



HAO ZHONG

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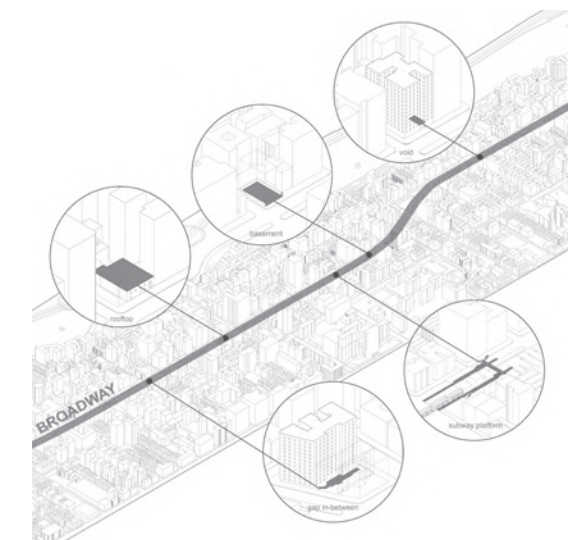


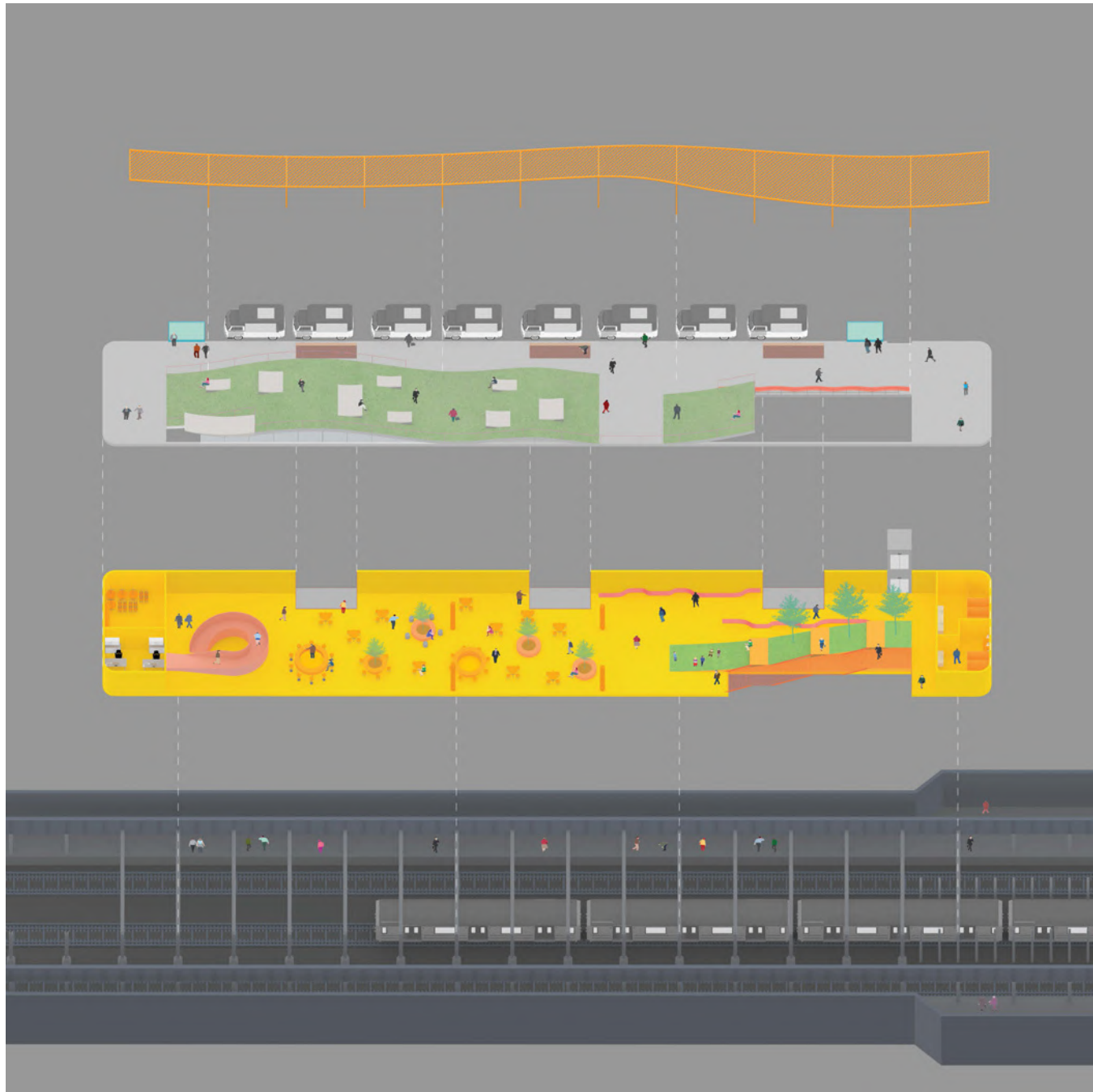
01 In Between

Median Park

Critic: Lindy Roy
Individual Work
2019 Fall Core I

With a length of 13 miles, Broadway is the oldest street crossing north-south the island of Manhattan. It runs through a diverse compendium of realities, making the observation of this particular street a suggestive exercise that allows to unveil the complexity of the whole urban structure and, ultimately, to understand Architecture in its relational nature. Broadway acts here as an element which allows to draw together a whole set of realities that permits a cross-reading, from the object to the urban scale.





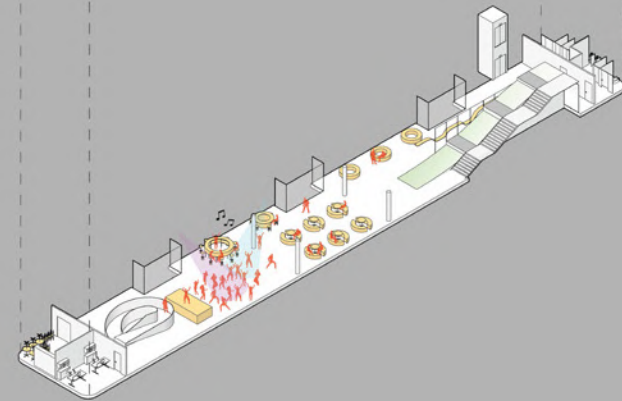
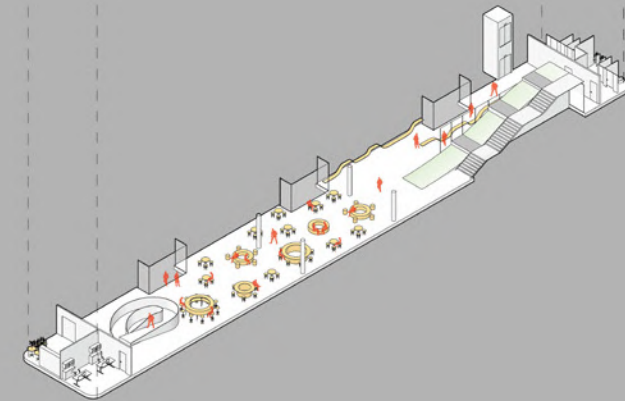
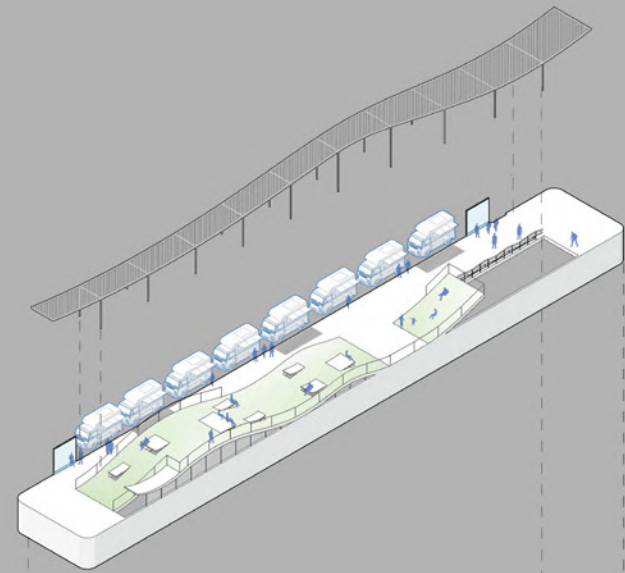
New Public Space

This project selects the median in front of the gate of Columbia University as a prototype to test the possibility of transferring an unaccessible landscape into a public space for people to stay. The invention possesses the existing features of medians and, at the same time, makes use of the space between subway and street, creating a mixed experience of interior and exterior, above ground and underground.



Above the Subway

It proposes a public park for students and residents to get food from food trucks, have meals, and host events.





Section Perspective



1:1 Floor Slab (24" x 6" x 24")

02 Elastic Giant

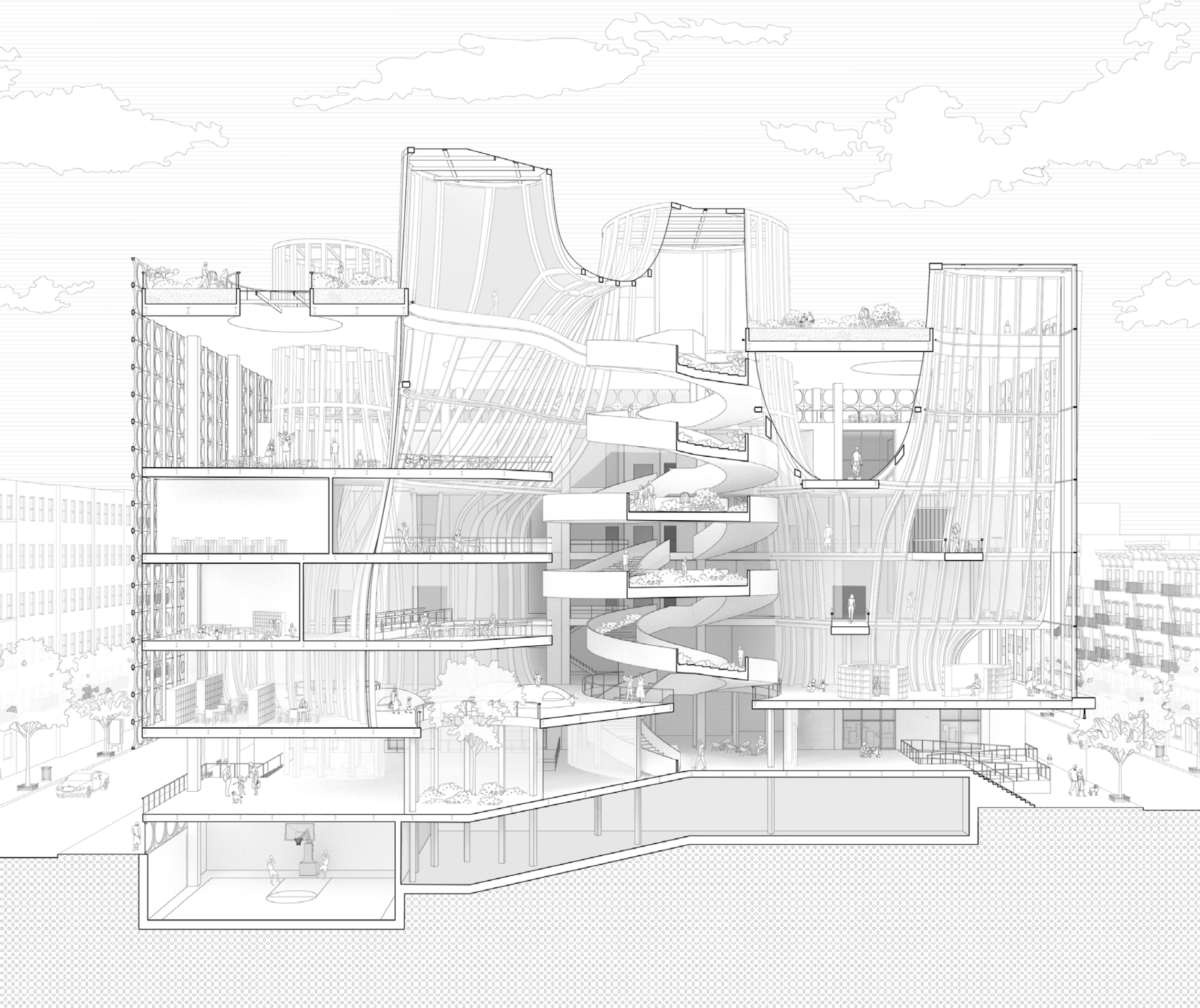
Renovation of P.S.64

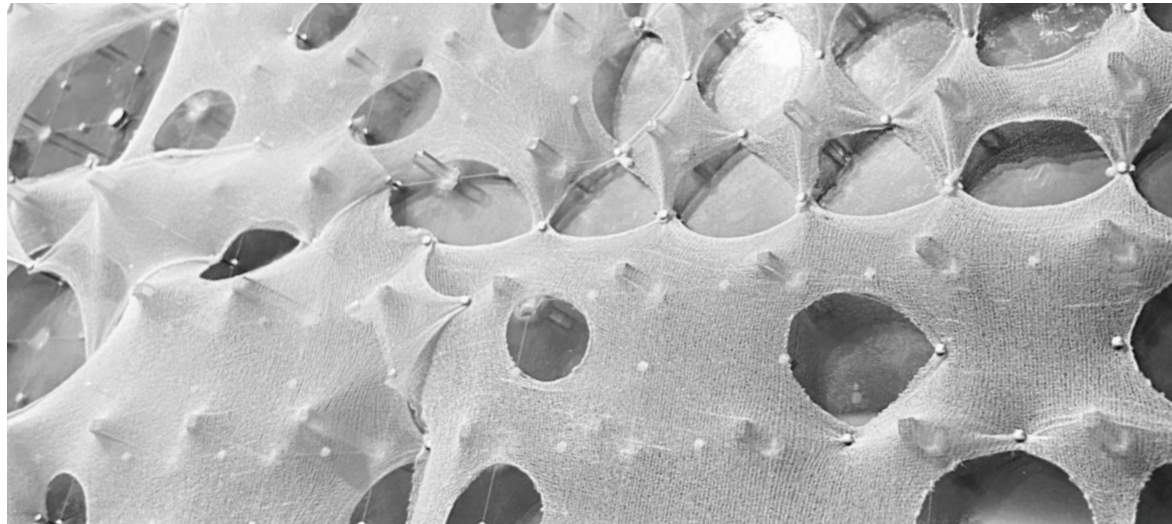
Critic: Karla Rothstein
Individual Work
2020 Spring Core II

P.S. 64 served as a public school in New York from 1907 until 1977 and then went on to house a variety of community organizations, but the building is currently vacant.

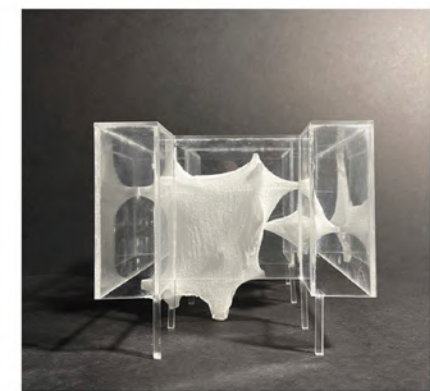
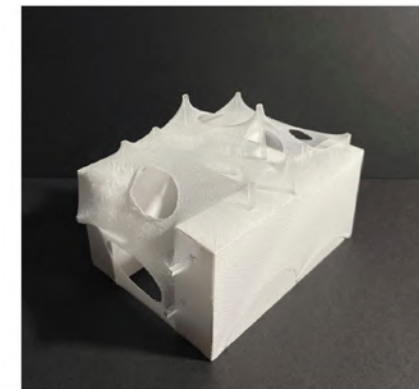
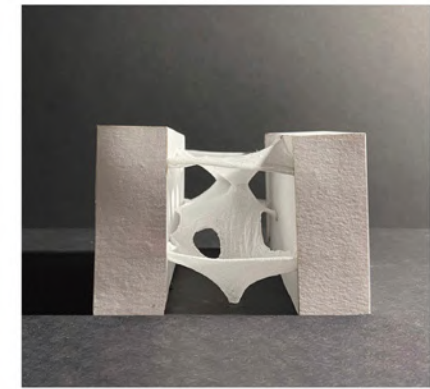
This proposal introduces a new elastic giant that carves out the existing building and merges with the original segments to become a new school. Aiming to produce a harmonious existence of the old and the new, the proposal forms thresholds and fluidity among material difference, spatial arrangement, and dynamic circulation.

In the new school, elasticity is experienced in both material and spatial quality. A gradient of spaces from normative to elastic/ regulated to autonomous is embraced to encourage communication, teamwork, and exploration.

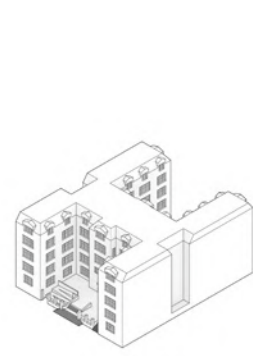
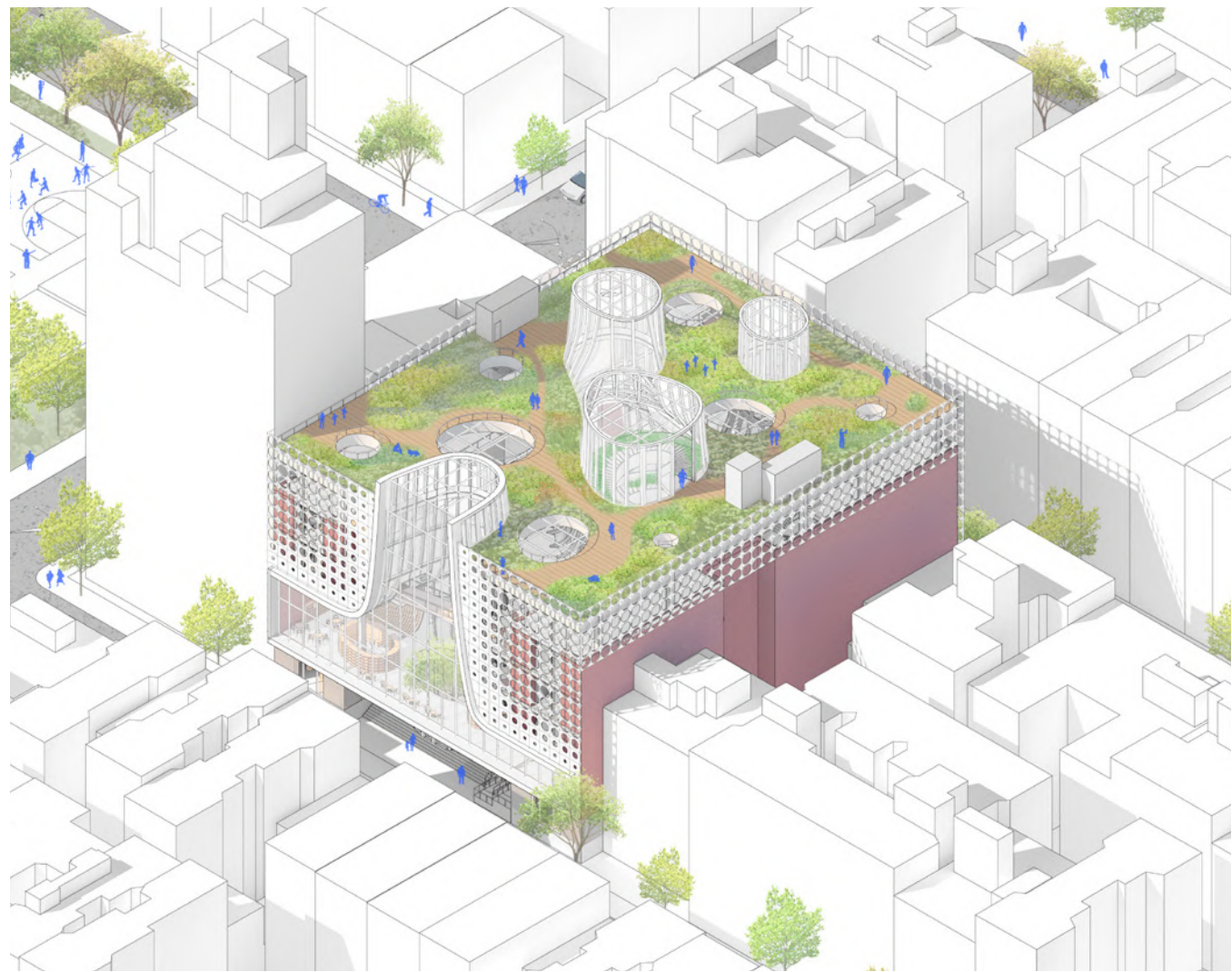




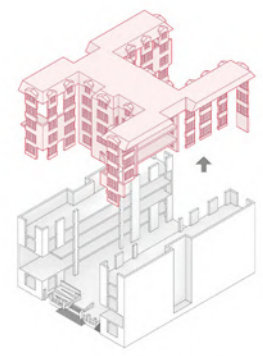
Study Models



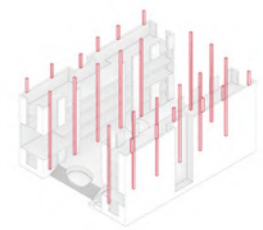
Proto Building Models



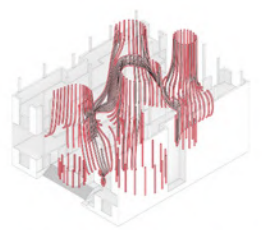
Existing Building



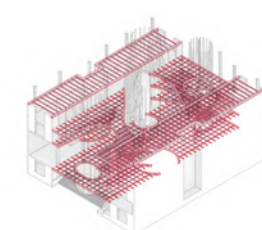
Removed Part



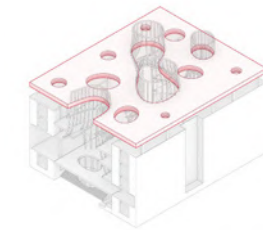
Add Columns



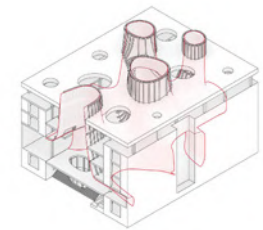
New Load-bearing Member



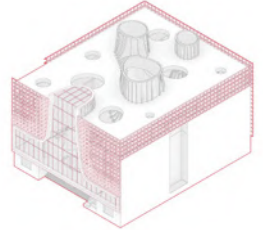
New Floors



Landscape Roof



Membrane System

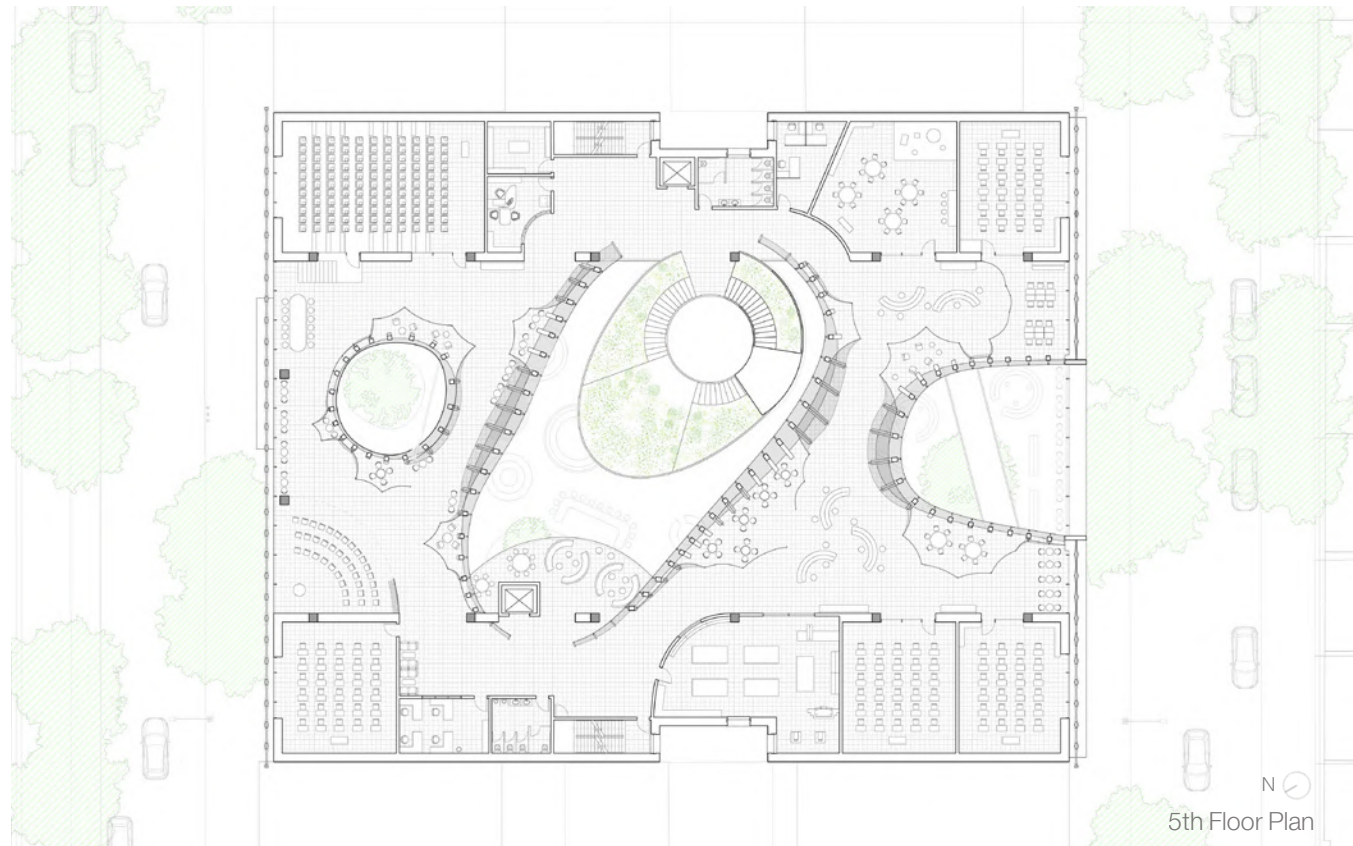


New Facade

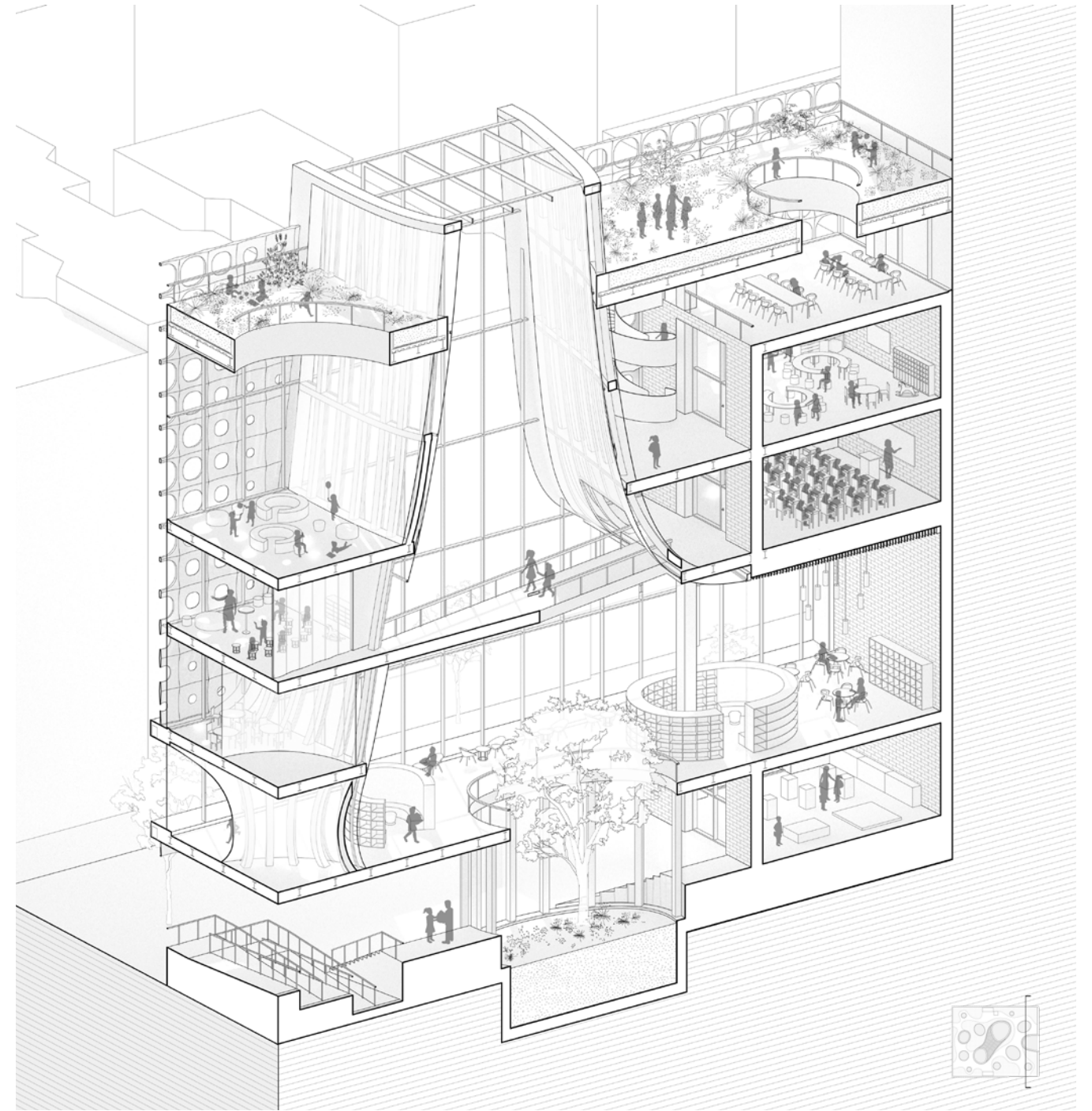




4th Floor Plan



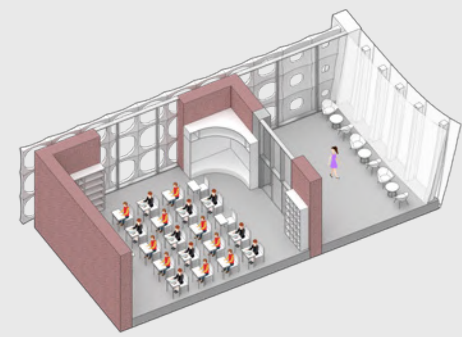
5th Floor Plan



The elastic giant is composed of three layers, including new load-bearing members, a sometimes-pliant secondary framing system, and the membranes that skin the interconnected voids. The continuous elastic space fulfills various purposes, including lighting, ventilation, circulation and collective activities. Situating in the center of the void, a spiral landscape ramp, which connects the ground level and the roof garden, creates a visual focus and a unique experience while students are traveling inside the building.



