

HAO ZHENG

2019 - 2022
Master Of Architecture
Columbia GSAPP

GRADUATION
PORTFOLIO

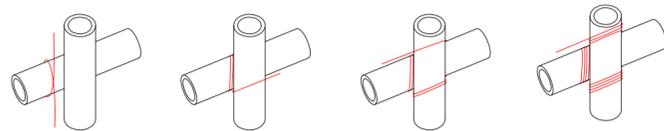


Avery Roof Addition

A Roof Addition Project for at BQE Expressway

2022 Spring, New York, NY
Instructor_Gordon Kipping

Joining Bamboo with Cords



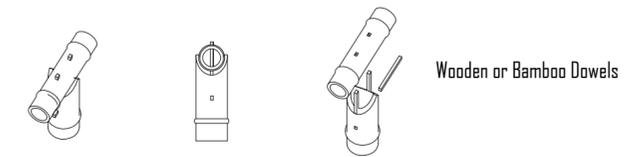
Common Bamboo Cuts



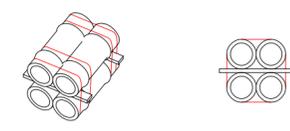
Joining Vertical with Horizontal Elements



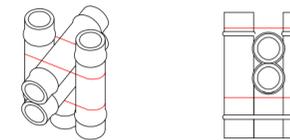
Joining Bamboo with Dowels and Lashing



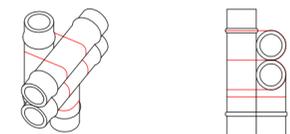
Double and Quadruple Bamboo Rafter Support



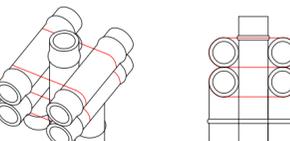
Beams formed by 4 or 6 members



Central Double Rafter



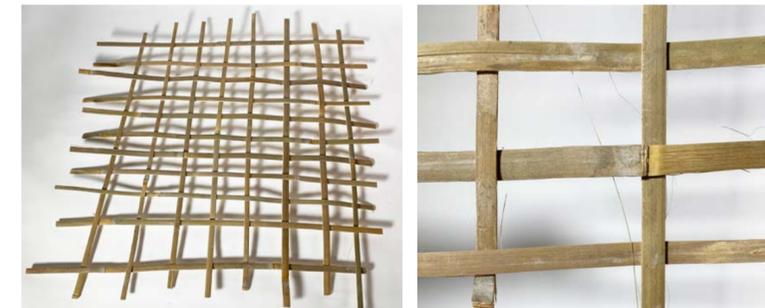
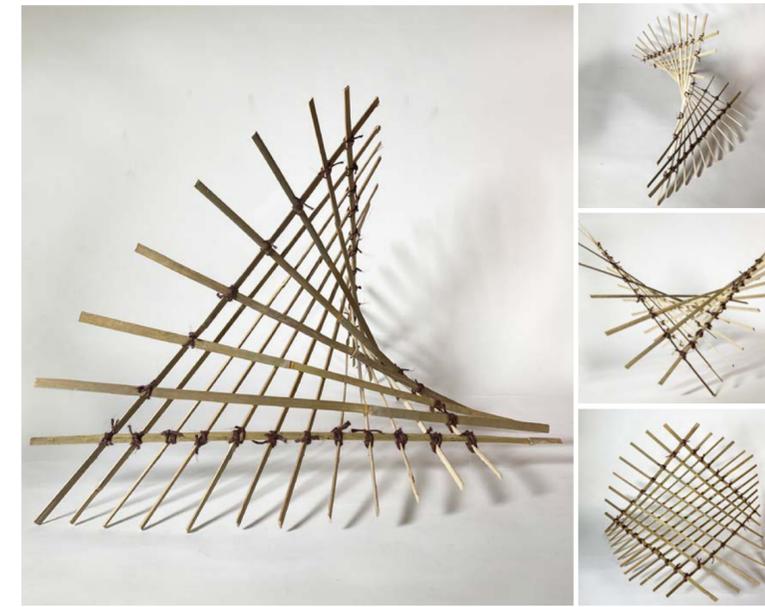
Lateral Double Rafter

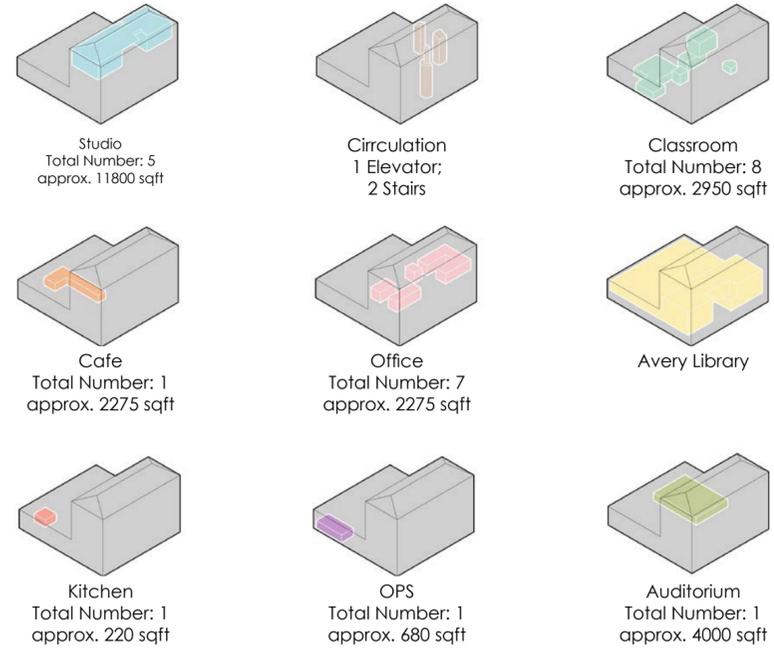


Lateral Double Rafters

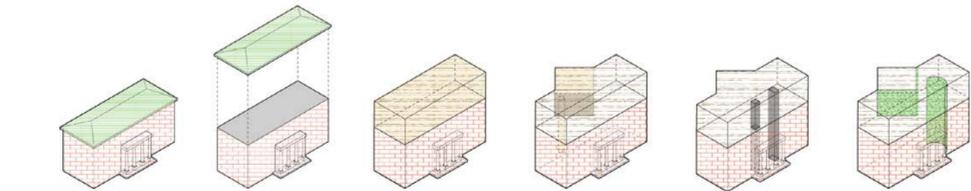
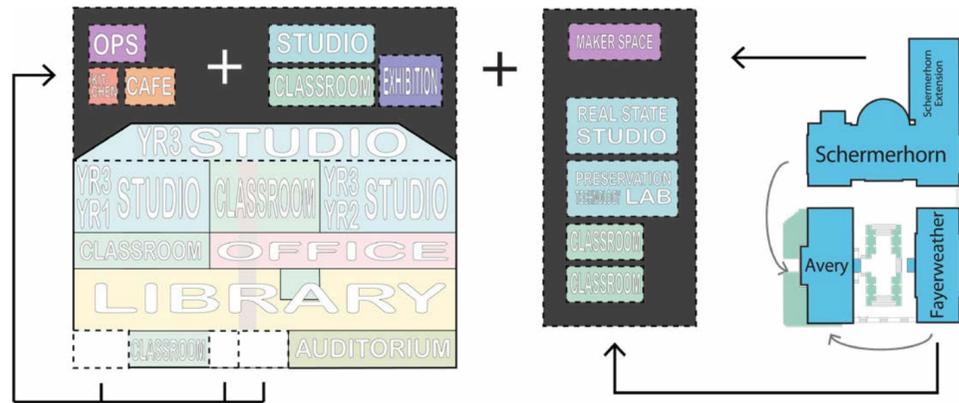


Using bamboo as building material has the strength that it is fast growing plants on the plant. Bamboo's strength-to-weight ratio is similar to timber, and its strength is generally similar to a strong soft-wood or hardwood timber.

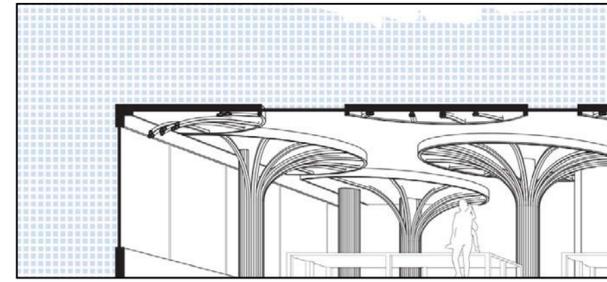




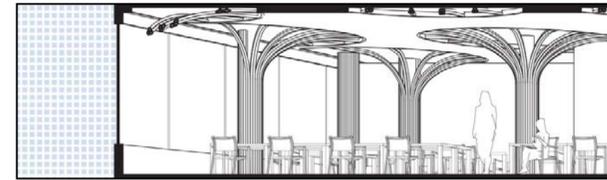
Additional Program Needed	Area Needed	Area Planned
4 Studio Space	2300 * 4 sqft	4 Studio Space
Exhibition	2500 sqft	2750 sqft
OPS	680 sqft	680 sqft
Maker Space	900 sqft	1150 sqft
Real State Studio	1500 sqft	3000 sqft
Preservation Technolgy Lab	1200 sqft	2750sqft
2 Classrooms	600 sqft * 2	4 Classrooms, 860 sqft *2
Cafe	flexible	3000 sqft



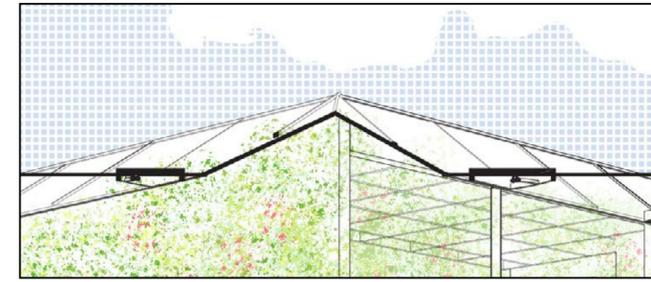
Existing Avery Remove the Roof Floor Add Wood Structured Floors Twist Add Additional Elevators Add Indoor Living Walls



Exhibition Space (glass roof)



