

MAXINE ZHAN GAO

SELECTED WORKS | 2020-2023

COLUMBIA UNIVERSITY, GSAPP
MASTER OF ARCHITECTURE

C O N T E N T S

01 / HUB

Energy Infrastructure

02 / (UN)NATURAL HISTORY MUSEUM

Post-Plantation Museum

03 / TRANSFORMING SEASONAL GROUNDS

Intervention

04 / THE BRONX VERTEBRA

Affordable Housing

05 / STACKING SCHOOL

Adaptive Reuse

06 / SOFT EDGE

Installation

07 / OTHER WORKS

Visual Representation, Fabrication, Technology

01

HUB

ENERGY INFRASTRUCTURE

GSAPP | ADV VI Studio | Jan-Apr 2023
Site: Accra, Ghana
Instructor: Gary Bates

Can energy dictate the space? Or can energy become the space? Accra is a city where inadequate access to energy and **public sanitation infrastructure** hold outsized urban influence. From illegal connections to the national power grid to frequent electricity outages, from lack of water supply to limited access to toilets, from tons of organic waste dumped into the sewage everyday to open burning of solid waste, the daily struggle in Accra is calling for reconsideration of the evolution of infrastructure and access to energy.

HUB is a proposal to create, expand and intervene on the infrastructure that provides access to energy. As public toilets being an indispensable urban infrastructure in Accra, they provide a unique set of challenges and possibilities. The project seeks to transform daily waste generated in the city into **renewable energy** - biogas, which can be further converted into electricity. The set of strategies are deployed in both **block and urban scales**. These infrastructure functions as “energy hotspots” powering and fueling homes and “urban machines” operated and maintained by the community. The energy hub becomes the new civic space.



ENERGY AS SPACE



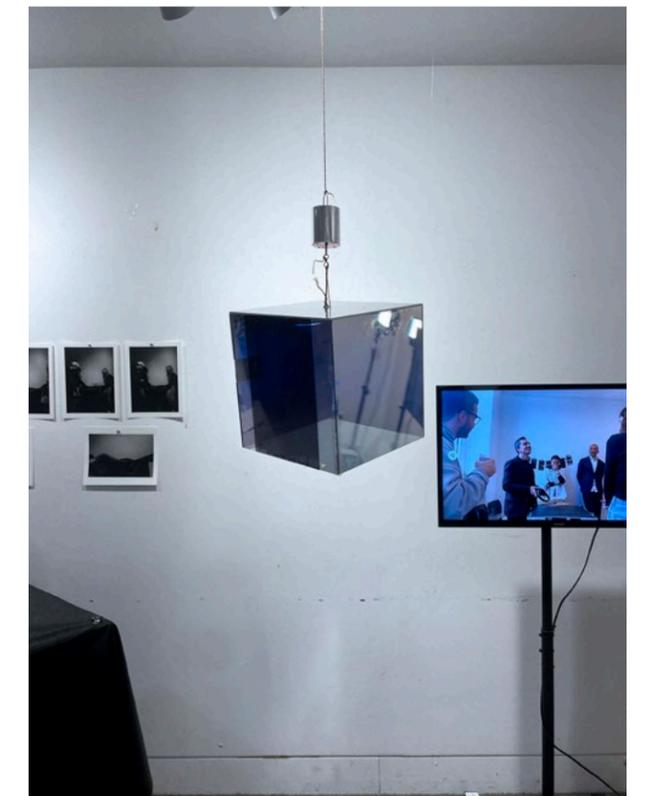
We first started looking at the electricity resources in West Africa, understanding that the electrical grid functioning as the proxy of development in the post colonial landscapes of west africa. Which further brought us to analyze the dislocated spatial implications that come along with the energy distribution. Such process is complicated by the multilayer of identities, neighborhood, national and international. Energy and resources act as the intangible forces that shape people's behavior and spaces close by or far away. Control over the energy essentially becomes the control over the space.

CIVIC SPACE?

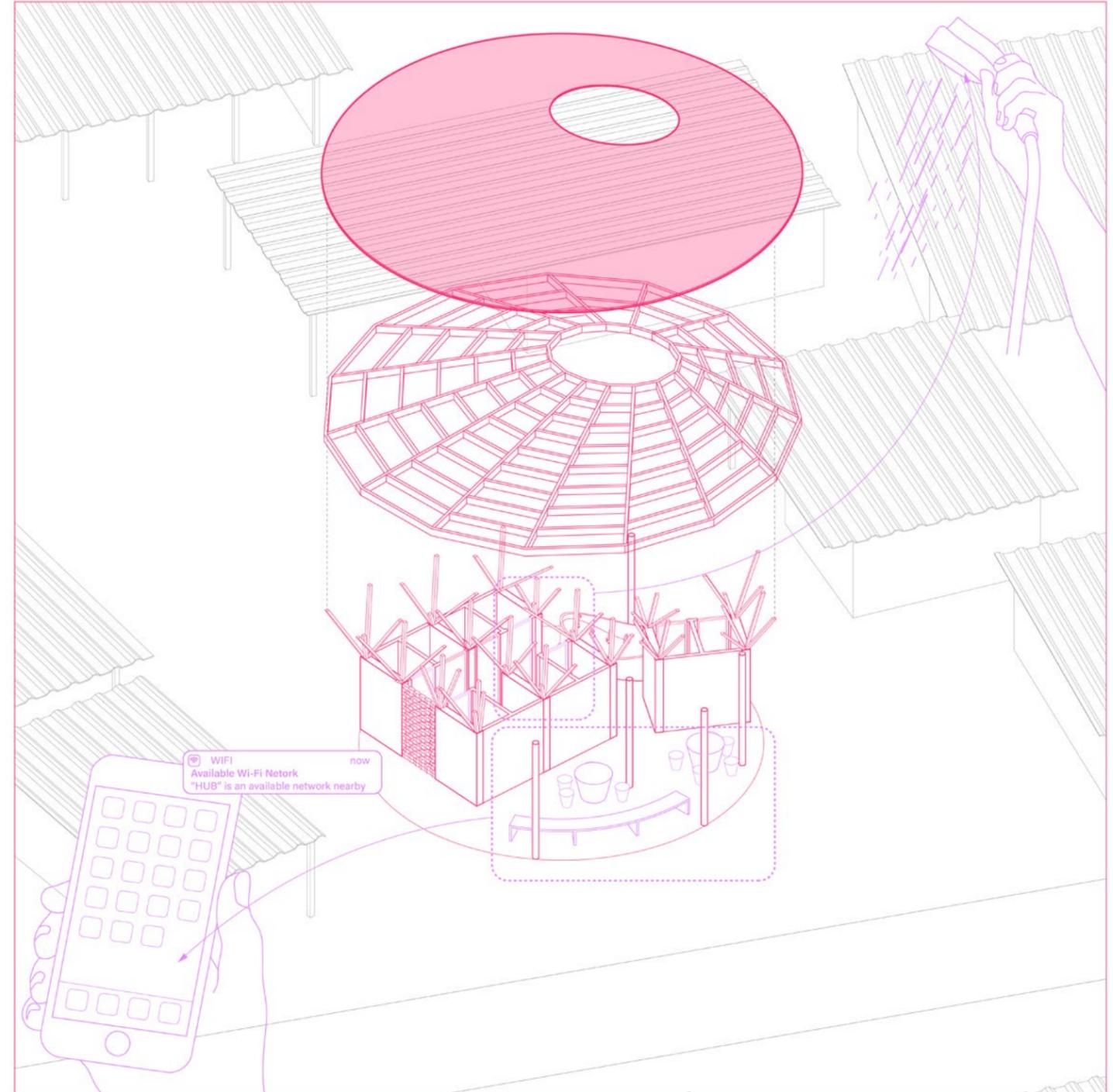


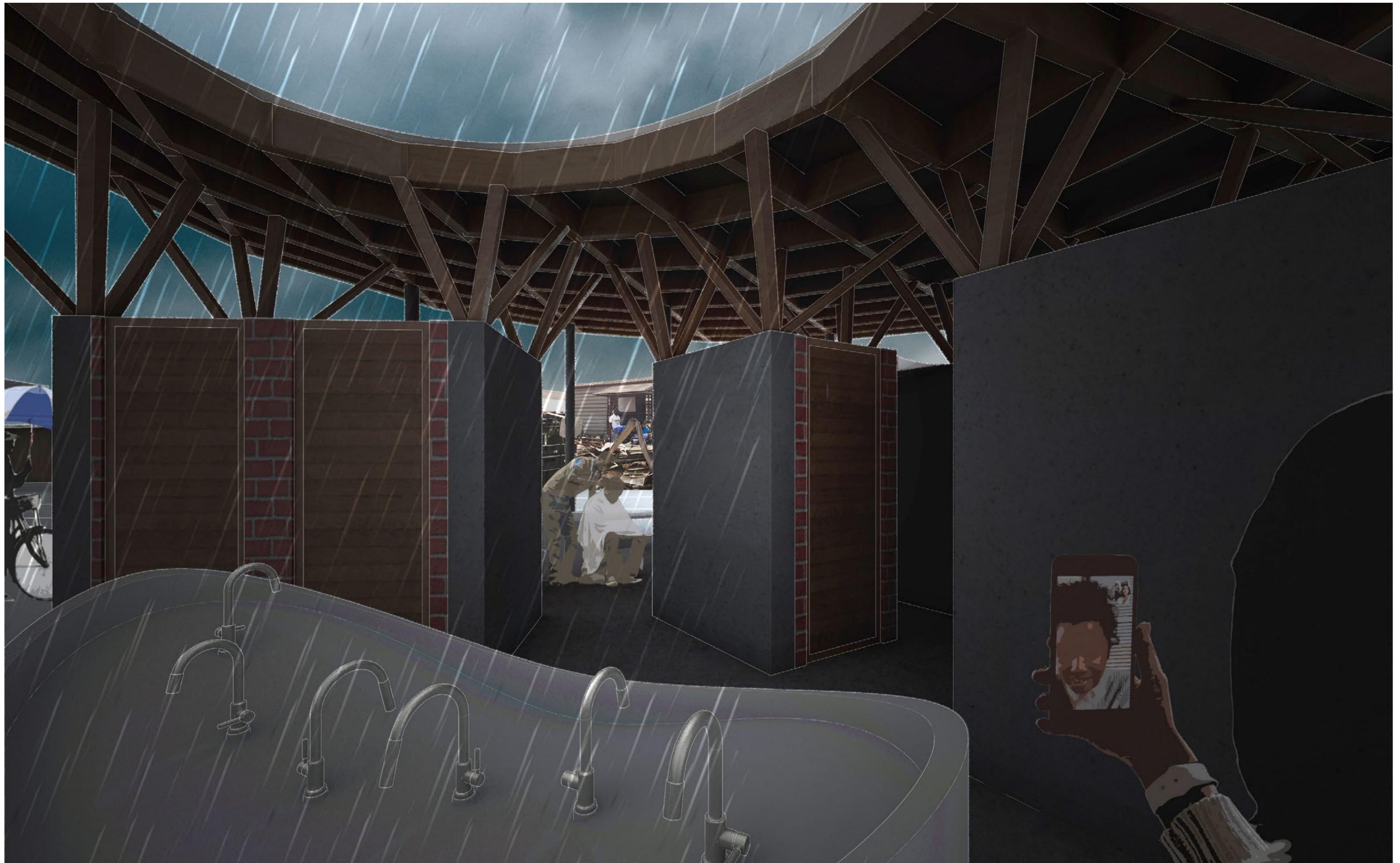
What is a civic space?

The reinterpretation of elevator ride presents an opportunity to calibrate the level of surveillance in a close and temporary civic space. Are you concerned about your privacy? Do you feel comfortable when surrounded by strangers? Do you know your rights or have any in such a small but shared public space? The transient nature of spaces like elevators deprives us of while gives us multiple sensory experiences. Although the physical environment stays the same, as time and space shifts, how we perceive the surroundings change.

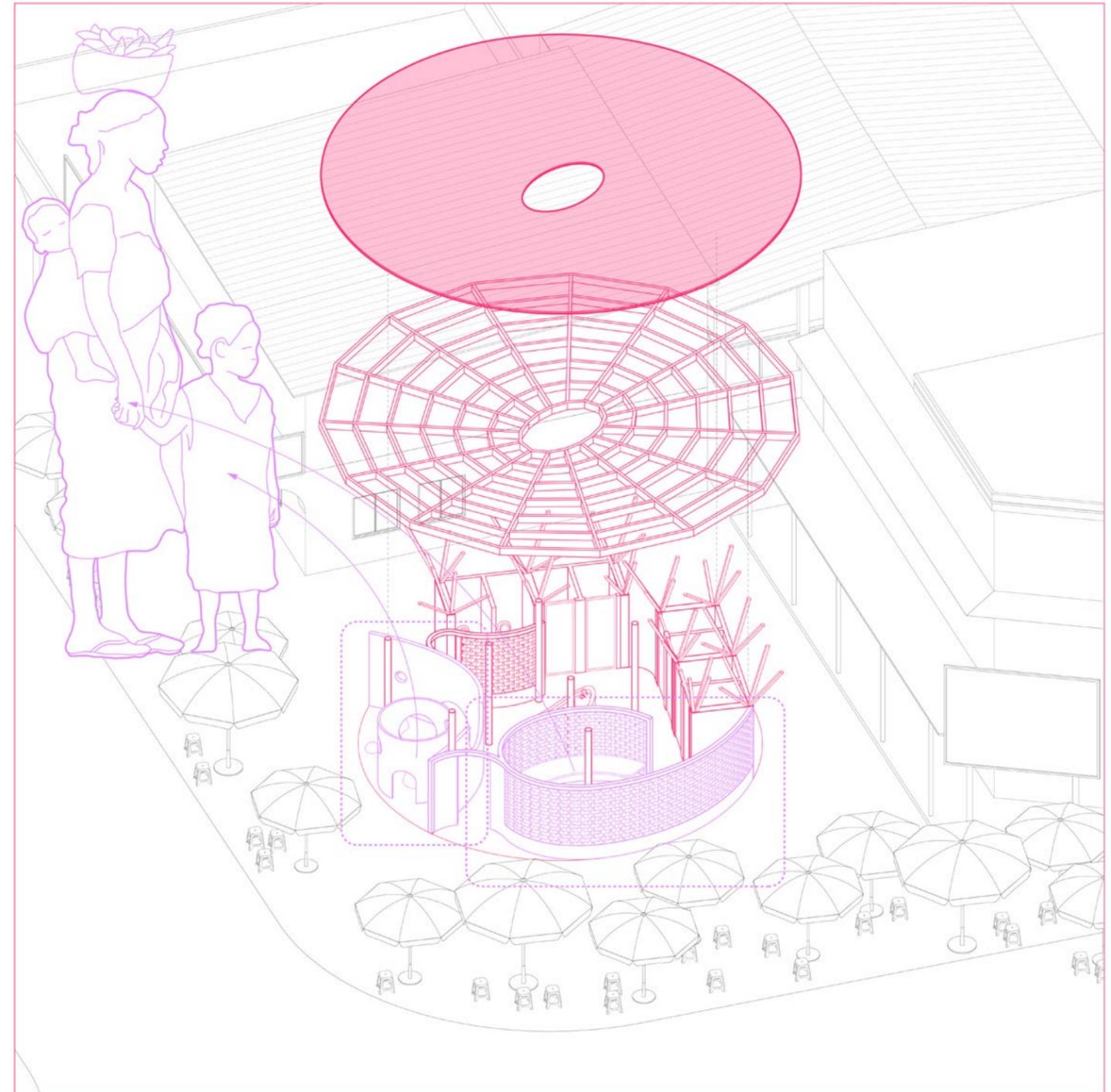


SITE A: FABRICATION AND MAKER SPACE



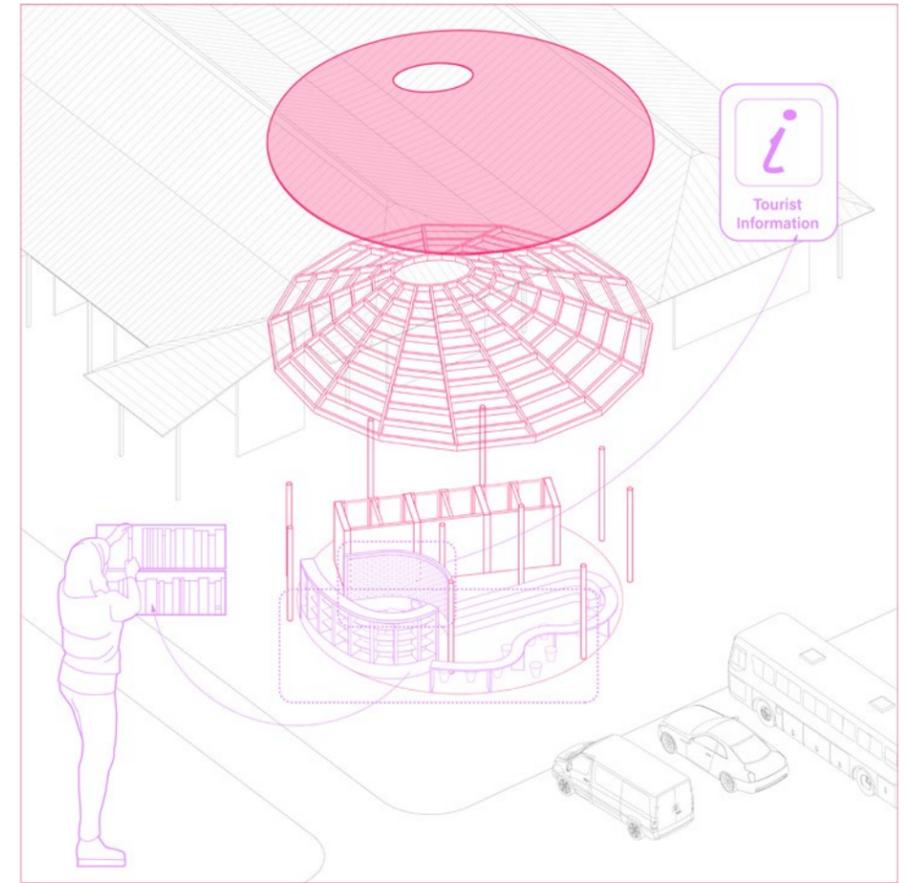


SITE B: MAKOLA MARKET

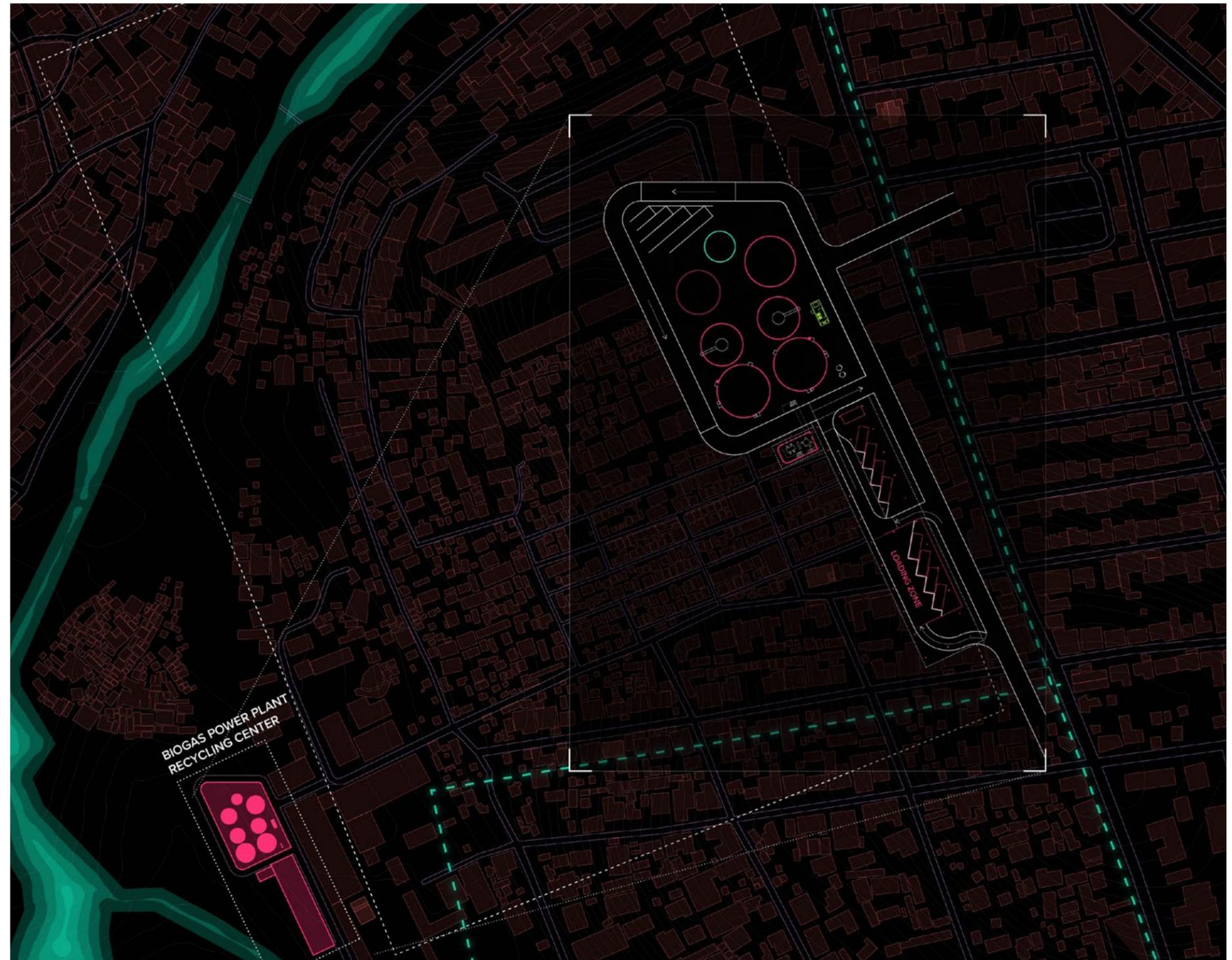
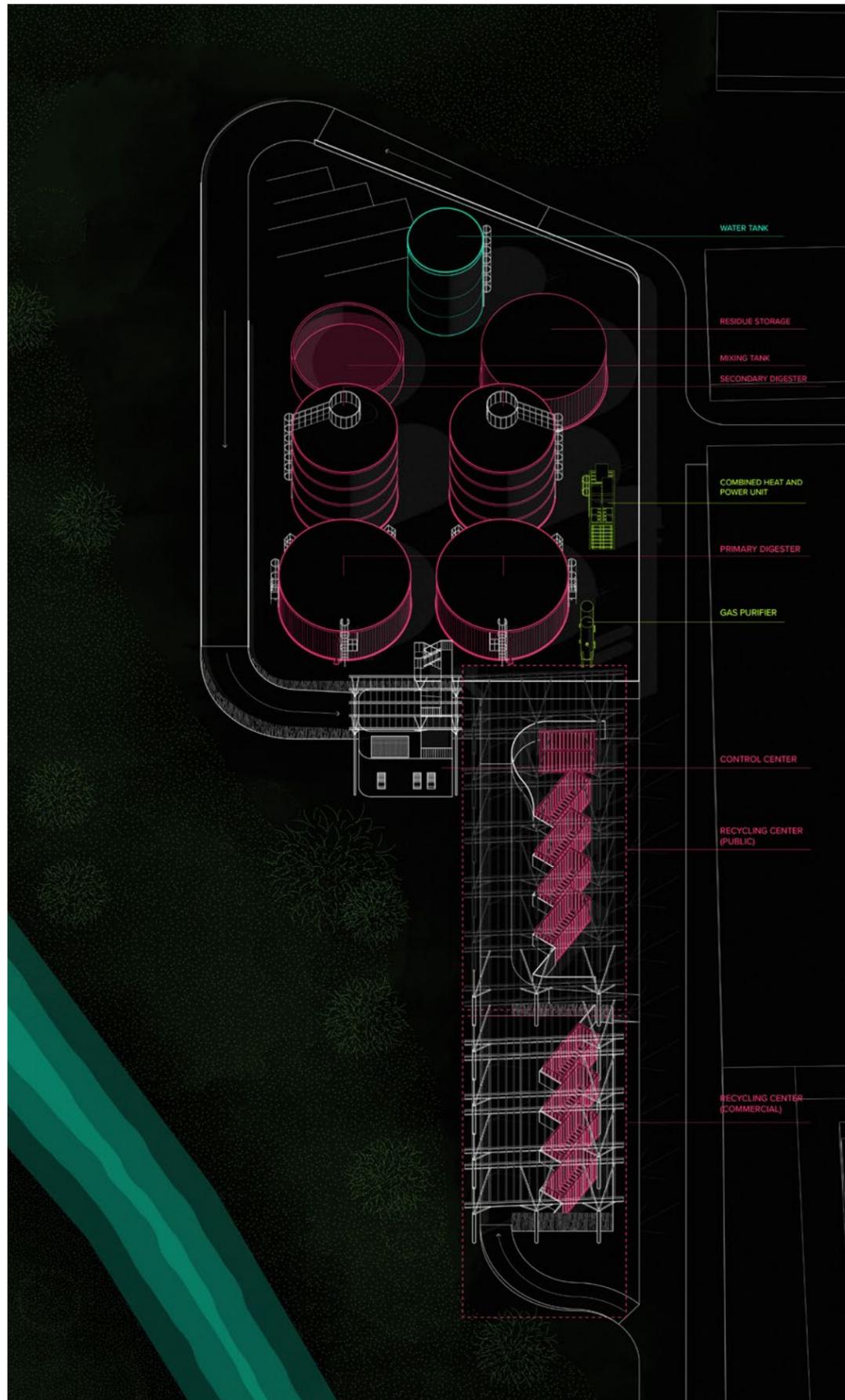




SITE C: ARTS AND CULTURAL CENTER



BIOGAS POWER PLANT & RECYCLING CENTER



By taking human waste and organic waste generated in the city, these infrastructure gives back electricity and function as “energy hotspots” powering and fueling homes and buildings and “urban machines” operated and maintained by the community. The energy hotspots become physical spaces for the community.

