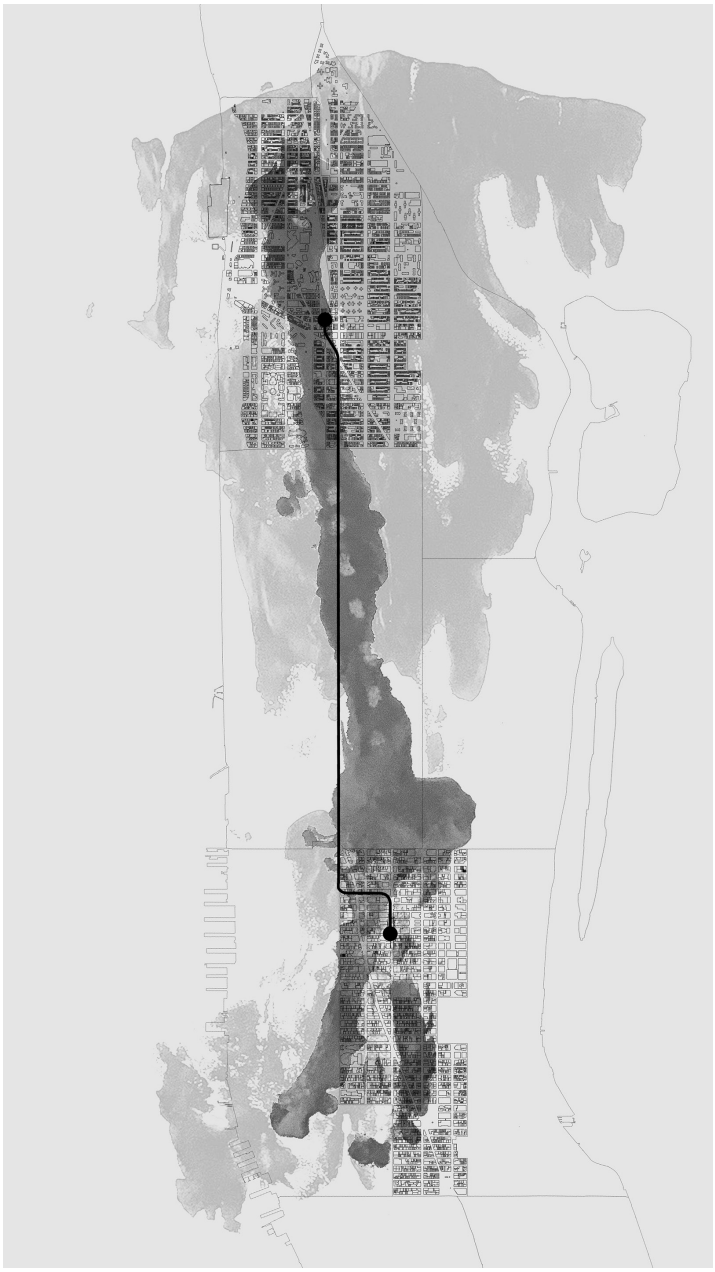
DAJIN WANG



Hyper-Organic Architecture

The architecture of the future is not only about buildings; it must grapple with aging and solitary death, illnesses such as dementia, educational inequality, social marginalization, and the fragile relationship between humanity and nature. I envision this future architecture as a village-scale organism that actively solves these problems—a framework I call "Hyper-Organic Architecture." Evolving from the ideals of organic architecture, this approach scales from individual structures to entire communities, enabling more direct, systematic responses to social and environmental challenges.

First, modular residential complexes can be combined to prevent elderly people from dying alone. Second, by weaving adaptive devices for diverse physical and mental needs throughout towns and cities, this system can become an inclusive civic foundation. Finally, distributing renewable-energy facilities across the urban fabric will foster a sustainable harmony between people and nature.

This portfolio explores my pursuit of Hyper-Organic Architecture—a systematic, village-scale approach to design that treats architecture as a living organism, capable of healing fragmented communities and restoring the broken ties between people and nature.

1. The Restorative Spine — Building
A Territorial Infrastructure for Metabolic Burial Cycles — Academic
Spring 2026 | *Advanced Studio VI (Columbia University GSAPP, NY, US)*

2. Growing Commons — Building
Transforming Temporary Hospitality into Lasting Community Infrastructure — Academic
Spring 2025 | *Advanced Studio IV (Columbia University GSAPP, NY, US)*

3. Wavy — Building
A New Model for Sustainable Apartments Blending Central and Residential Hubs — Academic
Fall 2024 | *Core Studio III (Columbia University GSAPP, NY, US)*

4. Oysty — Material Study
A wave-dissipation module designed for scalable deployment across diverse flood contexts — Academic
Fall 2025 | *Advanced Studio V (Columbia University GSAPP, NY, US)*

5. Protect Thacker Pass — Representation
Media Spectacle Armature Architecture for Reclaiming Cultural Heritage — Academic
Spring 2024 | *Core Studio II (Columbia University GSAPP, NY, US)*

6. Smoothly — Academic
Accessible Landscape Architecture with Bamboo
Fall 2023 | *Core Studio I (Columbia University GSAPP, NY, US)*

7. The Curve — Building
Redesigning the parking lot into a brand-new sports complex with a green roof — Academic
Fall 2024 | *Architectural Technology IV (Columbia University GSAPP, NY, US)*

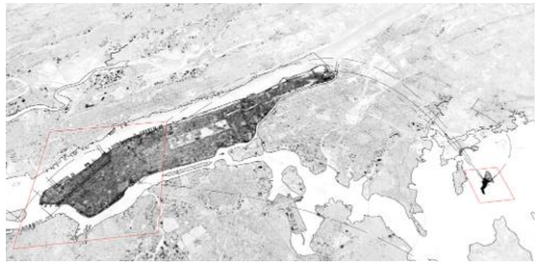
8. Fast and Slow — Computational Analysis
Facade design balancing sustainability and identity — Academic
Spring 2025 | *Architectural Technology V (Columbia University GSAPP, NY, US)*

9. Airflow in My House — Computational Analysis
Airflow analysis with CFD — Academic
Spring 2024 | *Architectural Drawing & Representation II (Columbia University GSAPP, NY, US)*

10. Mapping the Small Business Ownership — Computational Analysis
Urban scale analysis with GIS and data — Academic
Spring 2026 | *Methods in Spatial Research (Columbia University GSAPP, NY, US)*

11. Iris Facade — Computational Analysis
Kinetic Architectural envelope — Academic
Spring 2026 | *Making Senses (Columbia University GSAPP, NY, US)*

12. Confusion — Architectural Drawing Study
Case study representation — Academic
Fall 2024 | *Architectural Drawing & Representation I (Columbia University GSAPP, NY, US)*



Map of NYC connecting downton Manhattan and Hart Island

Hart Island_Physical model_1:100 scale (24" x 11" x 4")

1. The Restorative Spine

A Territorial Infrastructure for Metabolic Burial Cycles

Work type: *Academic Work (Columbia University GSAPP, NY, US)*
Work period: *Spring 2026 (Advanced Studio VI)*
Collaboration: *Tom Chaotang Iin*
Contribution: *material study, design drawing, physical model making, rendering*
Instructor: *Karla Rothstein*
Programs: *Rhino, Grasshopper, Enscape, D5 render, Photoshop, Illustrator*

This project redefines the 21st-century cemetery not as a static plot, but as a proactive territorial infrastructure that bridges the urban paradox between Manhattan and Hart Island. By identifying 161 Maiden Lane—a stalled skyscraper frozen by structural instability—as a site for intervention, the design transforms a compromised exoskeleton into a vertical Natural Organic Reduction (NOR) production hub. Rooted in material studies of absorption and phase transitions, the project establishes a metabolic exchange between the two islands: 161 Maiden Lane processes organic remains into nutrient-rich soil, which is then exported to Hart Island to combat coastal erosion and expand burial capacity. This synchronized logistical machine—integrating solar-carved vertical ecosystems, desalination processes, and telescopic structural units—recycles the structural framework of a failed development to restore one of New York's most vulnerable landscapes. Ultimately, The Restorative Spine envisions a future where the city's cycle of death is harnessed as a technical and poetic tool for land reclamation and ecological legacy.

161 Maiden Lane
_Physical model
_1:100 scale (29" x 11" x 32")
_ramming soil, rockite and ink
_laser cutting and 3D printing

Material Study 1.

Mulberry paper (Printer paper, Drawing paper, Art board, and Corrugated cardboard), salt, water, Ink

Material Study 2.

Mulberry paper with salt, water, Ink

After 3 hours

After 24 hours

Mulberry paper with different density, salt, water, Ink

After 24 hours

Observation

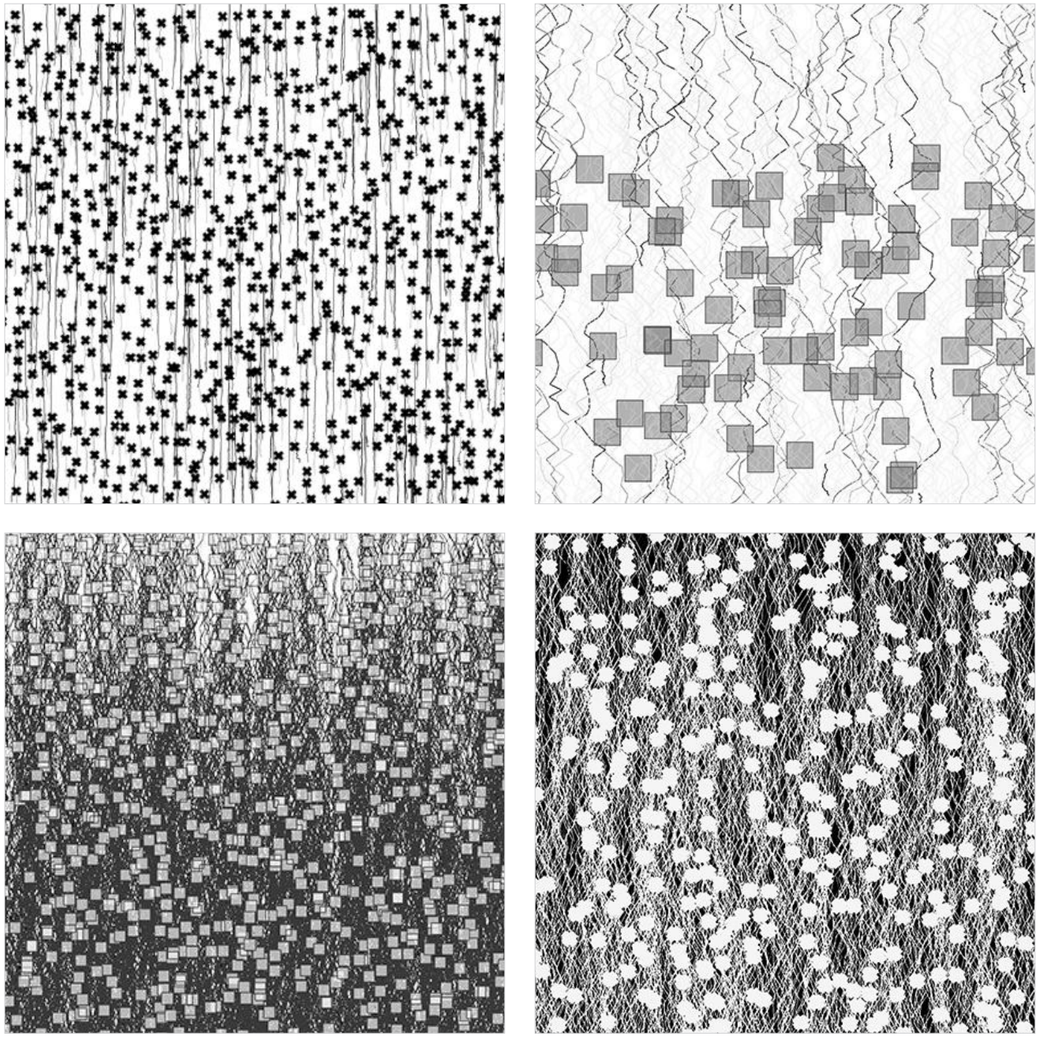
Different speed of liquid absorbtion based on the density of papers