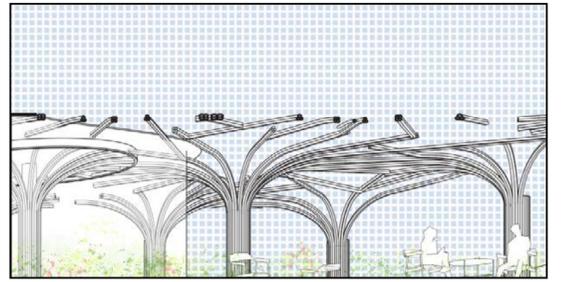
Studio Space



Skylight



Bamboo Screen Partition



Outdoor Pavillion



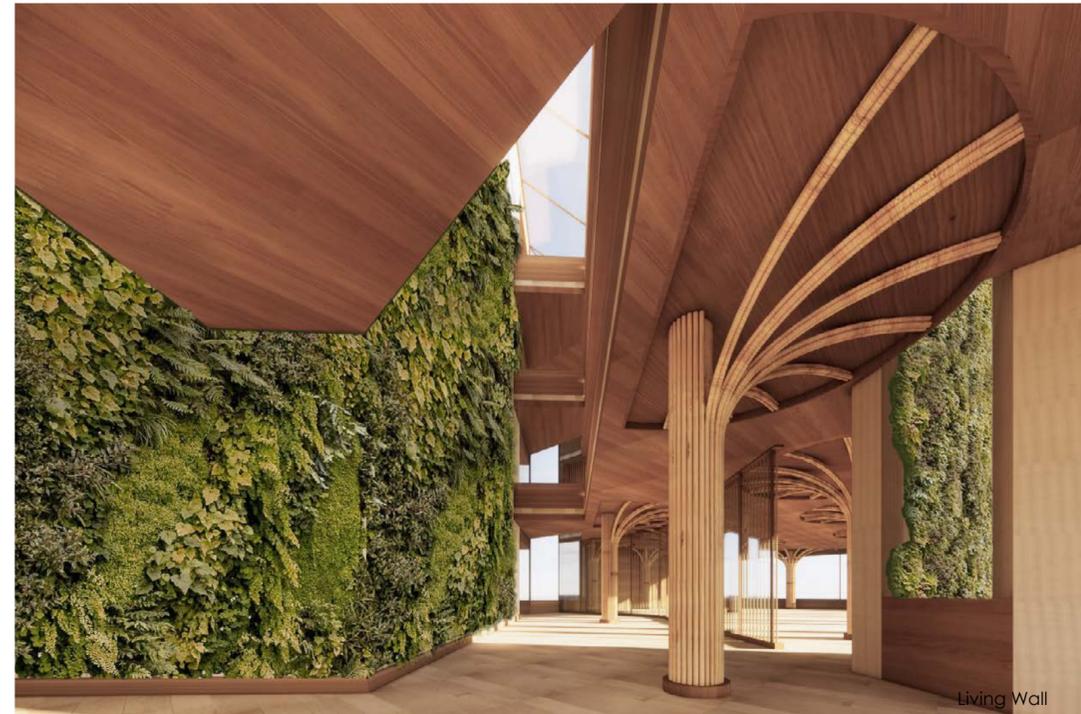
Living Wall



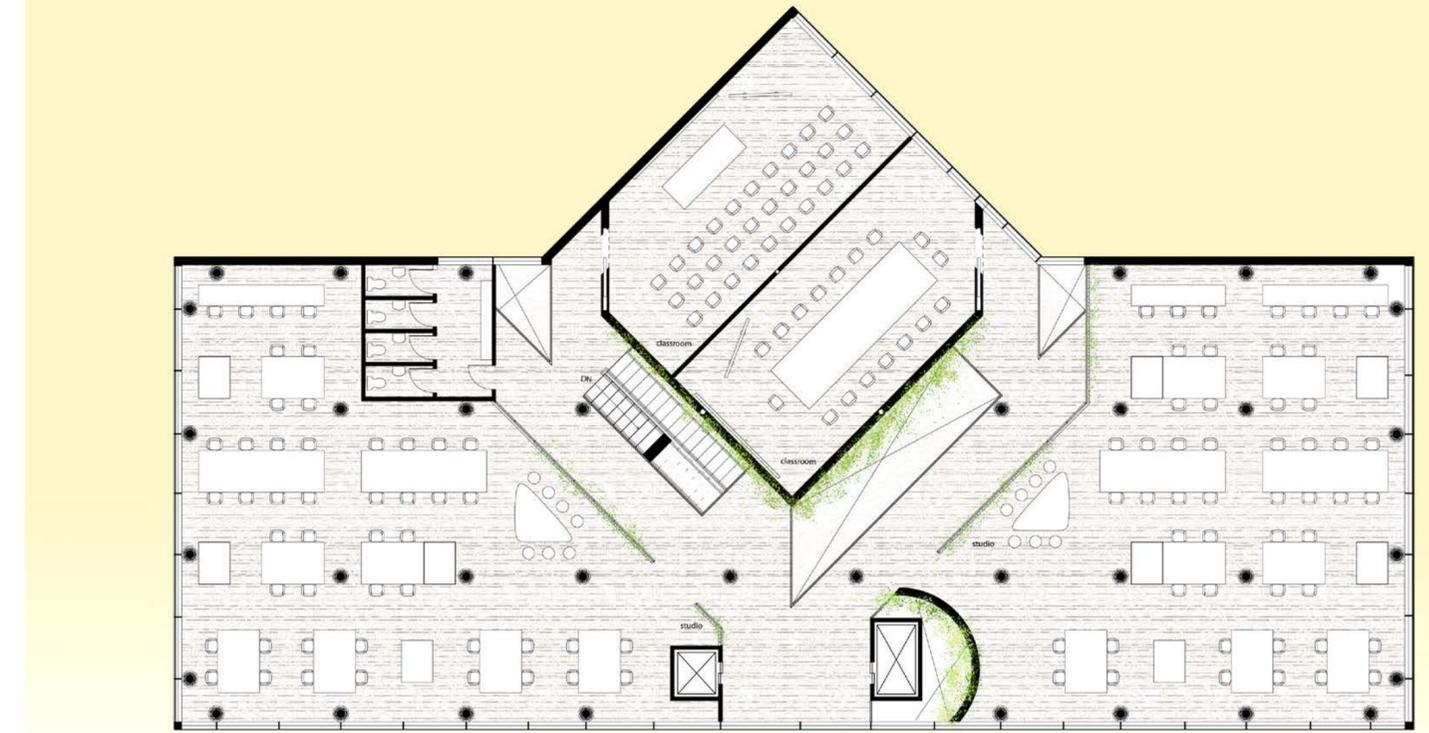
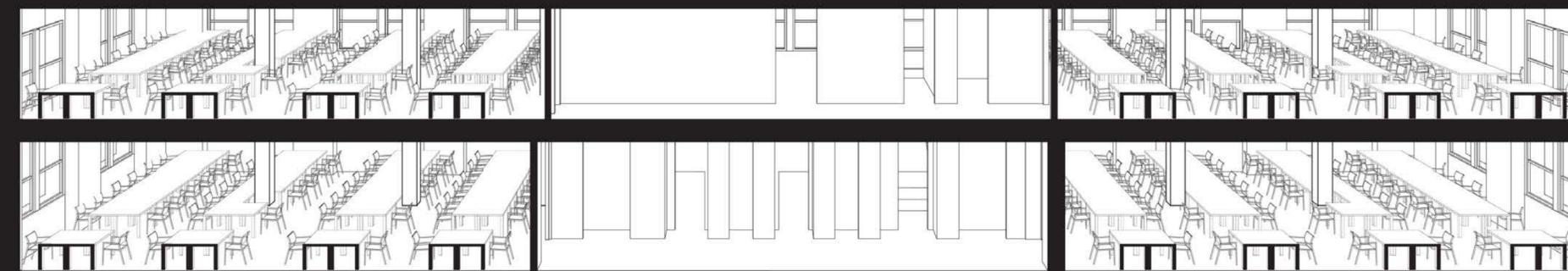
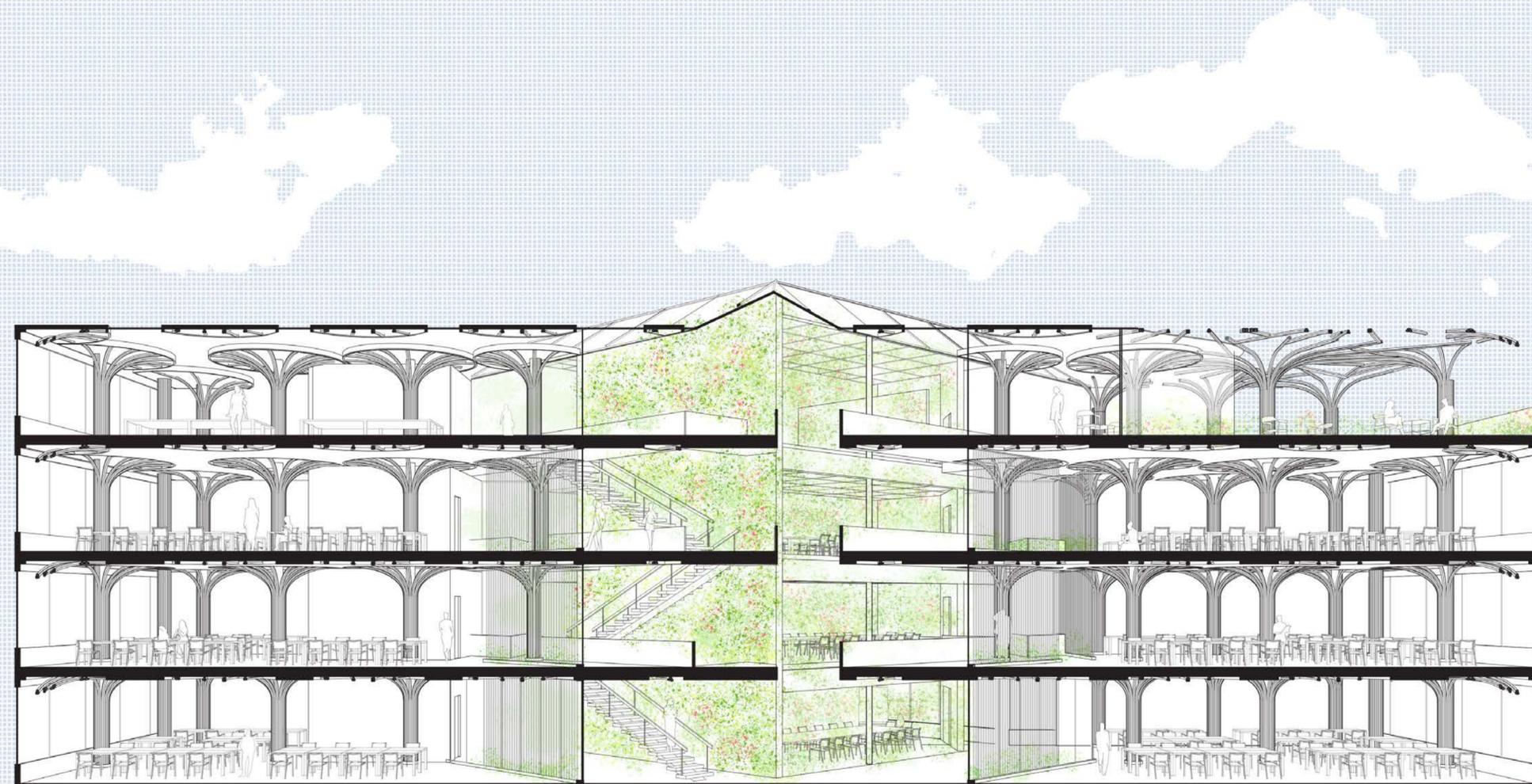
Classroom