Class Time vs Break Time



Interactions with the Elastic Giant

03 The Loop

Affordable Housing in Bronx

Critic: Erica Goetz
Teammate: Yuchen Qiu
2020 Fall Core III

This proposal for future living in the Melrose neighborhood provides housing for a diverse population which is common to the neighborhood - families with children, single people, and the elderly. The types of public programs are carefully thought out to accommodate the needs of local residents, such as catine, health care, job training, and after school center, etc. The LOOP carries the public programs and spaces (the space of air) that are interspersed among the living units, weaving in and out, up and down within the building to connect public and private, shared and individual space, and create porosity in the building scale. As a result, the LOOP will become an incubator where social interaction and shared programs foster a sense of community.





Site



Courtyard



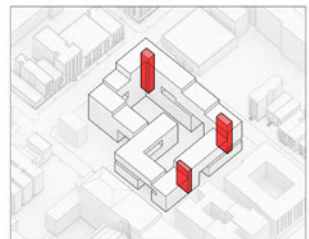
Stepdown Terrace



Loop



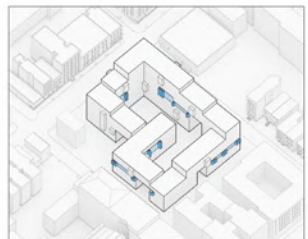
Massing Carved



Circulation Core



Shared Pocket



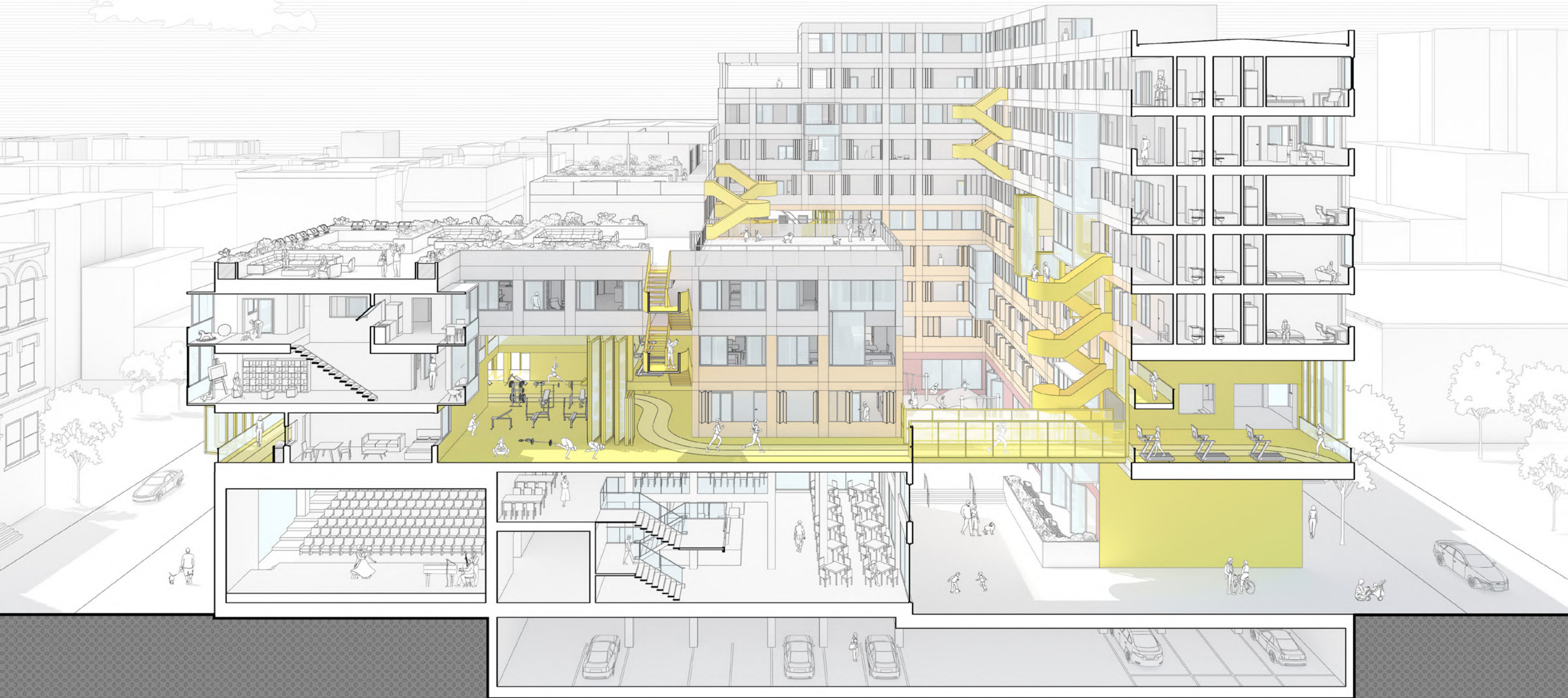
Operable Facade

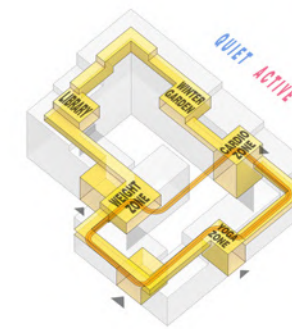
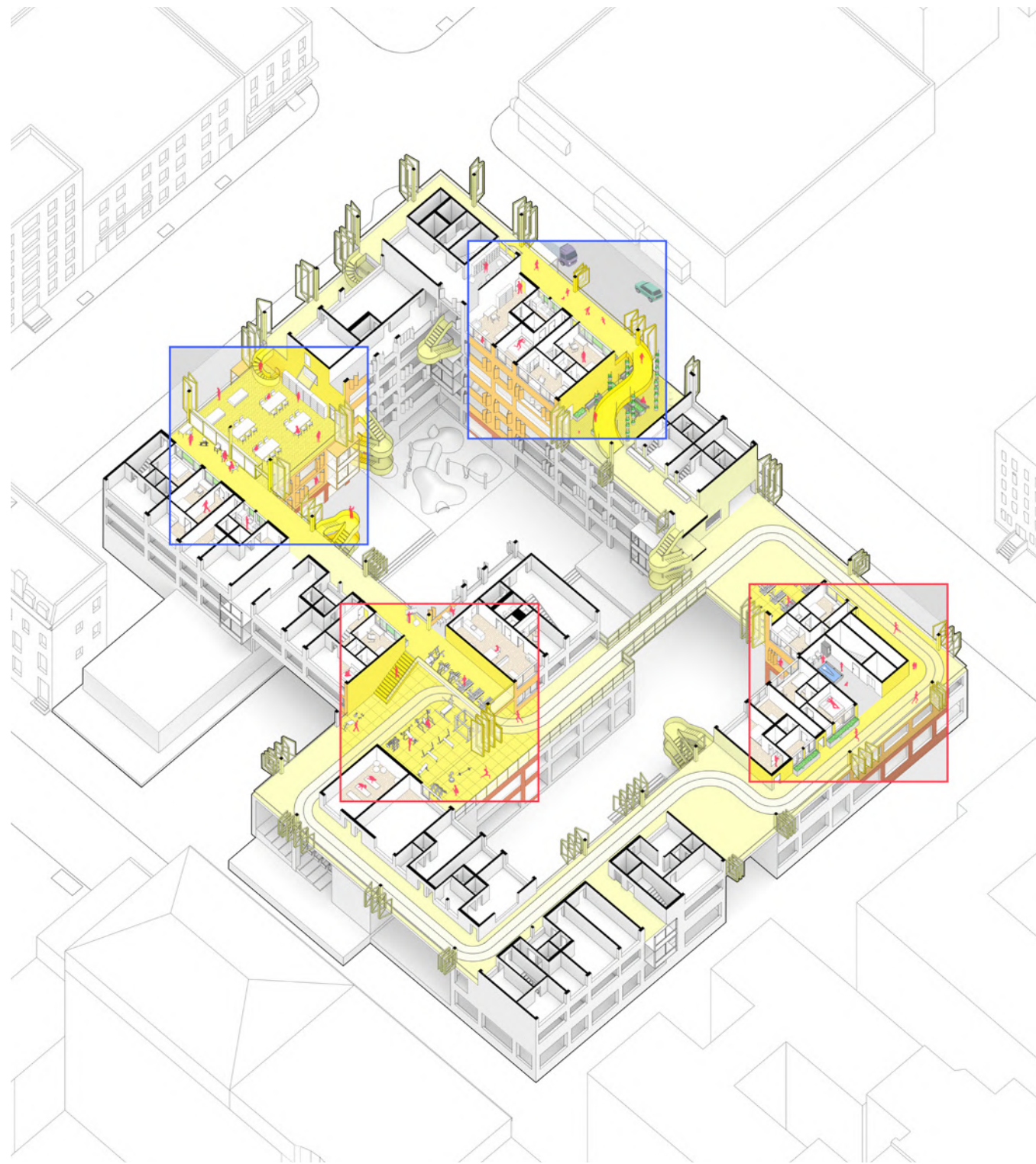


Community Life

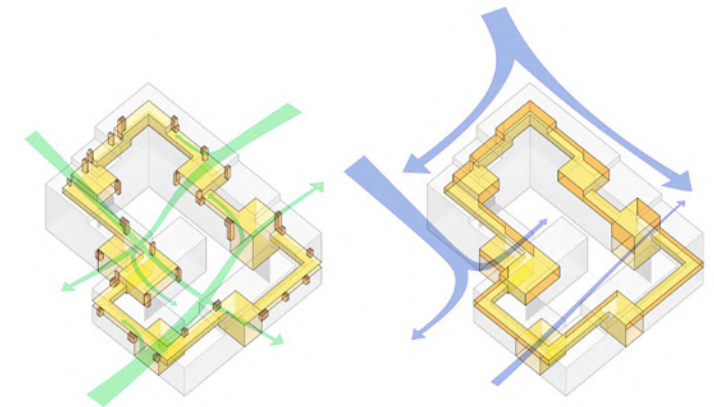
The ground floor plan is mainly reserved for the public. It provides programs such as senior center, after-school center, local clinic, employment training center, nutrition center, theater, and art studio. There is an opportunity to open up the public programs and allow some of the programs to extend beyond their physical boundary and into the street. The intention is to provide public services not only for the residents in the building but also for people from the neighborhood nearby.

Responding to the lack of access to fresh air and inadequate public resources in the Melrose neighborhood, which causes a significantly higher rate of respiratory illness and substandard living condition, the LOOP rethinks the concept of air/ void and uses it as the central organizational device and a public resource carrier in residential design. The space of air becomes the main vessel for enhancing health and community life.

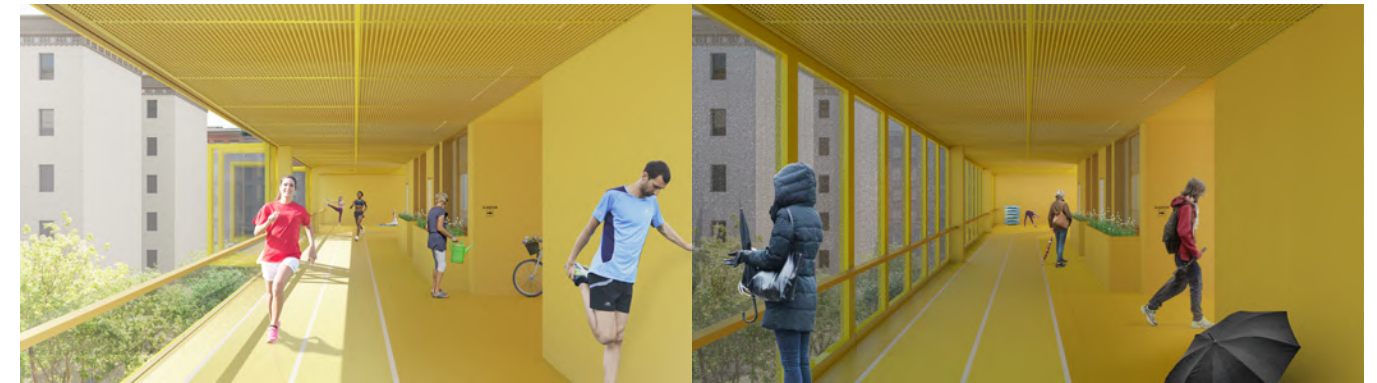




Loop as Public Resources
The loop provides various public programs as it weaves through the building.



Loop as Climatic Buffer Zone
Because of its operability, the loop serves as a climatic buffer zone. It could close or open up according to weather, season and resident's demand.

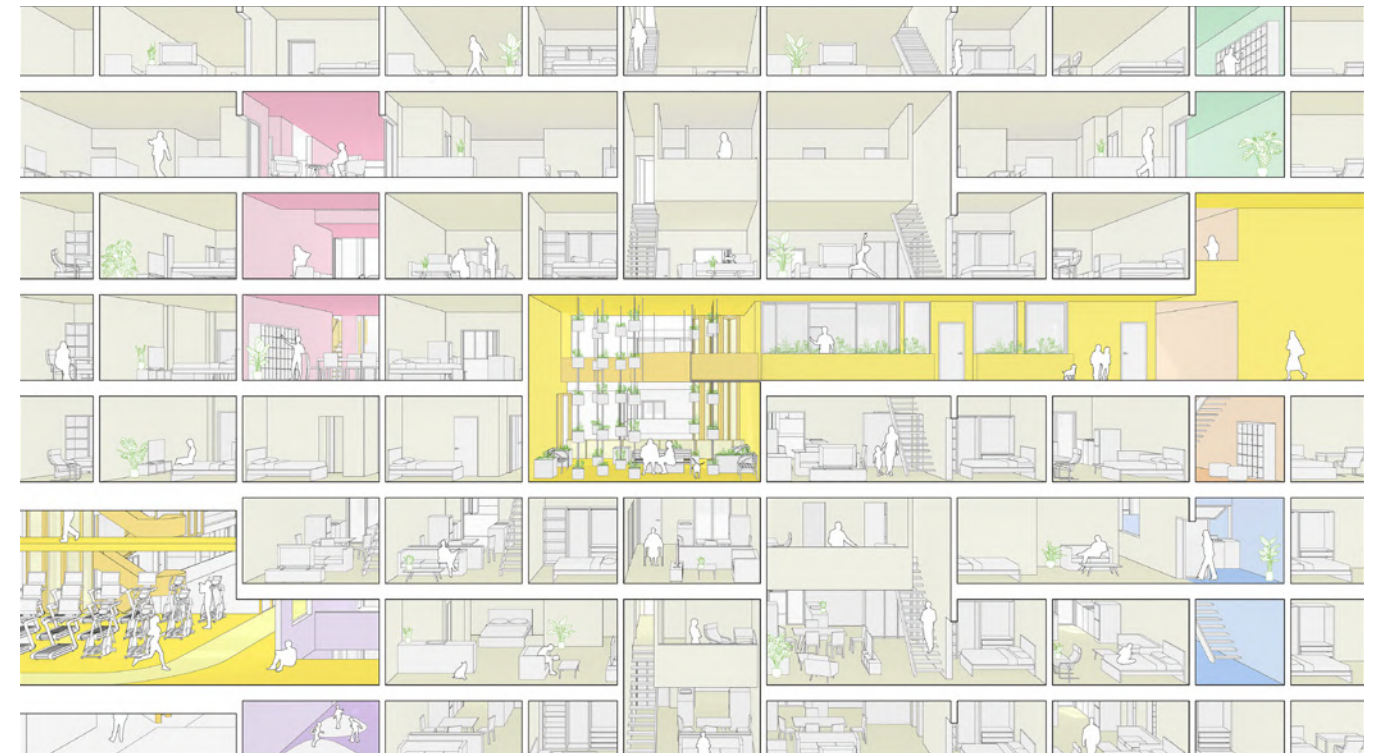
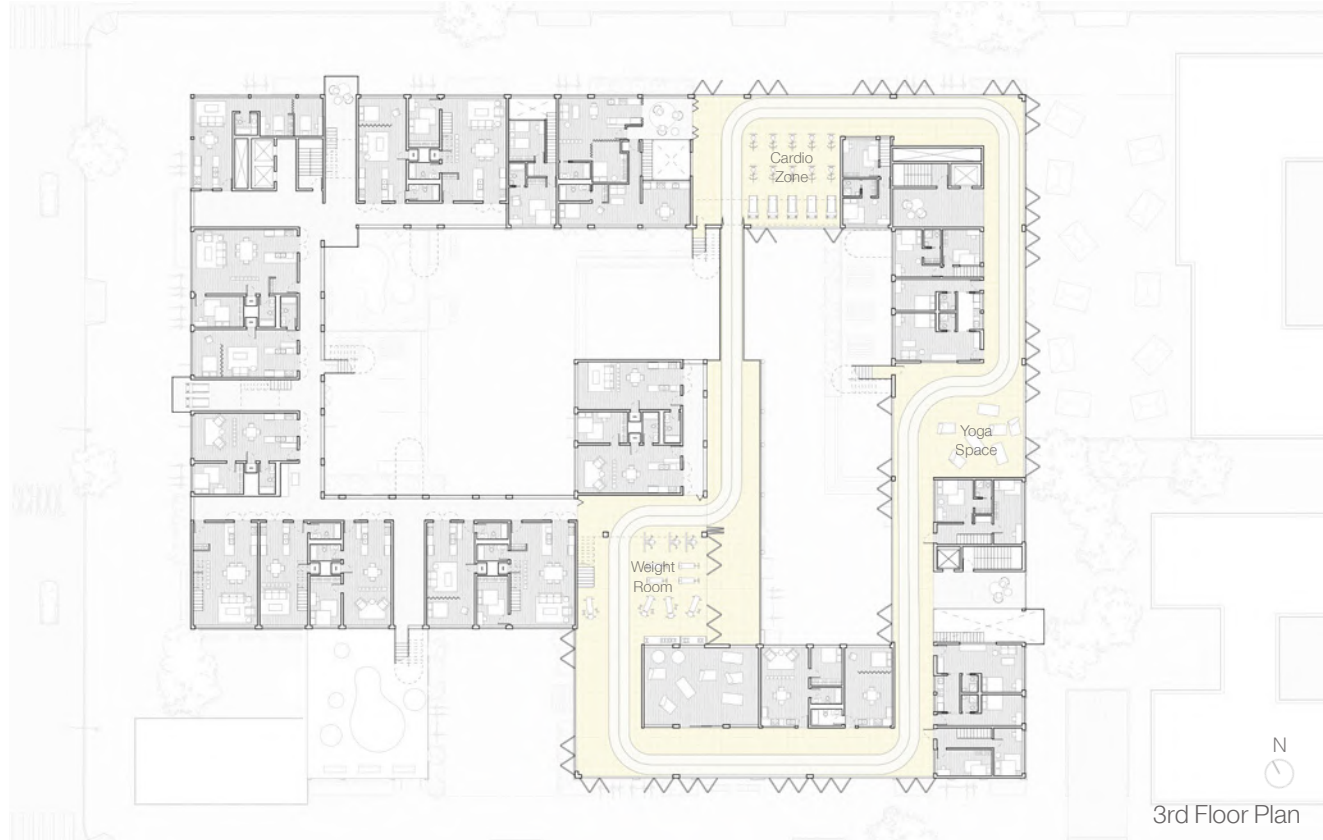


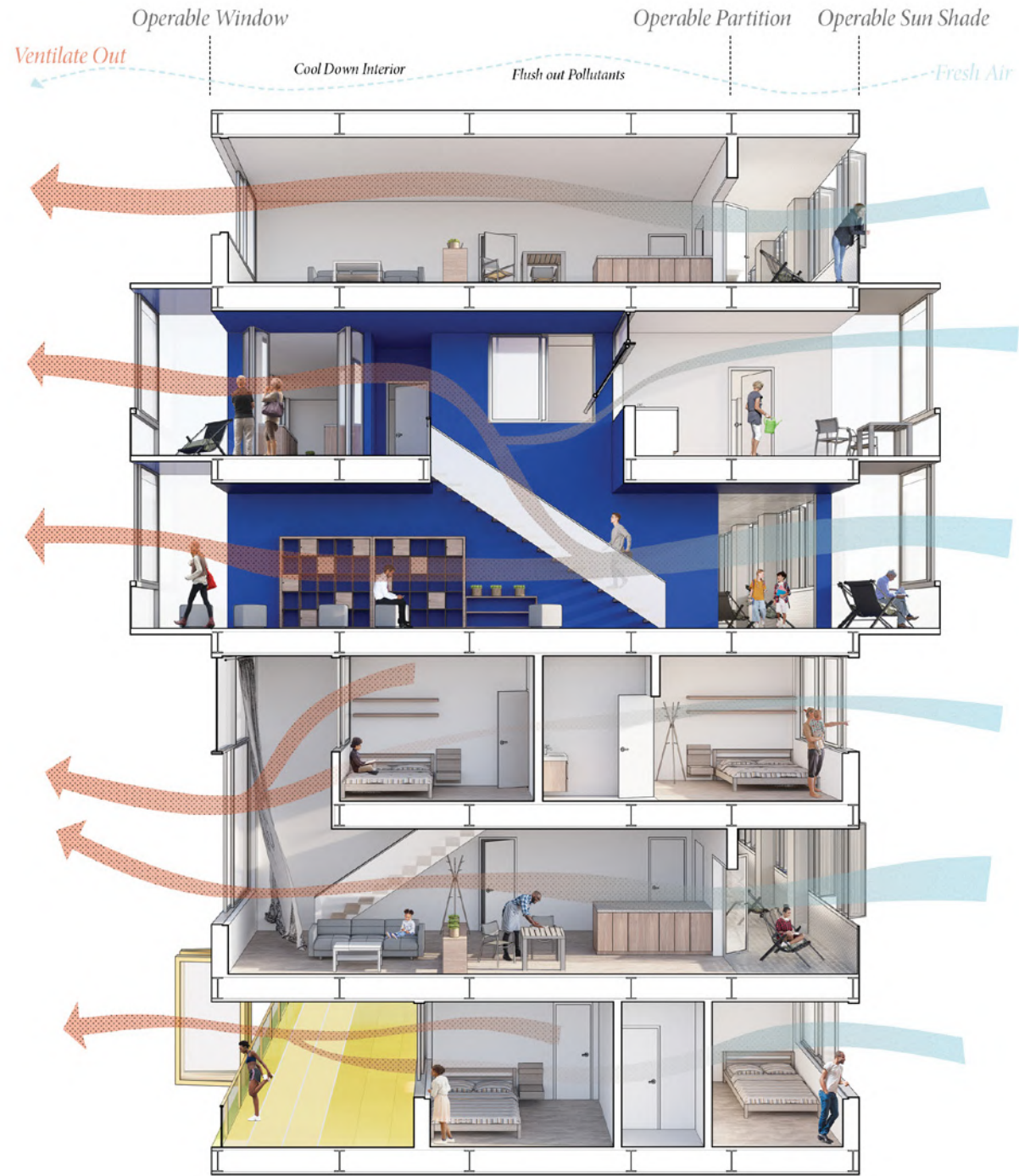
Open

Close



In climate aspect, the loop functions as the lung of the building. The operable window system will close or open up according to weather, seasons and resident's demand. When it is summer, wind can pass through the void to cool down the building. While in the winter, windows close up and the north and west sides of the building will form as screens against the prevailing wind.





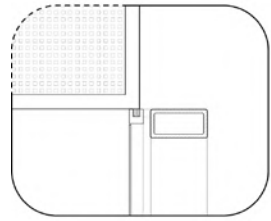
Air and Health

Long term exposure to indoor air pollutants such as VOCs and NO₂ will lead to respiratory illness such as asthma. The average asthma hospitalization rates in the Melrose neighborhood is 3 times as high as New York City. By making the interfaces between different spaces operable, the design gives the residents the autonomy to control their own micro-climate and opens up the potential for better ventilation and lower risk of risk of respiratory illness. The Air Changes Per Hour (ACH) of the units could reach 25 if all the operable elements are open, which is 4 times high as typical residential units.

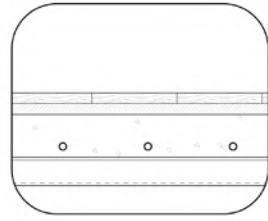


Structure and Details

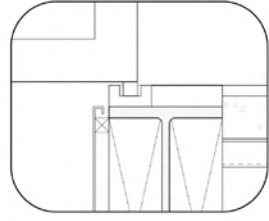
The zoom in east section shows how the structure and construction details correspond to the rhythm of the facade, and the materiality of the facade and some of the interior space. On the lower floors, materials of warmer tone are selected to echo with the context, especially on the ground floor, recycled bricks from the demolition of the existing building is reused.