02

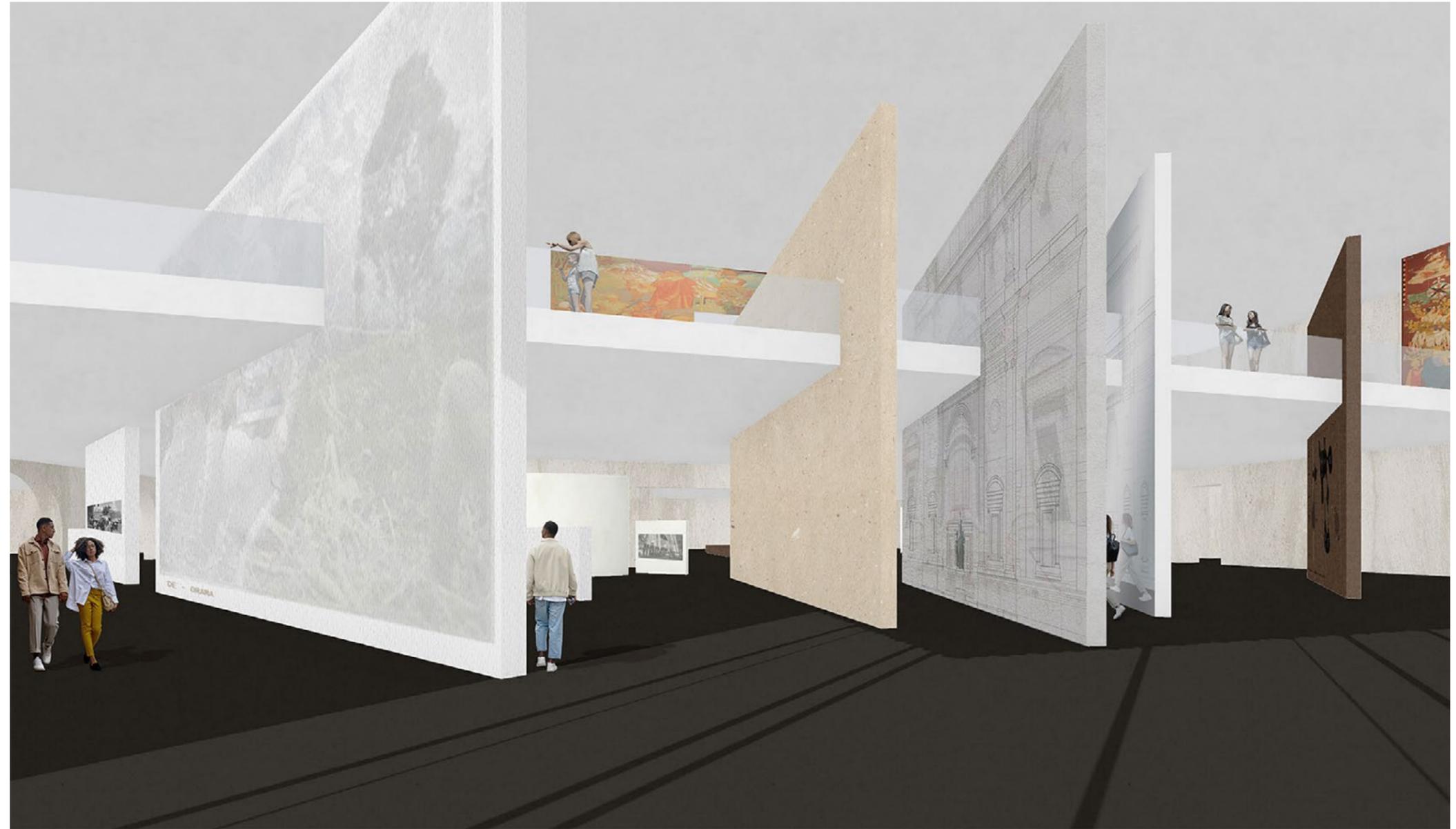
(UN)NATURAL HISTORY MUSEUM

POST-PLANTATION MUSEUM

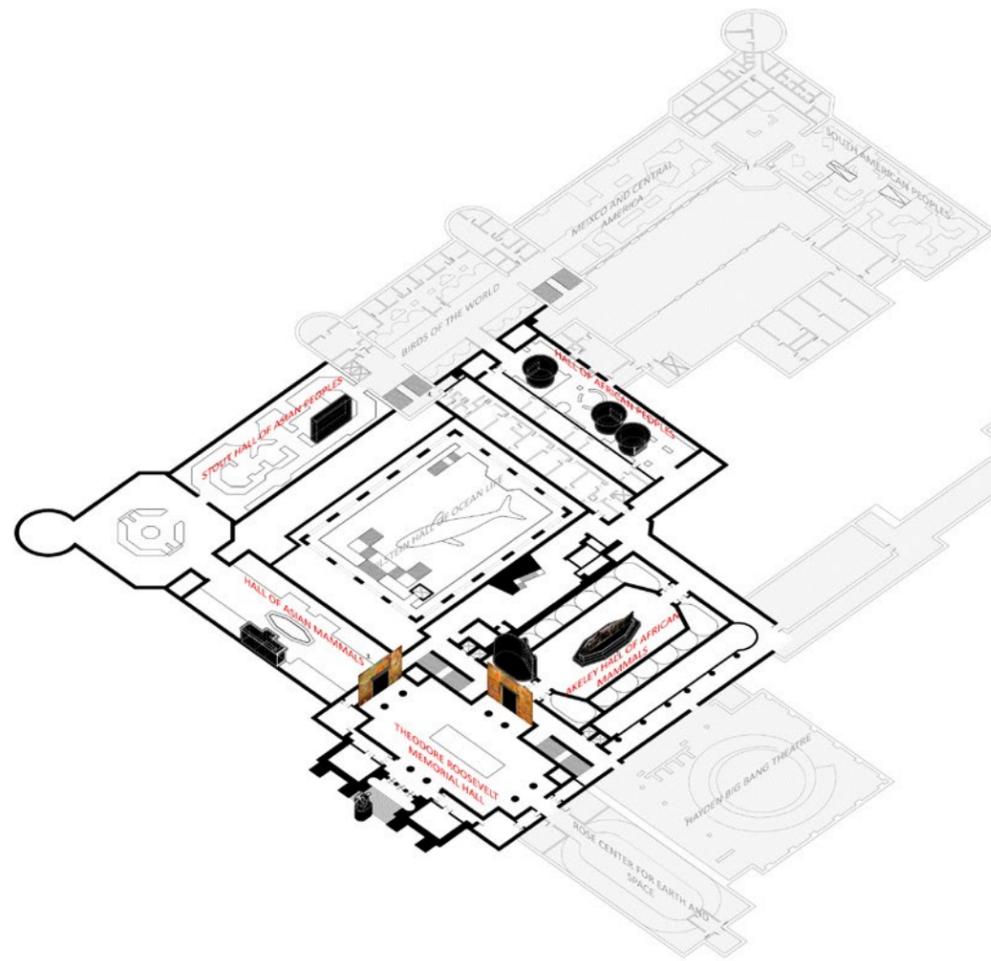
GSAPP | Advance V Studio | Sep-Dec 2022
Site: American Museum of Natural History, New York
Instructor: Mabel O. Wilson, Jordan H. Carver
In collaboration with Kim Langat

The (Un)Natural History Museum reflects the [temporal and ever shifting](#) nature of cultures and societies that were previously frozen for years by the American Museum of Natural history.

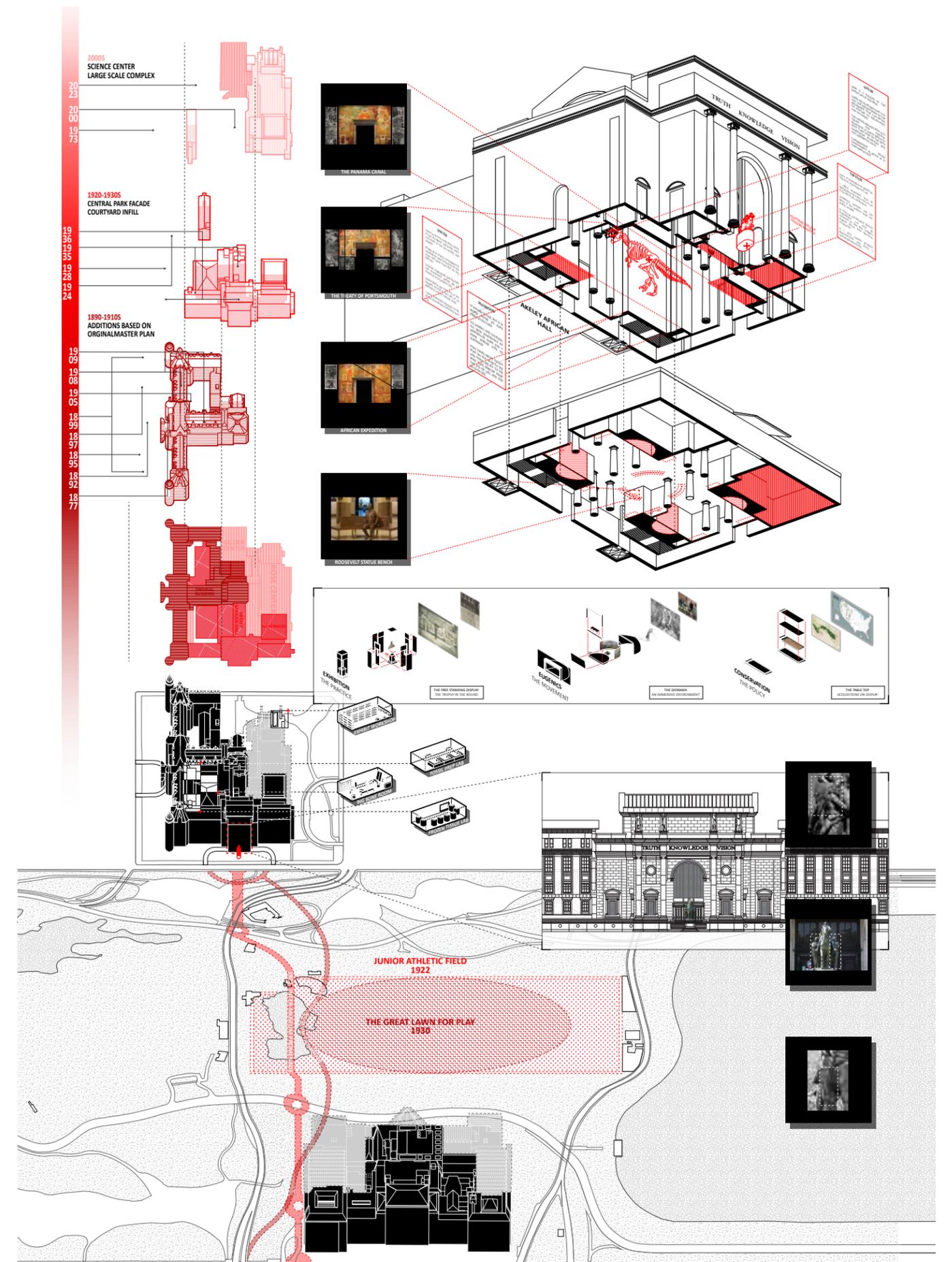
The American Museum of Natural History manifests the Plantation Logic by dehumanizing and demarcating the 'other' through the Eurocentric lens. Utilizing tools of [exhibition and display](#), the museum constructs an image that emphasizes the 'other' while isolating and freezing cultures in time. The (Un)natural History Museum rethinks natural history to de-territorialize the museum's portrayal of colonization and conquest to reveal the unnaturalness of natural history. Through rethinking the [diorama](#), a tool of power that arrests moments in time, the immersive image is disrupted to undo this theatrical staging. A new set of architectural tools [intercept, reflect, and reveal](#) a narrative to [animate and re-contextualize](#) the complex histories that were previously hidden. The (Un)Natural History Museum deconstructs and pulls apart the constructed image to reveal how history is not isolated, but interconnected and ever-changing.



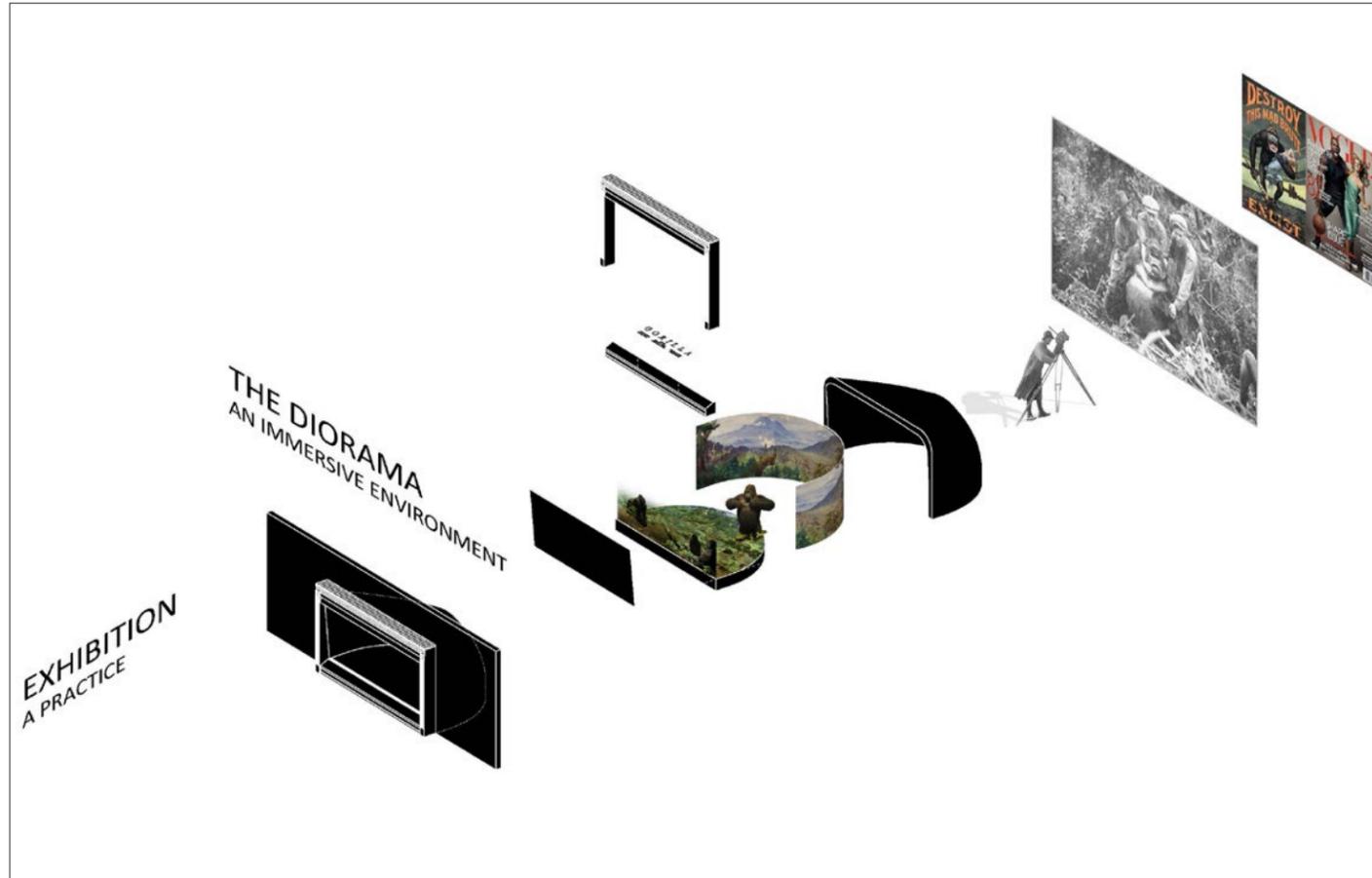
THE CONSTRUCTED IMAGE



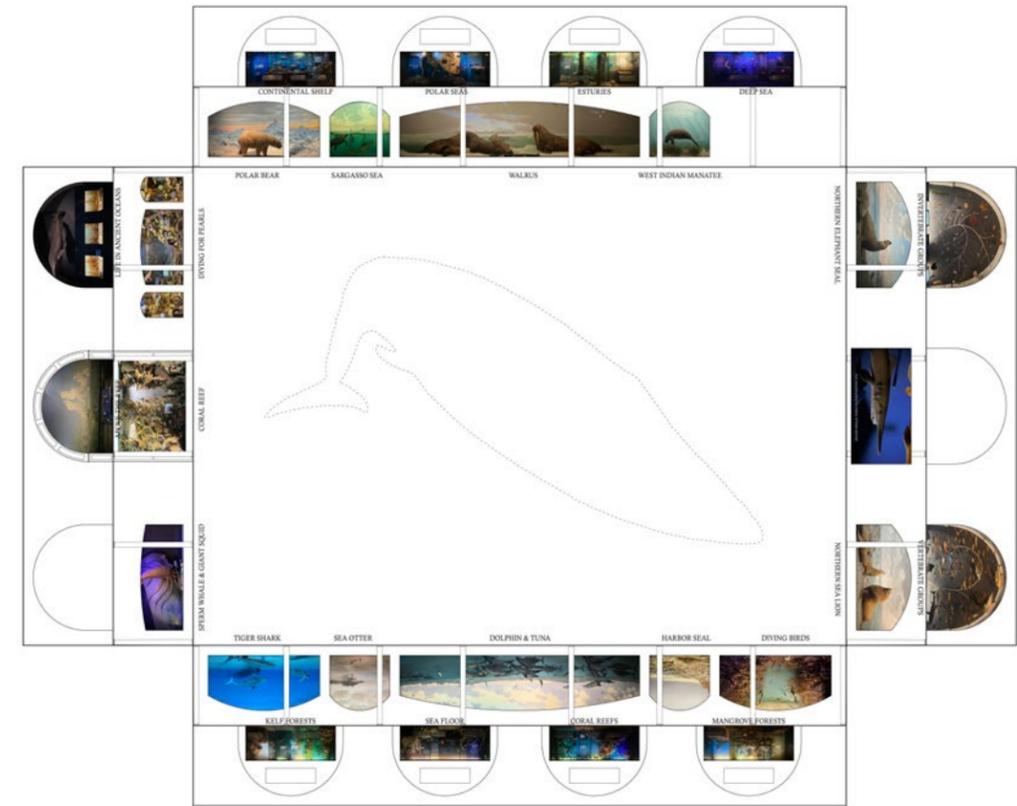
The American Natural History Museum constructs a narrative of America, masculinity, and whiteness through a sequence of imagery. The museum is organized by mammal halls leading to human ethnographic halls. Each of these halls have dioramas that theatrically depict humans and mammals as static and being of the past.



DIORAMAS

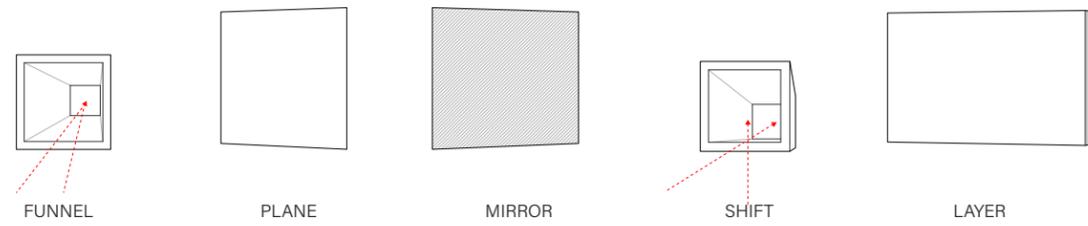
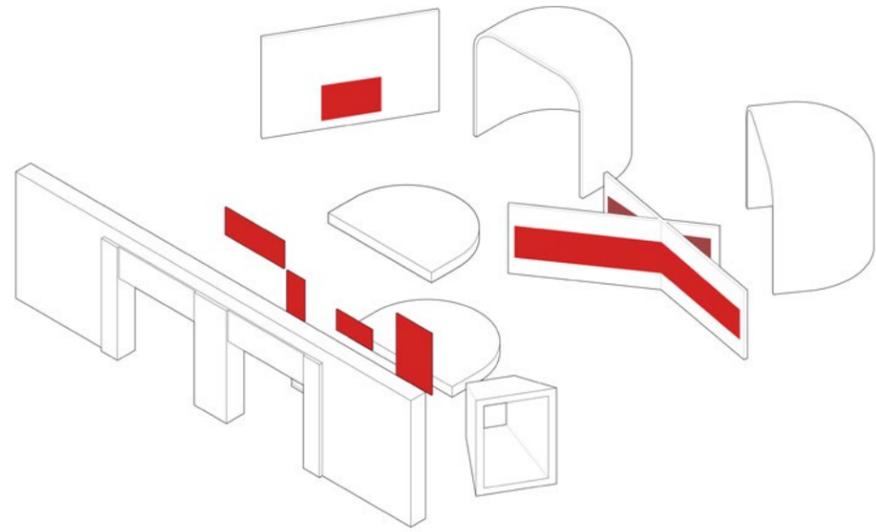


Dioramas are essential in displaying exhibitions within the museum and they serve as tools of power that arrest moments in time, putting the viewers within the world of that bubble.

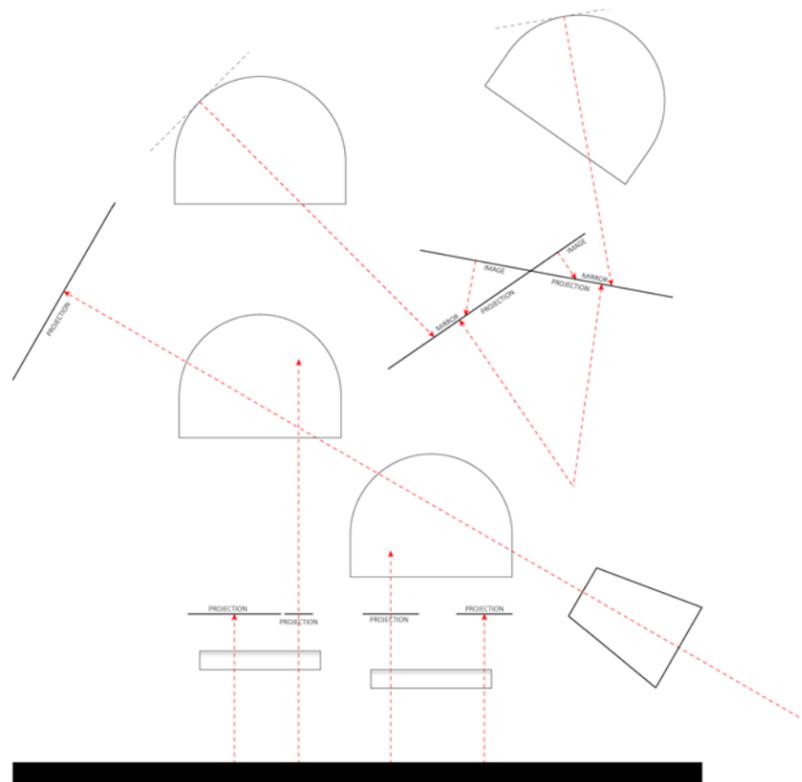


Through analyzing the dioramas in Akeley African Hall and Milstein Ocean Hall, we examine the complexity of animals and further understand how the museum compartmentalizes the geography and capture them in a static moment.

DE-CONSTRUCT THE DIORAMAS



Our intervention proposes to pop the bubble of the diorama, bringing the visitor behind the singular plane of the wall to reorient how the body previously moved through the museum. Through new architectural devices the layers of the constructed images can be intercepted, reflected, subverted, and emphasized to animate the complex histories and realities of these cultures.

