

ARCHITECTURE PORTFOLIO

JIALU DENG



Hurva Synagogue by Louis Kahn

PROLOGUE

Architecture is the carrier of memory. Such memory includes specific cultures, people, and values. Moreover, architecture enables people in other ages to perceive that memory and the story behind it, so as to make it continue. My portfolio reflects both my perception of past memories and contemporary memory that I hope to perceive in the future, namely the return of the spiritual world and real life.

Architecture is a way for architects to express self-understanding of society, nature, and humanity. The difference of architecture comes from worldviews of different architects. The process of learning architecture is to find a sense of identity, empathy, and responsibility in these values. I hope to learn different interpretations of architecture in the multicultural world and become an architect with self-identity and social responsibility.

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01 OXYGENATE THE UNDERWORLD

(A)cClimatizing natures

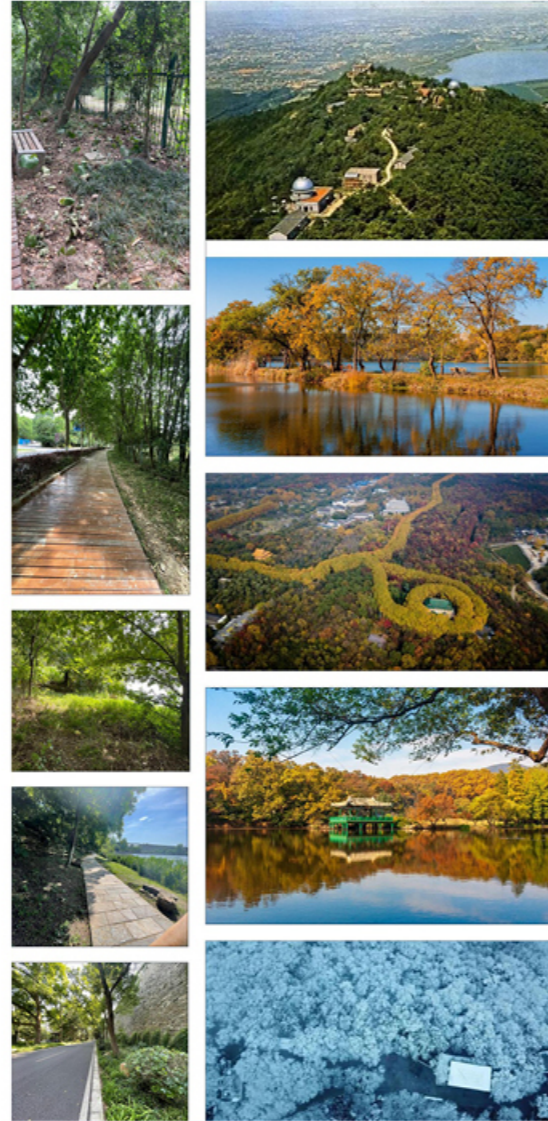
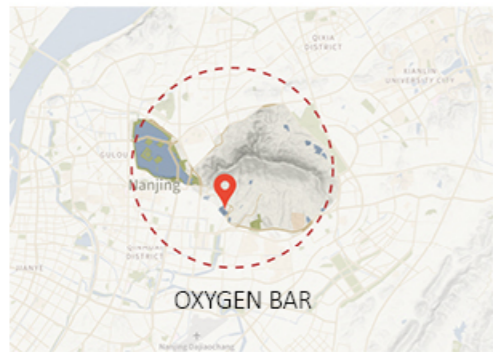


*Summer Studio In GSAPP 2021
Eight weeks from June to August in 2021
Location: Oxygen Bar in Nanjing, China*

*Design: Group Work with Cheng Shen, Jinxia Lou
Instructor: Nerea Calvillo*

The intervention activates invasive species: alligator weed, ramie and rumex found in the Oxygen Bar, Nanjing, China to intervene in the underworld environment challenge and oxygenating the underworld, which is always deprived of oxygen by the upper-ground. Industrial sewage, acid rain, chemical fertilizers and mono-crops are depleting the oxygen in soils and water bodies. This oxygen reduction has a strong impact in underworld ecosystems, causing biodiversity loss, soil erosion and desertification. Therefore, how can we oxygenate the underworld with the help of these invasive species? Our hypothesis is to transport current industry discharges into the lake in the Oxygen Bar and then propose two interventions to oxygenate the water: to pass a law that forbids polluting, and a demonstrational device with the help of our companion plants. It ends up in a three-year continuous impact that we not only decrease the blue-green algae pollution but also increase the biodiversity by proliferating oxygen above and underwater. These companion species can also contribute to oxygenating other waters and soils in China, like the desertification caused by rubber trees in the southern part of China, or the eutrophication of the Yangtze River.

OXYGEN BAR ABOVE GROUND



The Oxygen Bar is a mountain with many lakes, trees and wild animals. Every day it absorbs carbon dioxide from the city, and releases oxygen back. The Oxygen Bar is located in the center of Nanjing, China with a subtropical climate, warm in summer and cool in winter.

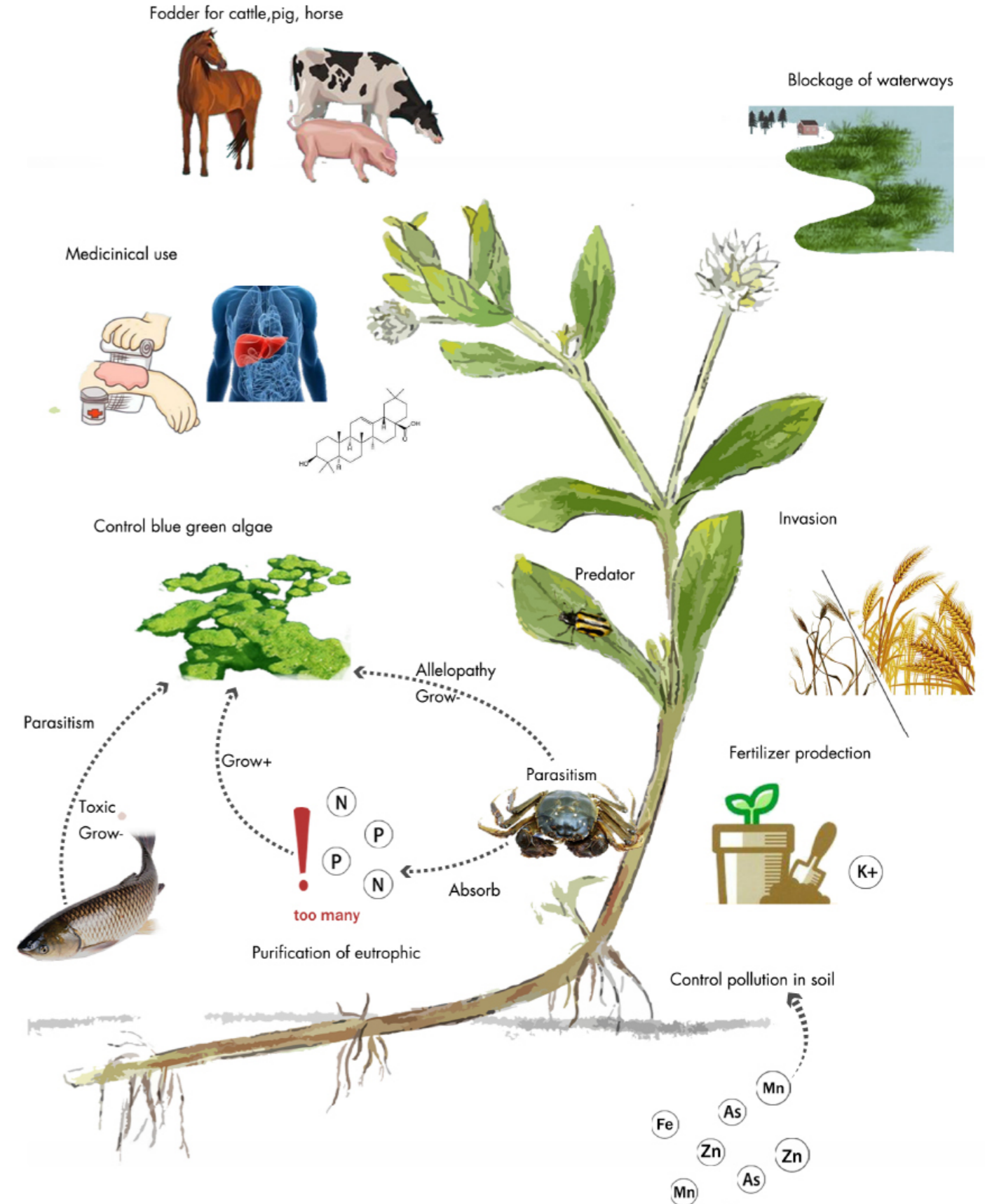
WHY ARE WE ONLY CONCERNED ABOUT THE OXYGEN ABOVE GROUND, THE ONE HUMAN BREATH?



CLIMATE CHANGE - CHALLENGE OF UNDERWORLD
Water Pollution

CLIMATE CHANGE - CHALLENGE OF UNDERWORLD
Soil Erosion & Green Desert

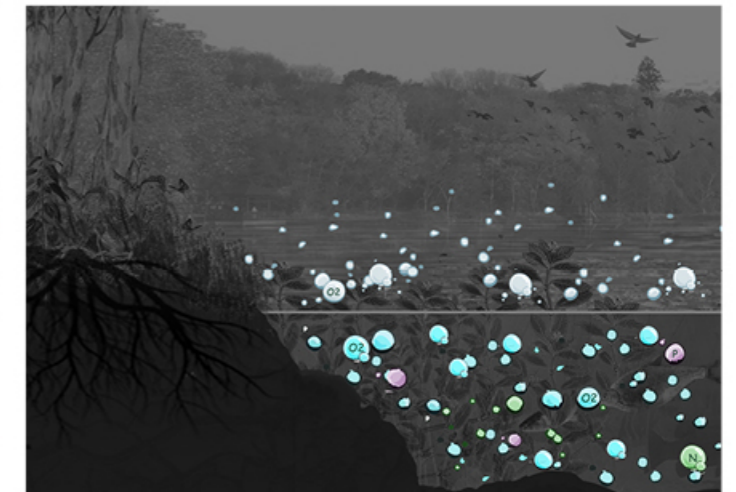
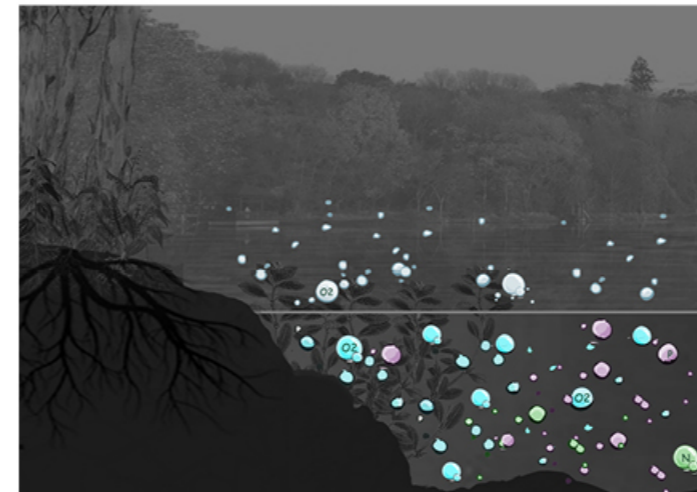
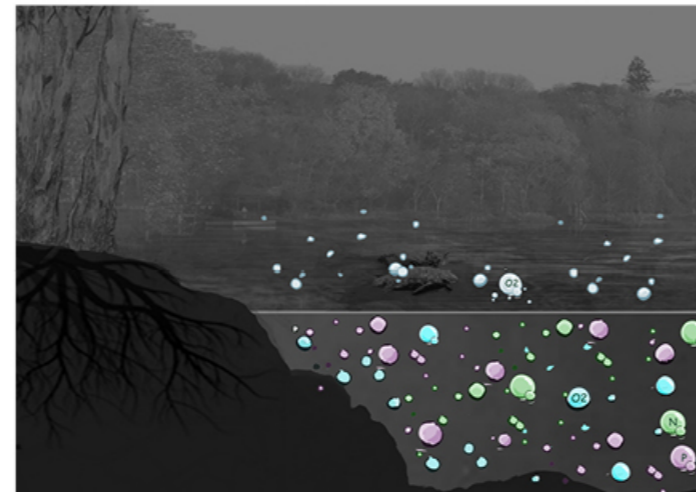
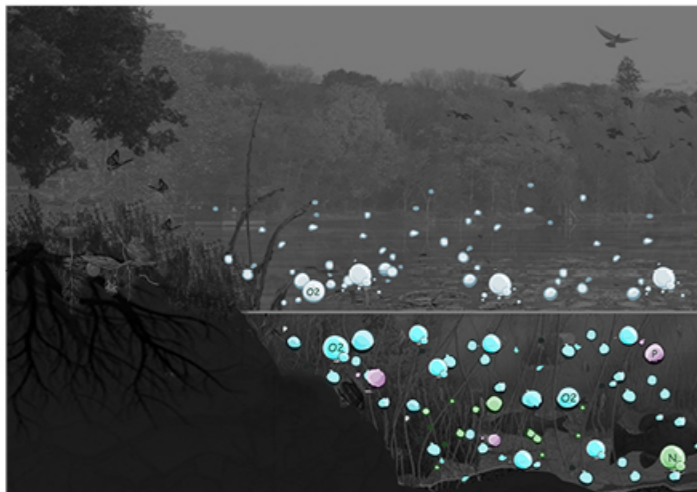
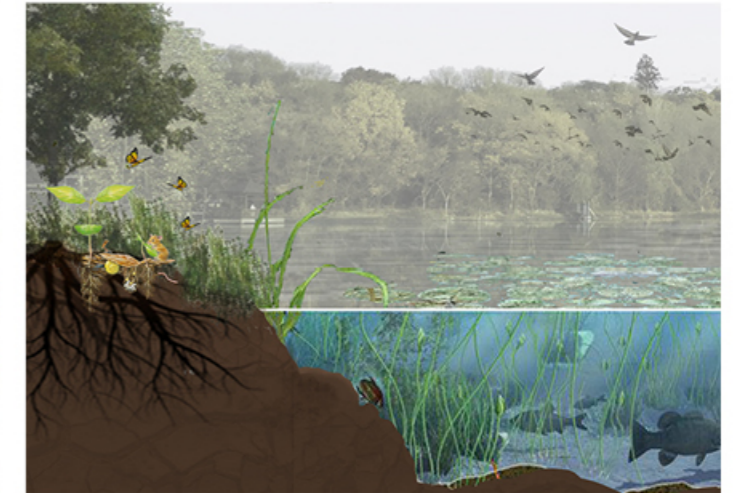
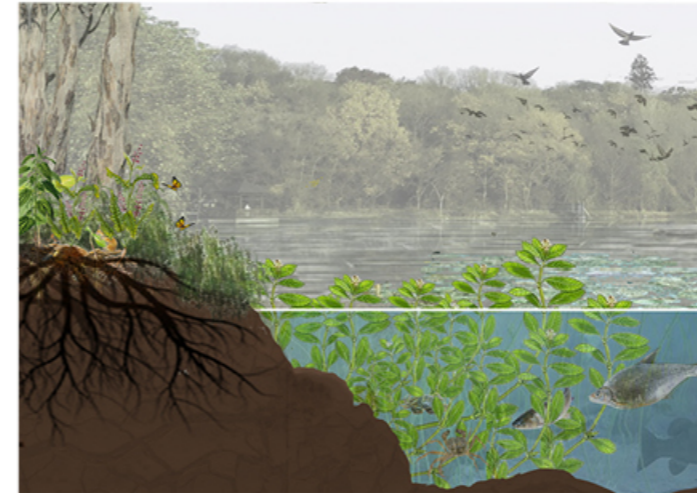
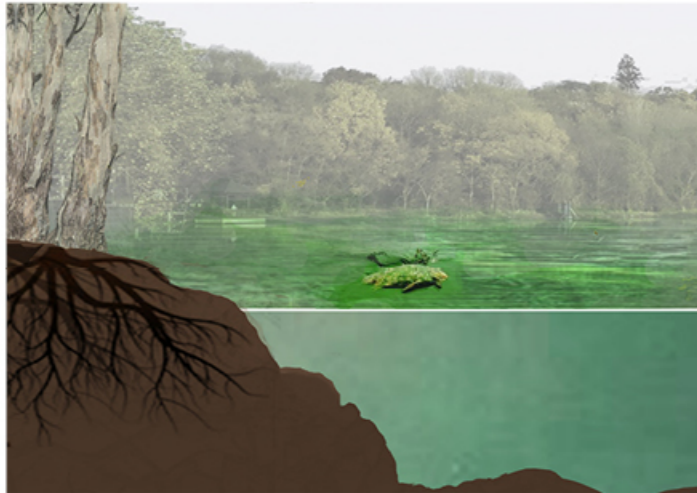
HOW CAN WE OXYGENATE THE UNDERWORLD?



