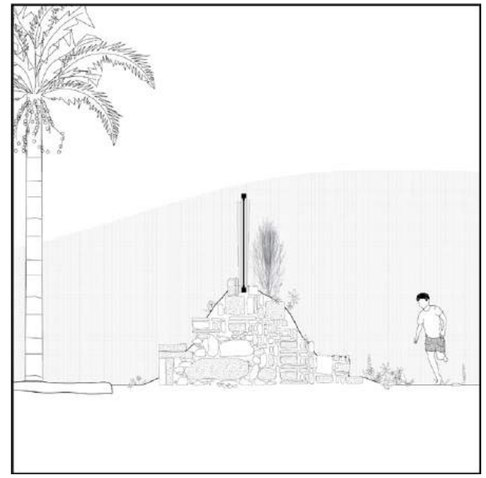


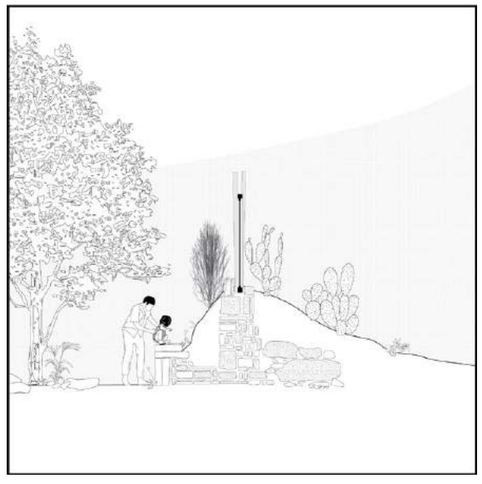


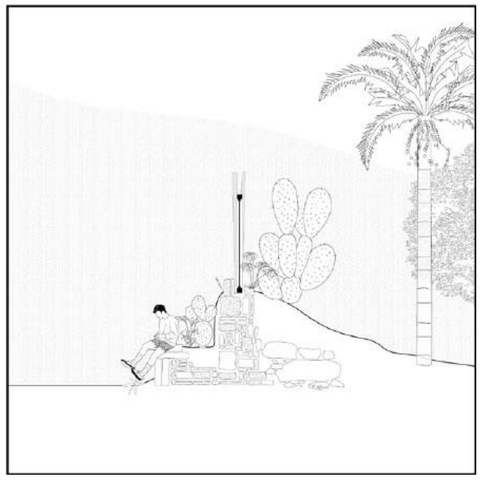


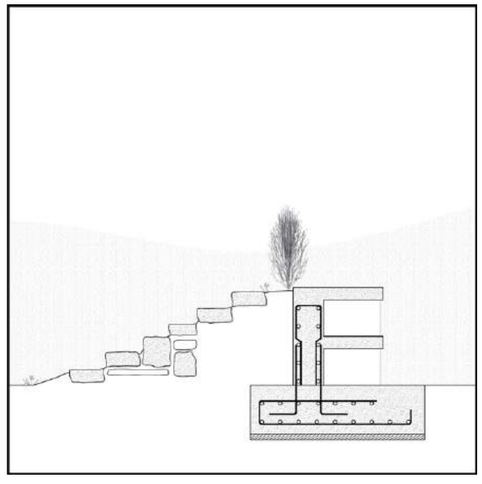


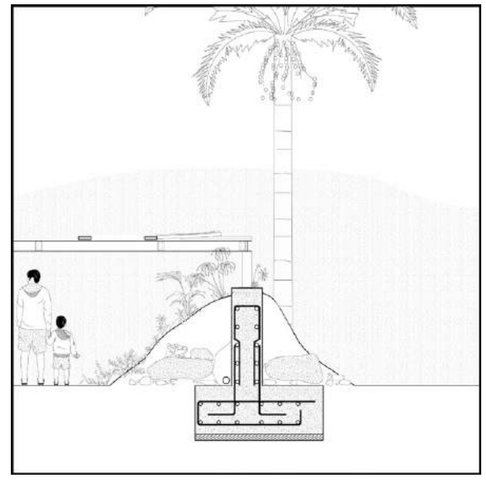


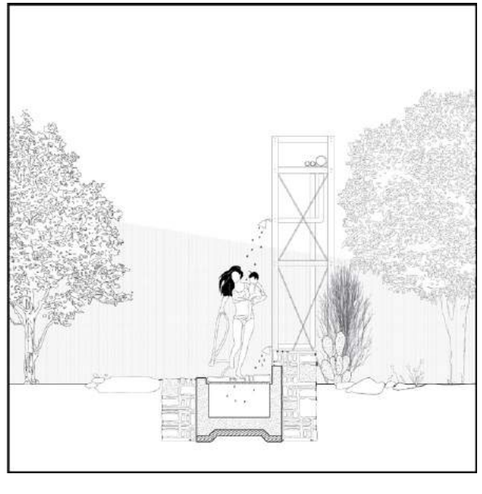


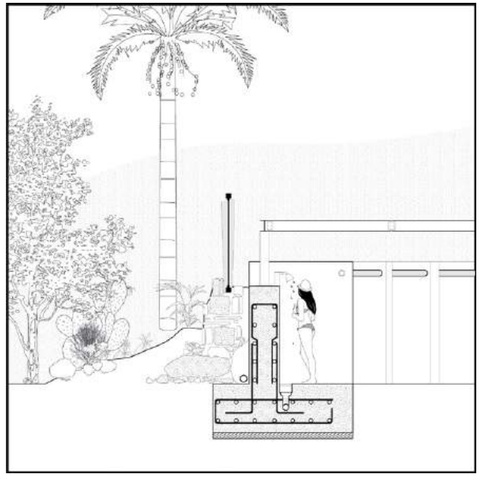


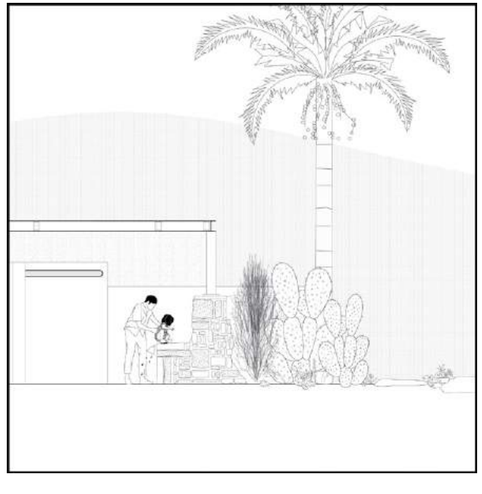


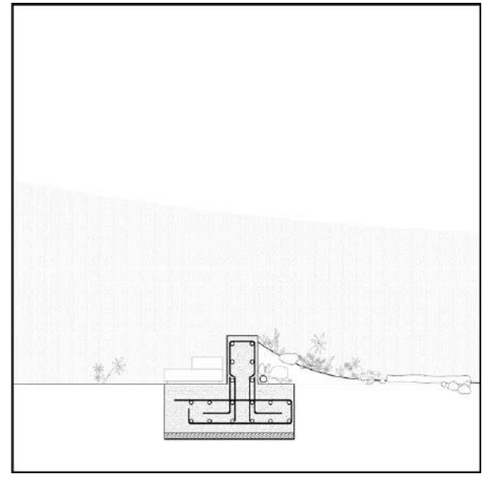


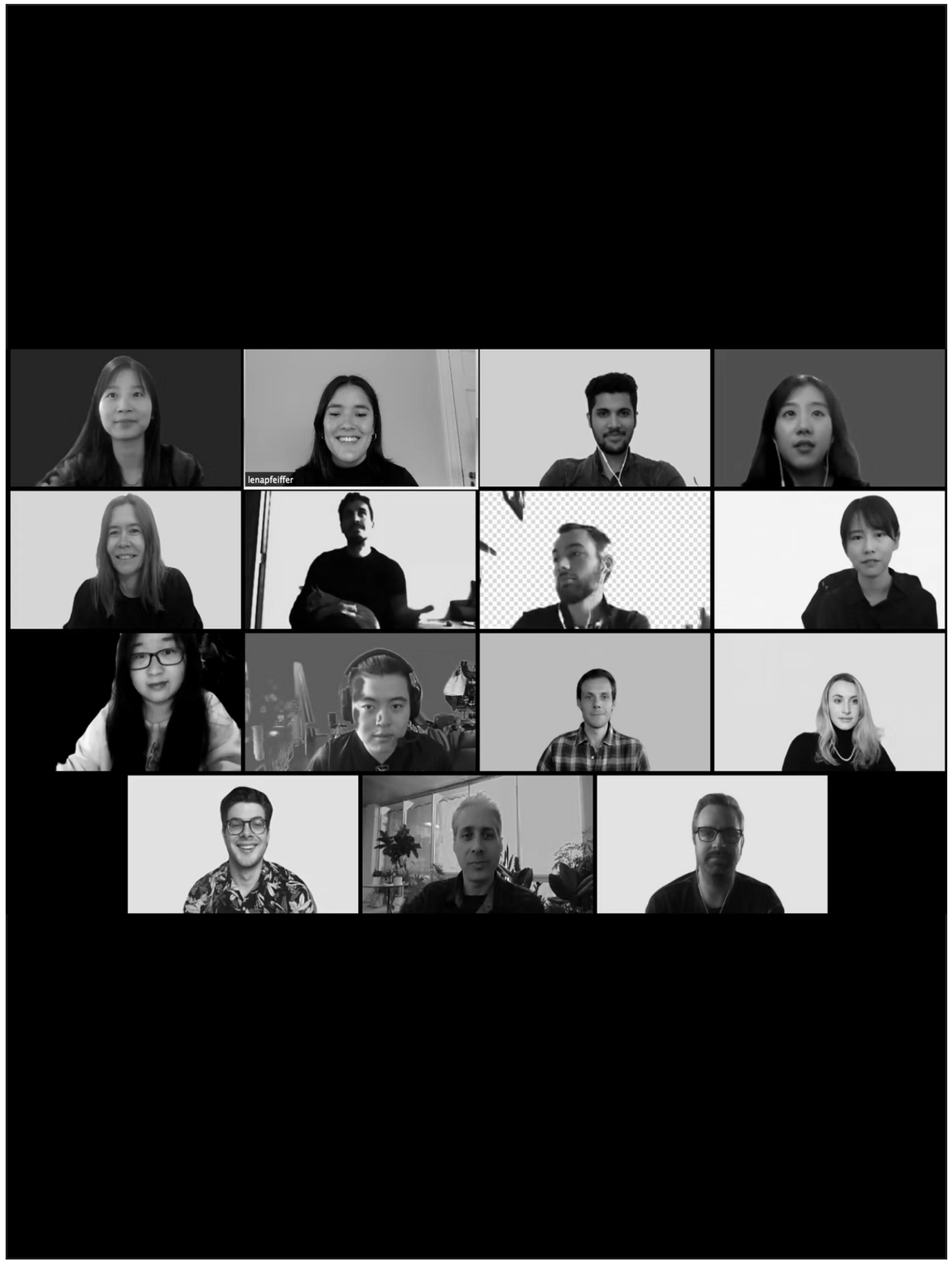












03

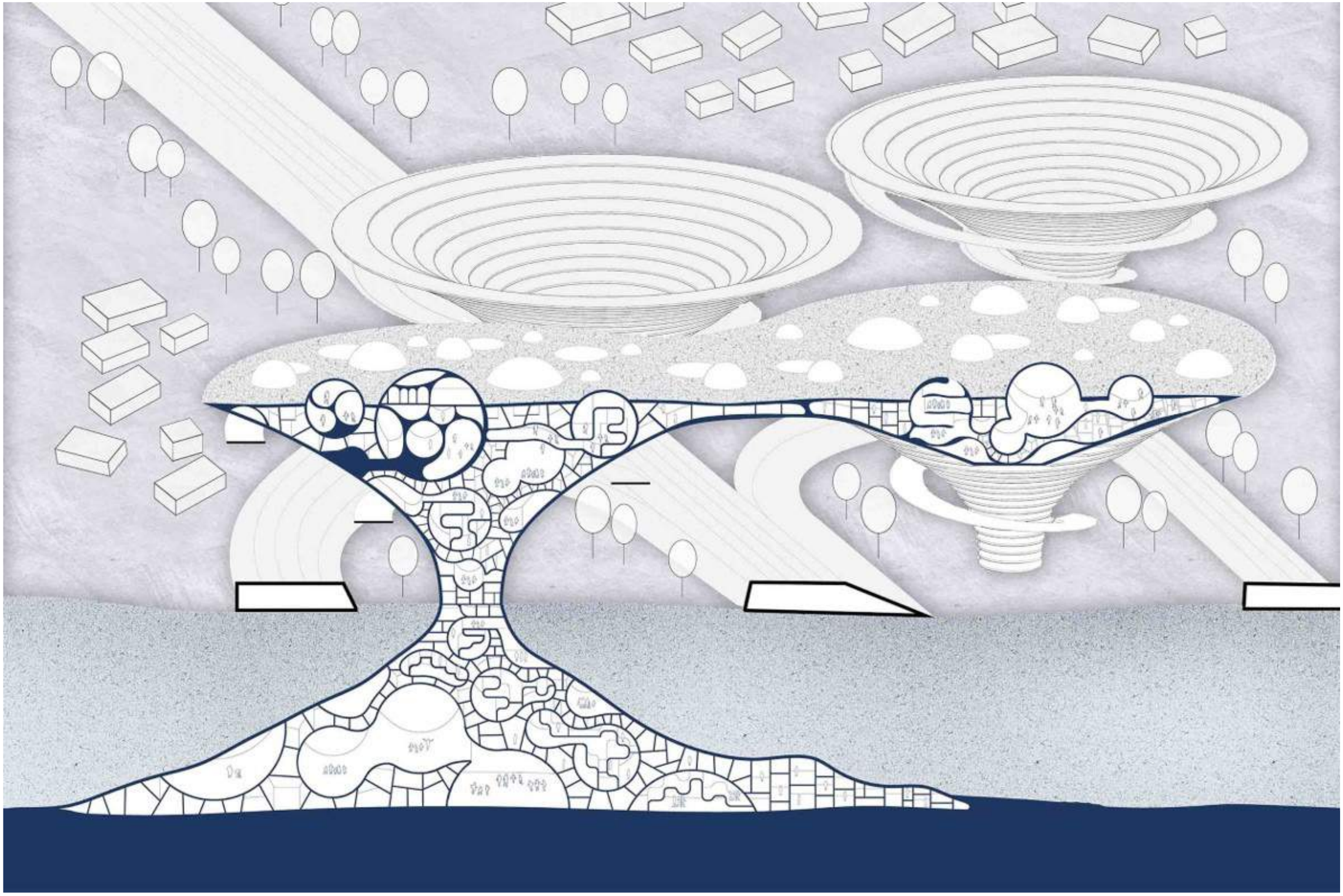
2020.01 - 2020.04

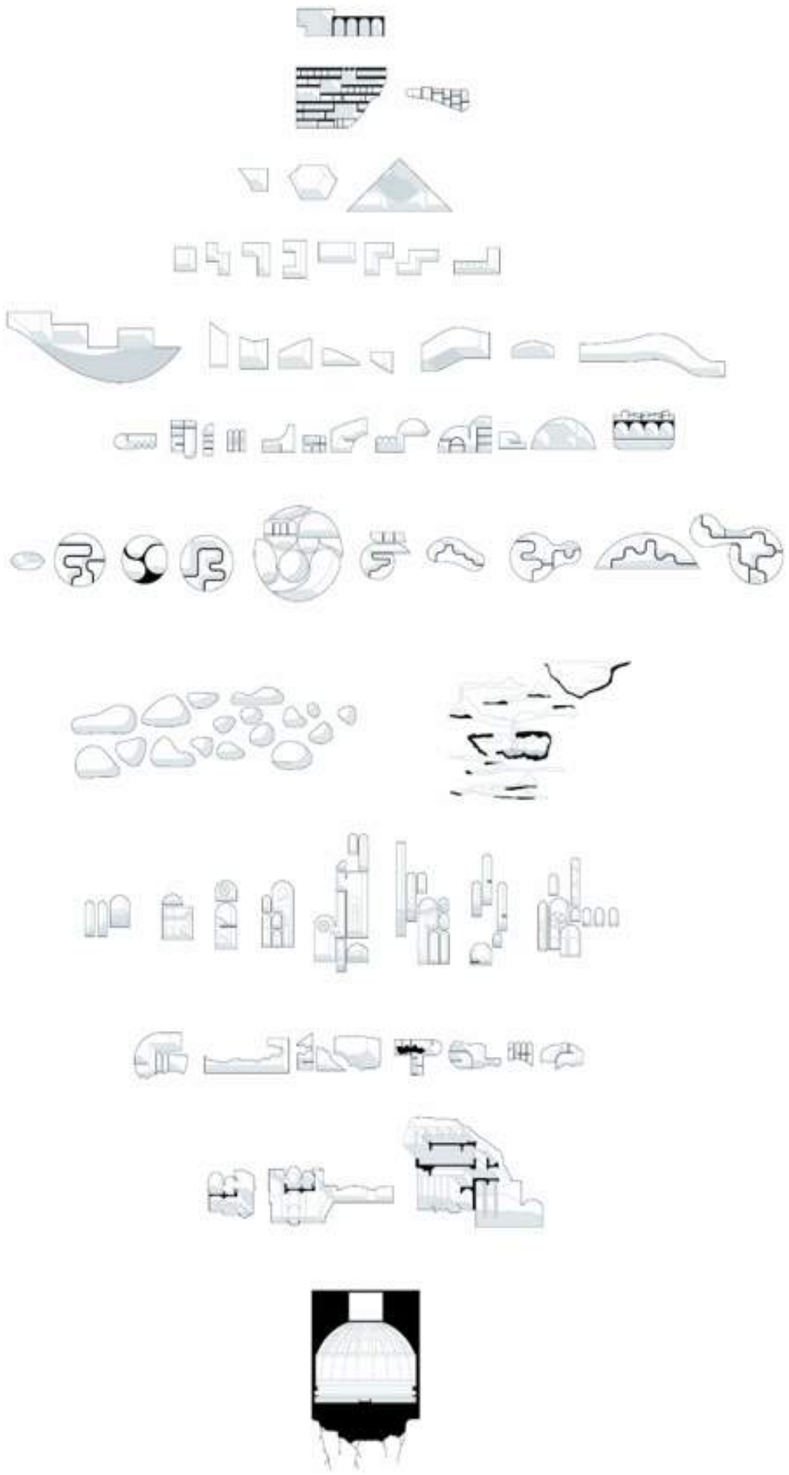
WHAT IF ... ? THEN ...