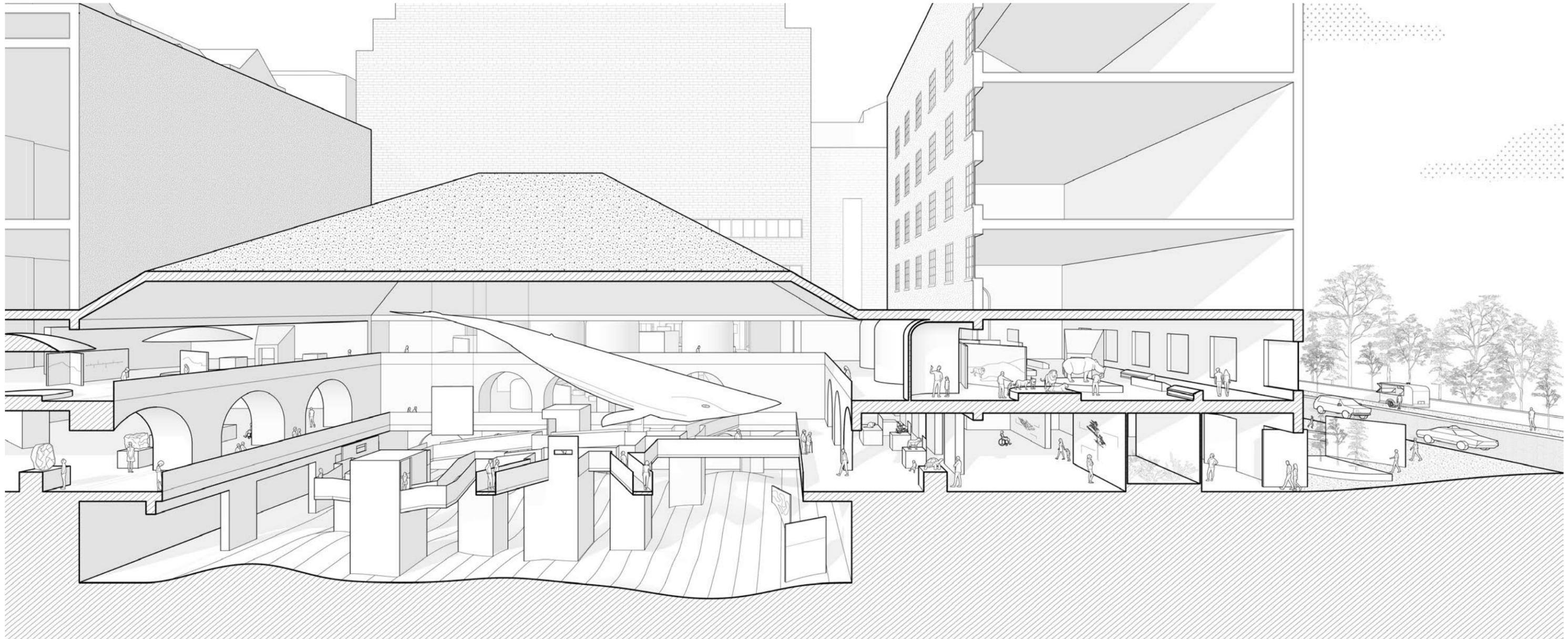
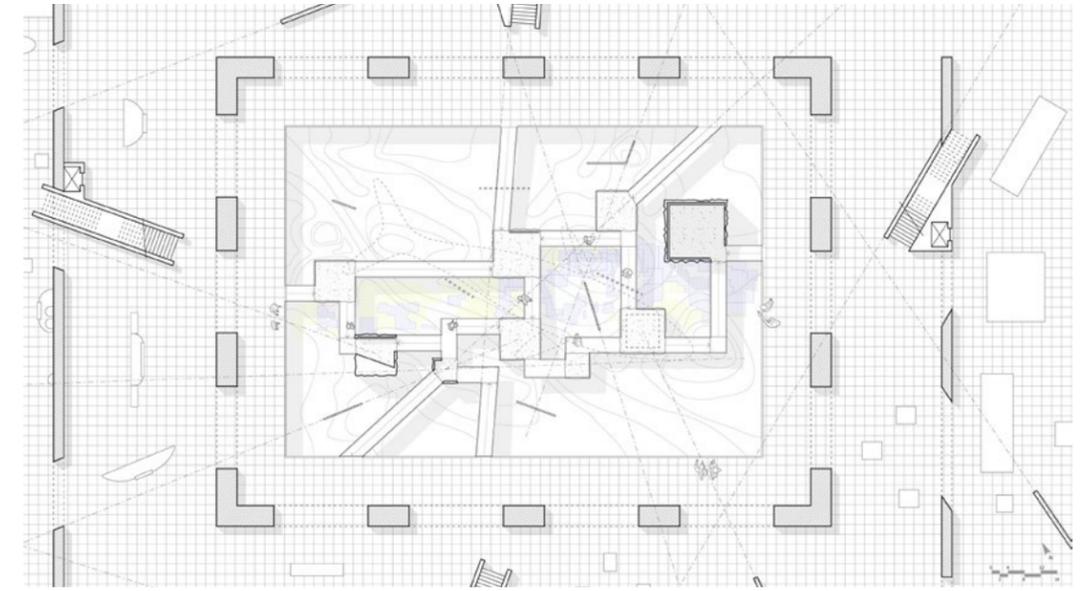
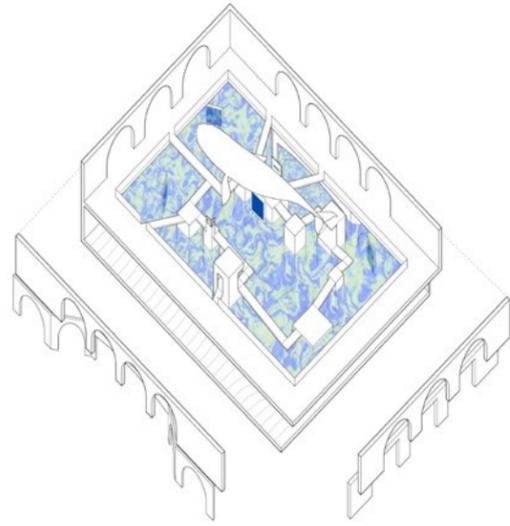


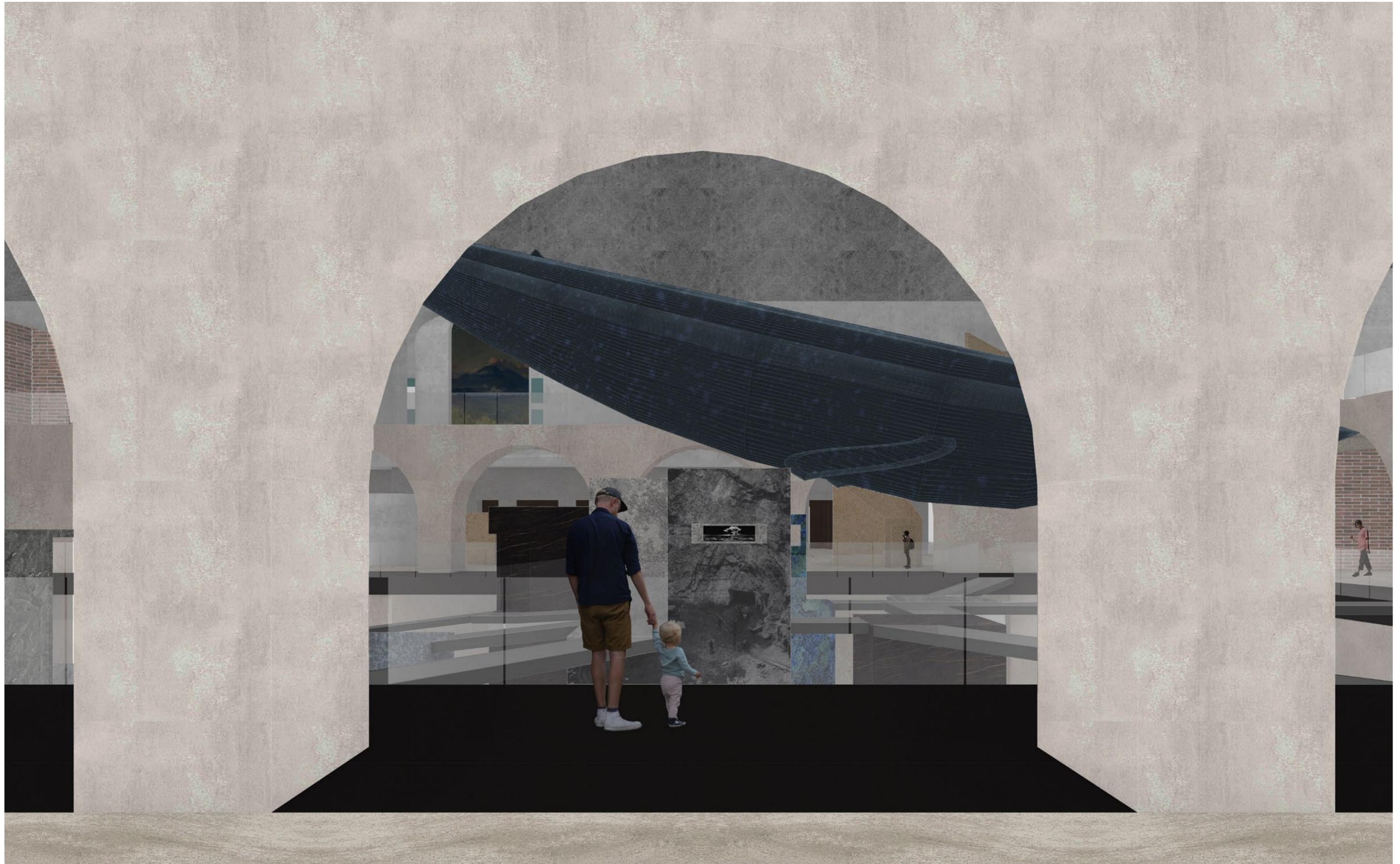


DE-CONSTRUCT THE IMMERSIVE EXPERIENCE

The museum uses different tools to create immersive experience, including the use of water lines, the blue ambient light and the blue whale floating above.

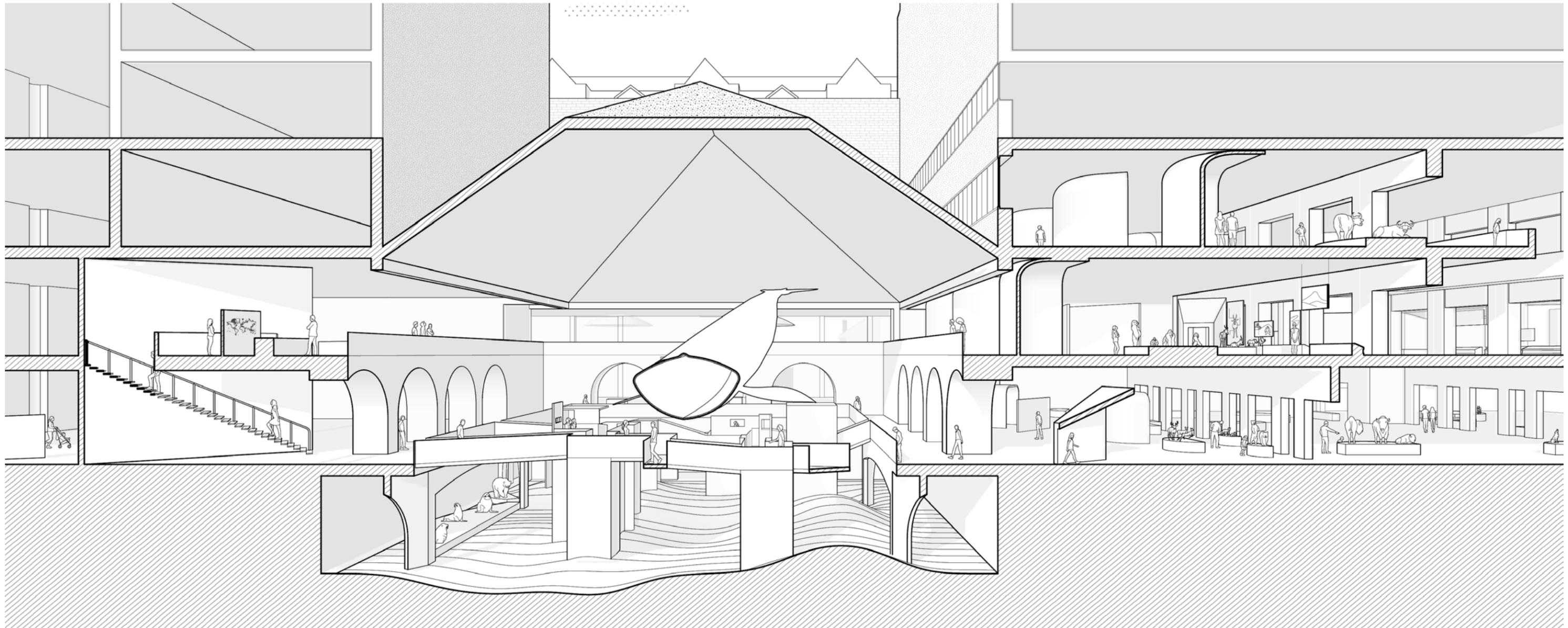
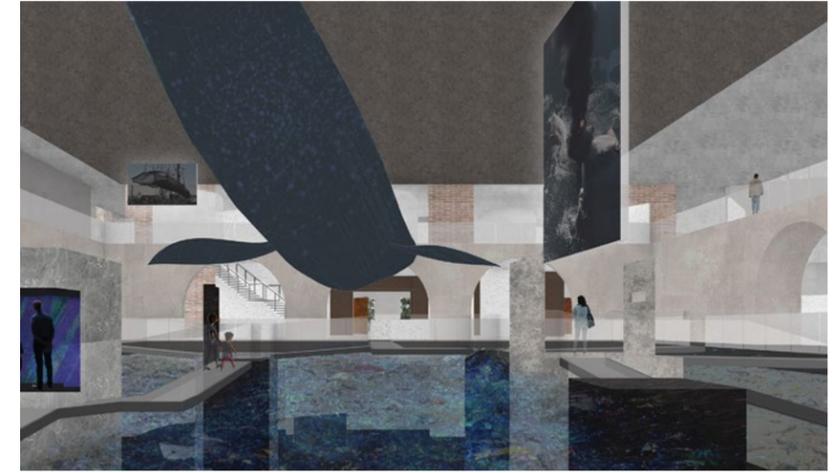
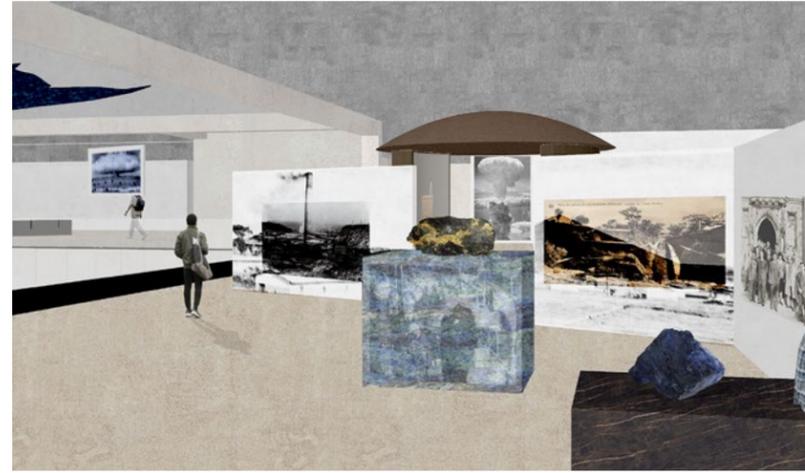
Intervening at this distinct ground-water line, we create an undulating plane on the lower floor to disrupt the space that would be used for galas and fundraisers. Through introducing plinths of stones from the hall of gems that were mined from the ocean and elevated walkways to cut through this space we are connecting the regions through the ocean that were previously confined to their designated hall.

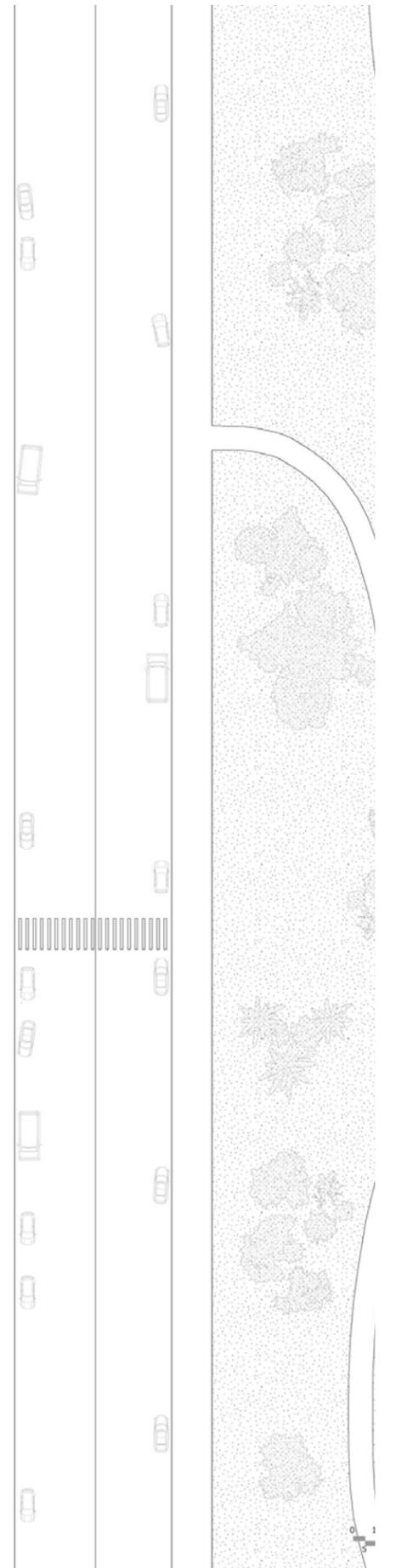
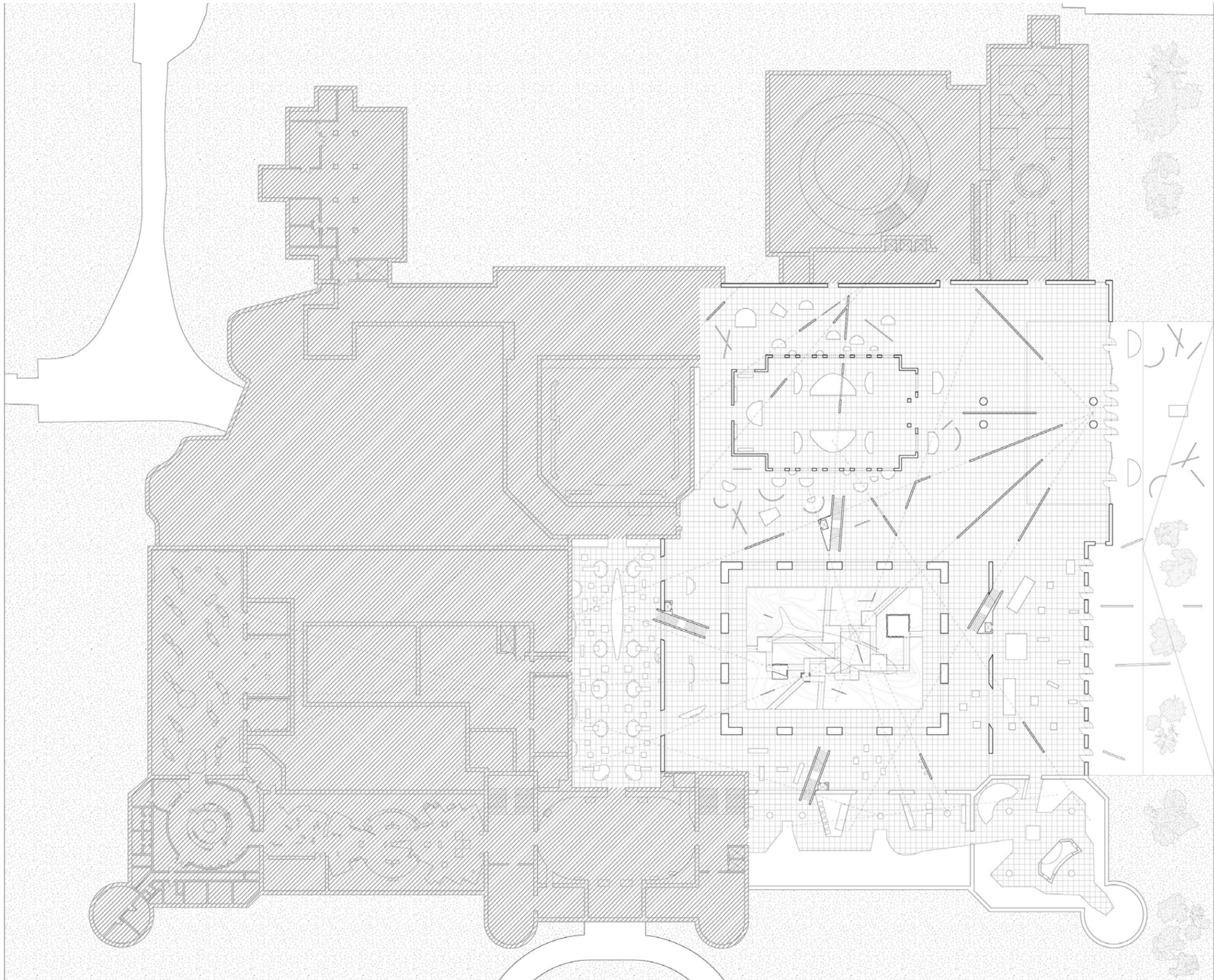


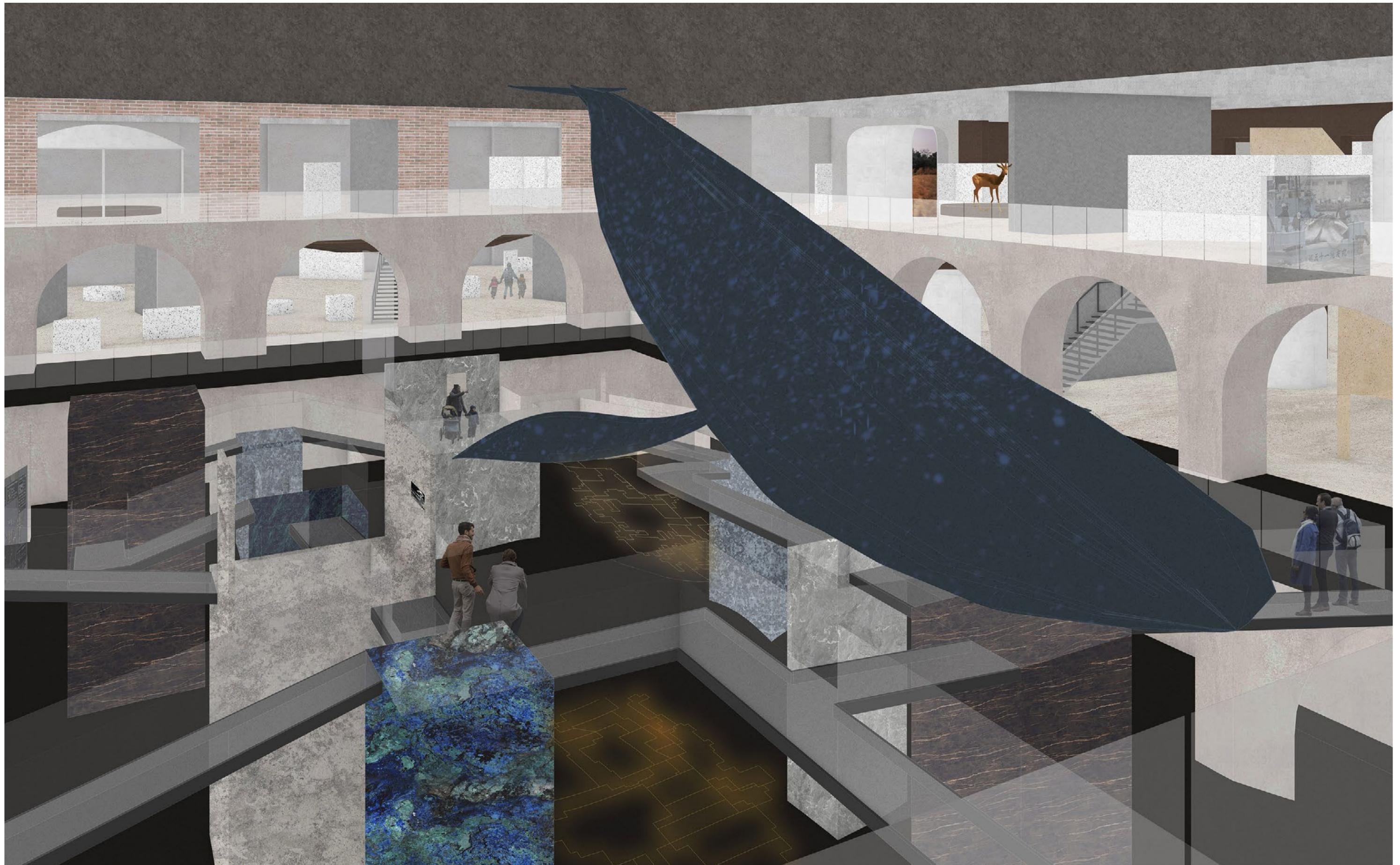


REVEAL THE UNNATURALNESS

Instead of framing the artifacts and exhibits in their previous isolated halls, the unnatural history museum reveals the previously hidden narrative and emphasizes the connection between these halls. The new devices become a way-finding method across the museum. Visitors can follow the wall from entry to discover a narrative that affects multiple regions.







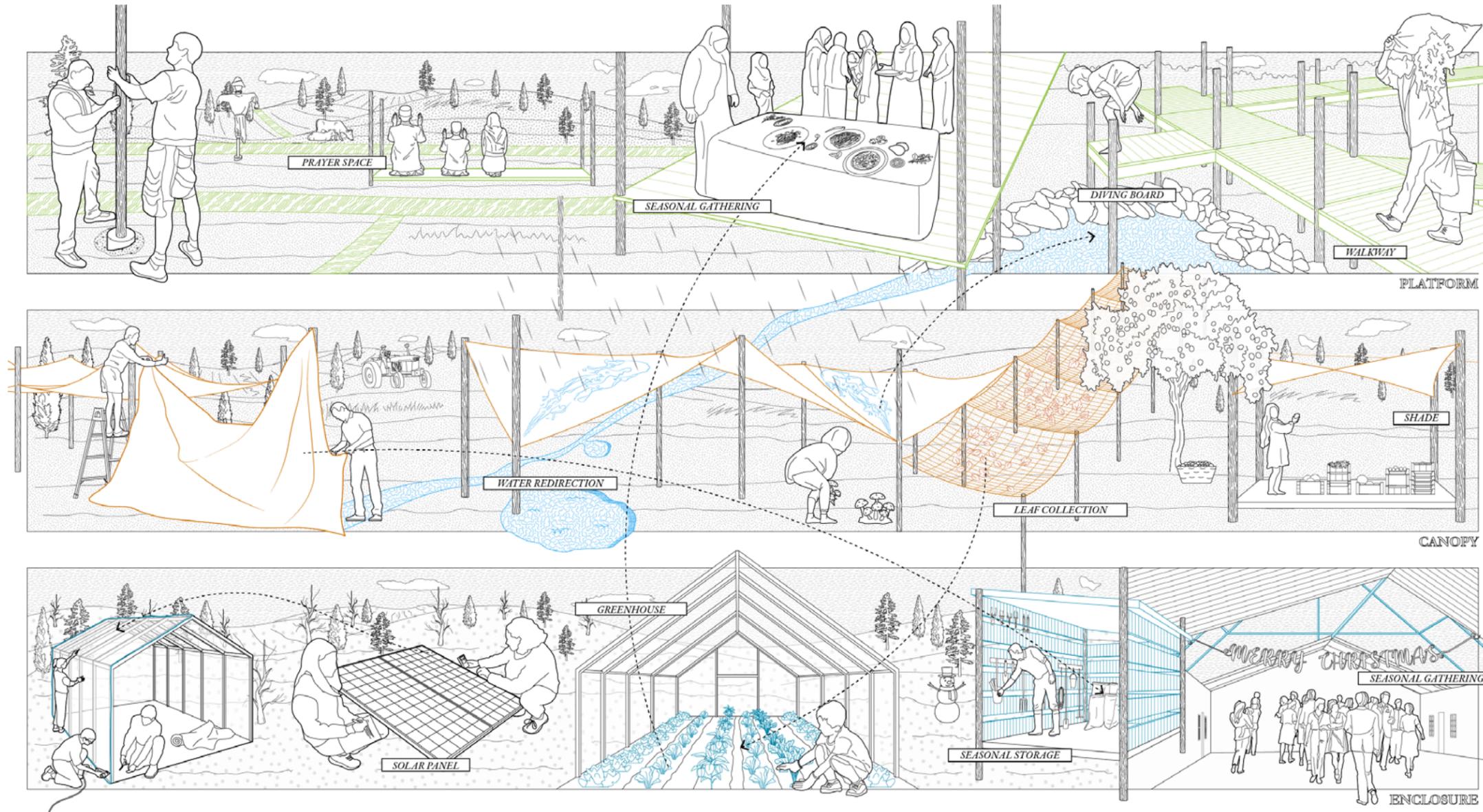
TRANSFORMING SEASONAL GROUNDS

SEASONAL INTERVENTION AND RELIGIOSITY

GSAPP | Advance IV Studio | Jan-Apr 2022
 Site: Camp Hilltop, NY
 In collaboration with Eleanor Birle

The studio scope consists of an investigation of the architectural and “charitable” programmatic capacity of the forms of rural settlement developed by religious communities, Islamberg, in Upstate New York. By unpacking Islamberg’s historical evolution and probing the hamlet’s dilemma of lacking spaces, interventions are proposed to partner Islamberg and previously [underused rural summer camp grounds](#).