Alligator weeds can acclimatize to either warm or wet weather, even in extreme conditions. It also can acclimatize to water with low oxygen and high nitrogen. Its strong adaptability makes it invasive to other species, occupying the living space of native plants and blocking waterways. However, it can also provide shelter and food for some species like crabs, fishes and beetles. It can also oxygenate the eutrophic water and soil rich in heavy metal. Even more, it can increase the oxygen of the water by limiting the spread of blue-green algae!

HOW CAN WE OXYGENATE THE UNDERWORLD?

Oxygenating the Underworld & Increasing Biodiversity



On one hand it can absorb nitrogen and phosphorus, which will promote blue-green algae to proliferate. On the other hand, its allelopathy function will constrain blue-green algae by producing toxic substances. Therefore, as long as oxygen rises, aquatic species will increase.

As long as oxygen rises, aquatic species will increase. Alligator weeds will then attract micro organisms, which will later be eaten by crabs, fishes, shrimps, etc. Abundant food and cool shelter make alligator weeds an ideal habitat for them, such as for alligator weed flea beetles.

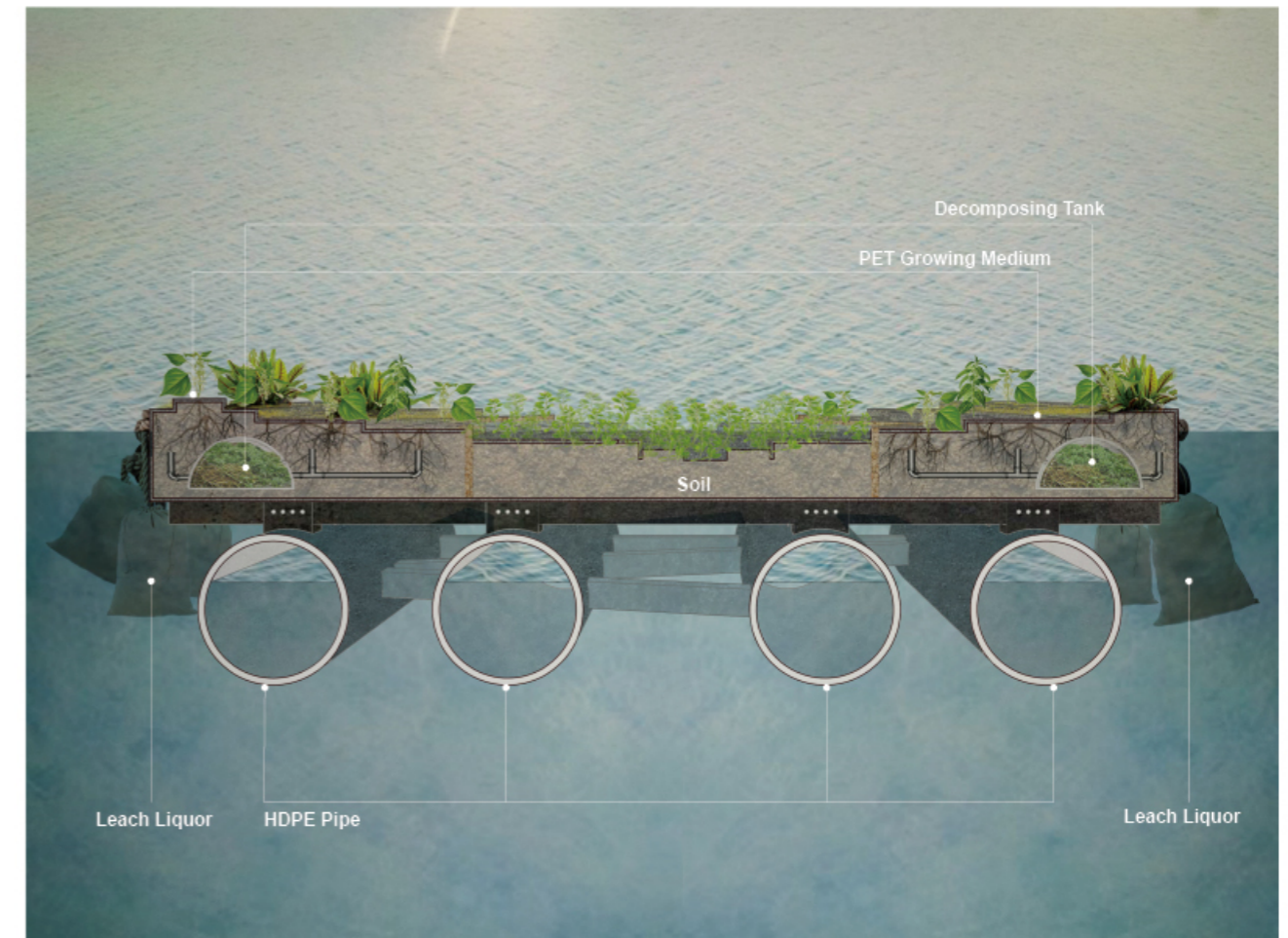
HOW CAN THEY INTERVENE IN THE UNDERWORLD ENVIRONMENT CHALLENGE?

Intervention 1: Law



Let's take a look at a beautiful lake called Taihu lake in another city near Nanjing. Some factories nearby discharge Food Production, Agricultural and industrial waste into the lake, which promotes the growth of blue-green algae. The more blue-green algae, the fewer oxygen under water. Then, the fewer water creatures. Our hypothesis is that industry discharges on the lake keep happening because very few people see the damage. So, what if we diverge the industry discharges and transport them into the lake in the Oxygen Bar, in the centre of Nanjing city, so that everyone can see the consequences? Taihu lake will reduce its pollution but the oxygen bar will suffer severe damage from blue-green algae.

Intervention 2: Demonstrational Device



So we propose two interventions:

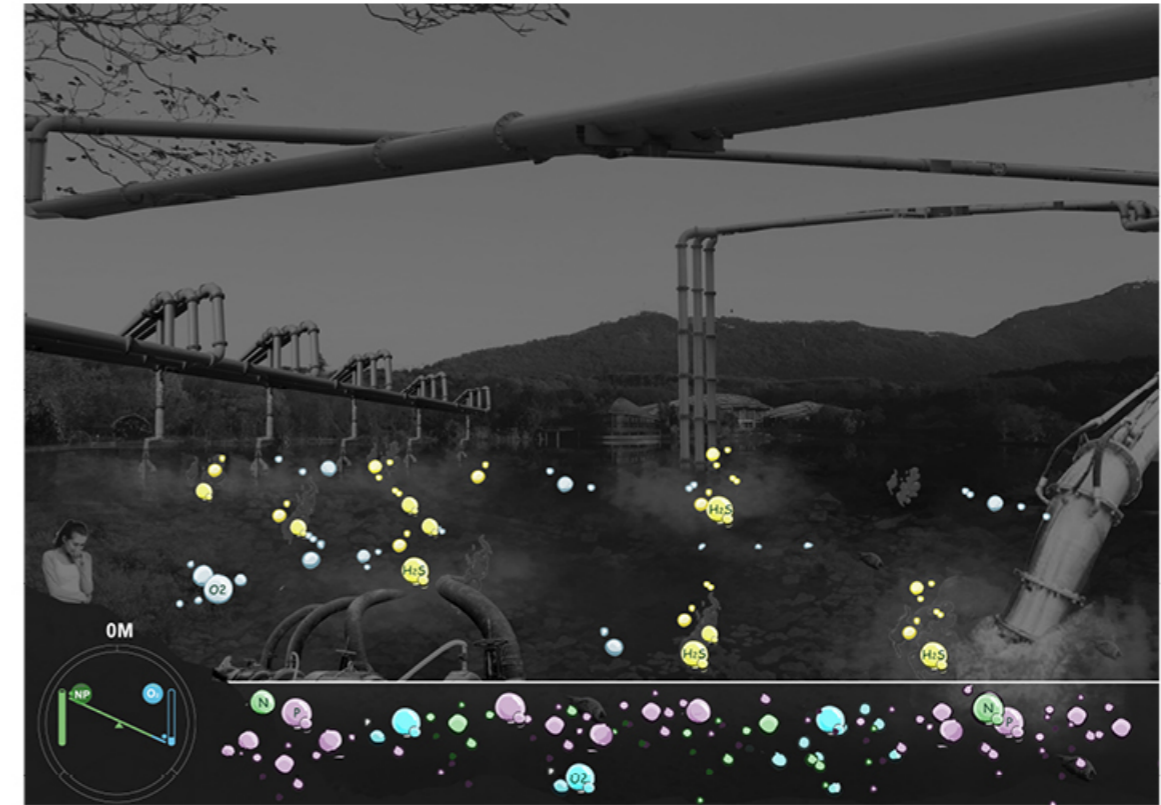
- to pass a law that forbids polluting,
- And a demonstrational device: A resilient floating prototype to oxygenate the water with the help of our companion plants.

WHAT IMPACT WILL THESE UNITS BRING?



Transport Food Production, Agricultural & Industrial Waste into Oxygen Bar

During the whole process of intervention, we use pipes to transport Food Production, Agricultural and Industrial Waste from Taihu lake to the oxygen bar to stop the pollution in Taihu lake. However, these wastes cause blue-green algae bloom in the oxygen bar.

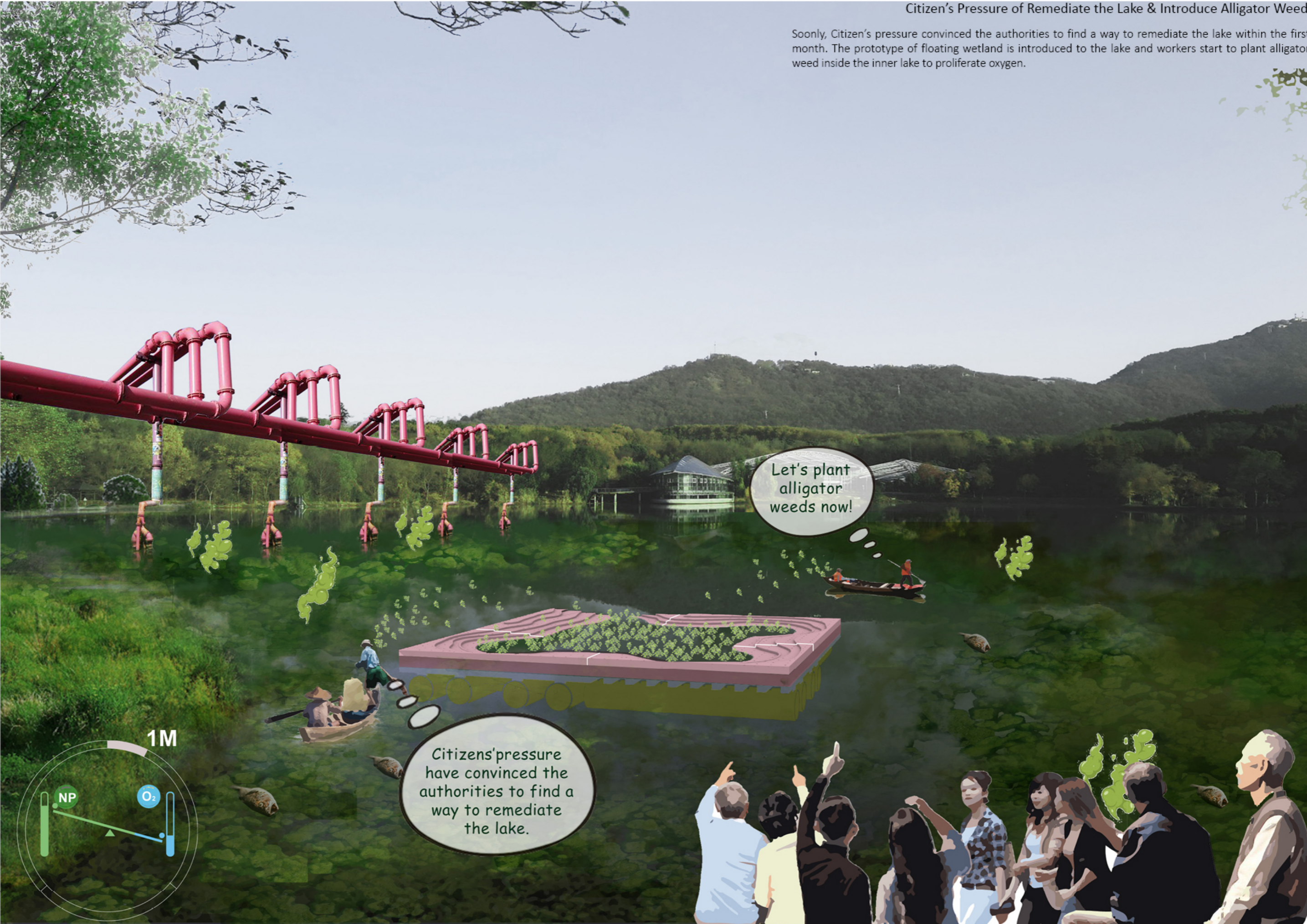


Transport Food Production, Agricultural & Industrial Waste into Oxygen Bar

The bloom is caused by a large amount of Nitrogen and phosphorus, which do harm to aquatic creatures together with the lack of oxygen underwater.