Blue ink pigment moves faster with water than other pigments in black ink

Melted salt reappears after water dried in a certain level of height

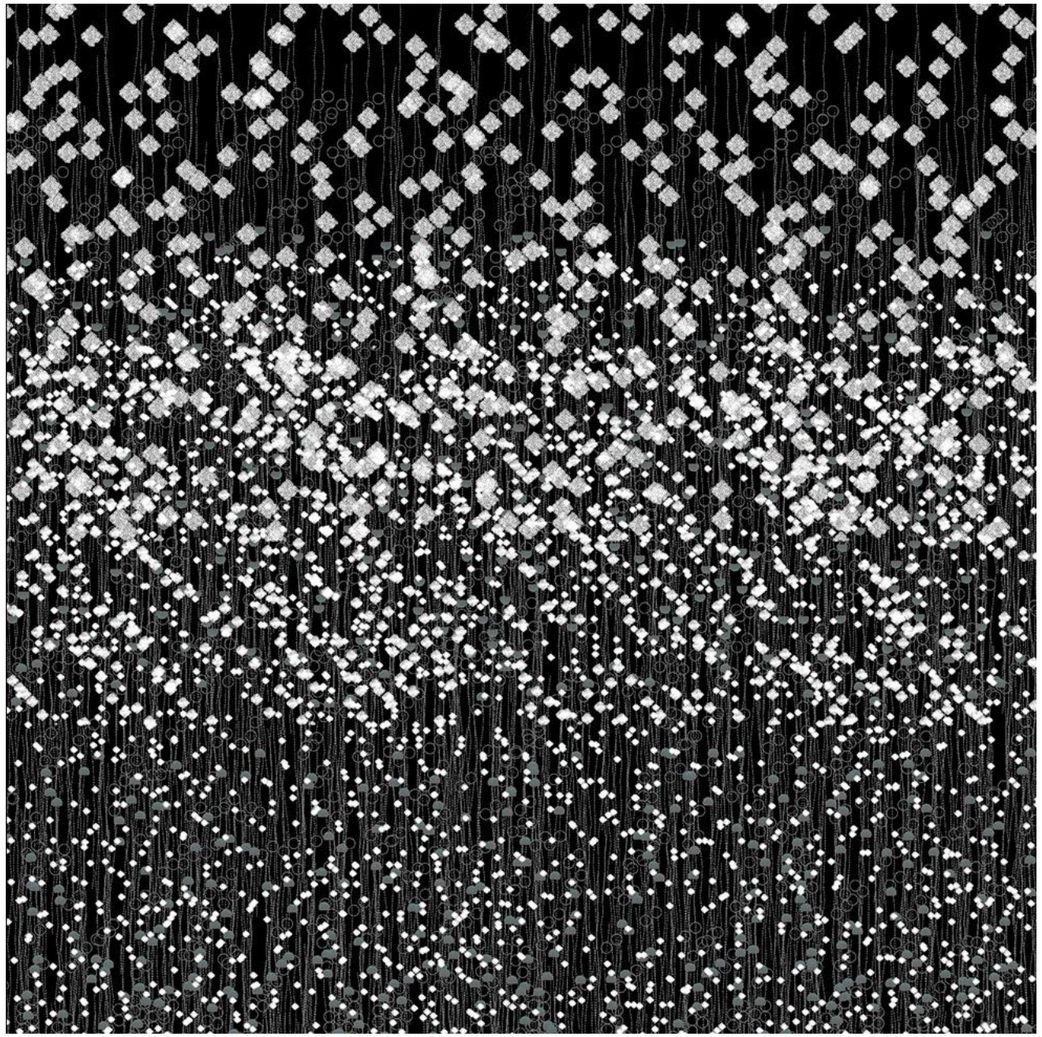
Operative Drawing-progress

Program: Rhino Grasshopper+Python



Operative Drawing-final

Program: Rhino Grasshopper+Python

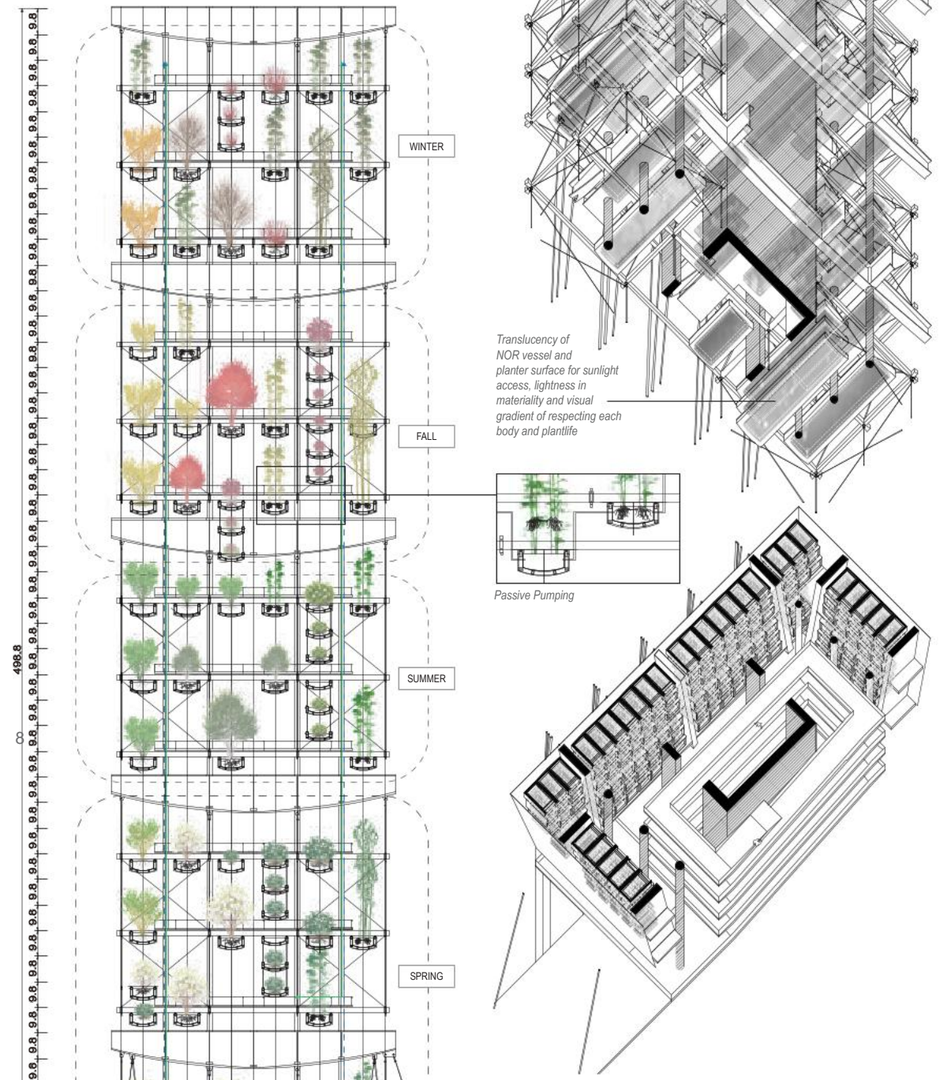


Extracted physical activity principle

Capillary action	*161 Maiden Lane - trees' water provision and tensile structure*
Salting Out Effect	*Hart Island - Water provision with disalination*
Saline Crust Formation (<>effluent)	*161 Maiden Lane - NOR block calcification* *Hart Island - Shoreline soil protection layer*

161 Maiden Lane- Hart Island Linear Section Diagram

Whole mineralized NOR block manufacturing, transporting, and deployment process



Design Plan - 161 Maiden Lane

161 Maiden Lane

Hart Island

NOR plants - for generating carbon rich biomass

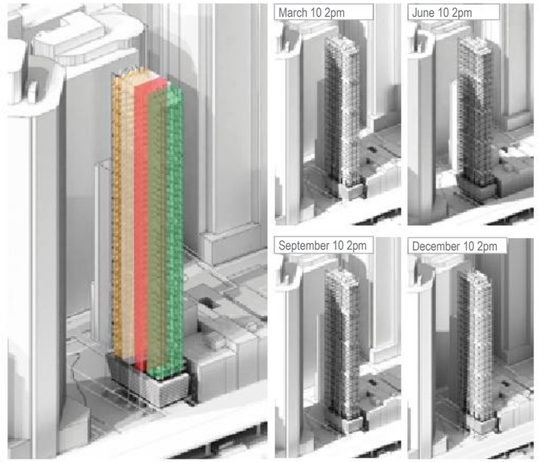
Bamboo
Carbon: ~50% (Dry wt.) | High CO_2 sequestration (10-30t/ha/yr)Light: Full Sun (1,200–2,000 $\mu mol/m^2/s$)Size: 5–15m (Fast vertical growth)Water: High (25–35% soil moisture)

Red Osier
Carbon: ~44% (Dry wt.) | Continuous biomass via coppicingLight: Full Sun (1,000–1,500 $\mu mol/m^2/s$)Size: 2–4m (Spreading shrub)Water: Very High (Wetland/Saturated soil)

Serviceberry
Carbon: ~48% (Dry wt.) | High-density structural biomassLight: Partial to Full Sun (700–1,200 $\mu mol/m^2/s$)Size: 3–8m (Mid-story tree)Water: Moderate (Well-drained/Moist)

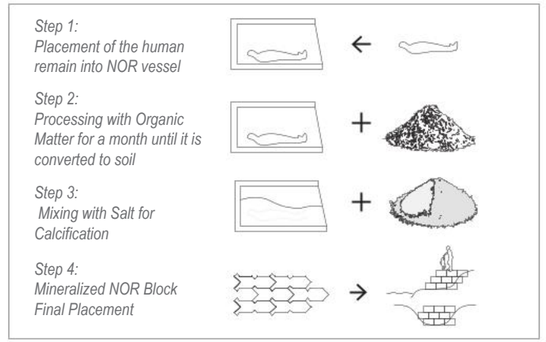
Witch Hazel
Carbon: ~45% (Dry wt.) | Understory sequestrationLight: Shade to Partial Sun (300–700 $\mu mol/m^2/s$)Size: 3–5m (Slow-growing understory)Water: Moderate to High (Organic/Moist soil)

Sunlight Analysis for NOR plants arrangement

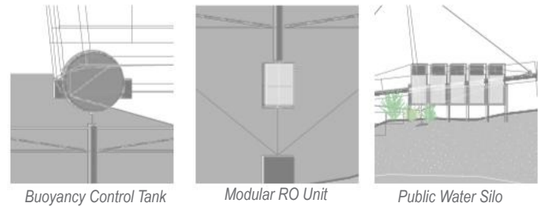


Plant arrangement

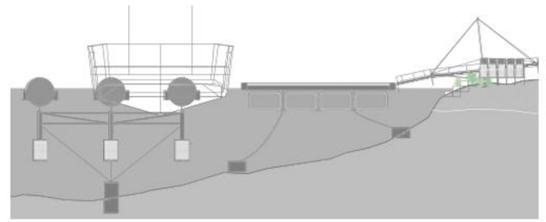
Natural Organic Reduction (NOR) Block formation & Mineralization process



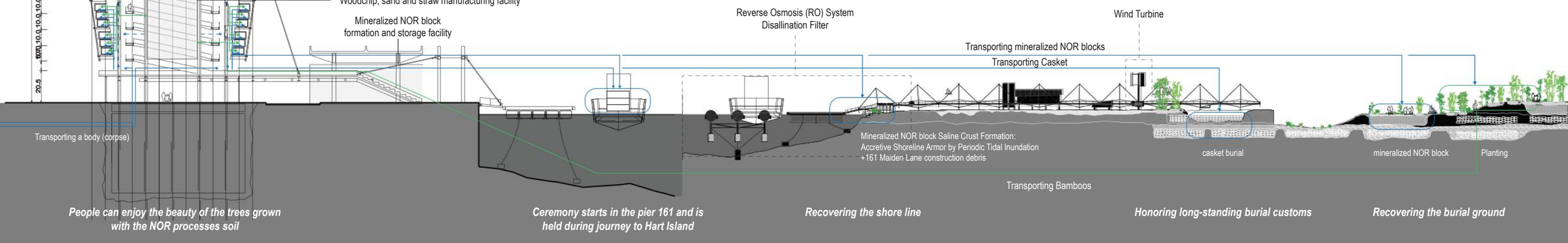
Reverse Osmosis (RO) system for potable water provision in Hart Island