The proposal is a [cyclical](#) practice that transcends the typical [seasonality](#) of camp land, drawing inspiration from the seasonality of Islamberg and the existing relationship with neighboring communities in an informal network. Through the seasonal intervention, this project seeks to soften the barrier to entry to the summer camp and create easier and more equitable access to the [educational, agricultural and recreational](#) facilities.

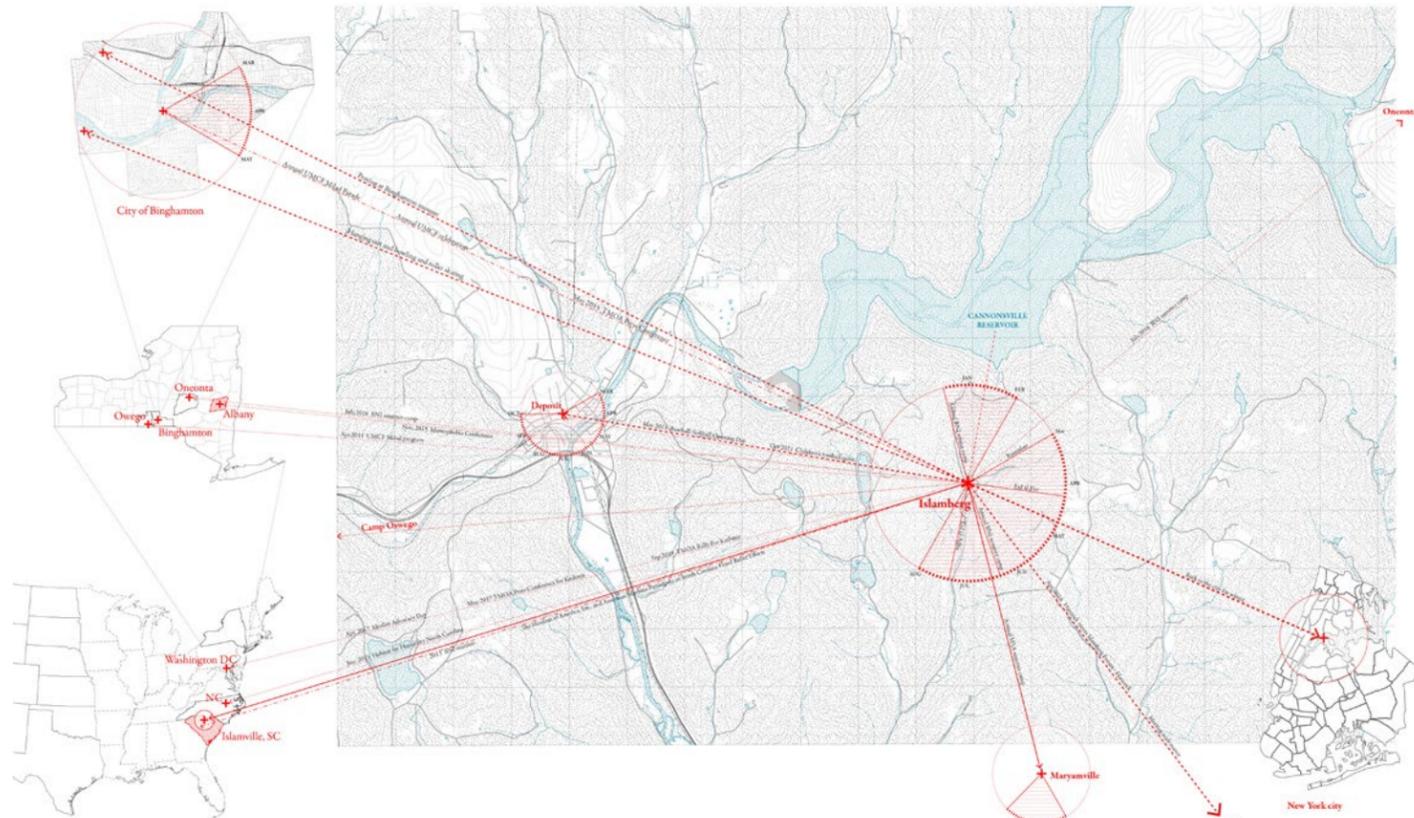


THE ISLAMBERG

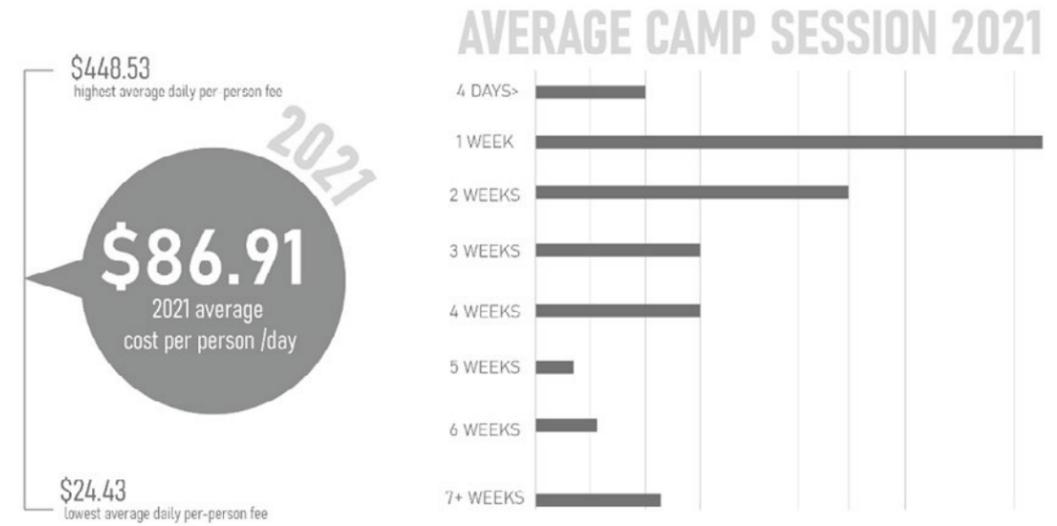


From the site visit to Islamberg, we knew that the community has been growing and building more residences, leading to less agricultural land and space for large gatherings. They have also expressed how much they enjoy outdoor recreations like hiking, fishing, hunting, and exploring the natural land around the community.

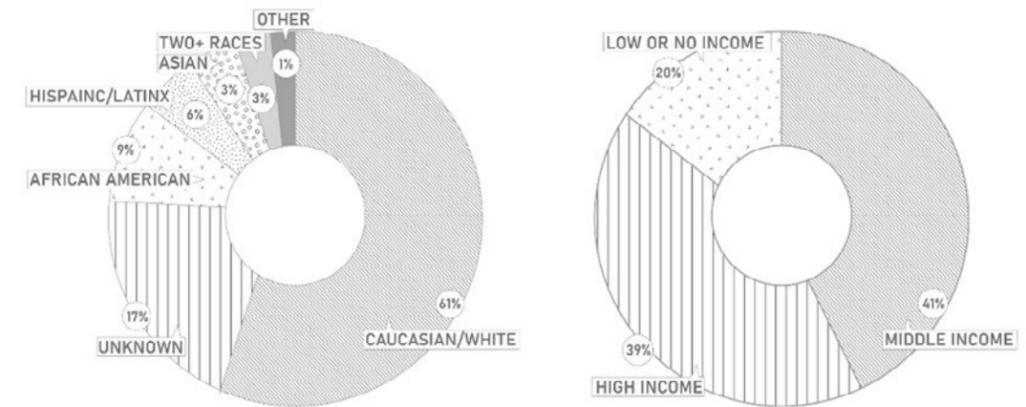
By recentering Islamberg and looking at the existing interactions happening in the community, it can be observed that the community operates in a seasonal way. Islamberg residents regularly leave their town for recreation, jobs, education, and to hold large events and conferences. People also come into Islamberg seasonally for annual religious gatherings like Ramadan and Islamberg's own camps.



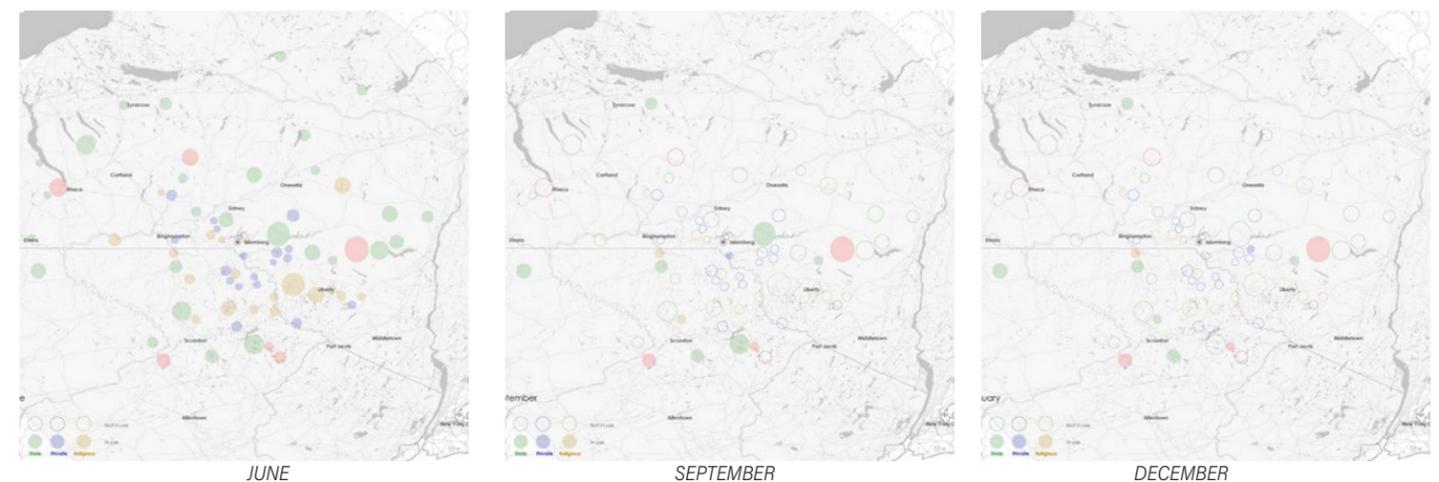
SEASONALITY OF CAMP SITES



CAMPER DEMOGRAPHICS 2021



Continuing with the interests in land resources and seasonal interactions, further research was done surrounding summer camps and seasonal land as well as how they are associated with religious charities. Although taking up a lot of land in the area, the rural summer camps are only in use for an average of three months of the year.

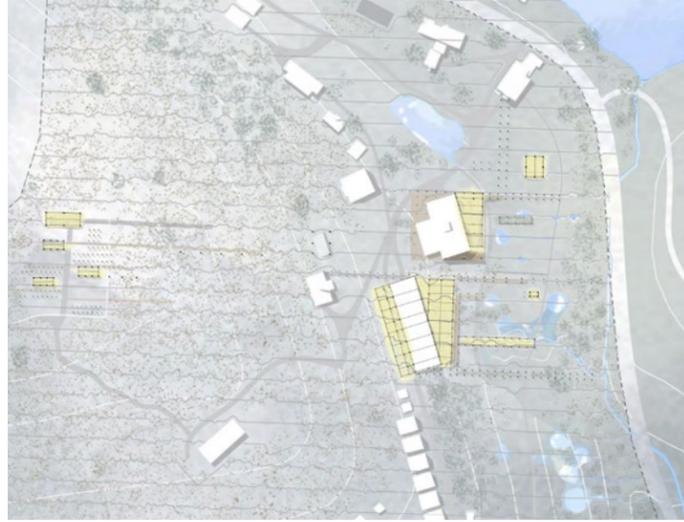


SEASONAL OPERATIONS

The transformation of the ground engages selective removals to make more space for farmland, redirection of water through swimming holes branching off an existing stream, and mining the campground for materials for re-use. The resultant spaces create opportunities for hands-on environmental education and recreation for campers in the summer, while providing adequate space year-round for agricultural farmland, pasture space, and religious gathering space for seasonal events - which are desires of Islamberg residents.

WINTER

A new alignment towards mecca through water redirection and a series of posts. Posts can become enclosed through ETFE to become greenhouse area or to winterize an existing camp building for year round use.



SPRING

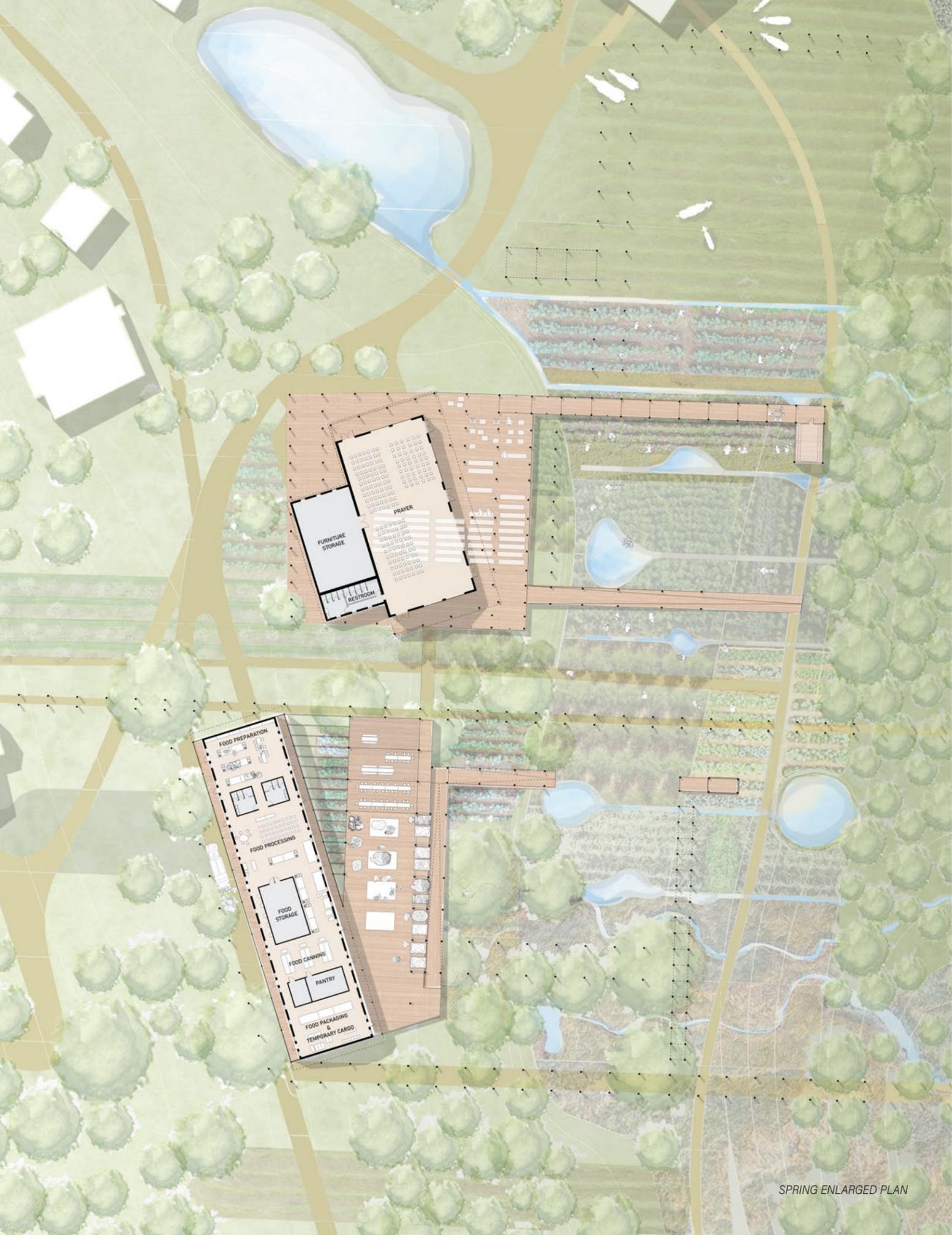
A network of paths and piers with a light touch on the ground are used for planting the sensitive soil.



AUTUMN

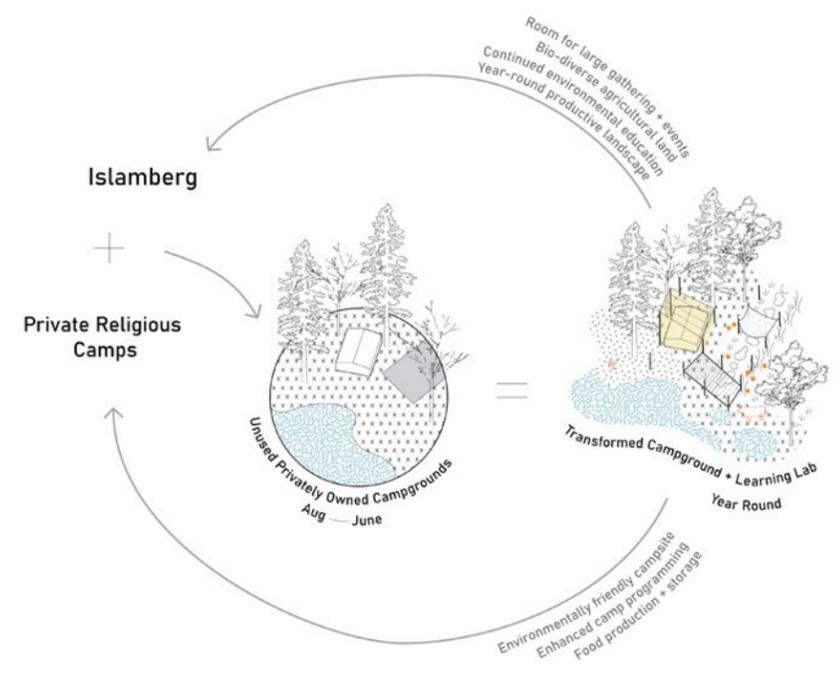
Canopies are deployed along the posts to protect the crops from falling leaves, and redirect water to better serve the farmland.



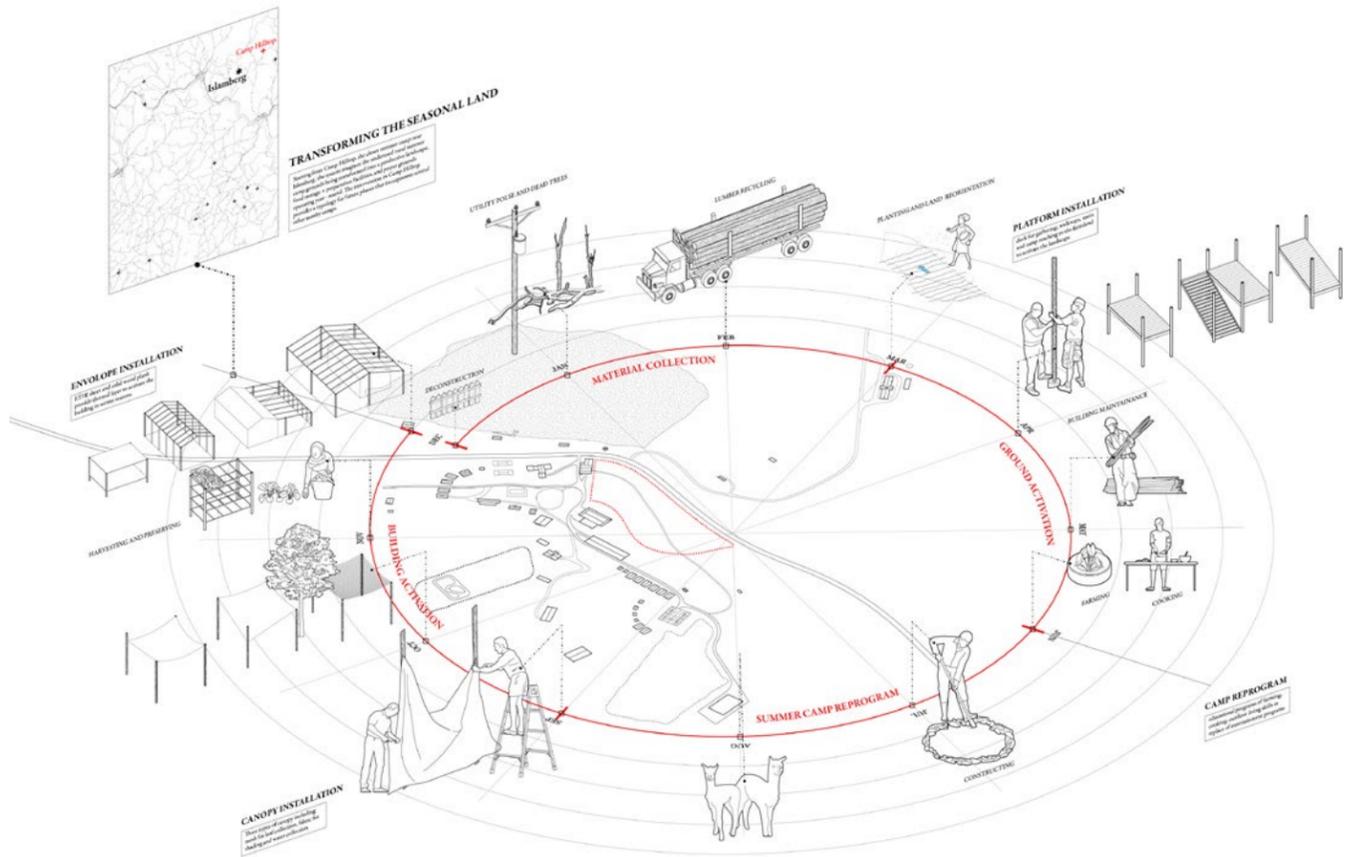


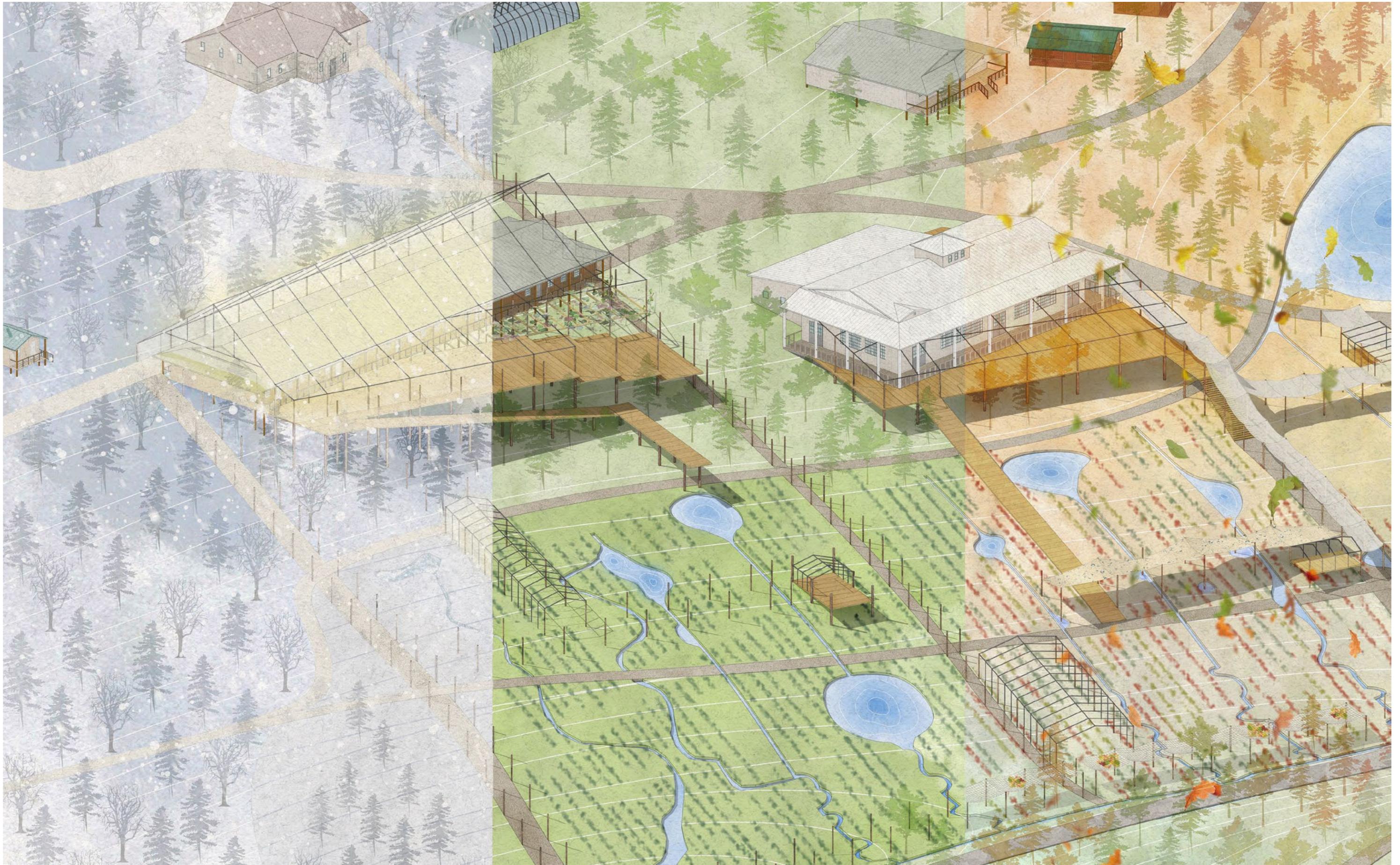
SPRING ENLARGED PLAN

CYCLICAL TRANSFORMATION



The proposal is in alignment with the existing cycles of seasonal maintenance that happens on the campground. This cyclical proposal transforms the campground through each season, and potentially expands to other campsites near Islamberg in a longer time frame. Through the seasonal intervention, this project seeks to soften the barrier to entry to the summer camp and create easier and more equitable access to the educational and recreational facilities.