Urban-scaled Architectural Speculation in Tokyo

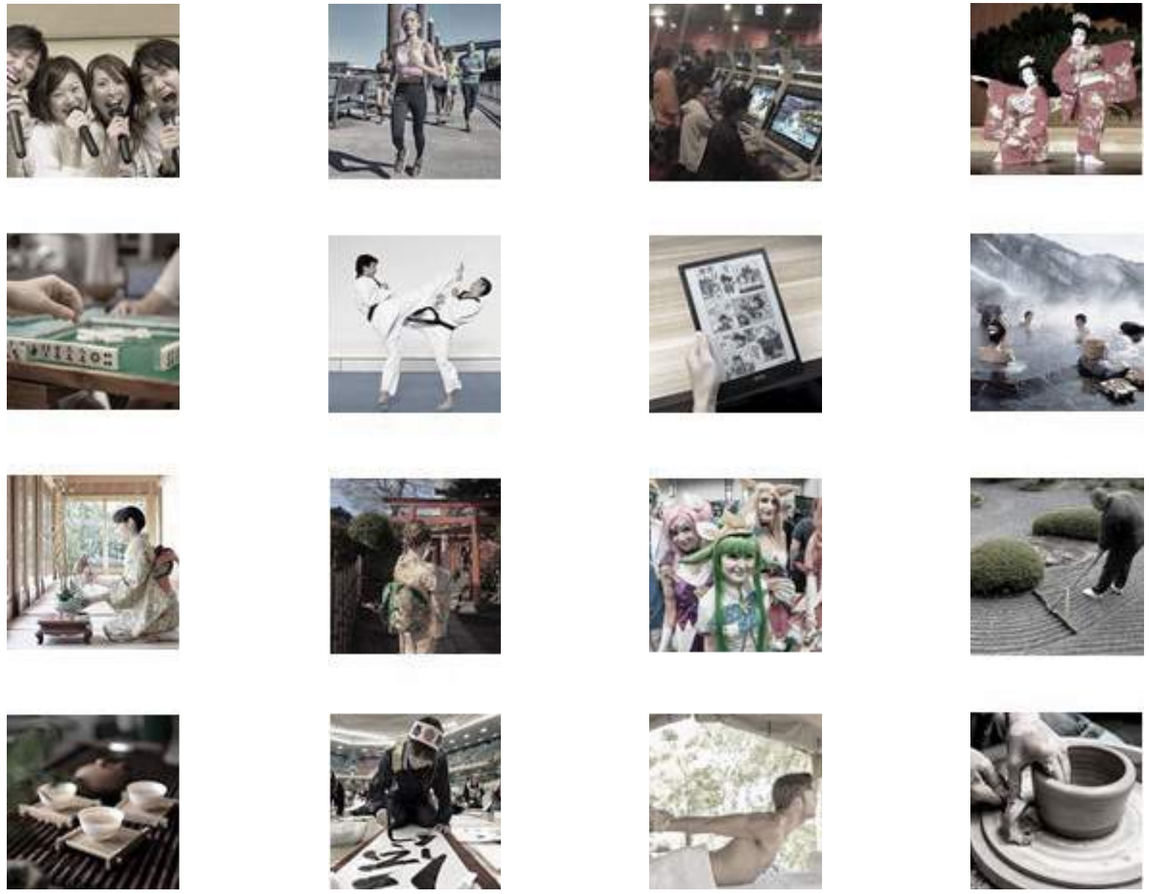
Professor: Sarah Dunn
Martin Felsen
Teammate: Xiaoxuan Hu
Project Title: One Day of a Salary(wo)man

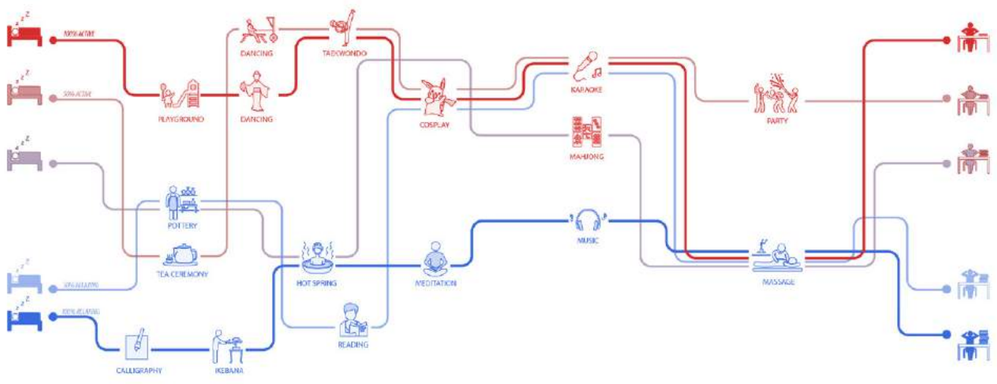

チンコ
スパス
DVD-VIDEO
カラオケ



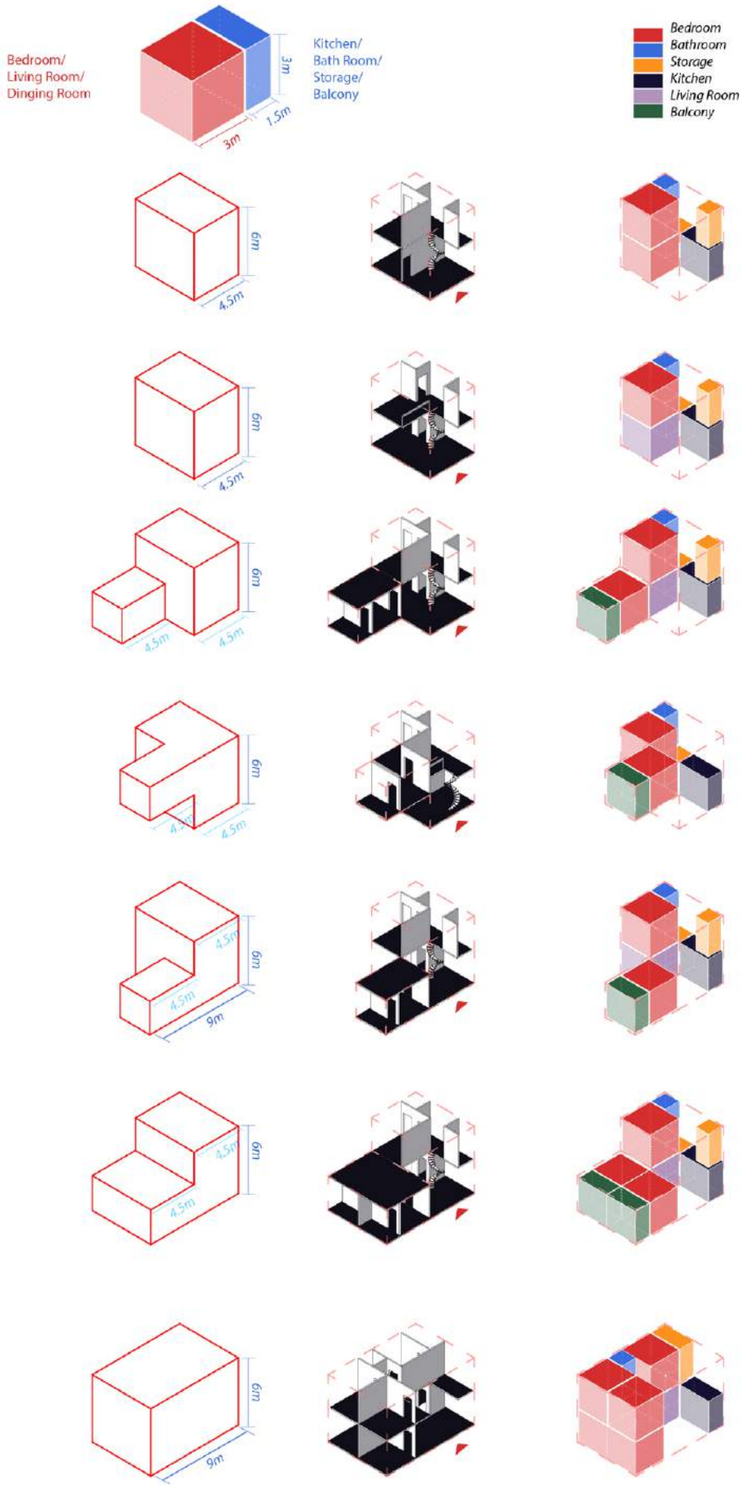


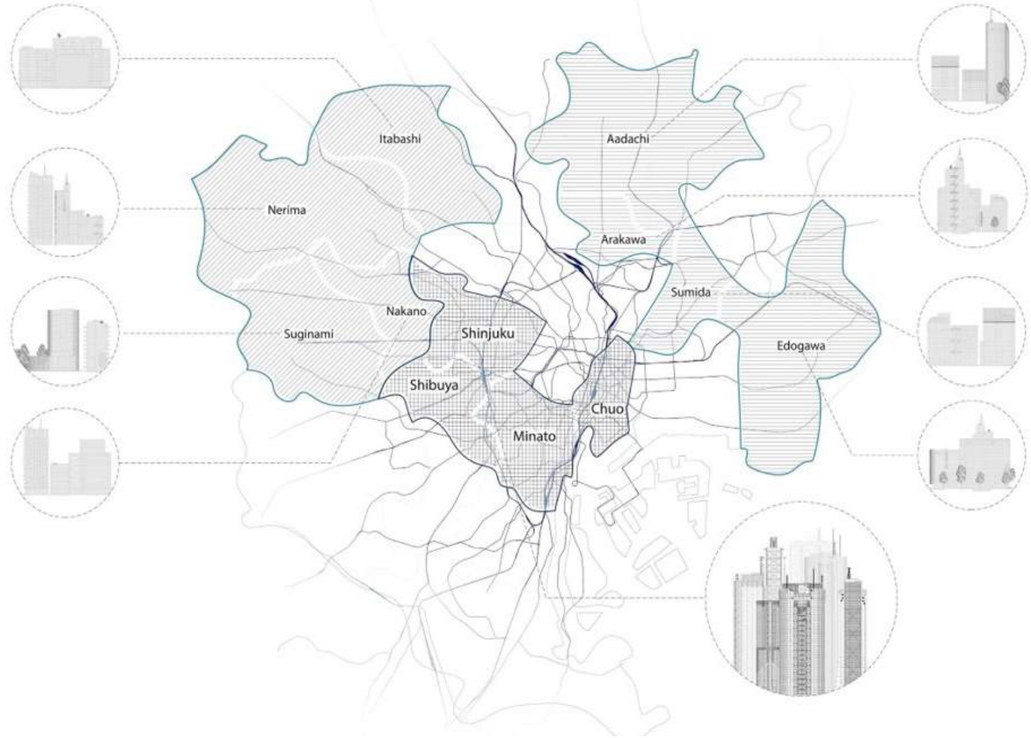
Section Catagory

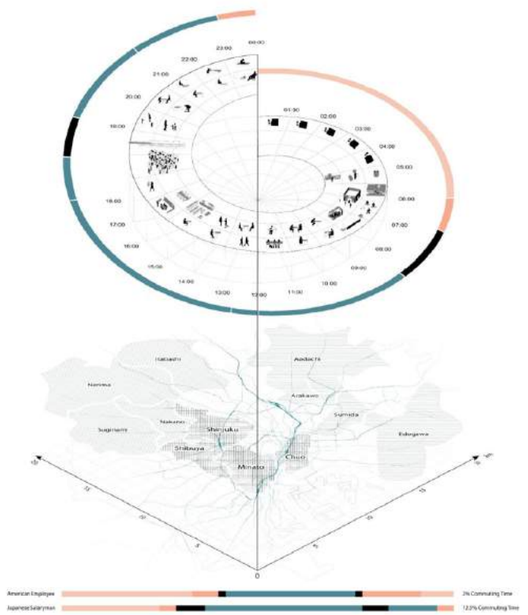




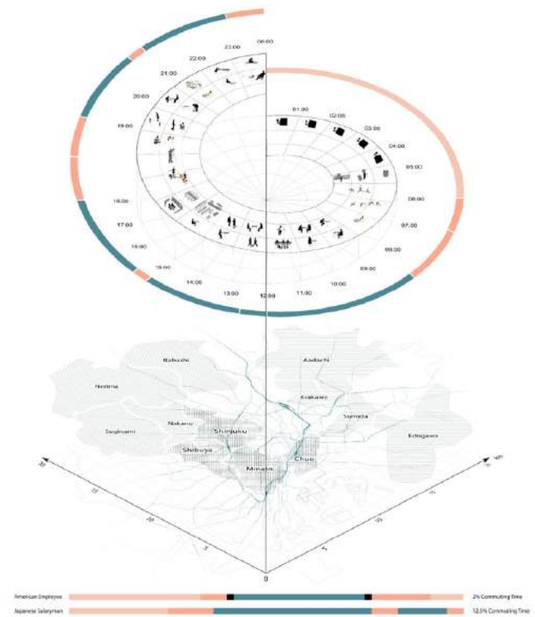
Space Arrangement



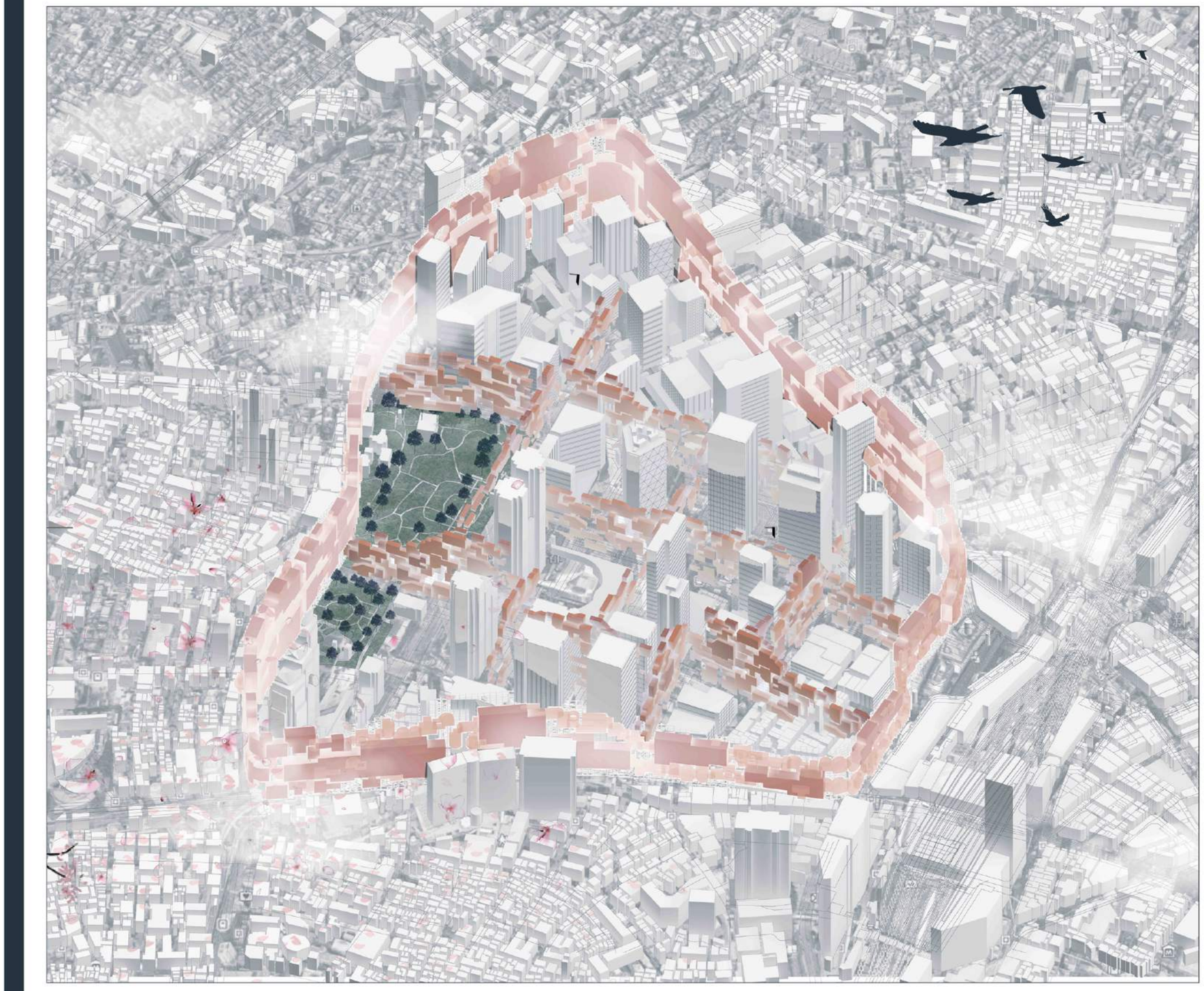




Timeline (Before)



Timeline (After)

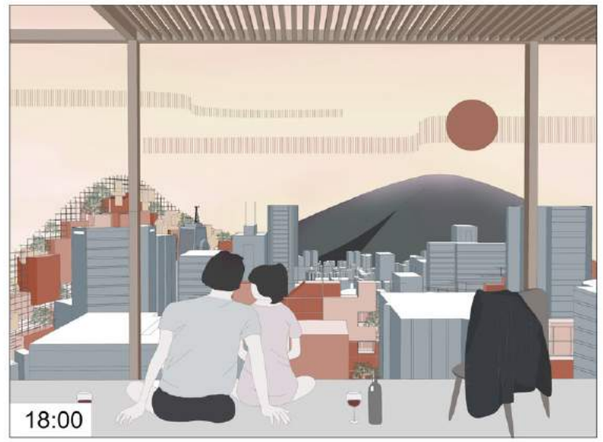



07:00


09:00


12:00


15:00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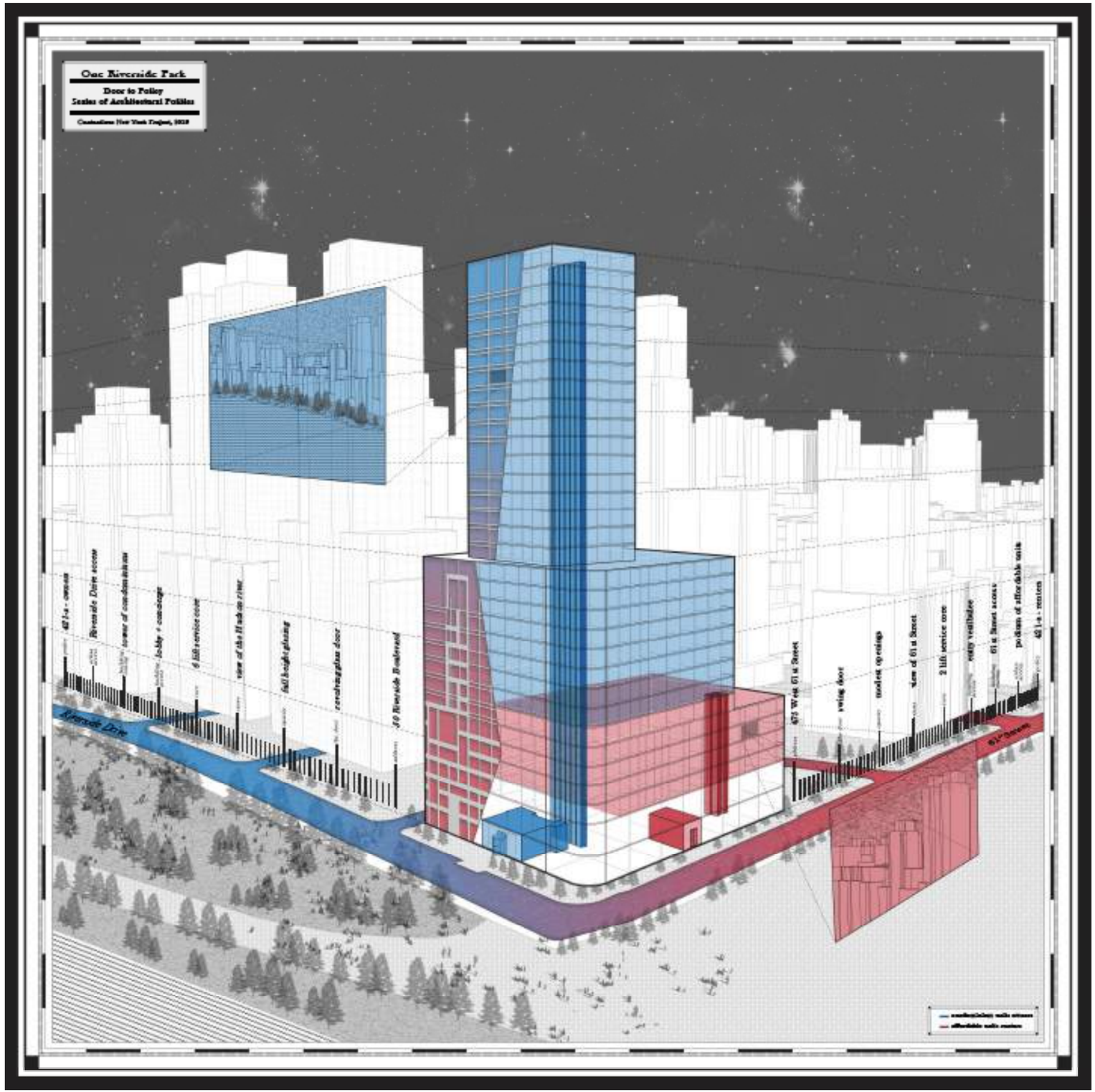
23:00