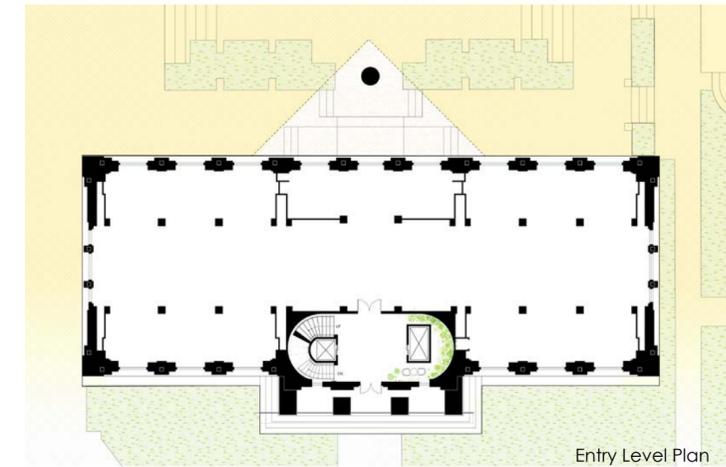
Studio Space



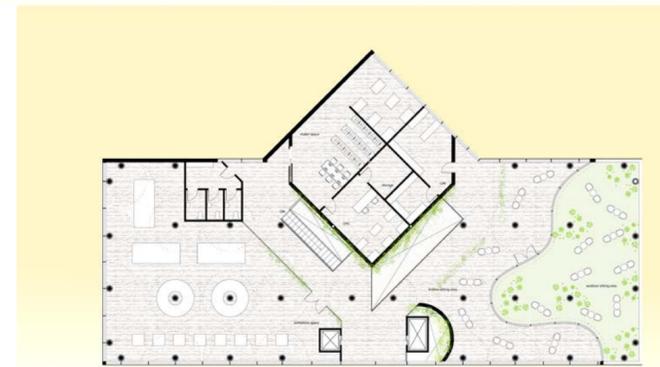
Living Wall



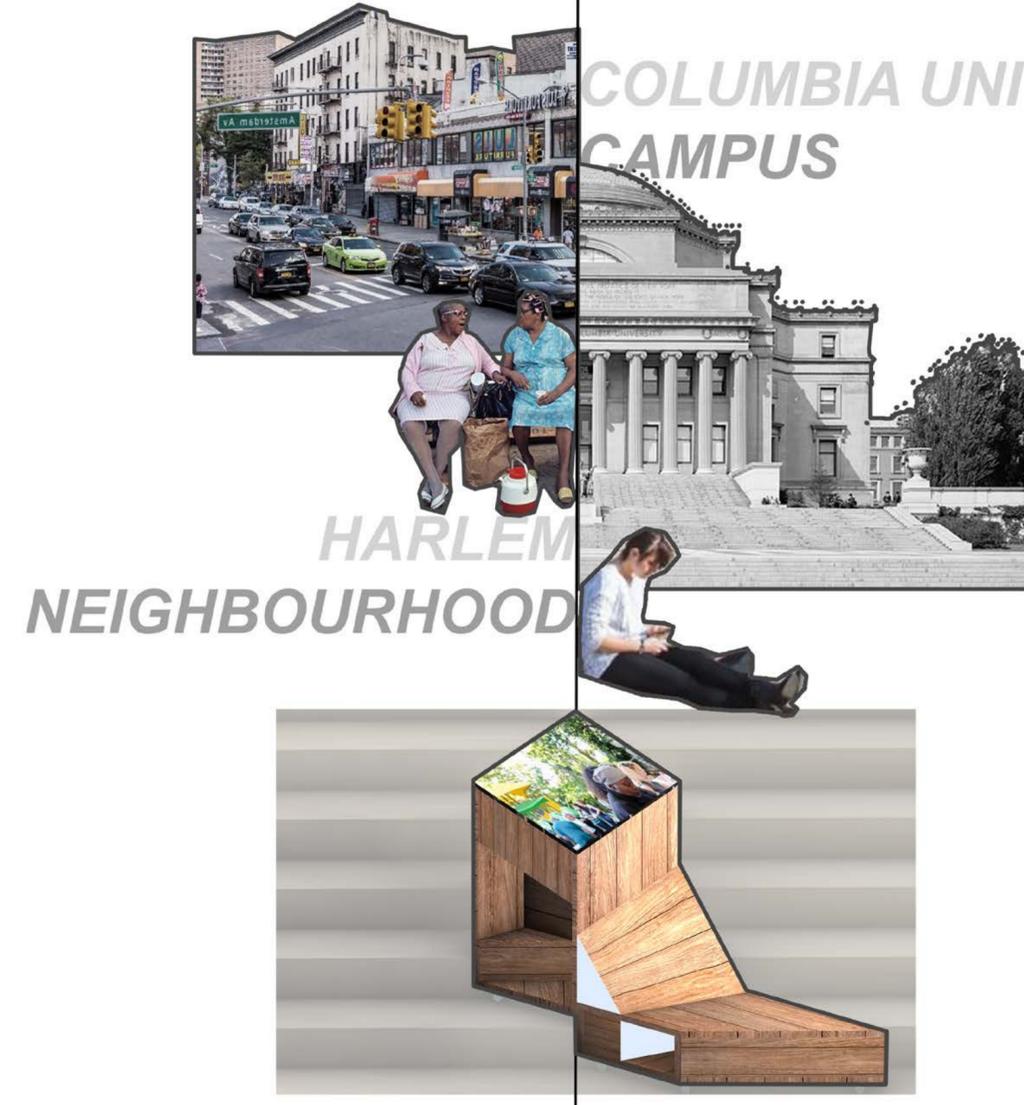
Typical Floor Plan



Entry Level Plan



Roof Plan



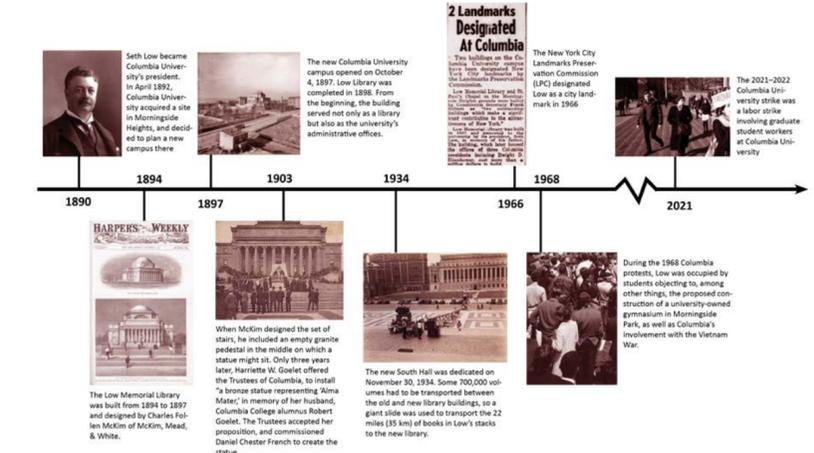
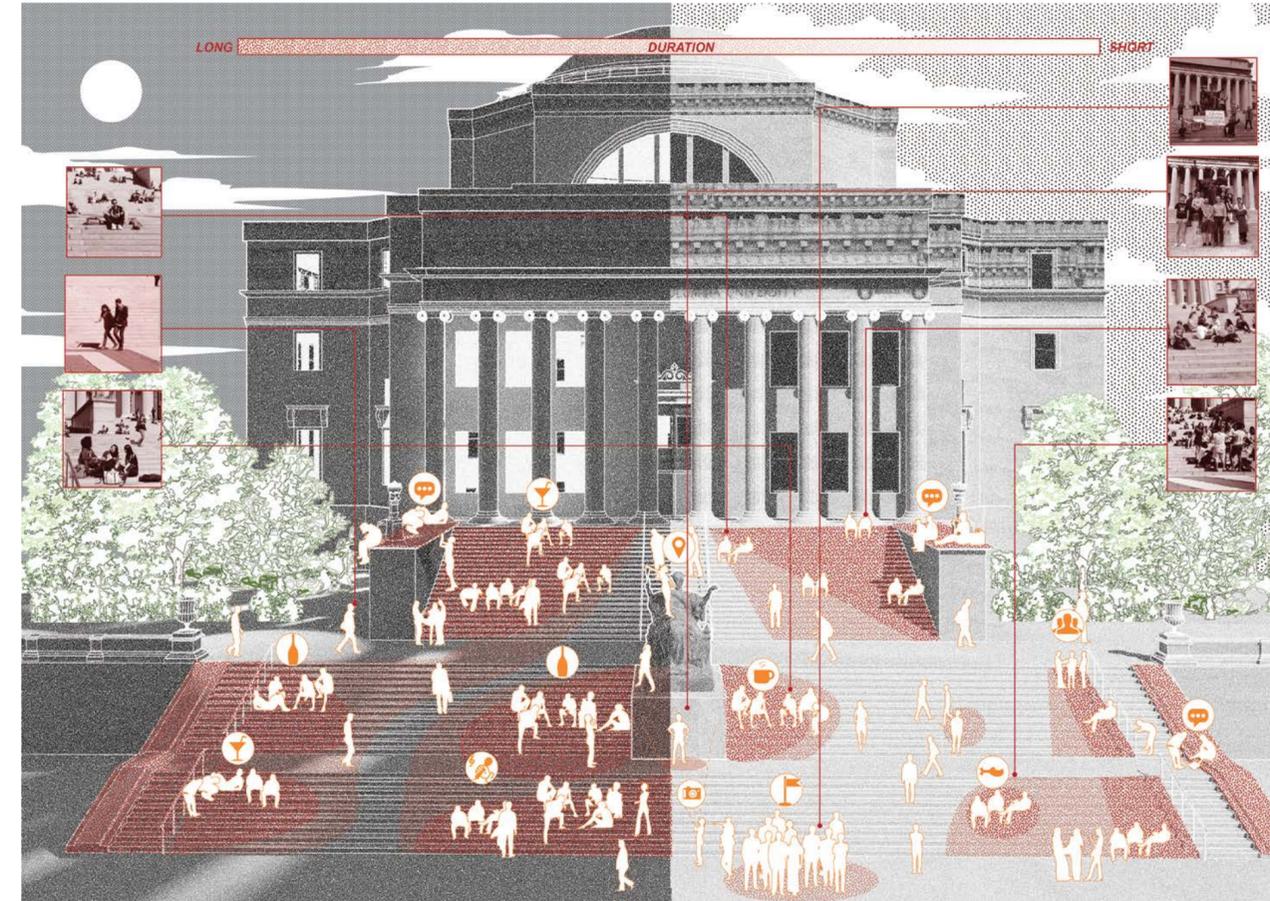
COLUMBIA UNIVERSITY
CAMPUS

HARLEM
NEIGHBOURHOOD

Back to Back

An Installation Project Reconnecting Columbia University
with Harlem Community

2022 Spring, New York, NY
Instructor: Sharon Ayalon
Group Project with Bisheng Hong, Chuqi Huang, Hazel Vil-
lena, Hao Zheng, Xinan Tan

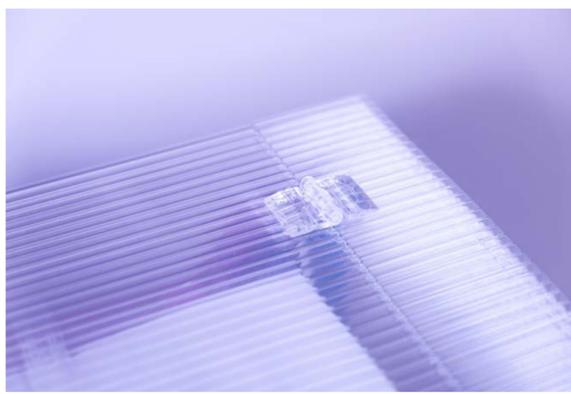
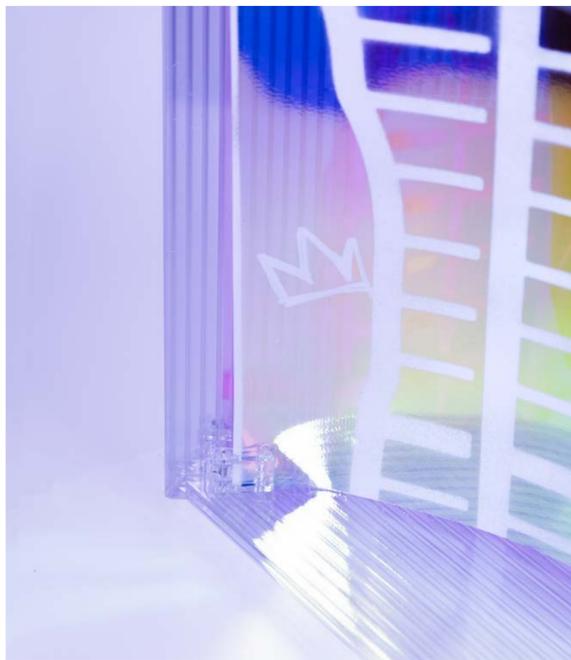


BACK TO BACK

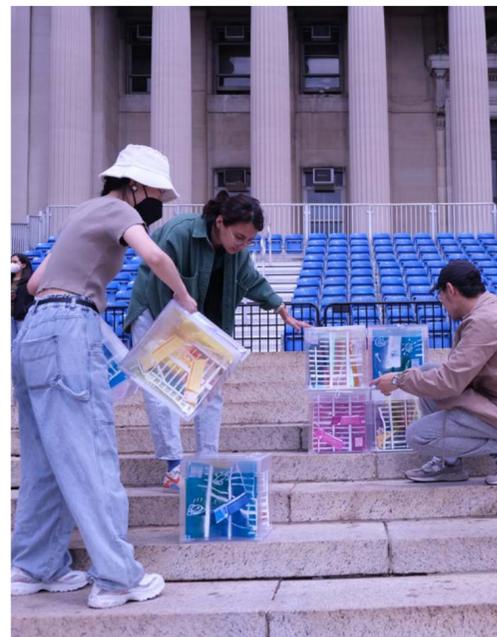
Aiming to link Harlem's daily life and diverse culture heritage to Columbia University, the project is located at the most dynamic stairway on the central axis. Boxes are designed as containers to support daily activities for Columbia communities while recording the everyday life of Harlem.

Four maps related to the food, art, music, and historical building are set on the eight boxes as puzzles. By moving around the boxes, people can actively explore the miniature Harlem. At the same time, the volumes can turn into small tables or shelves for people during their break.

During the daytime, materials with different textures and colors are used to guide the puzzles, enabling people to participate in the interaction. Pockets are designed to place in iPhones as lighting sources. The translucency of the materials makes them possible to explore during nighttime as well.



SCATTERING AS TABLES



MOVING AS PUZZLE



BOX AS A CONTAINER



REORGANIZED AS MESSAGE



ART INSTITUTION



RESTAURANT



HISTORIC SITE



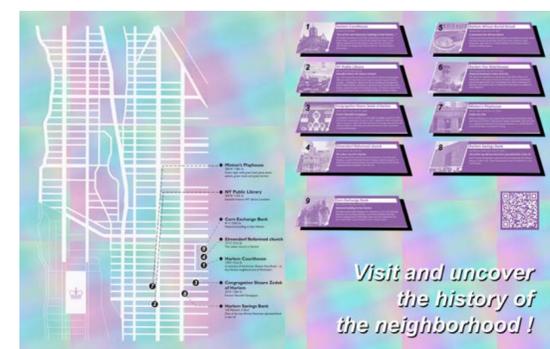
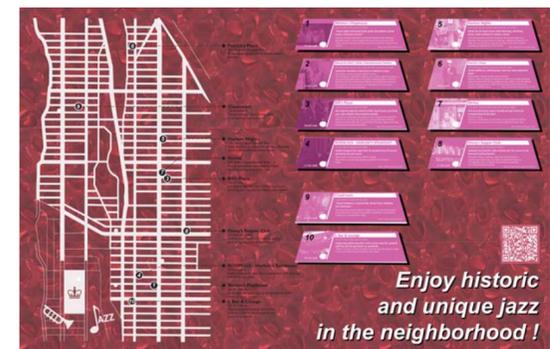
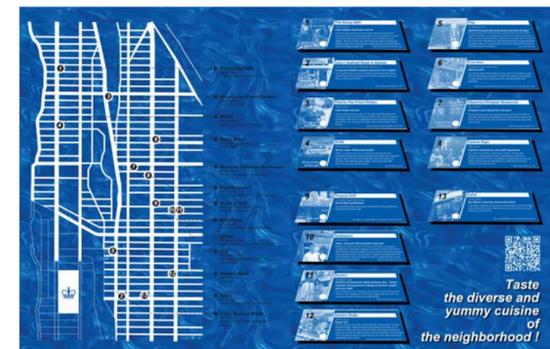
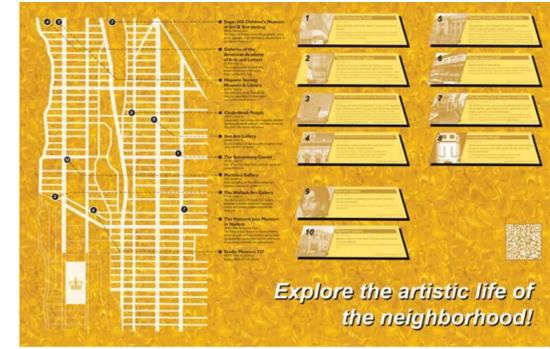
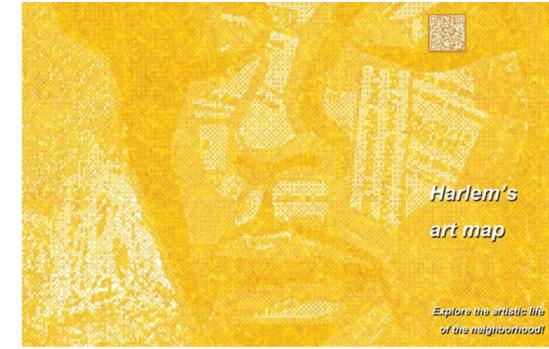
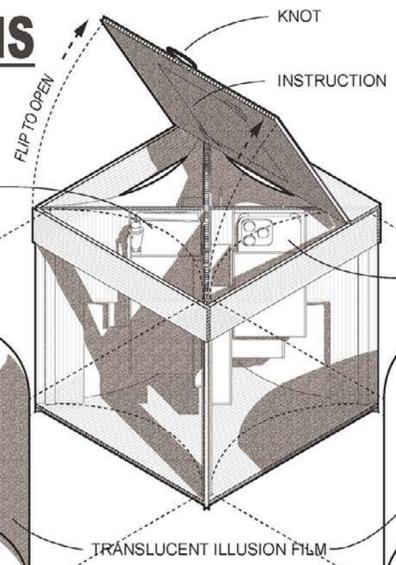
JAZZ BAR

INSTRUCTIONS

DRAW IT! PLAY IT!
MOVE IT! STACK IT!
FIND IT! EXPLORE IT!
REALIZE IT!
PARTICIPATE IT!
BE PROUD OF IT!
LOVE IT!
IMPROVE IT!
BE PART OF IT!
DRAW IT!
PLAY IT!
MOVE IT!
STACK IT!
FIND IT!

DRAW IT! PLAY IT!
MOVE IT! STACK IT!
FIND IT! EXPLORE IT!
REALIZE IT! PARTICI-
PATE IT! BE PROUD OF
IT! LOVE IT! IMPROVE
IT! BE PART OF IT!
DRAW IT! PLAY IT!
MOVE IT! STACK
IT! FIND IT!
EXPLORE IT!
REALIZE IT!
PARTICIPATE
IT! BE
PROUD OF
IT! LOVE IT!
IMPROVE IT!
BE PART OF
IT!