Citizen's Pressure of Remediate the Lake & Introduce Alligator Weed

Soonly, Citizen's pressure convinced the authorities to find a way to remediate the lake within the first month. The prototype of floating wetland is introduced to the lake and workers start to plant alligator weed inside the inner lake to proliferate oxygen.



Let's plant alligator weeds now!

Citizens' pressure have convinced the authorities to find a way to remediate the lake.



After several months of growth, workers started to change the shape of these prototypes, to let the clean inner lake get in touch with the outer dirty one as much as possible. Meanwhile, they started to plant ramie and rumex on the floating land to cover the structure. They are two close friends of alligator weed that we found in the oxygen bar. Ramie is an important fiber crop in China and is fodder for silkworms and butterflies. Rumex can increase the output and production quality of animal husbandry. They both have wide adaptability to be easily planted and increase soil fertility.



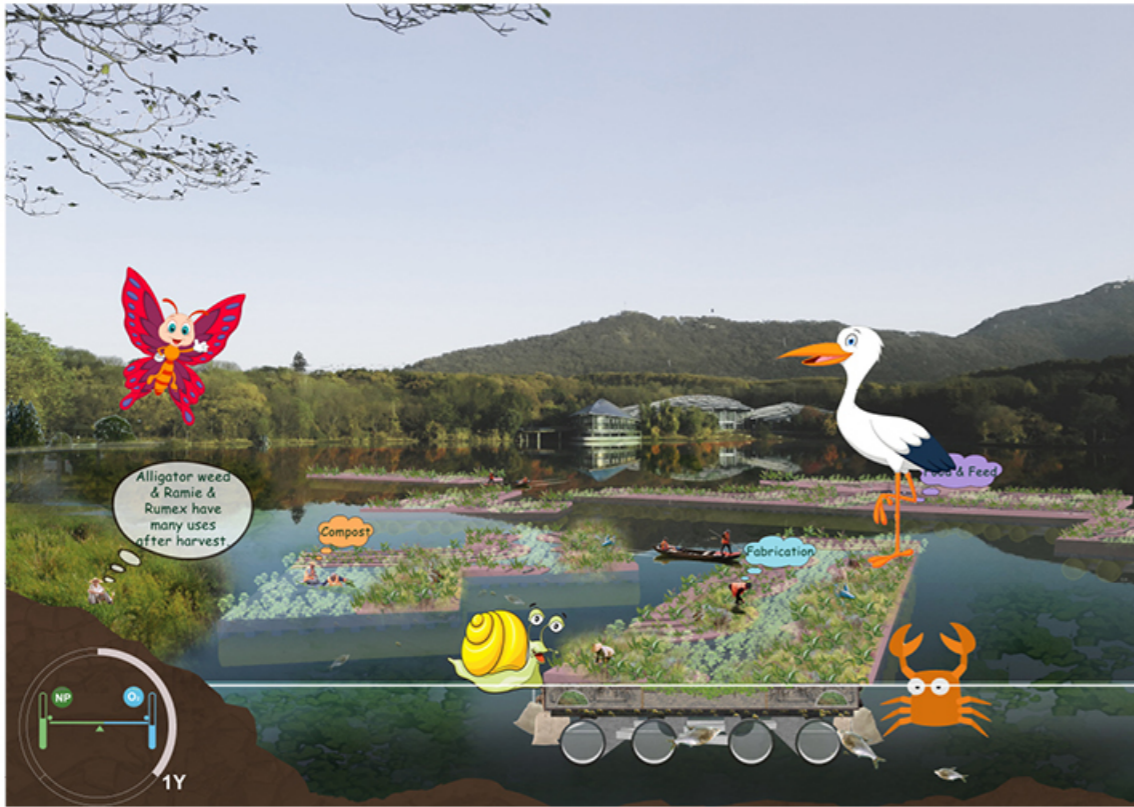
Let's plant ramie and rumex!

Let's transform several prototypes to tetris.

Ramie

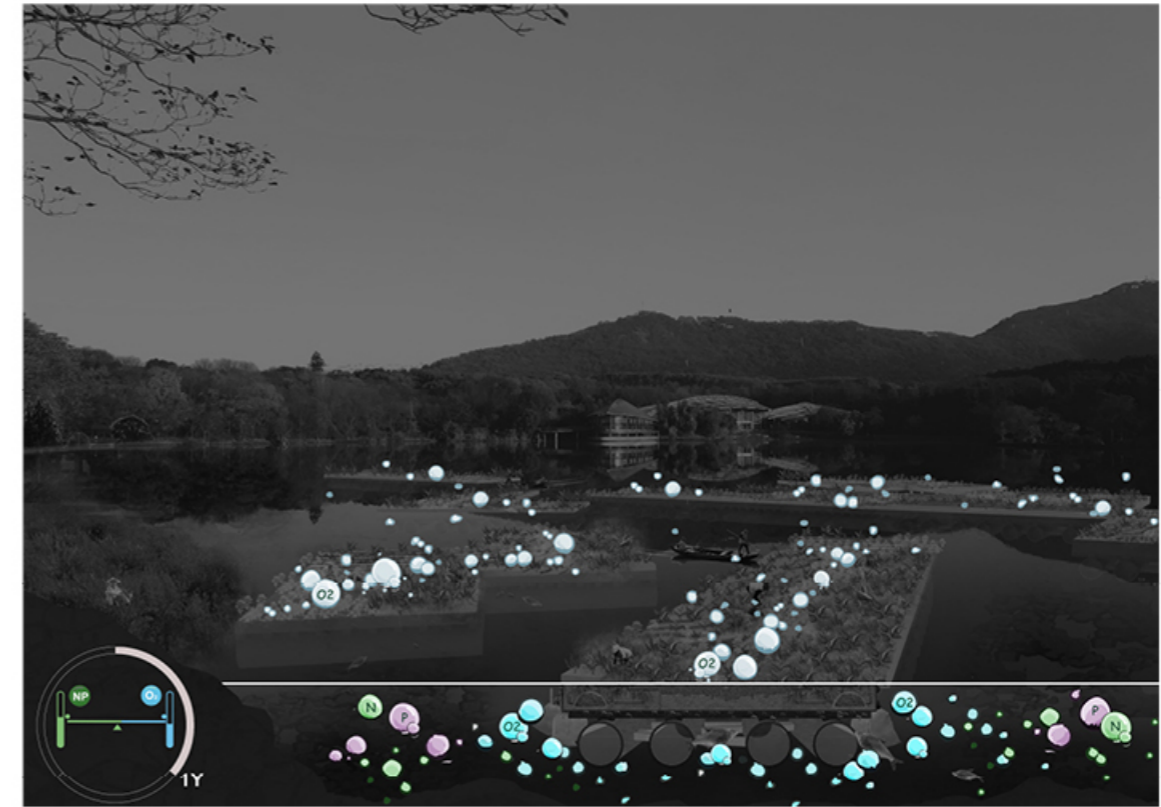
Rumex





Alligator Weed Tetris & Proliferation of Oxygen

After one year, the water is much clearer and workers started to connect these tetris into a whole one. With the growth of three plants, surprisingly, there comes some wild species like butterflies, waterfowls, snails, crabs, etc. To sustain the wetlands, some workers need to cut extra alligator weed for compost. Some need to keep planting rumex and ramie, which can be used for clothing, food and feed afterwards.



Alligator Weed Tetris & Proliferation of Oxygen

As a result, the oxygen around the floating wetland proliferated rapidly, which will attract more species.



Connection Into One & Proliferation of Biodiversity Underwater

Then comes the second year, the weeds cover the structure thoroughly and the lake is as clean as before. This is an ideal place to raise crabs where they have abundant food and different types of habitat.



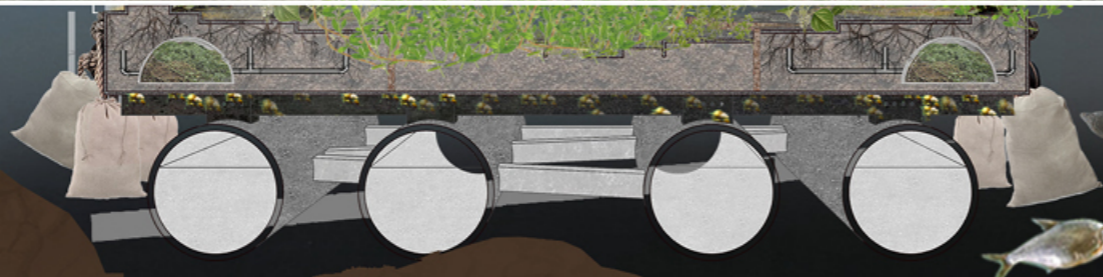
Connection Into One & Proliferation of Biodiversity Underwater

When the wetlands have a sustainable non-human ecology, it's time to introduce humans to it. The workers develop the same structure to connect to the shore. Citizens can visit the wetlands to get close contact with plants and animals.

Time flies to the third year, the wetlands become a space to be shared with humans. The floating wetlands become a new "wing" to the Botanical Garden: the Ethnobotanical Weed Floating Garden, where children have a chance to study plant knowledge in the field, and citizens have a chance to have barbecue and other activities



3Y



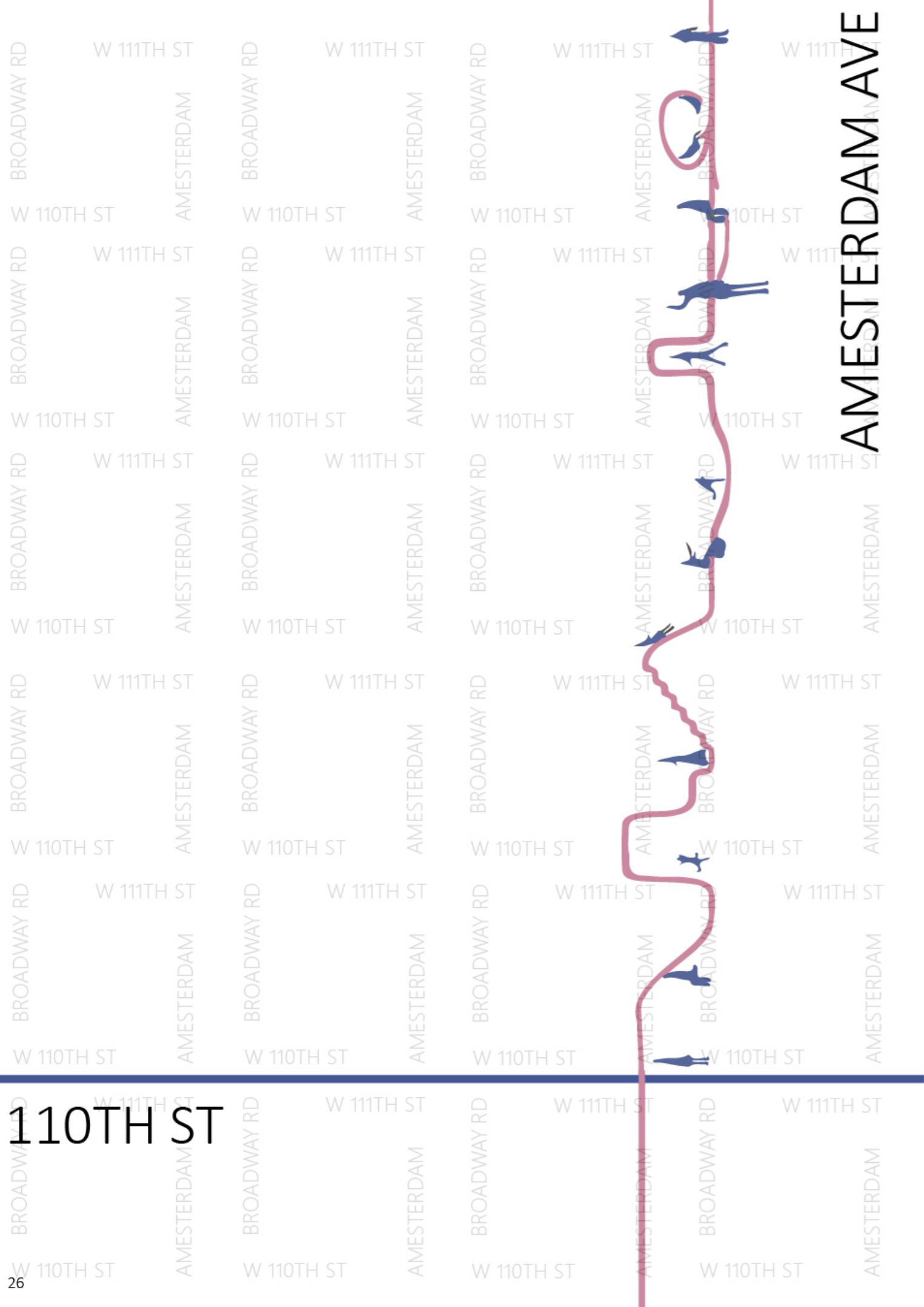
Ethnobotanical Weed Floating Garden & Human-non-human Ecology

With 3 years effort, we not only decrease the blue-green algae pollution but also increase the biodiversity by proliferating oxygen above and underwater.