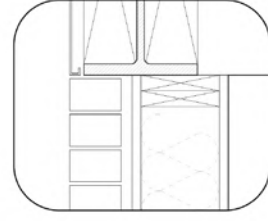
1. Operable Screen



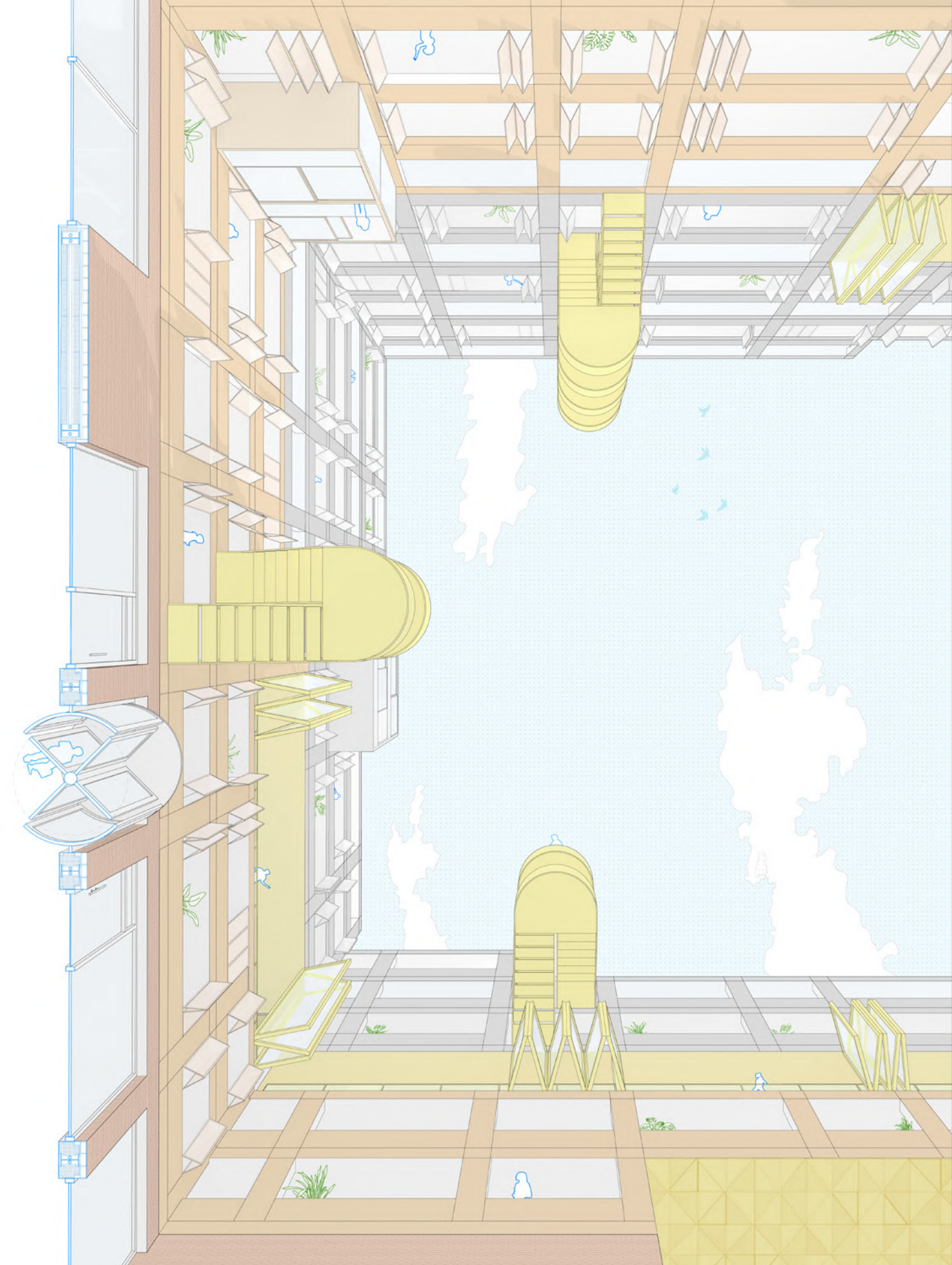
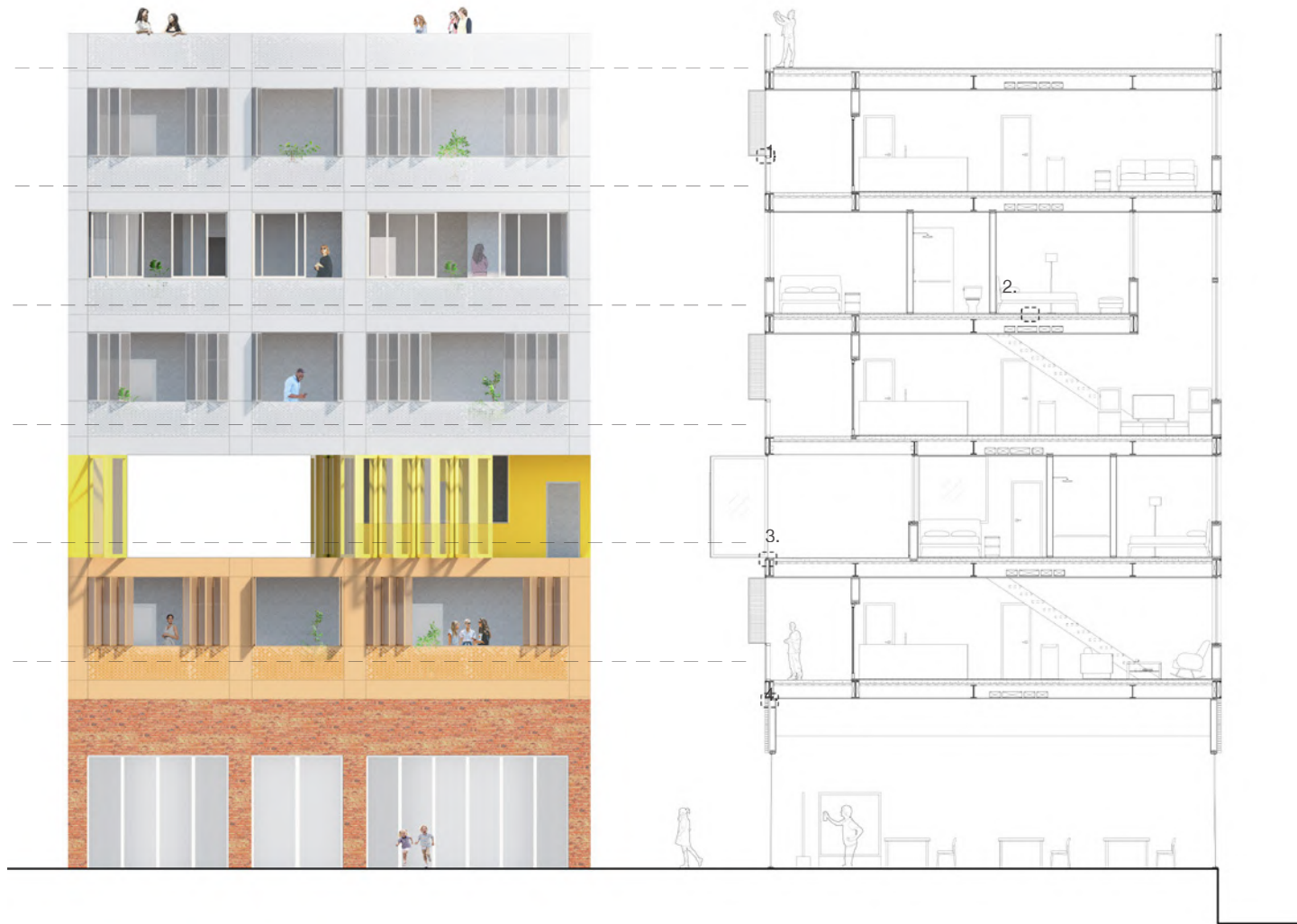
2. Floor with Radiant Heating



3. Operable Window

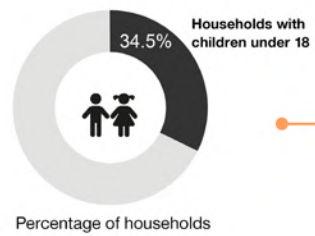


4. Brick & Copper Cladding



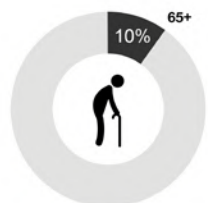


Name: James
Age: 15
Occupation:
High School Student



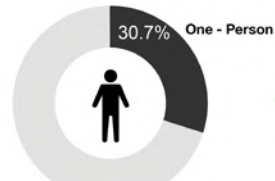
Percentage of households

Name: Mario
Age: 72
Occupation:
Volunteer at
Bronx Documentary Center



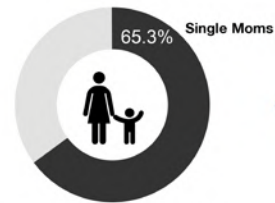
Population by age

Name: Andre
Age: 36
Occupation:
Currently Unemployed

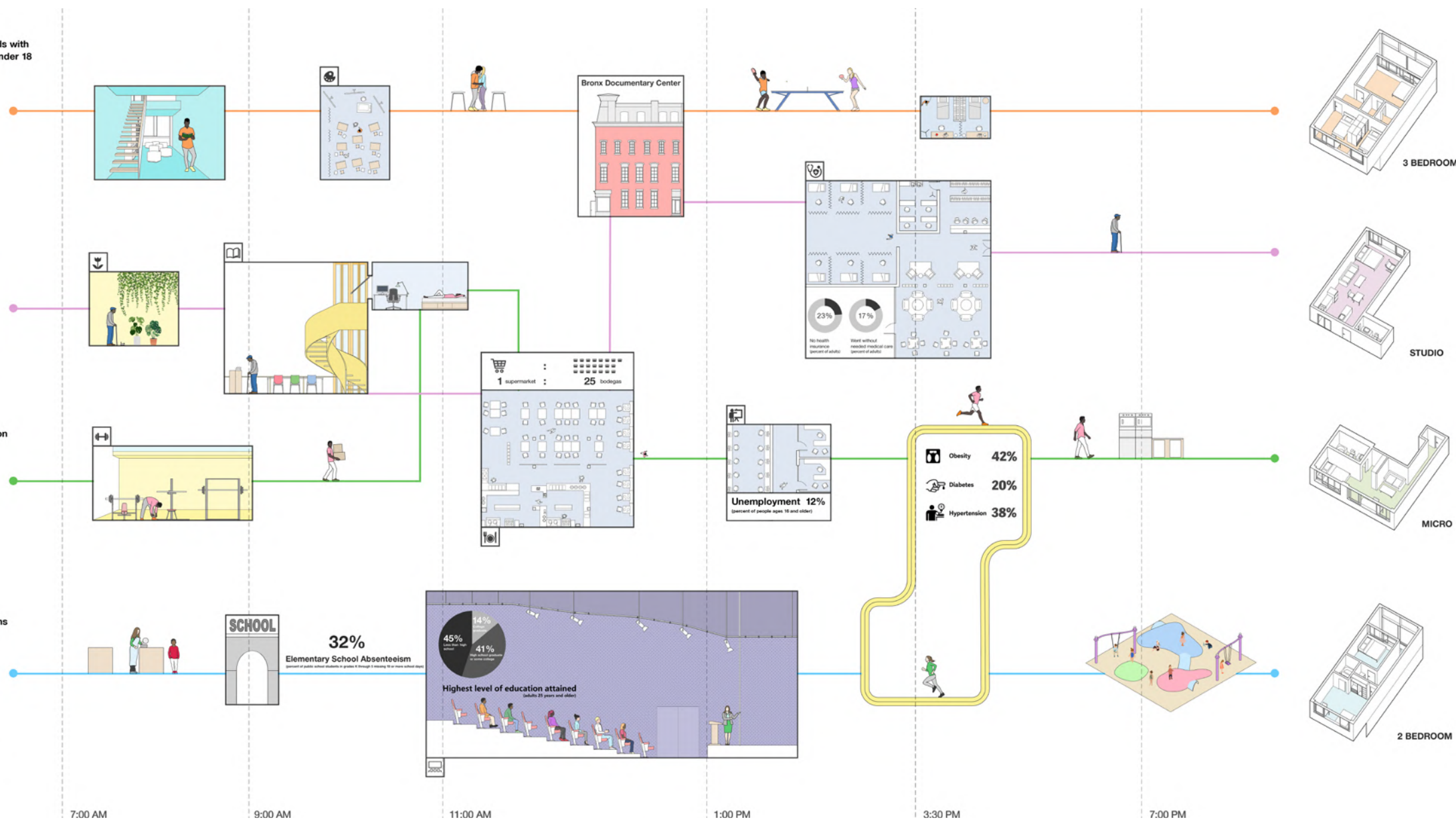


Percentage of households

Name: Kiara
Age: 31
Occupation:
Job Training Instructor



Percentage of family households with children under the age of 18



The LOOP advocates a more active and efficient community life in both building and unit scales. It encourages people to be more aware of the surroundings and the people near them. It prioritizes human health and experience by giving presence to the ethereal material of air. The ultimate goal of the project is to create a micro society that has fresh air, nice views, closer bonding and somehow improves quality of life in the neighborhood.



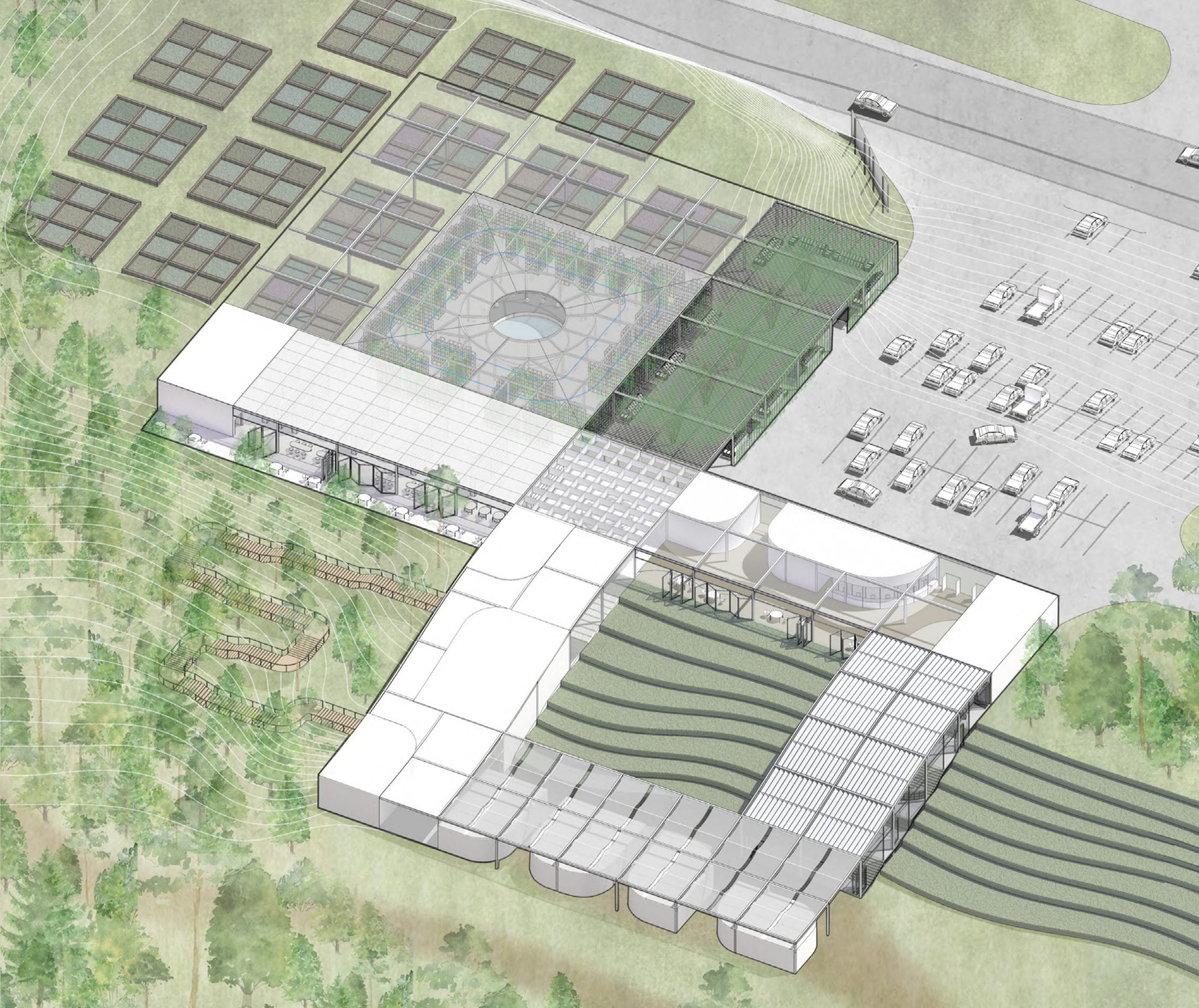
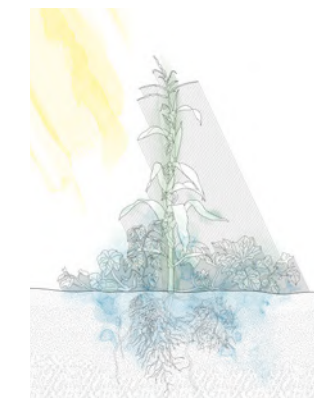
04 Trellis

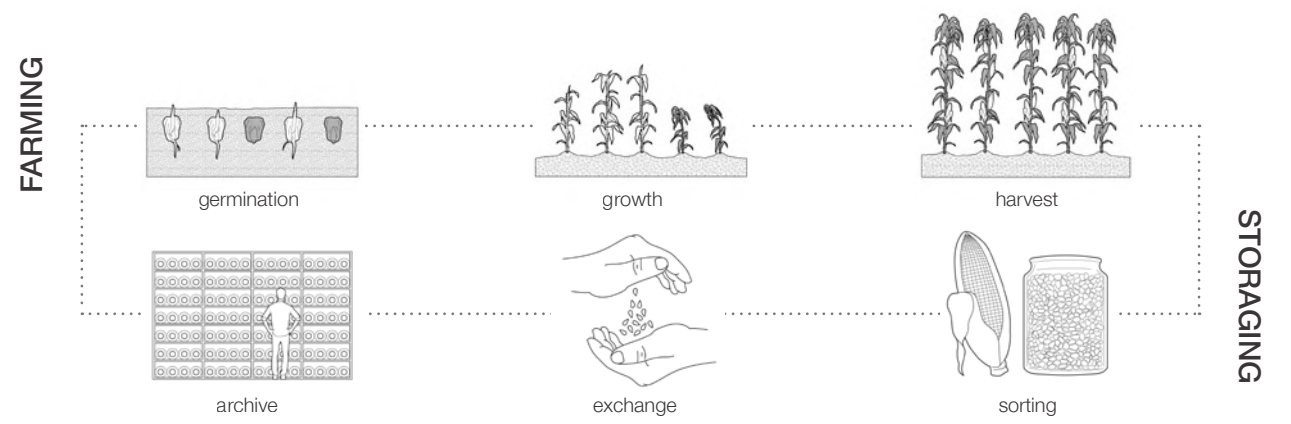
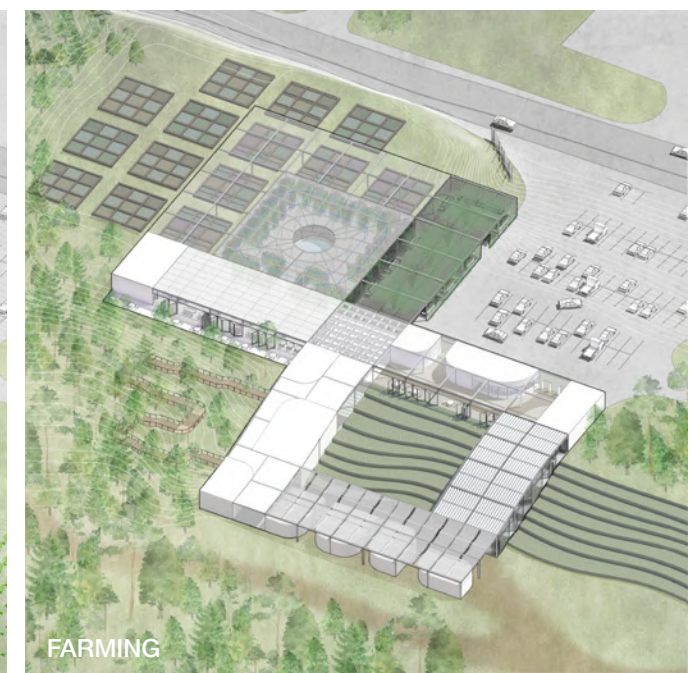
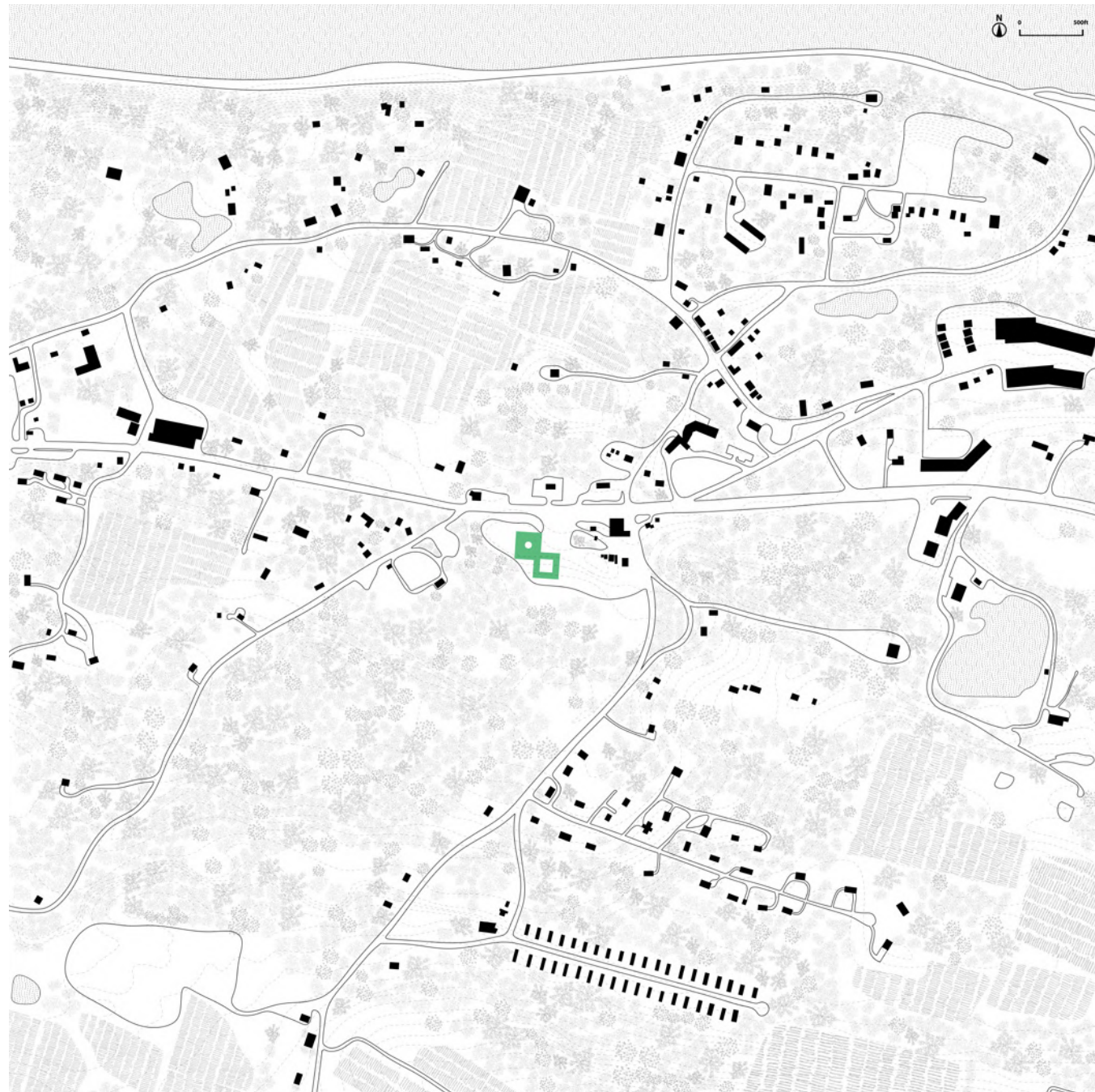
Mid-Hudson Valley Seed Bank

Critic: Phu Hoang
Teammate: Peicong Zhang
2021 Spring Advanced IV

The Mid-Hudson Valley area is a regional food hub yielding various products including corn, wheat, beef, wine and more. Tracing back to the origin of food, seed industry is fundamental to both regional and global food security.