01

THE BRONX VERTEBRA

AFFORDABLE HOUSING

GSAPP | Core III Studio | Sep-Dec 2021
Site: The Bronx, New York
In collaboration with Yiyi Gao

Bronx Vertebra responds to the missing role of public service in the Bronx and becomes an opportunity to reassess the fundamental modules of living. There is a need for [intermediate conditions](#) between the public and private: from households to the neighborhood, from dwellings to the community, and from the community to the city. How to calibrate the various [levels of privacy and connectedness](#)?

At the scale of each residential building, the Vertebra is a network of sharable amenity services and collective spaces in between units. On the street level, a central spine inside the block ties the community programs, forming a system of flexible, intermediate zones. The Vertebra bridges the residents with public services and, on an adjustable scale, connects the residential community to the larger city.



PUBLIC SERVICES

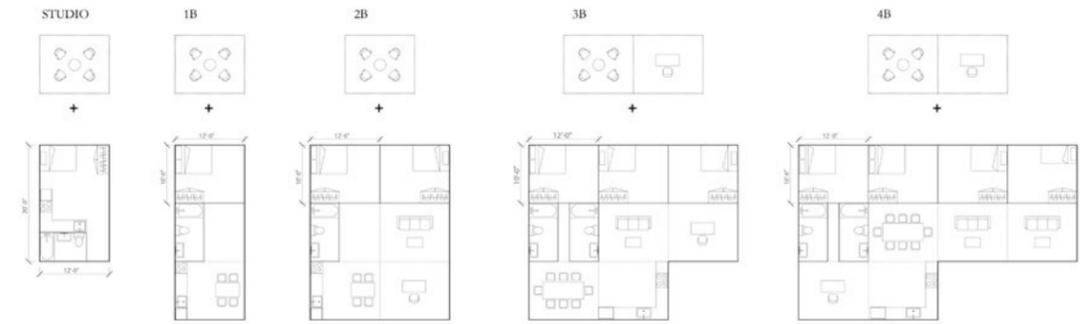
Bronx has been suffering from the lack of public services for decades, including primary care, food services, day care and physical health facilities. Responding to the missing role of public services in Bronx, the project reassesses the fundamental modules of living and empower the residents with different levels of shared space in the post pandemic world.



Terraces, serving as the essential place for daily interactions during lockdown, provides the intermediate condition between the public and private: from households to neighbors, from dwellings to the community, and from the community to the street and the city. How to calibrate this level of privacy and connectedness is the key to our project.

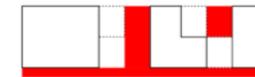


MINIMUM LIVING MODULE

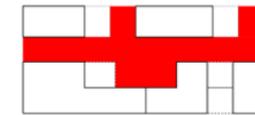


The minimal living module to accommodate daily activities is defined as 12*10. All four types of units are made up with the basic modules of bedrooms, living room, kitchen, bathroom, and most importantly the access to an outdoor terrace .

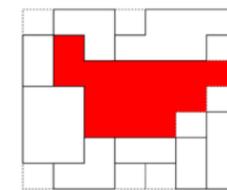
AGGREGATION TYPOLOGY OF SHARED SPACE



AGGREGATION 1
Single loaded corridor with collective spaces scattered around



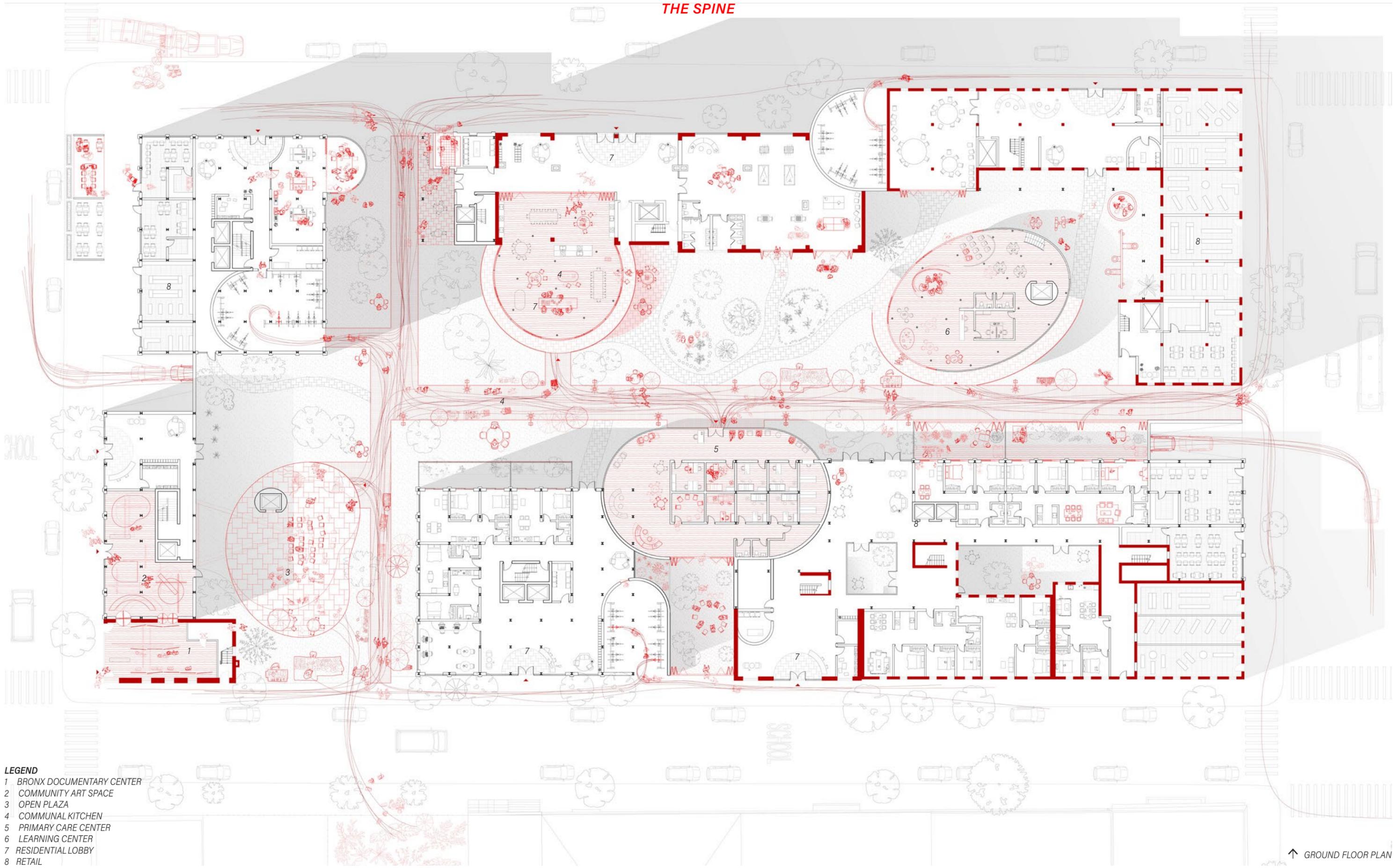
AGGREGATION 2
Double loaded corridor with collective space on both sides



AGGREGATION 3
Units and shared space are clustered around a central core

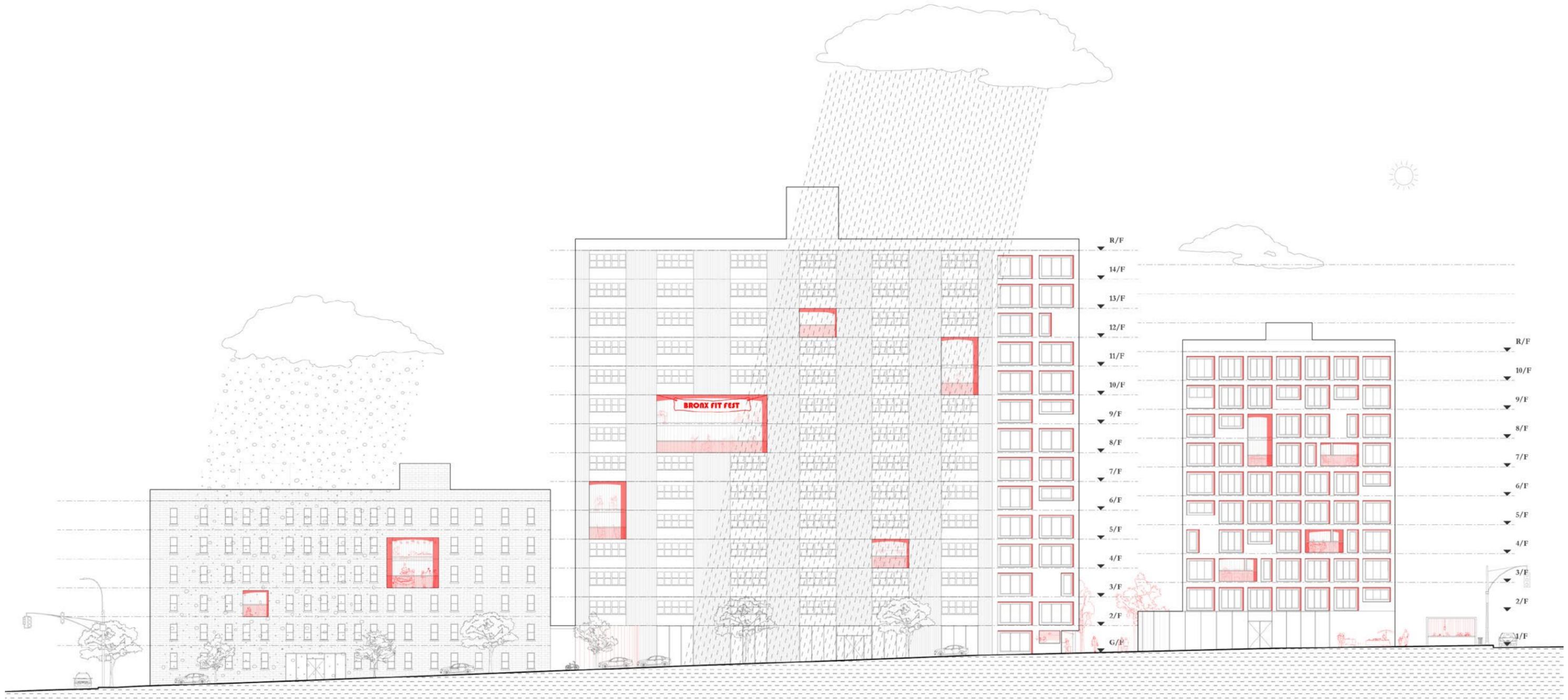


THE SPINE



- LEGEND**
- 1 BRONX DOCUMENTARY CENTER
 - 2 COMMUNITY ART SPACE
 - 3 OPEN PLAZA
 - 4 COMMUNAL KITCHEN
 - 5 PRIMARY CARE CENTER
 - 6 LEARNING CENTER
 - 7 RESIDENTIAL LOBBY
 - 8 RETAIL

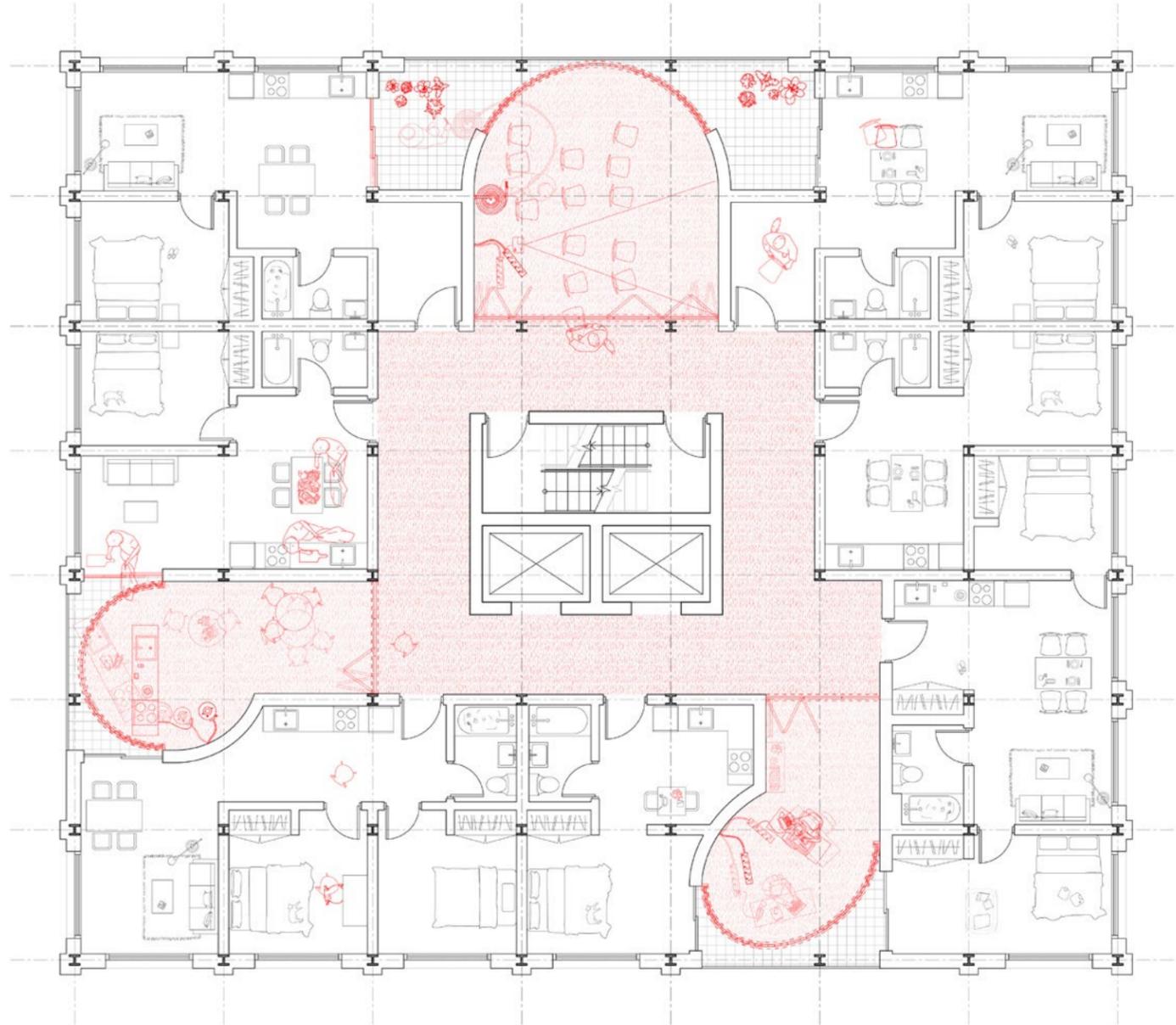
The collective and intermediate spaces are not only on the ground level but also on roof level at different scales and with different levels of collectiveness. The roof of existing buildings are intentionally left unoccupied because of the structure, while the roof of the new constructions are equipped with tracking field, green house farming, living patio and dogs park etc. The community spaces are differentiated from residential by the used polycarbonate and mesh, which has much more transparency.





THE INTERMEDIATE SPACE

The relationship between private units, semi public collective space and public program for the whole community is examined in different scales. The collective bubbles within the building serve the residents on each floor meanwhile become the intermediate zone between units and the city on the larger scale.

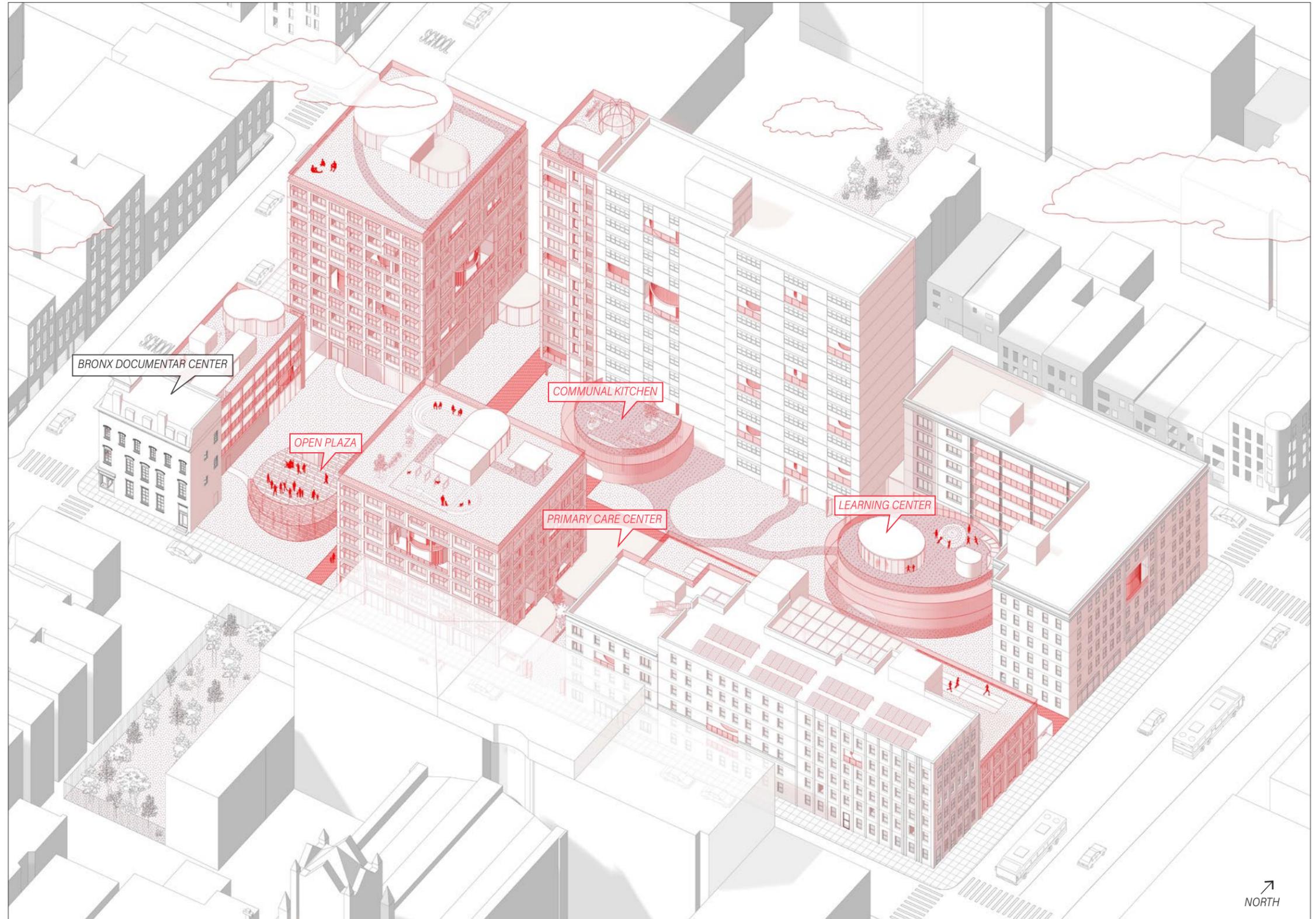


This system of creating shared space as the intermediate zone for both private/public and indoor/outdoor is achieved by the two layers of enclosure. By operating the double skin system, the residents are able to control the level of sharing.

Each of the shared space is attached to the central circulation with only basic infrastructure provided, such as gas, water, electricity, allowing for more possibilities and flexibility for future appropriation. Thus the pockets of spaces become negotiable depending on the needs of the residents.



ADAPTIVE REUSE



05

STACKING SCHOOL

PEDAGOGICAL EXPLORATION

GSAPP | Core II Studio | Jan-Apr 2021
Site: Manhattan, New York

This studio works with the existing shell of the abandoned public school, P.S.64, and explores the potential ecological, economic, and social benefits of [adaptive reuse](#). Under the guidance of experimenting with found and [readymade](#) objects, the project rethinks what architecture should look like, whether a building for children should be presented in a literal way.

Taking advantage of the diversity that readymade objects bring, the stacking school challenges the traditional primary school typology and reimagines the school being an [aggregation](#) with a set of diverse environments where students have different [spatial](#) experiences and [visual](#) access to the city. By deploying the readymade objects, the project also examines the politics of architectural form: Should an architecture for children look like an architecture for children? Also, should it be presented like an architecture for children?



THE READYMADE - SITE

The existing P.S.64 is a typical Snyder H-block building with a neo-classic facade where openings are framed in the same manner and classroom cells are stacked on top of each other repetitively. The standardized school design not only lead to the monotonous visual and spatial experiences but also an uninspiring environment for learning. The project challenges the typology of school building and invent new scenarios for experimental learning.



From the street level, the existing shell of P.S.64 resembles its neighbors which were all built in a similar height with the same neo-classical facade. As a building for kid, the school was not able to differentiate itself from those residential blocks.



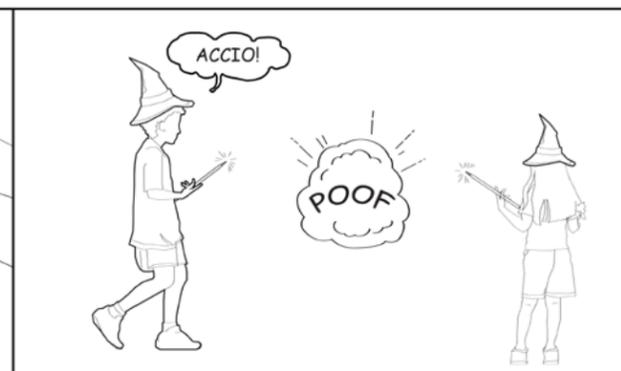
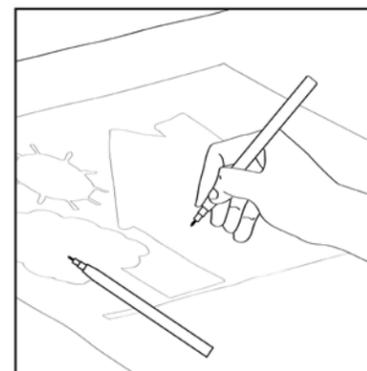
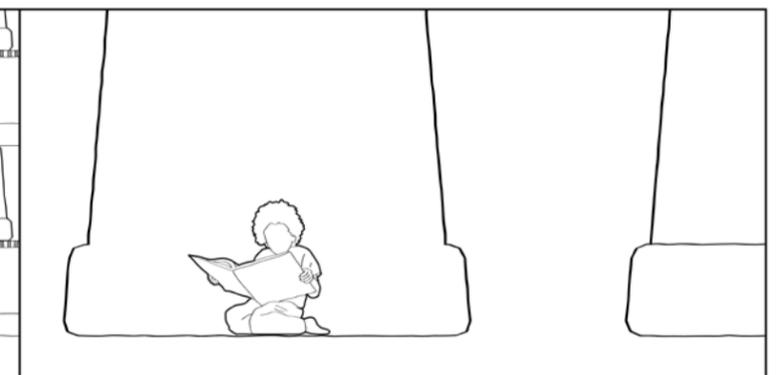
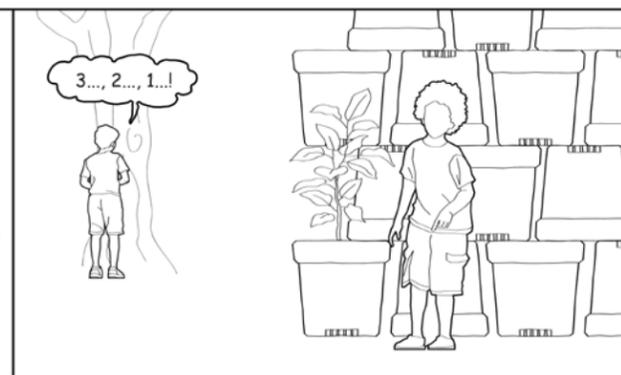
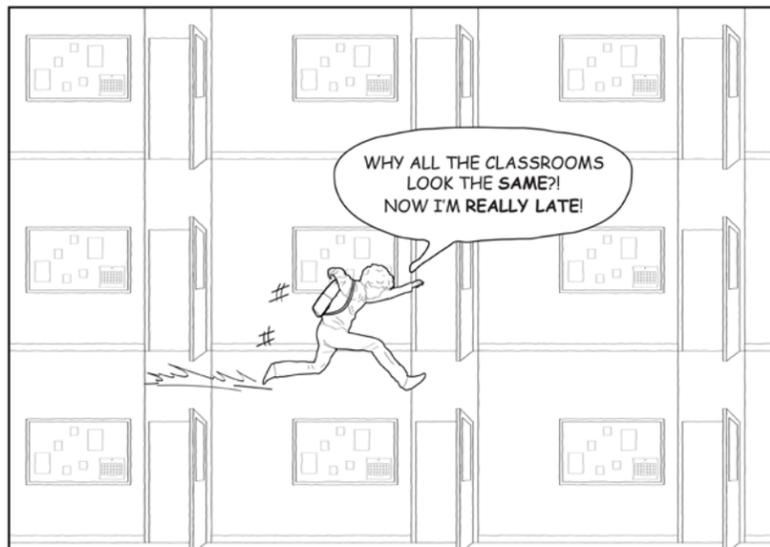
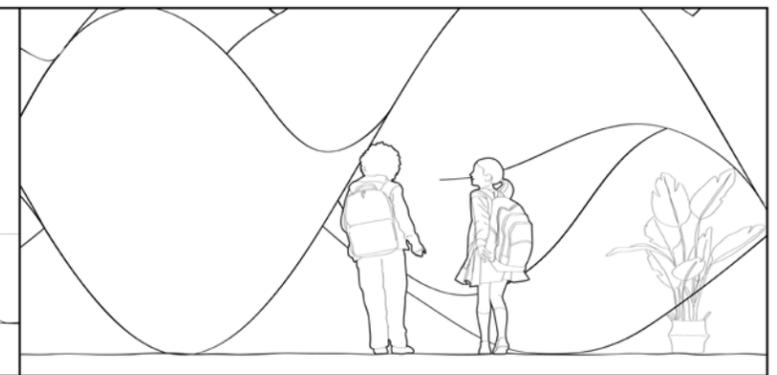
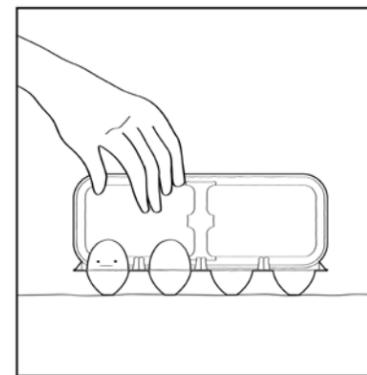
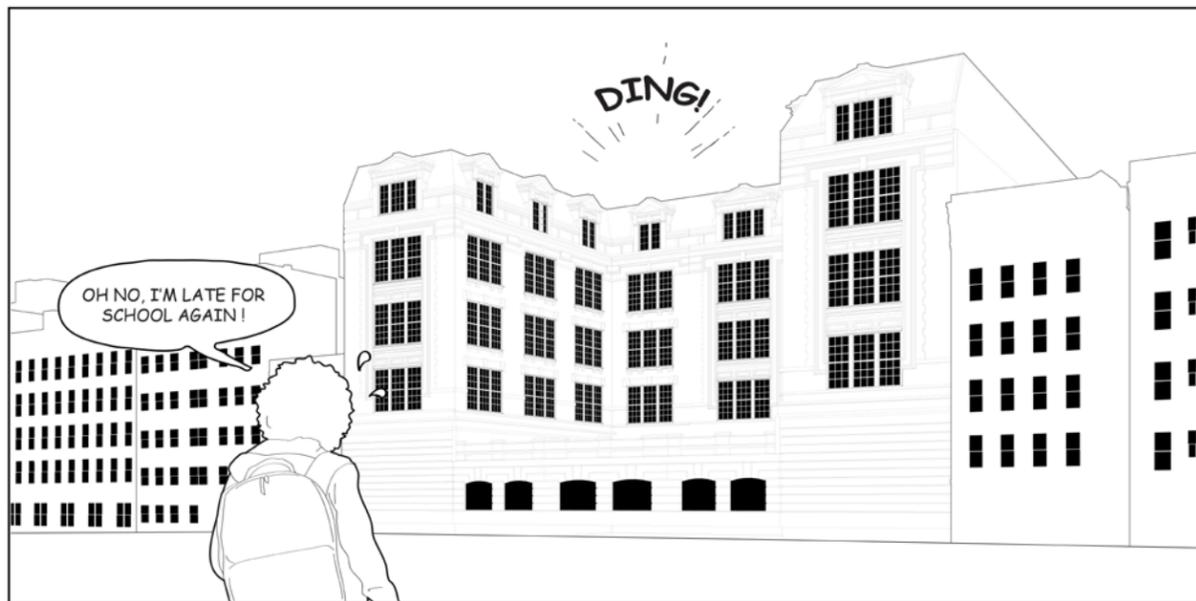
THE READYMADE - MODEL