3Y





02 MIXED STREET

Neurodiverse Children



Advanced V Studio, Fall 2021 In GSAPP

Four months from September to December in 2021

Location: Open street at the corner of Amsterdam Ave and 110th Street in NYC, USA

Design: Individual Work

Instructor: Bryony Roberts

My site is at the corner of Amsterdam Avenue and 110th St, which is currently an open street in NYC. My program aims to allow children, especially neurodiverse children to have a free playground to enjoy themselves. The gradient pipe structure is designed to create different sensory environments, such as active space (pink area) and quiet space (blue area) for children along the side of the park. Another side of the street is designed to cope with outside eating issues combined with restaurants. This new mixed street for children will be a prototype for open streets in NYC to arouse public awareness to pay more attention to neurodiverse children.

Waste Street Area

NYC 179km

Occupy 27%

More than other large cities in USA

Public Space have long born domain of cars.

Congested

Whose streets? The wealthy's.
Mayor de Blasio's Open Streets program — meant to give New Yorkers socially distanced recreation space during the COVID-19 crisis — caters to the rich, a Streetsblog analysis shows.

The city's median household income is \$60,762, but on streets that are part of the program, the median income average is \$81,567, according to Census data for the city's 235 open street locations analyzed by Streetsblog. And the same pattern emerges in the three most-populous boroughs:

- In Brooklyn, where the median household income is \$56,446, the median income average of the city's open streets is \$88,294 — roughly \$32,000, or nearly 50 percent, more.
- In Queens, where the median income is \$65,554, the median income average of the open streets is \$70,555, or 10 percent more (and nearly 20 percent more than the city median).
- In Manhattan, where the median income is \$83,151, the median income average of the open streets is \$97,733 — \$14,582, or 17 percent, more than the borough median (and 60 percent above the city median).

Streets' Are In Wealthier S, Data Show



New's Prospect Park West at the start of the open streets program. Photo: Derek Kutzman



The Pandemic Gave New York City's Open Streets' Will They Survive?



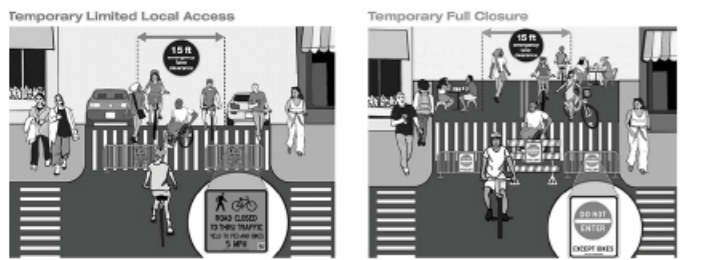
Management

- Reinforce Open Streets with immovable materials. In the interim, invest in signage and reinforced materials that clearly delineates and protects Open Streets and "pop-up" bike lanes from vehicle traffic.
- Put seating for Open Restaurants in the street not on the sidewalk. If seating for some reason must be located on the sidewalk, create an expanded path for people to walk safely in parking lanes or the street.
- Protect Open Restaurants from speeding drivers. Wherever possible, close Open Restaurant streets to all car traffic to eliminate the risk of diners being injured or killed in a traffic crash. Where it is not possible to close the street to cars, lower the speed limit to 10 mph on Open Restaurant streets, employ mobile speed cameras, and daylight intersections adjacent to in-street dining tables to reduce speeding.

What?



Overview
NYC's Open Streets program allows communities to embrace new public space and support small businesses. Open Streets prioritize pedestrians and cyclists by transforming streets into public space. These transformations allow for a range of activities, support local businesses, and create opportunities for New Yorkers to gather together safely. Open Streets are coordinated in partnership with local community organizations. There are two types of Open Streets:



Local vehicle access is allowed for limited use. Multiple blocks of streets are designated for pedestrian and cyclist use and enjoyment. Drivers are advised to be extremely cautious and to drive 5 MPH or slower on the Open Streets. No through traffic permitted while Open Streets are in effect. Only vehicles that must do the following are allowed on the street:

Temporary Full Closures allow for a range of car-free activities that support local businesses and create a safe place for New Yorkers to gather. These Open Streets support multiple uses, including outdoor dining, retail and service, and community programming. No vehicle access and no parking allowed when Temporary Full Closures is in effect. A 15 foot emergency lane must be clear at all times, for emergency vehicle access.

28 (including all regulations apply) • Emergency vehicles

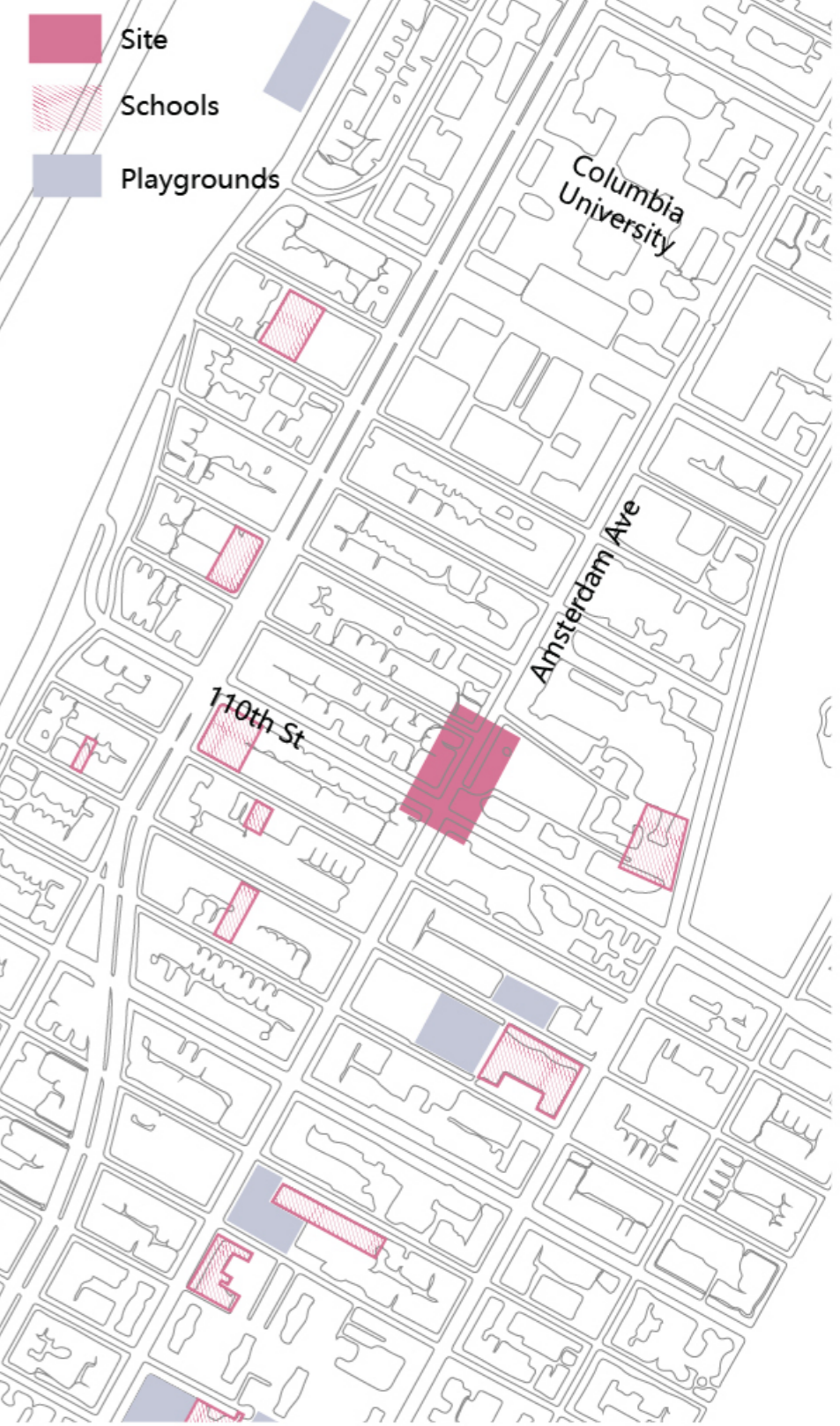


BACKGROUND

Site is located at the corner of Amsterdam Ave and 110th street in Manhattan. According to the research, there are many schools and playgrounds near my site, however, most of them are hard to access due to the covering structure and haven't paid attention to the neurodiverse children.

Meanwhile, in the wake of Covid-19, NYC is opening up some streets to provide space for people in the community. The area of the street occupied about 27 percent of the whole NYC, it's a large waste if only for traffic use.

So my program is a mixed street for children.

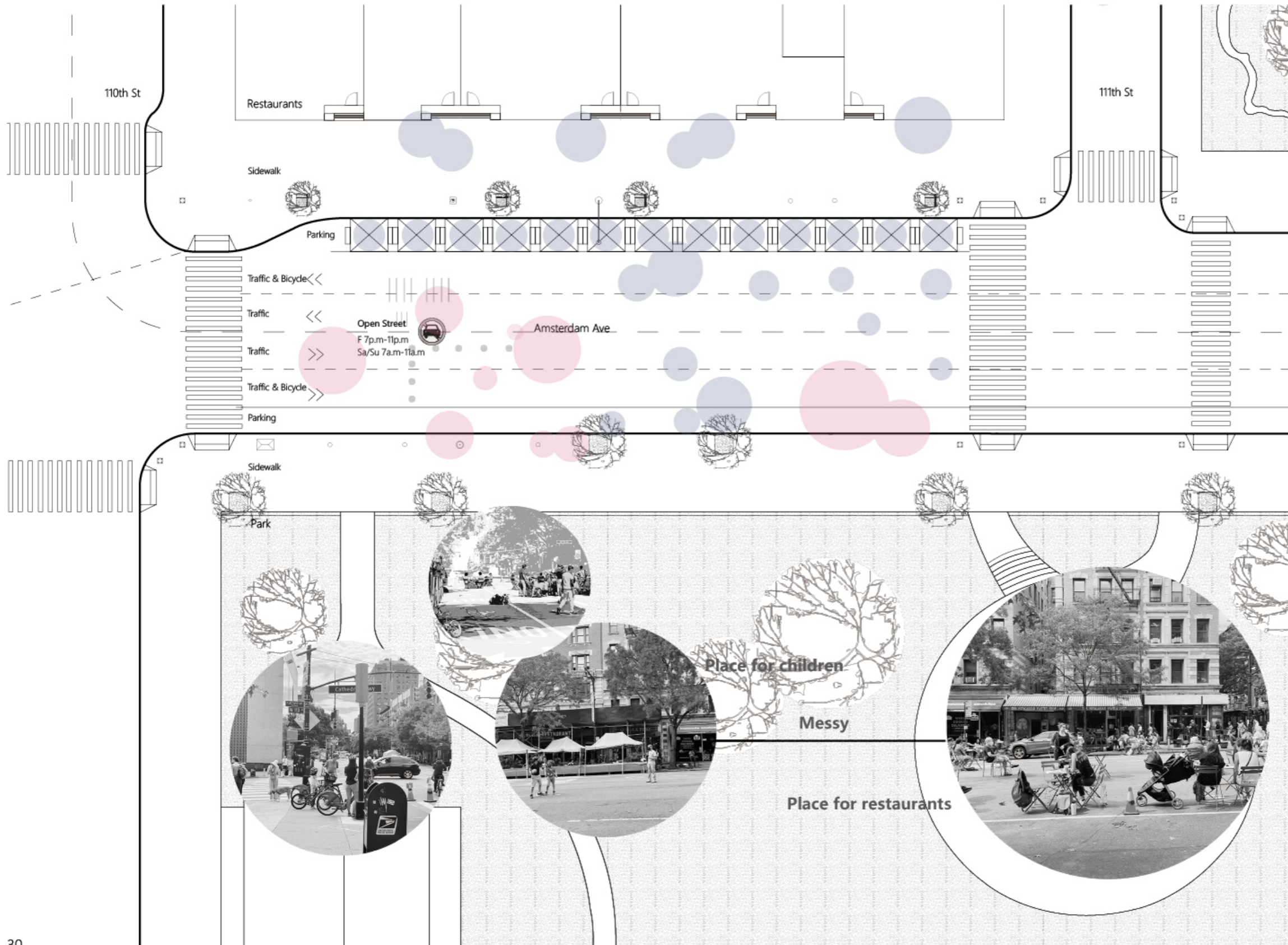


CURRENT SITUATION

Based on my observations, there are two main types of people on site, children to play and people to have a meal. Current problems with the streets mainly revolve around three conflicts, pedestrian VS Traffic, Children VS Restaurants and Temporary VS permanent.

My program pays attention to children especially those neurodiverse children and also to energize communities in the post-pandemic period.

Current open street is temporary, which is open from 7p.m-11p.m on Friday and from 7 a.m-11.p.m. on weekends. There are four roads and two sides for parking. I reserve the current open time and design the permanent part and temporary part of the open street.



ANALYSIS: Mayor de Blasio Has Abandoned the Open Streets 'Program'

By Gersh Kuntzman | Apr 12, 2021 | 92 COMMENTS



Vanderbilt Avenue in Brooklyn is a successful open street, but too many others have challenges. It will take a city Office of Public Space Management to ensure that people-centered placemaking thrives, argues Streetsblog publisher Mark Gorton. File photo: Prospect Heights Neighborhood Development Council

Open streets or open warfare?
The mayor's signature effort to bring car-free outdoor space to COVID-stricken neighborhoods last year is increasingly looking like it will collapse unless city officials do something to assert authority over a program that has left volunteers beaten, harassed, uncompensated and just plain exhausted.