LIGHT IT UP GRAFFITI IT MOVE IT AROUND

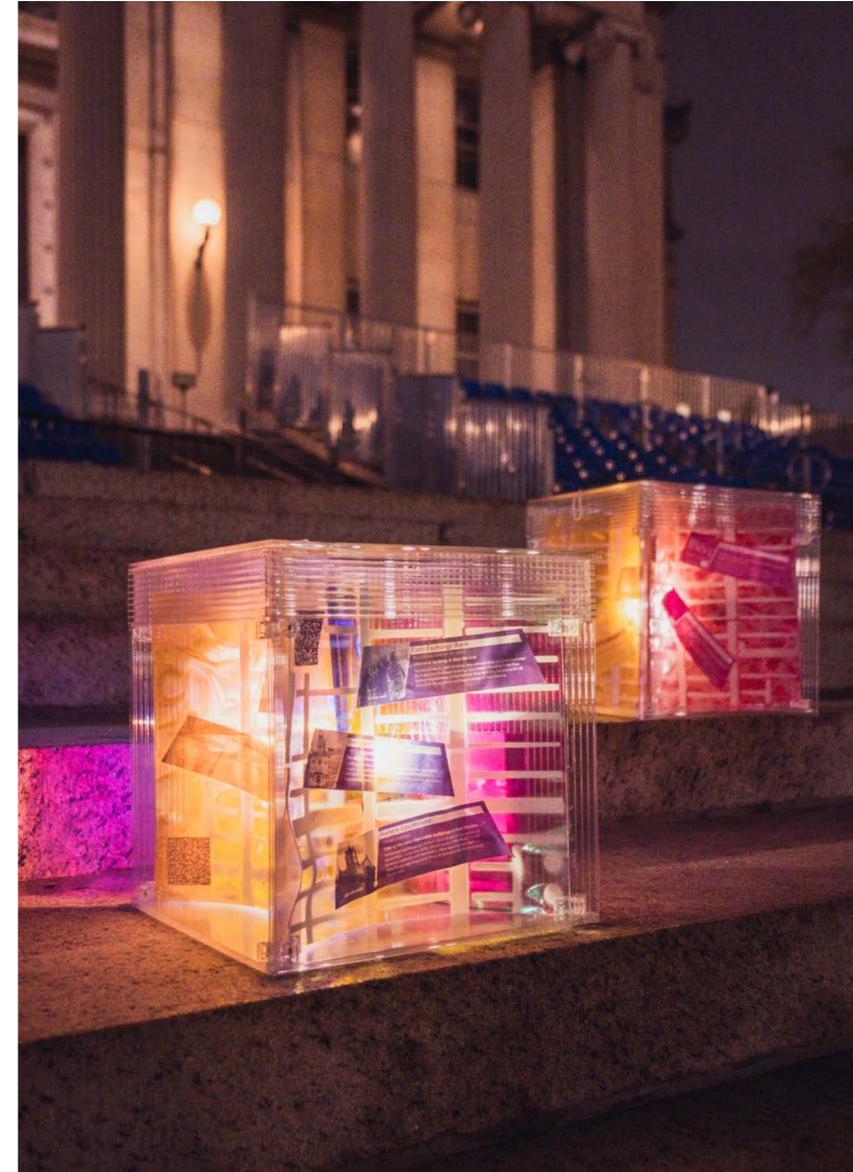




DAY-TIME



NIGHT-TIME

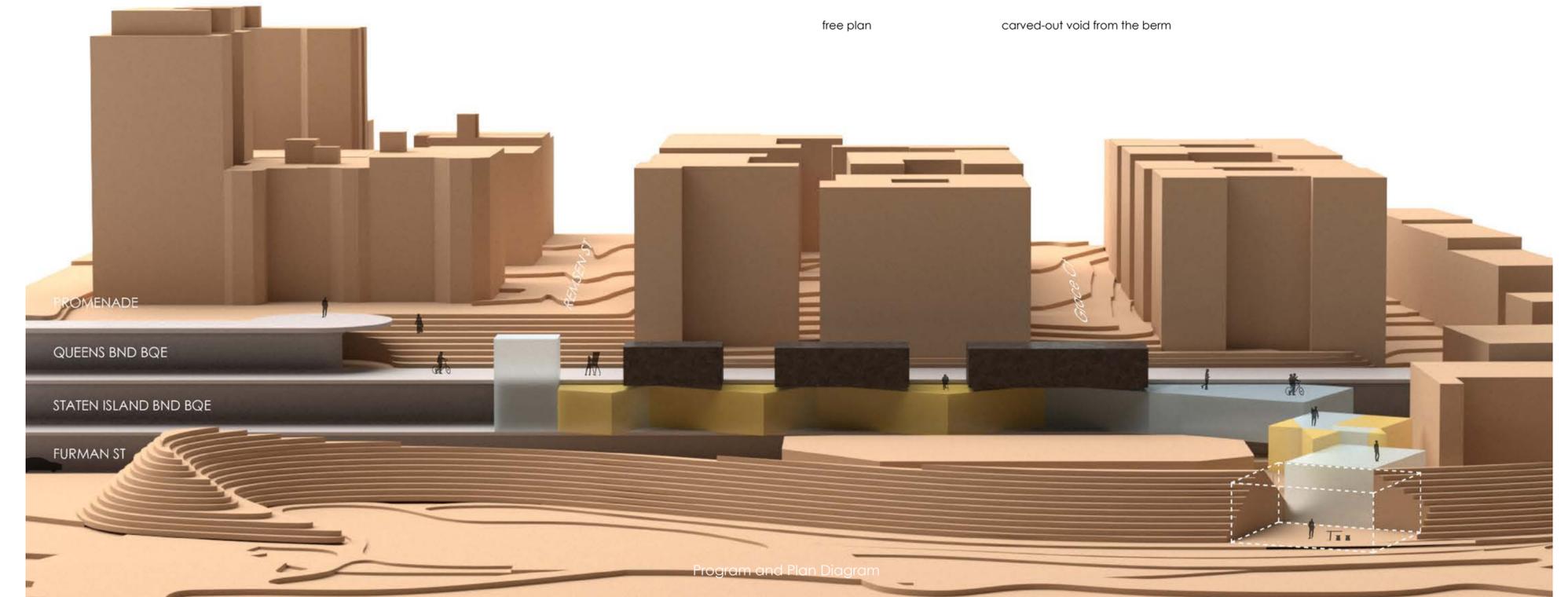
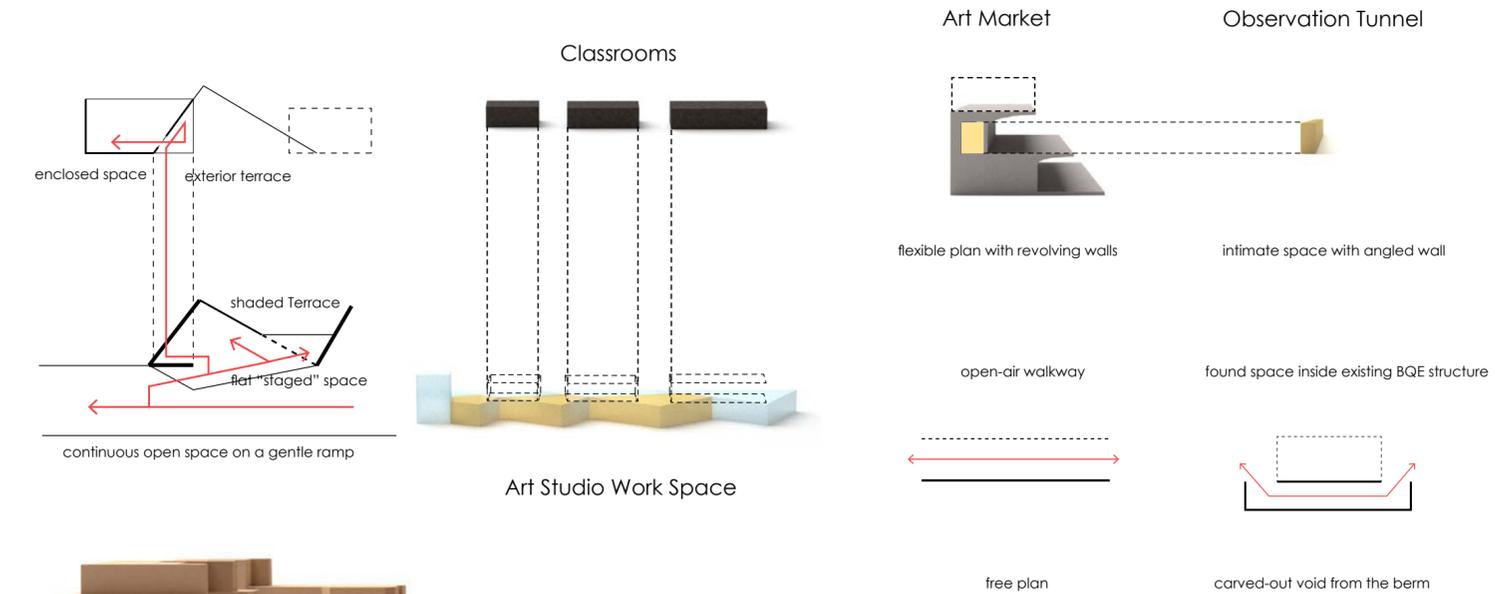




**VISUAL ARTS CENTER
AT BQE EXPRESSWAY**

An Adaptive Reuse Program
at BQE Expressway

2021 Fall, New York, NY
Instructor: Laurie Hawkinson
Group Work with Ningyuan Deng

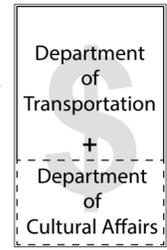


The Visual Arts Center at BQE Expressway provides a connection between Brooklyn Bridge Park and Brooklyn Heights. It takes on Biden's Infrastructure Bill to repair the existing crumbling structure; in addition, it provides social space and events for the Brooklyn heights residents. The art studios attract people with artistic interest to receive proper art training. Artists and students here hold exhibitions and art markets to showcase their work. Each program space has a particular plan and circulation type tailored to the program for better use.

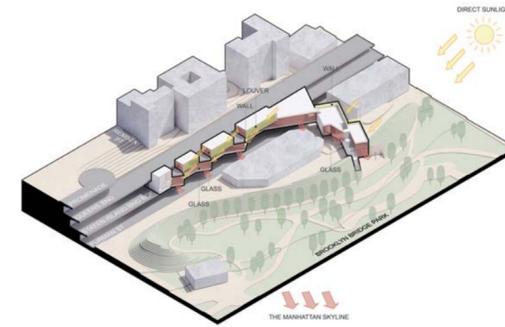
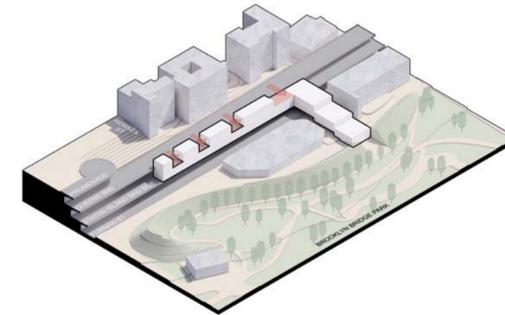
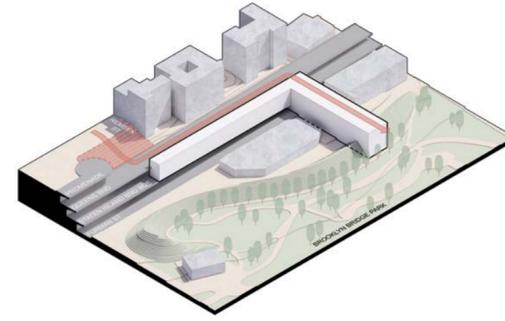