04

2019.06 - 2019.08

TRANSSCALARITY

Door to Policy: Scales of Architectural Politics

Professor: Ife Salema Vanable
Teammate: Kabir Sahni, Shuchang Zhou
Sub-section: Contentious New York Projects 2019

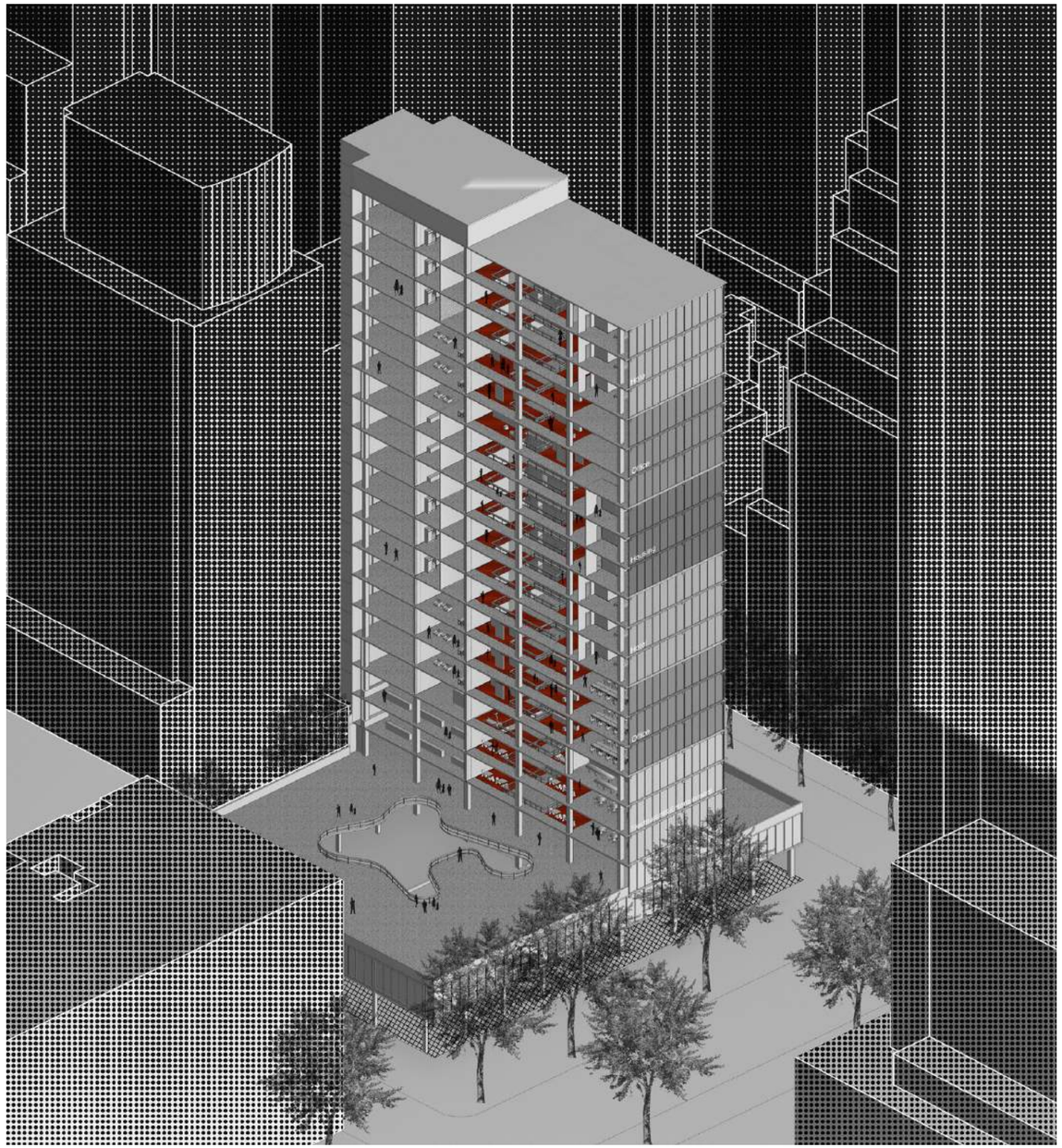
Address:
475 West 61 St. vs 50 Riverside Drive

Views:
street vs Hudson

Material
opaque vs transparent

Access
61 Street vs Riverside Drive

Doors:
swing vs revolving



05

2019.09 - 2019.12

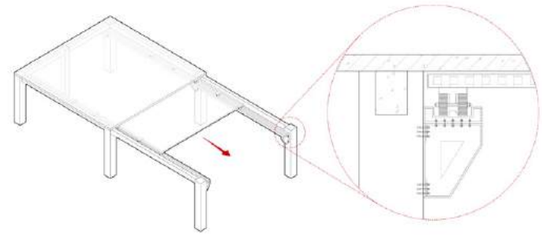
RE-THINKING THE BIM

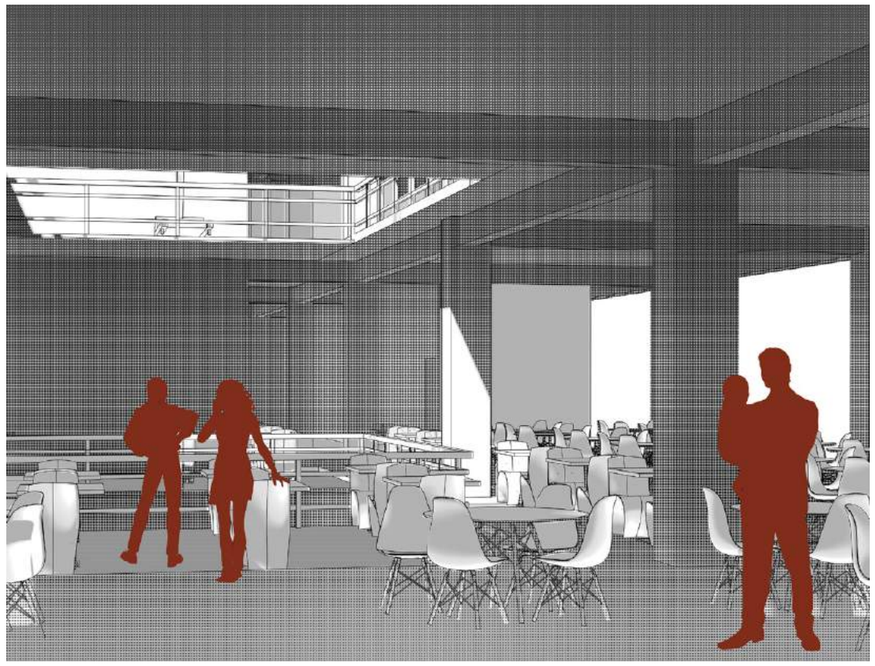
Re-programming of the Lever House

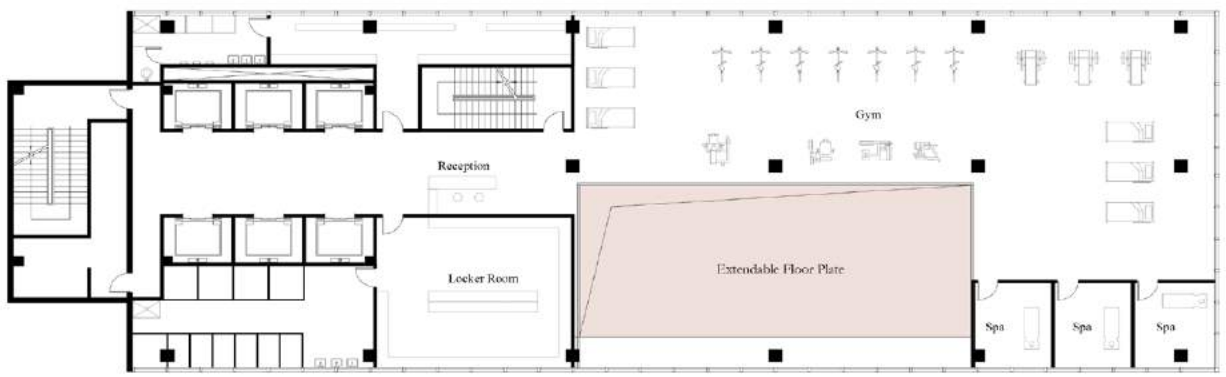
Professor: Jared B. Friedman
Teammate: Feibai An
Project Title: Lever House Re-programming (Extendable Floor Plate)

The urban landuse is in high density in the city of New York, especially Manhattan. The natural lighting is poor inside the buidling. In addition, the narrow living space and crowded traffic are also key social problems.

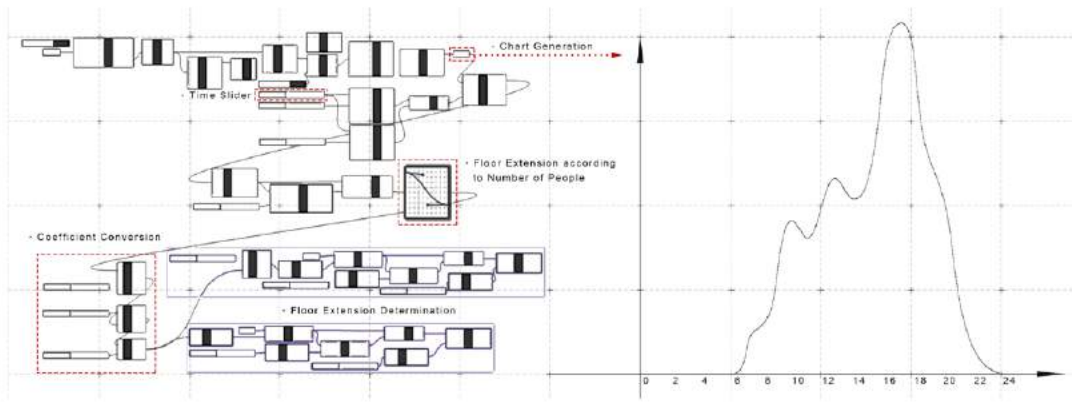
Through this re-programming, we hope to use the land more efficiently. We also hope to improve open space and natural lighting inside the building as well as providing exonomic housing for the young people in Manhattan.