City officials say 34th Avenue is safer at a time when traffic fatalities have soared citywide. The number of crashes on 34th Avenue fell to 90 during the first year of the open street from an average of 148 a year during the prior three-year period.

Still, some residents complain that many bike, motorcycle and scooter riders ignore the posted five-mile-per-hour speed limit.

"It's not just about traffic, it's about the safety of anyone using 34th Avenue," said Gloria Contreras, 52, citing her 6-year-old daughter's near misses with a cyclist and an electric scooter rider.



Management

- Reinforce Open Streets with immovable materials. In the interim, invest in signage and reinforced materials that clearly delineates and protects Open Streets and "pop-up" bike lanes from vehicle traffic.
- Put seating for Open Restaurants in the street not on the sidewalk. If seating for some reason must be located on the sidewalk, create an expanded path for people to walk safely in parking lanes or the street.

110th St

111th St

Restaurants

Sidewalk

Bicycle

Traffic <<

Traffic >>

Traffic >>

Amsterdam Ave

Open
F 7p.m-11p.m
Sa/Su 7a.m-11p.m

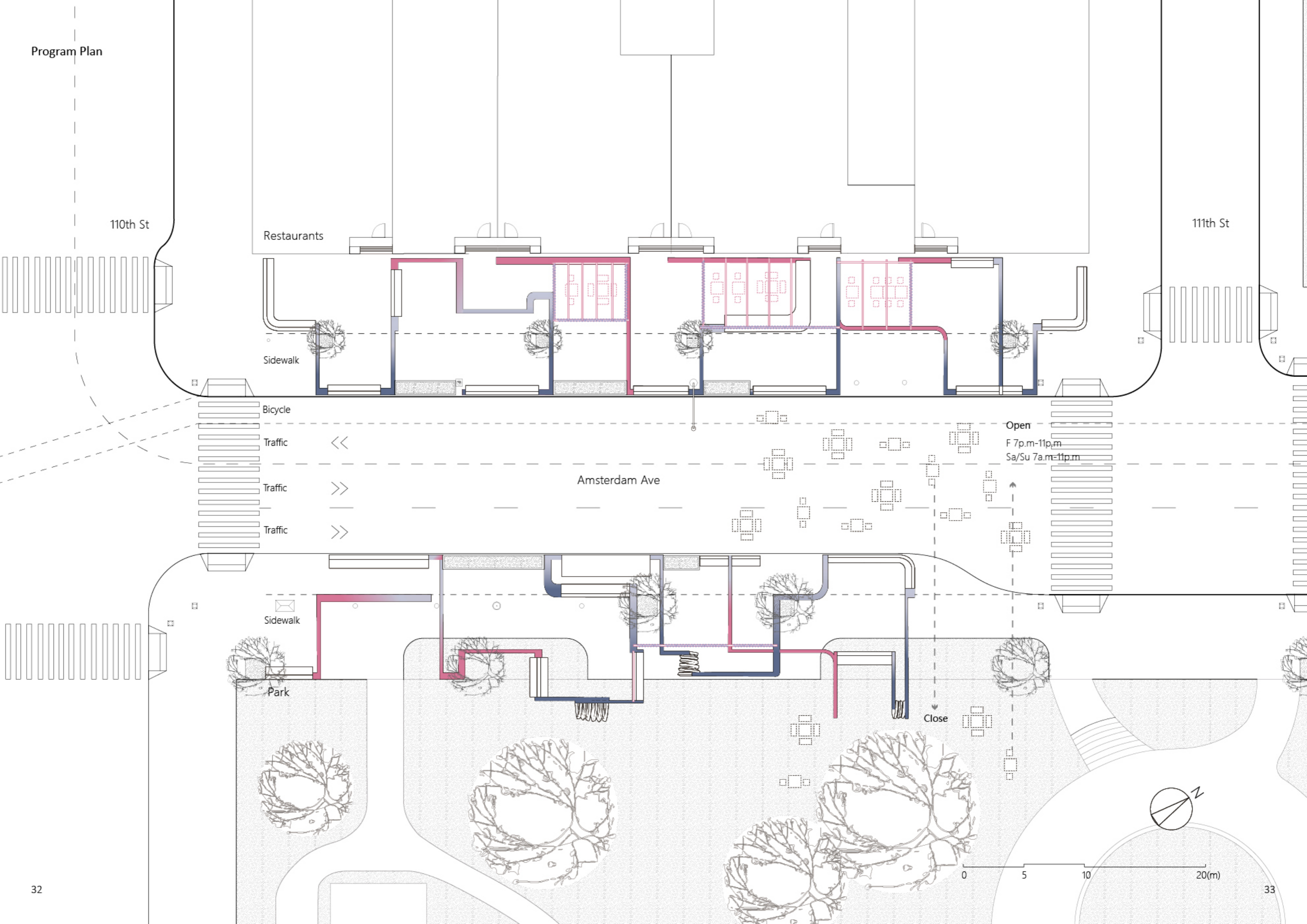
Sidewalk

Park

Close



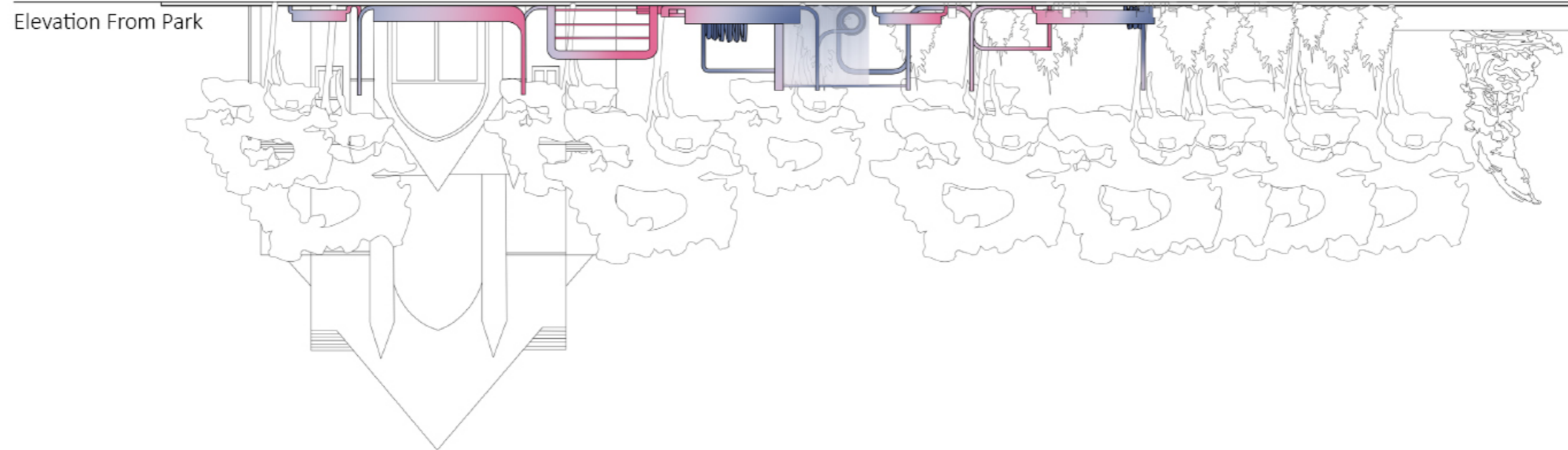
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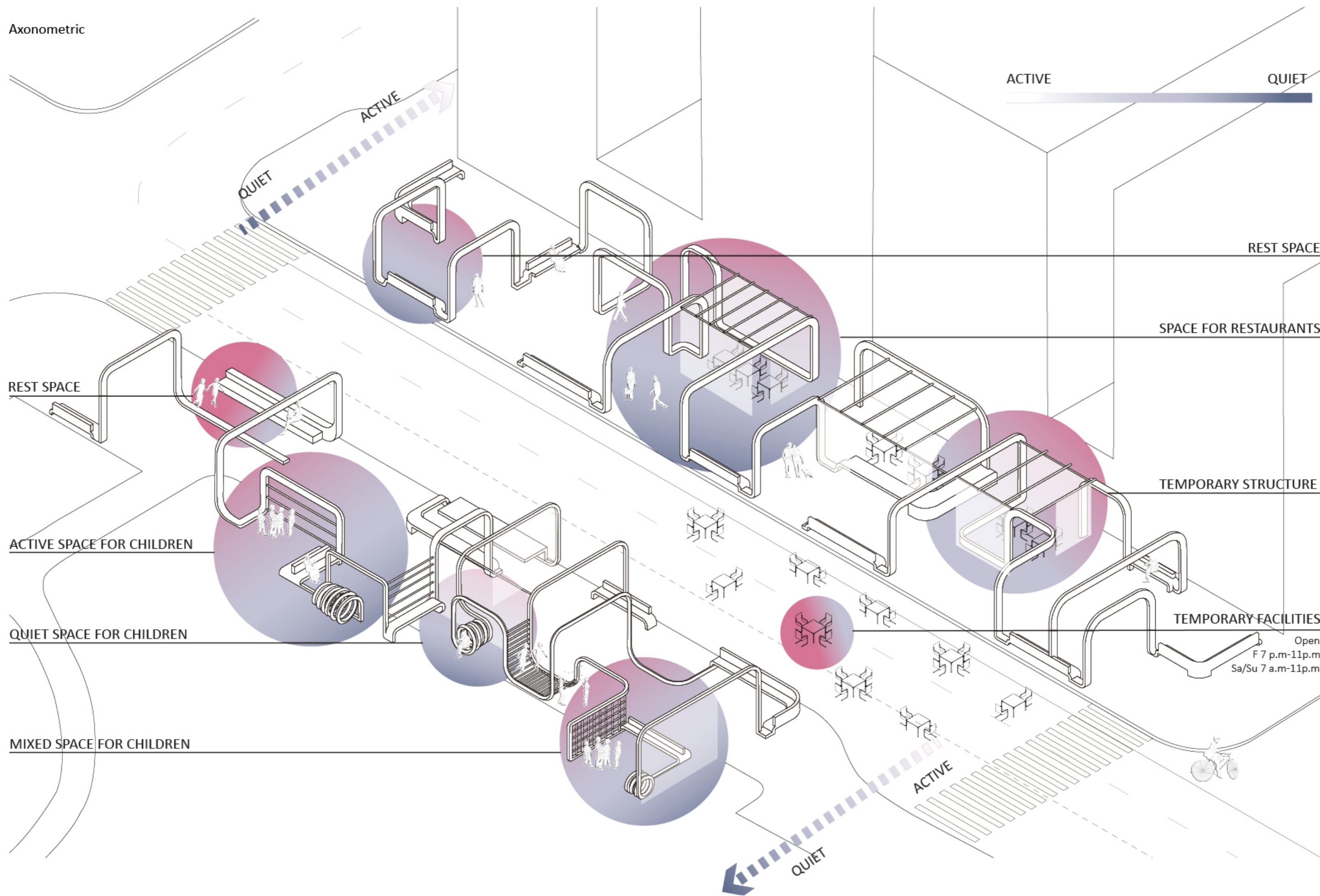
Elevation