Current Condition of the BQE Expressway

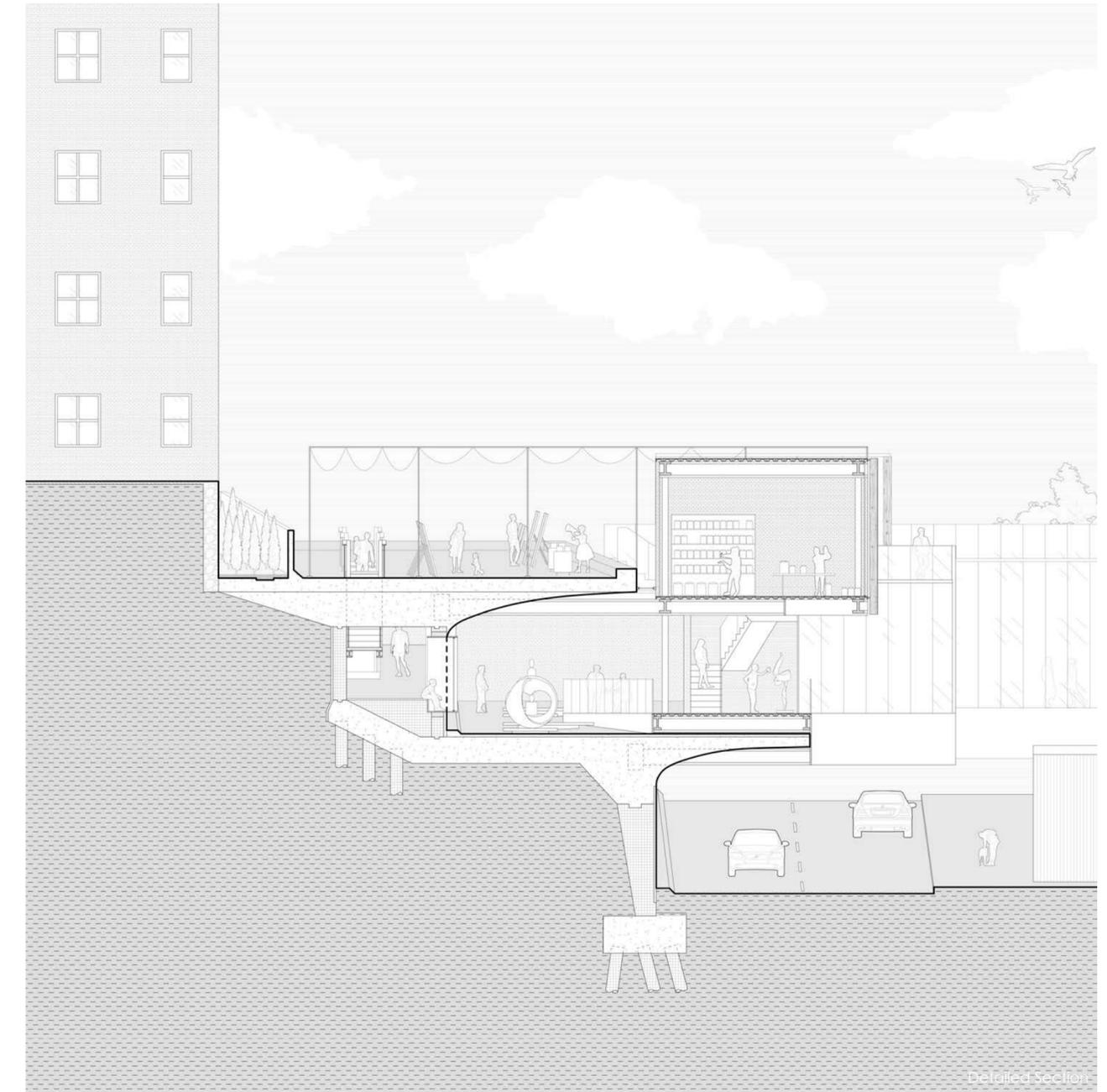
BIPARTISAN INFRASTRUCTURE BILL	
	Amount (billions)
Total	\$579
TRANSPORTATION	\$312
Roads, bridges, major projects	\$109
Safety	\$11
Public transit	\$49
Passenger and Freight Rail	\$66
EV infrastructure	\$7.5
Electric buses / transit	\$7.5
Reconnecting communities	\$1
Airports	\$25
Ports & Waterways	\$16
Infrastructure Financing	\$20
Other Infrastructure	\$266
Water Infrastructure	\$55
Broadband infrastructure	\$65
Environmental remediation	\$21
Power infrastructure incl. fid authority	\$73
Western Water Storage	\$5
Resilience	\$47
HUMANITIES	\$0 ?



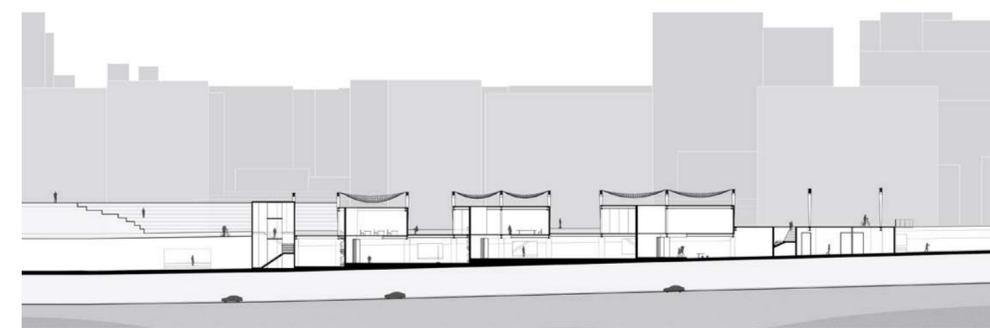
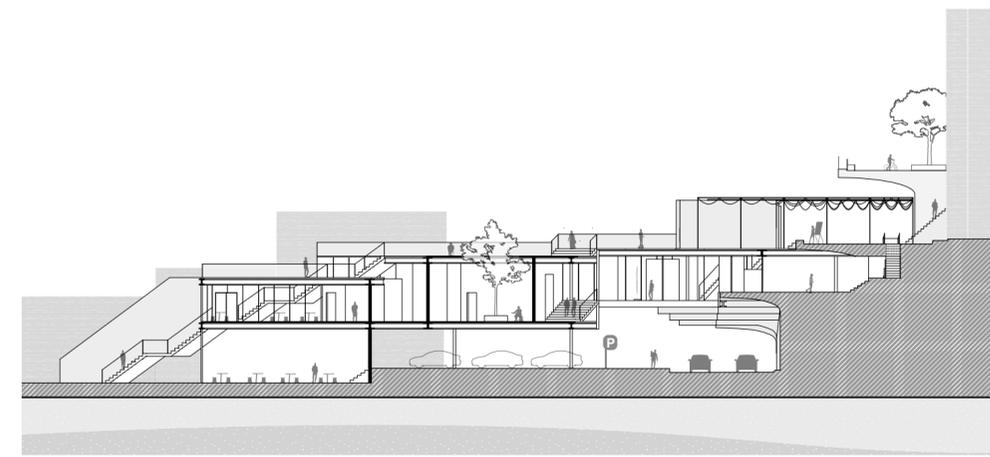
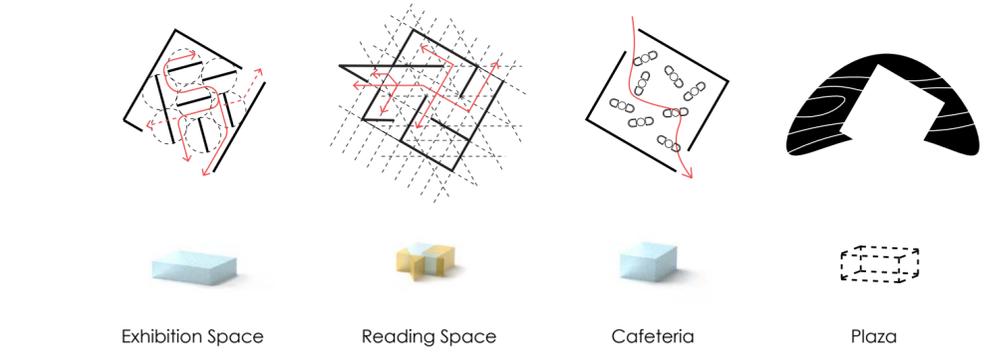
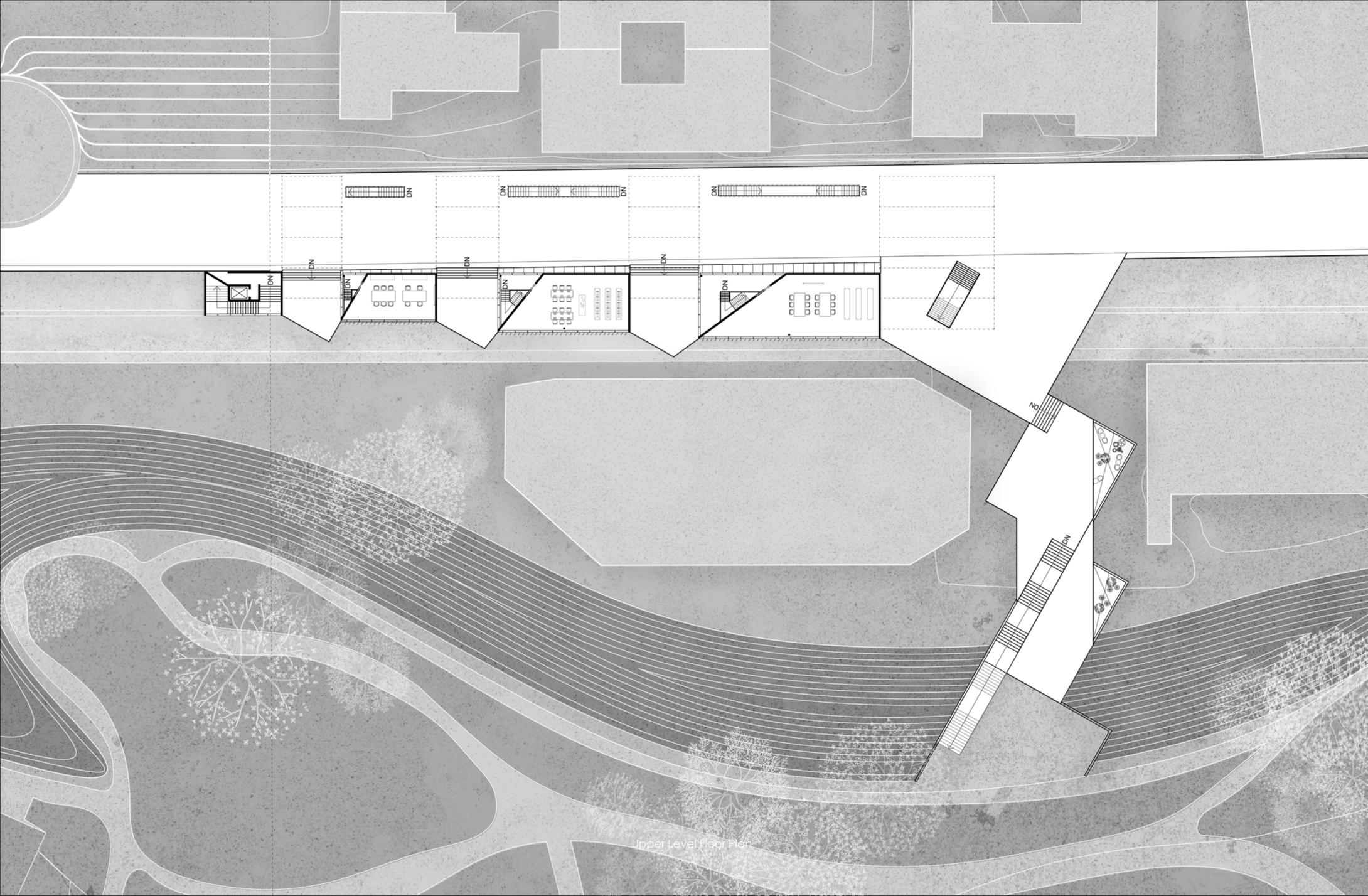
- Repair BQE existing structure
- Create a connection between Brooklyn heights and brooklyn bridge park
- Extend Brooklyn Heights Promenade
- Offer Artists specific tools and space for free
- Provide students quality art education
- Opportunity to sell and promote their creative work
- Offer locals and tourists events and space