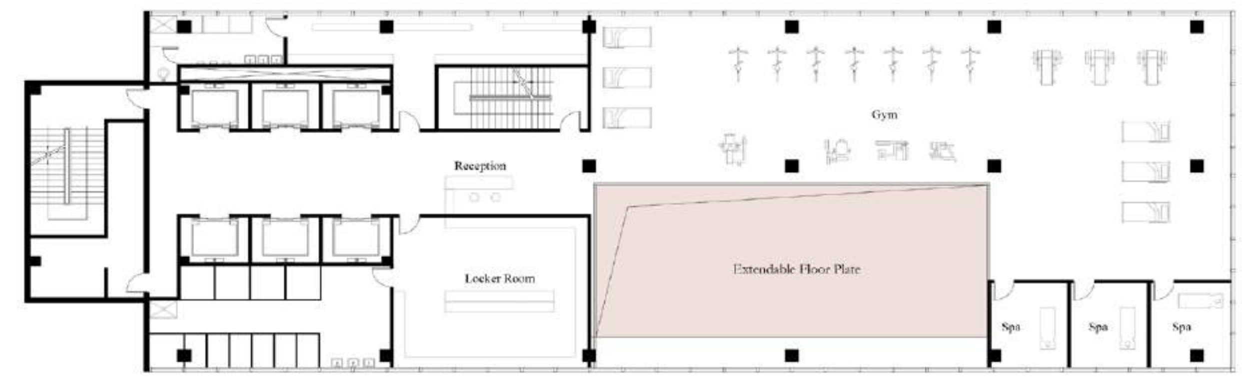




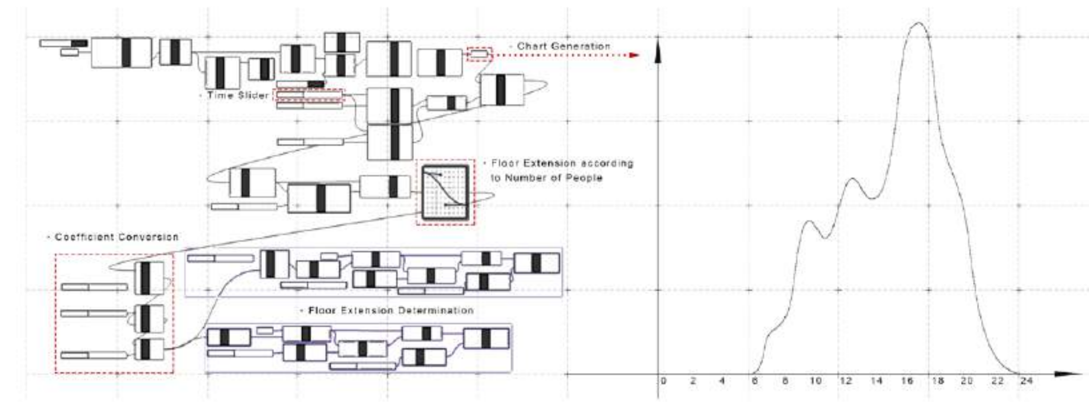


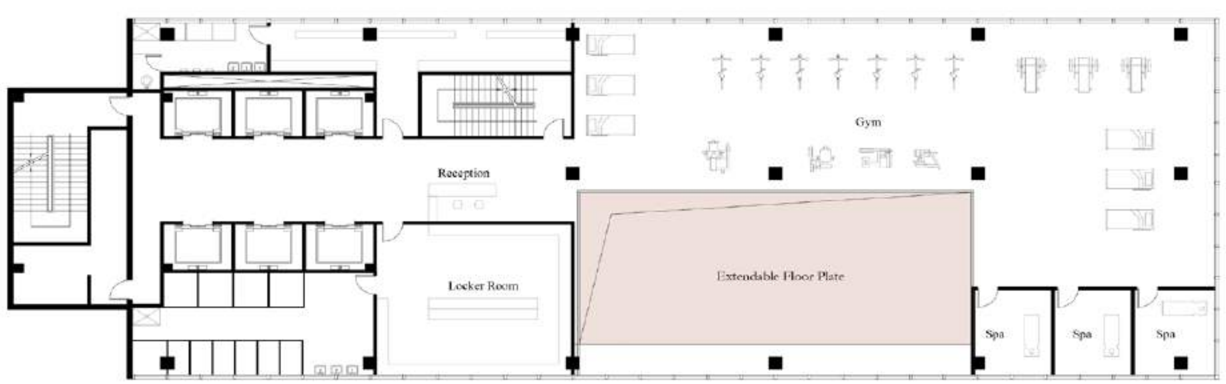
Entertainment: Floor 6
1:200



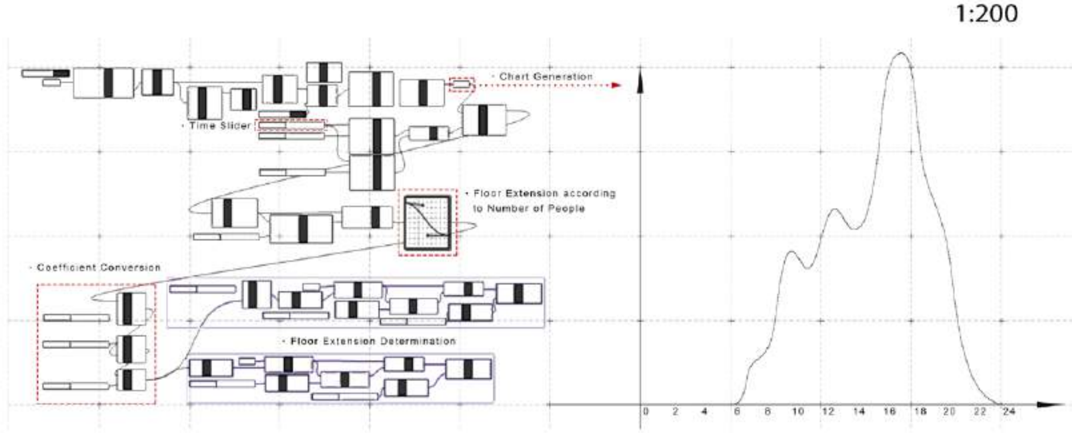


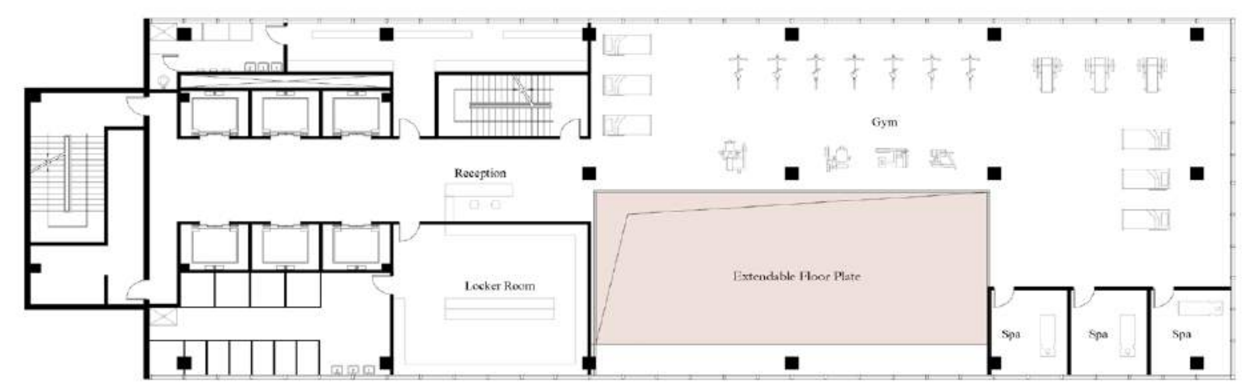
Entertainment: Floor 6
1:200





Entertainment: Floor 6
1:200





Entertainment: Floor 6
1:200

06

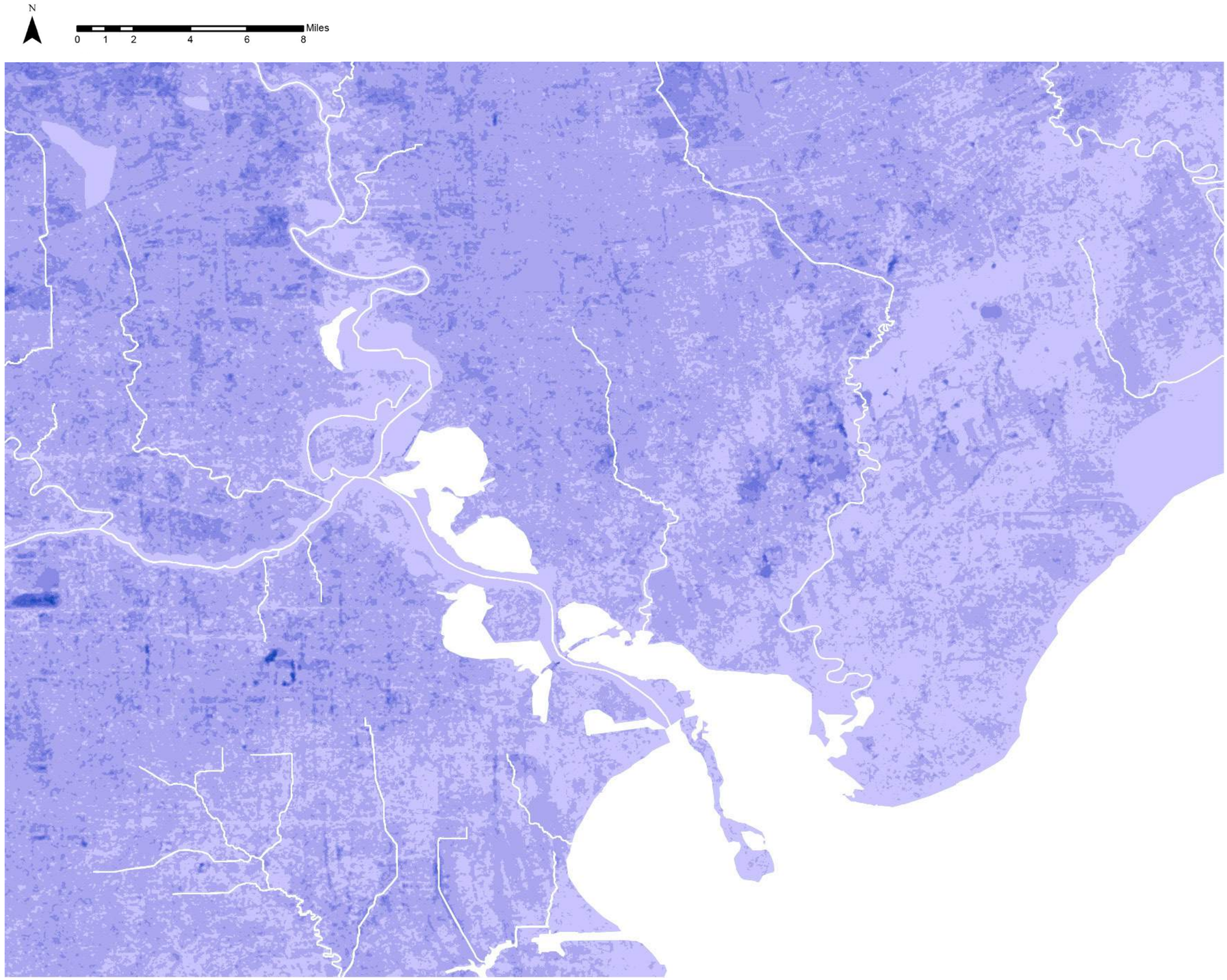
2019.09 - 2019.12

GEOGRAPHICAL INFO SYSTEM

Evaluation of Land Development Value in Houston Suburb Areas

——Based on Flood Risk Analysis

Professor: Leah Meisterlin
Teammate: Xinyi Zhang

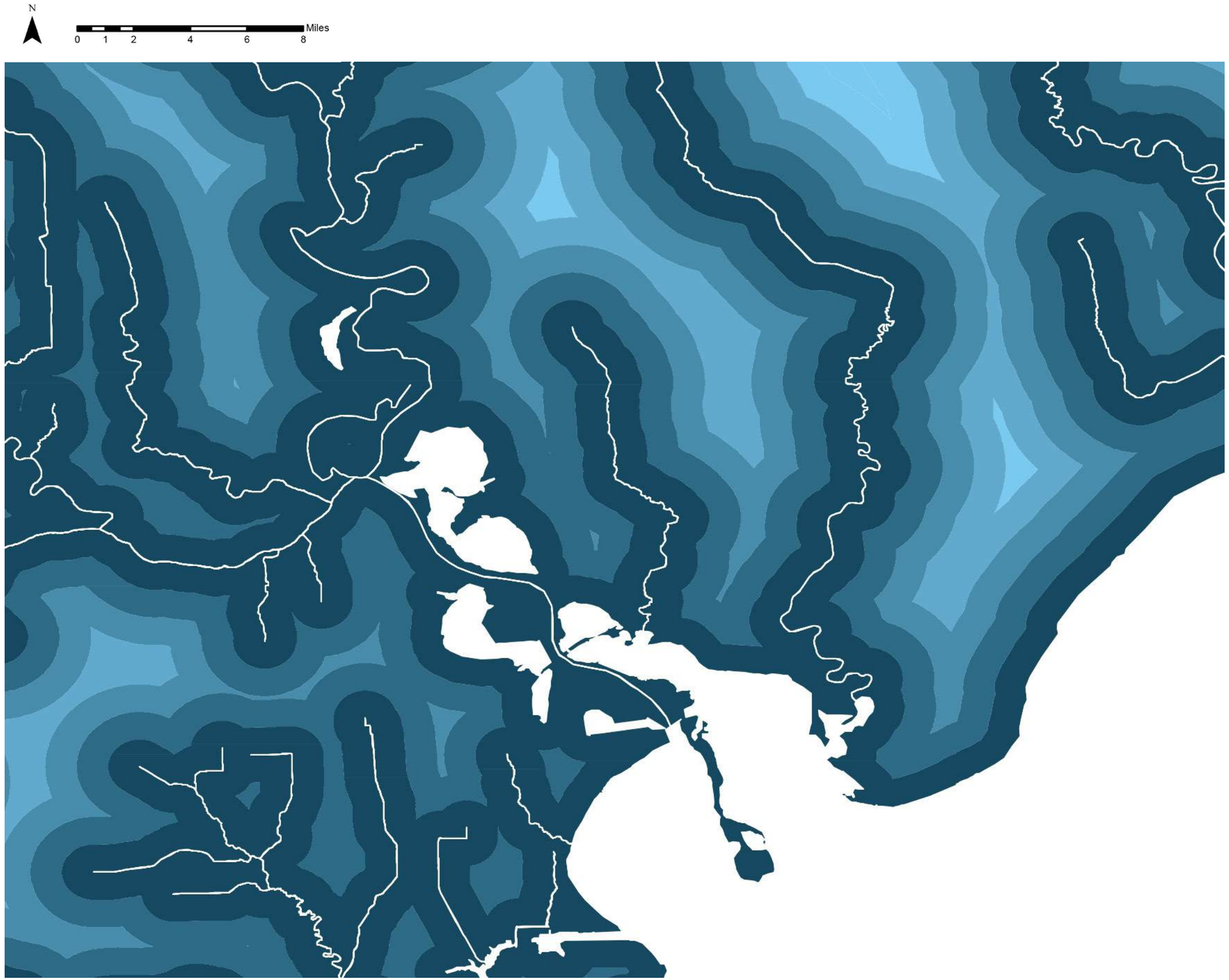


Terrain Map

The elevation of the study area ranges from 0 to 96 meters. The lower elevation usually gathers more precipitation and surface water, thus it obtains a higher flood risk value.

For the future construction and development, the greater the flood risk, the smaller the development value, so we divide it into five grades according to the altitude from small to high, scoring from 1 to 5 respectively.

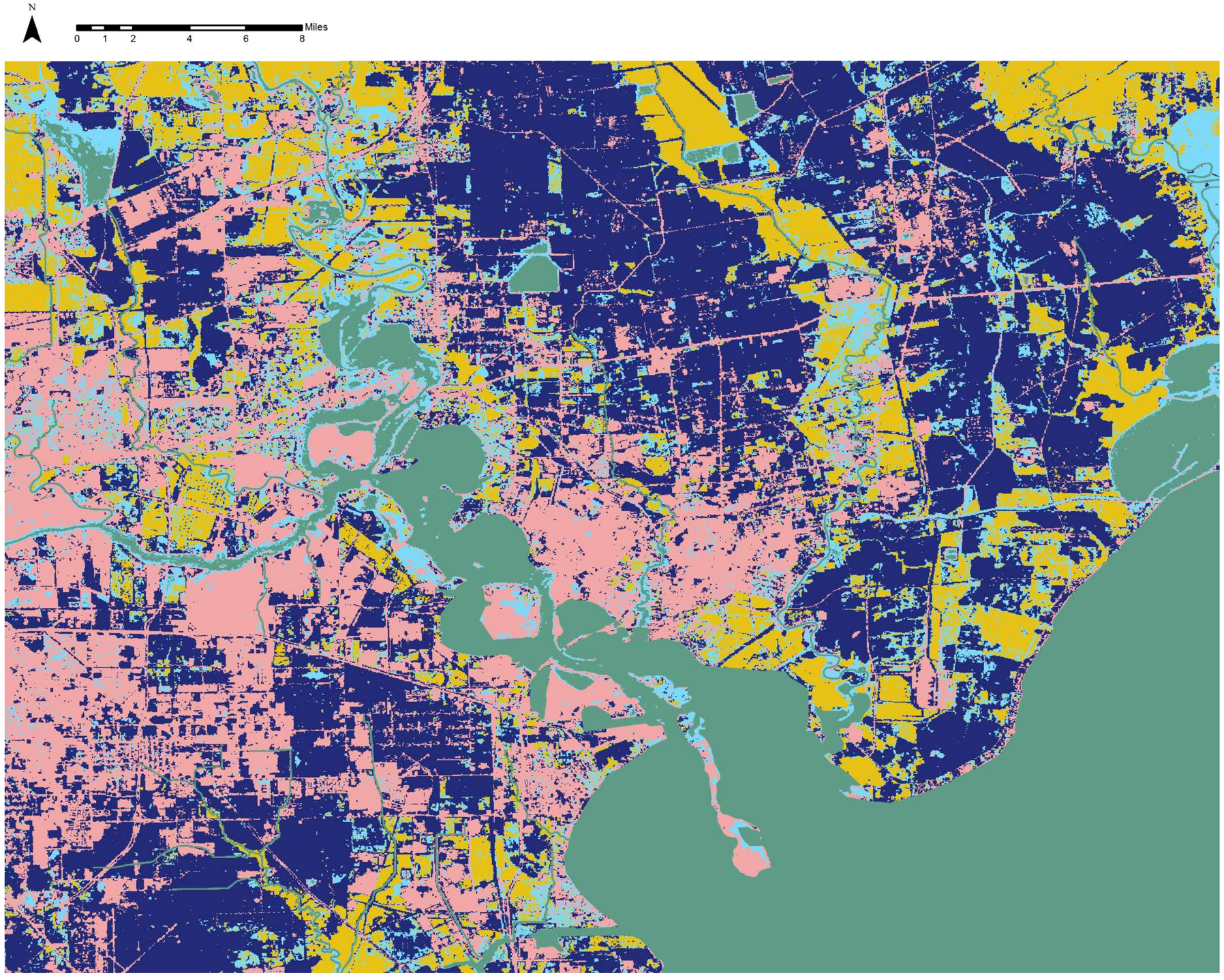
- 5 points
- 4 points
- 3 points
- 2 points
- 1 ponts



Distance from Water

There are many waters in the suburban area that we analyzed. The Houston River flows into the sea. The terrain around the river is relatively low, and when the river overflows nearby, it is easy to flood, resulting in some places at lower altitudes being more likely to be submerged.

Therefore, we extracted all the waters in the region (rivers, lakes and bays) and analyzed their distances. Flood risk increases as the distance from the river decreases. We divide the distance from the water into five grades (1km to 5km) based on the unit of 1km, and score them from 5 to 1 point.



Landuse Map

From the angle of ecological development, we need to study the current land use situation in this region. The study area is rich in land types, mainly including wetlands, forests, farmland, construction areas and water areas.

The waters have no value for exploitation, so this item has the lowest score, one point. We think wetland has the effect of flood prevention, and from the perspective of flood prevention, it is not suitable for development, so we give two points. As a benign ecosystem, the forest should also be protected as much as possible. Its development level is only higher than that of wetlands, so this item gets three points.

Farmland has economic benefits and ecological value such as water retention and biodiversity, the over-exploitation may have a negative impact on the local economy, so the score is 4. Areas that is developed have relatively sound infrastructure and are more suitable for

1 points - Water
4 points - Farmland
2 points - Wetland
5 points - Building
3 ponts - Forest

N

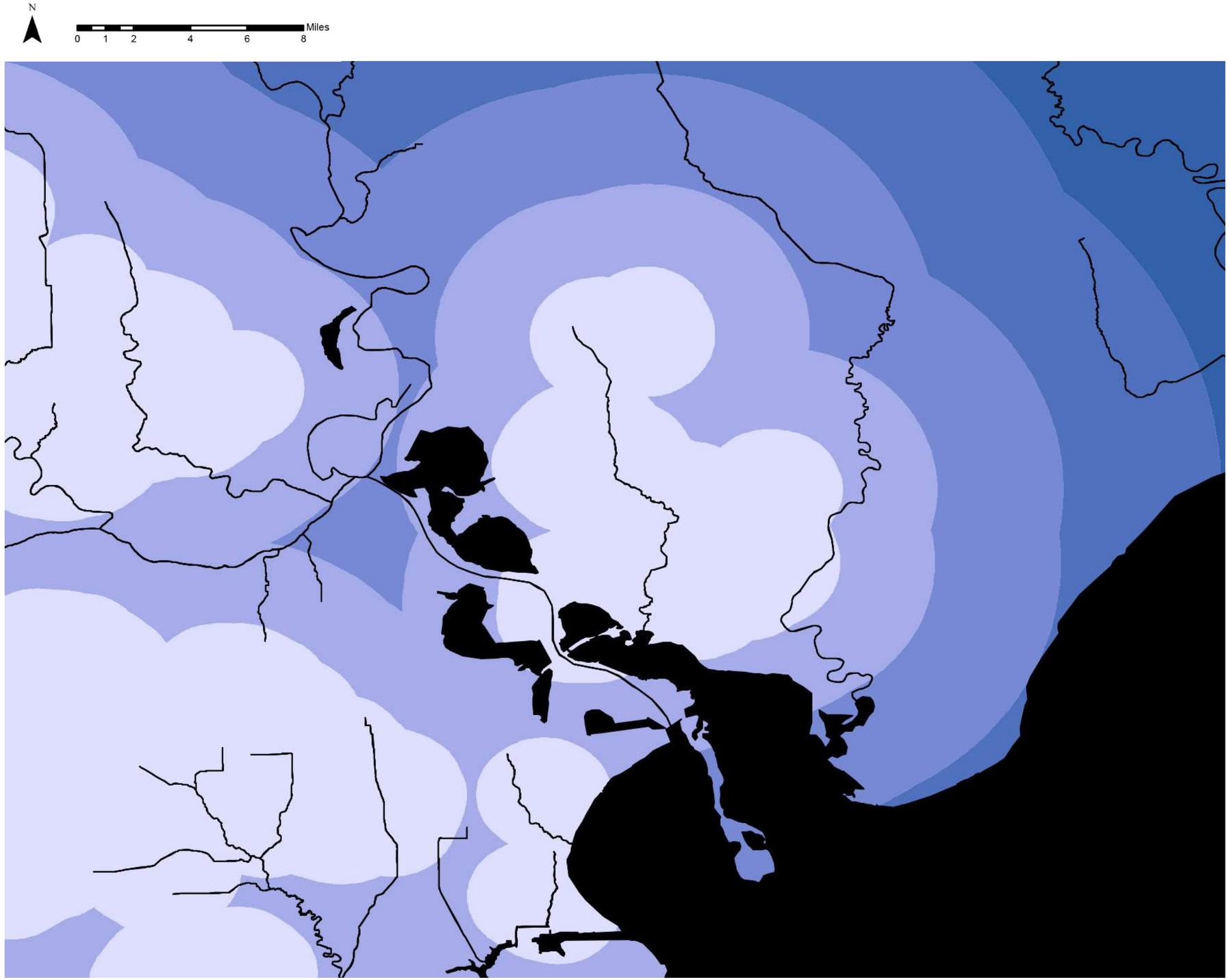
0 1 2 4 6 8 Miles

Population Density

This is a map of population density analysis, which is calculated from 0 to 5250 per square kilometer. The darker the color, the greater the population density, which means that the area has been built and developed.

We divided it into four grades, excluding the area with the lowest population density (classified as undeveloped area), and merging the other three grades into the area with existing construction and development.

5250-7134
3500-5250
1750-3500
0-1750

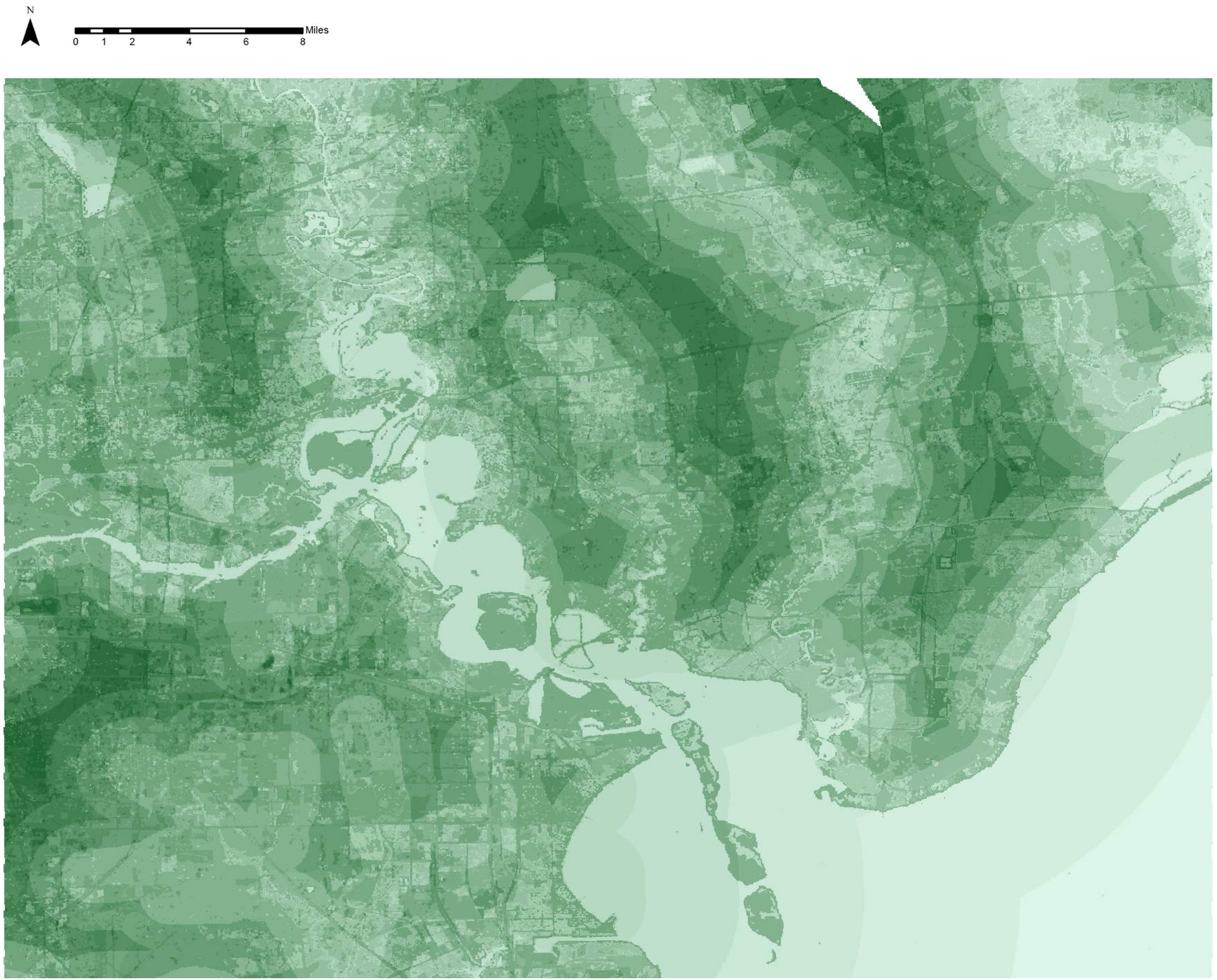


Distance from Developed zones

We defined the place with a population density of more than 1750 per square kilometer as the developed zone, and made this map with the distance between the research area and the development zone.