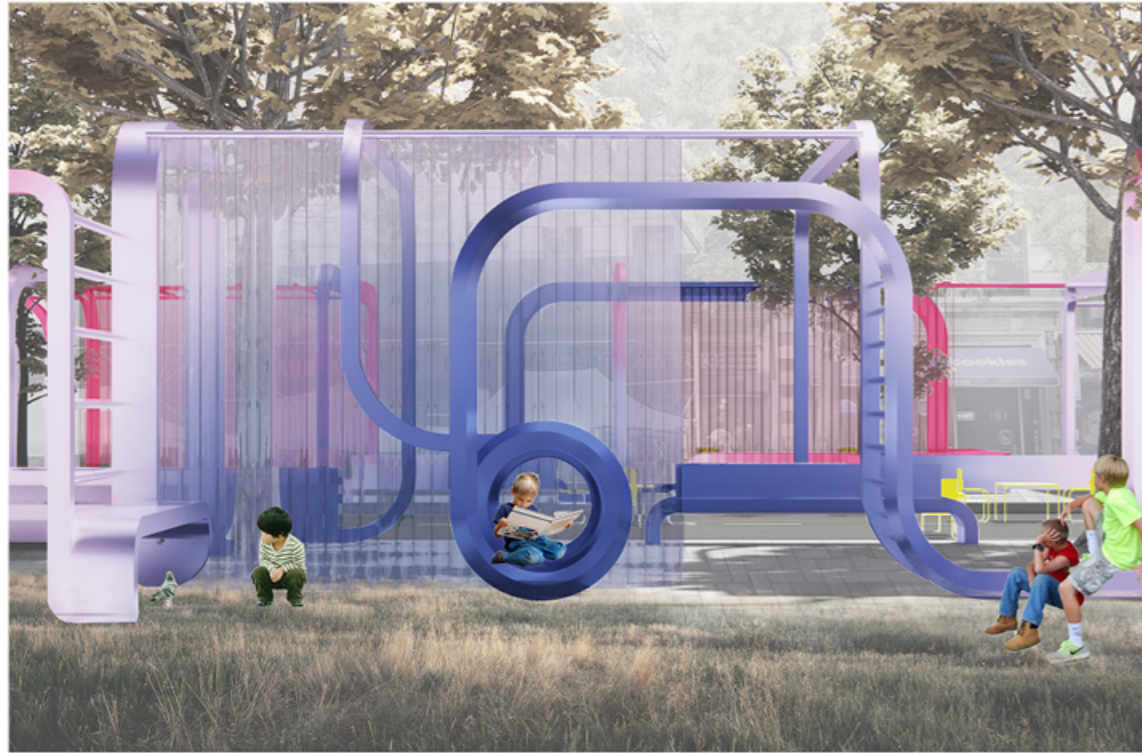


Amsterdam Ave



Axonometric





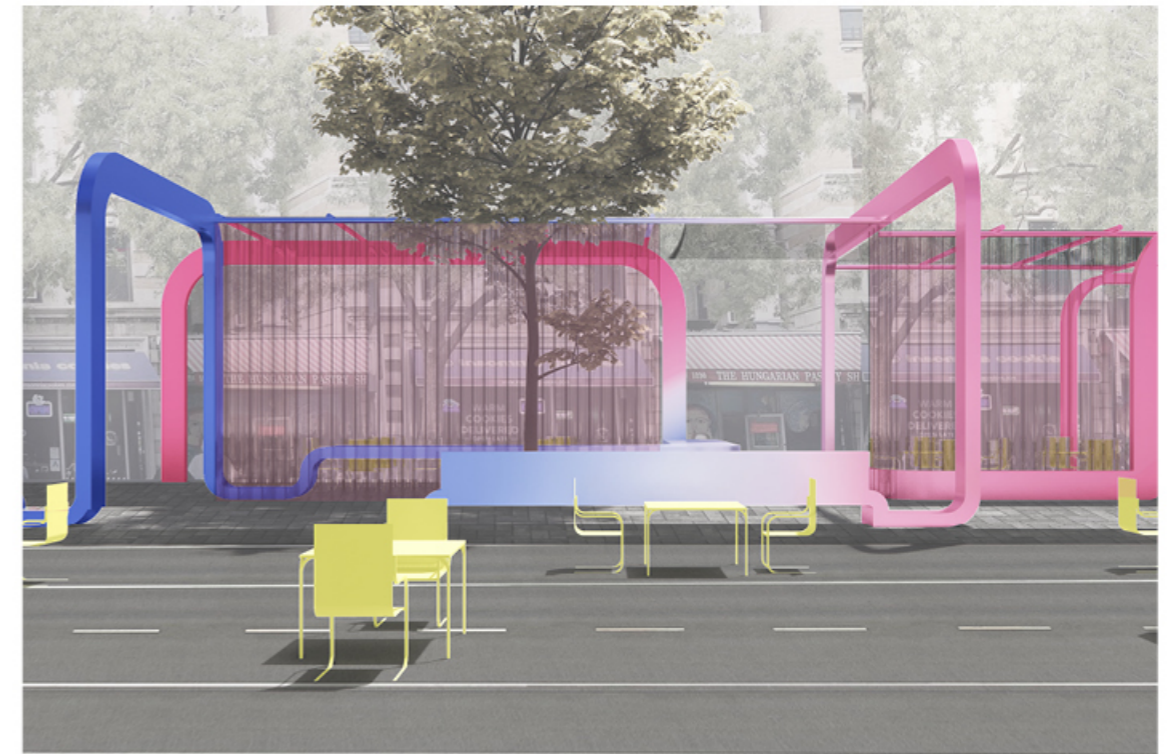
Quiet Space



Rest Space



Active Space



Temporary Space

Space For Children

In quiet space, I add more loops by pipes to keep the space more isolated for neurodiverse children. And I also add some temporary curtains in order to make their parents sit near them and stay with them together. In active space, there are many climb structures for children to climb ups and downs.

Space For Restaurants

For temporary parts for restaurants, like outside tents and facilities in the street, in winter, these outside tents can provide warm space for people to have a meal. And when the open street is closed, the facilities set up outside can be moved into the park as another rest space.

03 WILDLIFE THINK TANK

Human And Wildlife



*Advanced VI Studio, Spring 2022 In GSAPP
Three months from February to April in 2022
Location: Mount St Mary's Fire Rd, Los Angeles, CA 90049 in LA, USA*

*Design: Group Work with Ningyuan Deng
Instructor: Galia Solomonoff*

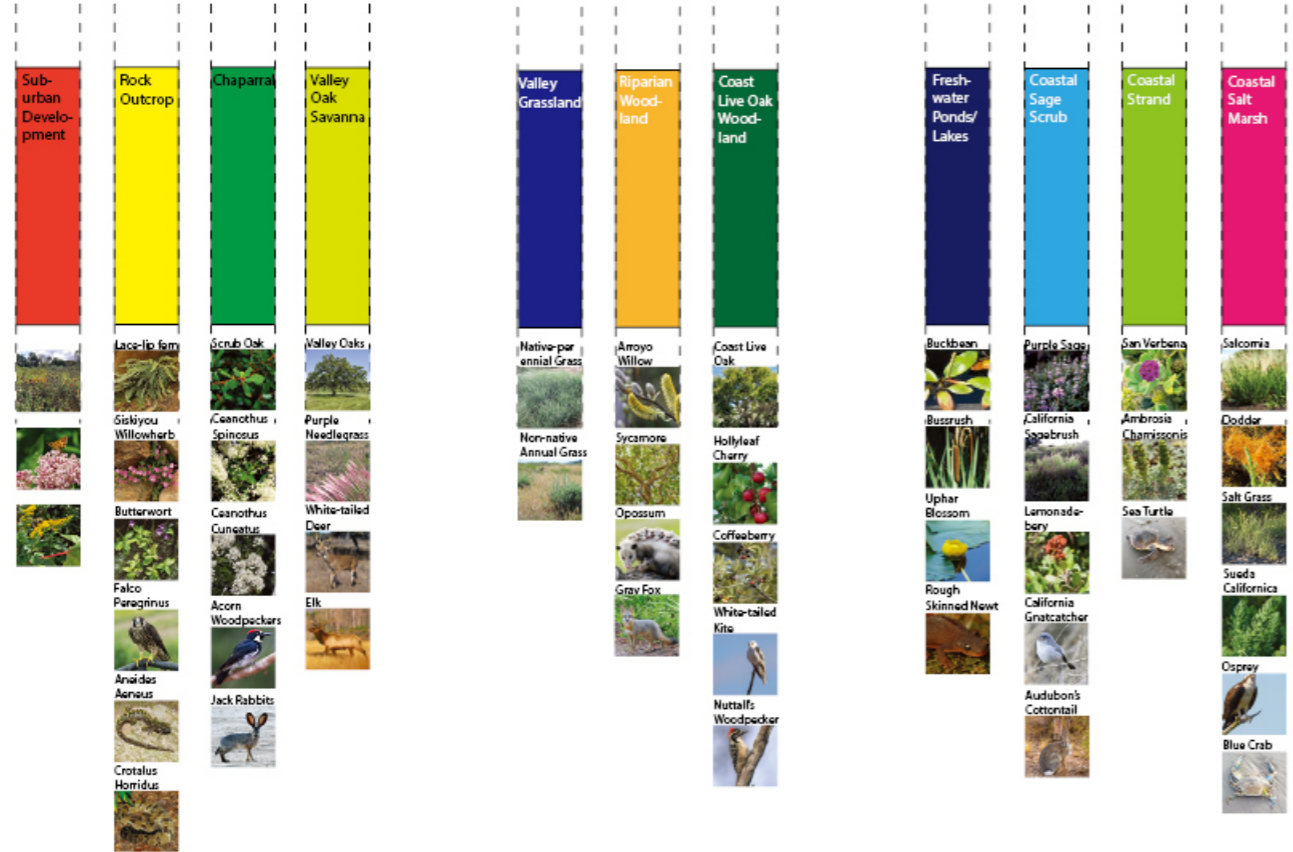
To make things understandable, we have segmented knowledge into professions, departments, ministries, parties, regions, countries, disciplines, genders. We then compared mentalized information, allocated resources, and grouped people based on those fragments. And in the process of understanding one thing, one organ, one problem, we lost track of the whole, the whole body, the whole city, the whole country, the whole planet.

But the world and most things in it are interconnected. And Covid made it most clear. We now understand how things are related, connected, part of the same whole, where when one thing comes out of balance in one part, it destabilizes something else that seemed remote or not connected. The world is fluid and interdependent, markets like rivers flow and affect one another.

A think tank is an organized group of cross-disciplinary research with the objective of providing advice or action on a diverse range of issues through the use of combined specialized knowledge and the activation of networks.



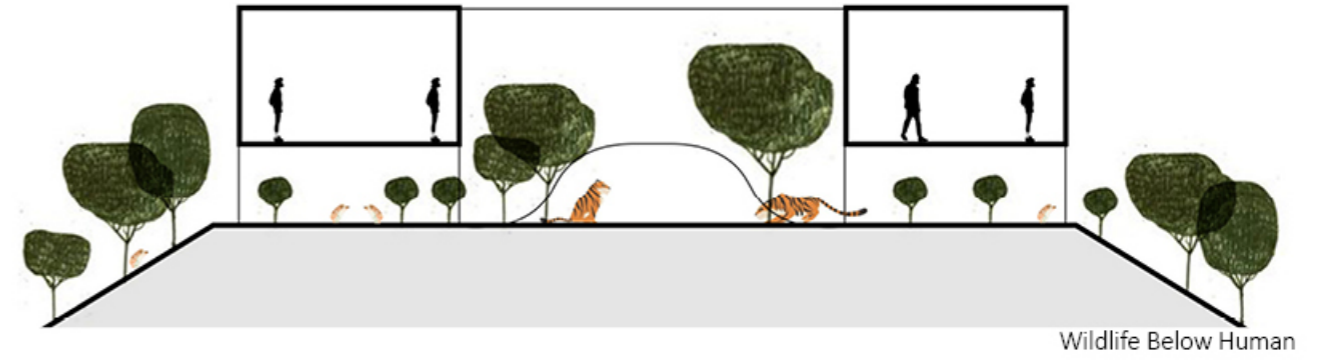
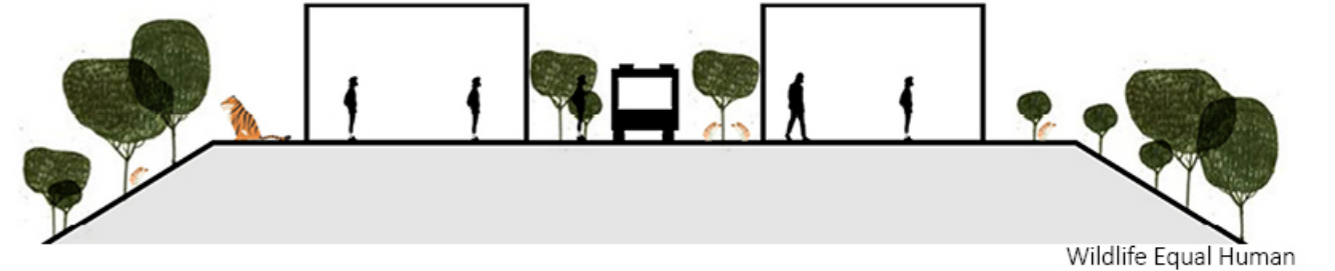
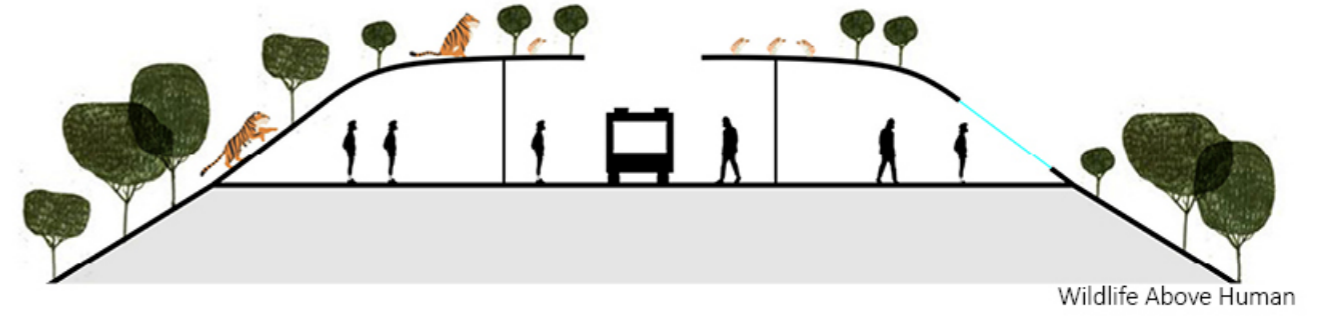
SITE CONTEXT



PROBLEMS

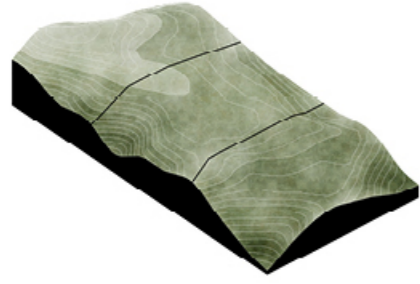


CONCEPT DIAGRAM

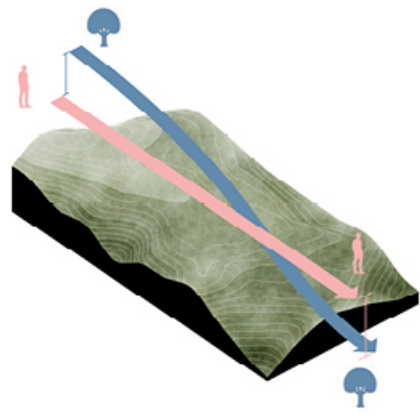


According to our research, The Santa Monica Mountains are home to 11 vegetation communities, which are derived from 26 vegetation associations identified by the California Natural Diversity Database classification system. We divide 11 communities into main three categories. Herbaceous area, Forest area and aquatic environment area. We are also thinking about wildlife through sections. We explored the relationships between animals and human beings and propose three architecture prototypes. The first one is wildlife living above people. The architecture is more like earth-covered building. The second one is that human beings and wildlife exist on the same level. People mainly have activities in architecture, and animals mainly live outside of buildings. The third one is people above wildlife. Architecture not only provides space to human, but also offers shelters and passages to animals.