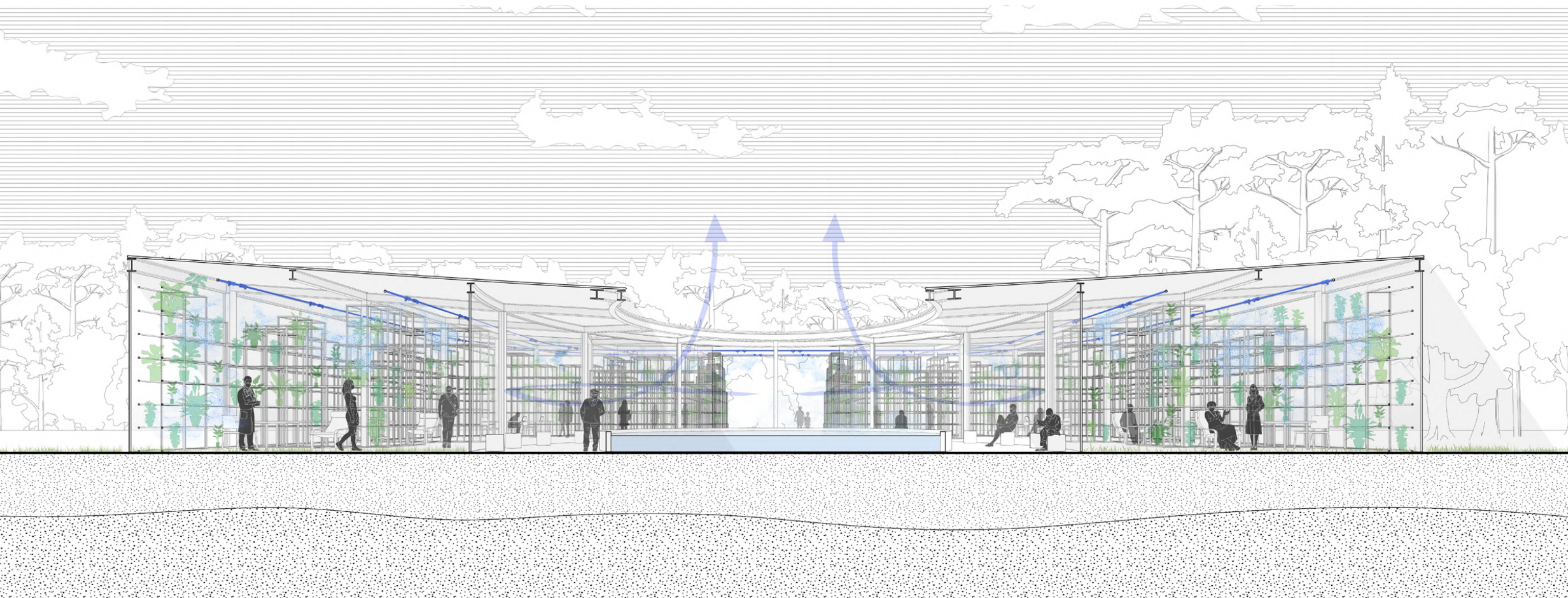
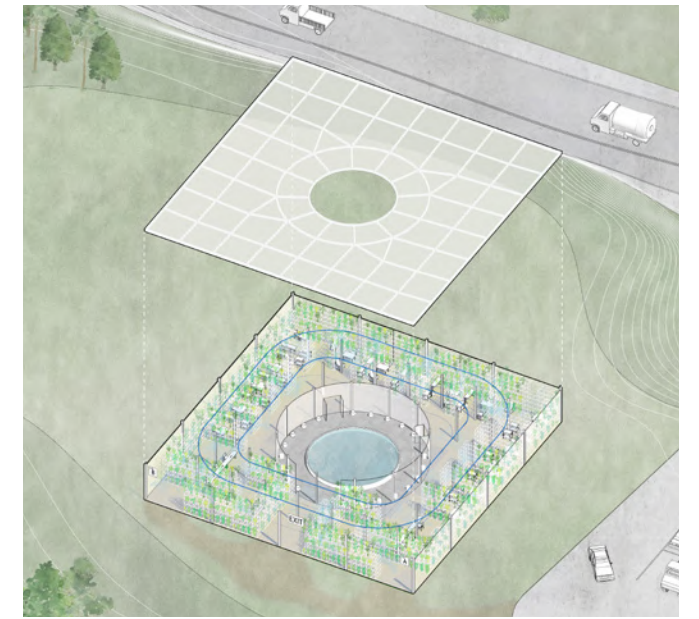
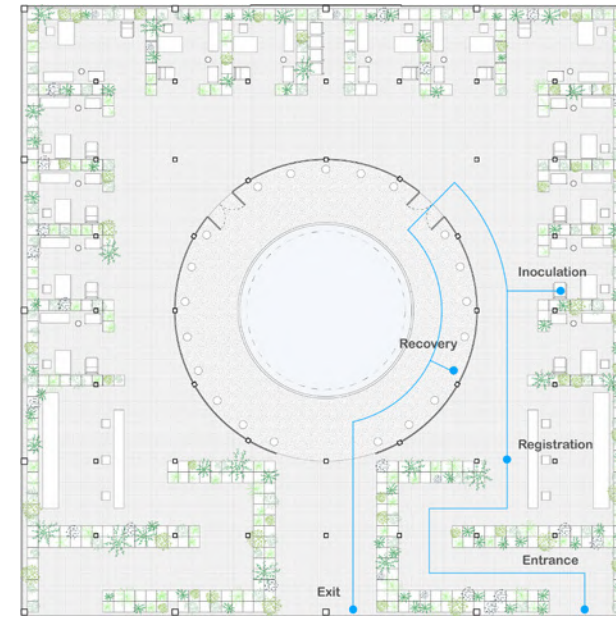
The main goal of seed banks is to preserve seed genetic diversity. It matters a lot because it directly relates to regional and global food production. Due to the accelerating climate change and environmental degradation, it becomes even more crucial to take actions on it right now. A community seed bank can help with that on a regional scale by fostering active exchanges, preserving local species, improving seed yield and quality.

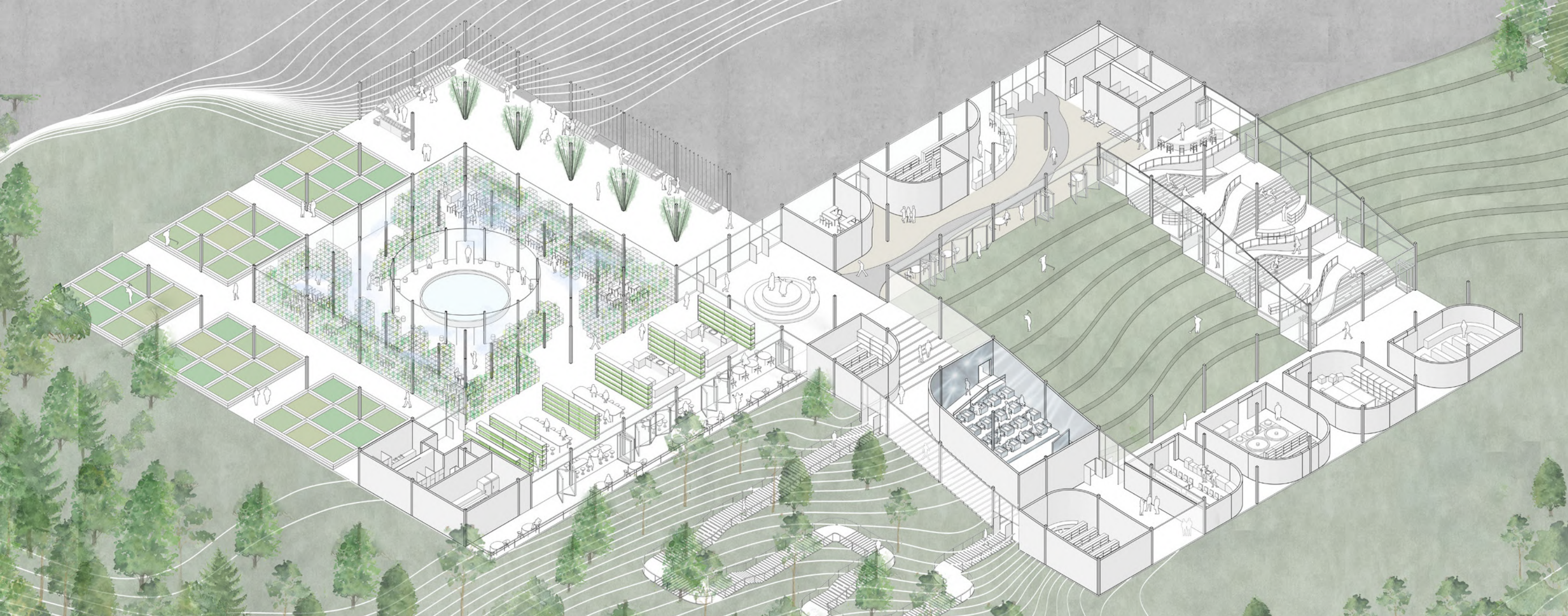




The Trellis is an open structural framework that creates an inseparable triangle between human, architecture, and nature. Serving as an immediate vaccine center, the Trellis follows the topography and gradually grows into a dwelling space for seeds, plants, and nature. Functioning as a community seed bank, it can help ameliorate seed quality, preserve local species, and foster active exchanges and communications. Through an integrated variation of climate, landscape, and activities, the Trellis attempts to trigger people's sense of respective interdependencies and encourage people's engagement in seed diversity and food security.

Serving as an immediate vaccine center, the Trellis employs prefabricated modular elements for quick construction. A mist spray system is installed on the roof to cool down the space and add humidity for both humans and plants. Modular plants shelves function as distance keeper and space divider. As people circulating under the structure, they will feel like entering a “mist forest” because of the density of shelves, plants and also the mist. By visually seeing the greens and physically feeling the moisture and the wind, the coolness will make people stay calm and relaxed. The inoculation process is designed as a sensorial experience that adds a collective memory to people’s physical and mental consciousness, thereby building up trust, equity and connections within the community.





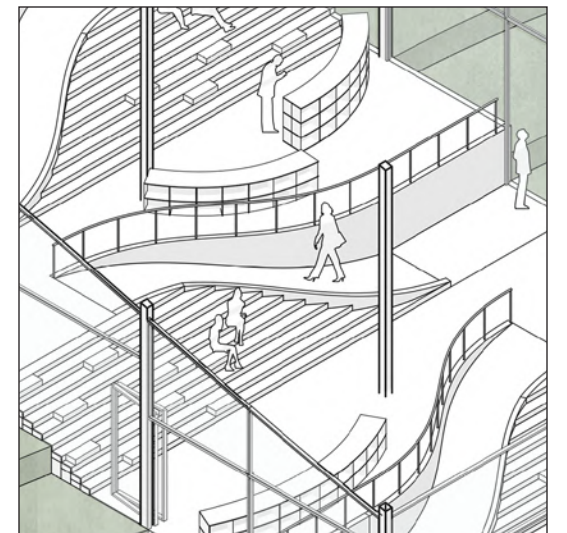
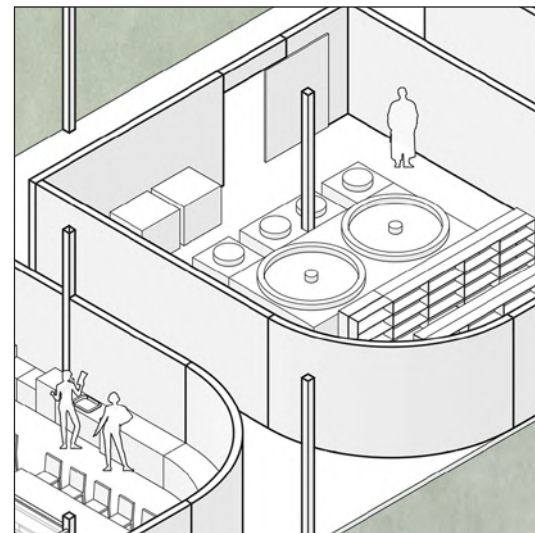
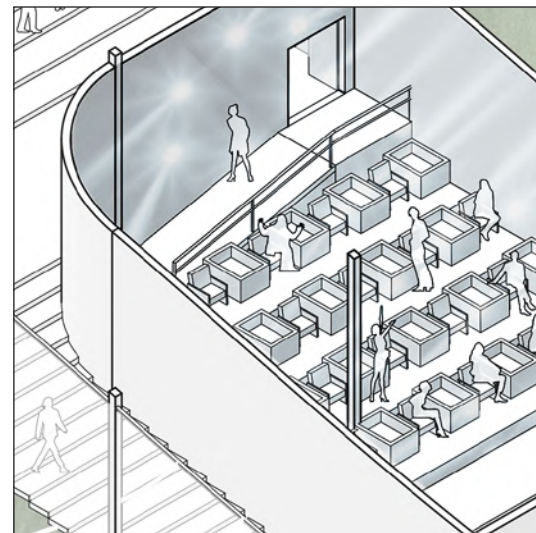
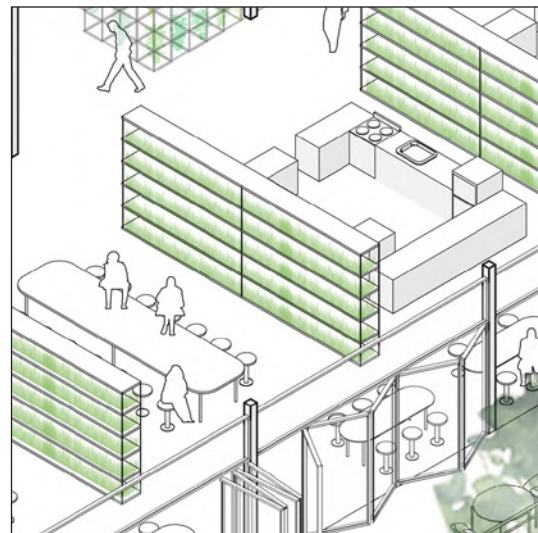
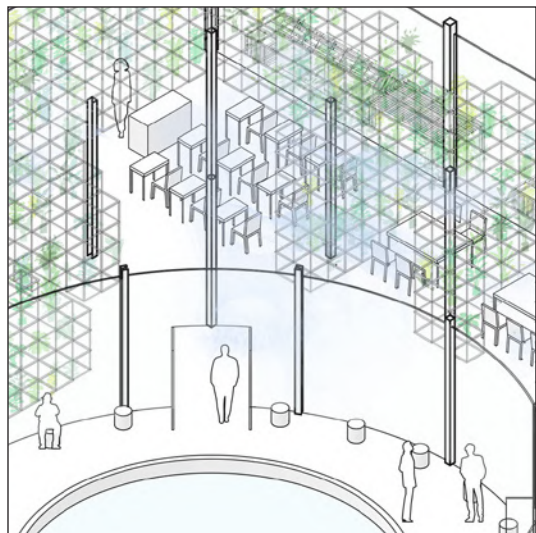
Classroom

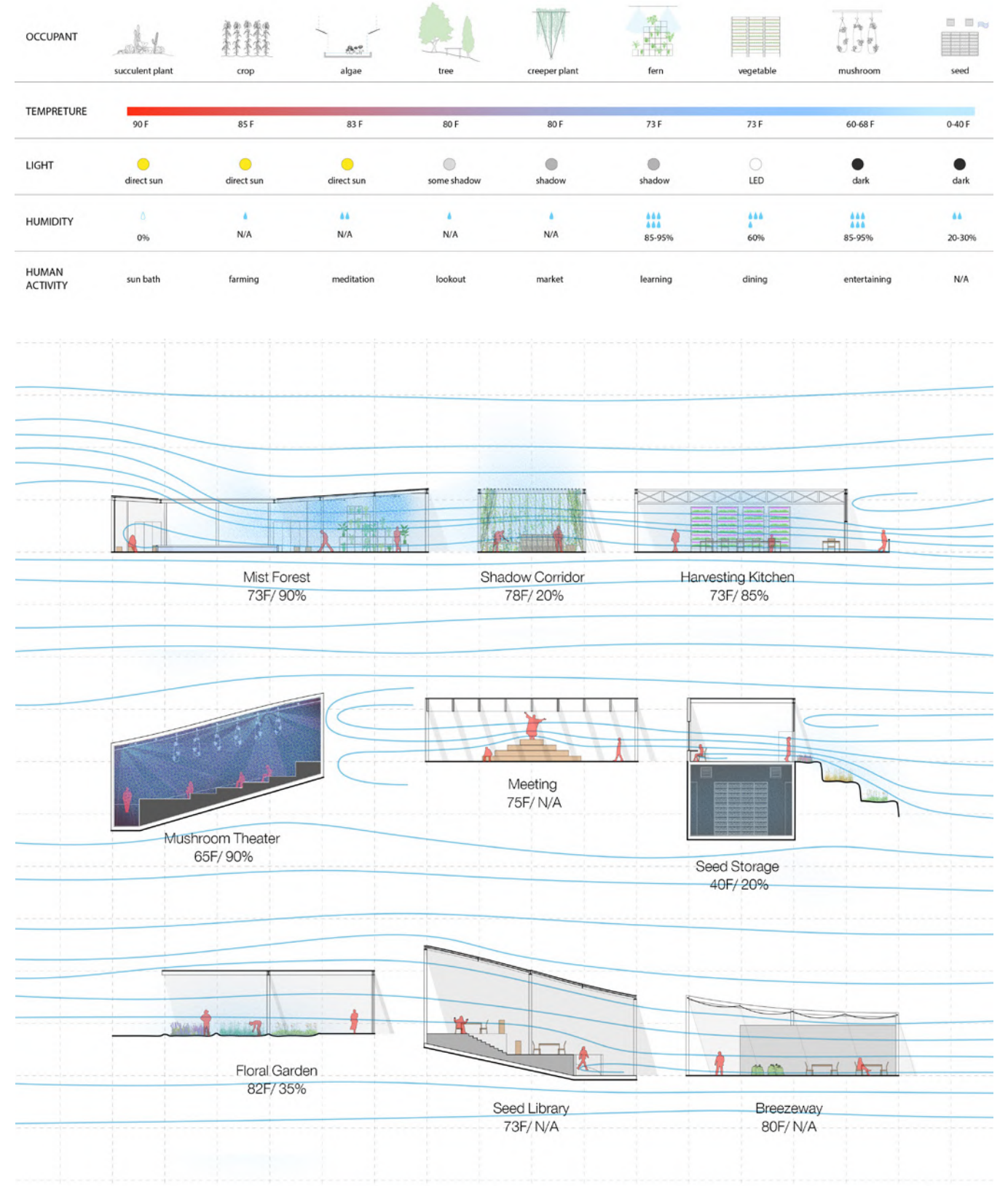
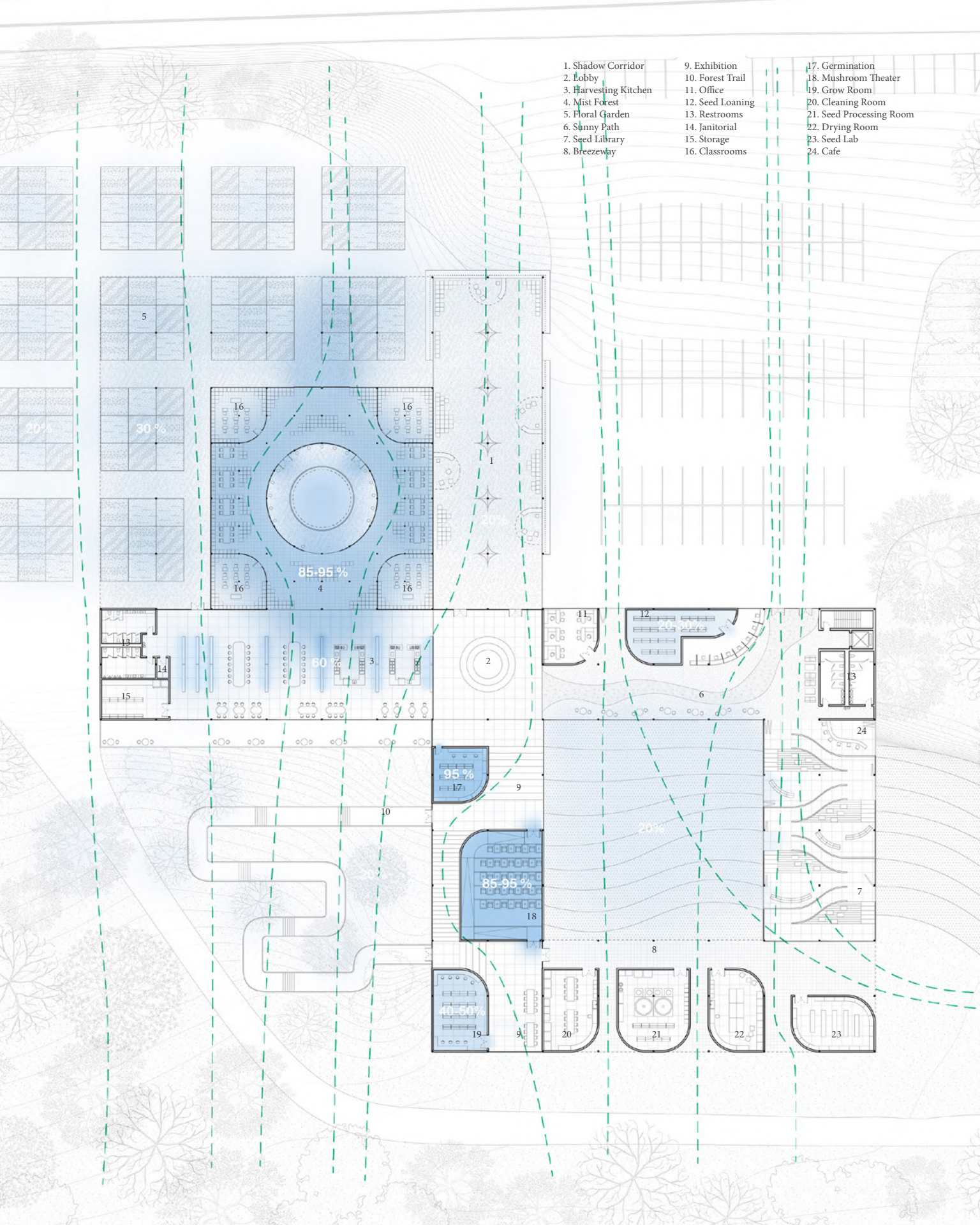
Harvesting Kitchen

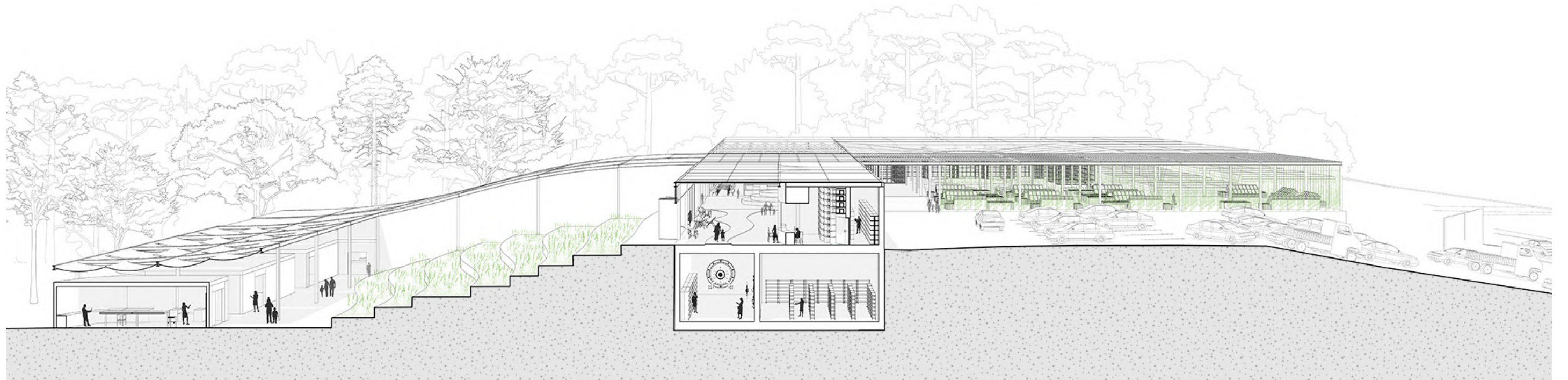
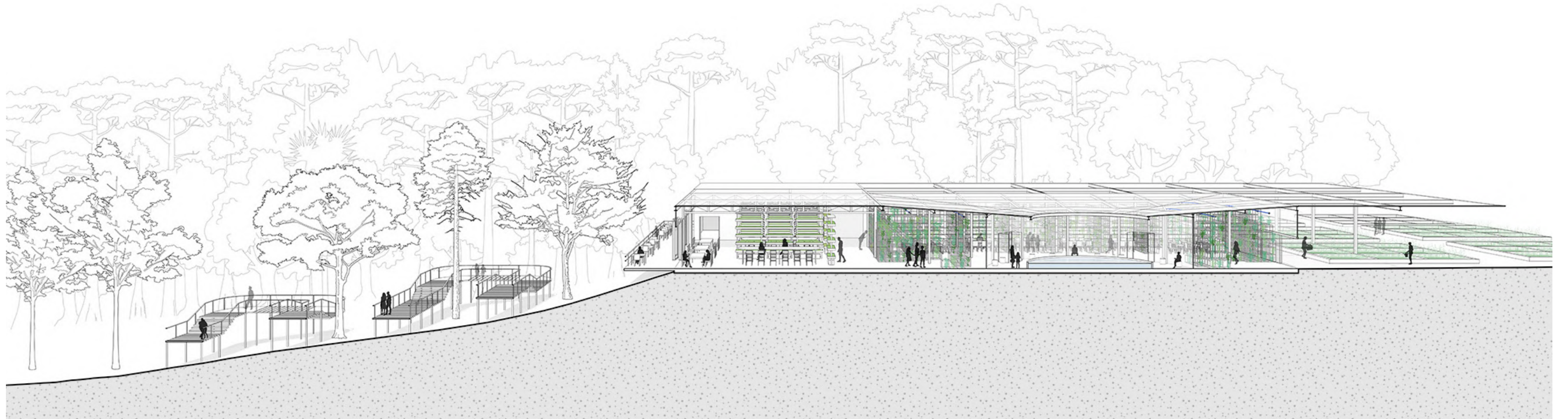
Mushroom Theater

Seed Processing

Seed Library







Shadow Corridor (Farmers' Market)



Sunny Path & Seed Loaning



Exhibition Space



Seed Library



05 Weaving Under

New Public Space Underneath the Viaduct

Critic: Bryony Roberts
Individual Work
2021 Fall

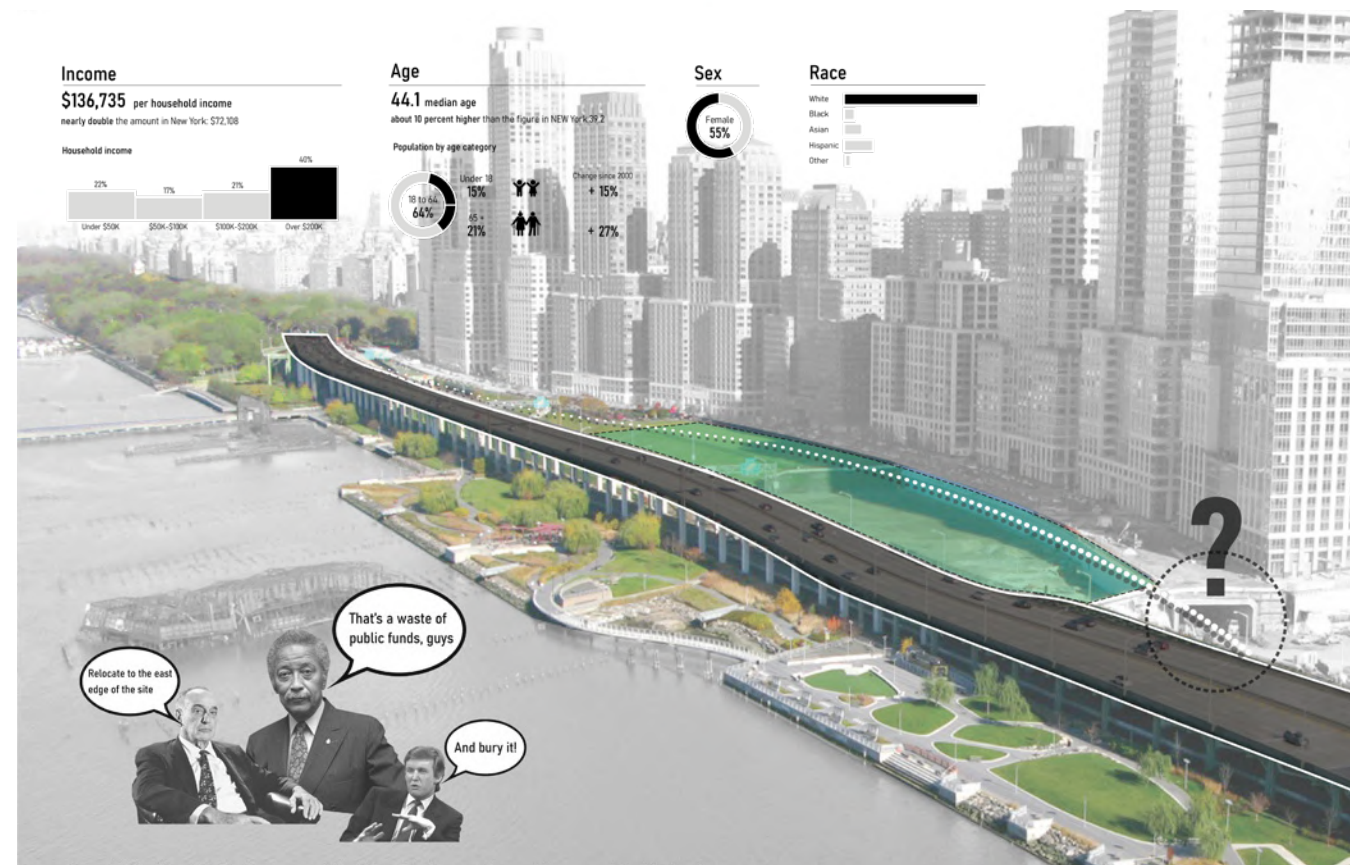
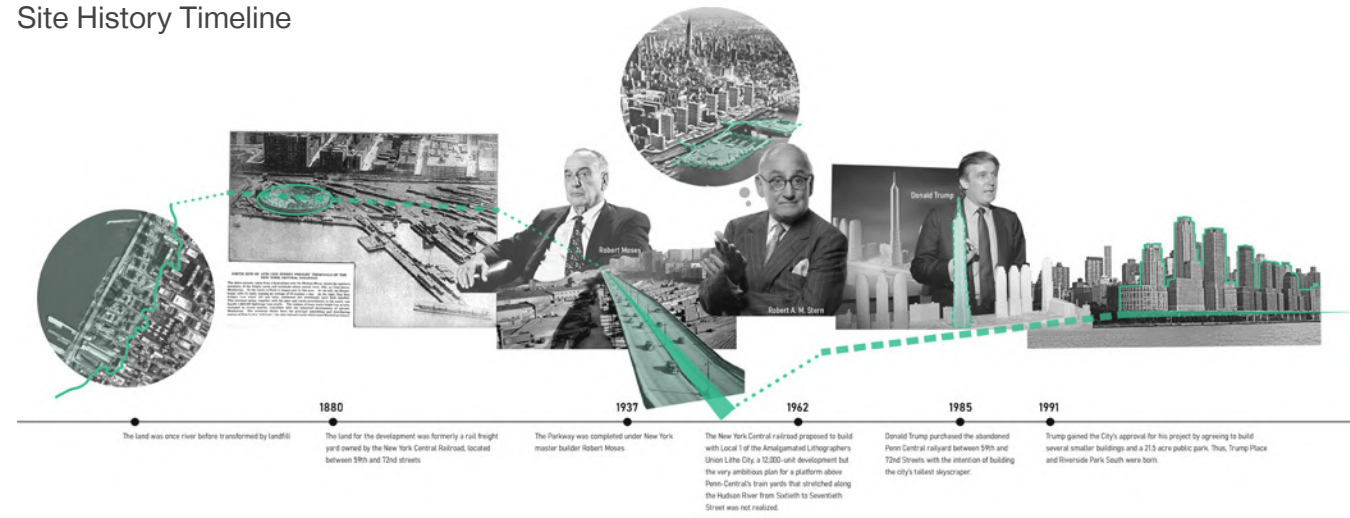
Riverside Park South situates at the west edge of Manhattan, right in front of the Hudson River. The site once served as Penn Central's railyard. It was purchased by Donald Trump in 1985 and gradually transformed into the park we see today.