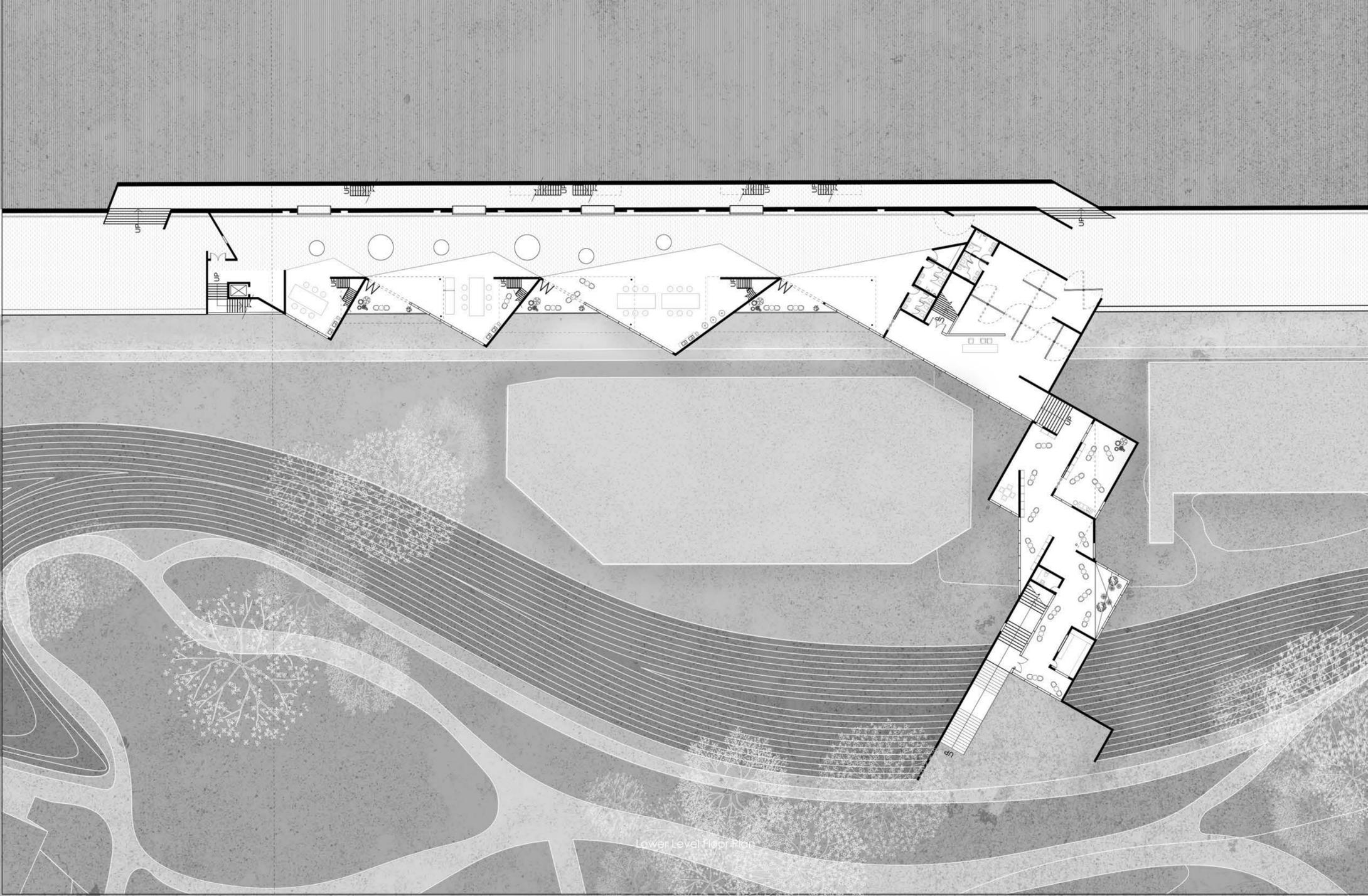


Massing Diagram



Detailed section



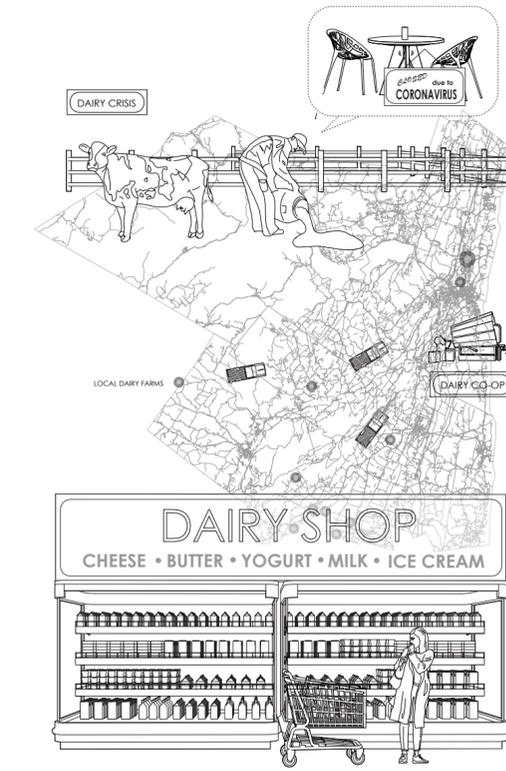




THE OPEN DAIRY

Food Processing Plant in Hudson Valley

2021 Spring_Kingston, NY
 Instructor_Phu Hoang
 Group Work with Karen Chen

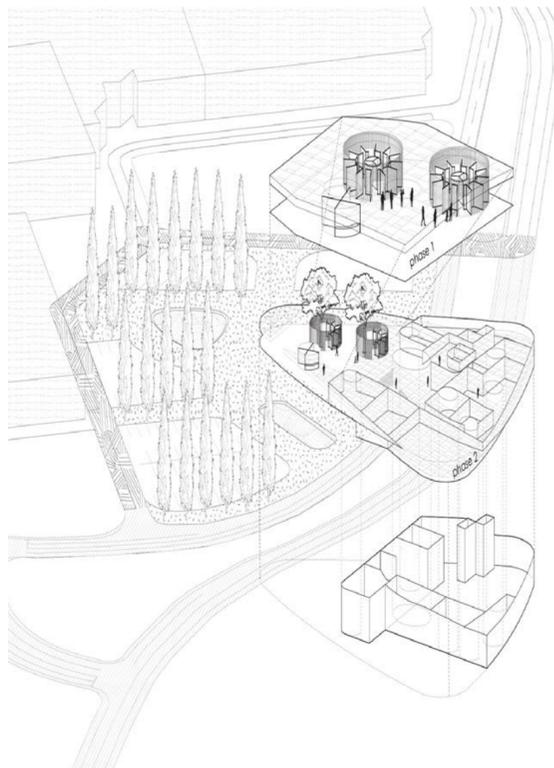


The risks and health issues of essential workers are often veiled by the importance of their social role, especially during Covid-19. Our proposal aims to create them a healing working environment that maximizes nature exposure during work.

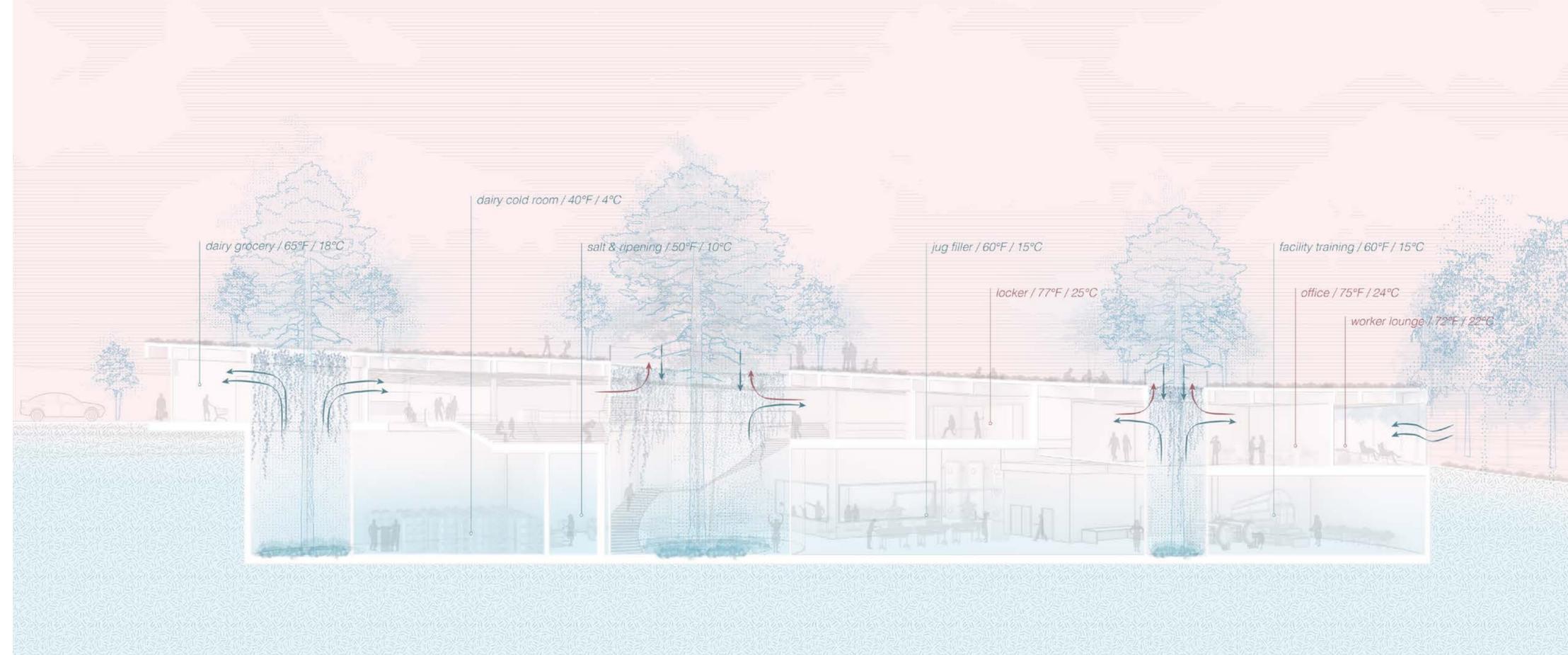


Proposed Dairy Plan VS Traditional Dairy Plant Diagram

Located at the commercial parking lot of the Hudson Valley shopping center facing shutdown in Kingston, the project's first phase prefabricated pods serve the region as a COVID vaccination station. Expanding into a demonstrative co-op dairy plant, the pods remain as a health clinic accompanying future shopping mall programs to support the community. Maintaining an open-air structure and inserting vegetated vertical tubes underground, the project utilizes passive cooling and maximizes ventilation. Simultaneously as a public amenity, the dairy plant not only supports local dairy farmers in the supply chain, but also give workers access to wellness programs alongside healthier workplaces.



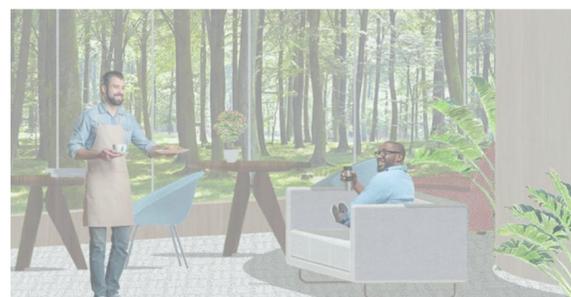
Two Phases Transition Diagram



Mean Earth Temperature Diagram

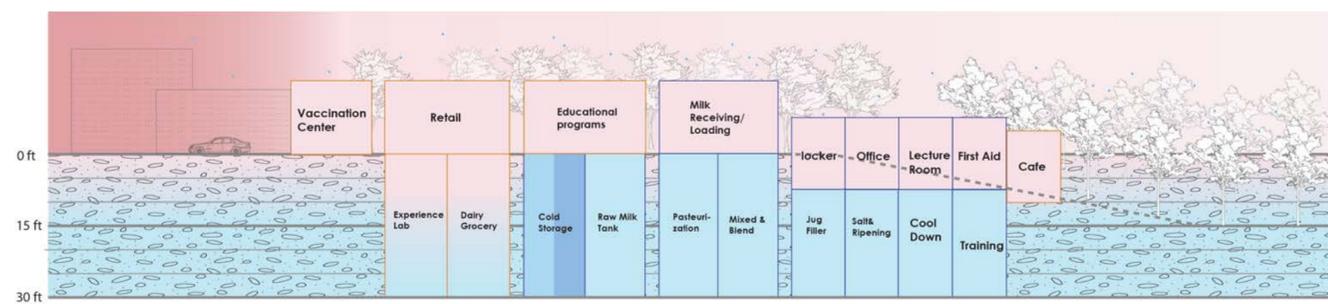


Food Processing Plant Working Environment

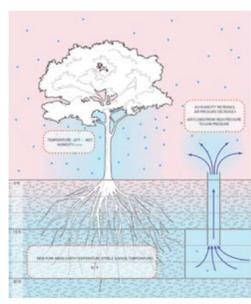


Food Processing Plant Workers' Lounge View

Subsoil temperature becomes stable at 20ft to 30ft below ground, which is called "Mean Earth Temperature." In upstate New York, the mean earth temperature is around 47 °F. Different programs require different temperatures. The plant takes advantage of the forest and topography by building underground for the natural cooler subsoil temperature.



Temperature Section

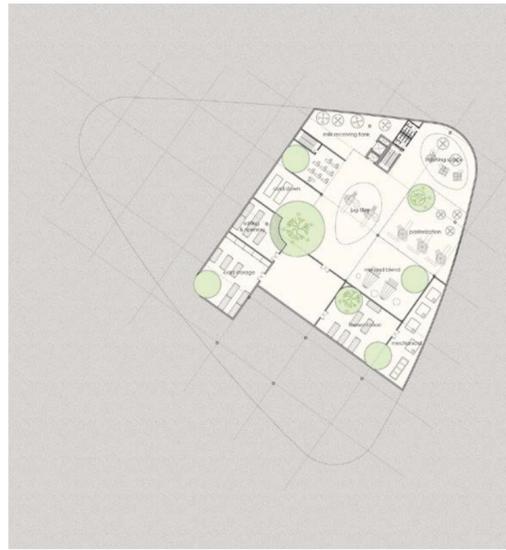




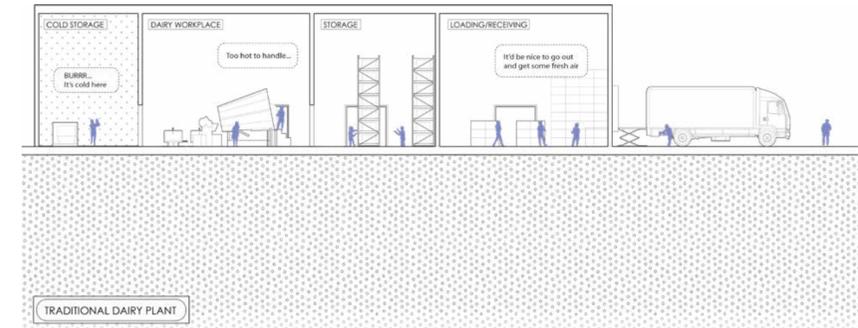
Phase 2 Ground Floor Plan



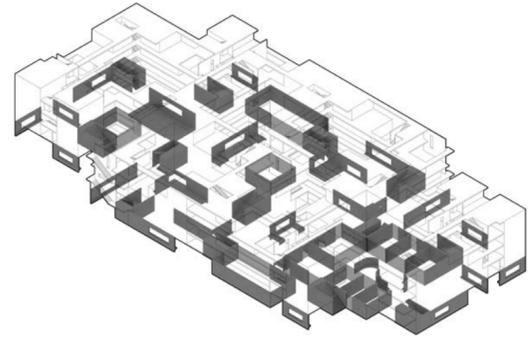
Phase 2 Underground Floor Plan



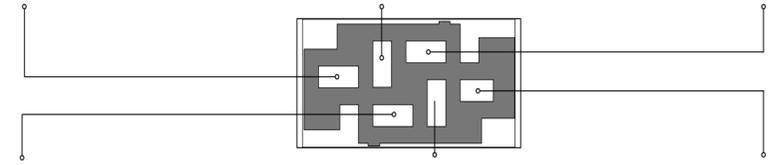
Phase 1 Ground Floor Plan



The traditional dairy plant focuses on the product production while often neglects creating a healthy environment for the workers. Introducing tourism into the dairy plant program not only attracts people but also benefits the workers to get a same level of pleasing environment as the tourists.



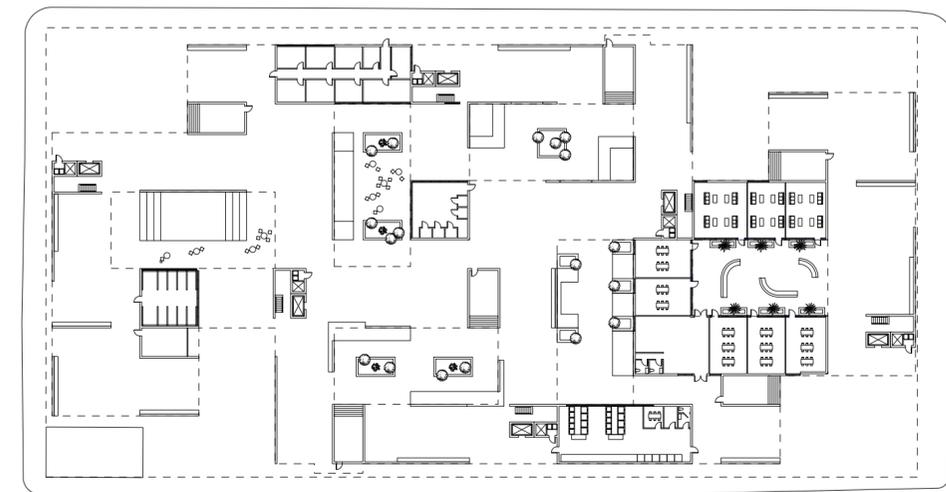
This project is oriented by six distinct courtyards. The ground floor is the community programs, including commercial spaces and community centers. While each residential unit bar is modularized, people can locate themselves by these six courtyards.