Buoyancy Control Tank *Modular RO Unit* *Public Water Silo*



Revers Osmosis (RO) system



People can enjoy the beauty of the trees grown with the NOR processes soil

Ceremony starts in the pier 161 and is held during journey to Hart Island

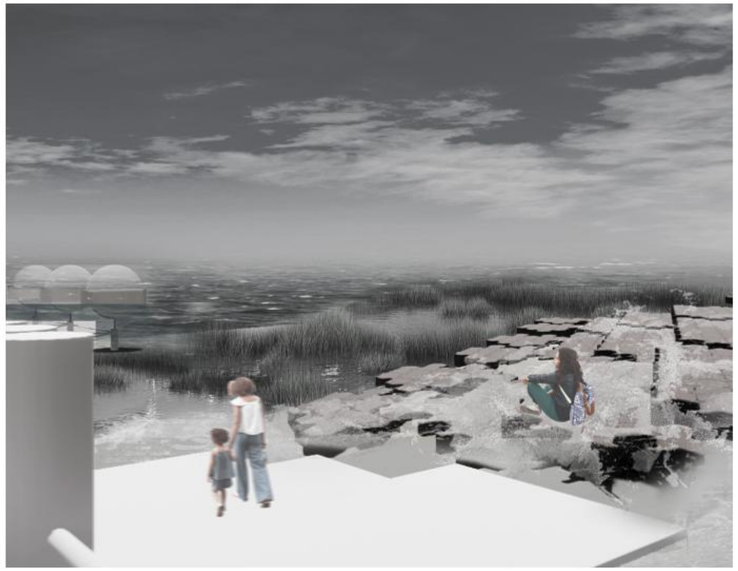
Recovering the shore line

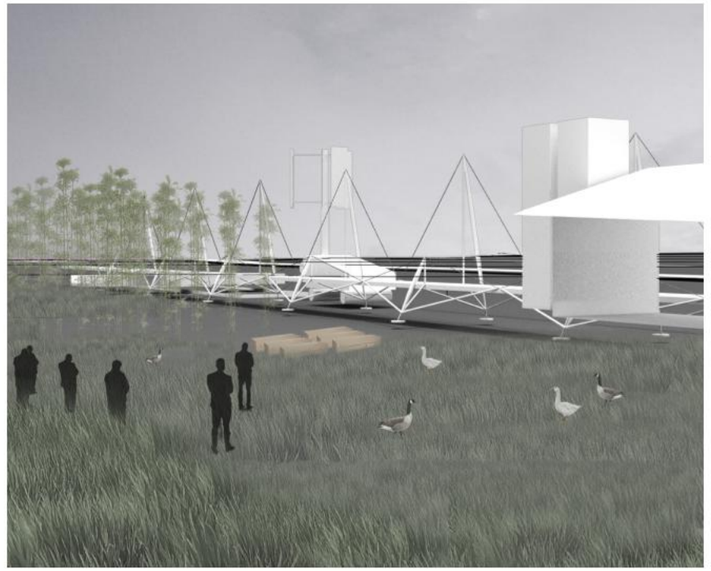
Honoring long-standing burial customs

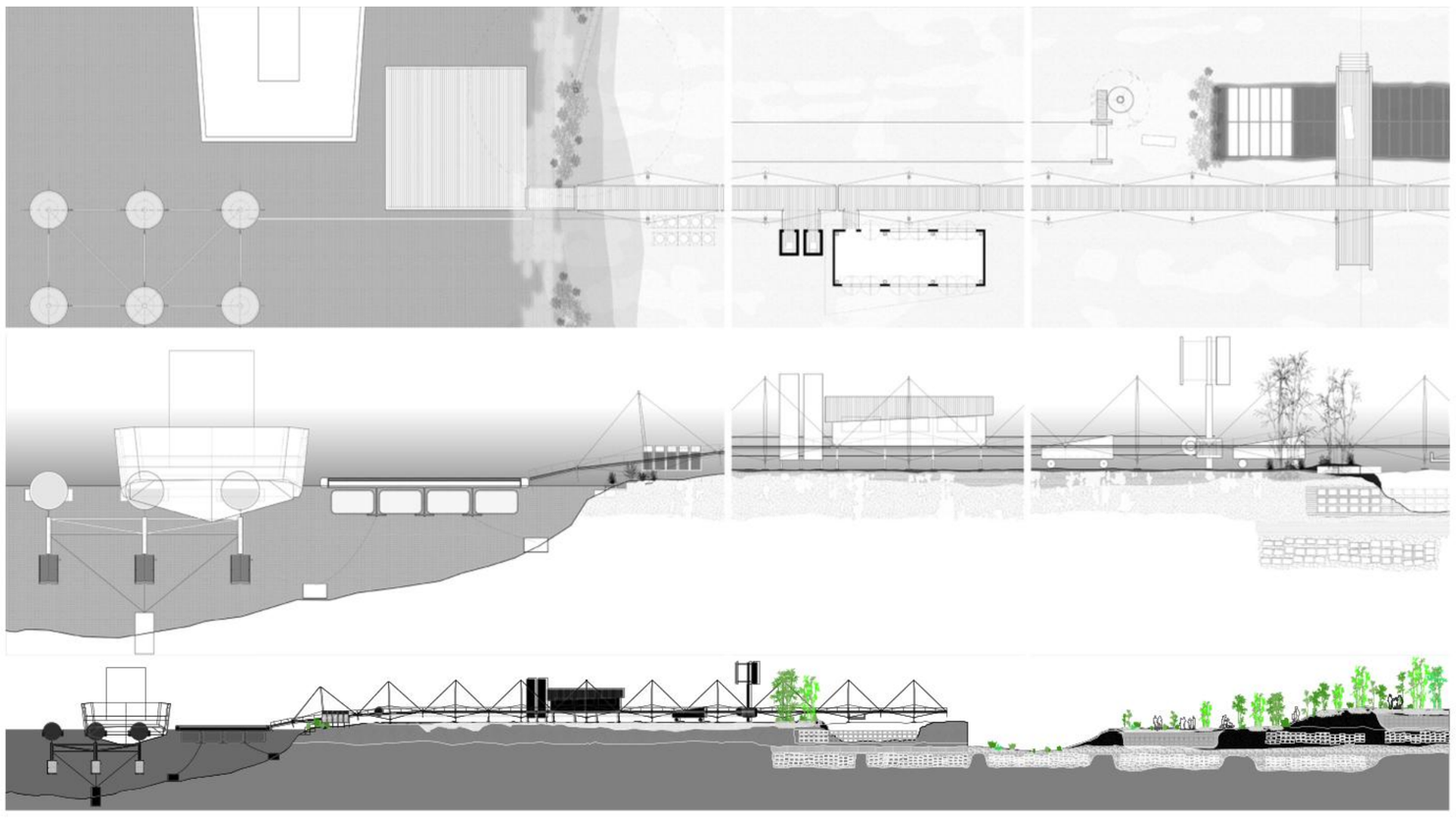
Recovering the burial ground

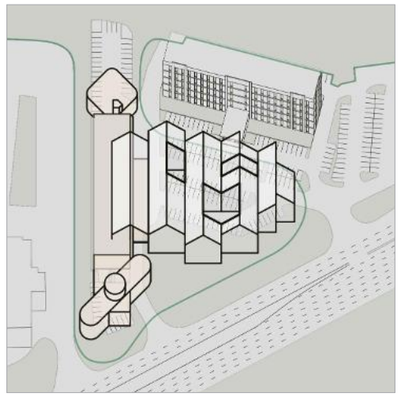
161 Maiden Lane-Rendered View

Hart Island-Rendered View and Detailed Drawing









Massing and parking diagram under new zoning

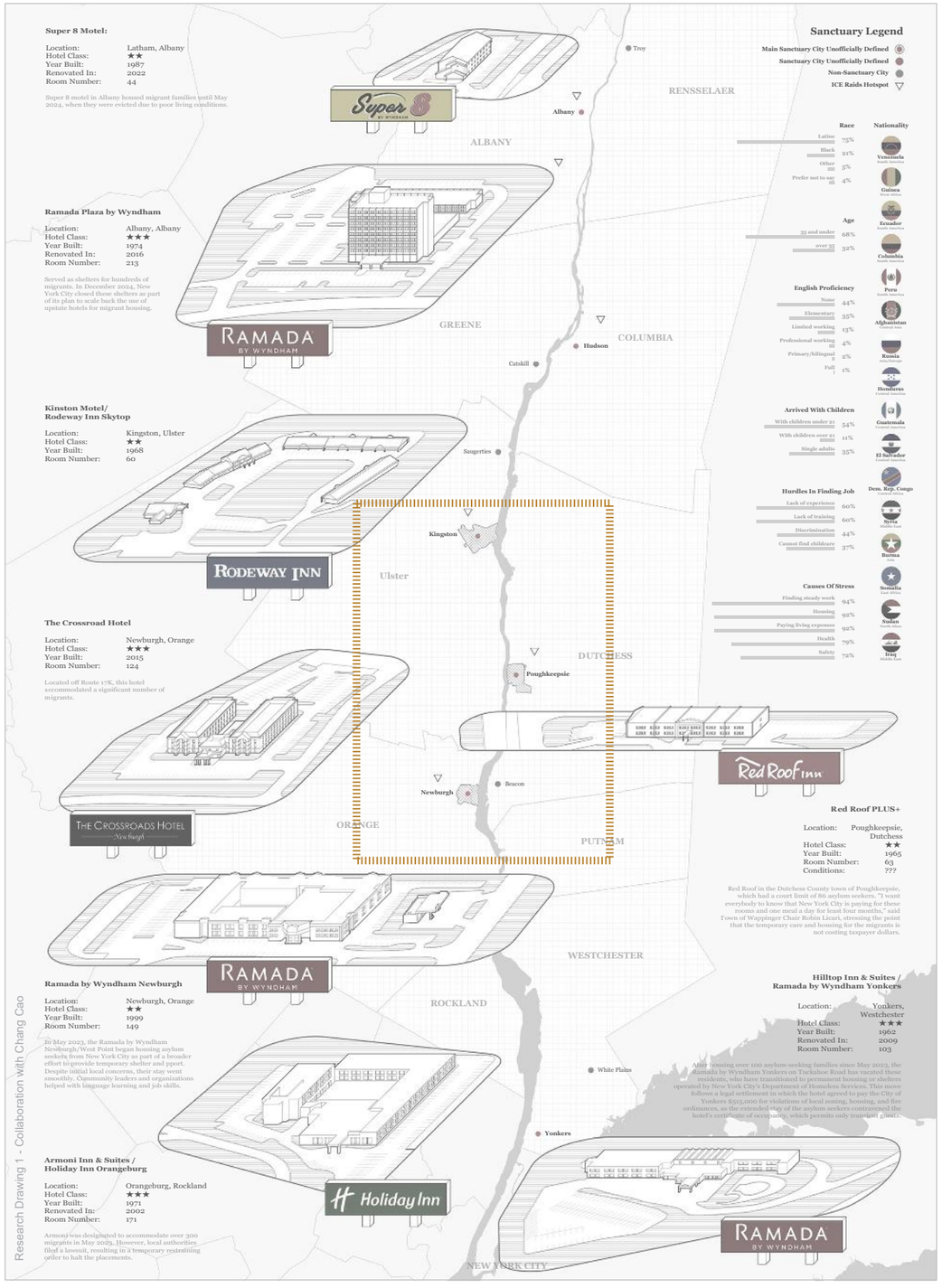
2. Growing Commons

Transforming Temporary Hospitality into Lasting Community Infrastructure

Work type: *Academic Work (Columbia University GSAPP, NY, US)*
Work period: *Spring 2025 (Advanced Studio IV)*
Collaboration: *Individual*
Instructor: *Nahyun Hwang*
Programs: *D5 Render, Enscape, Midjourney, AutoCAD, Rhino, Grasshopper, Photoshop, Illustrator*

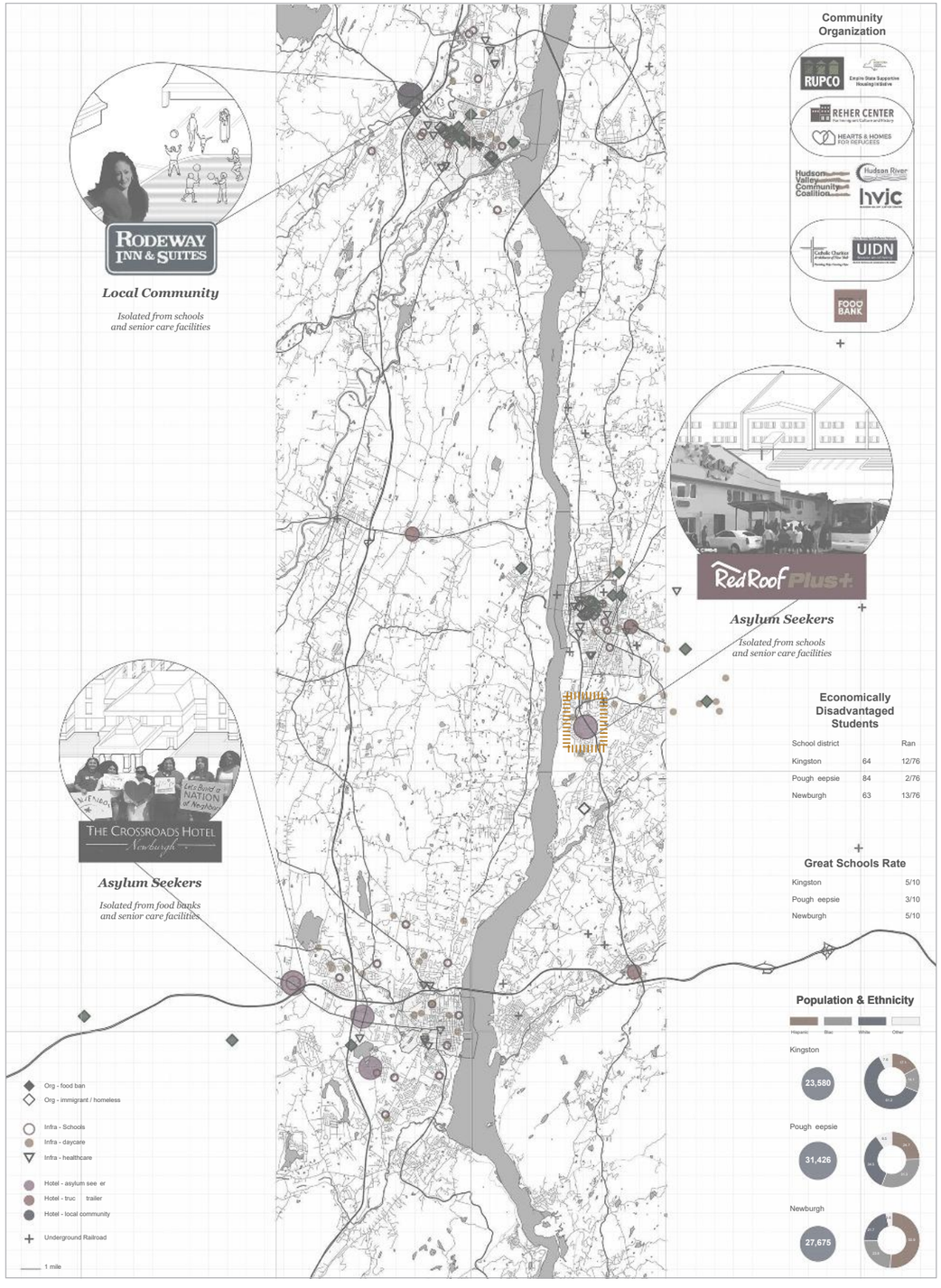
This project transforms a roadside motel into a long-term civic infrastructure. Rather than providing temporary shelter, the scheme reconfigures existing units into a system of productive spaces that support food production, gathering, and local economies. Greenhouse structures extend from the existing building, enabling year-round cultivation while reorganizing circulation and shared space. The project operates as an incremental system, allowing programs to expand and adapt over time. The project provides long-term stability for asylum seekers, shared productive resources for local communities, and operates as an alternative civic infrastructure that reduces reliance on emergency housing systems. Here, "growing" refers not only to food production, but also to the incremental expansion of space and the formation of shared social infrastructure.

Sanctuary System in the Hudson Valley through Hotels



Sanctuary counties, cities, and hotels for asylum seekers in the Hudson Valley, characterized by low-quality but efficient architectural types.

In-Depth Mapping of the Mid-Hudson Valley



Located far from major cities, with limited access to healthcare, clinics, and food resources; affecting both asylum seekers and local communities impacted by gentrification

Design Principle

Threshold

1. No clear front or elevator (ADA accessibility)
2. No community space
3. No equitable quality of the service
4. Large parking areas underutilized, with no strategy to maximize spatial potential
5. Rooms too small to accommodate families of 3–4

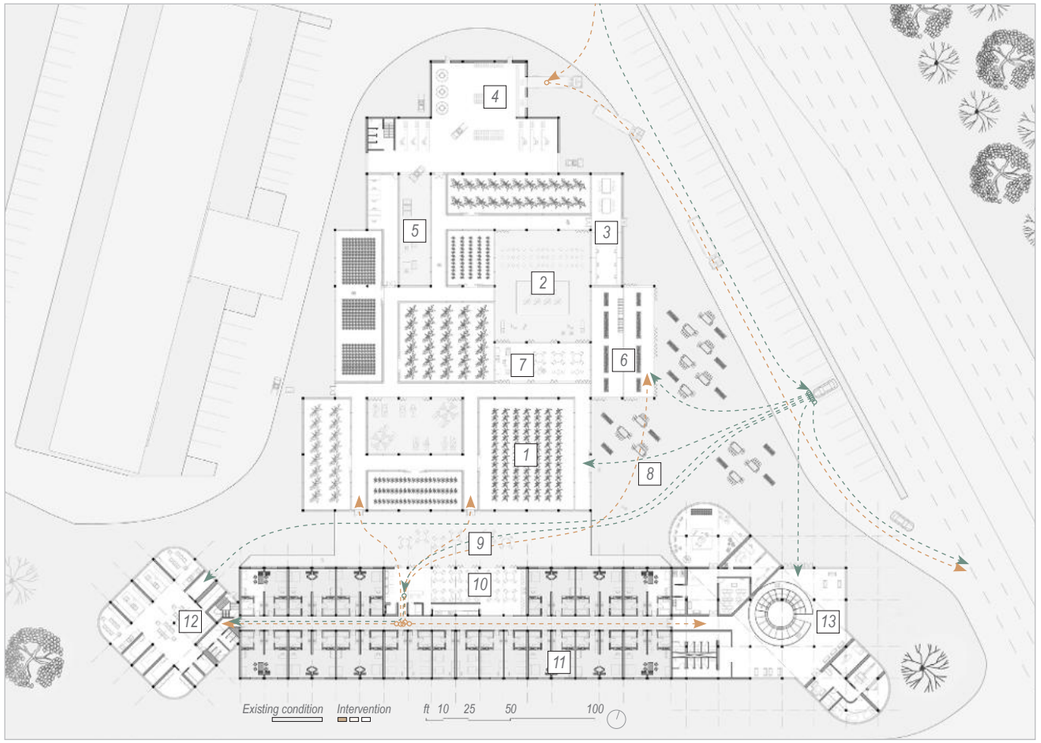
Intervention

1.Addition of elevators (3 levels) for ADA accessibility
2. Introduction of community kitchens and flexible dining spaces
3. Integration of daycare and clinic services
4. Implementation of greenhouses with community programs
5. Reconfiguration of rooms with transformable partitions

Sustainability

1. Installation of rooftop solar panels
2. Integration of rainwater collection systems
3. Composting systems for planting

Ground Level Plan



1. *Greenhouse - Farming & education*
2. *Greenhouse - Outer Community Space*
3. *Greenhouse - Laboratory*
4. *Greenhouse - Storage, watering, Loading dock*
5. *Greenhouse - Composting*
6. *Open-air Farmers Market*
7. *Cafe - inside*
8. *Outdoor Community Space*
9. *Outside - Dining & Event area*
10. *Insside - Lobby & Dinning*
11. *Motel Rooms*
12. *Community Kitchen*
13. *Community Services – Daycare and Clinic*