Above the park, there is a busy highway called the Henry Hudson Parkway. It becomes a viaduct from 72nd St and lands on the ground at 57th St. And it is the last section of the historical Miller Highway.

An interesting debate for decades is whether to relocate the traffic into a tunnel and demolish the viaduct. Removing the structure would cost a lot of public funds and resources. Therefore, the intention of this project is to create things that can live with the giant infrastructure and help it transit to the next stage. I'm interested in reimagining this under-utilized void space and developing a new urban park typology that can be adapted to other places.

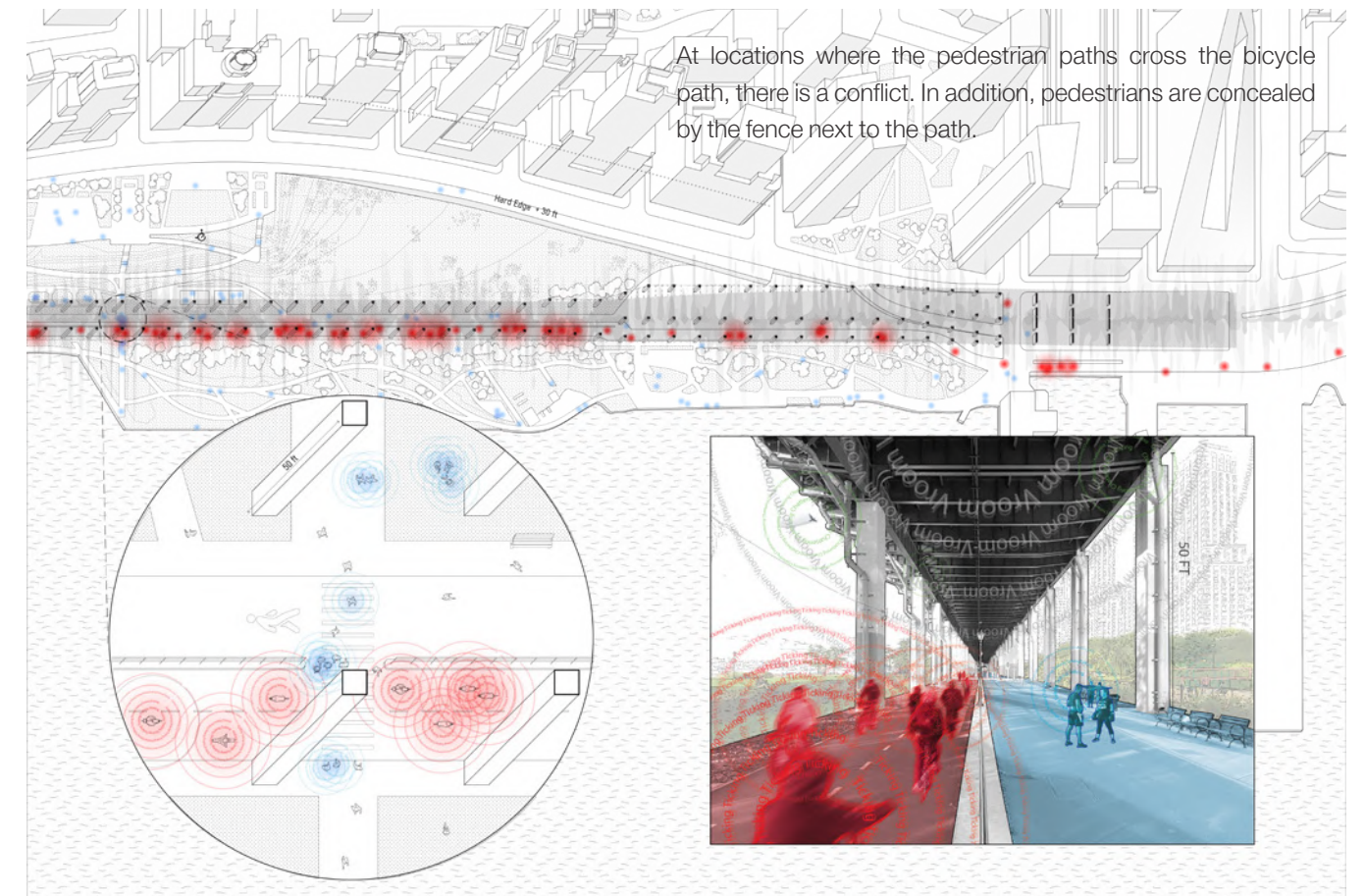


Site History Timeline

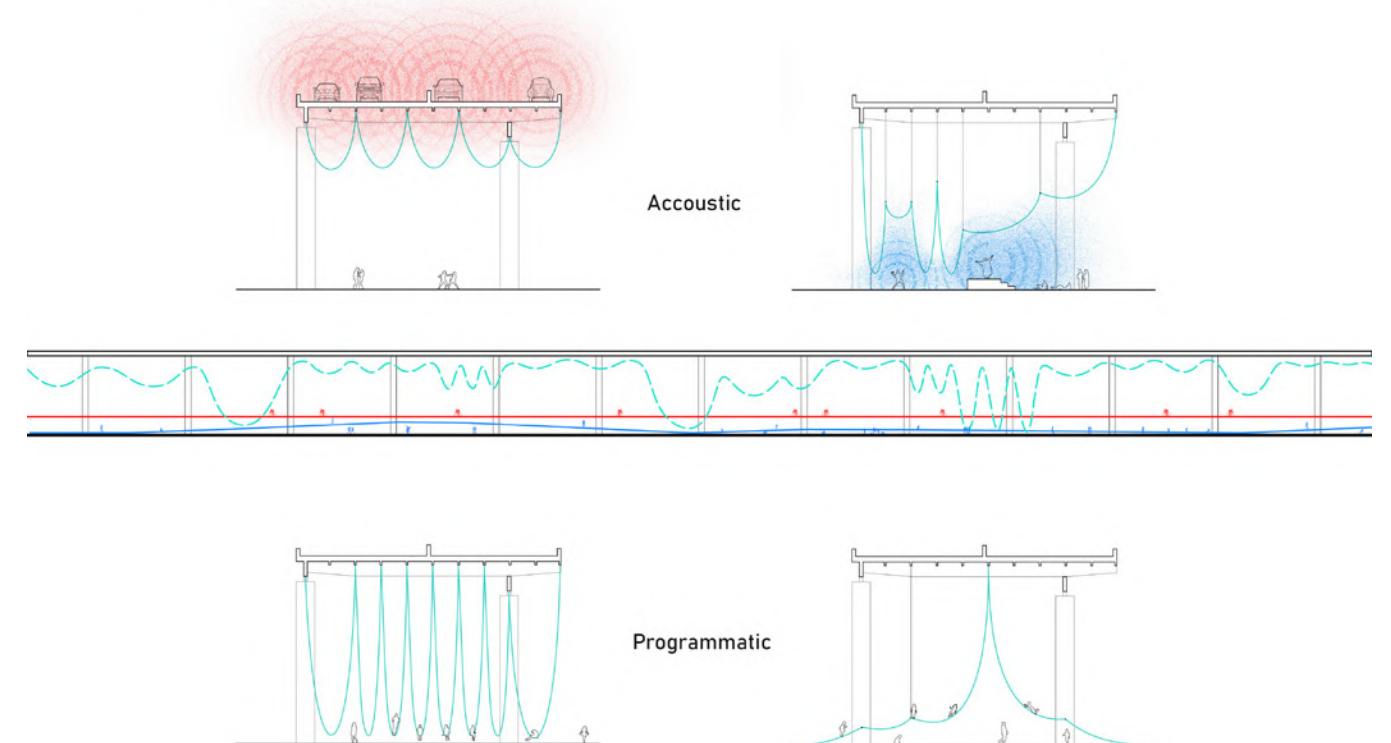


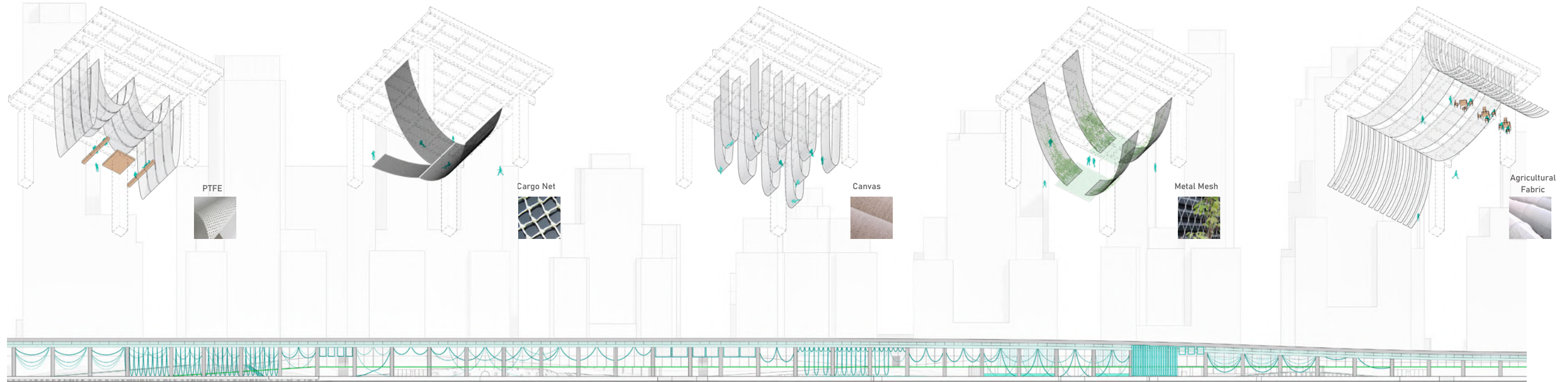
Traffic Relocation

As part of the Riverside South agreement, the Urban Development Corporation proceeded with planning and environmental studies for a relocated highway. But relocating and burying the elevated highway section became politically complicated when, at the same time, NYSDOT went ahead with its \$70 million project to straighten, widen, and reinforce the viaduct. In 2005 Trump's majority partners sold the project to the Carlyle Group and Extell Development Company. In June 2006, the new developer began construction of a tunnel between 61st and 65th streets for the relocated highway.



Site Concept





ART & PERFORMANCE

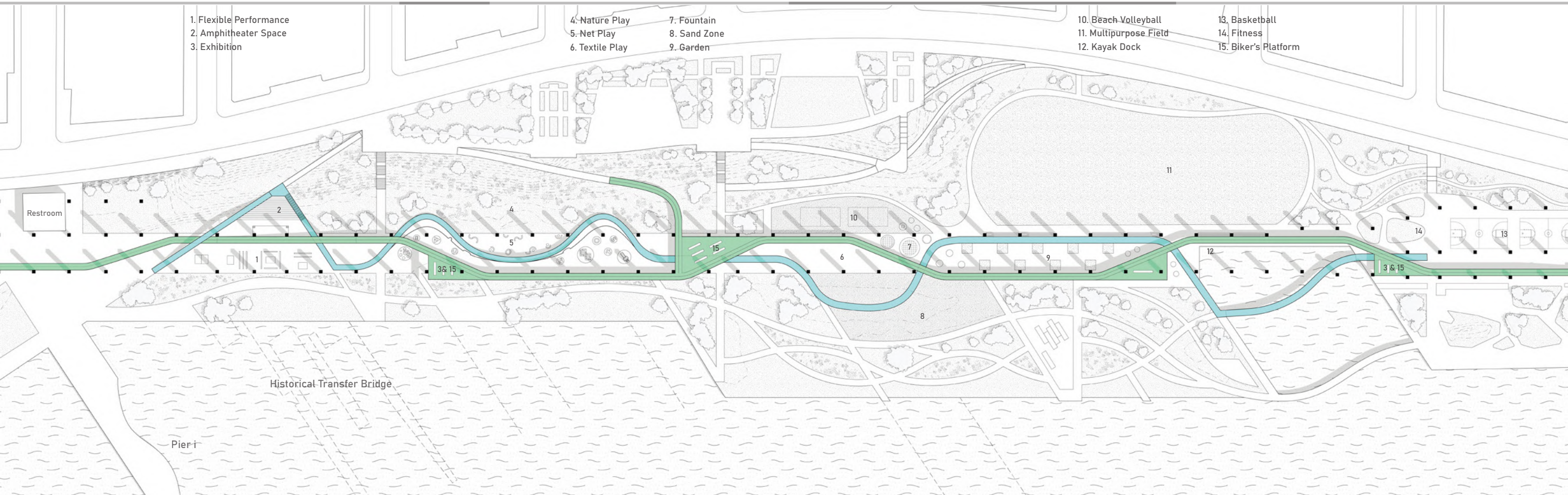
SENSORY PLAY

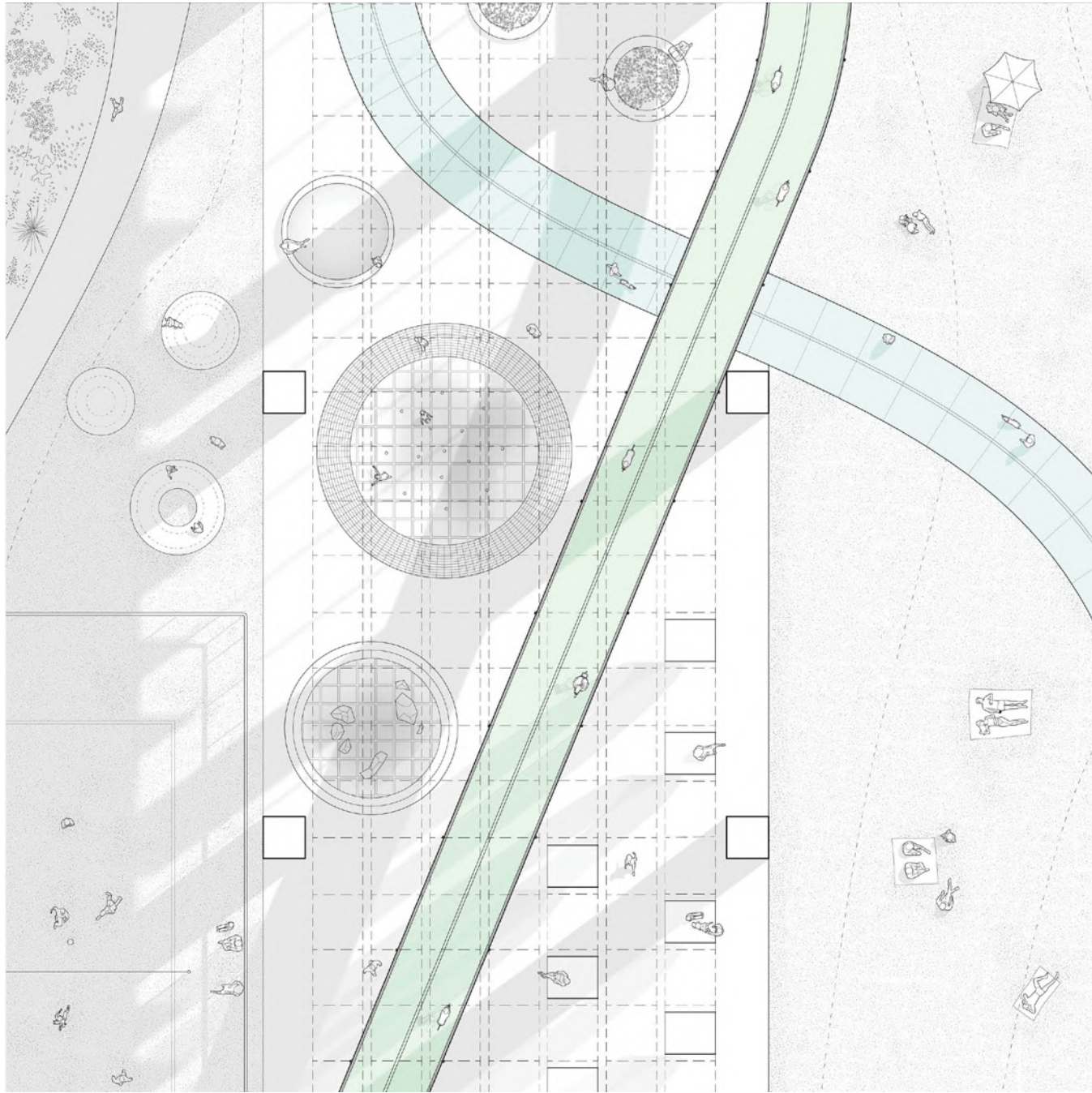
SPORTS

- 1. Flexible Performance
- 2. Amphitheater Space
- 3. Exhibition

- 4. Nature Play
- 5. Net Play
- 6. Textile Play
- 7. Fountain
- 8. Sand Zone
- 9. Garden

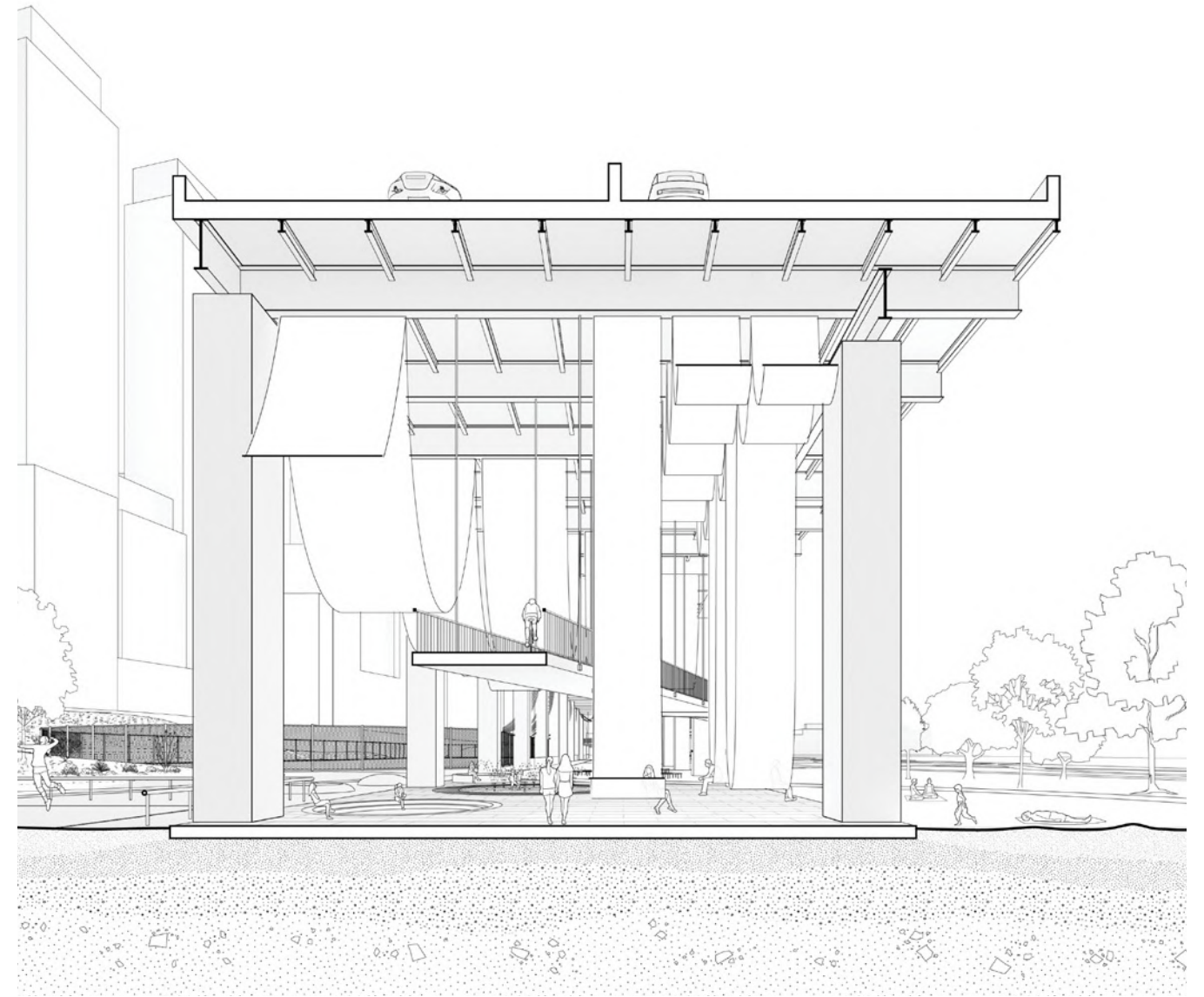
- 10. Beach Volleyball
- 11. Multipurpose Field
- 12. Kayak Dock
- 13. Basketball
- 14. Fitness
- 15. Biker's Platform





Detailed Plan of Sand Zone

On the east side of the viaduct are the existing beach volleyball courts. The other side is the new sunbath area. Right next to the fountain, there is a resting space where the long canvas pieces function as chairs, swings, and hammocks.



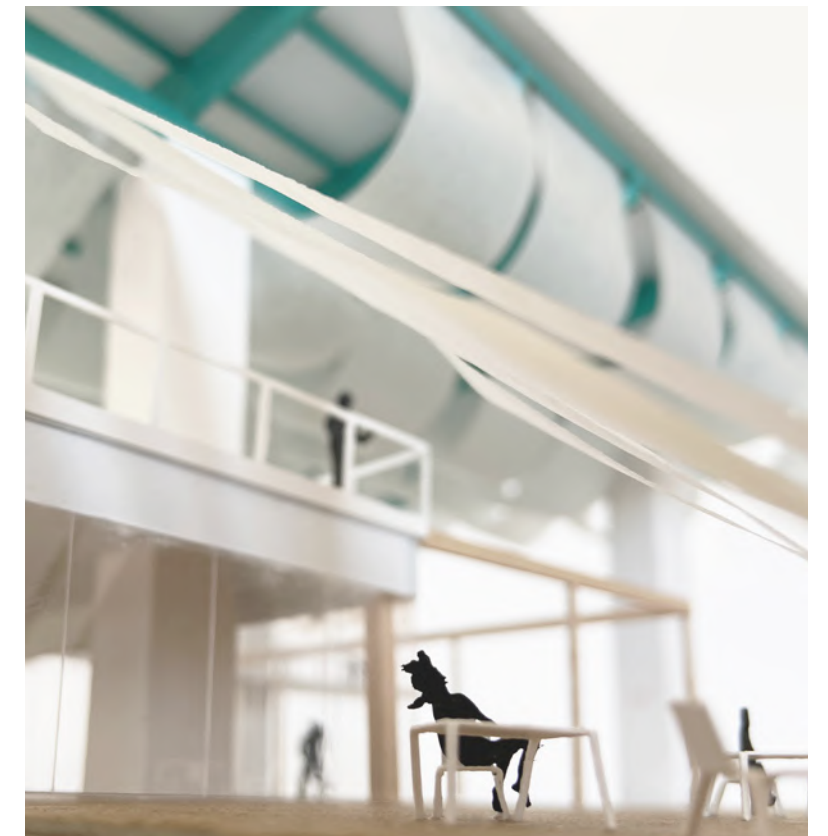
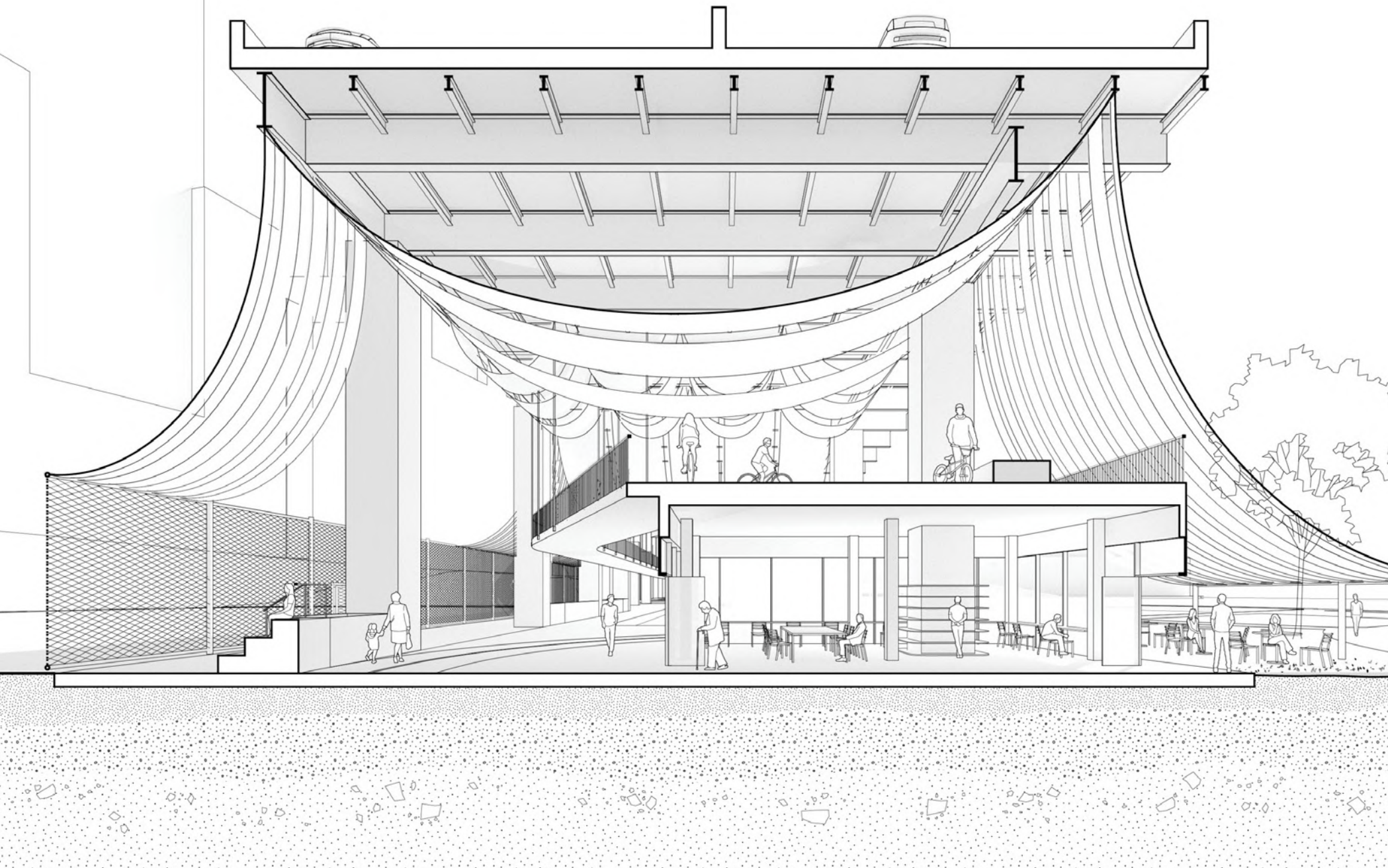
Section of Sand Zone

shows how different sensory experiences come together. People can have fun with water, sand, textile all together.