HOUSING WITH SIX COURTYARDS

Housing Project in Bronx

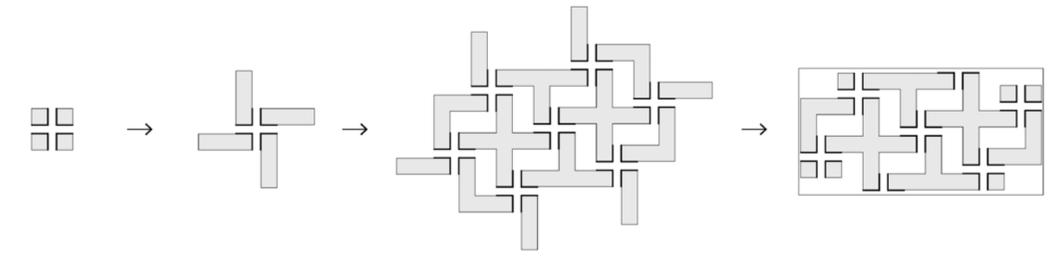
2020 FALL, New York, NY
Group Work with Yang Lu



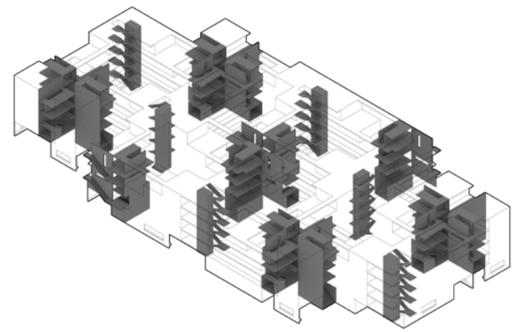
Ground Floor Plan



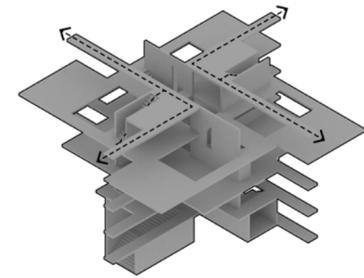
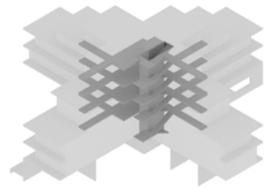
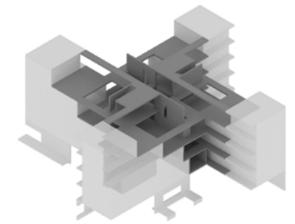
Courtyard Diagram



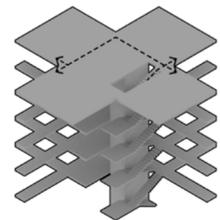
Massing Diagram



Two types of circulations are designed. Circulation 1 has relatively complicated circulations and platforms, and it is intended to be a social space for people to interact on the move. Circulation 2 fulfills the ADA requirement and efficiency.



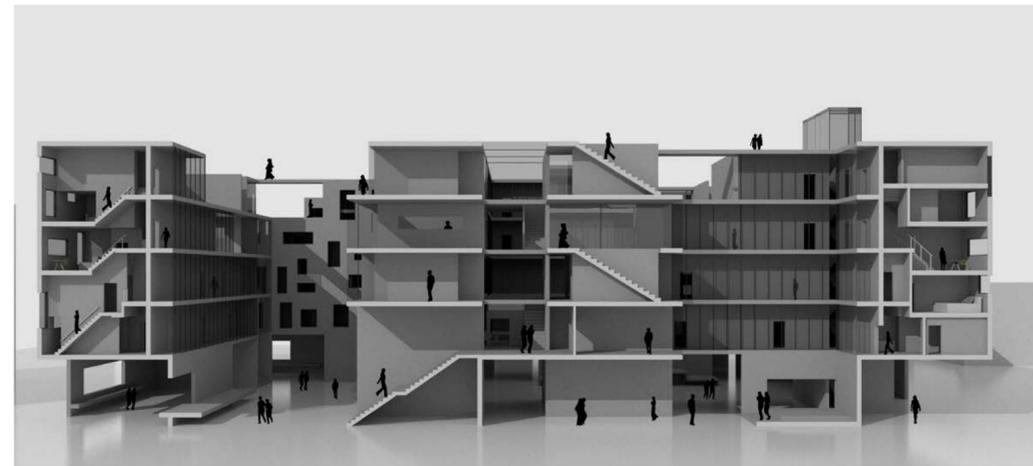
Circulation 1



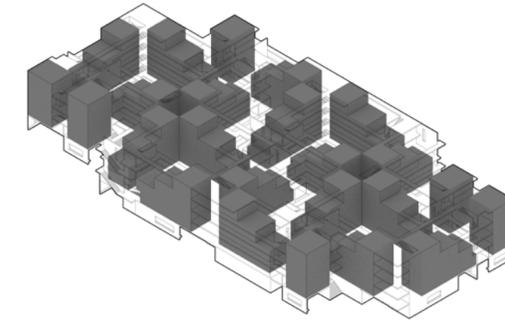
Circulation 2



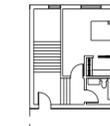
View From Circulation 1



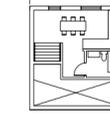
Section



Each unit bar has six types of units, including two-bedroom, one-bedroom, and studio units. Short stairs in the units are designed to be armatures. In "View From Inside of Unit 4," a girl is sitting on the short stair and looking outside to the sky and courtyard view.



Unit 1
One Bedroom
Approx. 815 SF



Unit 2
Two Bedroom
Approx. 1000 SF



Unit 3
Studio
Approx. 500 SF



Unit 4
Studio
Approx. 570 SF



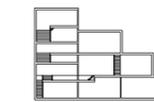
Unit 5
Two Bedroom
Approx. 880 SF



Unit 6
Studio
Approx. 530 SF



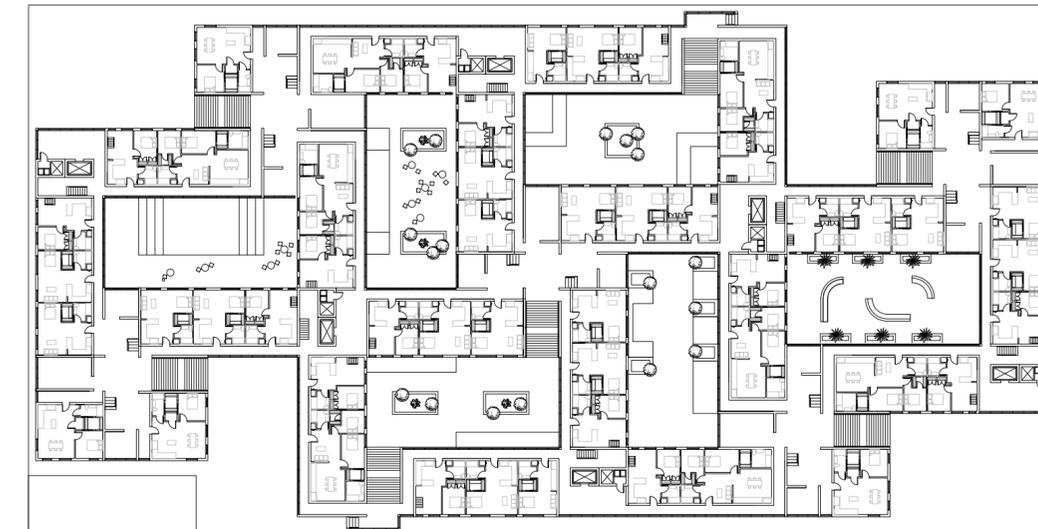
Unit 7
Studio
Approx. 670 SF



Unit Types



View From Inside of Unit 4



Typical Floor Plan



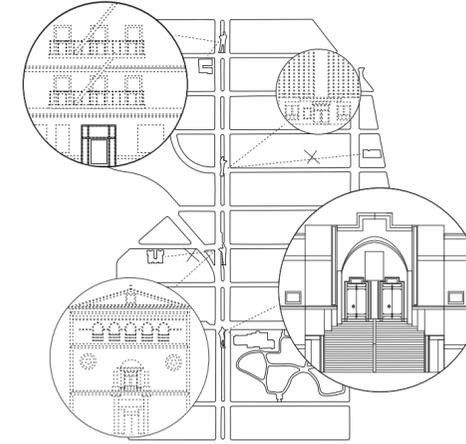
This project aims to bring out senior-friendly spaces in Washington Heights. The sites and programs are chosen based on the properties and existing programs of NYC Department of Parks and Recreation and NYC Department for the Aging. Comparing to Central Park, Washington Heights have scattered and small park spaces. Therefore, this project intends to create a one-hour long walking path with five pavilions to link the small parks together. The main design is the underground building in J. Hood Park uses inclined lawn as its roof where people could still interact to preserve continuous large spaces for the park. Two ramps as entrance and exist are places on two sides of the building. Inside, there is a sun room, courtyards, bathrooms, service room, a small library, and a small gallery. There are spaces in different scale and atmosphere. People can always find a comfortable space for themselves.



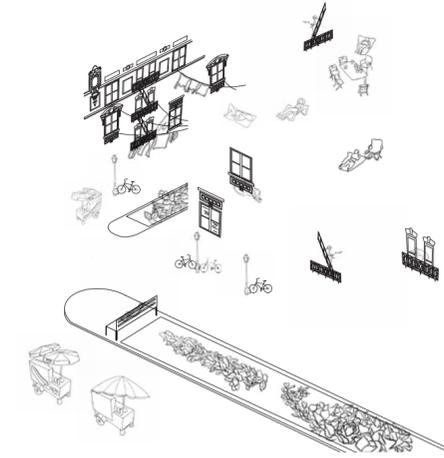
Washington Heights Sunken Plaza

Core 1 Project Focusing on Model Making

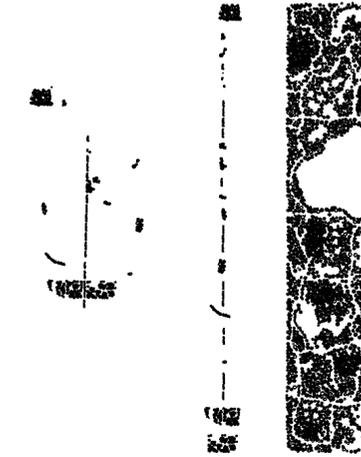
2019 FALL, New York, NY
Instructor: Jaffer Kolb



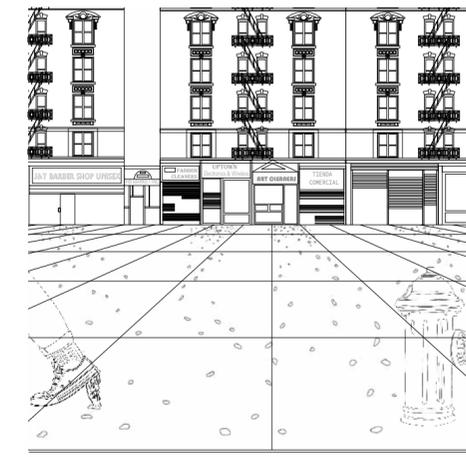
Public Old People Facilities



Illegal Use of Space



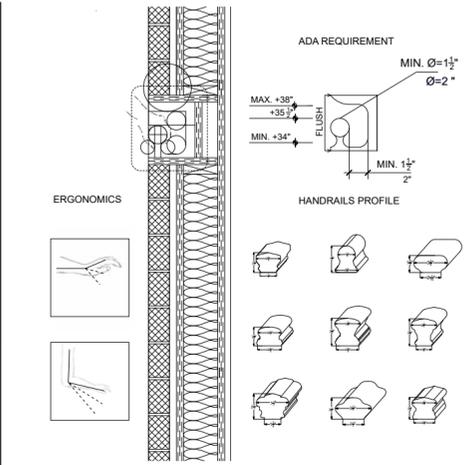
Washington Heights Park VS Central Park



Gum Stain as Human Activity Trace



One to One Mock Up Model



Handrail Study



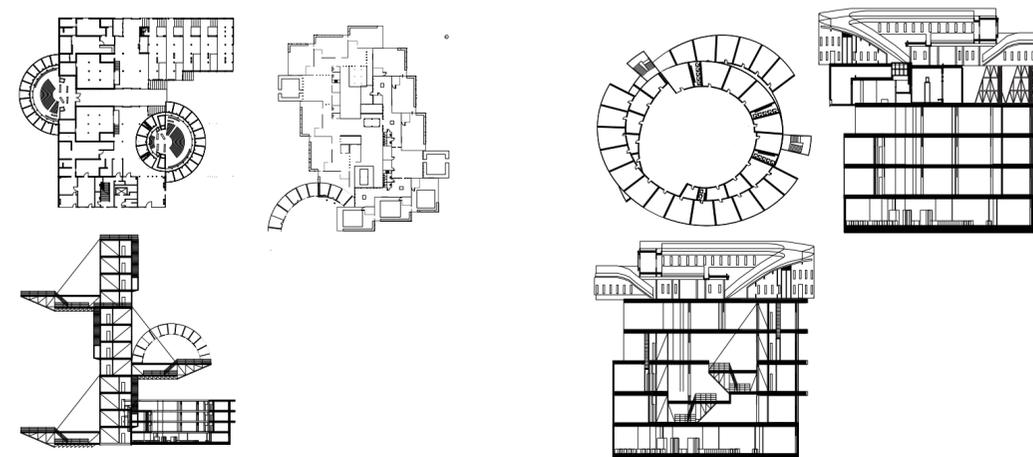
Three Collaged Space for Different Displines

