HAO ZHENG

2019 - 2022
Master Of Architecture
Columbia GSAPP

GRADUATION PORTFOLIO
Joining Bamboo with Cords

Common Bamboo Cuts
- Top Cut
- Bottom
- Full Width
- Full Width

Joining Vertical with Horizontal Elements
- One Ear
- Two Ear
- Central Double Rafter
- Lateral Double Rafter
- Bevelled Flute Mouth
- Fish Mouth
- Wooden or Bamboo Dowels
- Wooden or Bamboo Dowels
- Lateral Double Rafter
- Lateral Double Rafter

Joining Bamboo with Dowels and Lashing

Double and Quadruple Bamboo Rafter Support
- Bamboo formed by 4 or 6 members

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 softwood or hardwood timber.
Avery Library
Total Number: 7
approx. 2275 sqft

Cafe
Total Number: 1
approx. 2275 sqft

Kitchen
Total Number: 1
approx. 220 sqft

OPS
Total Number: 1
approx. 680 sqft

Classroom
Total Number: 8
approx. 2950 sqft

Auditorium
Total Number: 1
approx. 4000 sqft

Studio
Total Number: 5
approx. 1180 sqft

Additional Program Needed
Real Estate Studio
Maker Space
4 Studio Space
Exhibition
OPS

Area Needed Area Planned
Preservation  Technolgy Lab
2 Classrooms
1200 sqft 2750 sqft
600 sqft * 2 flexible
3000 sqft
4 Classrooms, 860 sqft *2
2500 sqft 2750 sqft
680 sqft 680 sqft

Remove the Roof Floor
Add Wood Struc- tured Floors
Twist Add Additional Elevators
Add Indoor Living Walls

Building Avery
Remove the Roof Floor
Add Raised Struc- tured Room
Foot! Add Additional Mezzanine
Add Indoor Living Walls

Studio Space
Bamboo Screen Partition
Living Wall
Classroom
Skylight
Outdoor Pavilion

Exisiting Avery
Exhibition Space (glass roof)
Studio Space Bamboo Screen Partition
Living Wall Classroom
Skylight
Outdoor Pavilion

Studio Space
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

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.
THE BOX

Final Version

ART INSTITUTION

RESTAURANT

SCATTERING AS TABLES

MOVING AS PUZZLE

BOX AS A CONTAINER

REORGANIZED AS MESSAGE

HISTORIC SITE

JAZZ BAR
An Adaptive Reuse Program at BQE Expressway

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.
BIPARTISAN INFRASTRUCTURE BILL

<table>
<thead>
<tr>
<th>Total</th>
<th>TRANSPORTATION</th>
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|       | Roads, bridges, major projects | $579
|       | Safety | $312
|       | Public transit | $109
|       | Passenger and Freight Rail | $11
|       | EV infrastructure | $49
|       | Electric buses / transit | $66
|       | Reconnecting communities | $7.5
|       | Airports | $7.5
|       | Ports & Waterways | $1
|       | Infrastructure Financing | $25
|       | Other Infrastructure | $16
|       | Water Infrastructure | $20
|       | Broadband infrastructure | $266
|       | Environmental remediation | $55
|       | Power infrastructure incl. frid authority | $65
|       | Western Water Storage | $21
|       | Resilience | $73
|       | Humanities | $5
|       | TOTAL | $47

FEDERAL GOVERNMENT
NYC GOVERNMENT
MAYOR
FIRST DEPUTY MAYOR

Department of Transportation
Department of Cultural Affairs

- 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

Current Condition of the BQE Expressway

Detailed Section Massing Diagram
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.
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 gives workers access to wellness programs alongside healthier workspaces.

Subsoil temperature becomes stable at 200 to 300 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.
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.
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.

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.

View From Circulation 1

View From Circulation 2

Section

Unit Types

- 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 7: Studio
  Approx. 670 SF

- Unit 4: Studio
  Approx. 570 SF

- Unit 6: Studio
  Approx. 530 SF
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 exit 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.
Three Collaged Space for Different Disiplines

P.S. 64 School

2020 SPRING New York, NY
Instructor Emmett Zeifman

- Model Collage Exercise
- Plan and Section Collage Exercise