Path - Asylum seeker
Path - Local community & travellers

Rendered View

2. Greenhouse - Outer Community Space

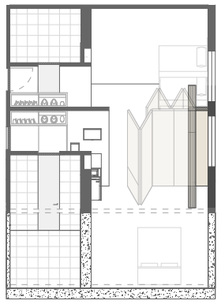
1. Greenhouse - Farming & education

Unit Design

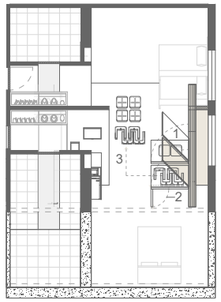
Needs

1. *Demand for long-term stay units for stable accommodation*
2. *High proportion of family units, with 50% of asylum seekers traveling as families (often with children)*
3. *Need to accommodate seasonal fluctuations between asylum stays and short-term travel occupancy*

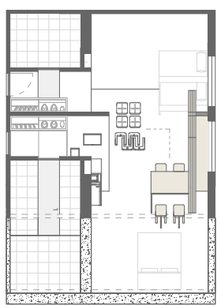
Unit Transformation



1. Fully fold door

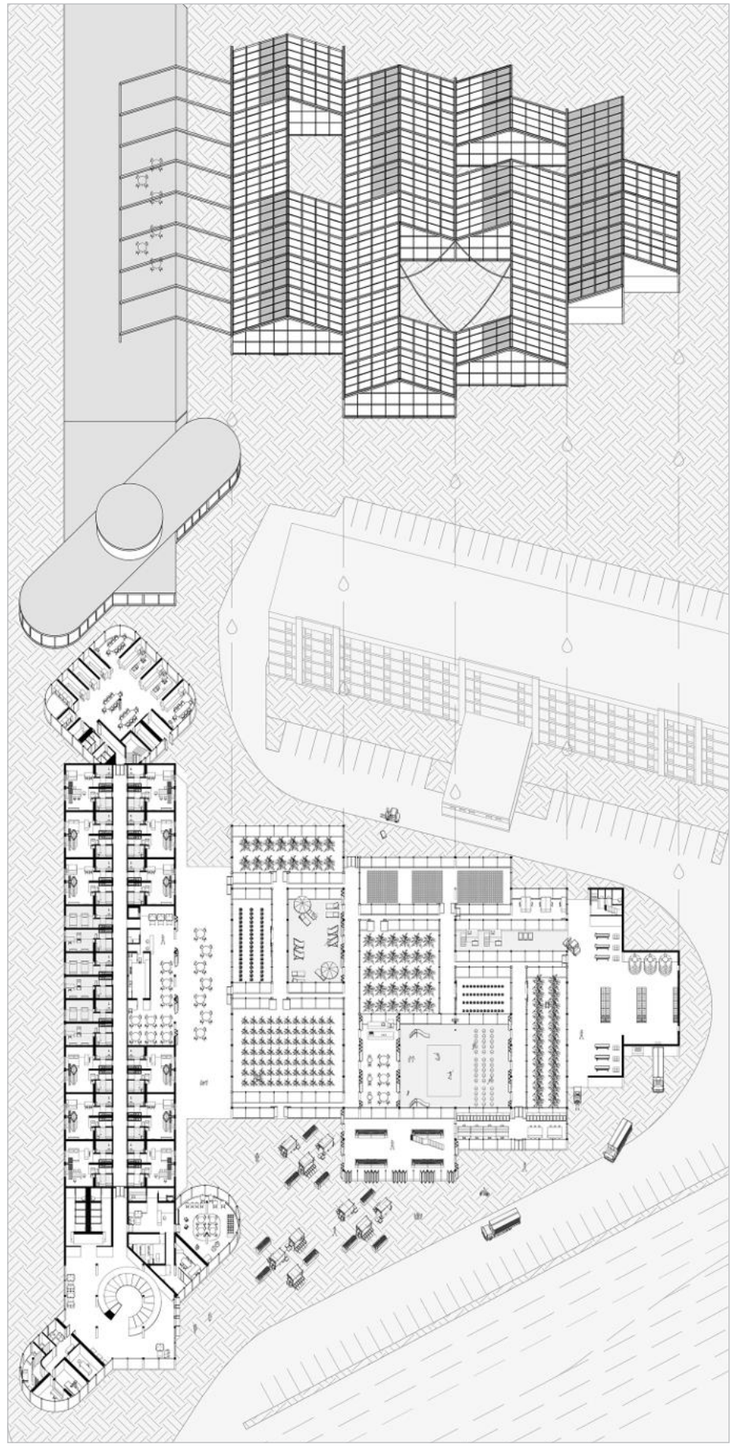


2. Unfold tables and unpack chairs



3. Assemble chairs

Overview

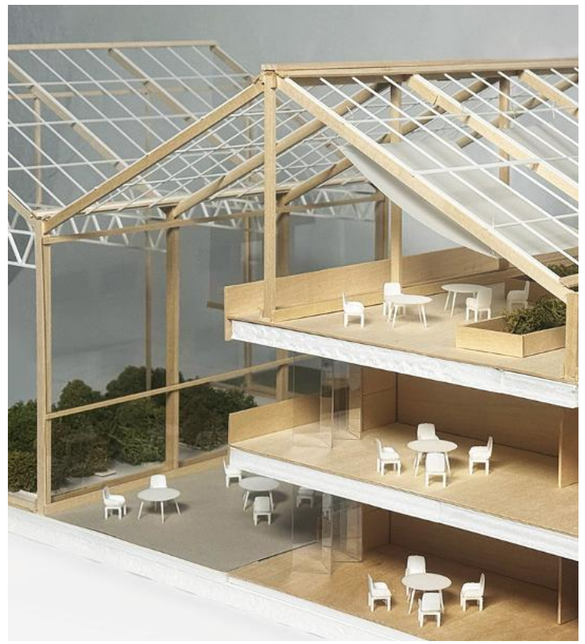


Physical Model

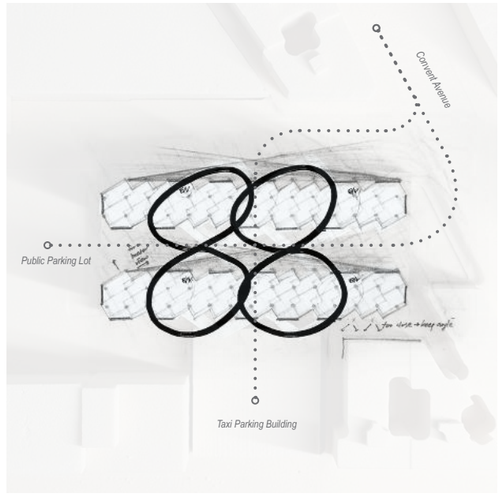
Final Design Model
Scale: 1:50 (18.2" × 33.5" × 13")
Hand-cut: Wood board, foam core, paper board, film paper
Laser-cut: Closets and desks
3D-printed: Structural frames and furniture

A. Section showing expandable unit details with folding doors and shared outdoor areas (including a lawn, farmers market, and dining/food event zone)
- CLT structure & wood panels on the interior walls

B. Unit type variations — with and without folding doors



C. Indoor common areas (dining and terrace) extending into the outdoor space



454-458 W 128th St, New York, NY 10027
Study Model_1:500 scale_CNC foam and papers

3. Wavy

A New Model for Sustainable Apartments Blending Central and Residential Hubs

Work type: *Academic Work (Columbia University GSAPP, NY, US)*
Work period: *Fall 2024 (Core Studio III)*
Collaboration: *Individual*
Instructor: *Gary Bates*
Programs: *D5 render, Enscape, Rhino, Grasshopper, AutoCAD, Photoshop, Illustrator*

This project organizes housing through continuous looped circulation that operates as shared social infrastructure. Rather than isolating units, looping pathways connect them vertically and horizontally. The wavy geometry is driven by circulation and light, maximizing daylight access while maintaining gradients of privacy. Responding to Harlem's lack of accessible open space, a porous ground level extends public life into the building through programs such as a farmers market and communal spaces. Housing becomes a connected system defined by circulation, light, and shared access.

Section Overview

Sustainable system and open space circulation

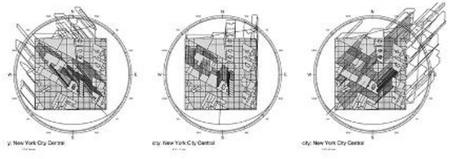
Mass Design

Seasonal Sunlight Analysis

1. Shadows with sharp angle
2. So many shadows on the ground during winter

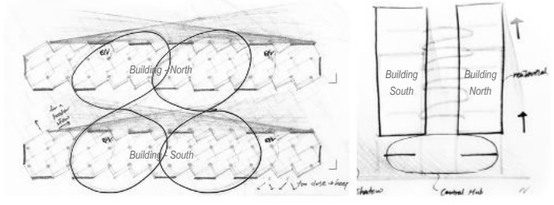
Dec.

9 am. 12 pm. 15 pm.



Mass Design Principle

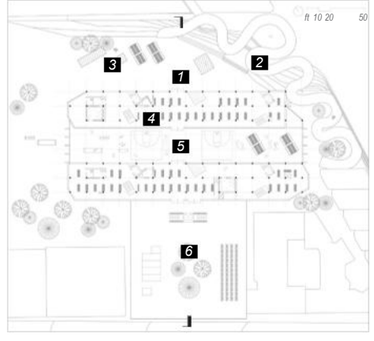
1. Refining the area based on the relationship between privacy and publicity
2. Designing bridges to connect the two buildings



Sunlight Condition Result

December 10th

Ground Level Plan



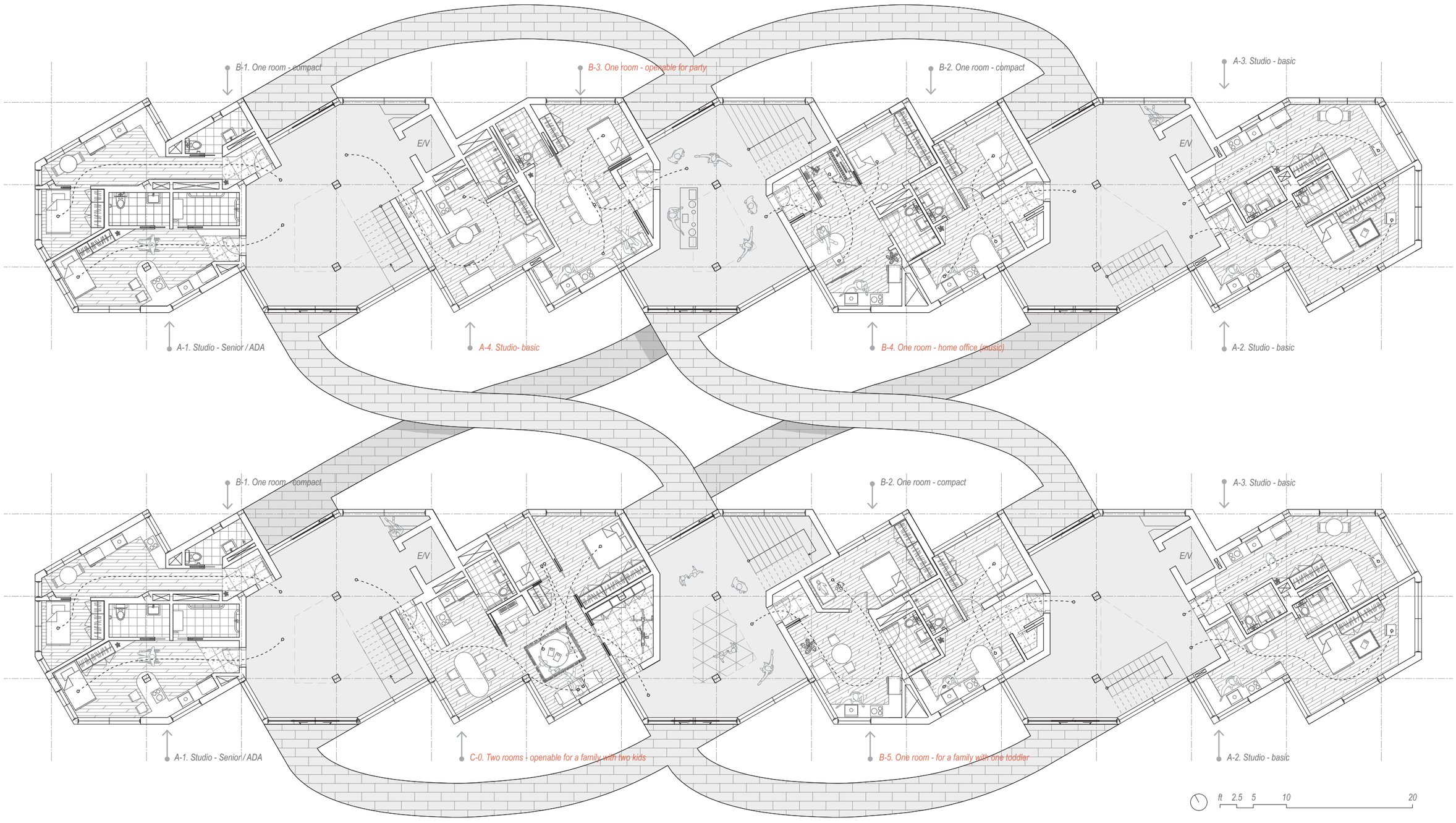
1. Main Entrance
2. Ramp to the entrance
3. Outer Community market
4. Inner Community Farm
5. Central Hub for all neighbors
6. Taxi Parking lot (remained)

Typical Plan with Unit Types and Loop Circulation

96-unit intergenerational housing organized for diverse resident types

Path inside units

10 Types of Units	***A. Studio***	***B. One-bedroom***	***C. Two-bedroom***
	A-1. Studio - Senior / ADA	*B-1. One room - compact*	*C-0. Two rooms - openable for a family with two kids*
	A-2. Studio - basic	*B-2. One room - compact*	
	A-3. Studio - basic	*B-3. One room - openable for party*	
	A-4. Studio- basic	*B-4. One room - home office (music)*	
		B-5. One room - for a family with one toddler	



Overview

The loop shaped bridges and double heighted cores make circulable within residents. The ground level is expandable to neighbors. The Anaerobic Digester system makes economy(remaining the existing taxi building).