The lighter the color, the closer the area is to the development zone, and the greater their development potential can be. Therefore, we divided the distance from far to near into five grades with a boundary of 2 kilometers, and scored them from 1 to 5 respectively.

5 points - 0-2 km
4 points - 2-5 km
3 points - 5-9 km
2 points - 9-14 km
1 ponts - 14-20 km

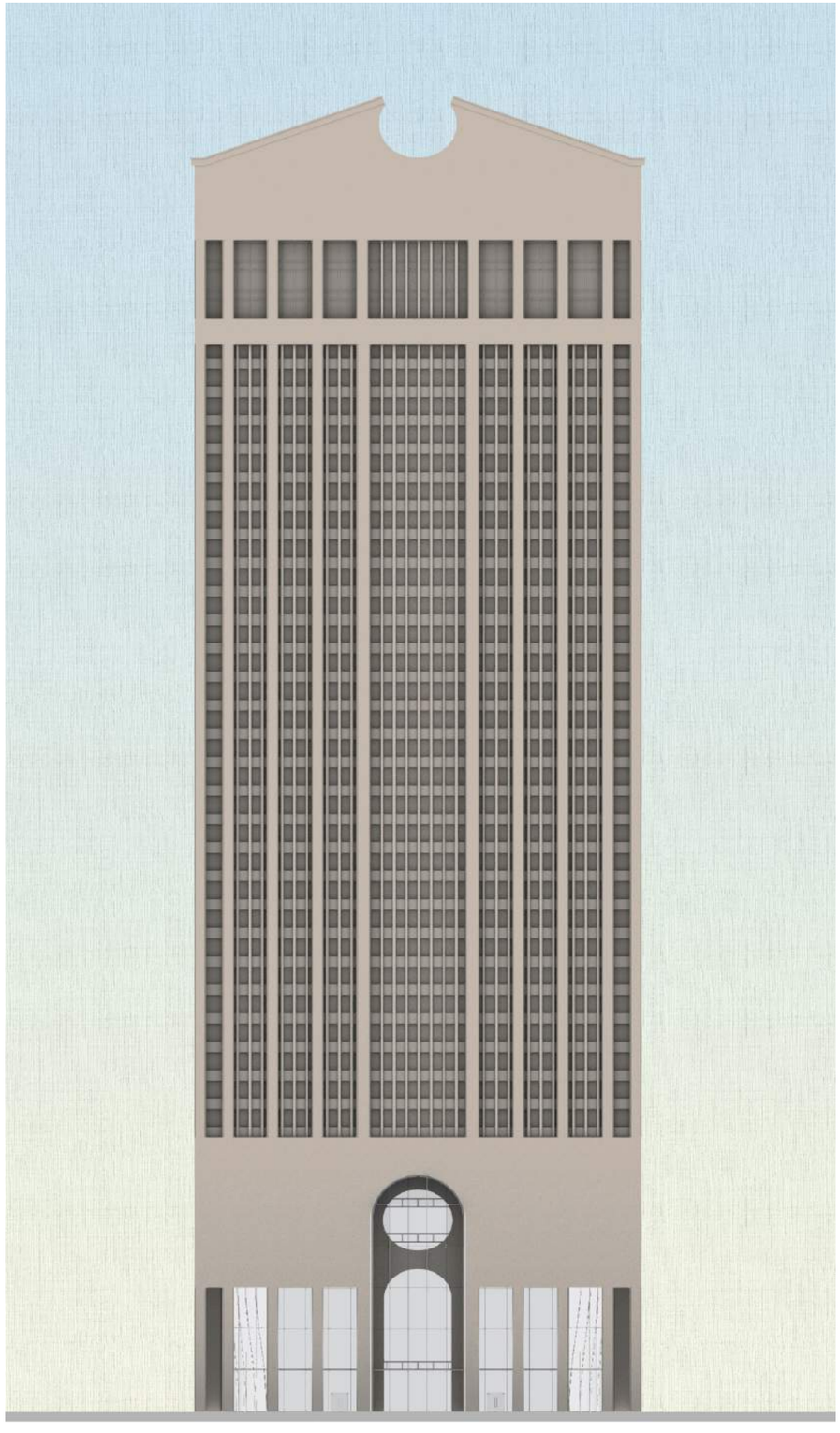


Total Score Calculation Map

After all the above scores are weighted and accumulated, we have got this score map on the right, the range of the score is from 7 to 43. The darker the color is, the higher the score is, which means the greater the development value of the area in our development analysis based mainly on flood risk.

From the map, we can clearly see that the scores of the areas close to the waters are generally lower, and the scores of the areas with higher terrain in inland areas are also relatively higher. Taking the developed areas as the center, the scores show a spreading development and a gradually decreasing trend.

7 43



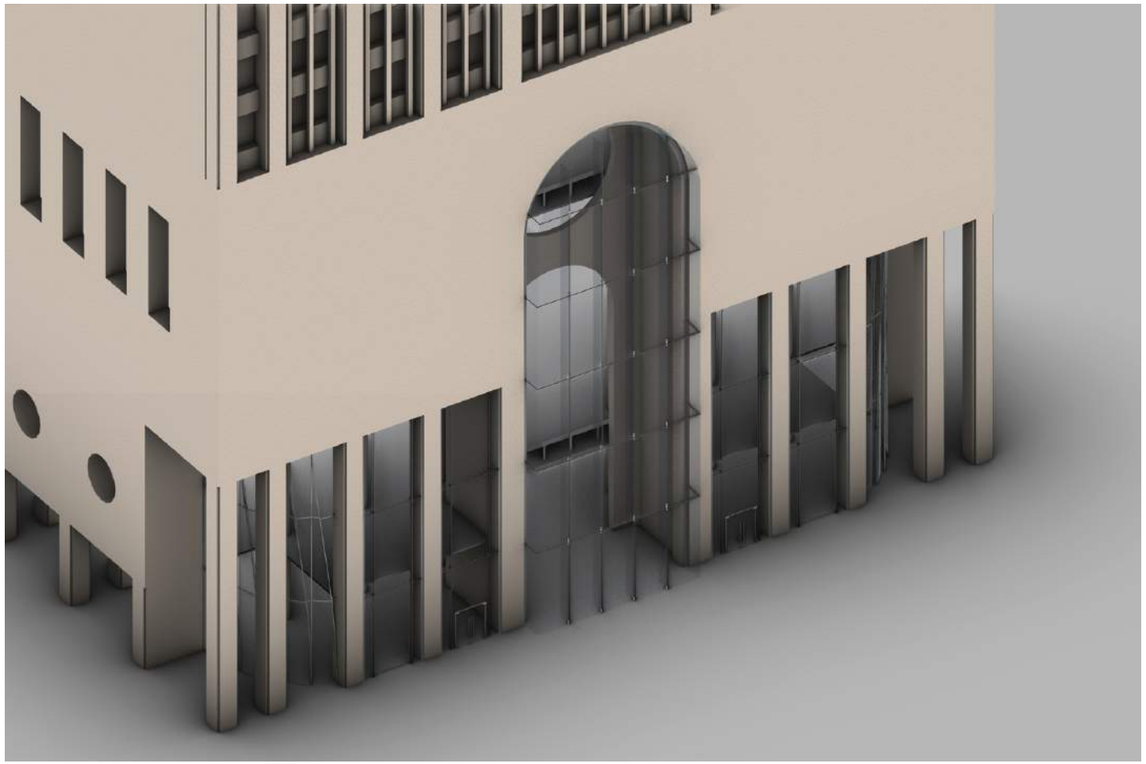
07

2020.01 - 2020.04

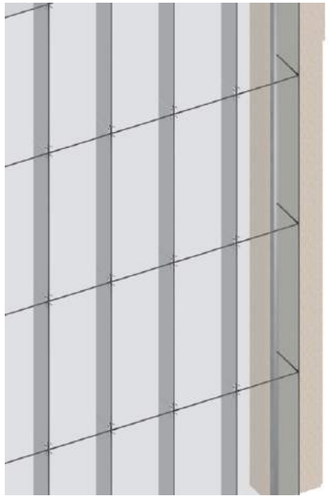
FACADE DTAILING

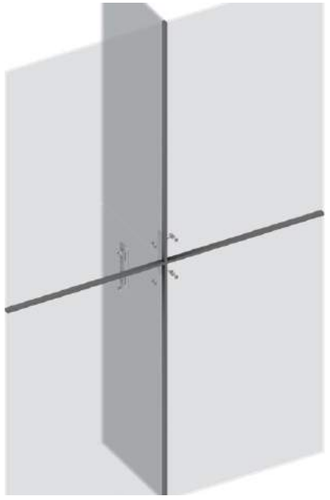
Facade Renovation of the AT&T Building in New York City

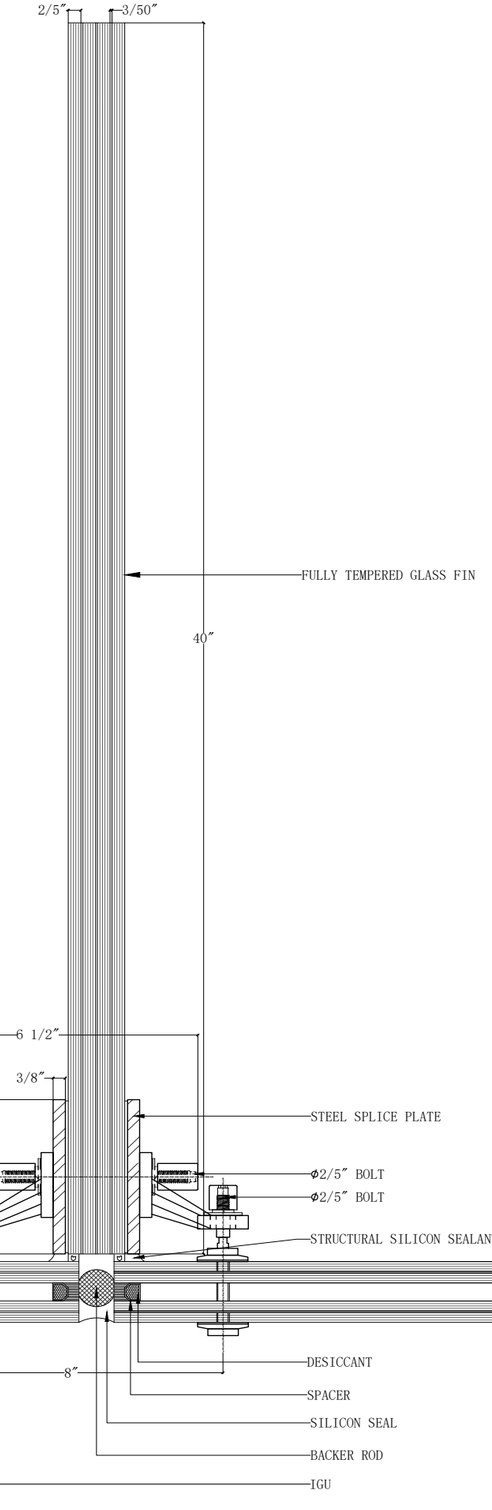
Professor: Kevin L. Schorn
Teammate: Feibai An