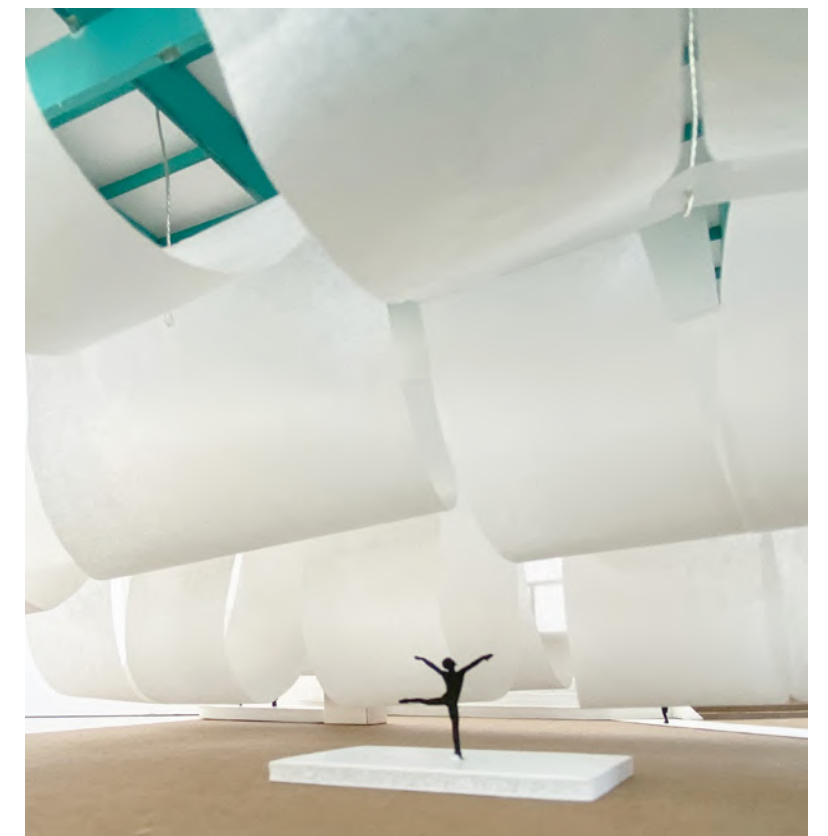
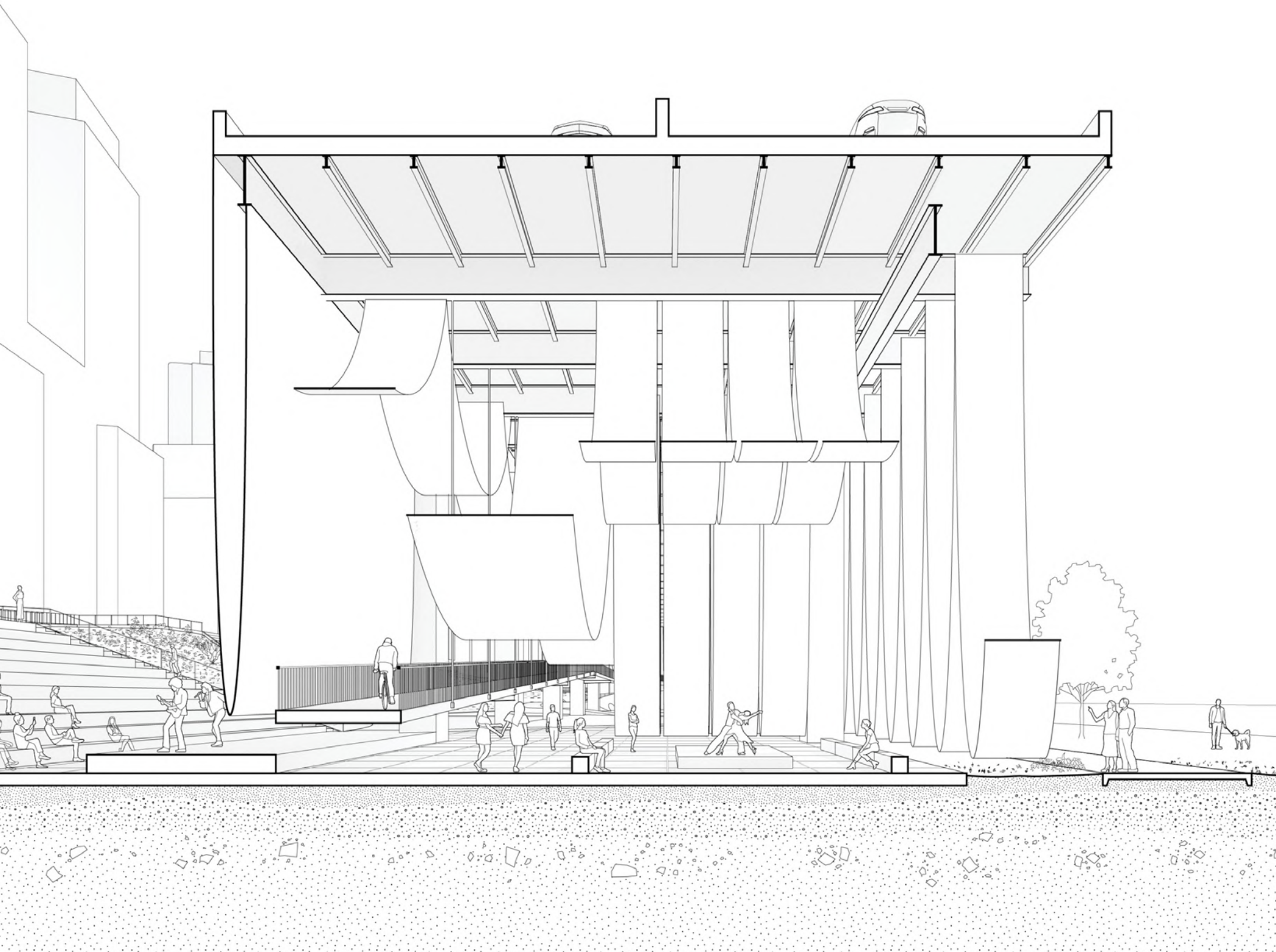
Everything in this project is hanging except the grounded pedestrian lane. I'm taking advantage of the existing structure and making it become the framework for the new intervention. Different materials are hanging under the structure, creating a gradient of translucency. And it is constantly changing as you move in space. The dialogue between what is light versus what is heavy, what is transparent versus what is opaque has always been present.



The cafe under the biker's resting platform will become a place for people to gather before or after sports. The agriculture textile extends outside the viaduct here and becomes a canopy to shade the stand and the outdoor space of the cafe. At the biker's platform, the fabrics are hung really low. Together with the extending pieces on both sides, the space feels more compressed to slow down the bikers. People standing underneath are able to glimpse the sky through the translucent material and the gaps between the fabric.



The amphitheater is on the east side of the viaduct. Here is the moment of the bike lane landing on the ground and the pedestrian lane from the landscape ramp passing above it. For the space under, PTFE fabrics are hung really low, for better acoustic condition. Here the fabric is shaped like a curtain. The transparency makes it an obscure boundary between the performing space and the landscape beyond.

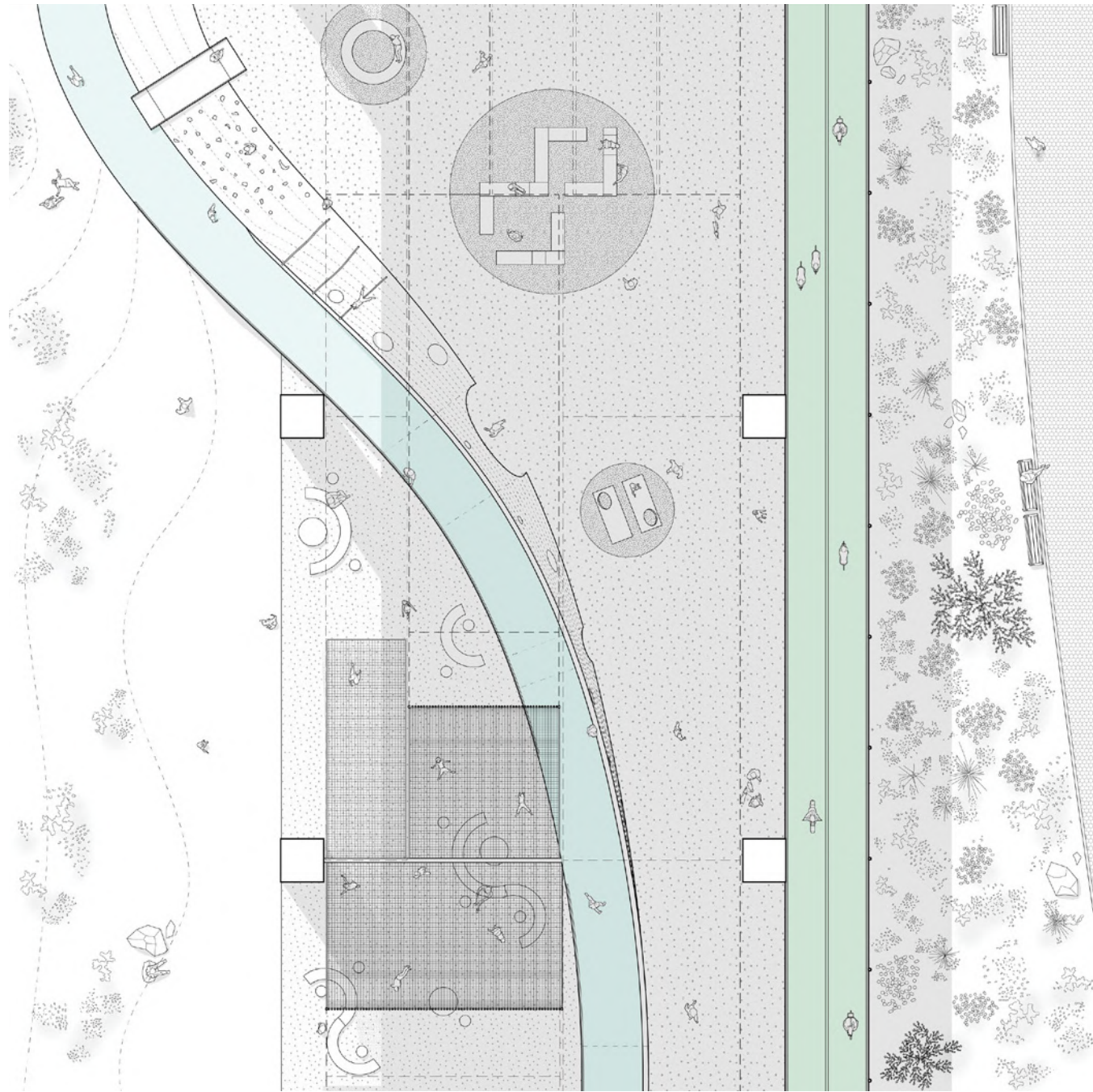




The density of the fabric will make people feel more enclosed. The sunlight is filtered. The breeze that can't stop drifting in and out while exciting the fabric. As all this happens, you will be continually moving between blurred and bright images.

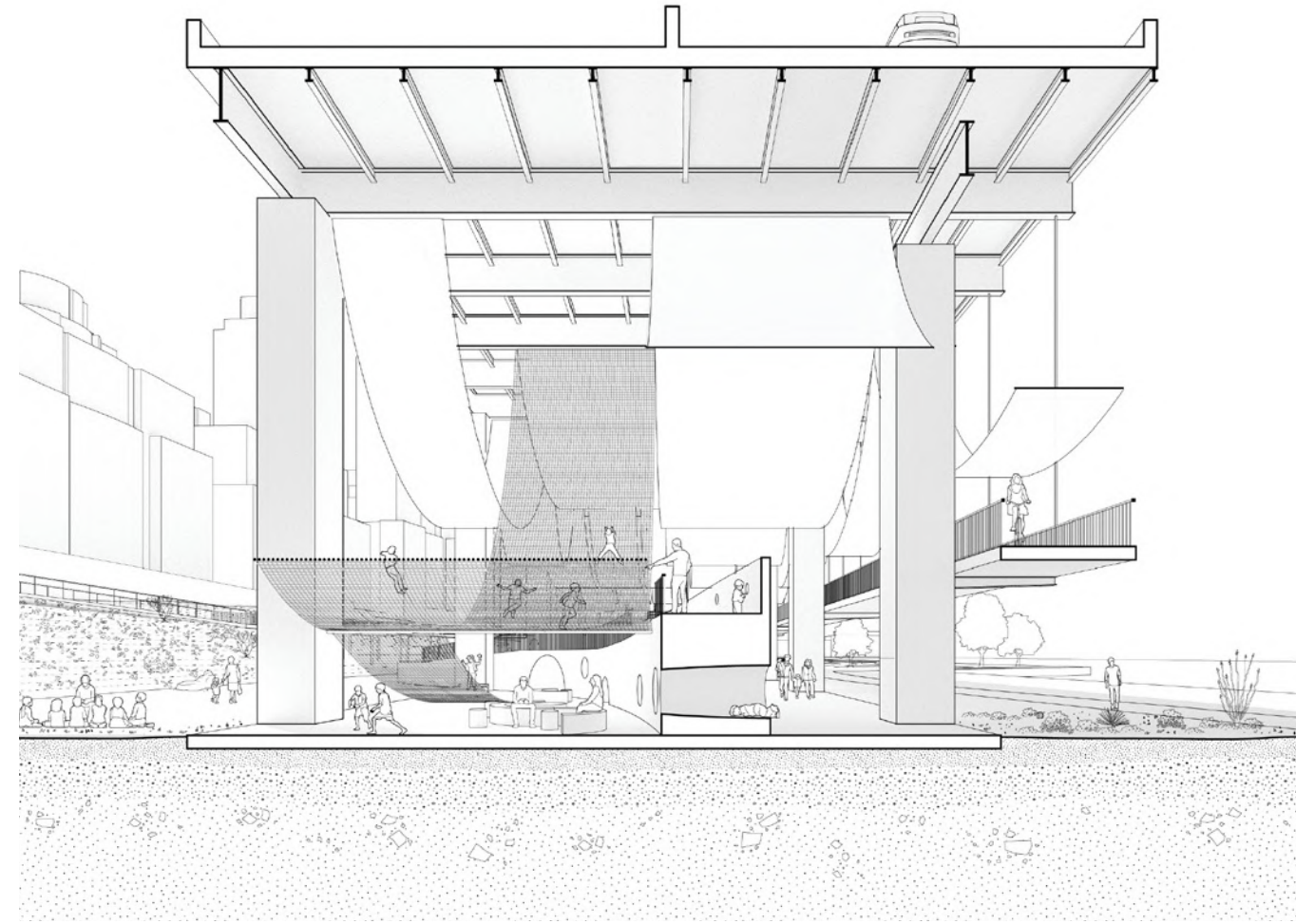


At night, the site will still be active. Movies and performances are going to happen here. The fabrics will look even more ethereal due to the light. The curvature of the fabric is highlighted to make the viaduct proud and add a new feature to the waterfront park.



Detailed Plan of Kids' Playground

The pedestrian pathway follows a curve that leads people to switch the experience of entering or exiting the under viaduct space. The pathway itself is elevated and transformed into giant playful furniture for kids.



Section through Kids' Playground

The cargo net is in place to interact with people on the ground and on the pathway. Kids are offered different types of sensory play in this project. Ranging from natural to man-made, from traditional to unconventional.



06 The Living Crown

Avery Hall Roof Addition

Critic: Gordon Kippingg
Individual Work
2022 Spring

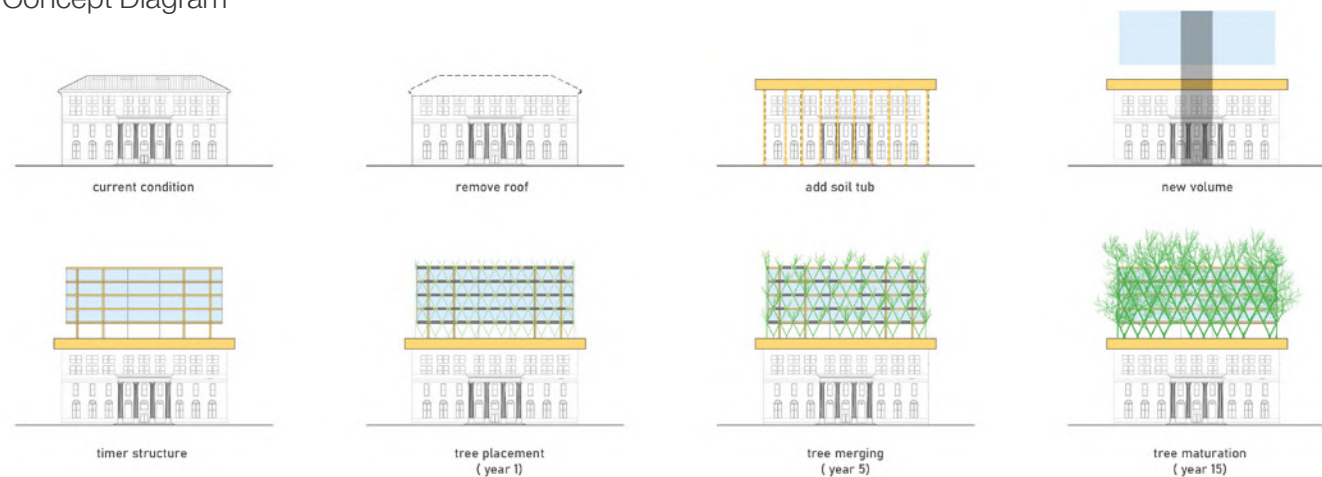
My proposal respect the shell of the historical Avery Hall and only do small surgery inside to regulate the circulation and program arrangement. The big picture idea is to remove the roof of Avery and replaced with a giant soil tub for trees to grow upon. Above that, four more levels are supported by glulam columns in the beginning. Trees are placed in a vertical network held by the scaffold. After 15-20 years, when the living structure is mature. It will carry the horizontal members and columns will be removed.

Baubotanik is a new building method in which architectural structures are created through the interaction of technical joints and plant growth. An important strategy for Baubotanik building is tree grafting to increase the strength of the structural elements. In this regard, living and non-living elements are intertwined in such a way that they grow together into plant-technical composite structure.

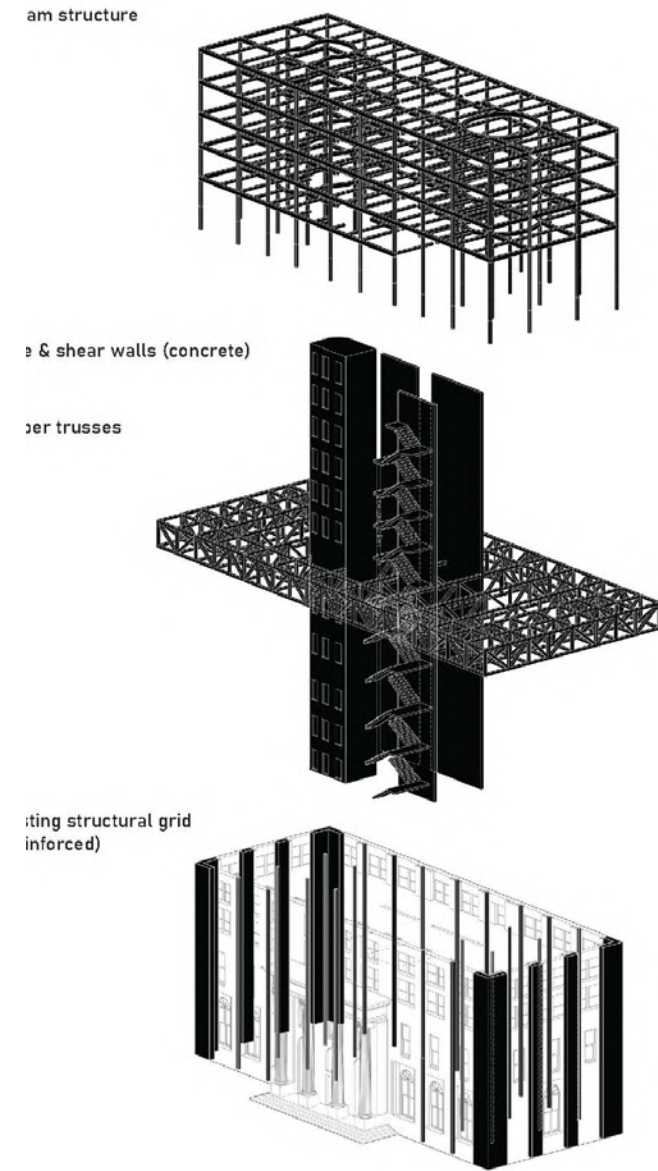




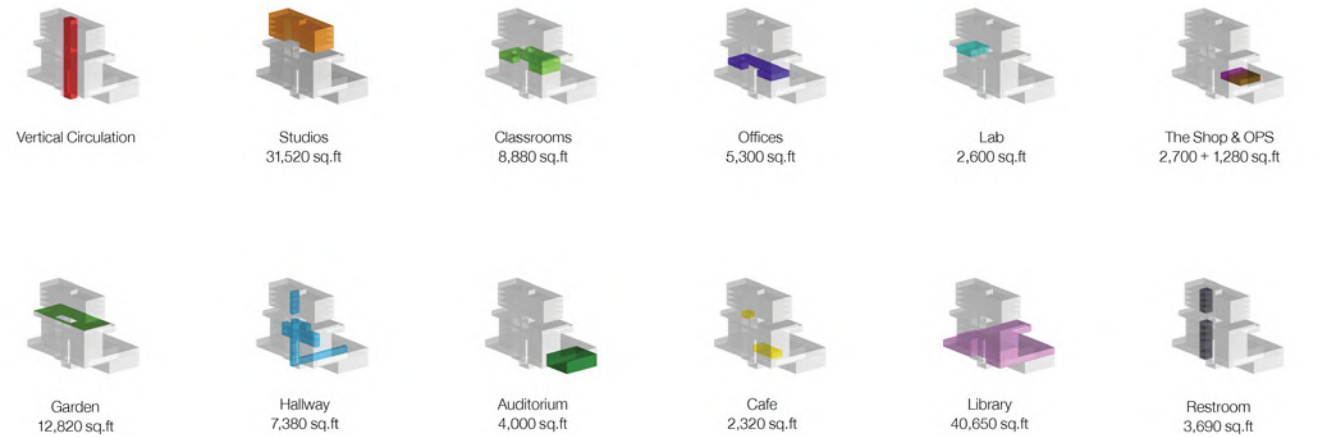
Concept Diagram



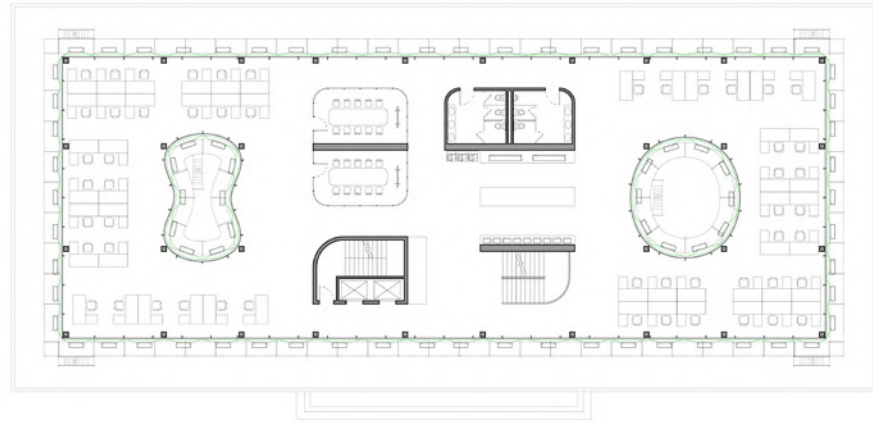
Structure Diagram



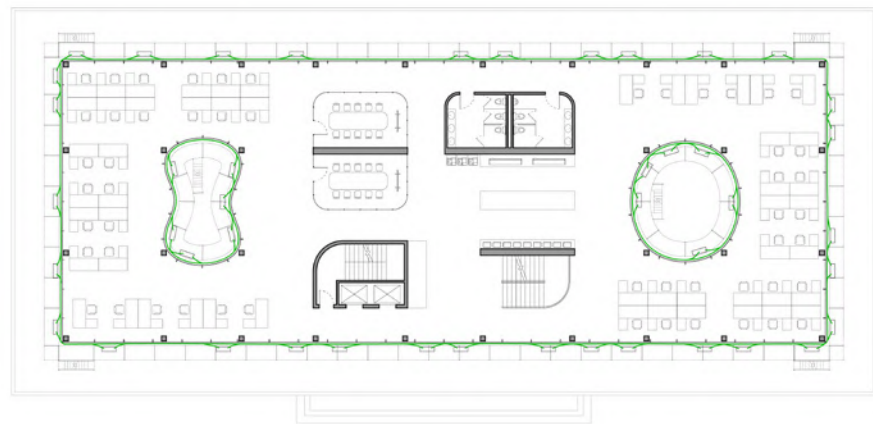
Proposed Program Arrangement



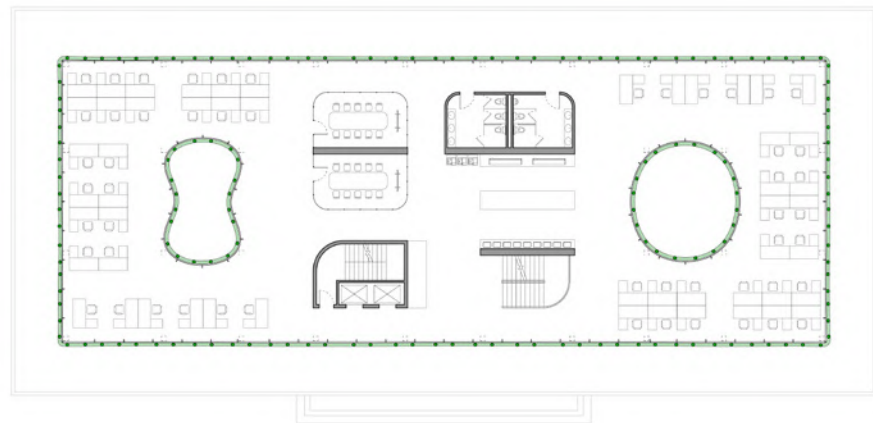
The middle part is circulation, service space, and space for collaboration. The two sides are the studio space organized around the light shaft. The scaffold system is installed at the peripheral and inside the two voids. Tree trunks are bundled together at different levels to form a network. As younger trees are growing into each other, their roots will become redundant. So the roots in the air can be cut away and they will eventually grow into one stronger tree that is nurtured by the soil down in the ground.