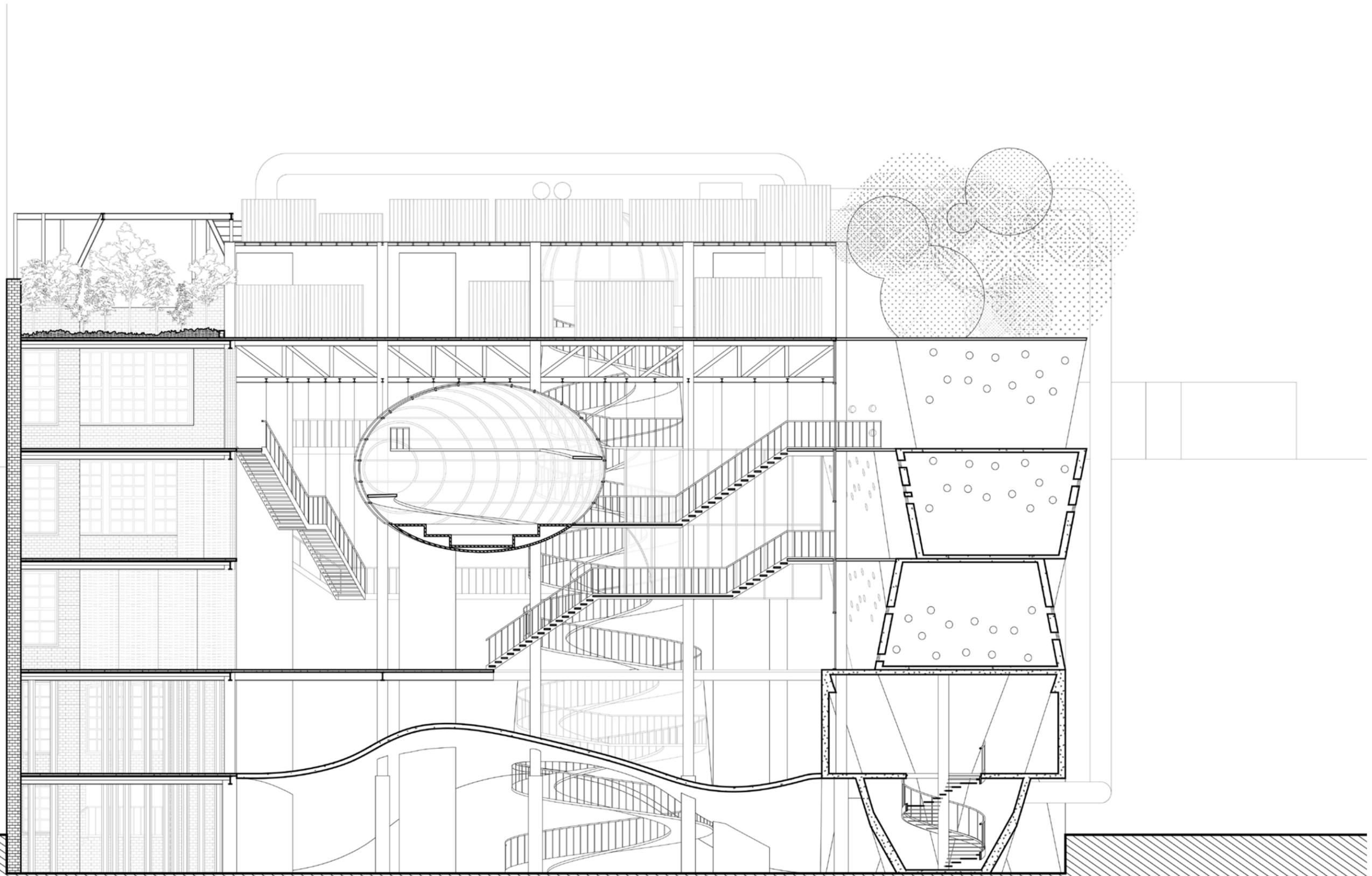
The model expresses itself as 9 elements: each of the components at the two wings could find its counterparts on the opposite wing. The left wing is more of a combination of a modern architectural elements with pillars, cellular units and a roof garden. While the right wing is less conventional with caves, staggered blocks, and transient space. The middle block acts as the connective tissue.

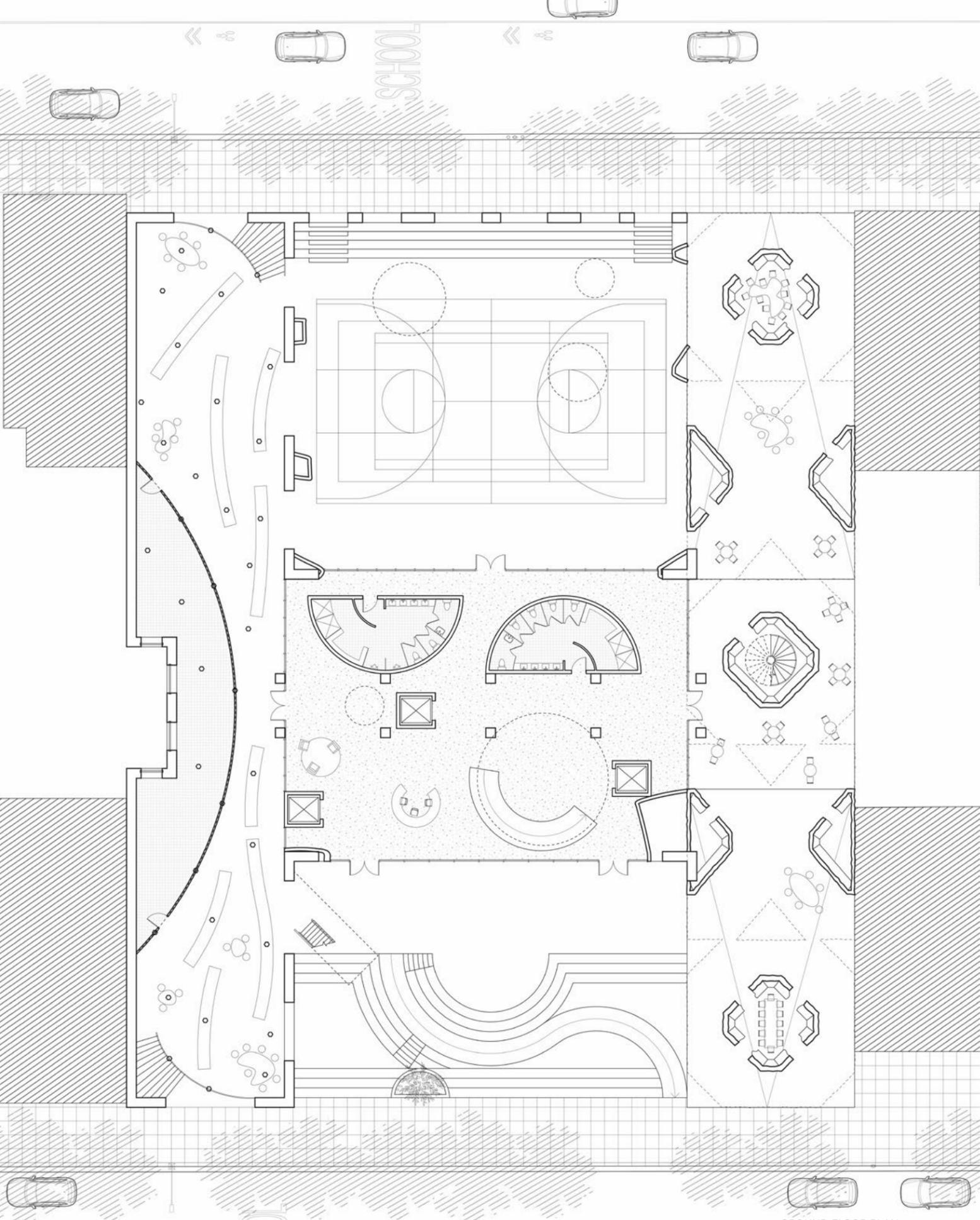
THE READYMADE - FANTASY

Starting with a day of a kid who cannot orient himself in the school building because all the classrooms are the same, the comic imagines the daily objects gradually change the scale and become a school space.



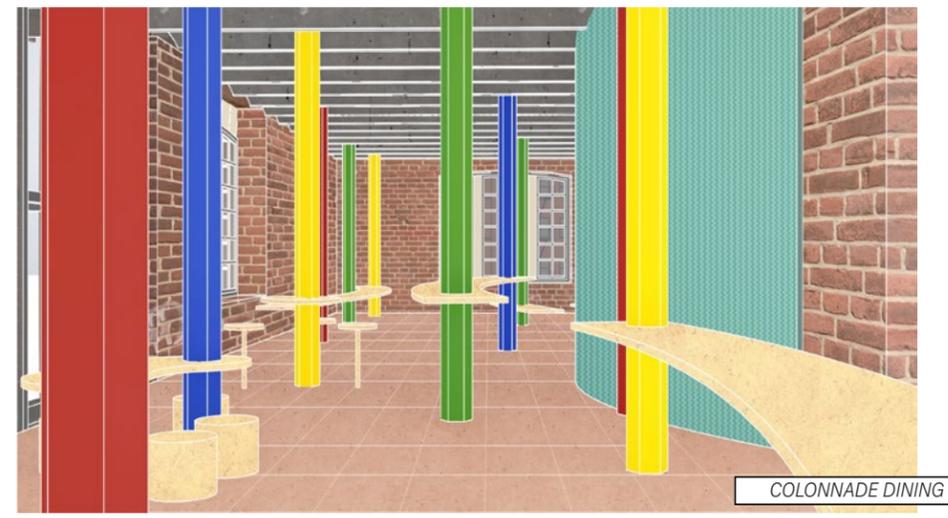
"THE EXQUISITE CORPSE"





GROUND FLOOR PLAN

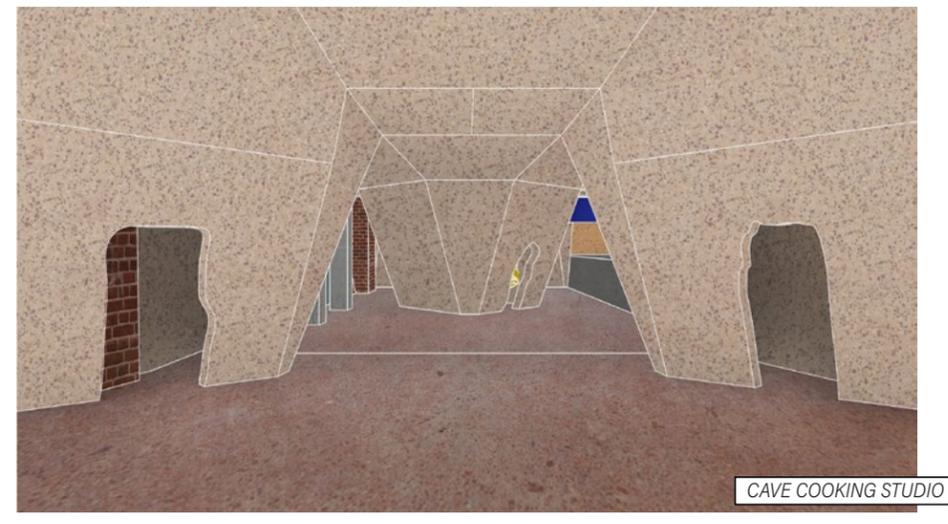
AN AGGREGATION



COLONNADE DINING

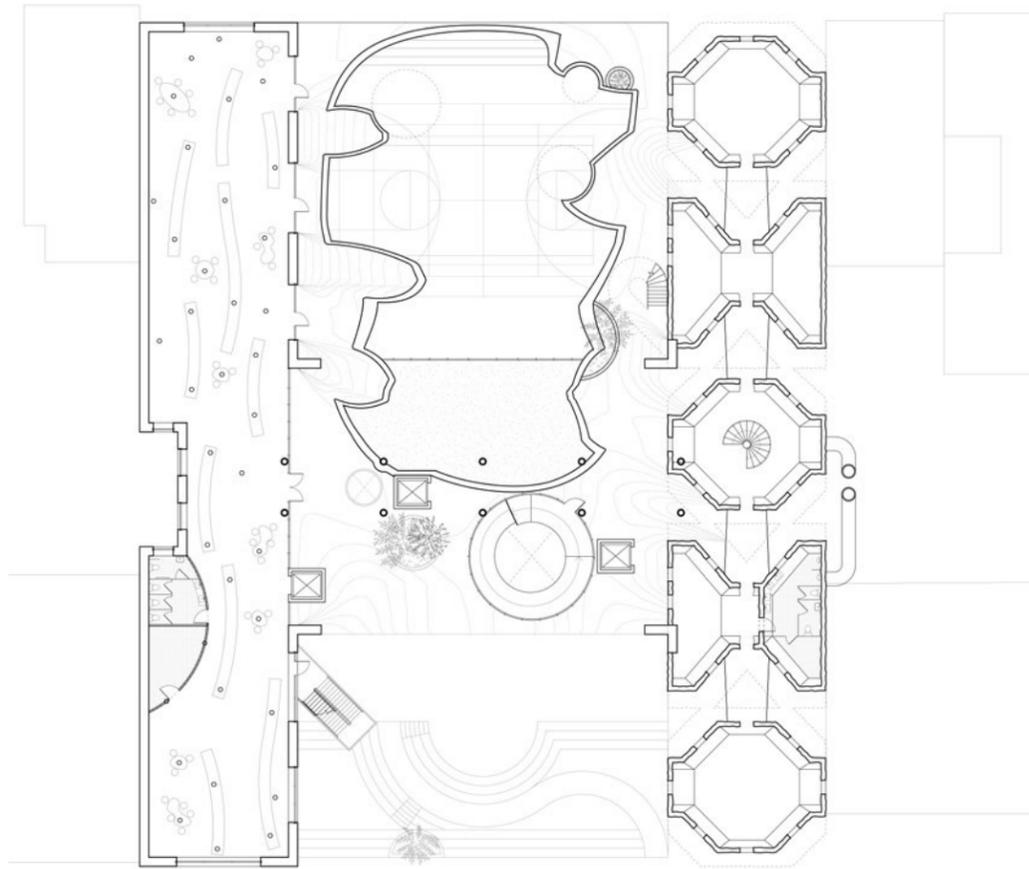


BASKETBALL COURT

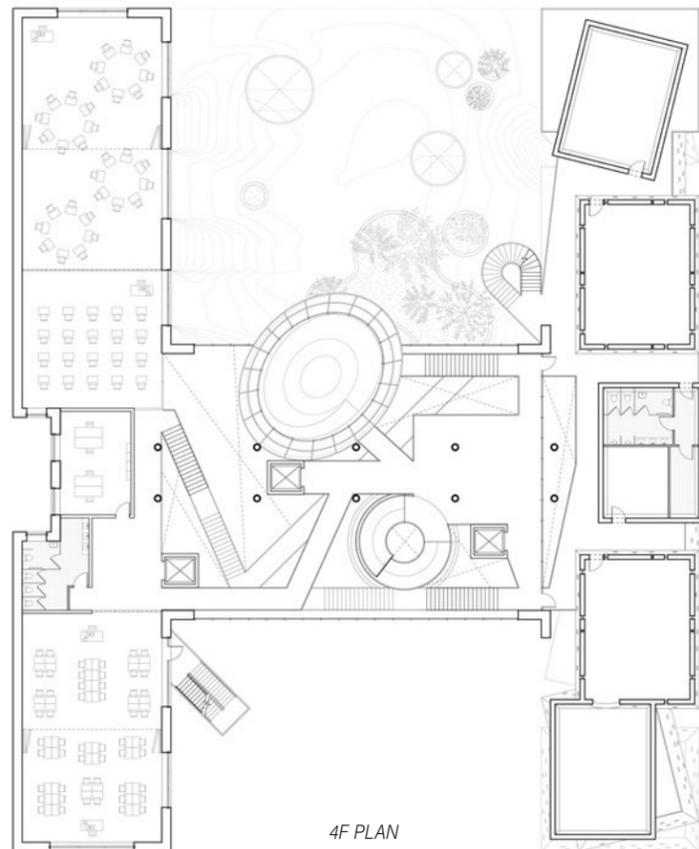


CAVE COOKING STUDIO

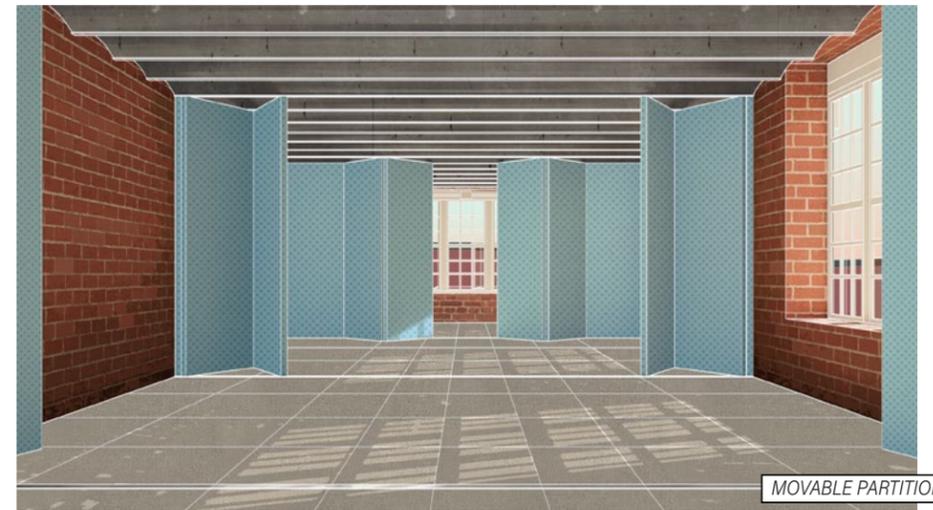
By stacking different types of spaces together, the building becomes an aggregation with unique spatial and visual experiences. The spaces take the form from the found objects in a literal and brutal way. Thus the architecture itself is given the possibility to act as didactic and representational tool, using the form of architecture to “teach” users and viewers something.