Rendered View

D-4. Residential Bridge

D-1. Central Hub

D-3. Farmers Market

Concept Model Study 1. Typical block design

4. Oysty

A wave-dissipation module designed for scalable deployment

Work type: *Academic Work (Columbia University GSAPP, NY, US)*
Work period: *Fall 2025 (Advanced Studio V)*
Collaboration: *Individual*
Instructor: *Marc Tsurumaki*
Programs: *D5 Render, Rhino, Photoshop, Illustrator*

Urban-scale modular infrastructure is proposed for Edgemere Landfill, the oldest landfill in the United States, where large amounts of waste remain stored and actively monitored. The site is located adjacent to Ocean Bay Apartments, a NYCHA housing complex, and occupies a paradoxical position within the Rockaway Peninsula: during flood events, it remains one of the few areas above projected flood levels. This condition allows the site to function simultaneously as a recreational refuge and a protective buffer against backflow and wave action, while supporting active ecological habitats. The proposal reimagines the landfill as a sanctuary for birds and horseshoe crabs, establishing a modular system that can be adapted and scaled to other sites with similar typologies.

- Concept Model Study 2 -
Study Model of Initial dike module design

Study Model

1. Study model of initial dike module design

Molding based on the typical brick size

Scale_1:1_3.9" x 8.7" x 2.4" (100 x 220 x 60 mm)

Oystershell	1
Rockite	3
Sand	0.5
Water	1
Density:	Solid + Hard
Texture:	oystershell crashed only
Application:	Retaining Wall

Oystershell	3
Lime	1
Sand	2
Water	0.5
Density:	Solid + SemiHard
Texture:	oystershell crashed only
Application:	Dike next to the retaining wall

Oystershell	3
Lime	1
Sand	2
Water	0.5
Density:	Solid + fragile (1inch thick)
Texture:	oystershell crashed only
Application:	Berm inside the marsh

Oystershell	3
Lime	1
Sand	2
Water	0.5
Density:	Solid + Semihard
Texture:	oystershell crashed and solid
Application:	Berm between marsh and retaining wall

Oystershell	3
Lime	1
Sand	2
Water	0.5
Density:	Solid + Hard
Texture:	Oystershell solid only
Application:	Berm next to the retaining wall

2. Casting a Real-Scale Module

Molding based on the natural shape of sea wave

Scale_1:1_19" x 36" x 0.5"

1. Starting with a conventional casting material ratio

Material	:	lb
Oystershell	3	18
Lime	1	6
Sand	2	12
Water	0.5	3
Total after dried		36

2. Adding more slurry to bond seashells

Material	:	lb
Oystershell	3	18
Lime	4	24
Sand	3	18
Water	2	12
Total after dried		60

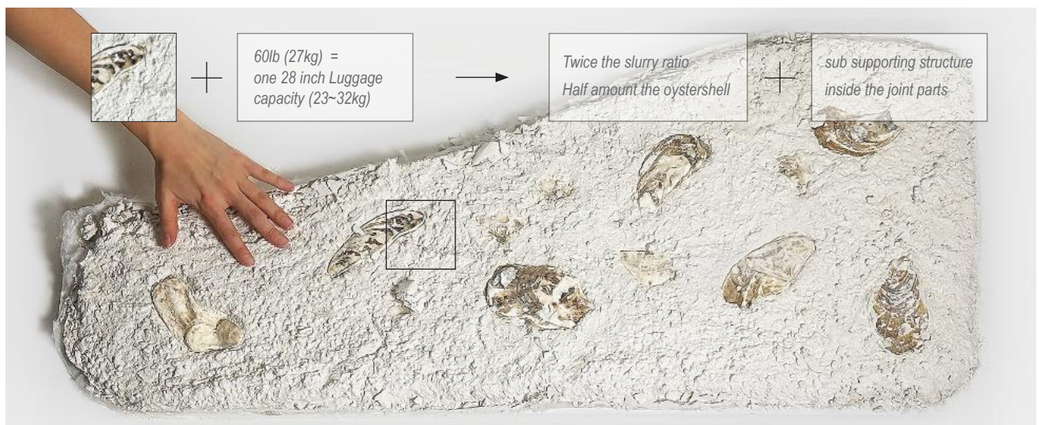
3. Mixture and texture testing

Mixing the slurry, check viscosity, and adding oystershell on the top as a surface texture

4. Curing and Drying

The slurry turns white. -one week: undried yet two weeks: dried all

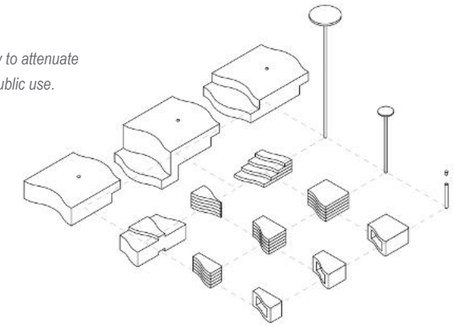
2. Casting results and design development



Dike Module and Assembly Design

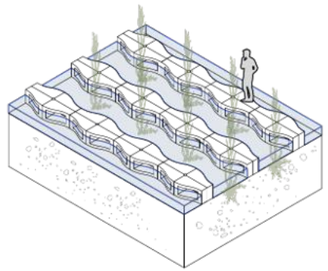
1. Oystershell Module

Oyster shell module with varied porosity to attenuate wave energy and support habitat and public use.

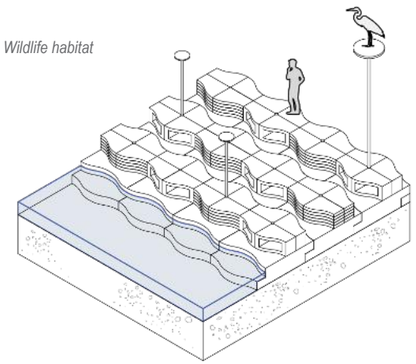


2. Assembly Configuration

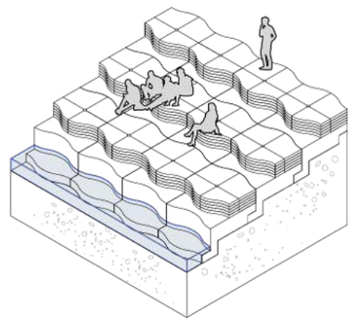
1. Berm – Cordgrass Planting



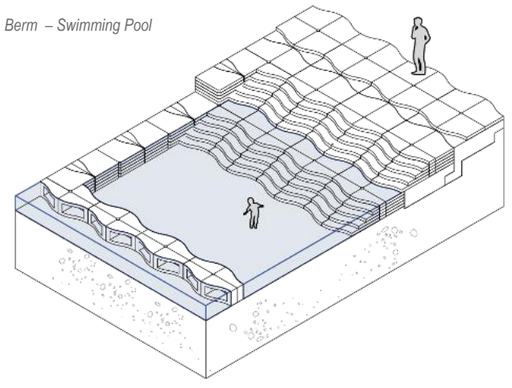
2. Berm – Wildlife habitat



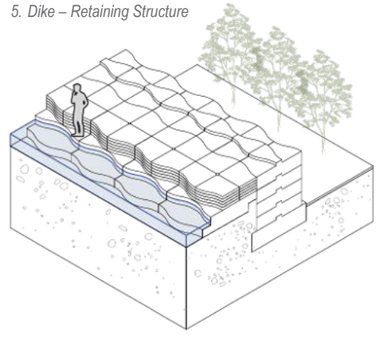
3. Berm – Seating



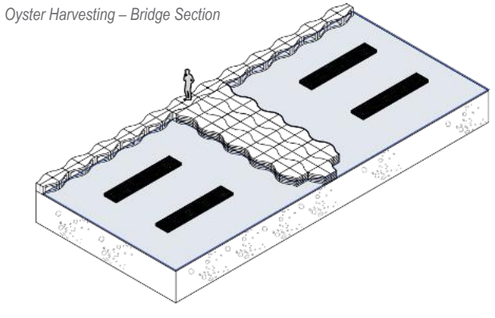
4. Berm – Swimming Pool



5. Dike – Retaining Structure

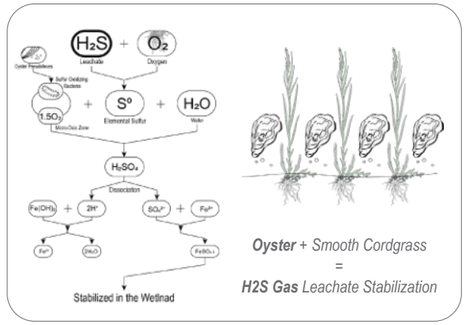


6. Oyster Harvesting – Bridge Section

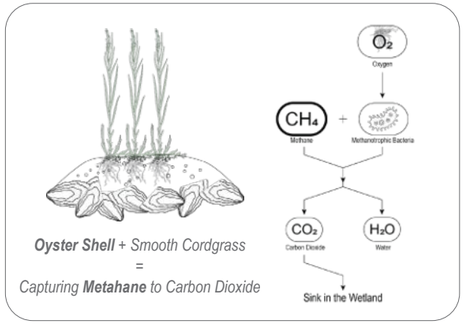


Oyster Shell System: Filtration and Habitat Support

Oysters filtering toxic substances and sequestering carbon dioxide, producing shells as a byproduct that are repurposed into structural modules for wave attenuation and the support of both human use and ecological habitats

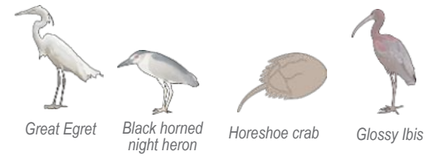


Oyster *+ Smooth Cordgrass*
=
H2S Gas *Leachate Stabilization*



Oyster Shell *+ Smooth Cordgrass*
=
Capturing ***Metahane*** *to Carbon Dioxide*

Becoming a sanctuary for both community and wildlife



Great Egret *Black horned night heron* *Horeshoe crab* *Glossy Ibis*

Oystershell Block Manufacturing Process

Light, low-impact on-site fabrication avoiding industrial processes, enabling low-carbon, community-scale production and distributed deployment

1. Oystershell Block Prefabrication
Oystershell → Cleaned → Crushed → Mixed → Molded → Cured → Block

2. On-site Storage
Made and stored on site — efficient for stacking and storage on the landfill

3. Transportation
from the landfill to nearby shorelines by vehicle

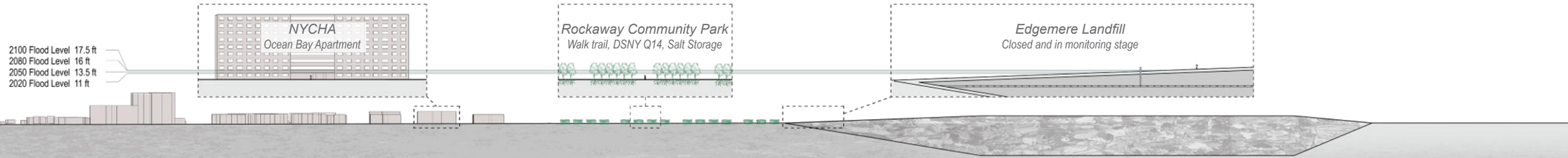
4. Installation by Hand
Volunteer program, job opportunities, funded by community organization

5. Maintenance & Reinstallation
based on the 3-10 year decaying period

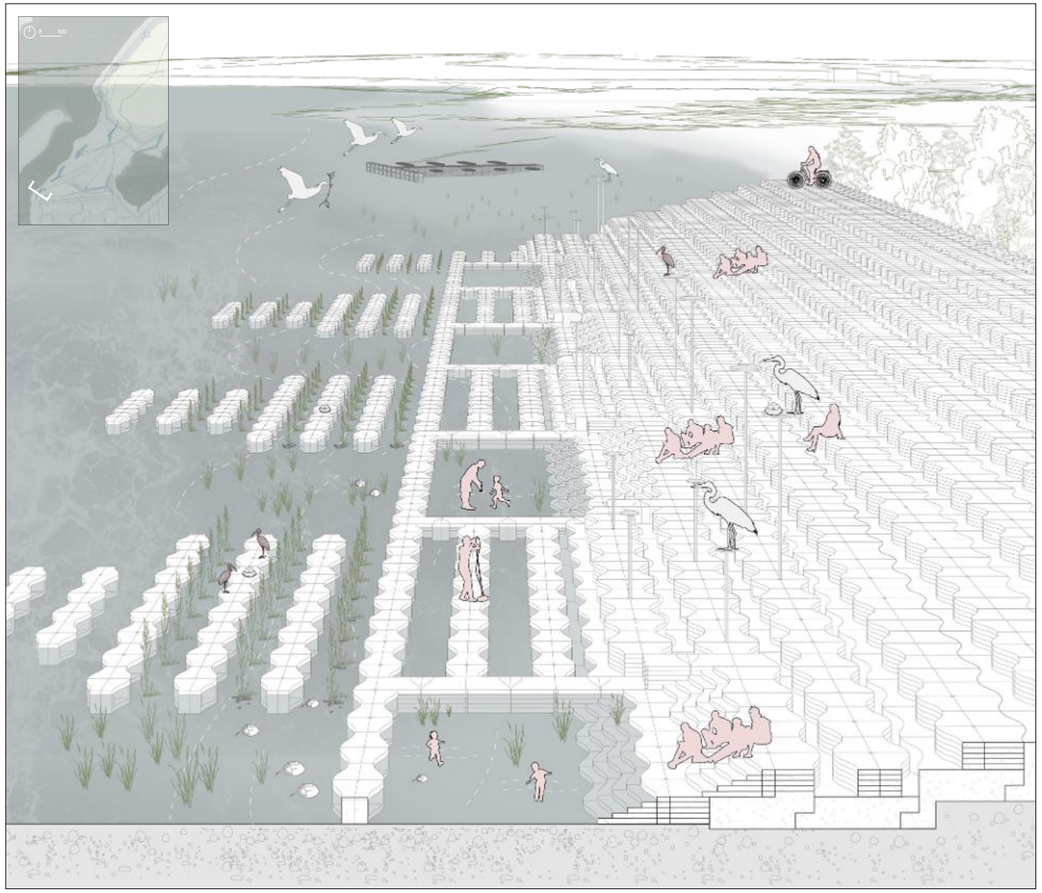
6. Oyster Farming
1,000 oysters → 20–25 kg shell → ≈2–3 blocks (10 kg each)
40,000–60,000 oysters/yr → 800–1,500 kg shell → ≈80–150 blocks/yr
120–150 oysters/net → ≈270–500 farming nets
(net size 190x35x6 in)