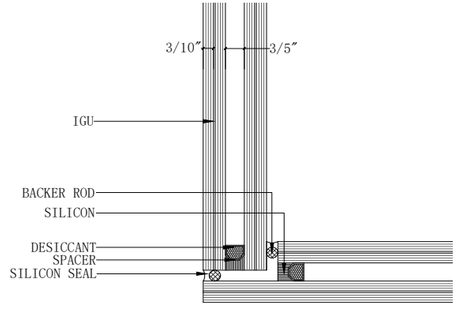


Class Fin



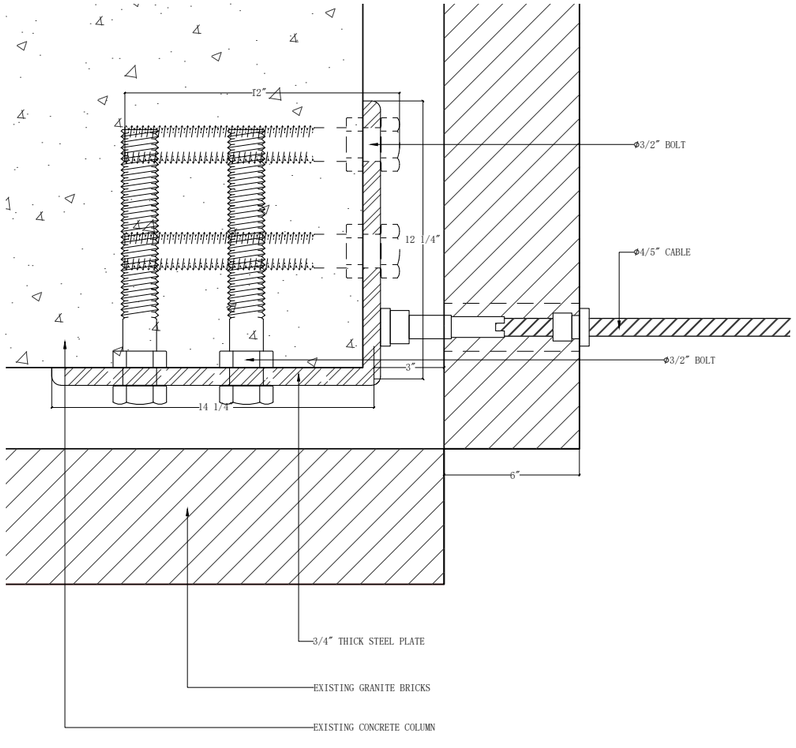




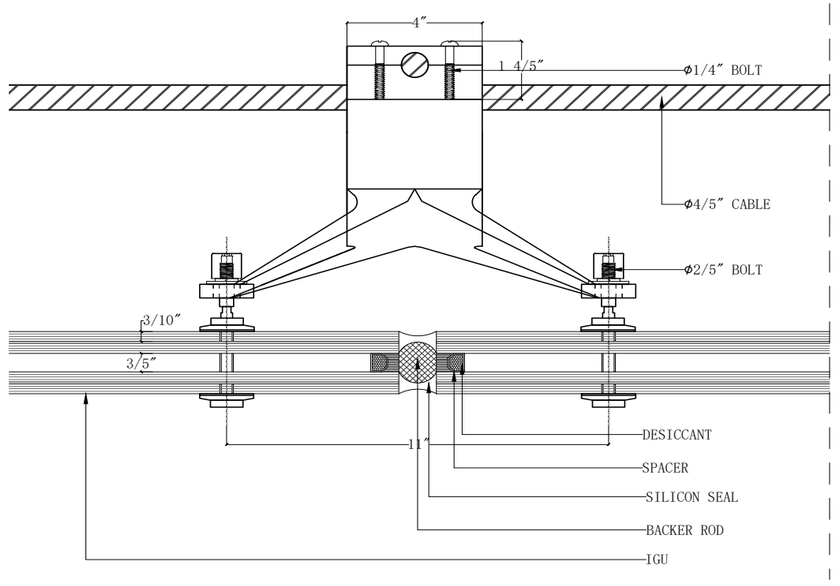


Glass Fin &Corner Detail 1:4

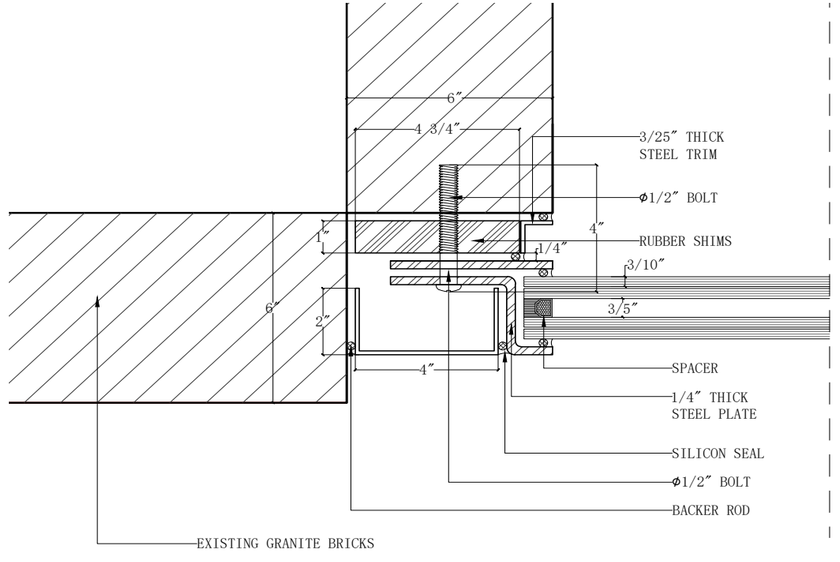
Cable Net Facade System



Cable End Detail 1:4

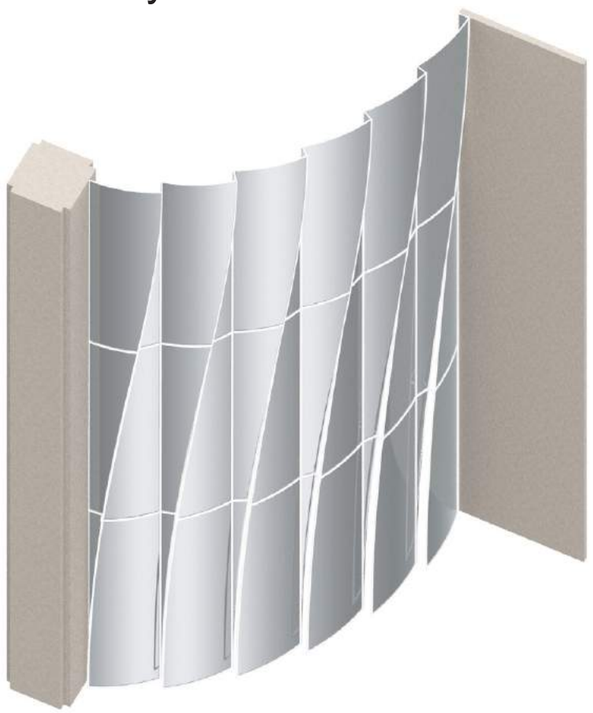


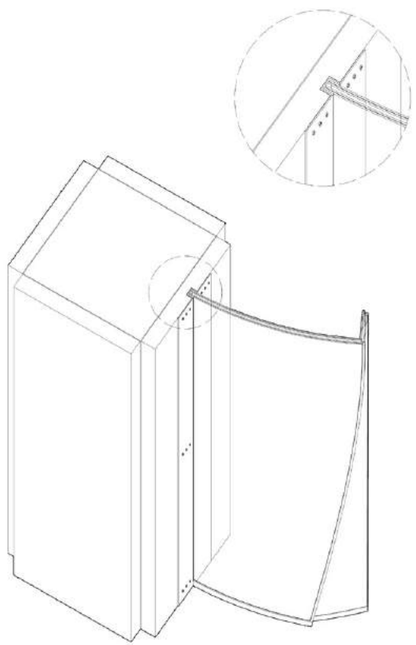
Spider Detail 1:4

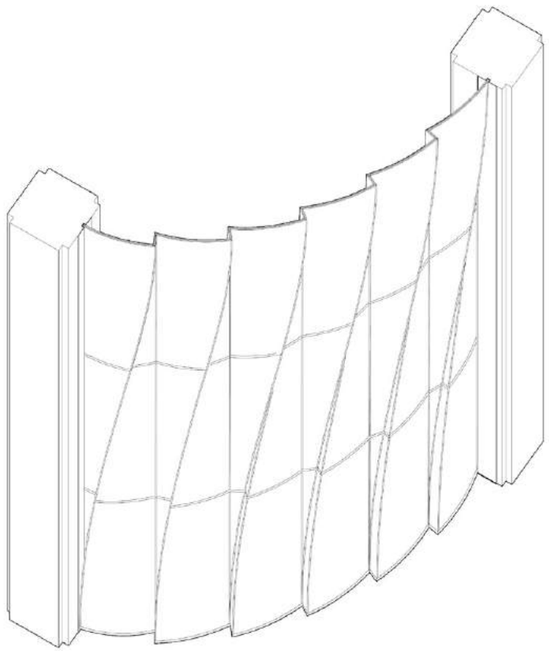


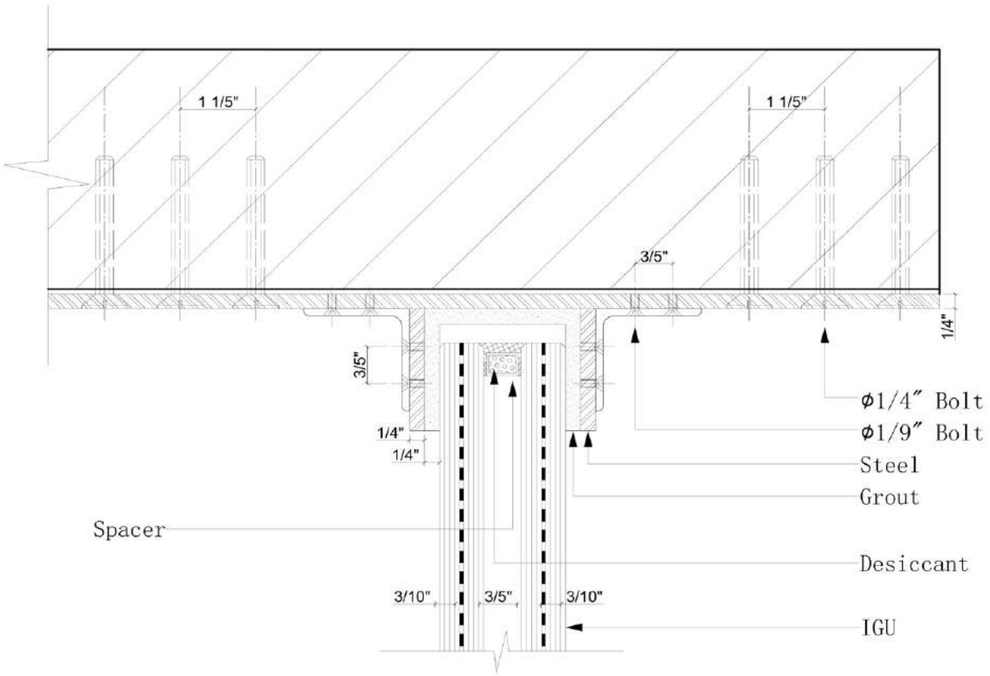
Joint of Glass and Granite 1:4

Curved Curtain Wall System

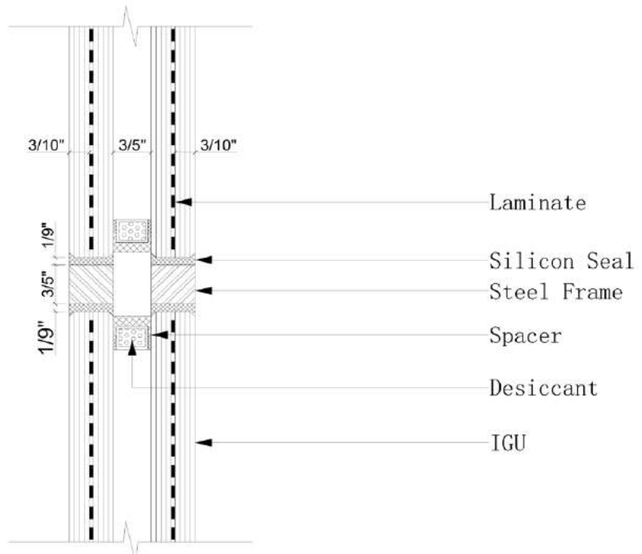




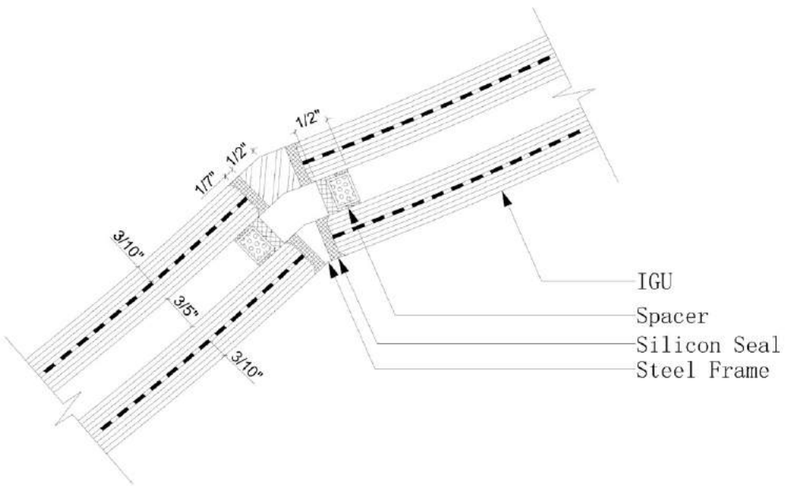




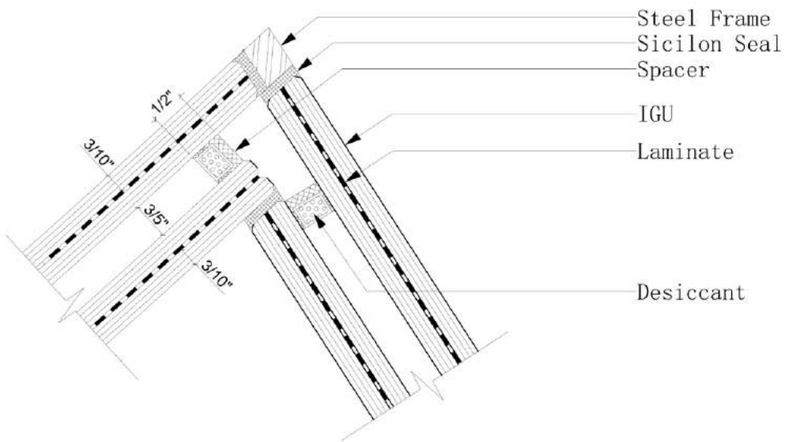
Joint of Glass and Ceiling 1:2



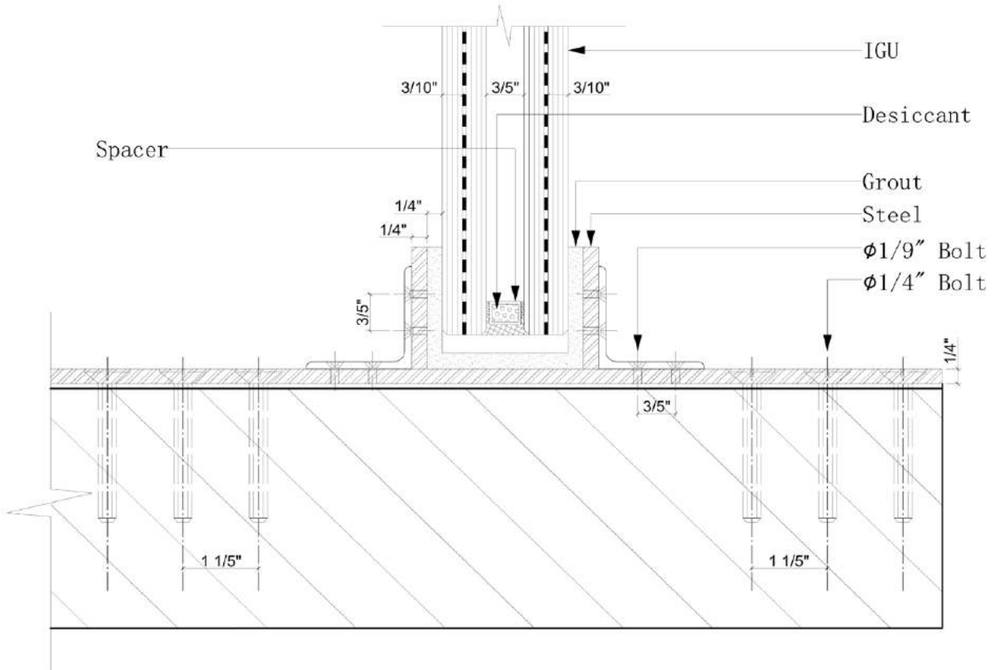
Joint of Two Glass Panels 1:2



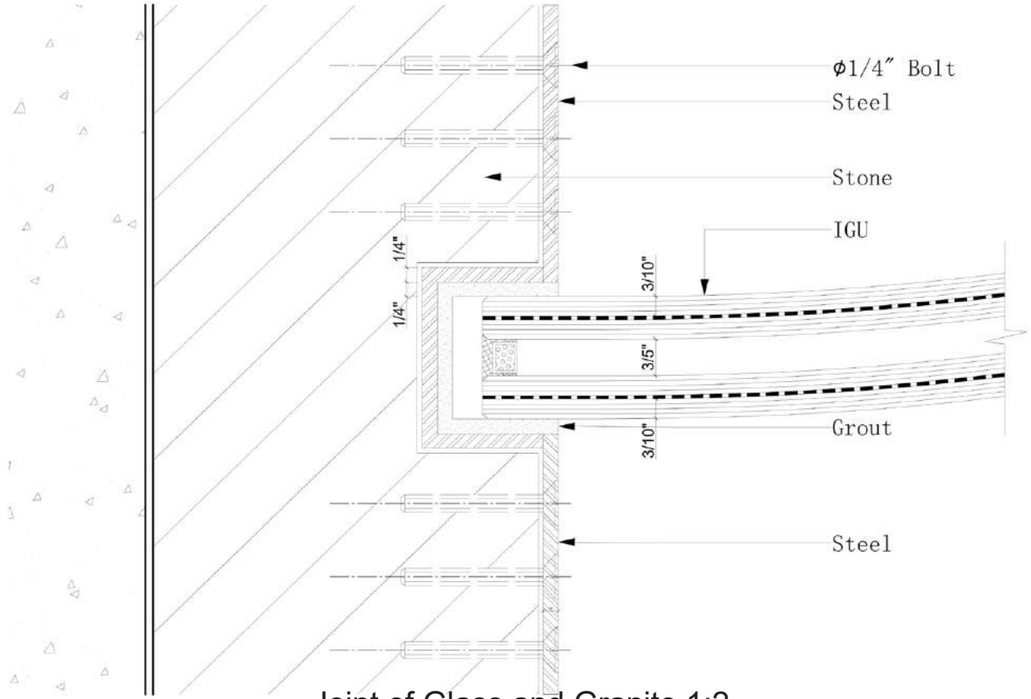
Steel Frame Detail 1:2



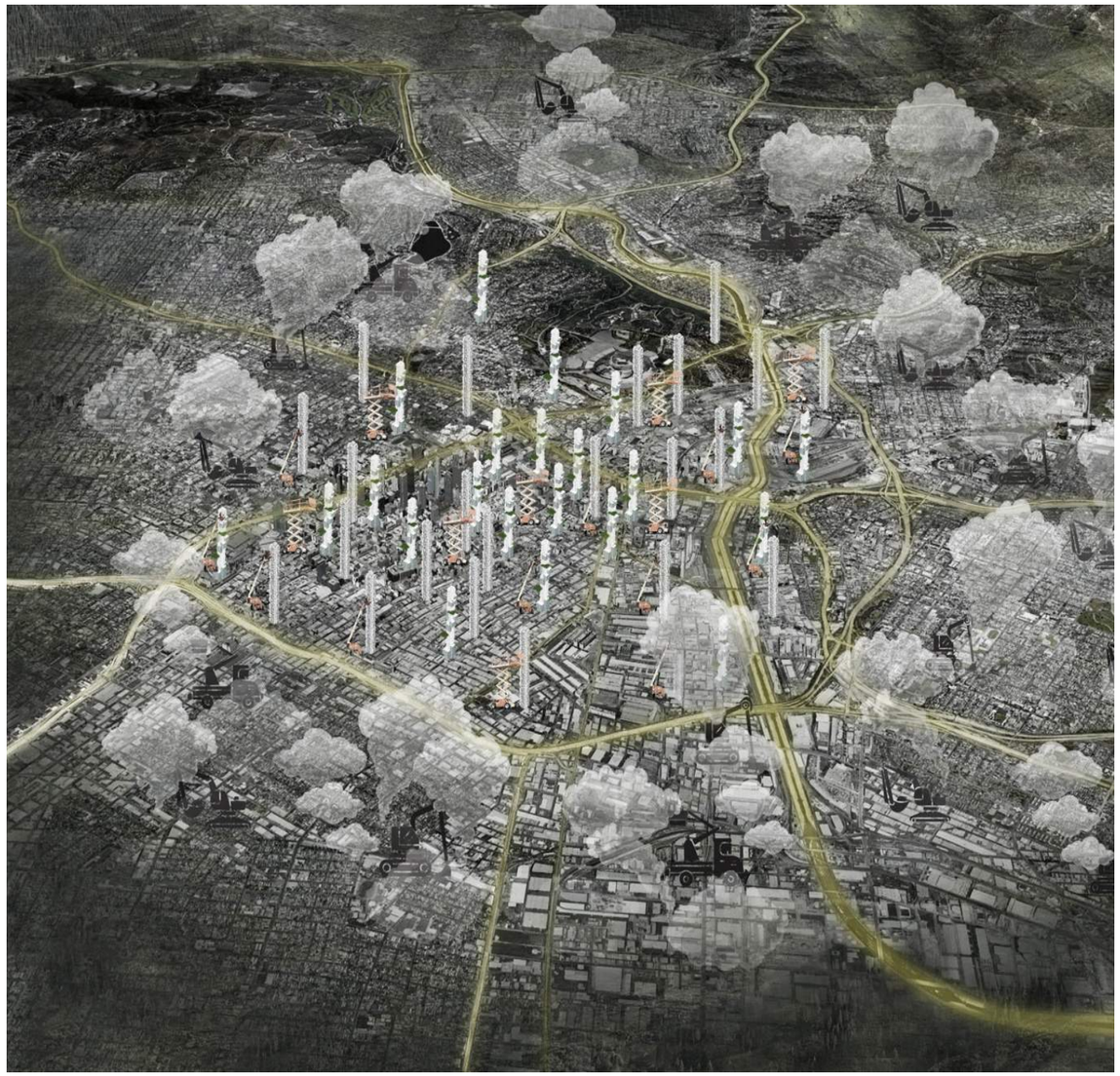
Spacer Detail 1:2



Joint of Glass and Ground 1:2



Joint of Glass and Granite 1:2



08

2020.01 - 2020.04

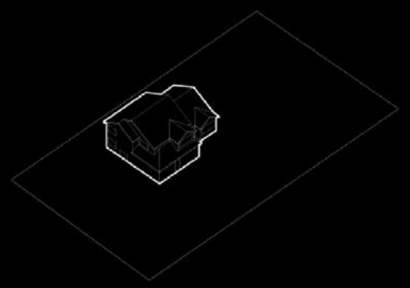
GENERATIVE DESIGN

Optimization with Energy Consumption Simulation

Professor: Danil Nagy
Teammate: Luyi Huang, Shaolin Feng

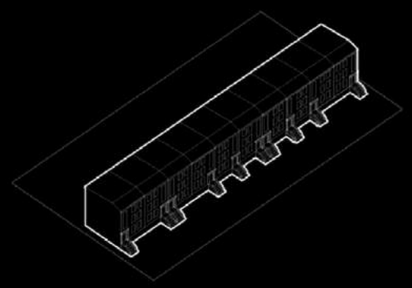
Annual Carbon Emissions per Household

Suburban



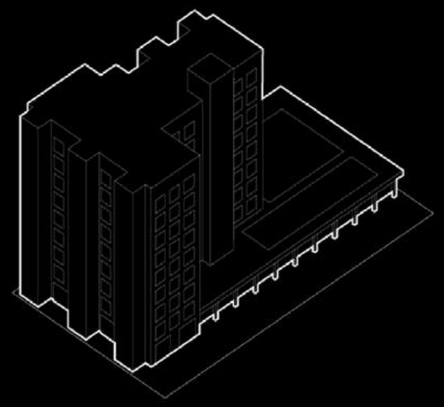
8.47 tons

Urban

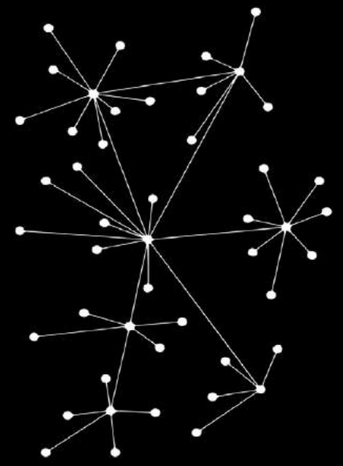


4.21 tons

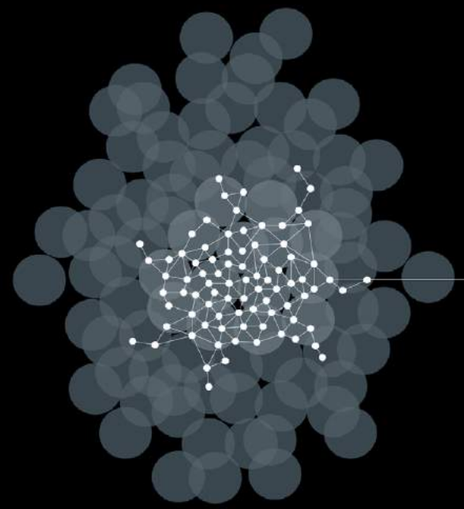
Carless Urban



1.29 tons

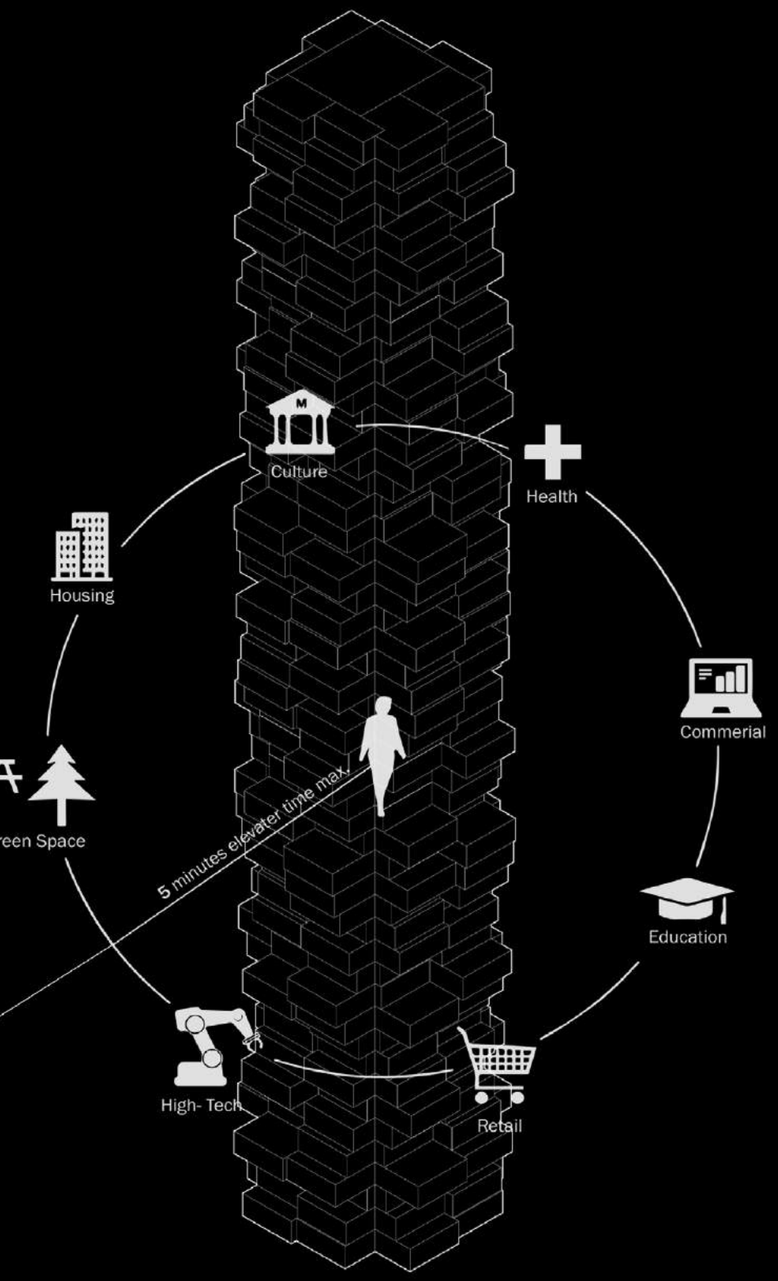


High Carbon Emission Urban Form



Low Carbon Emission Urban Form

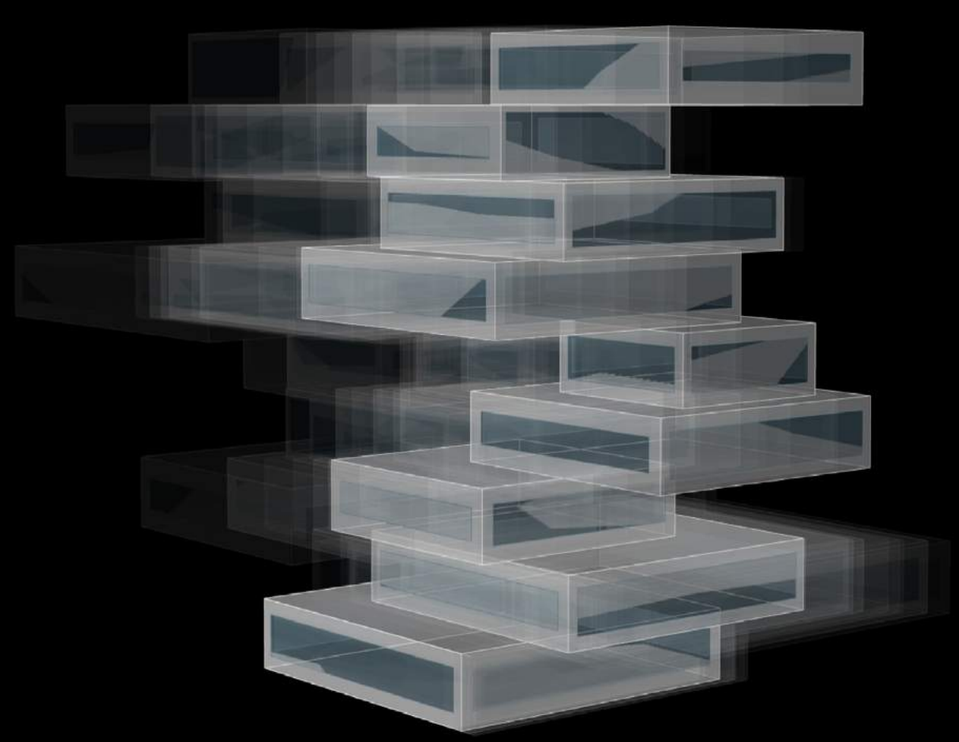
Combined Urban Community



Design Space Model

INPUTS

- Gross Floor Area (m^2)
- Window Opening (m^2)
- LA Weather File
- Energy Consumption(w_0)
- Energy Consumption(w_1)
- ...
- Energy Consumption(w_{200})



OUTPUTS

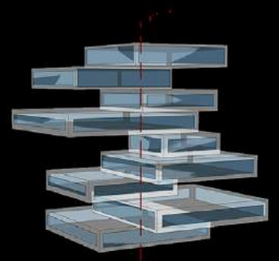
- Energy Consumption(w)
- Performance
- Window- Wall Ratio
- Sunlit Fraction

Objective

Constraint

OPTIMIZATION WITH SIMULATION

Generative Design for Architecture



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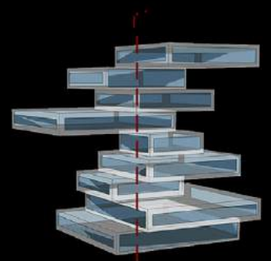

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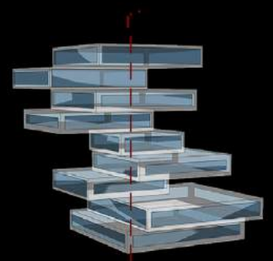
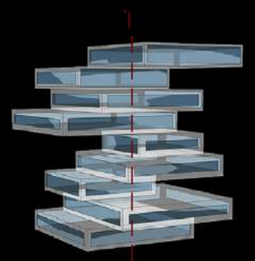