Year 1 - Typical Floor Plan (scaffold and soil containers in place)



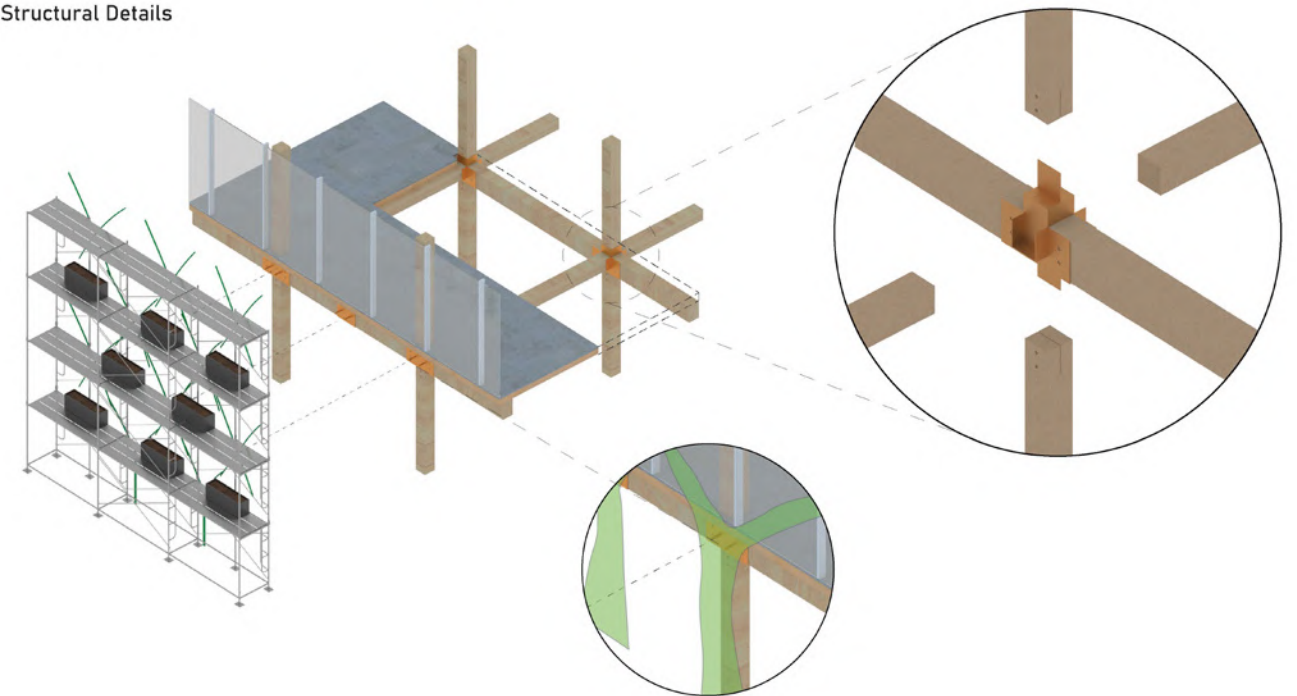
Year 5 - Typical Floor Plan (trees merging)

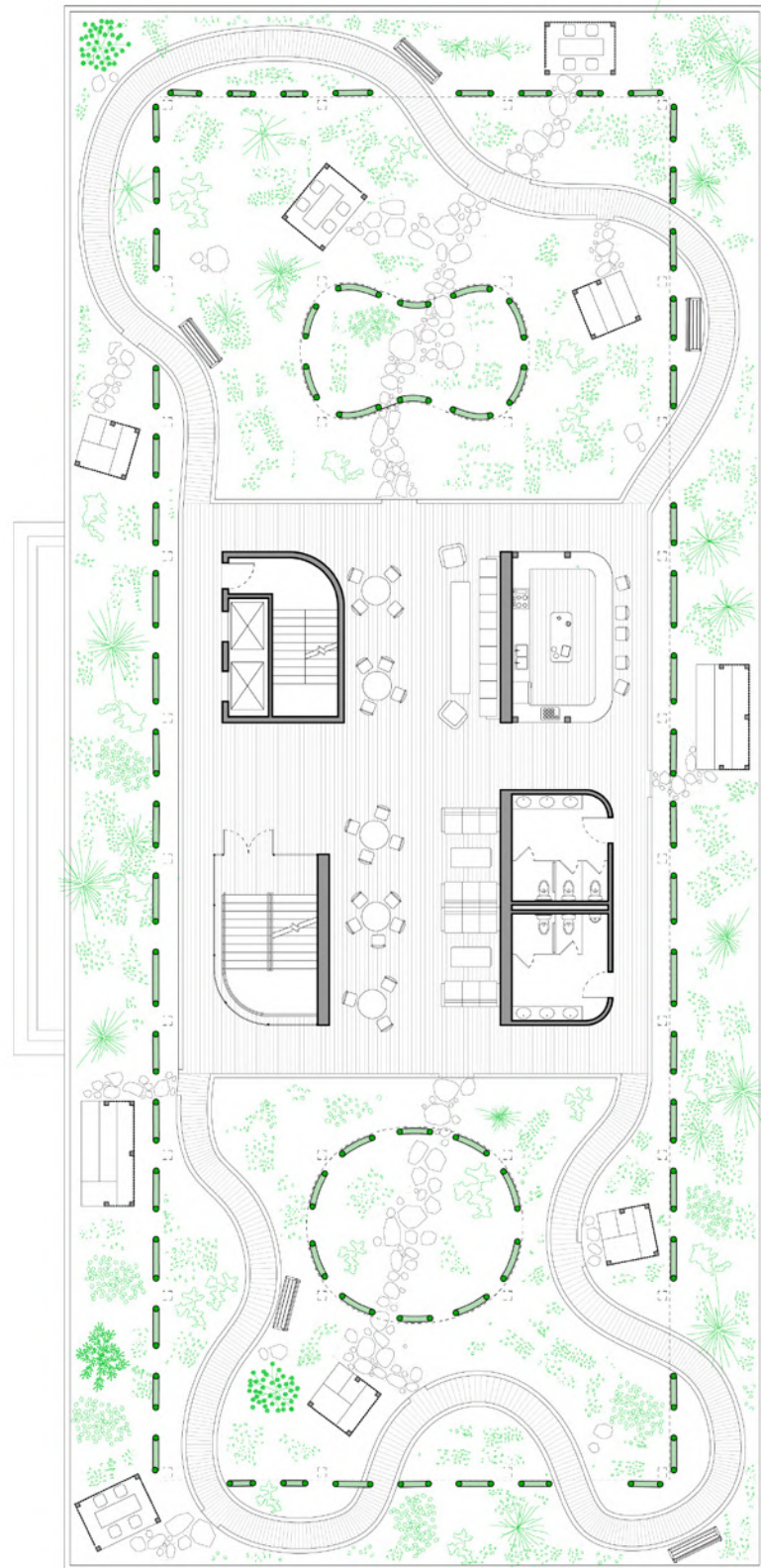


Year 15 - Typical Floor Plan (tree matured | scaffold and columns removed)



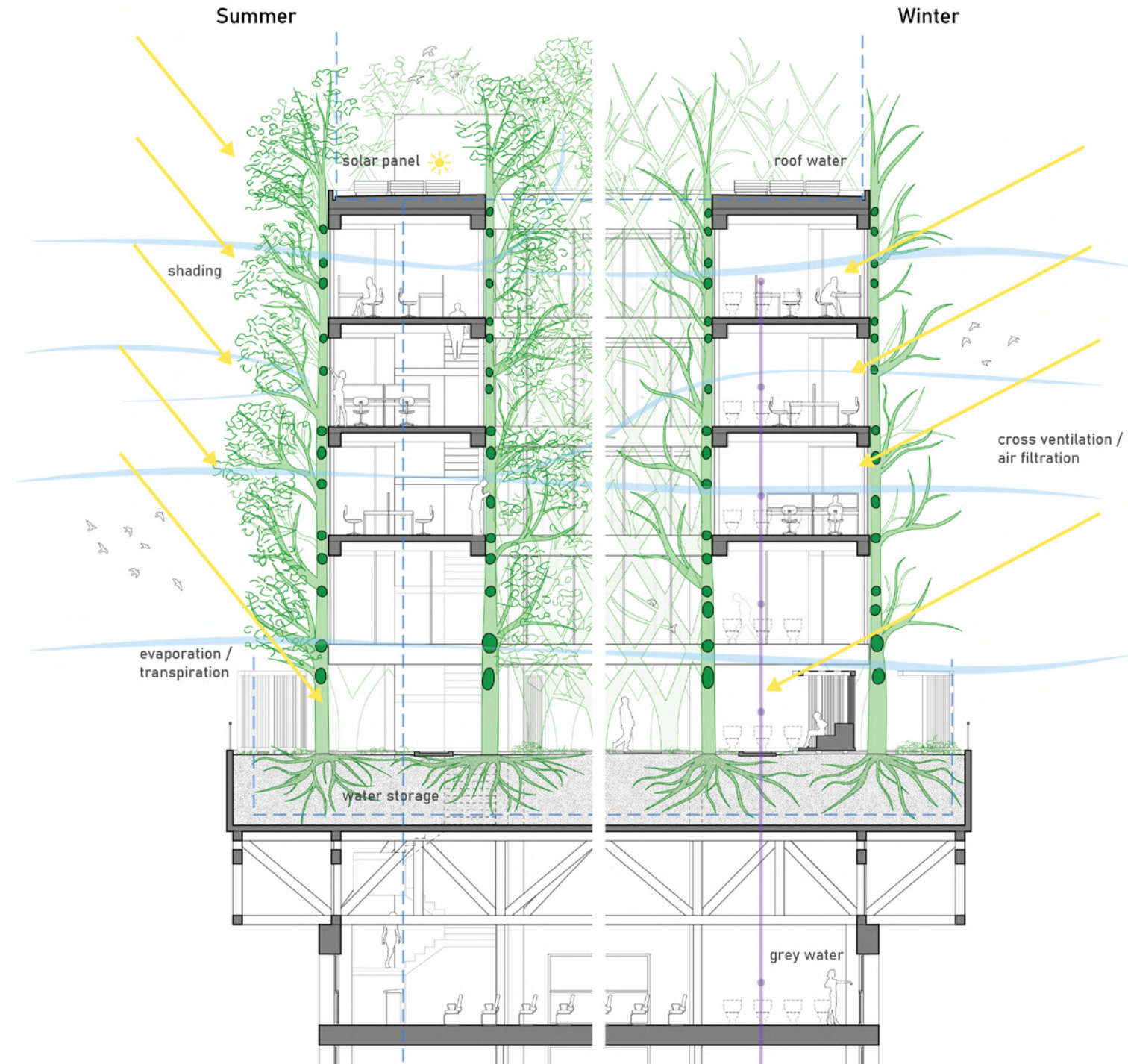
Structural Details





Why Baubotanik?

By using living trees as a construction material I try to break down the differences between the man-made and the natural. The project is built but live. And it shows all the positive aspects we know of trees: They provide shade, cool and filter the air, regulate the natural water cycle, produce oxygen, and absorb CO₂. Their impressive canopies are aesthetically enriching and a co-habitat for humans, plants, and animals.



The garden is an intermediate space between the old Avery and the new addition. It will become a place for students to breathe, gather, chat, and get food and coffee. By entering the garden, People will be received by the shady coolness of a tree that is both, a natural and an architecturally designed space. There are all the sensuous qualities one knows from naturally grown trees and forests: like the leaves swooshing in the wind or their dancing shadows.



The building is a constructed tree, a regular box, that will change its shape over the years.

At the same time, the building is a challenge for architecture and a call to action for collective activities. Innovative techniques allow realizing living buildings immediately in the dimension of fully grown trees. At the same time, designing living architecture questions our static design approach. It rather requires process-based thinking, the acceptance of partly uncontrollable factors, and the willingness to recognize these as aesthetic opportunities. Which I think is valuable for us as designers to think about.



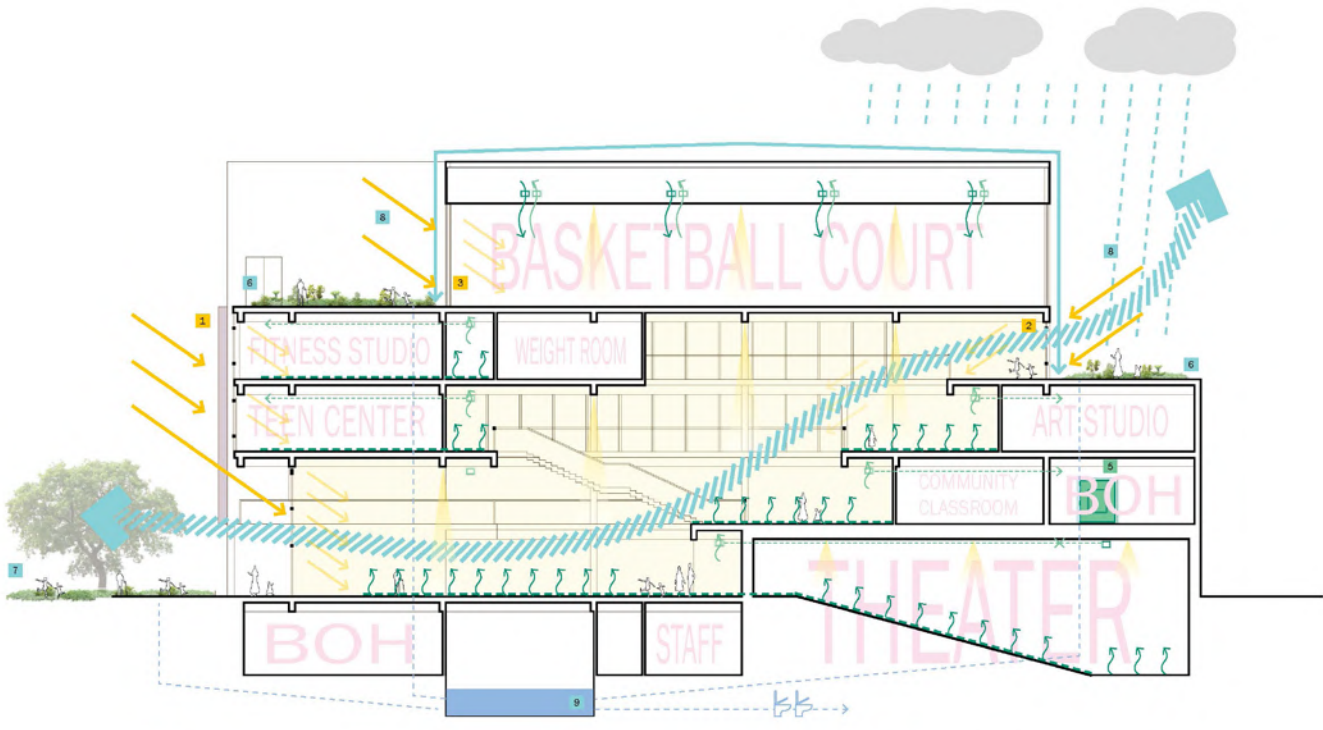
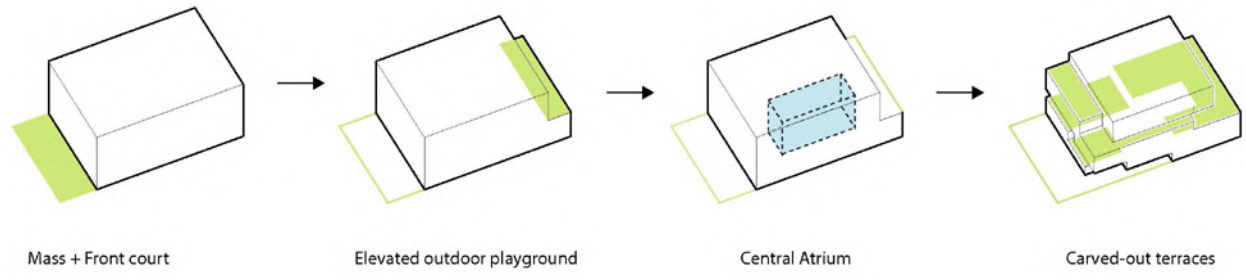
07 Oblique Atrium

Melrose Community Center

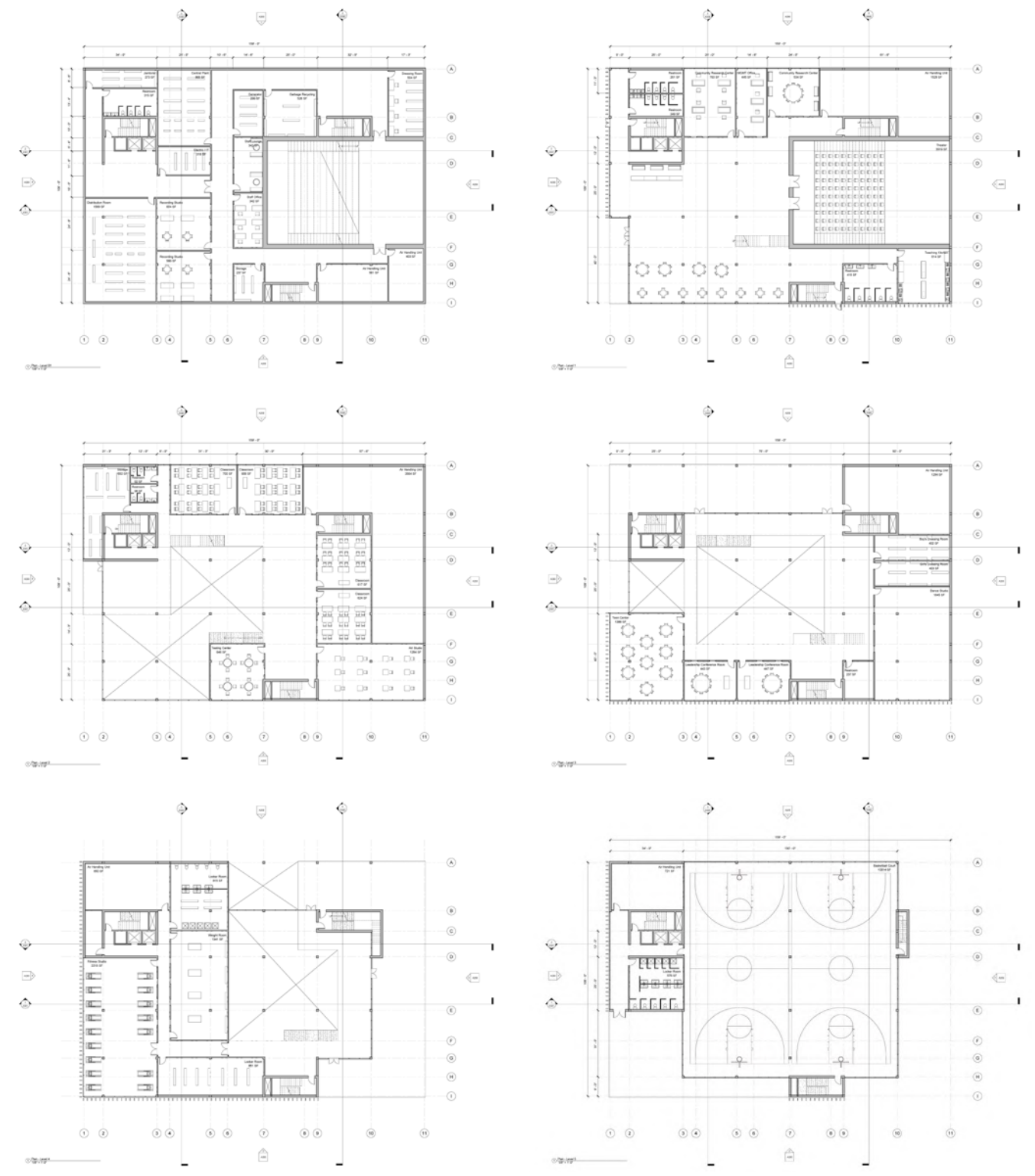
Teammate: Sixuan Chen, Hao Zheng, Peicong Zhang
2020 Fall AT III&IV

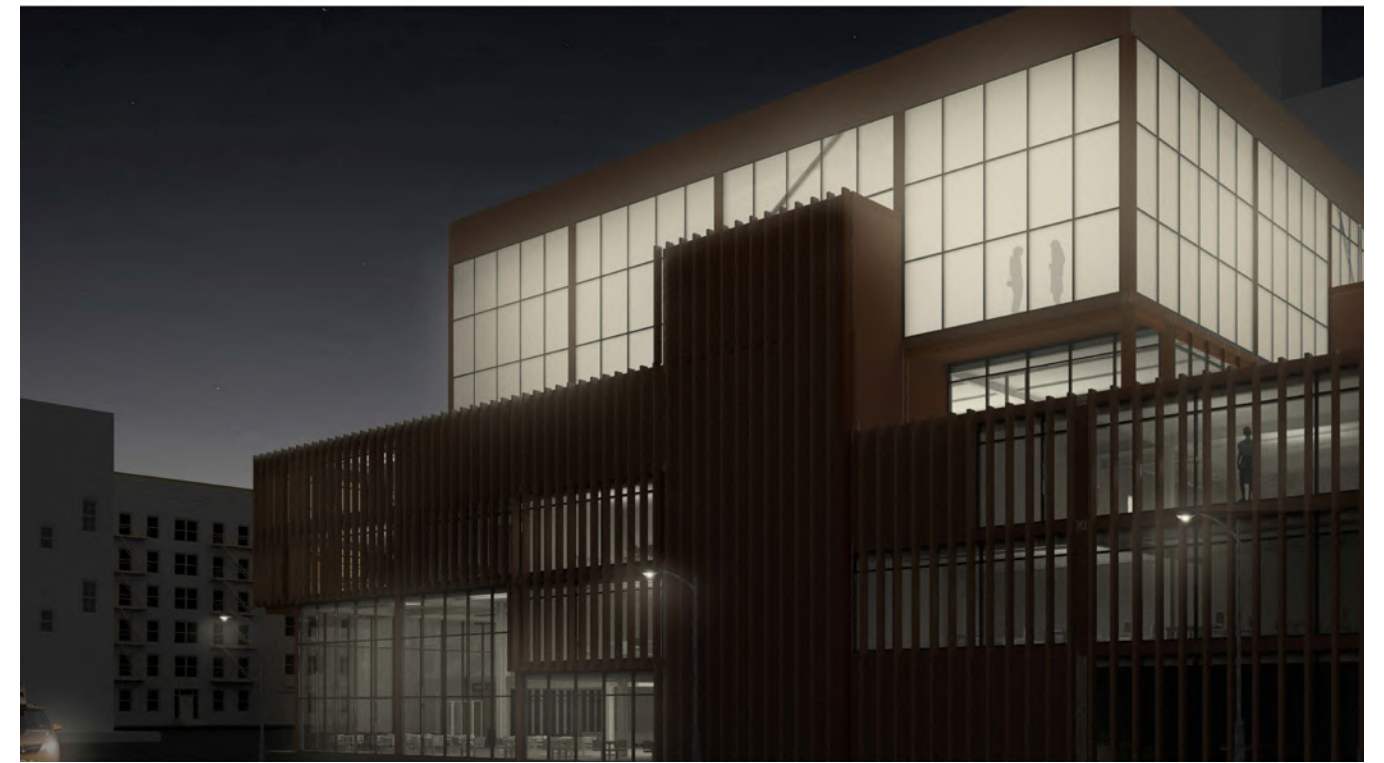
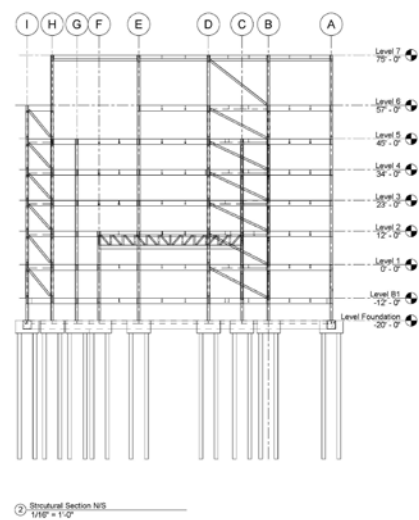
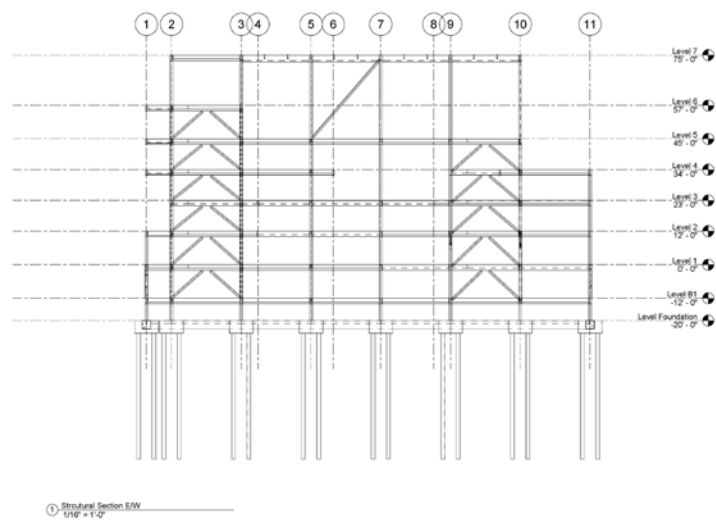
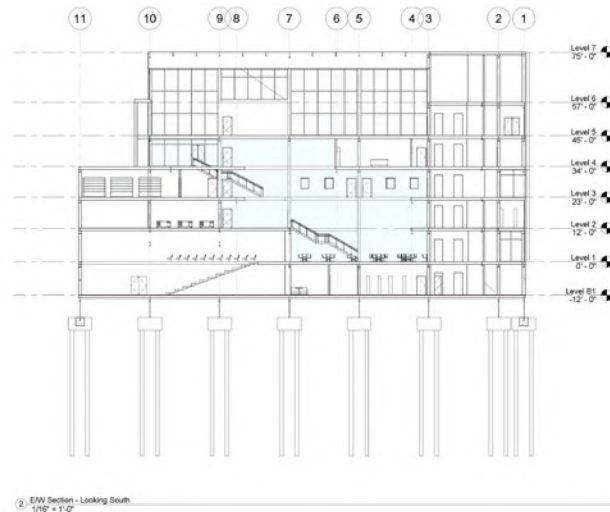
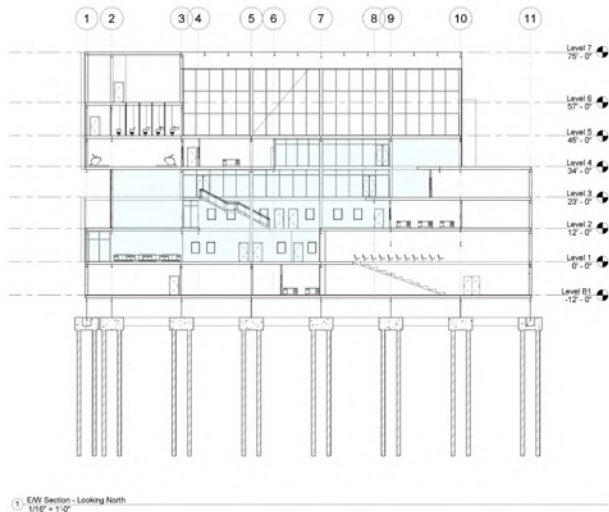
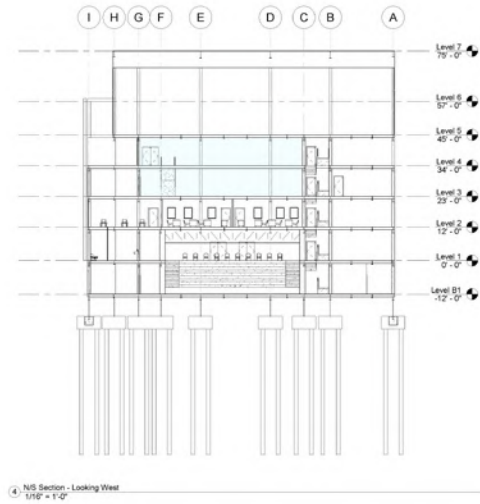
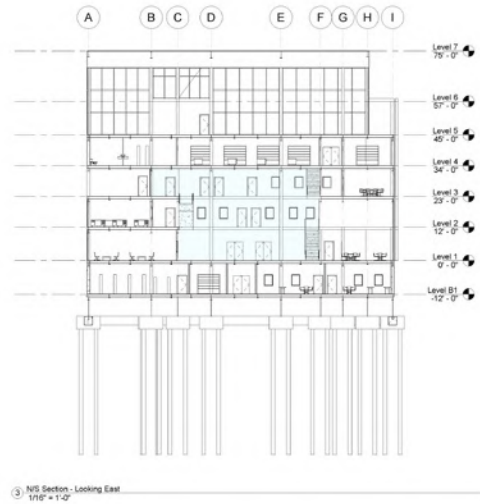
This is a collaborative project completed during the Integrated Systems technology class offered by GSAPP. The intent of the course is an intensive introduction into the application of technical systems through design, development and integration. The course objectives are to establish an understanding and experience in the construction of the technical aspects of architecture. Structural form, environmental systems, materials, construction methods and fire protection elements are developed systematically and integrated with one another.