Flood Level Impacts on Topology

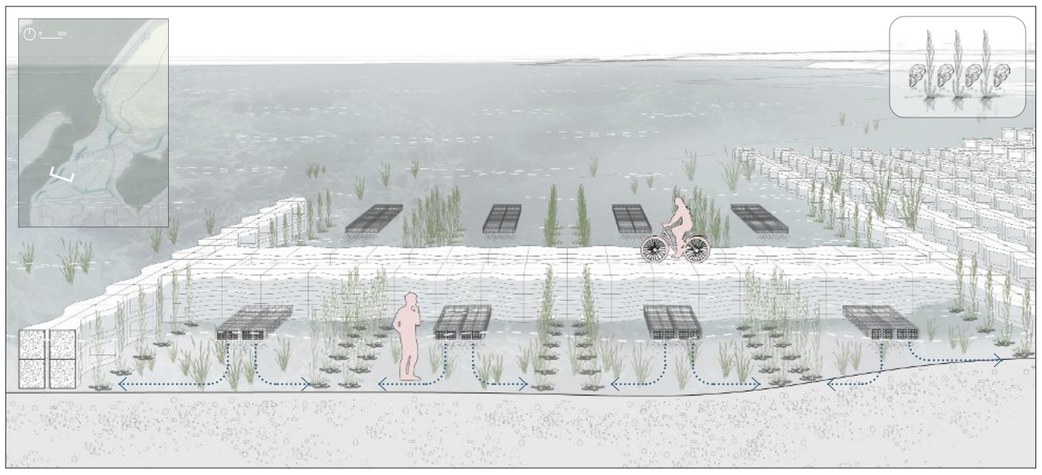
Projected flood levels reshaping landfill topography, increasing exposure across adjacent zones while revealing elevation as both vulnerability and potential refuge



Assembly Configuration



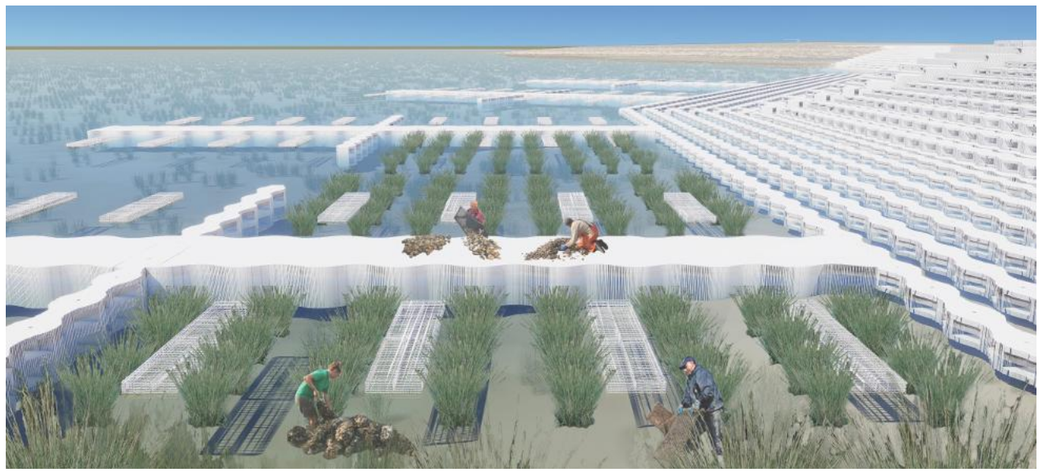
Zone A – Berm for wave dissipation, smooth cordgrass, and recreation



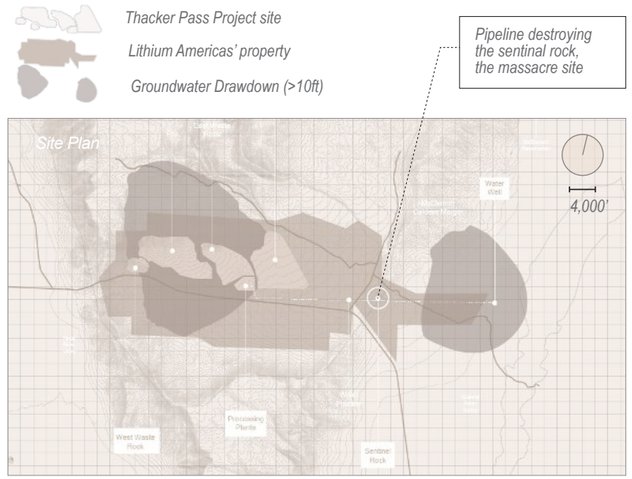
Zone B – Oyster farming and smooth cordgrass for H2S mitigation

Rendered View

Zone A.



Zone B.



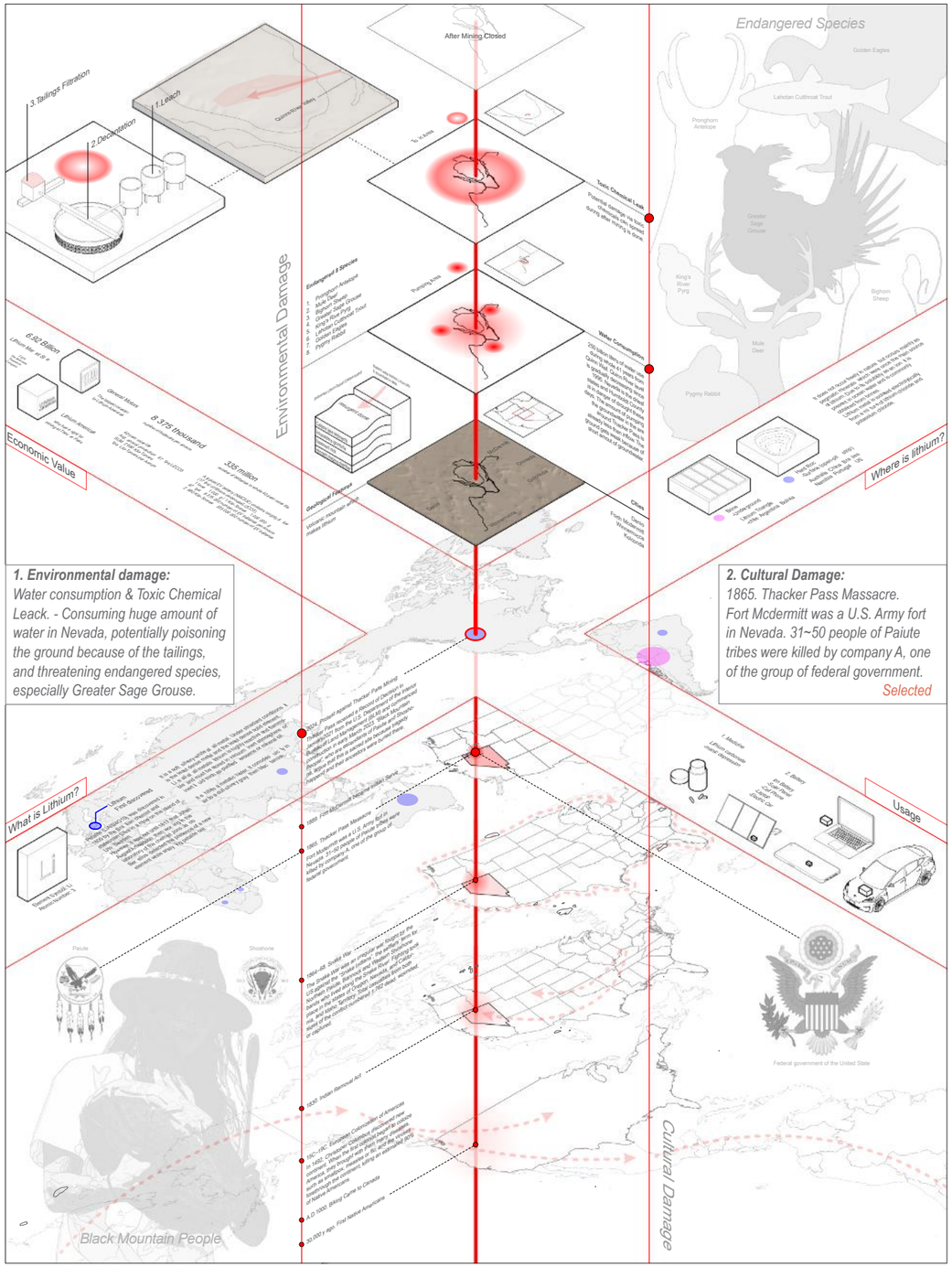
5. Protect Thacker Pass

Media Spectacle Armature Architecture for Reclaiming Cultural Heritage

Work type: *Academic Work (Columbia University GSAPP, NY, US)*
Work period: *Spring 2024 (Core Studio II)*
Collaboration: *Individual*
Instructor: *Grace Alli*
Programs: *Rhino, Enscape, Photoshop, Illustrator*

Today, there is a global lithium mining boom driven by the development of autonomous vehicles. There is an open-pit lithium mining currently under construction in Nevada called Thacker Pass Project. However, the lithium mining process at this site Thacker Pass raises various cultural and environmental issues around land sovereignty and water resources. For phase 1, the sacred site for Native Amercians called 'Red mountain people' will be destroyed and 1.7 billion gallons of groundwater annually from the Quinn River aquifer will be pumped which means it is already over-allocated ground water basin. For phase 2, 40 years later after the mining closes, there will be a huge amount of tailings piled up on the mining site, which has a potential damage of leaking toxic chemicals such as sulfuric acid, which is fatal for endangered species living there. To address the current damages, the project addresses the obstacles for the protesting. The proposal seeks to raise awareness about these damages to the world through the media.

Site Analysis



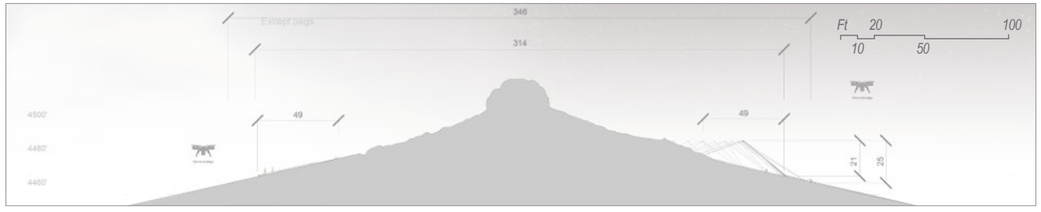
Analysis of Industry and History, and Damages

Physical Model - Layering Damages

Scale_15.7” x 23.6” x 17.7” (400 x 600 x 450 mm), Laser cutting, 3D printing and CNC

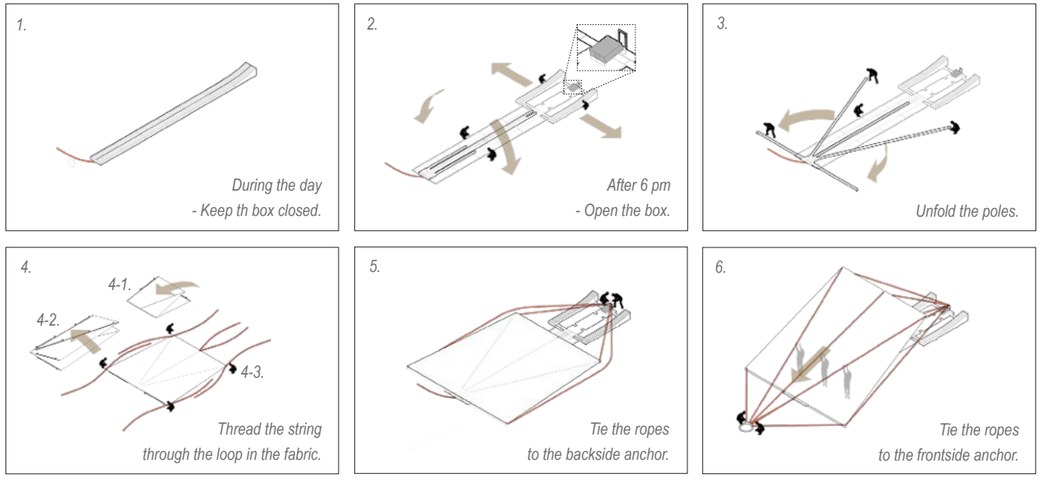
Combining the Modules

PLAN



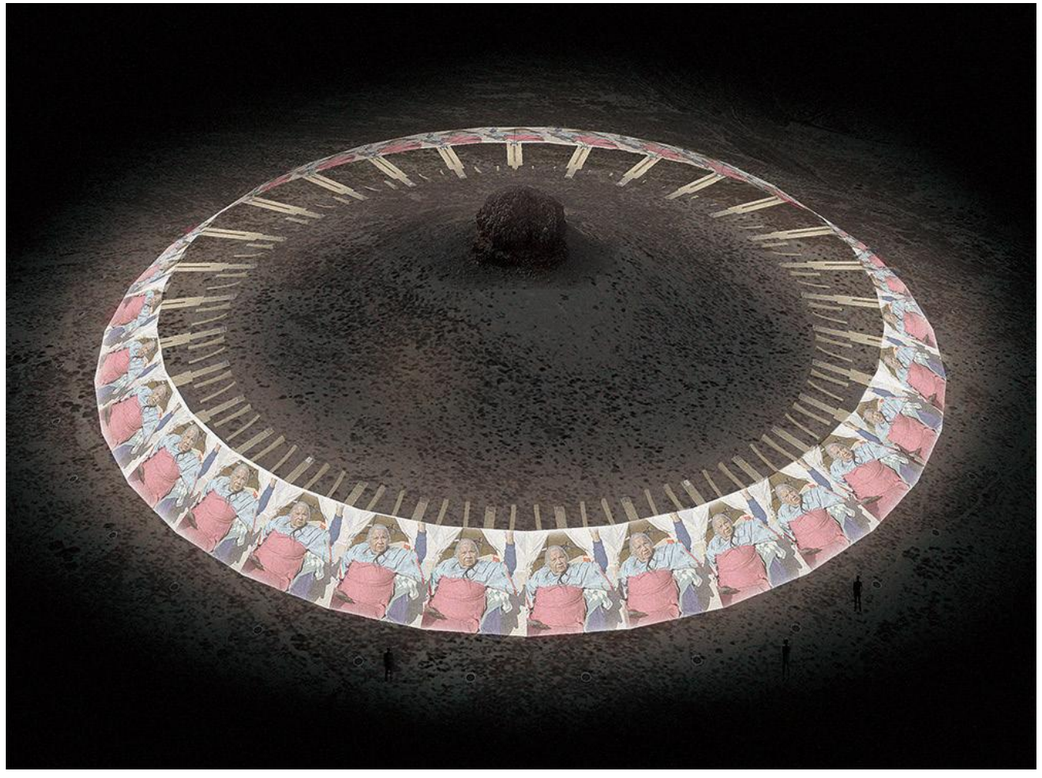
SECTION A-A'

Assembly



Rendered View

A. DAY TIME



B. NIGHT TIME

Material - Bamboo
1. stand-structure 2. stand-fabric cover 3. leaf-buffer

6. Smoothly

Accessible Landscape Architecture with Bamboo

Work type: *Academic Work (Columbia University GSAPP, NY)*
Work period: *Fall 2023 (Core Studio I)*
Collaboration: *Individual*
Instructor: *Mpho Matsipa*
Programs: *Rhino, Grasshopper, 3Ds Max, Photoshop, Illustrator*

The range of types of movement and distances as a result of various body shapes are limited by standardized, social and architectural structures. I observed people with various bodies and movements at 125st in Harlem, analyzed architectural elements that impede people's movement and researched design solutions in order to solve these problems. Although Marcus Garvey Park is a space that various people can enjoy, it has multiple architectural elements that disabled people or people with physical mobility difficulties are unable to enjoy. I aspire to design the necessary architectural elements in this park with bamboos, which is eco-friendly, in order to transform it into a park that people of various body types can enjoy.