Design_opt_1.3



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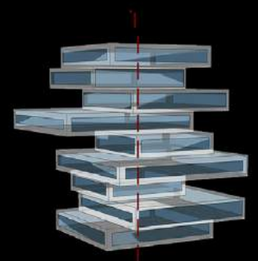

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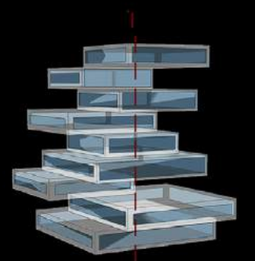

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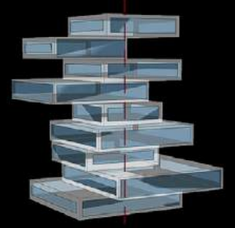

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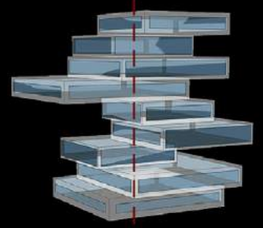
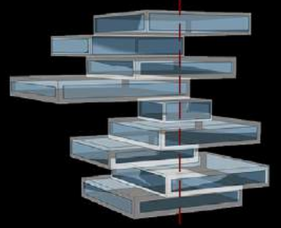
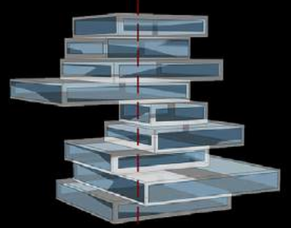


Design_opt_2.2



Design_opt_2.3

Design_opt_2.4



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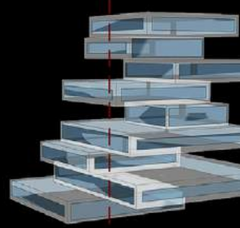

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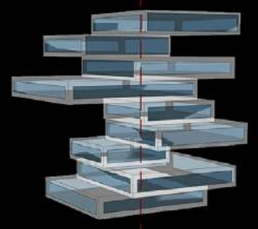

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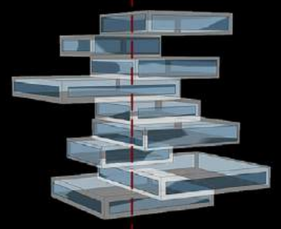

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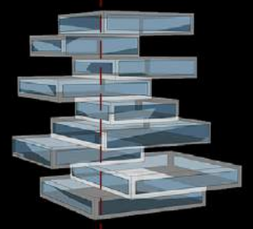

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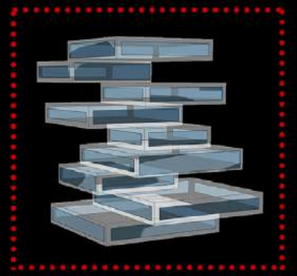

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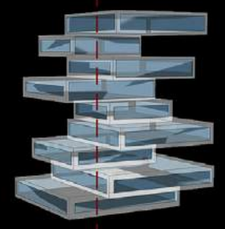

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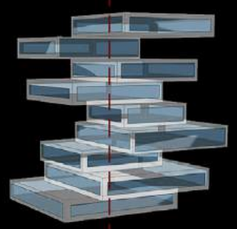

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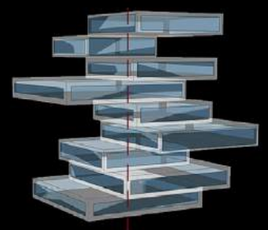

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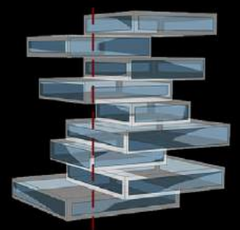

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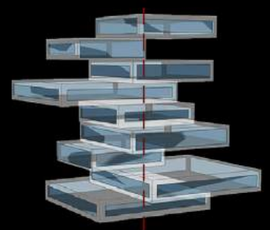

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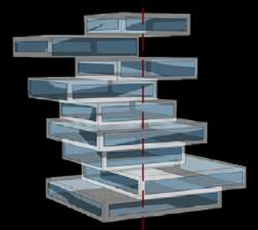

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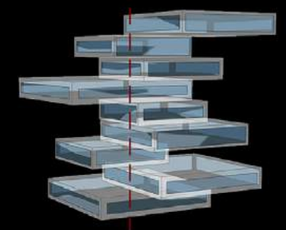

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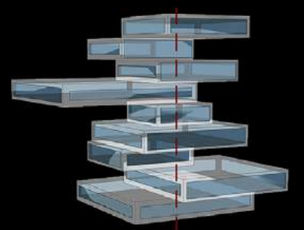

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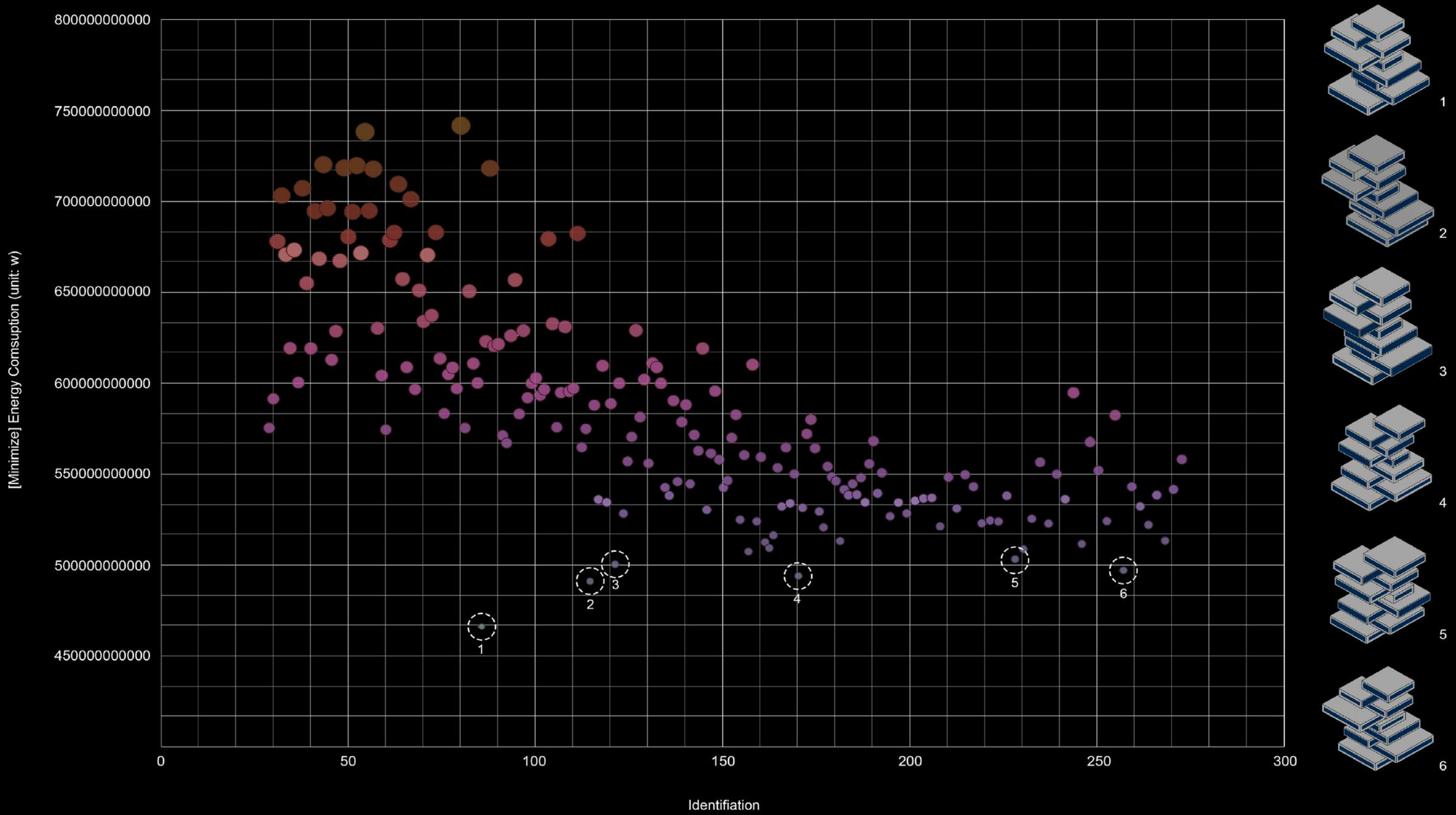
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750000000000
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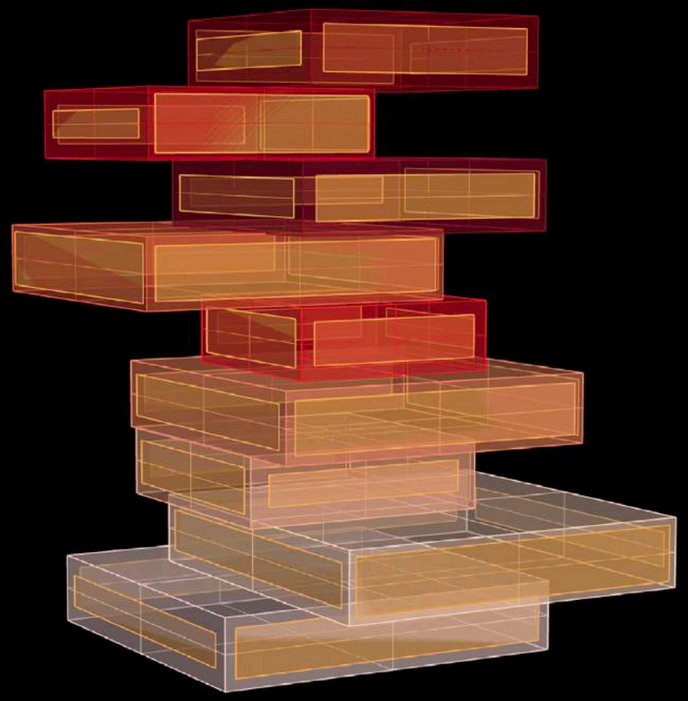
650000000000
600000000000
550000000000
500000000000
450000000000
[Minimize] Energy Comsuption (unit: w)
0
50
100
150
200
250
300
Identifiation
1
2
3
4
5
6
1
2
3
4
5
6