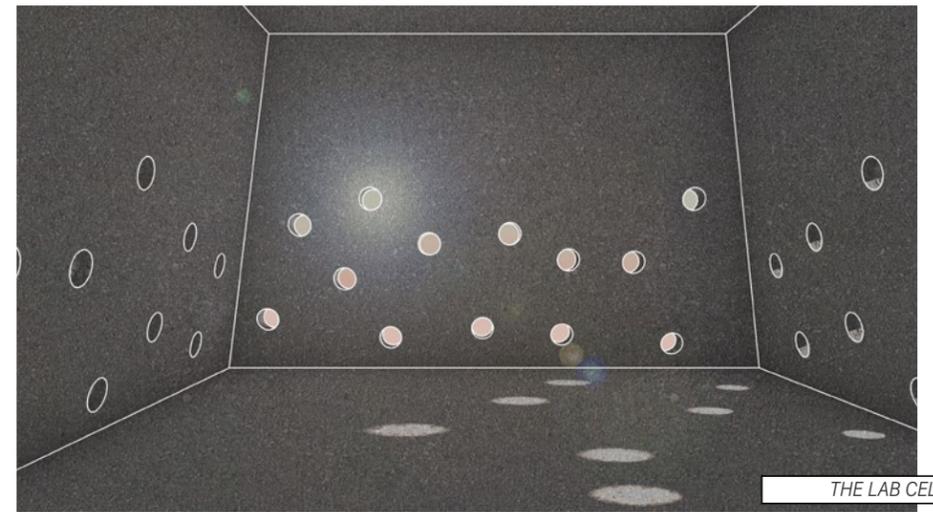
2F PLAN



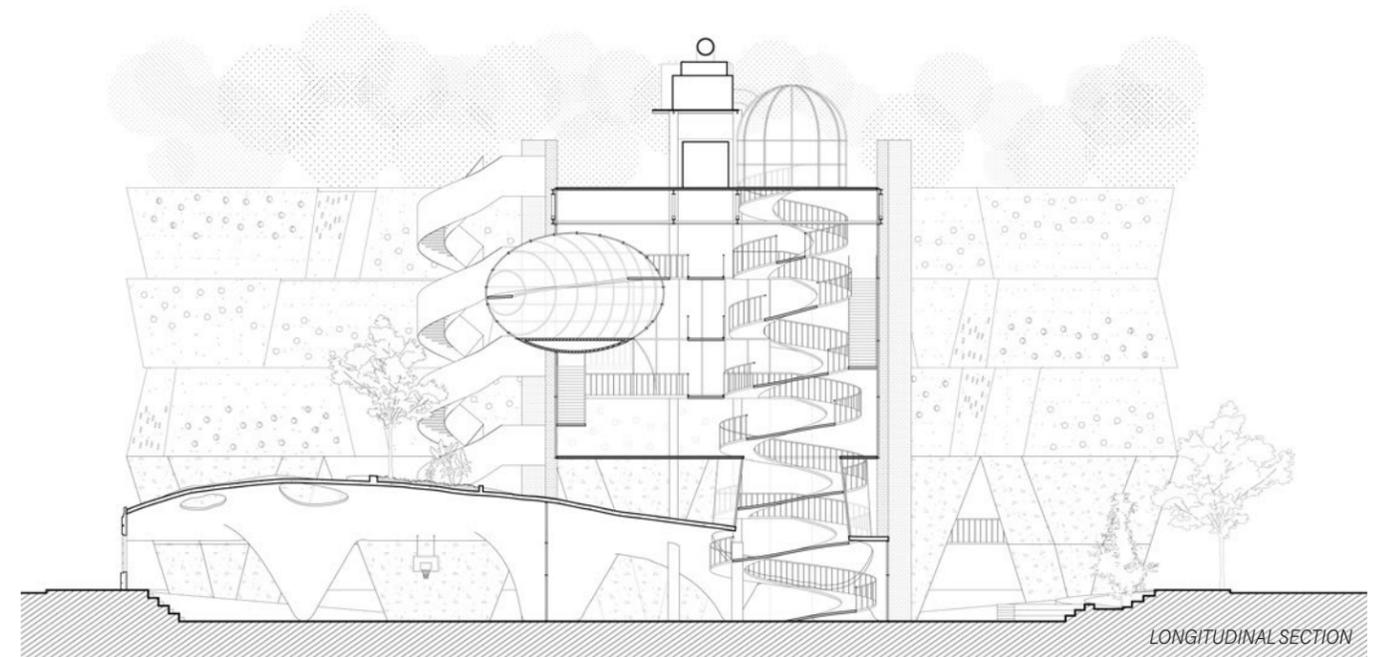
4F PLAN



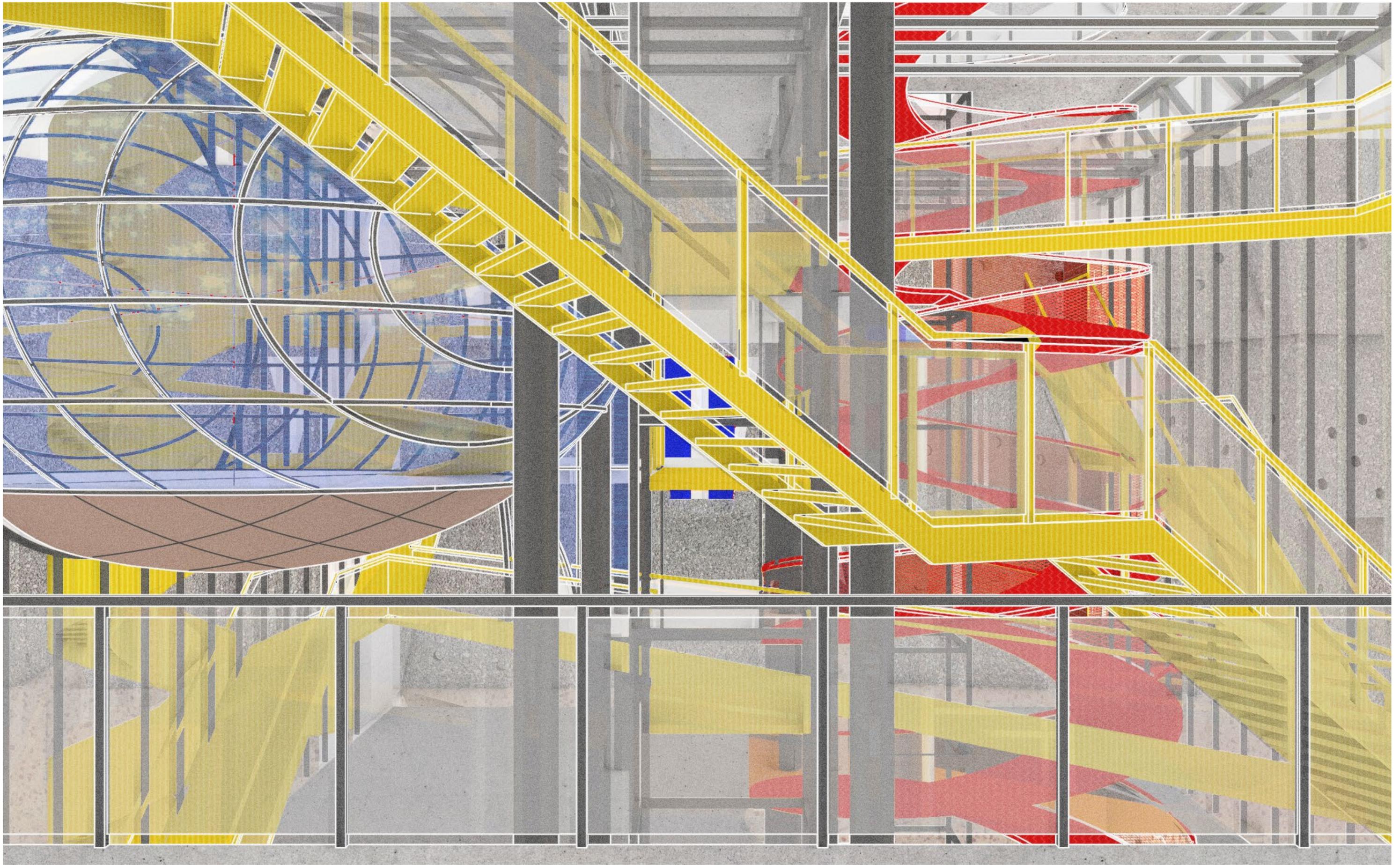
MOVABLE PARTITION

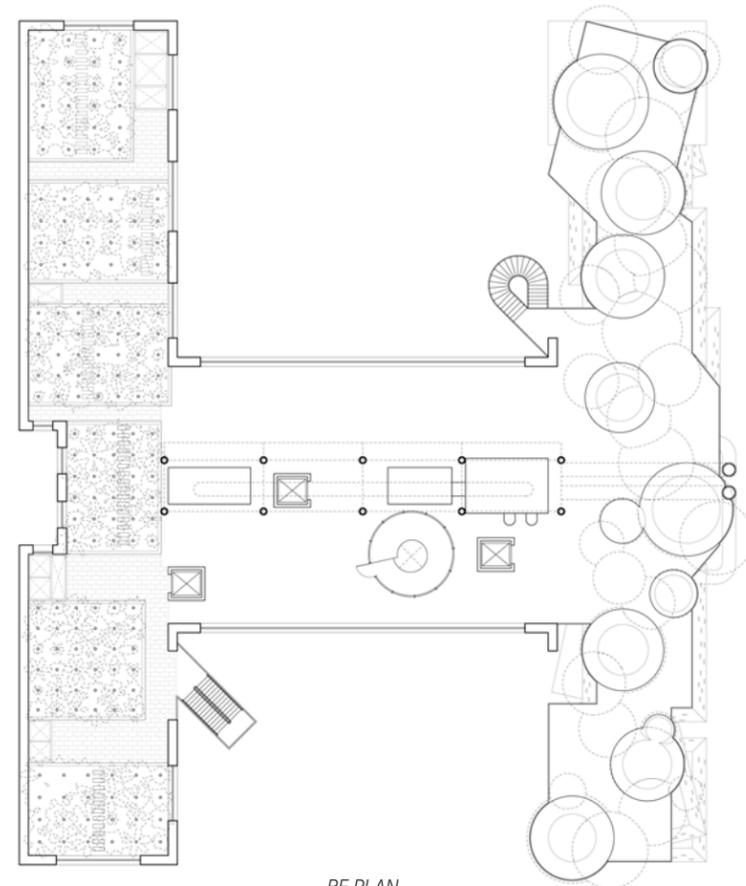


THE LAB CELL



LONGITUDINAL SECTION





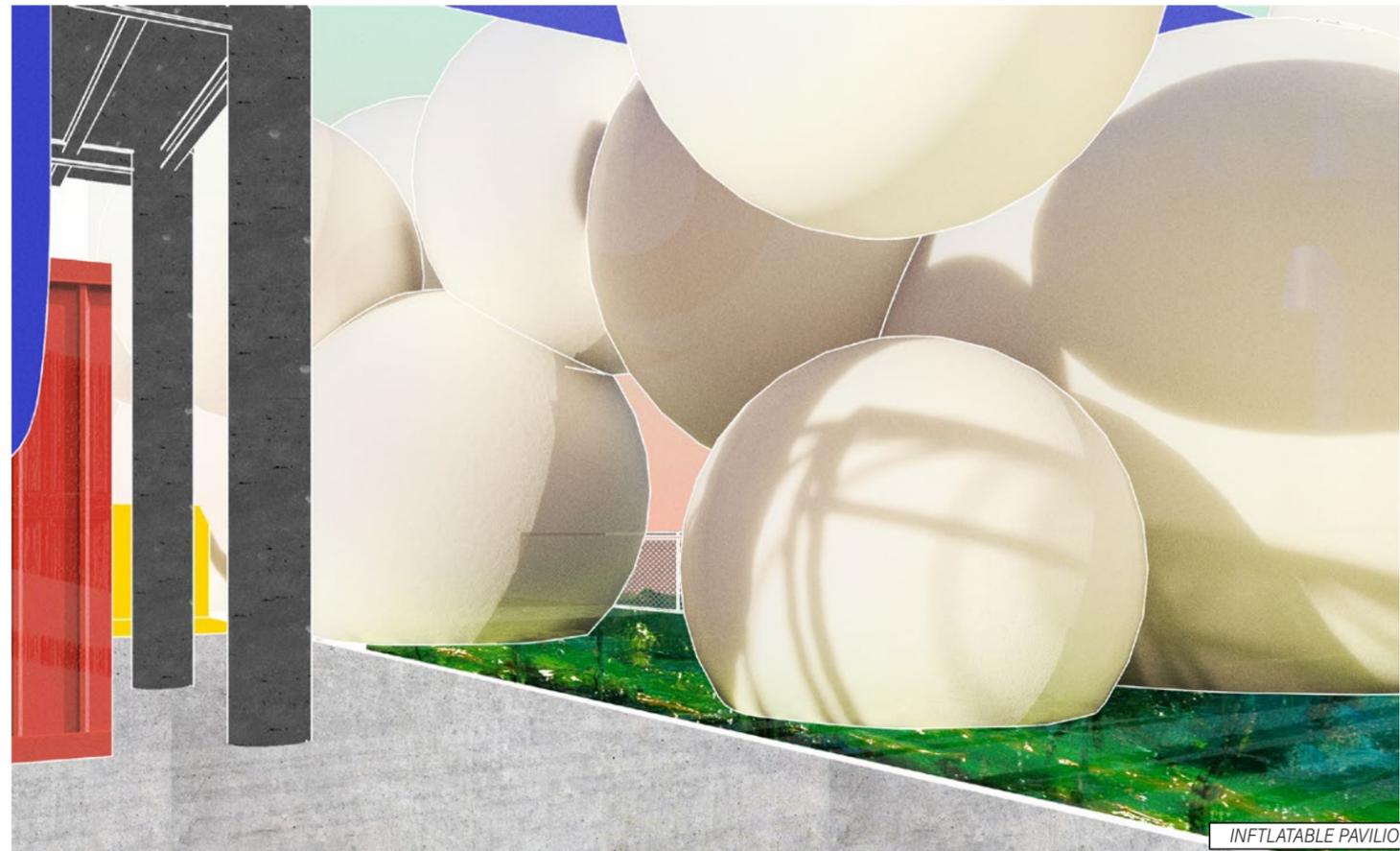
RF PLAN



THE GARDEN



MECHANICAL PLAY STATION



INFLATABLE PAVILION

06

SOFT EDGE

INSTALLATION

GSAPP | Core I Studio | Sep-Dec 2020
Site: Morningside Park, New York
Instructor: Lindy Roy

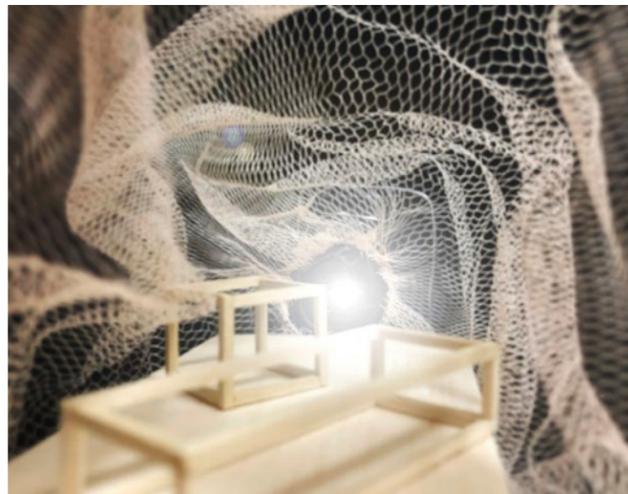
When we talk about the park, it's usually a place where people could hang out. But what we often see is that the intimidating fences surrounding the park are blocking people out so people could only access the park through few entrances. What if we challenge the stability of the edge of the park? What if the edge instead of being this layer of fences, could be an edge with [flexibility](#) more related to the daily life of local residents to reconcile the park with the sidewalk.

The project reimages the edge of Morningside Park in Harlem being replaced by a series of [pop-up public spaces](#) that fully explores the nomadic possibility that an [inflatable](#) structure can offer during the pandemic situation.

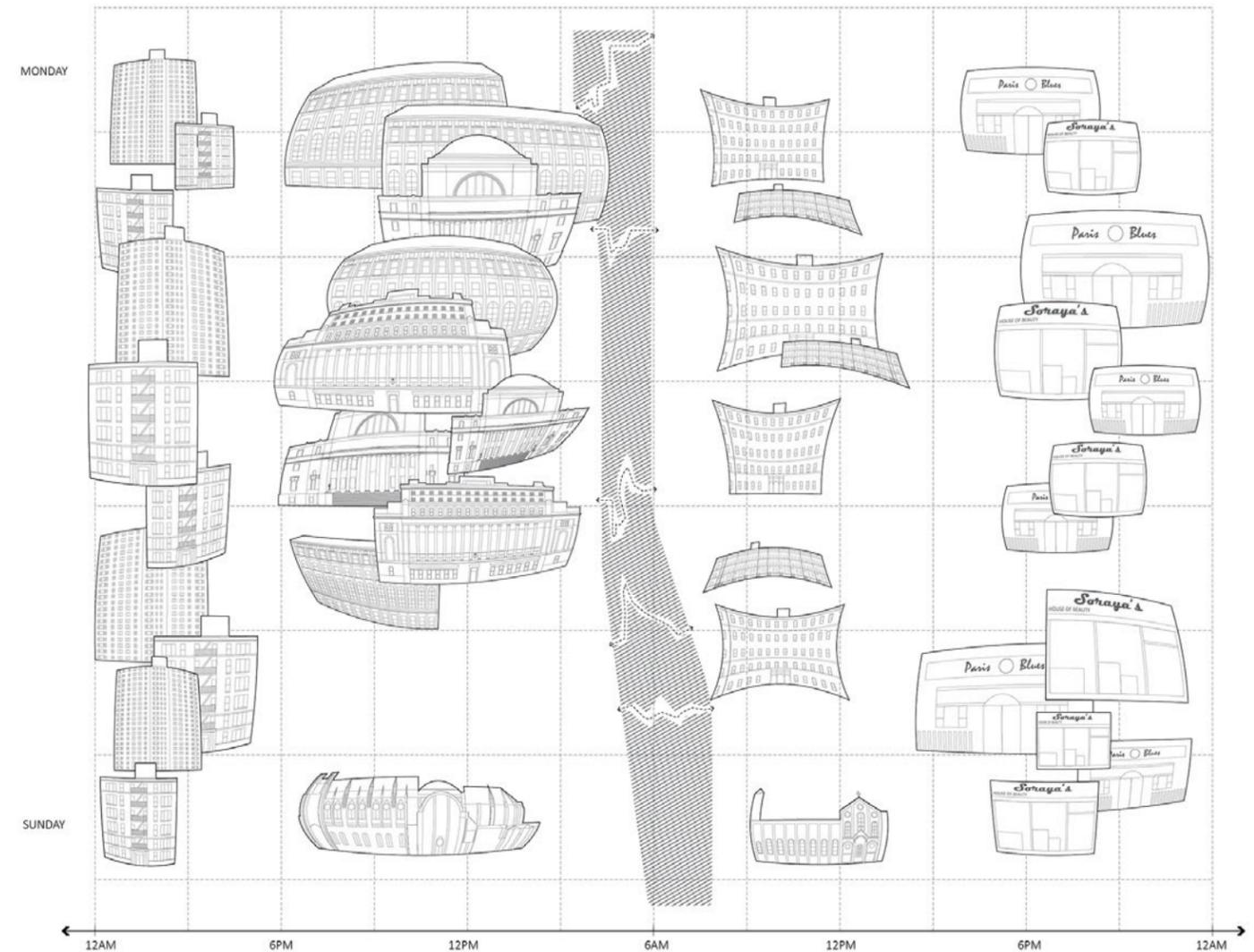


POP-UP

The conceptual idea was to create a series of flexible semi-outdoor public space along the edge, engaging both the sidewalk and the interior of the park to provide various spaces according to different times and activities to serve the neighborhood. With the use of elastic fabric mesh, I tried to experiment the idea of this pop-up programmatic spaces.



FLEXIBILITY



Following this, research was done considering the “stability” and “flexibility”. The distinction in active hours of buildings and spaces along the two sides of Morningside Park suggests a difference in the flow of people and indicates the need for flexible spaces.

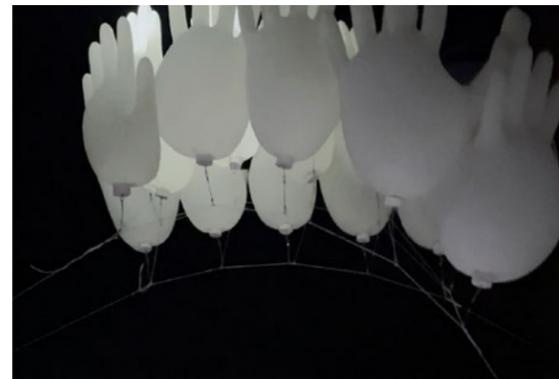
HANDS TAXONOMY

The project ended up with a series of inflatable helium canopy placed along the east periphery of Morningside park providing temporary public spaces for outdoor activities. Taking the shape of hands, the inflatables pick up the playful and interactive characteristic and challenge the self-seriousness that has long been given to architecture.

PROTOTYPE 01 - CROSS FINGURE



PROTOTYPE 02 - WAVING



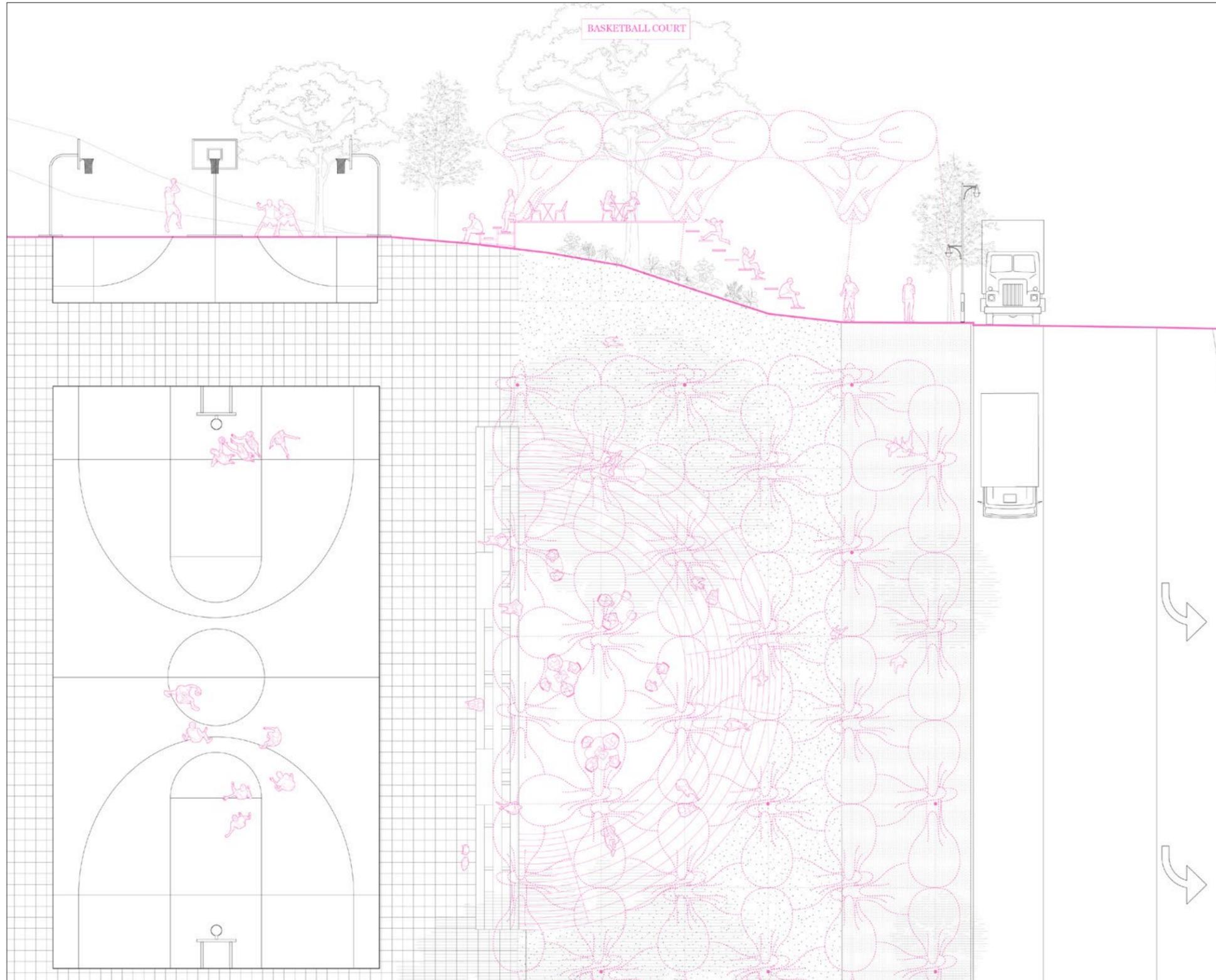
PROTOTYPE 03 - OKAY



With the use of latex gloves, I tested on 3 prototypes that is possible to pose different hand languages and each of the prototype is placed on site with different datums: whether the ground level is flat or either one side higher.

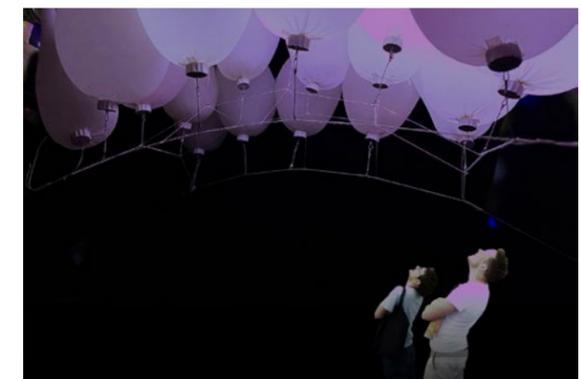
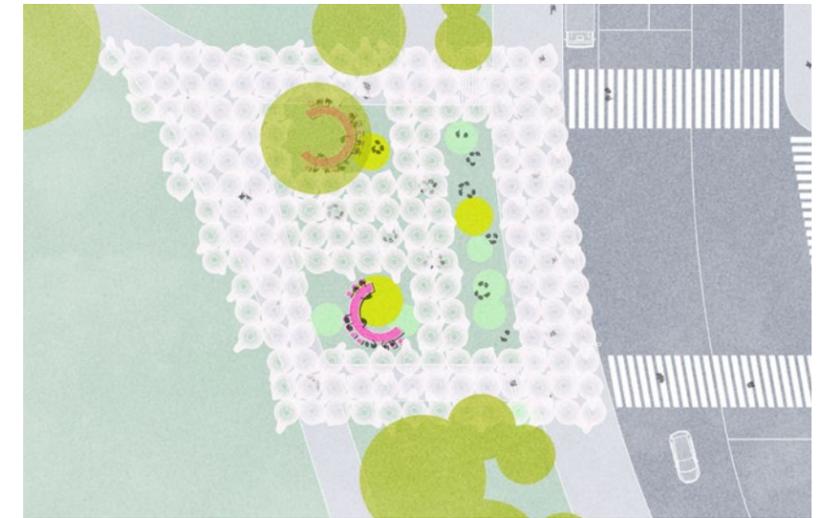
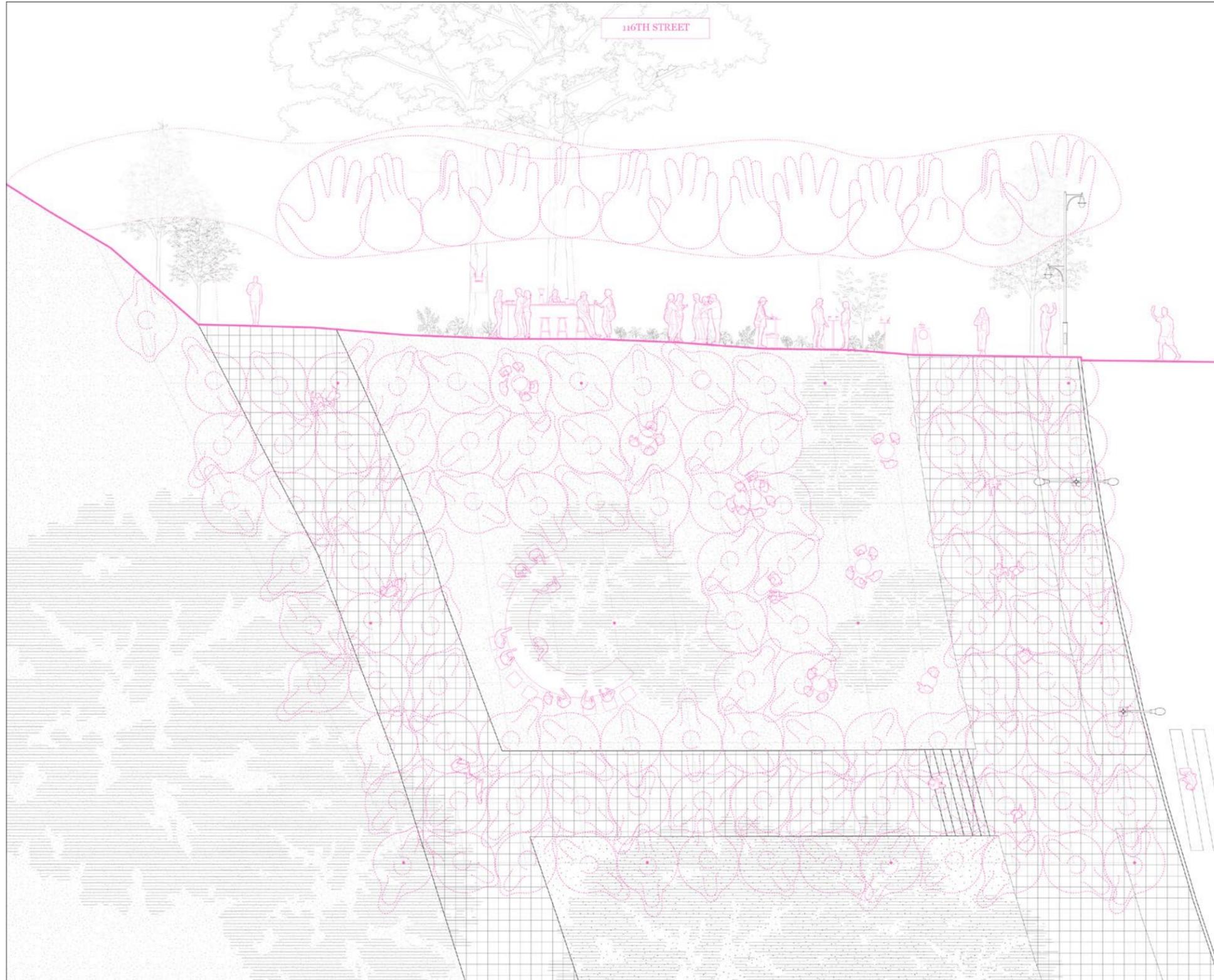
PROTOTYPE 01

The first option with figures intertwining with each other forms a 3-dimensional matrix. Placed near the 118th basketball court, it is elevated by a light-structured platform acting as an outdoor spectator stand and a collective dining platform.