SITE ANALYSIS

MOMENTS OF THRESHOLD

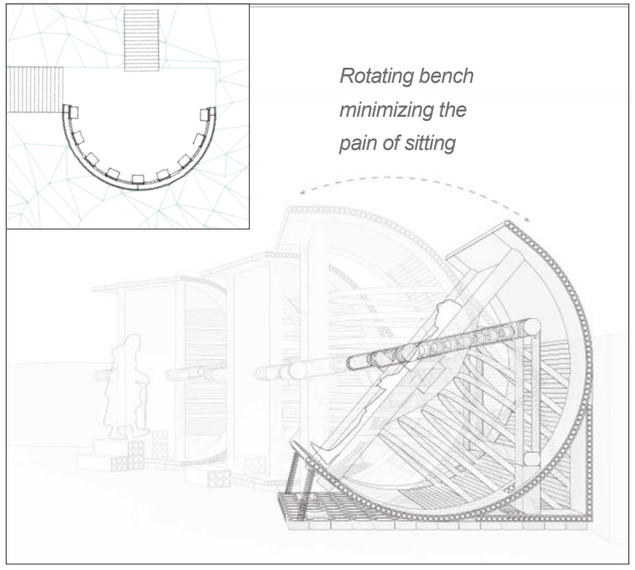
There are Lack of accessibility for disabled bodies in Marcus Garvey Park.
- Location: Marcus Garvey Park, Central Harlem

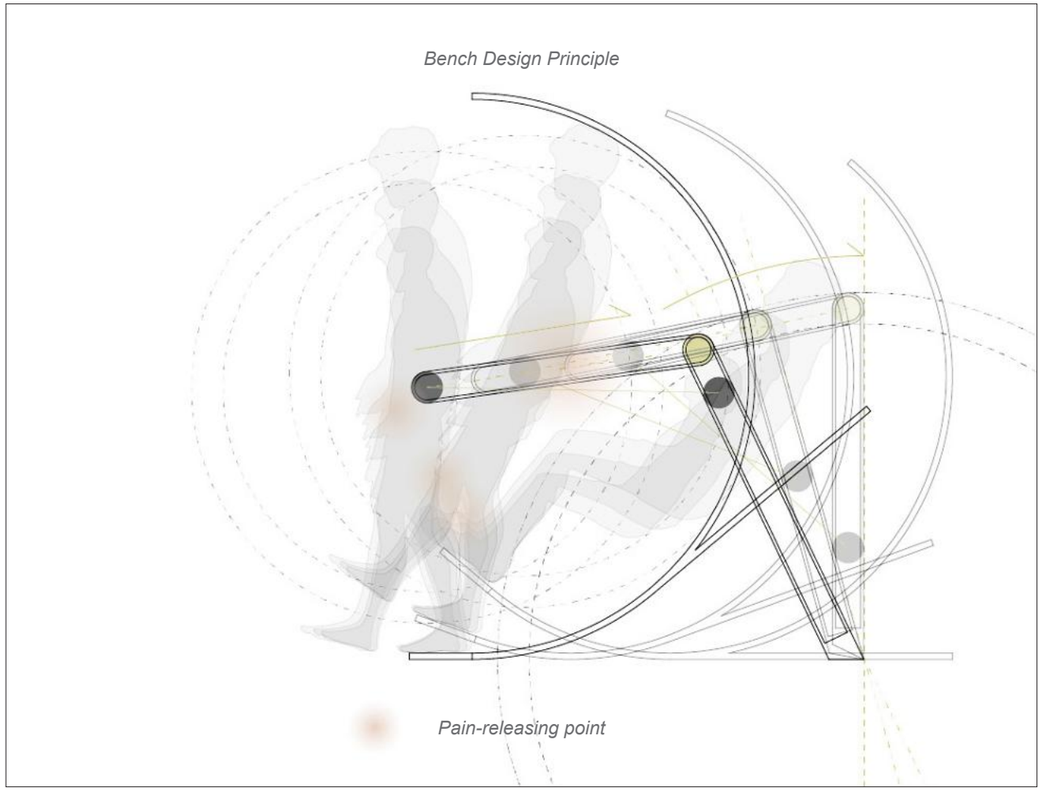
▲ *Entrances(Accessibility)*
▬ *stairs*
● *Schist exposed*

1. *rest area even though it is along the way to the Acropolis* > *Bench for individuals*
2. *a. the way of access to the acropolis for the disabled.* > *Ramp*
   b. rest area even though some parts are a long way.
3. *a. the bench for communivcation even though it has a wide space* > *Bench for a group*
   b. rest area for people with pains in their body movement
4. *a. the way of access to nature close even though it has a wide space* > *Platform*
   b. the bench for communication except with the chess table
   c. rest area for people with pains in their body movement

FINAL DESIGN

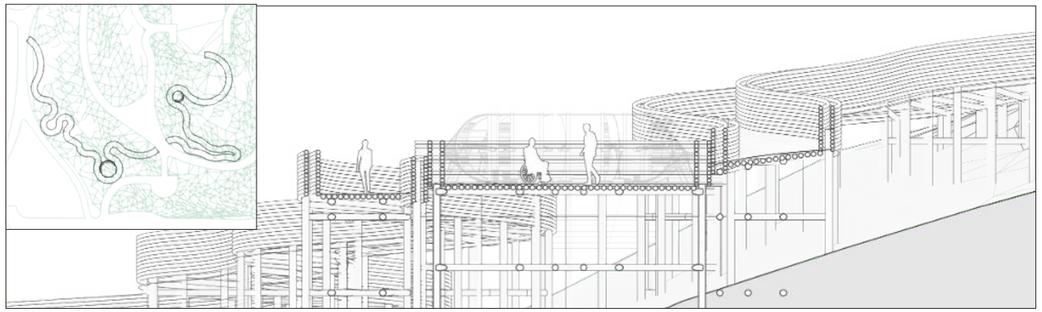
1. Bench

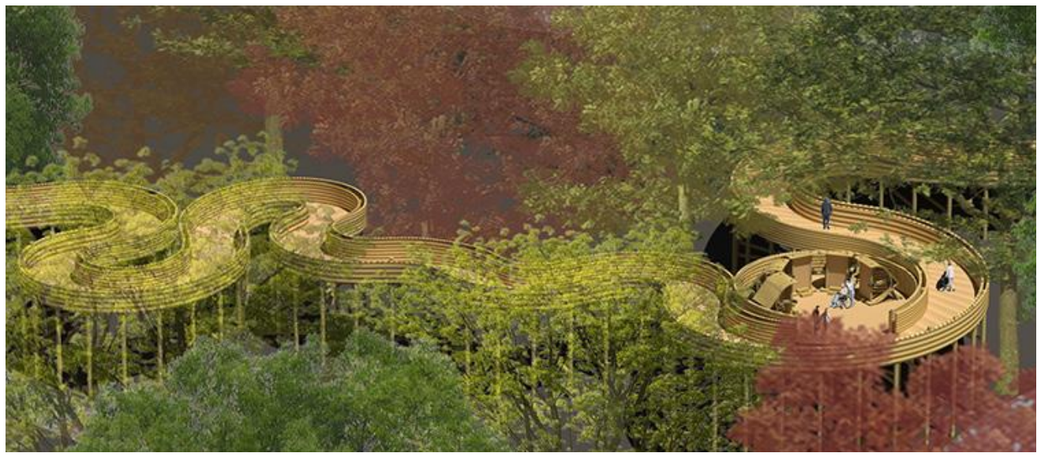




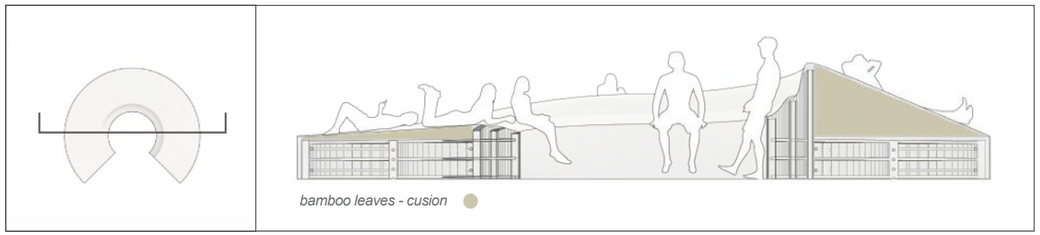
FINAL DESIGN

2. Ramp

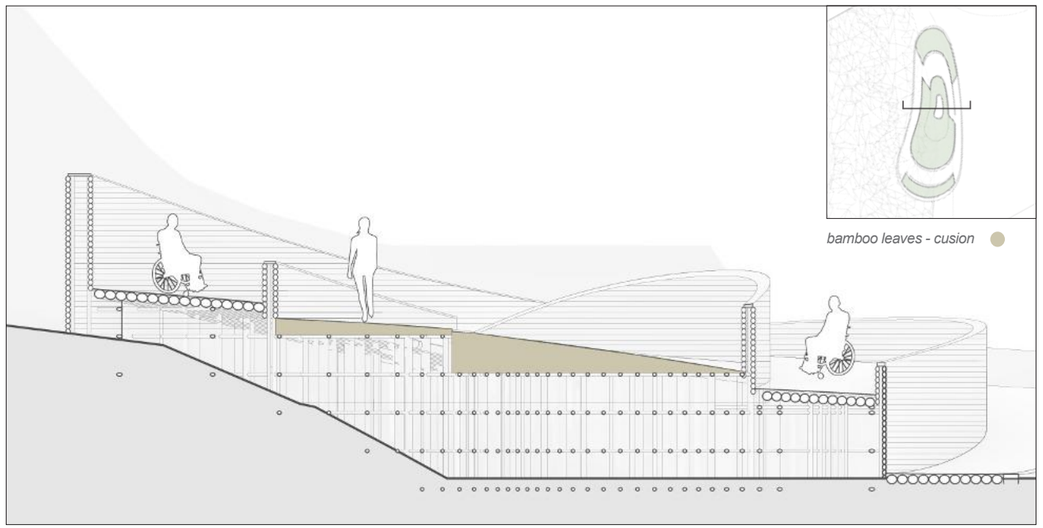


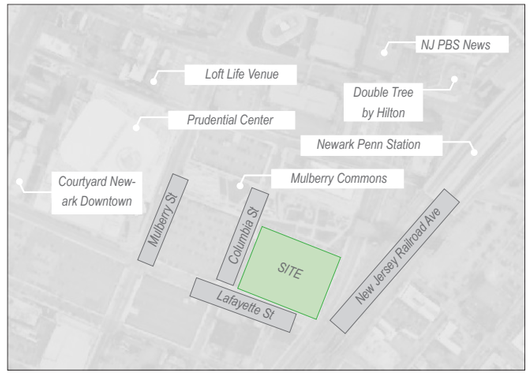


3. Bench



4. Ramp





97 Lafayette St, Newark, NJ 07102

7. The Curve

Redesigning the parking lot into a brand-new sports complex

Work type:	*Academic Work (Columbia GSAPP)*
Work period:	*Fall 2024 (Tech IV)*
Collaboration:	*Sam Junho Ro, Julian Krusic O'Donnell and Jana Marinovic*
Role:	*3D modeling, drawing of the facade wall system*
Instructor:	*Berardo Matalucci*
Programs:	*Revit, Rhino, AutoCAD, Illustrator*

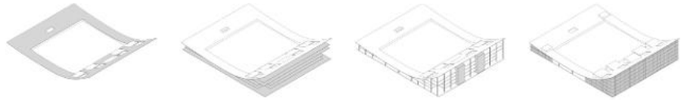
This project reimagines an existing parking lot as a sports complex organized around a continuous curved roof that extends the site's original geometry. The façade system negotiates transparency and performance through a dual strategy: a glass curtain wall for visual continuity and a terracotta assembly for thermal control and material depth. The curtain wall is structurally separated from the roof, allowing clearer load paths and improved thermal detailing at the interface. Through this layered system, the curved roof and façade operate not as a single surface, but as coordinated environmental assemblies.

Design Principle & Sustainability

1. Concept of the Program

Multiplying the programs for neighbors in New Jersey, from just a parking lot to a sports complex

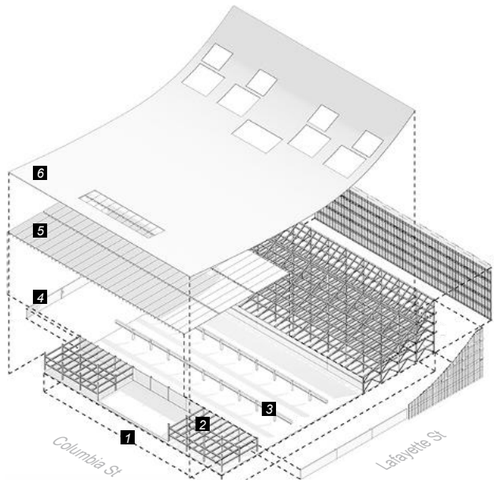
1. Massing *2. Layering* *3. Core arrangement* *4. Enclosure*



2. Structure Exploded Axon

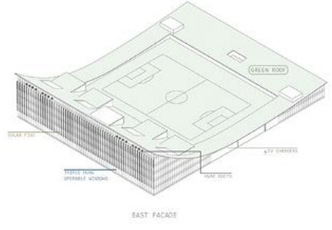
- Top: Sloped green roof
- Facade: Curtain wall
- Structure: Steel Frame

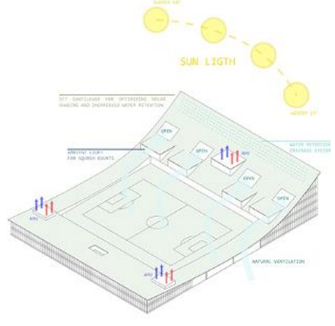
1. Shallow Foundation
2. Steel Frame
3. Precast Concrete Column
4. Precast Concrete Shear Wall
5. Precast Concrete Double Tee
6. Precast Composite Deck Roof
7. Curtain Wall Dead Load



3. Sustainability Diagram

Green Sedum Roof: Long-term urbam development
- Operation: stormwater management, natural insulation, carbon sequestration, noise reduction