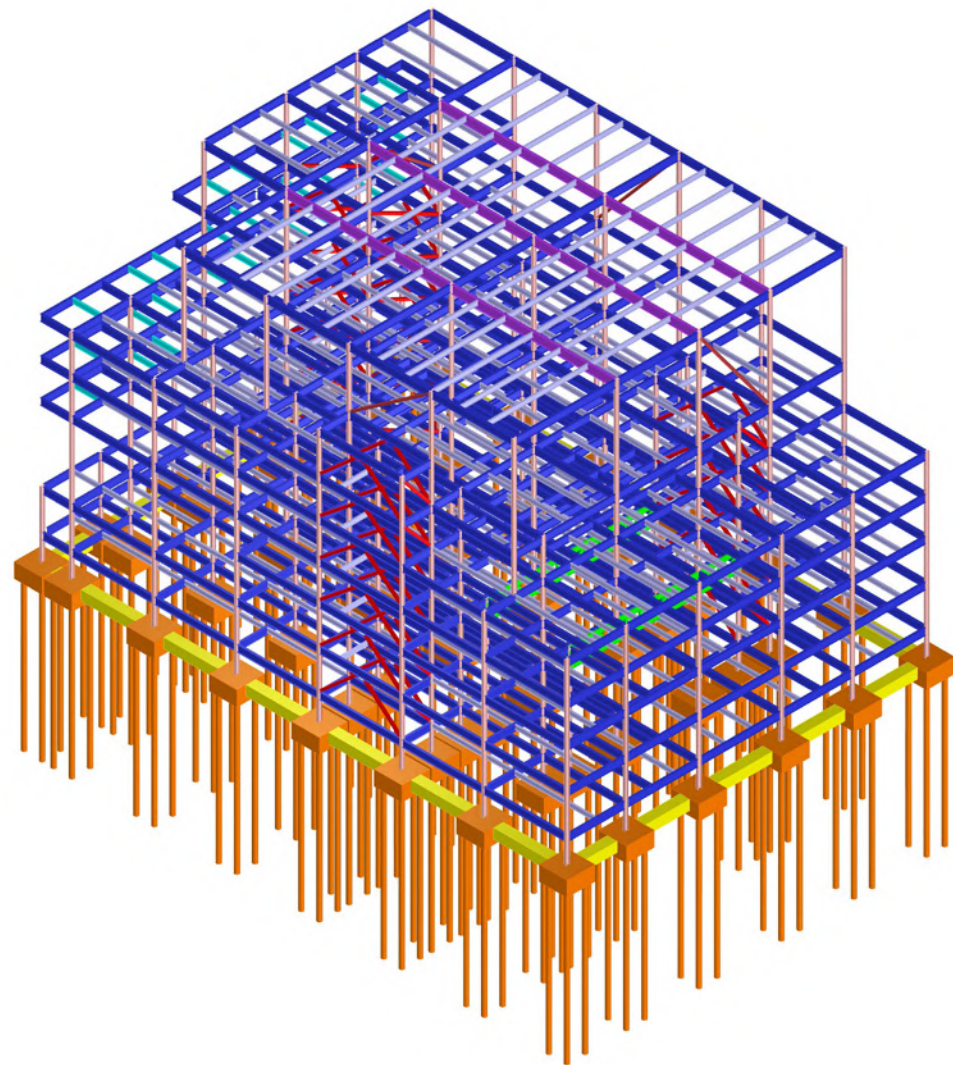




- 1 SUN SHADING SYSTEM ON SOUTH AND EAST FACADE
- 2 SUNLIGHT FILTERED WHEN TRAVELING DOWN THE INTERIOR PLATFORMS
- 3 TRANSCULENT GLASS AROUND BASKETBALL COURT
- 4 OPERABLE WINDOW TO ALLOW NATURAL VENTILATION INTO FLEXIBLE CENTRAL ATRIUM
- 5 AHU ON EACH FLOOR TO PROVIDE CONDITIONED AIR
- 6 GREENERY SPACE ON TERRACES AROUND THE PERIMETER
- 7 GREENERY SPACE AT FRONT COURT
- 8 WATER DETENTION AND COLLECTION ON THE BLUEFOUR TERRACES
- 9 WATER FILTERED AND REUSED FOR TOILETS AND IRRIGATION

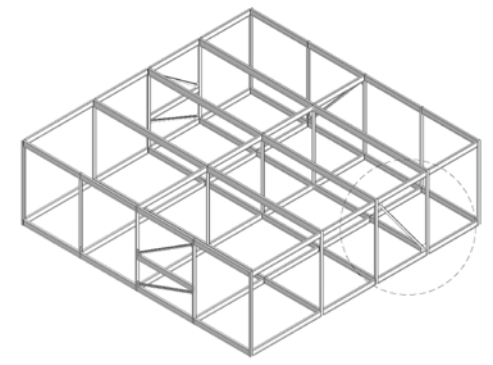




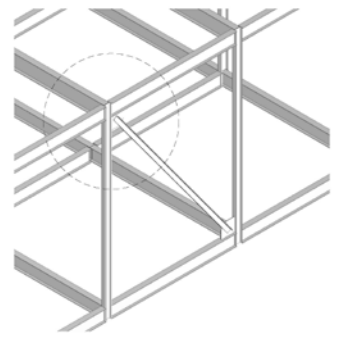


- COLUMNS W 12x106
- 4 PILE CAPS
- GRADE BEAMS 36x36
- BEAMS W24x103
- BEAMS W16x57
- BEAMS W18x76
- BEAMS W30x108
- 2L 8x6x3/4
- HSS 8x6x3/8
- 5' DEEP TRUSS

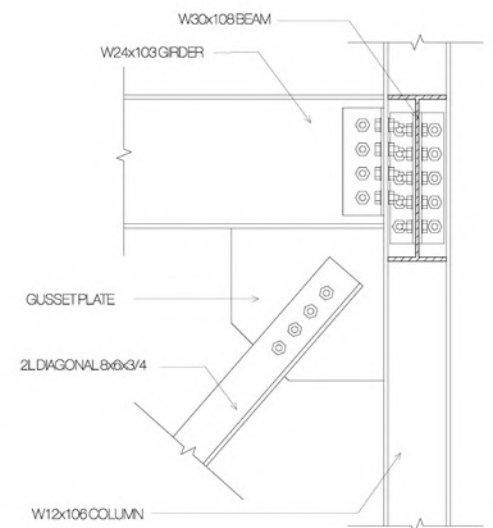
1 Structural Diagram Axon
1 1/2" = 1'-0"



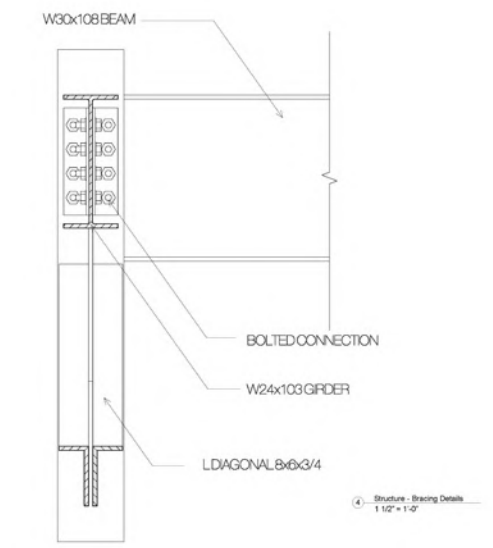
1 Structure - Basketball Court



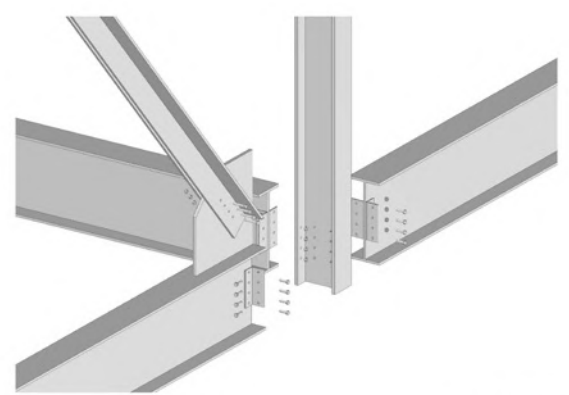
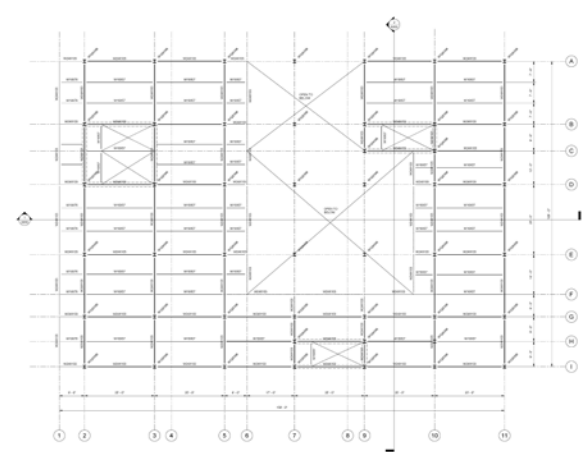
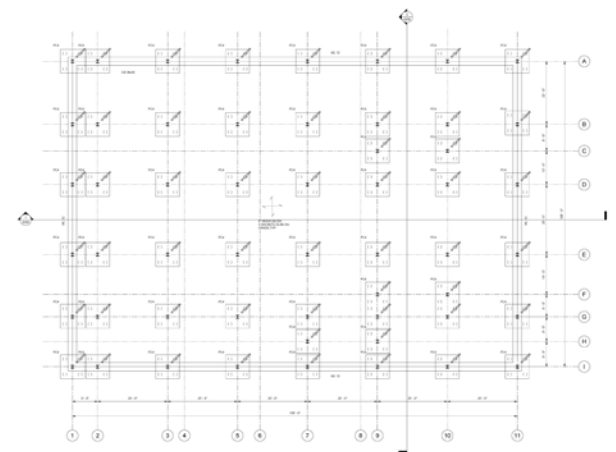
2 Structure - Basketball Court



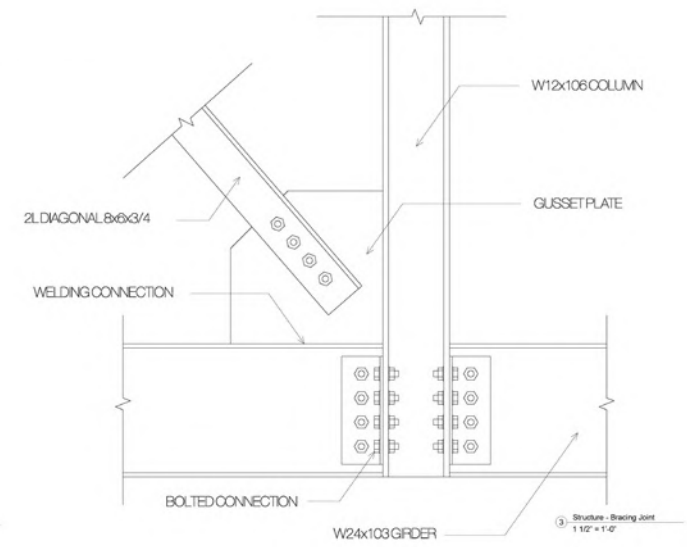
3 Structure - Bracing Details
1 1/2" = 1'-0"



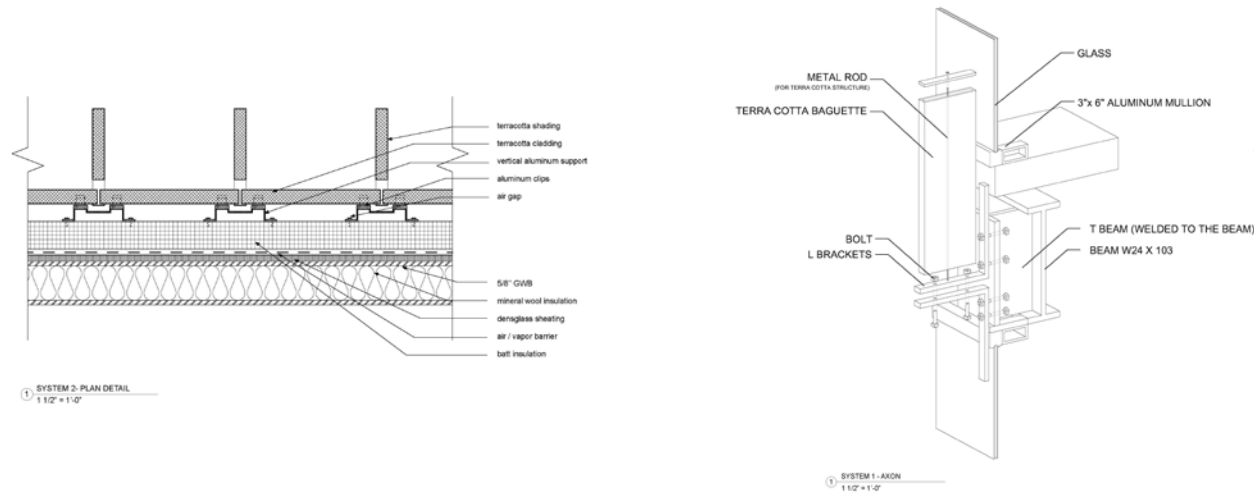
4 Structure - Bracing Details
1 1/2" = 1'-0"



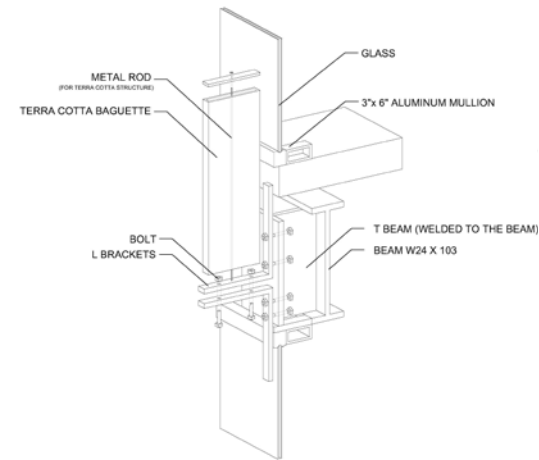
2 Structure - Bracing Joint
1 1/2" = 1'-0"



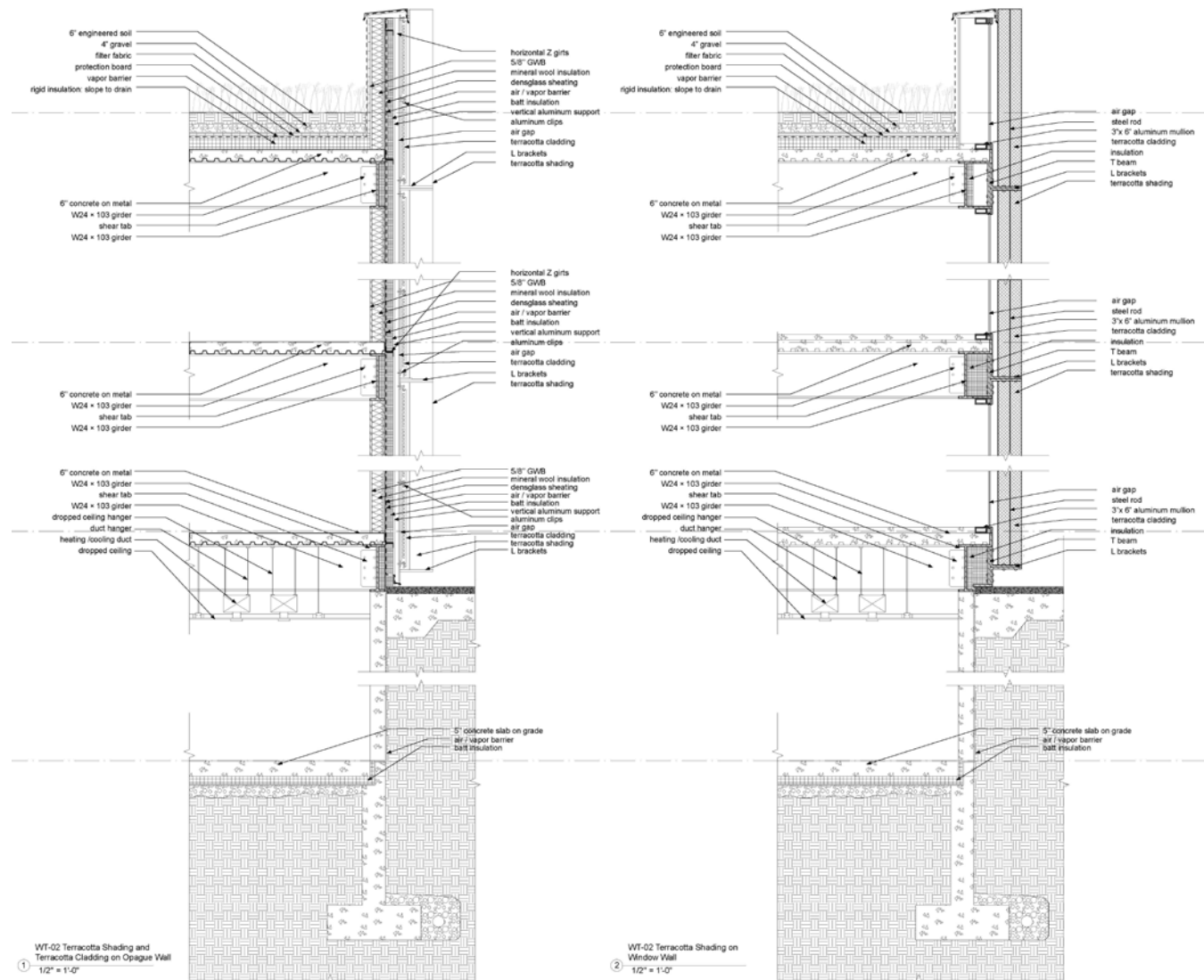
3 Structure - Bracing Joint
1 1/2" = 1'-0"



1 SYSTEM 2: PLAN DETAIL
1/12" = 1'-0"

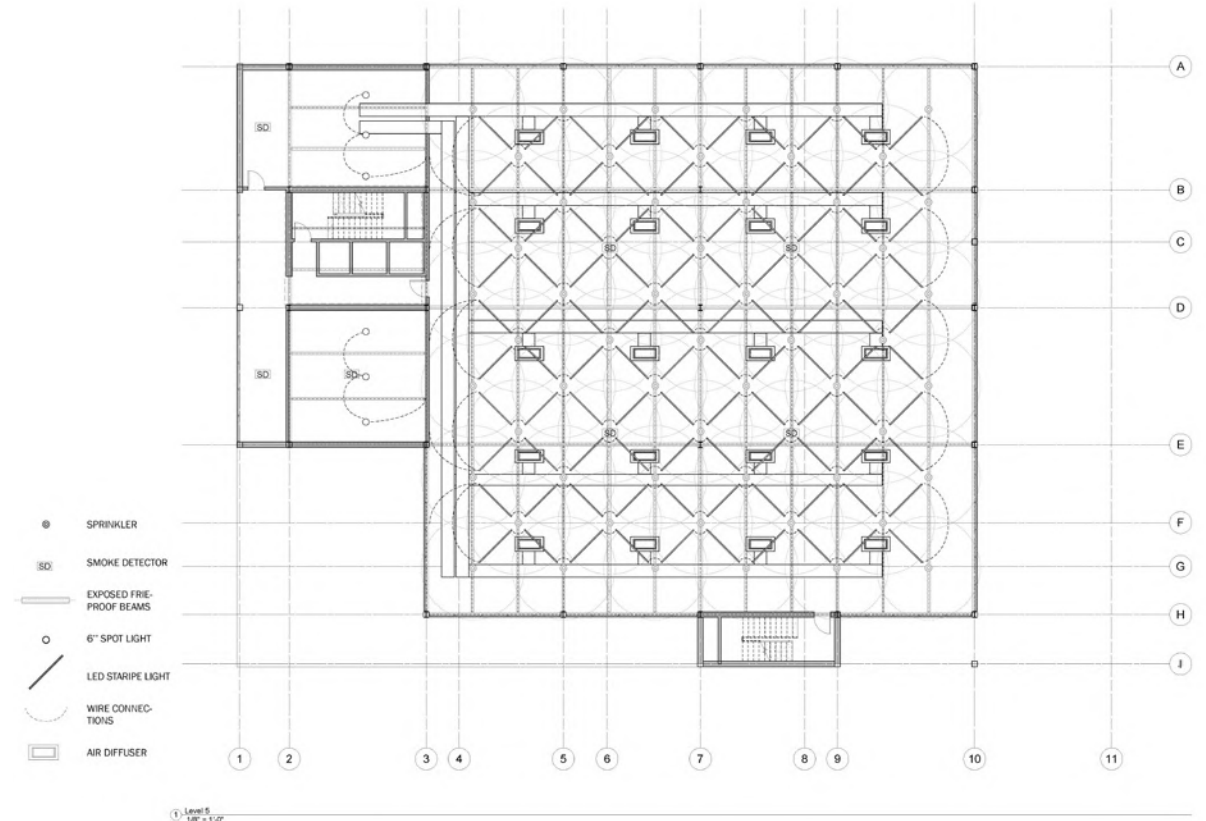


1 SYSTEM 1: AXON
1/12" = 1'-0"

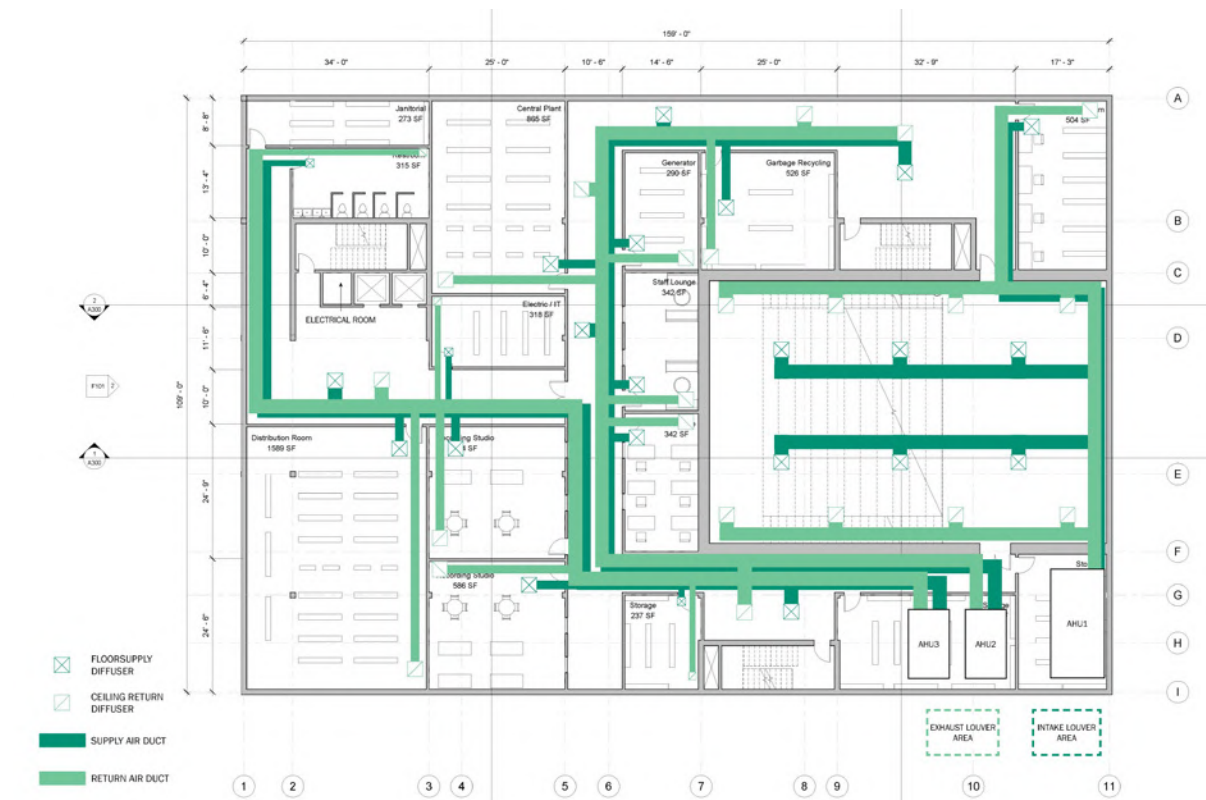


1 WT-02 Terracotta Shading and Terracotta Cladding on Opaque Wall
1/12" = 1'-0"

2 WT-02 Terracotta Shading on Window Wall
1/12" = 1'-0"



1 Level 5
1/8" = 1'-0"



- FLOOR SUPPLY DIFFUSER
- CEILING RETURN DIFFUSER
- SUPPLY AIR DUCT
- RETURN AIR DUCT

EXHAUST LOUVER AREA
INTAKE LOUVER AREA