Window-Wall Ratio

High

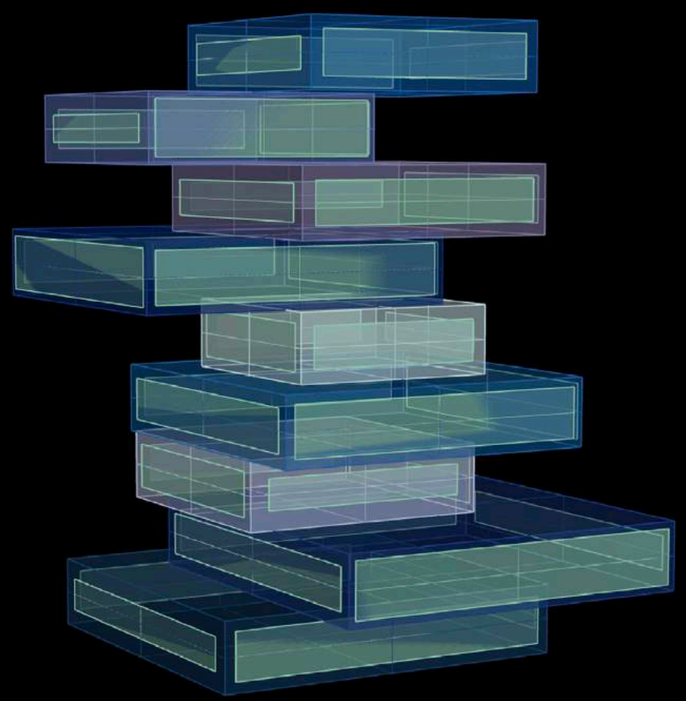
Low



Heating Consumption

High

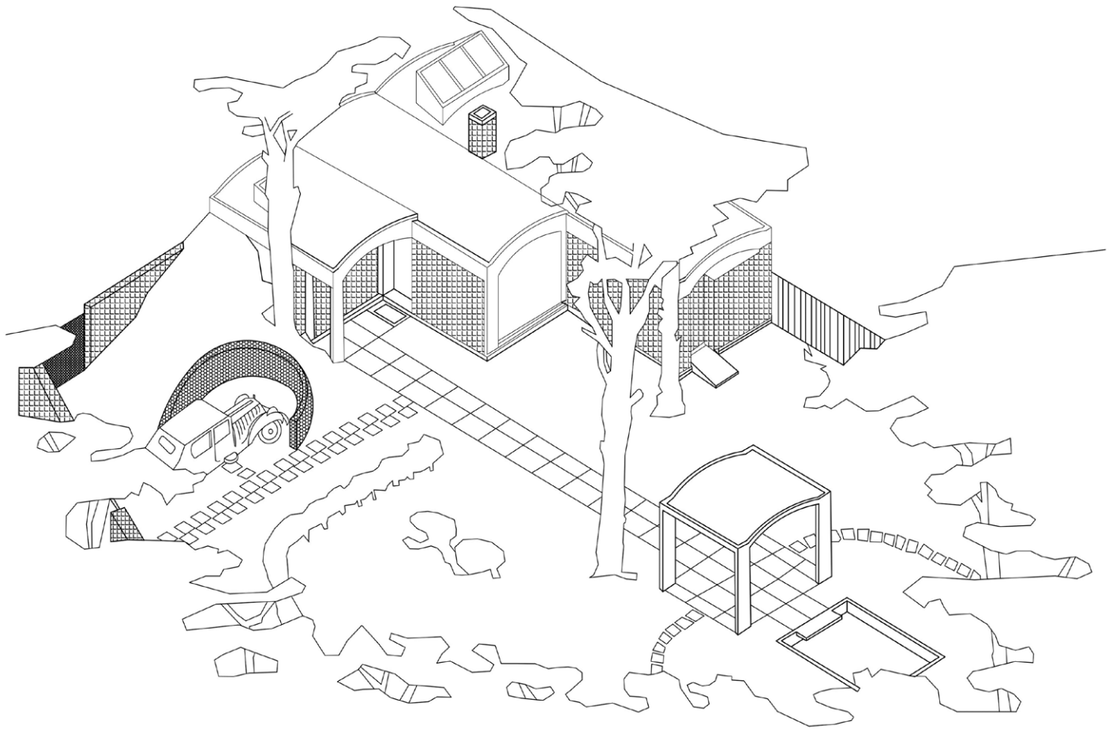
Low



Cooling Consumption

High

Low



09

2020.01 - 2020.04

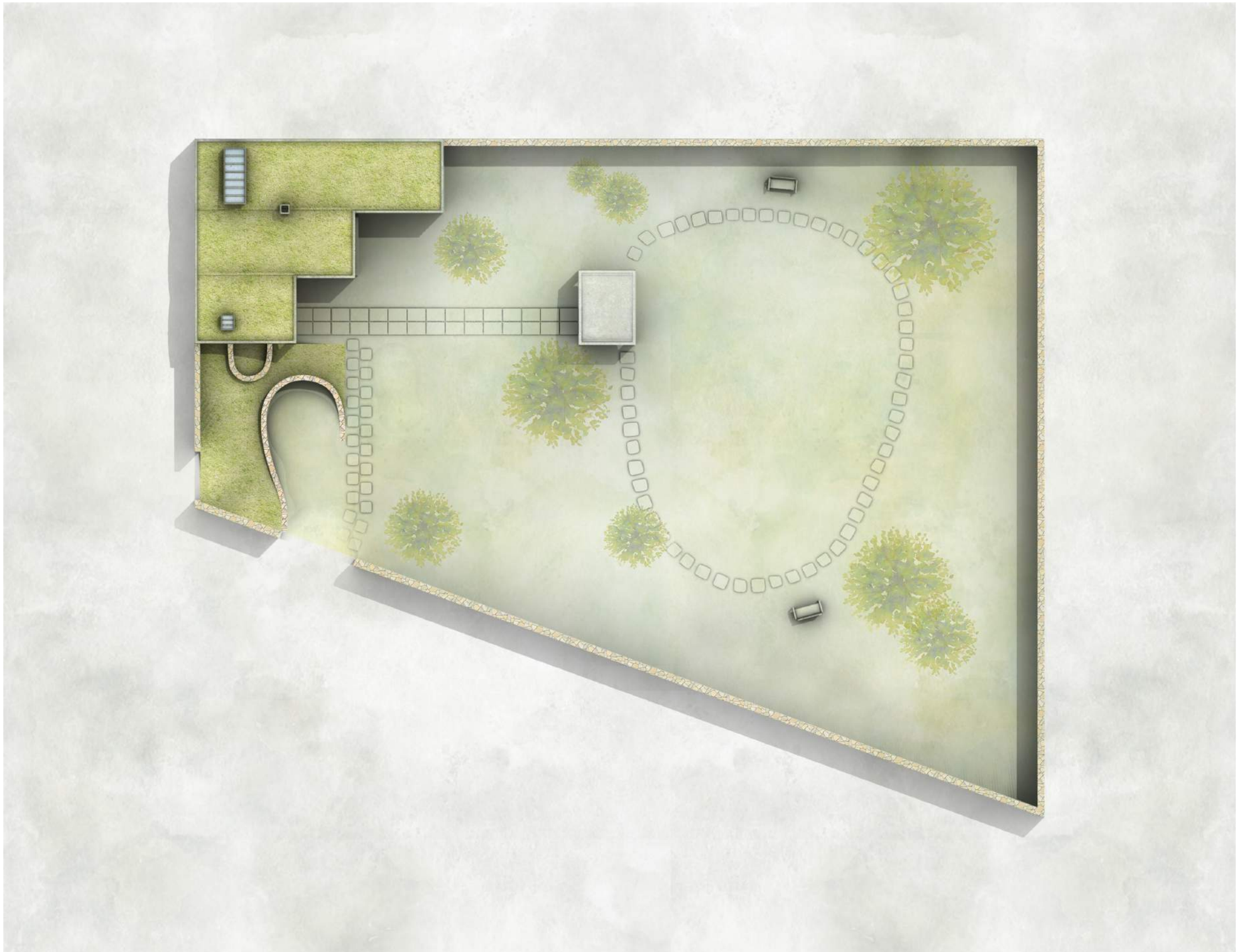
LE CORBUSIER

Maison De Weekend

Professor: Kenneth Frampton
Teammate: Shaolin Feng

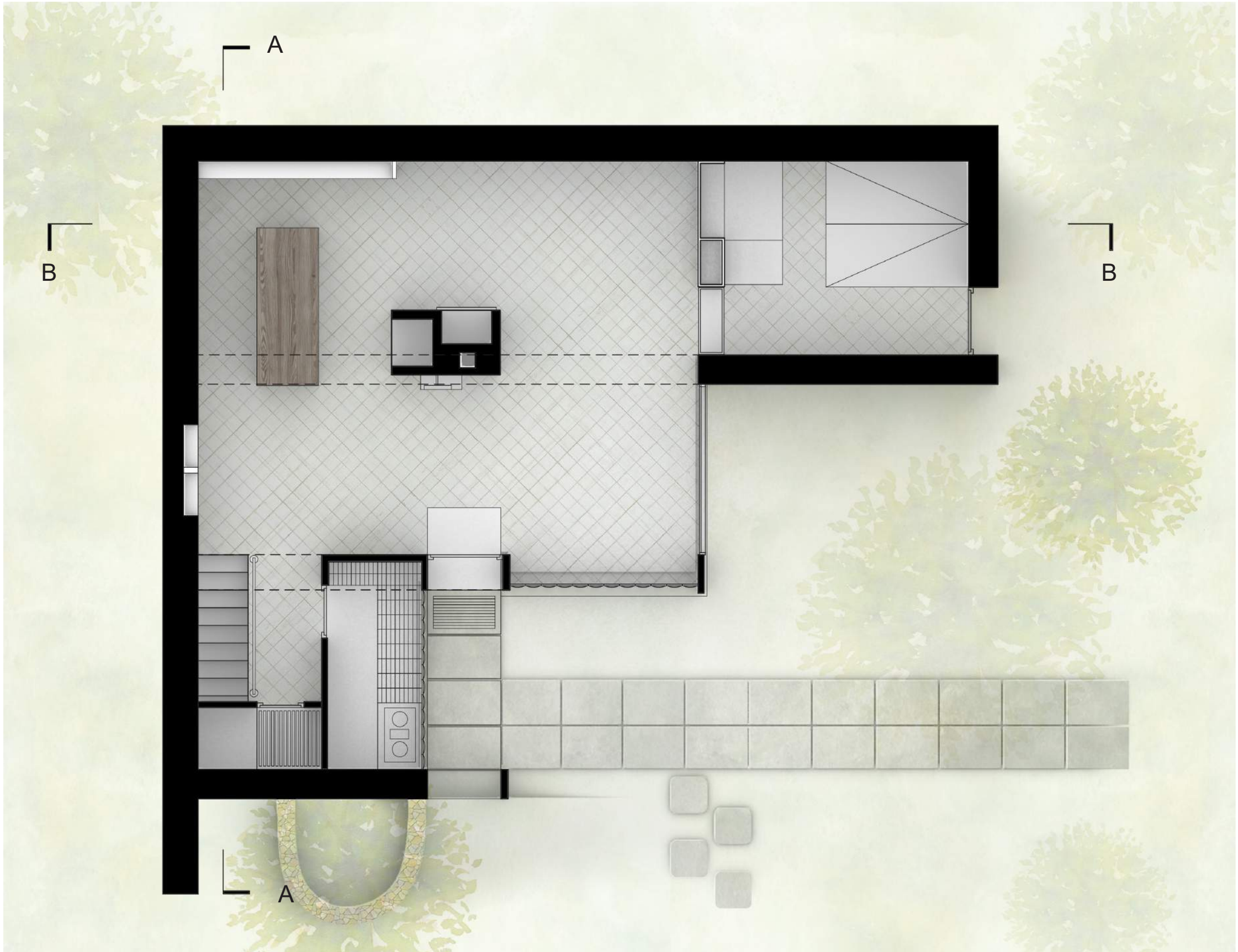
Brief:

This building by Le Corbusier is located in La Celle-Saint-Cloud, a suburb near Paris, France, was built in 1934 for a client named Henri Felix as a small weekend house. The features that this house provides are concrete vaults, load-bearing masonry and a sod roof.



N

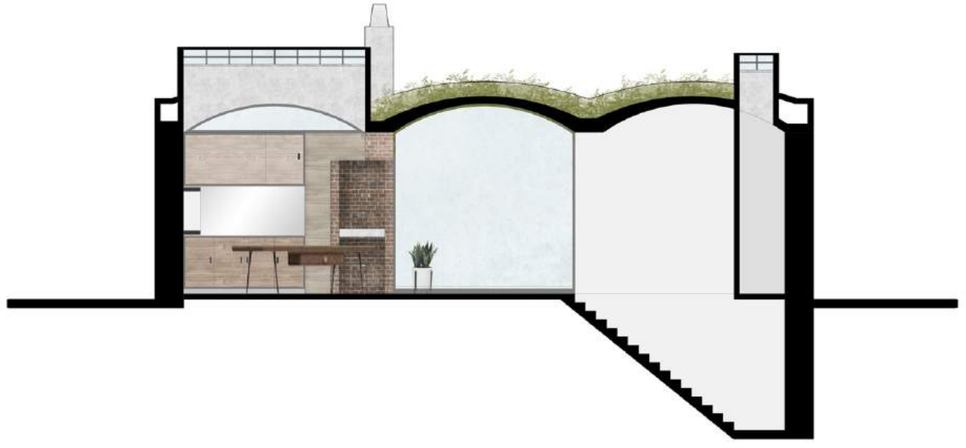
Site Plan 1:300



N

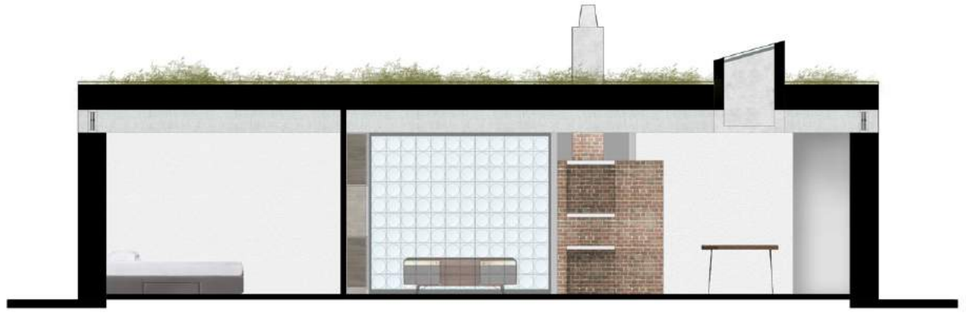
Site Plan 1:150

West Elevation 1:200

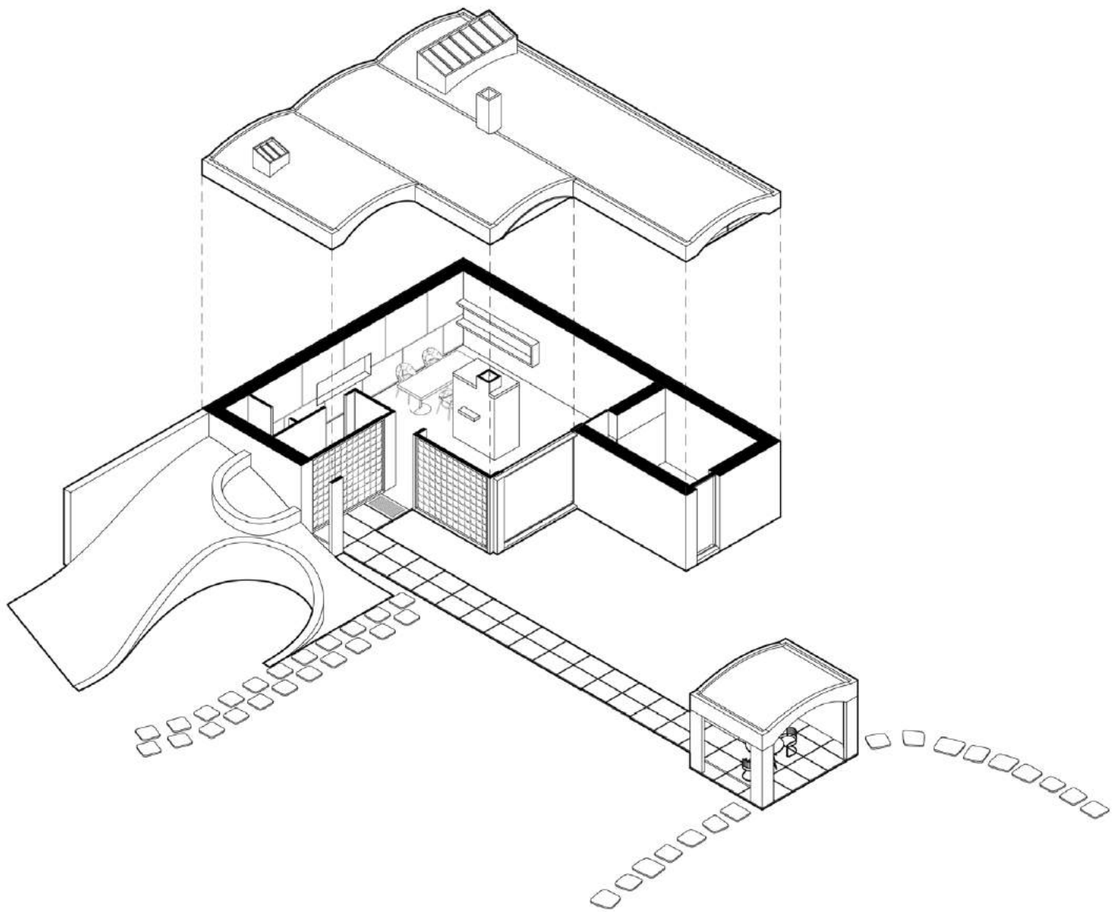


Section A-A 1:200

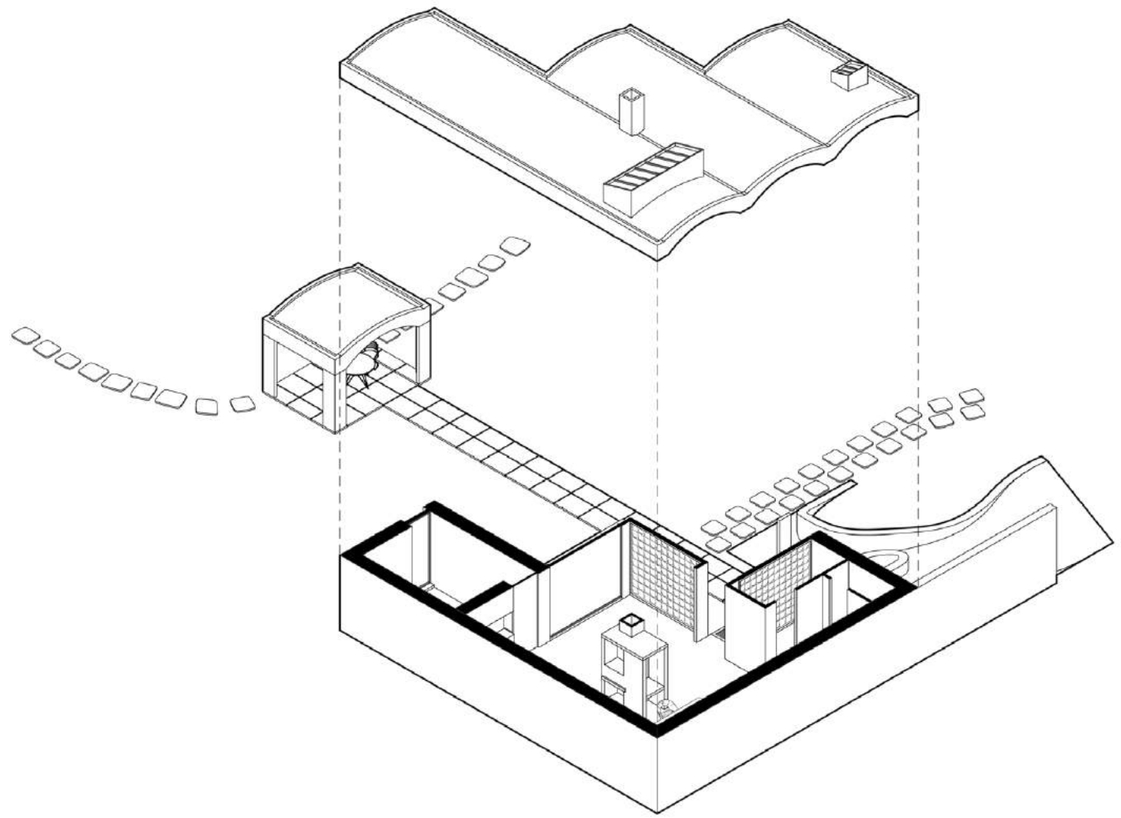
South Elevation 1:200



Section B-B 1:200



Axonometric 1



Axonometric 2


It never ends ...