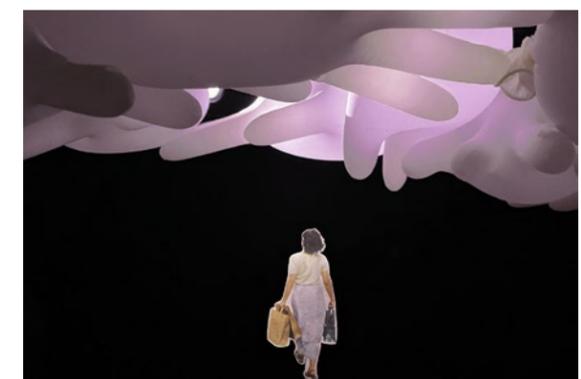
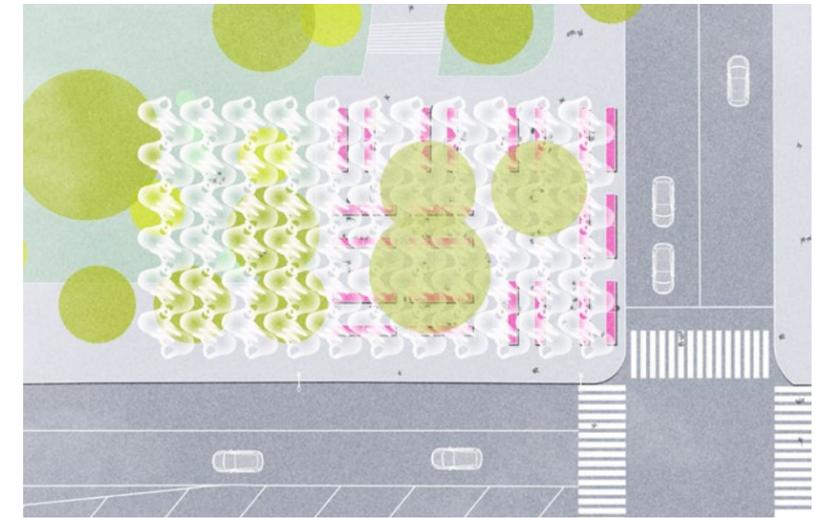
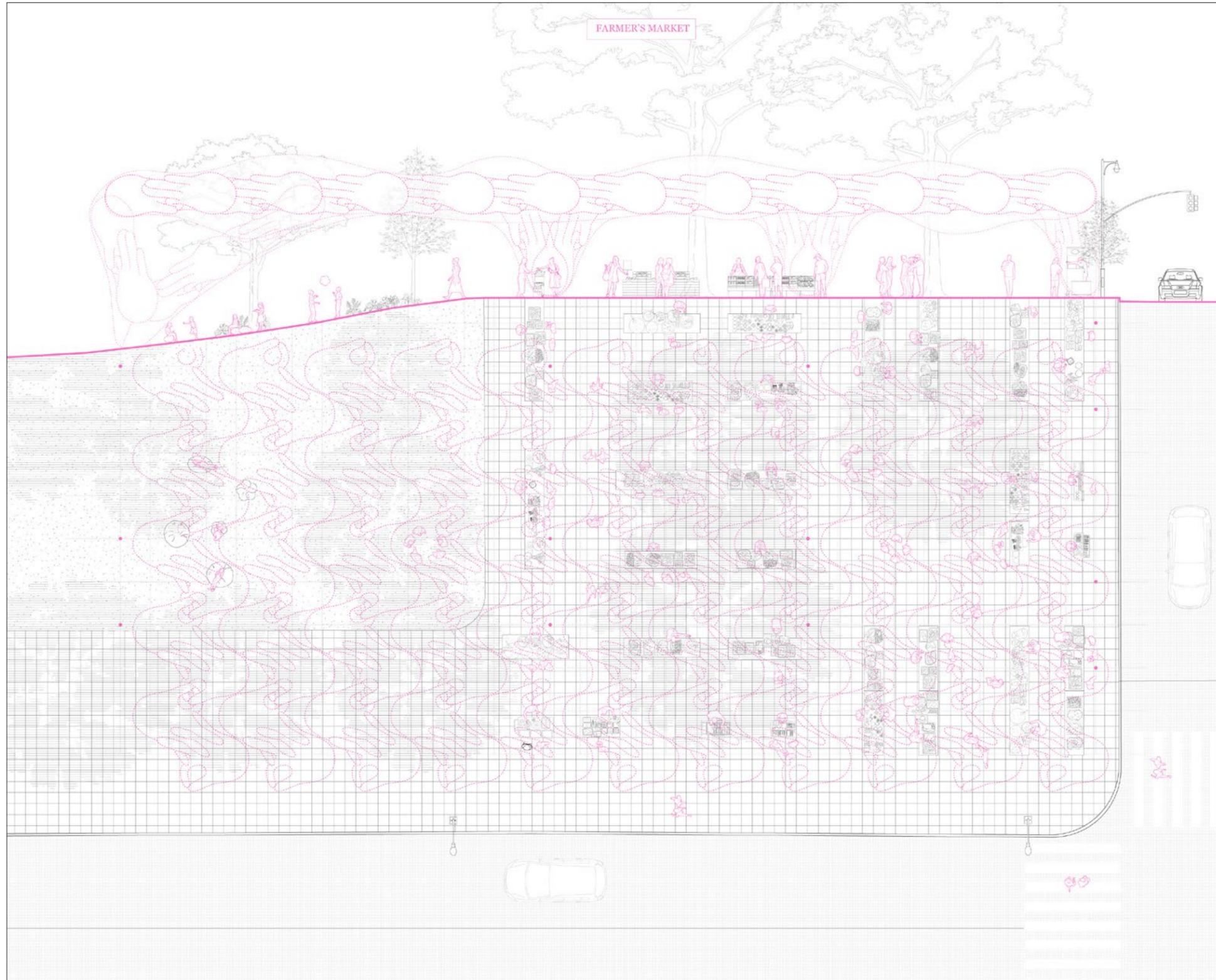
PROTOTYPE 02

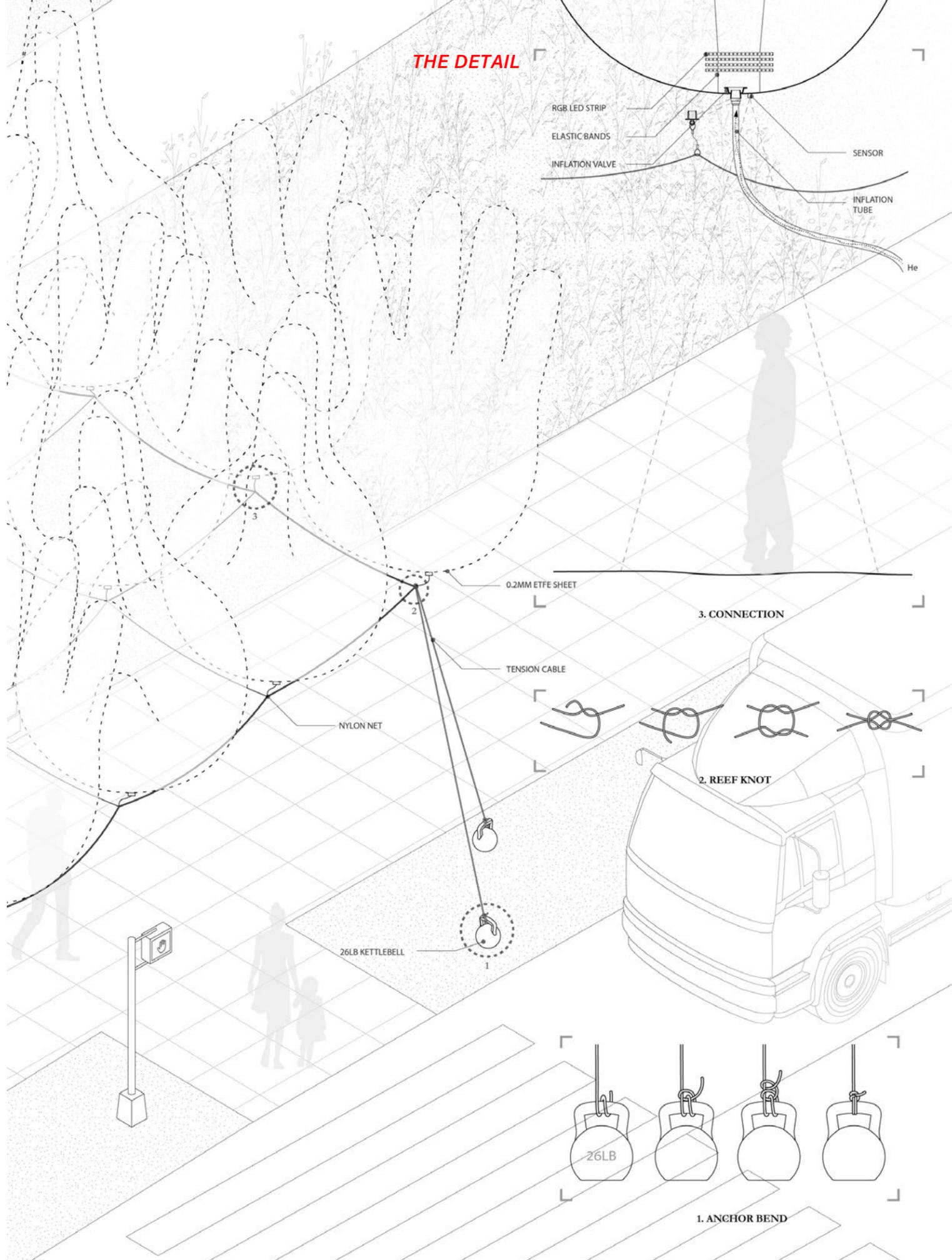
The second option is pack of inflated hands tied up at the wrist and posing the waving and greeting gesture. Placed near the main entrance of the park, which is right opposite the Columbia University's gate, this space is more as a meeting point or gateway.



PROTOTYPE 03

The third is the “OKAY” hands interlocking with each other placed at the weekend farmers market on the right bottom corner of the Morningsaide Park.





Taking advantage of the nomadic possibilities that a canopy offers, it is a project of social nature and multi-purposes. The lightweight helium structure is easy to assemble and disassemble. It is transportable, flexible and unstable, permitting the ambivalence between appearing and disappearing/inside and outside and allows different interpretations of spatial experience without changing the local landscape.

07

OTHER WORKS

VISUAL REPRESENTATION, FABRICATION,
BUILDING TECHNOLOGY

001. Virtual Architecture | Jan-Apr 2023

002. Techniques of the Ultrareal | Jan-Apr 2022

003. ADR II | Jan-Apr 2021

004. ADR I | Sep-Dec 2020

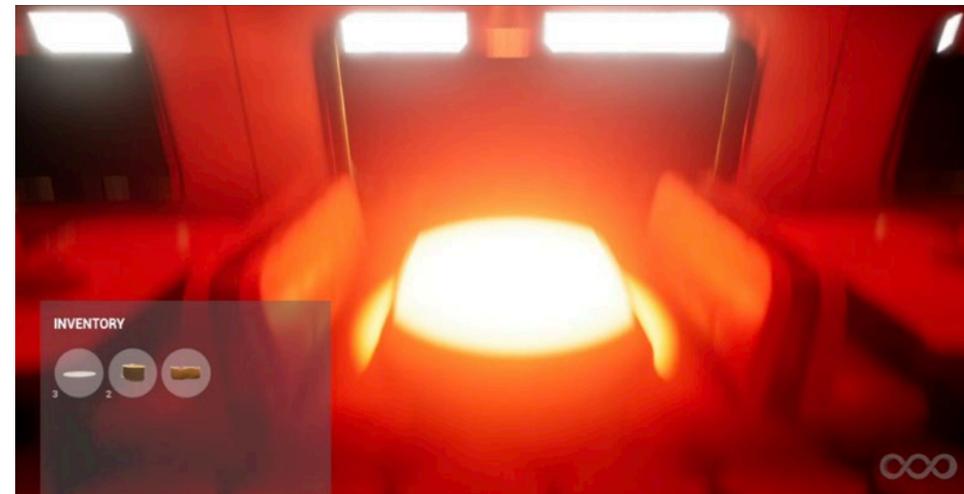
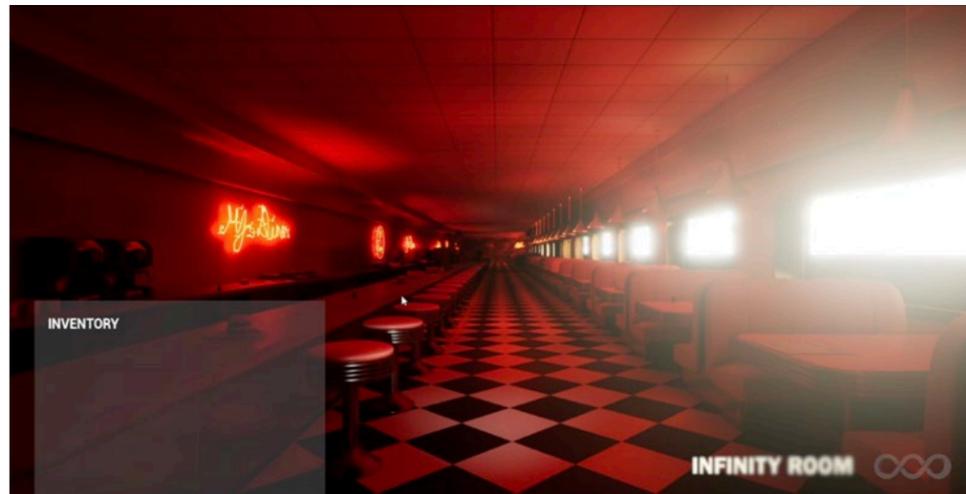
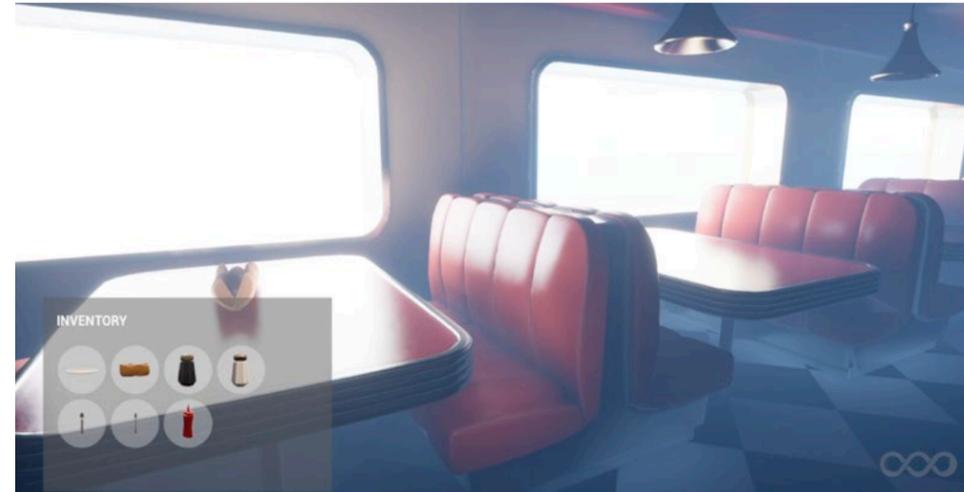
005. 1:1 Crafting and Fabrication | Sep-Dec 2022

006. AT V | Jan-Apr 2022



001 - VIRTUAL ARCHITECTURE

Instructor: Nitzan Bartov
In collaboration with Yiyi Gao, Luis Salinas



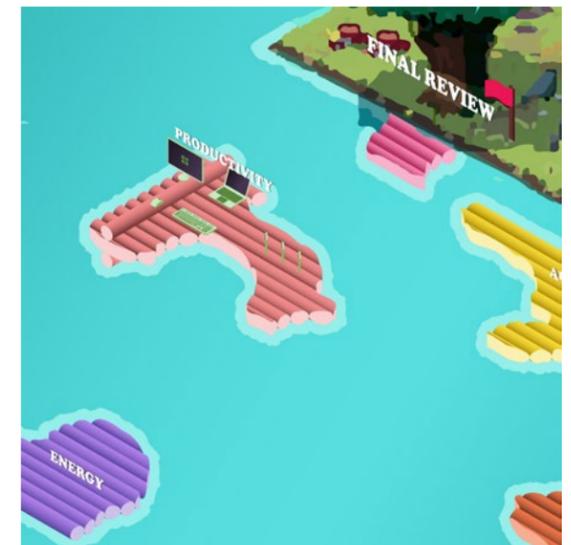
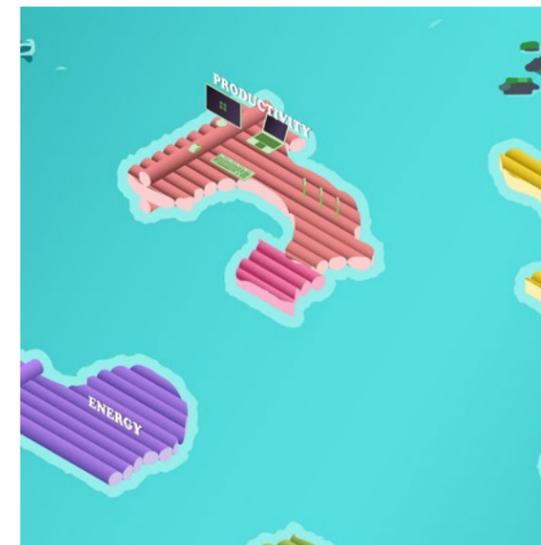
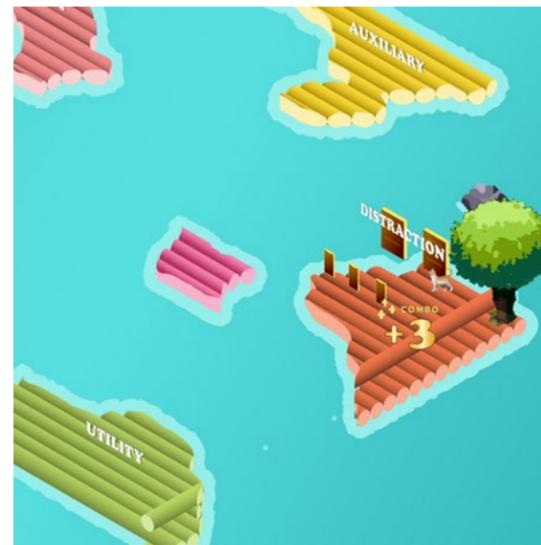
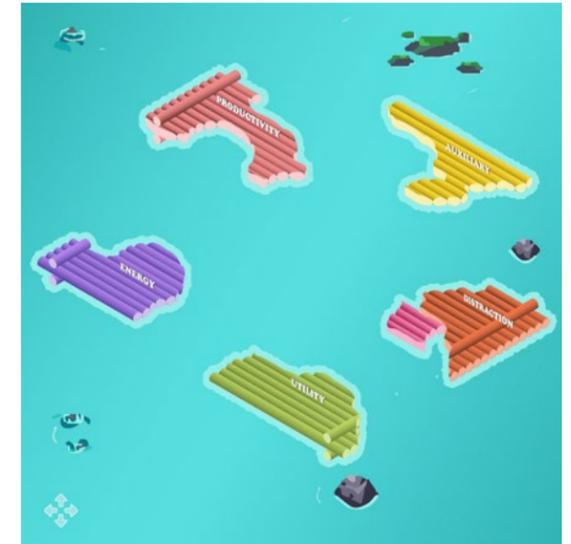
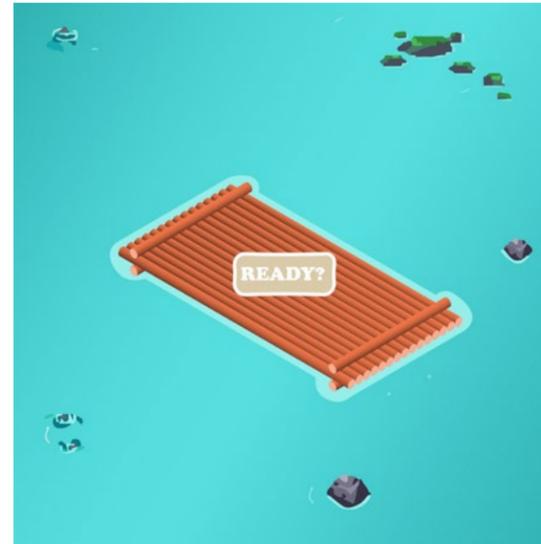
002 - TECHNIQUES OF THE ULTRAREAL

Instructor: Phillip Crupi
In collaboration with Michael Lau, Nara Radinal



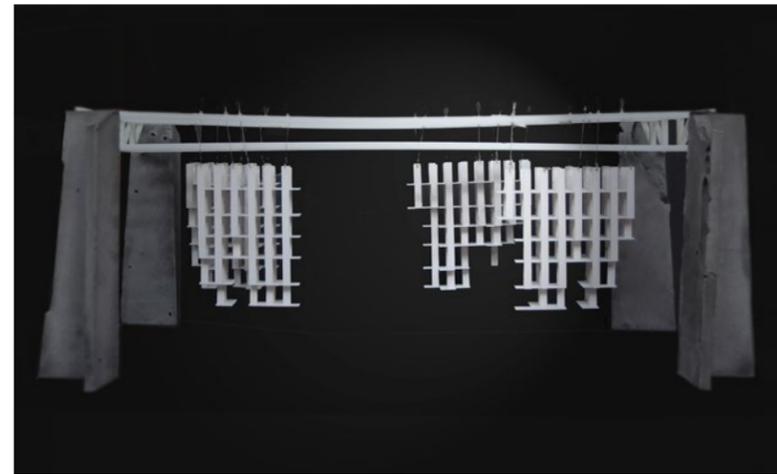
003 - ADR II

Instructor: Lexi Tsien



004 - ADR I

Instructor: Josh Uhl



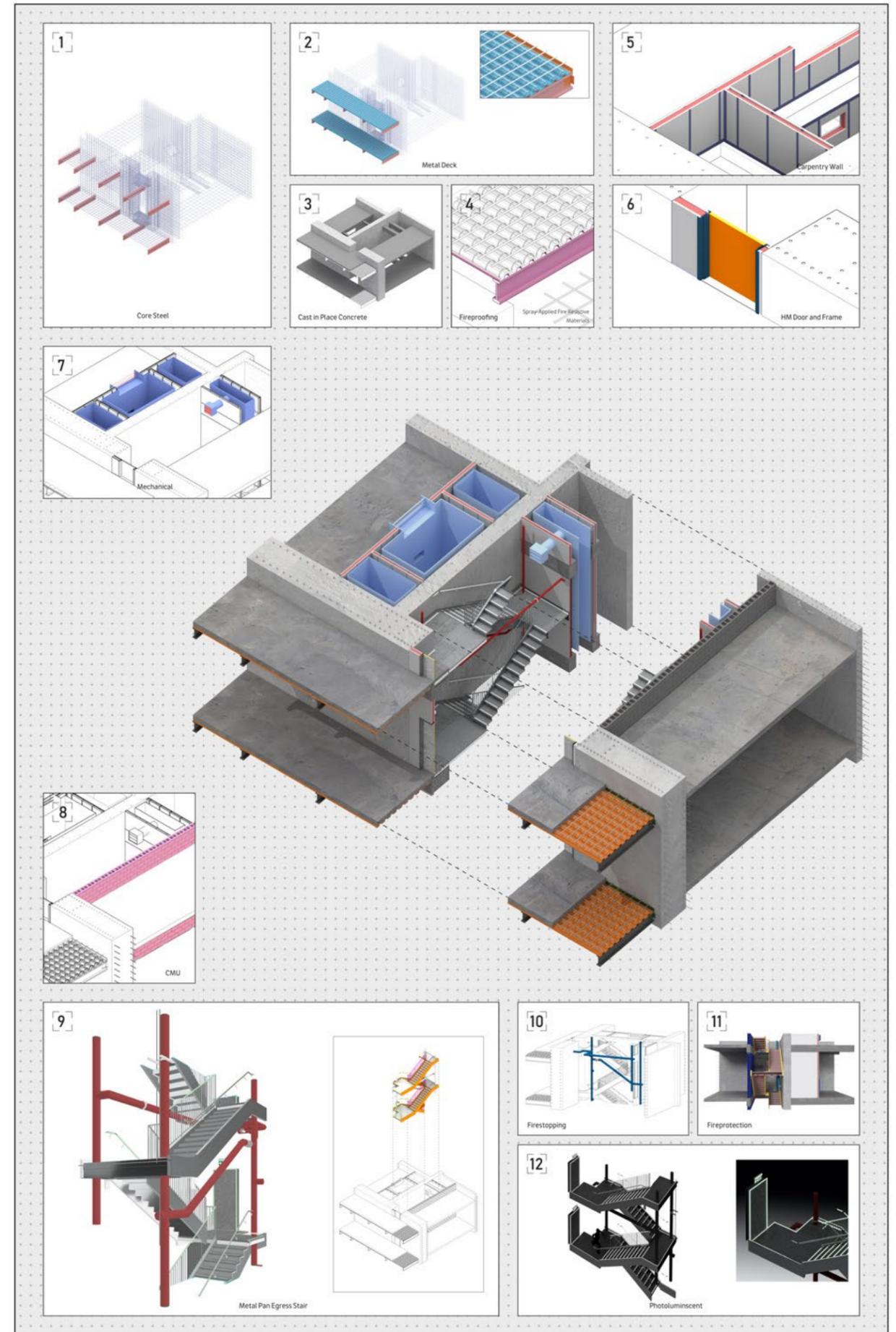
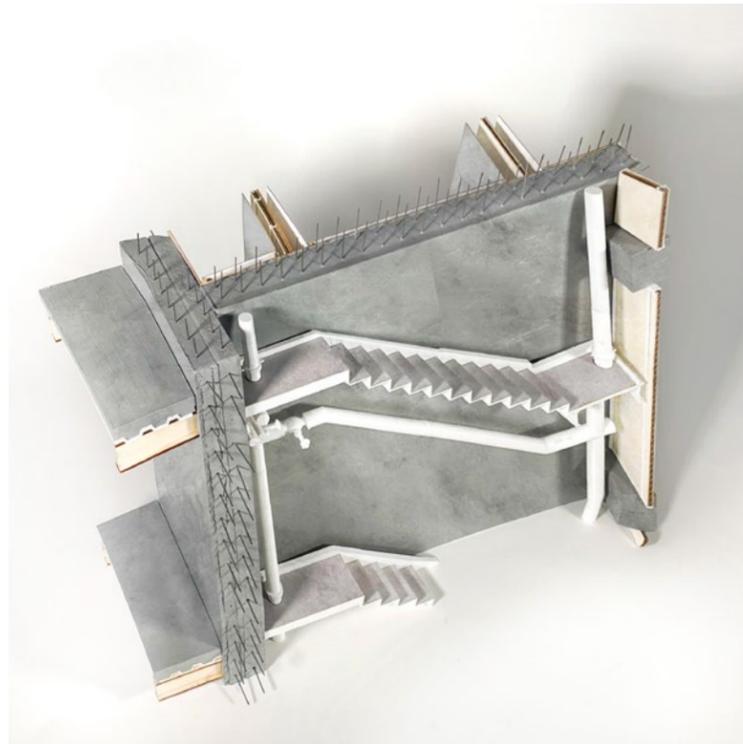
005 - 1:1 CRAFTING AND FABRICATION

Instructor: Zachary Mulitauopele
In collaboration with Michael Lau, Wenjing Tu



006 - AT V

Instructor: Nicole Dosso
In collaboration with Laura Blaszcak, Hallie Chuba, Kaixi Tu



MAXINE GAO

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