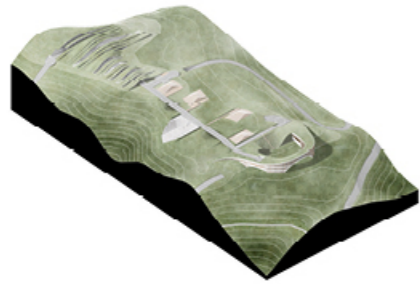
MASSING DIAGRAM



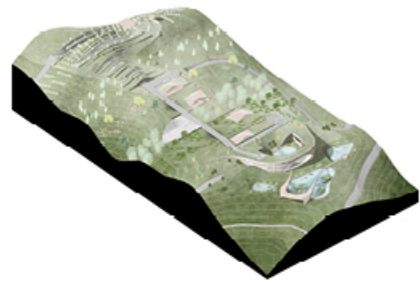
Site Condition



Different Layers



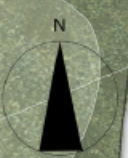
Architecture



Landscape



Master Plan

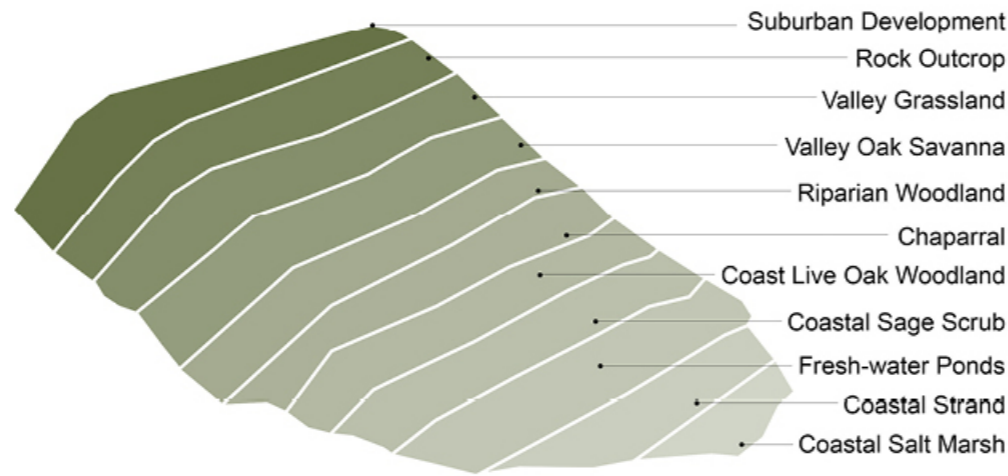


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SITE DIAGRAM

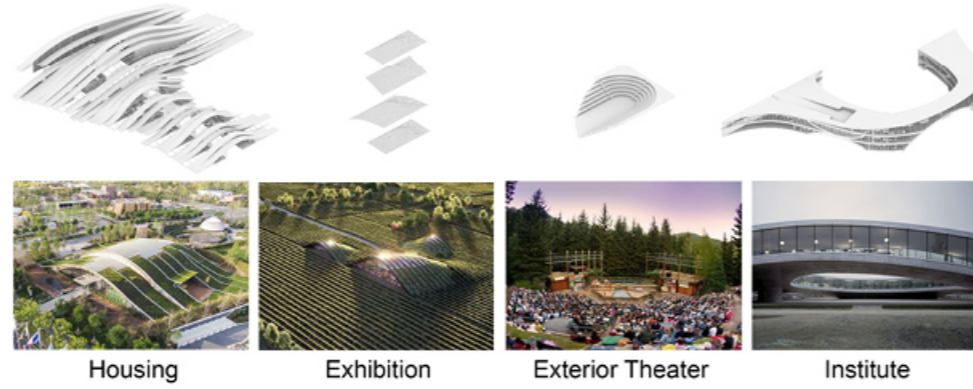
Landscape

In order to exhibit all types of plants in Santa Monica Mountains, we create eleven different environments for different plants. In this way, visitors can enjoy all kinds of landscape in this area as they go through the site which can be used for clothing, food and feed afterwards.



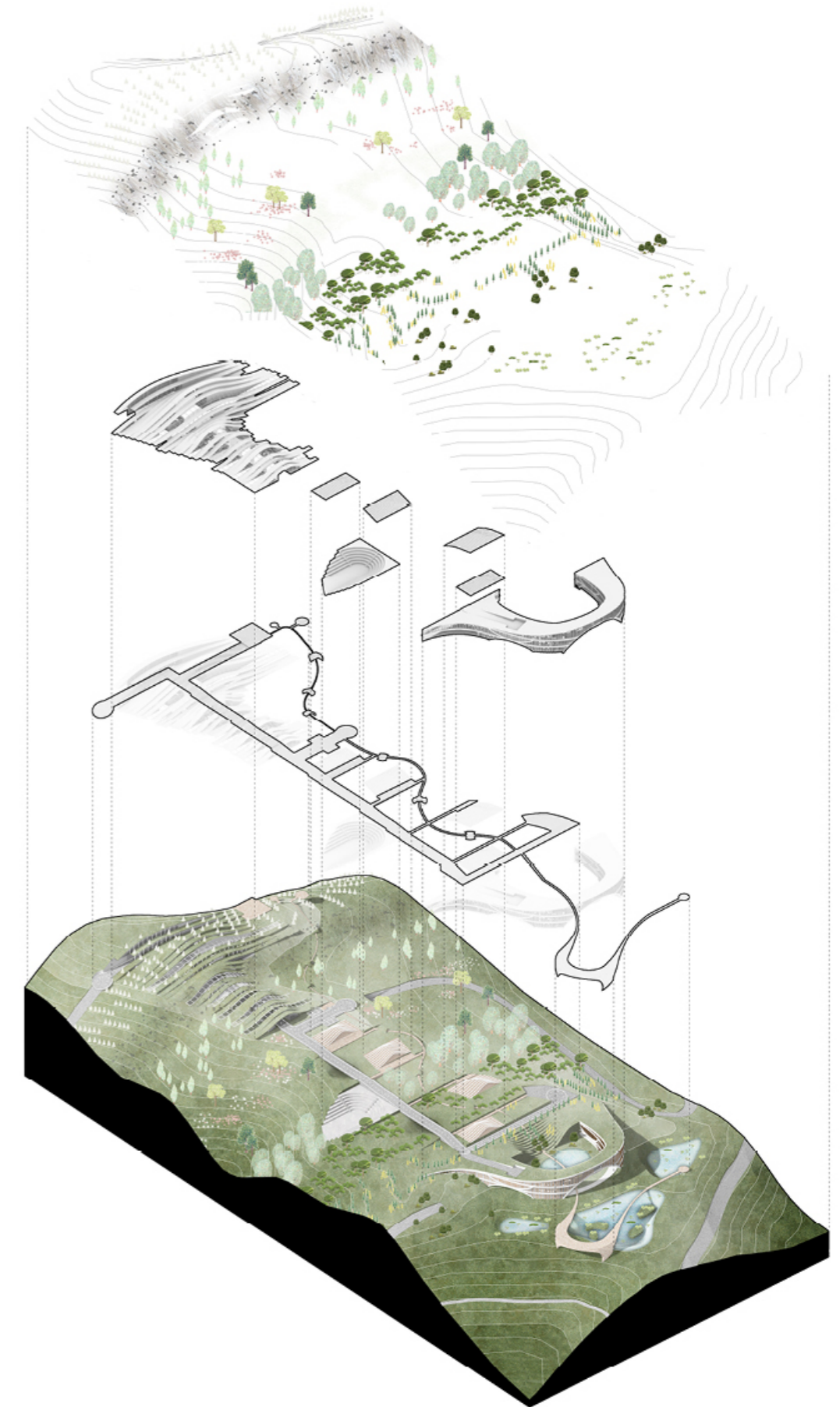
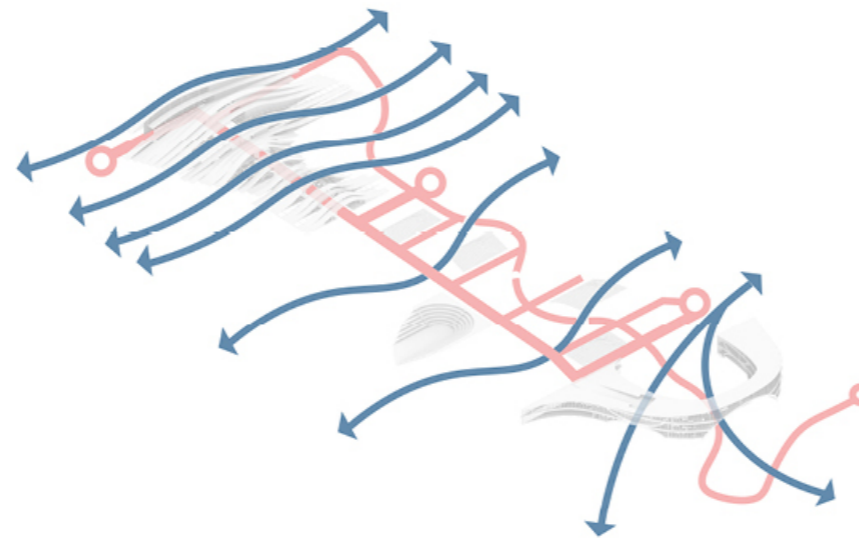
Architecture

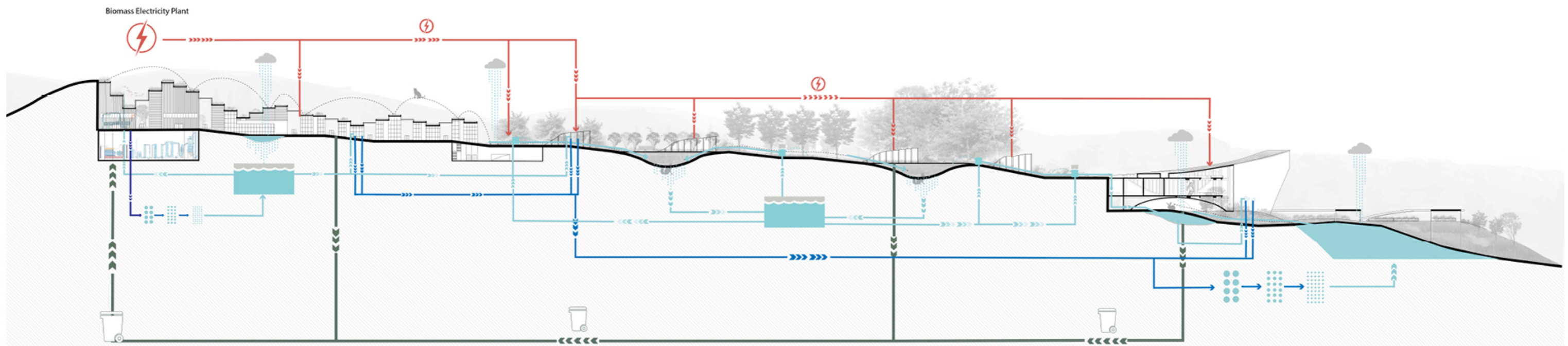
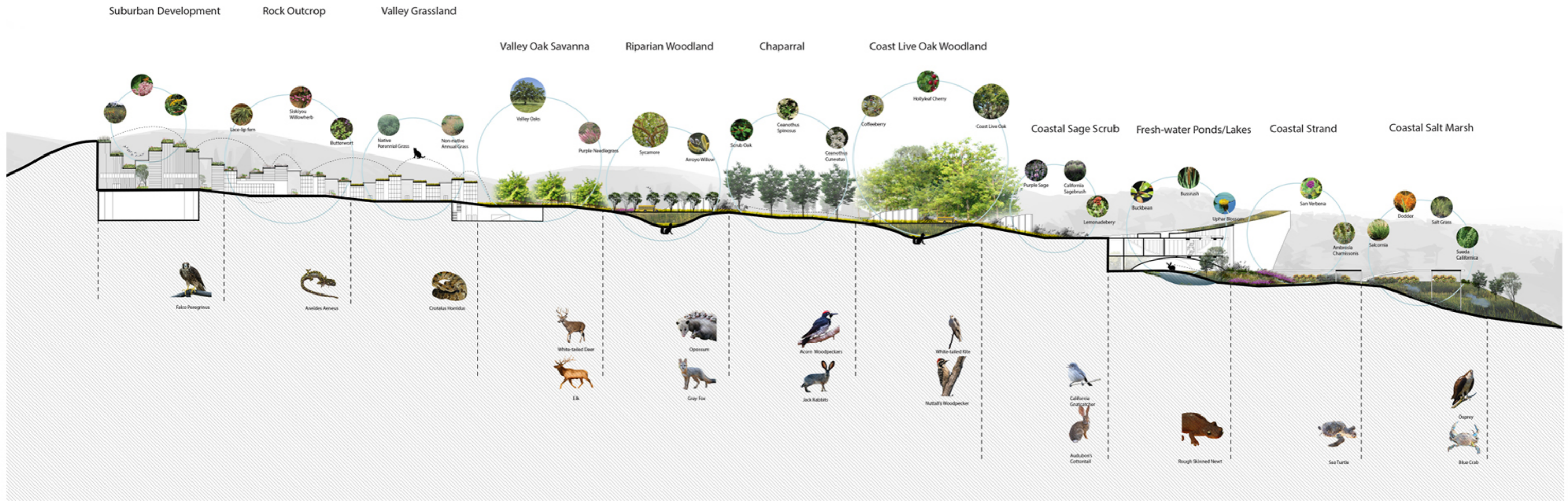
Along the long axis of the site, we set housing area, exhibition space, exterior theater and an institute in sequence. Different programs have different architecture prototype, which enriches the relationship between human beings and wildlife.