P.S. 64 School

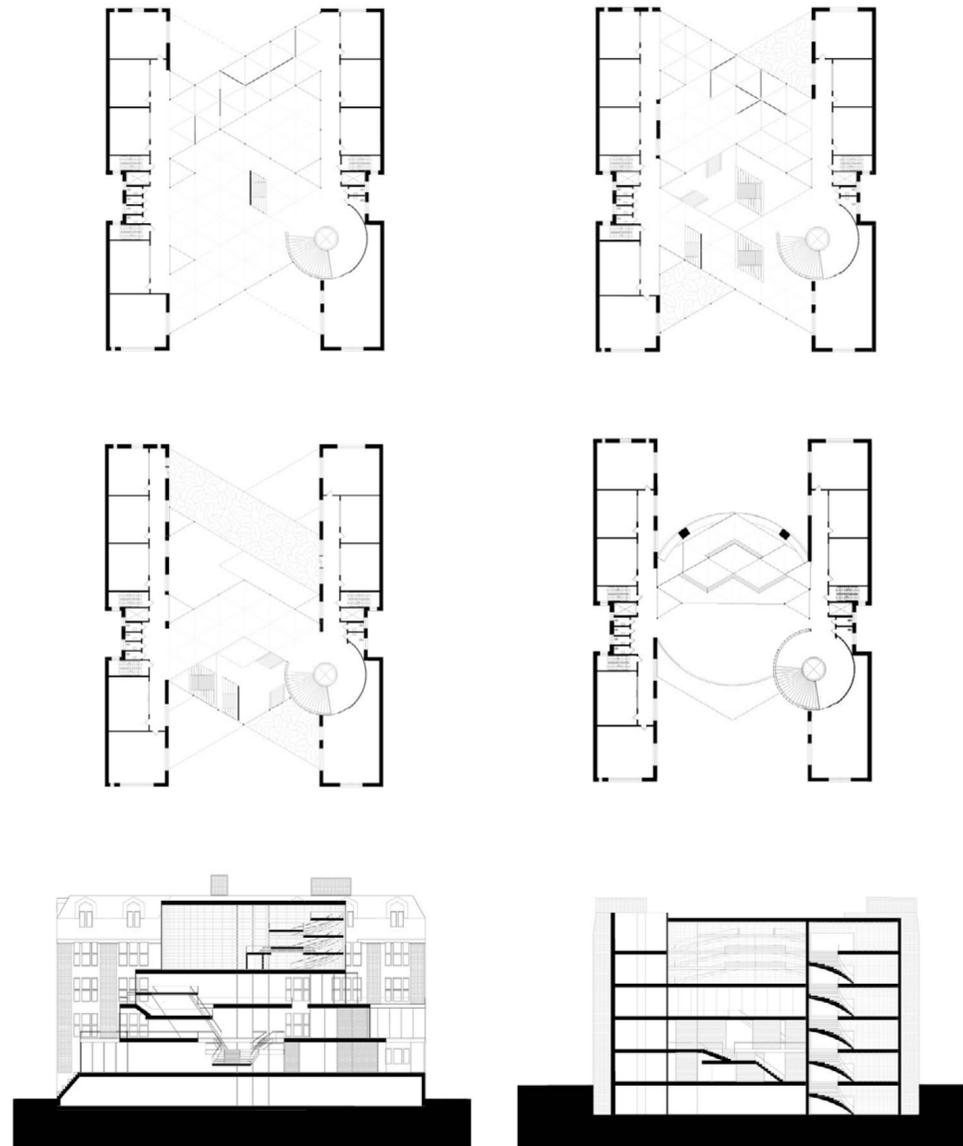
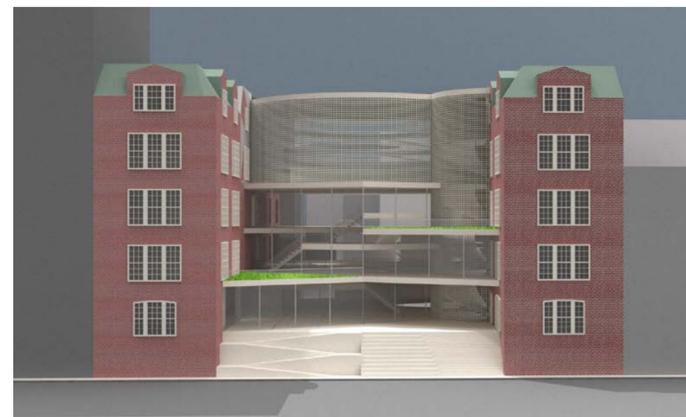
2020 SPRING_New York, NY
Instructor _Emmett Zeifman



Model Collage Exercise



Plan and Section Collage Exercise

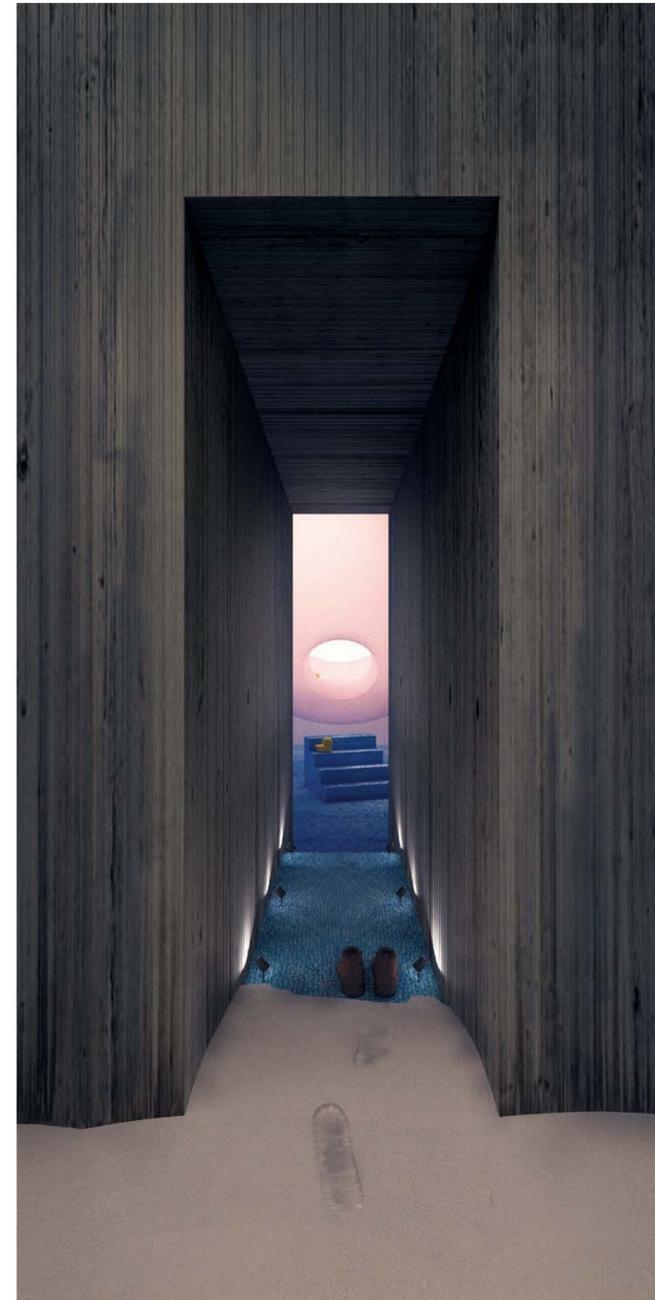




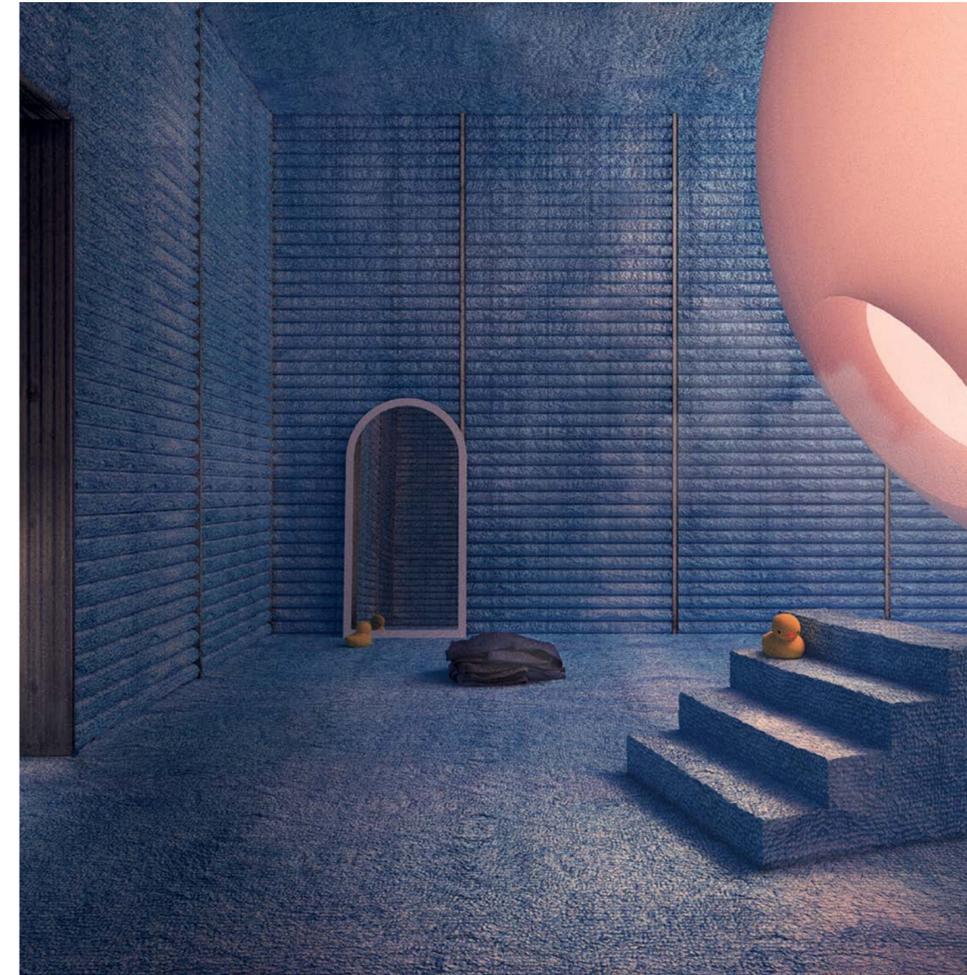
Duck Bath

Render Project Exploring Interior Materials

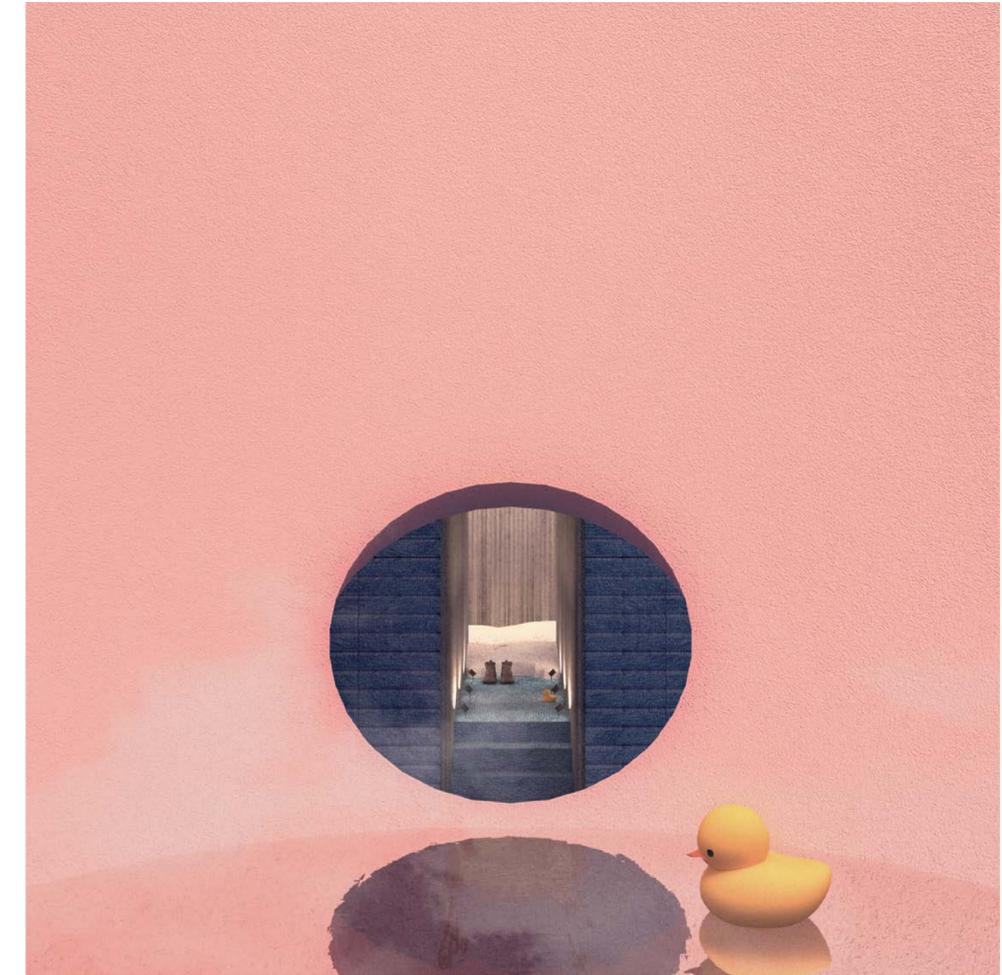
2022 SPRING_ New York, NY
Instructor _Philip Crupi_Group Work with Sixuan Chen, Osvaldo Delbrey, Yerin Won



Room of Concrete and Snow



Room of Towels



Duck Bathtub of Silicone