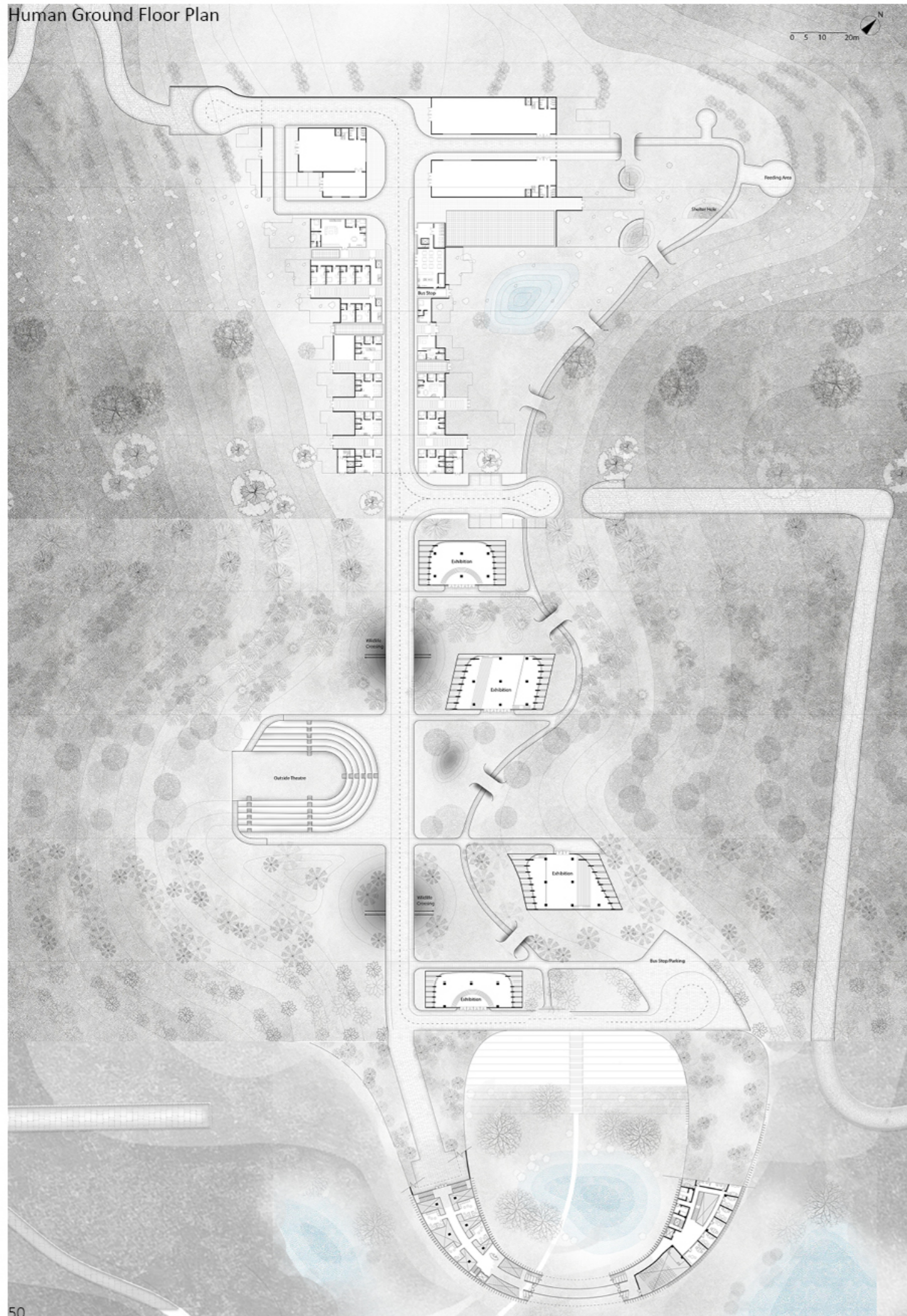
Circulation

We are trying to create spaces for both human beings and animals. Therefore it's important to allow animals cross the site as well as human can have activities.

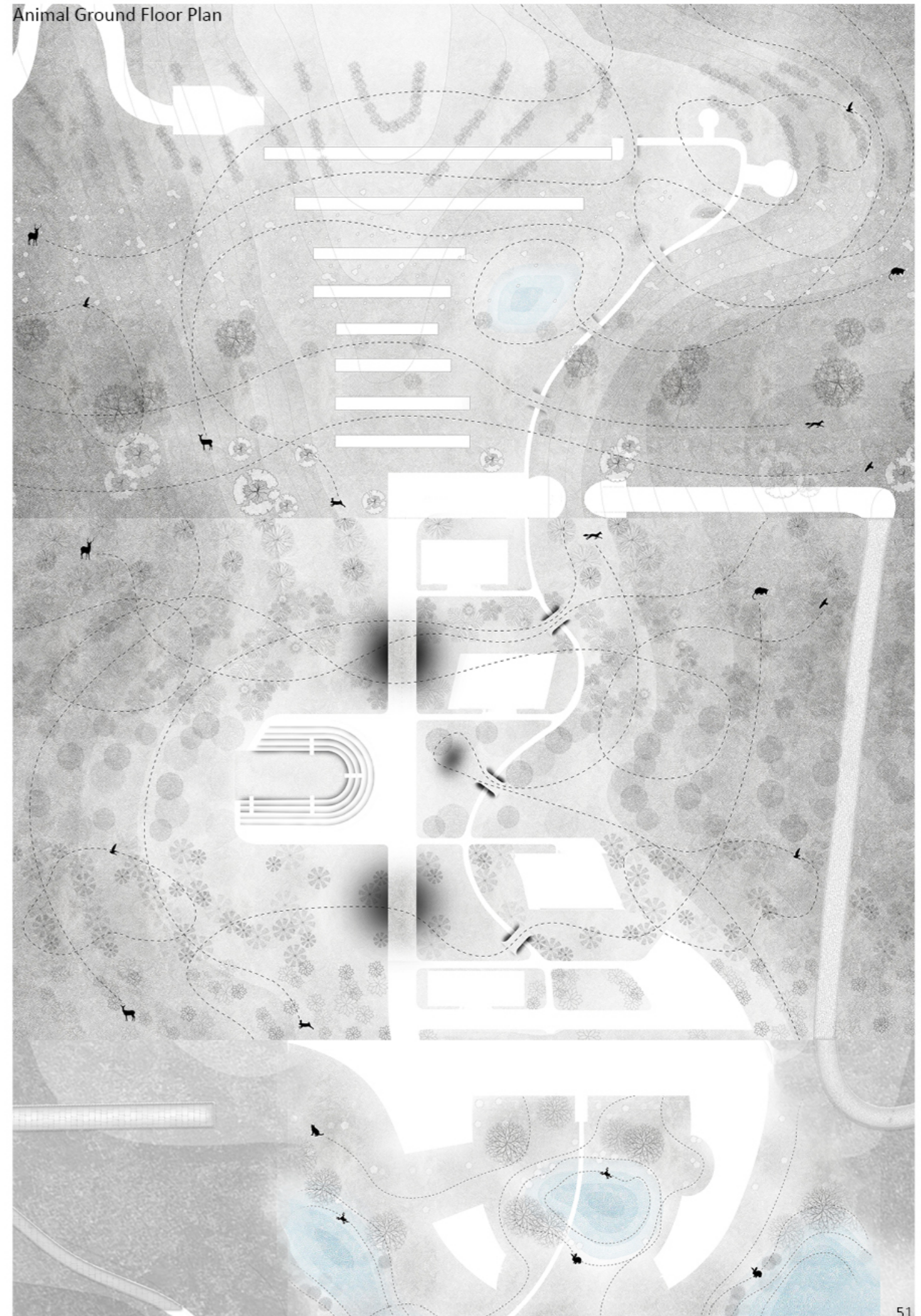


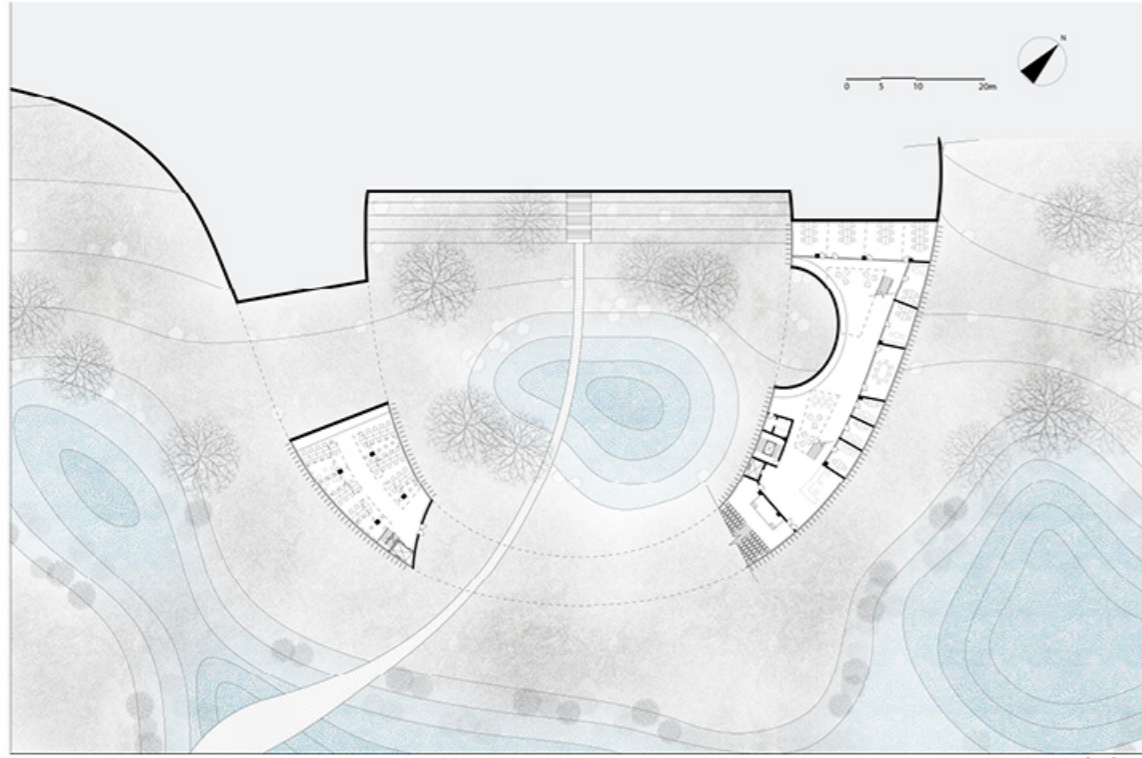


Human Ground Floor Plan

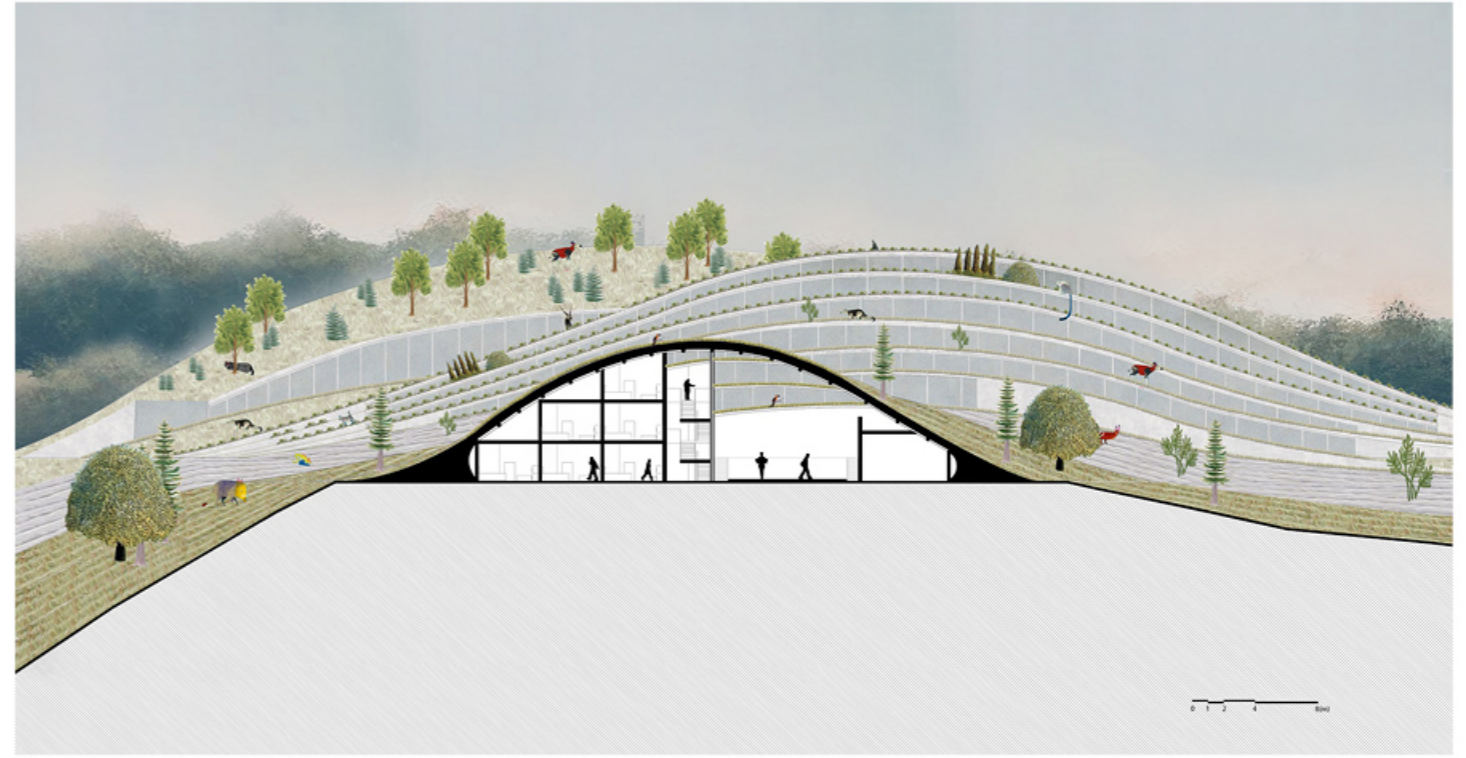


Animal Ground Floor Plan

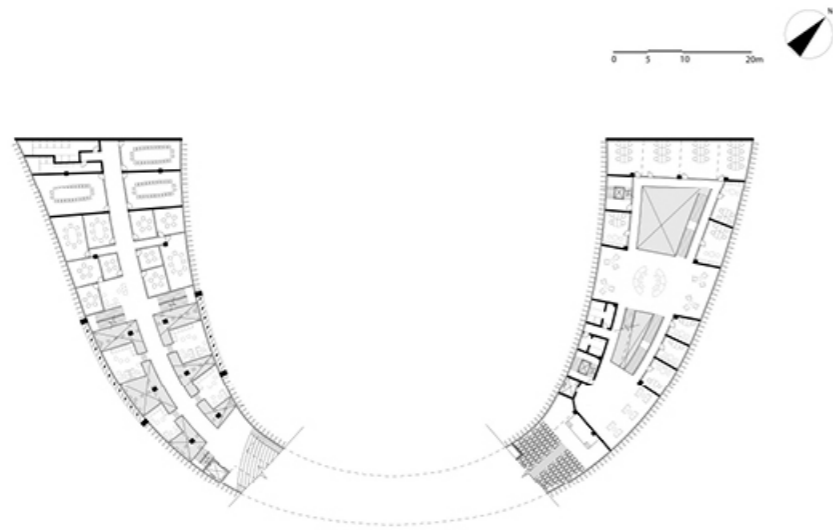




Institute Ground Plan



Section A



Institute Second Floor Plan



Section B