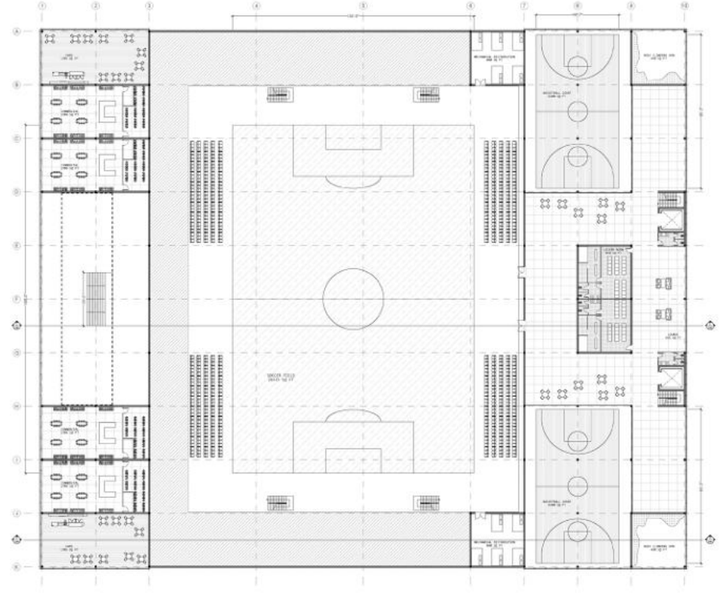
Design Plan

1st Floor

Parkling space, indoor sports area(baseball court and Rock climbing wall), and shops (food and clothes)

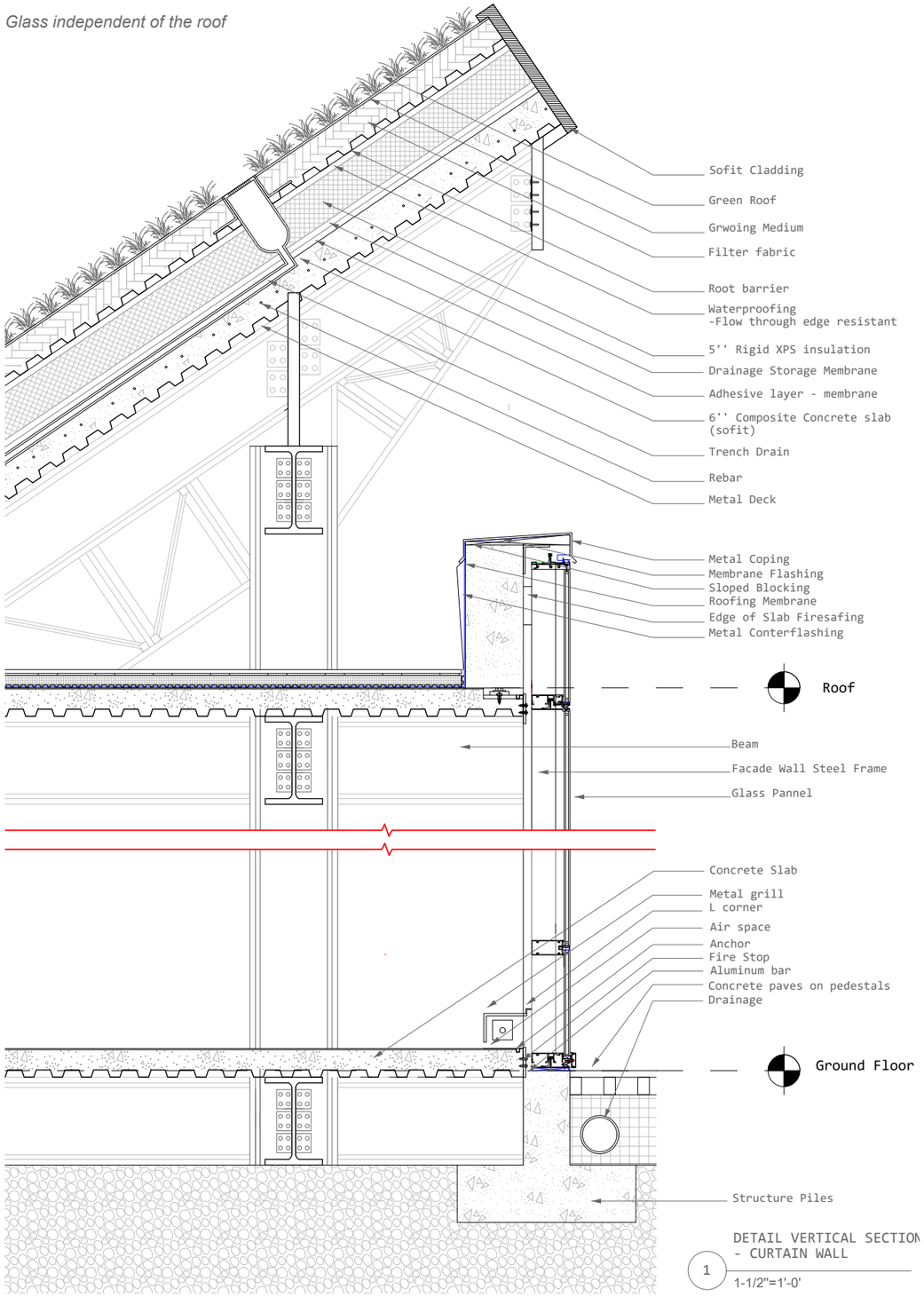
2nd Floor

Outside soccer field



Curved Roof-Facade Interface

Glass independent of the roof

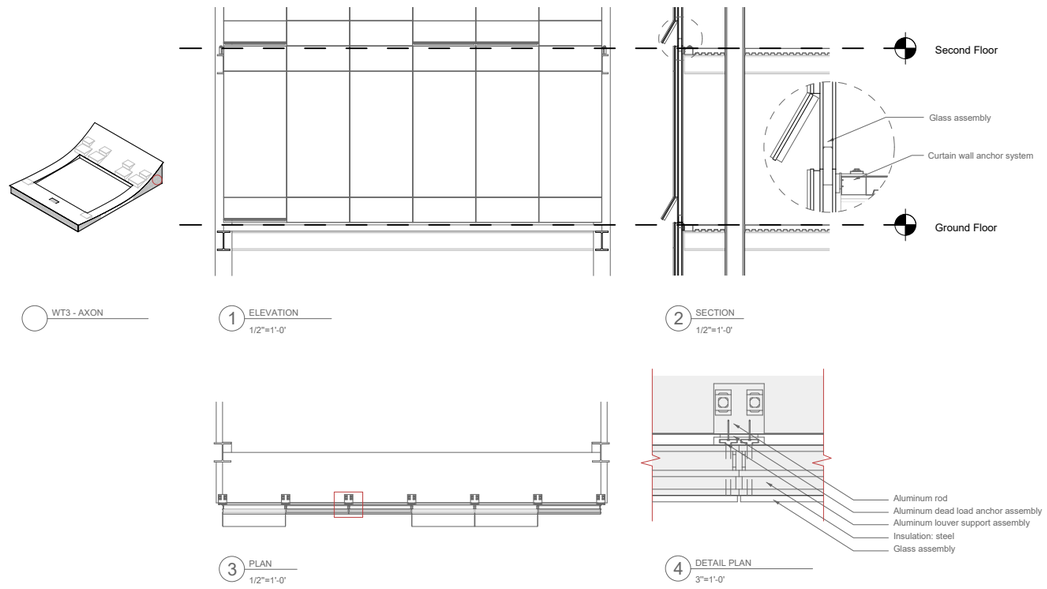


DETAIL VERTICAL SECTION
- CURTAIN WALL

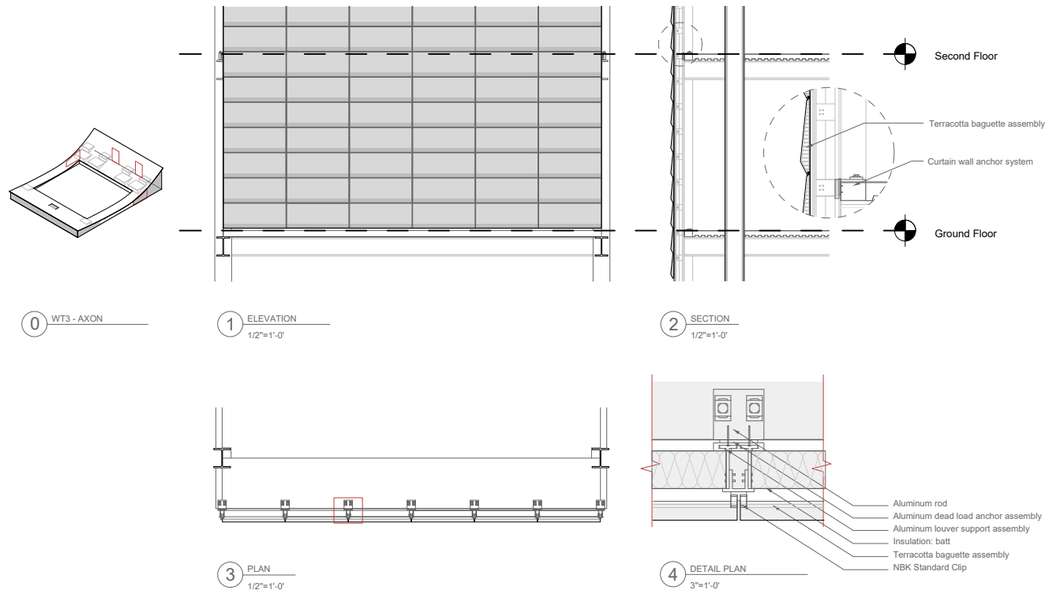
1 — 1-1/2"=1'-0'

Facade Wall System

Facade Detail - glass wall system (main)



Facade Detail - Terracotta wall system (for sustainability)



213 E 14th Street Los Angeles, CA 90021

8. Fast and Slow

Facade design balancing sustainability and identity

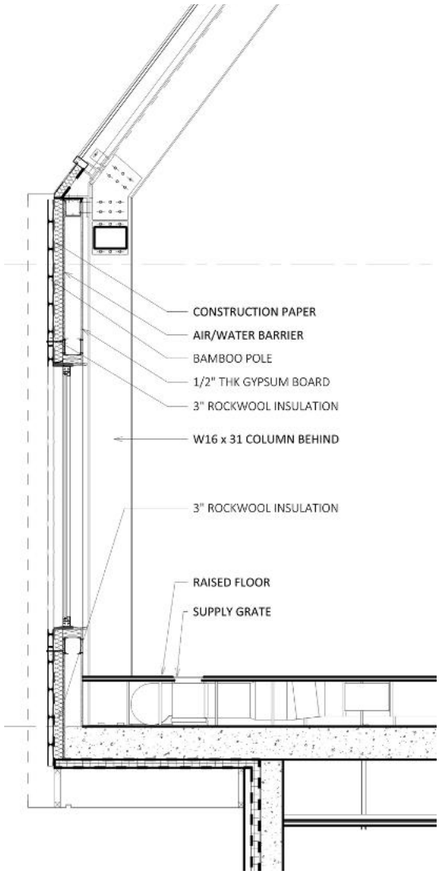
Work type: Academic Work (Columbia University GSAPP, NY, US)
Work period: Spring 2025 (Architectural Technology V)
Collaboration: Junge Huang, Tsz Tung Kwong, Saniana Patel, To Quynh Pham, Xiaoyu Zhang
Role: drawing a section, making a model
Instructor: Tommy Schaperkotter
Programs: Revit+Tally, Rhino, AutoCAD, Photoshop

This project is a redesign of an existing boutique shopping mall project (Atelier Aqua, Architectural Technology IV) in Los Angeles, reimagining its facade with bamboo to enhance both identity and sustainability. The design responds to the region's dry climate by focusing on efficient material processing and labor systems suited to the environment.
Our proposal aims to create a quick-to-assemble, environmentally sustainable envelope that not only contributes to the local labor economy in Los Angeles but also supports the revitalization of the fashion retail sector through architectural innovation.

Detailed Structure

1. Vertical Section

Bamboo joint and rainscreen in detail and determining a design moment



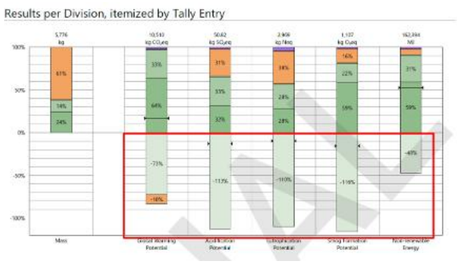
Physical Model

1:1 scale (20"x20"x15")
bamboo, jute rope, mineral wool, nails, gypsum board, wood board, 3d printingand spraying, acrylic and window gasket

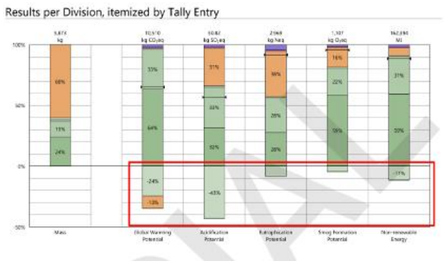
Tally Analysis

- Material Comparison : zinc, alumium, bamboo
- Material DecisionBamboo(wood) has the least Global Warming, Acidification, Eutrophication, Smog Formation, and Non-renowablilty

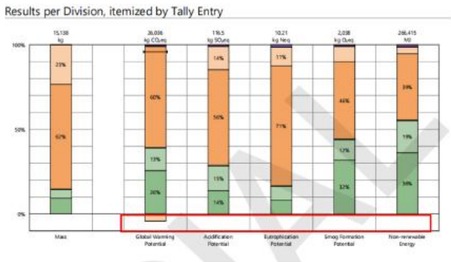
Zinc

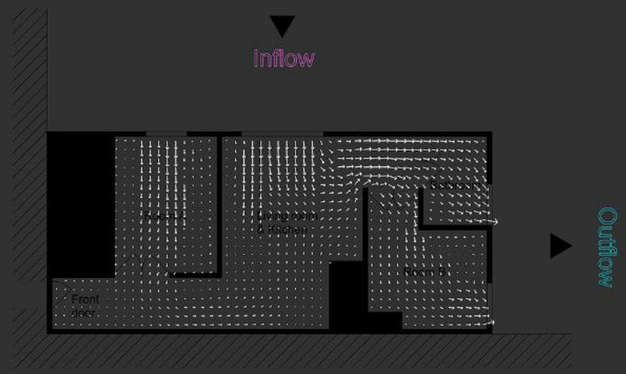


Aluminum



Wood (Bamboo)





9. Airflow in My House

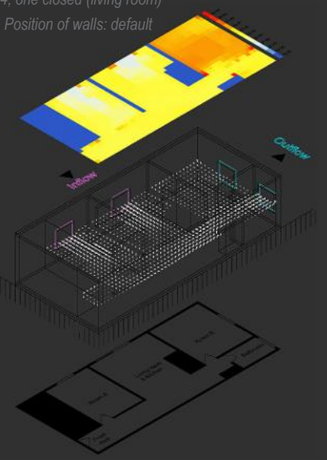
Airflow analysis study with CFD algorithm

Work type: Academic Work (Columbia University GSAPP, NY, US)
Work period: Spring 2024 (ADR II)
Collaboration: Individual
Instructor: Lorenzo Villaggi
Programs: Rhino, Grasshopper + Ladybug(butterfly-CFD)

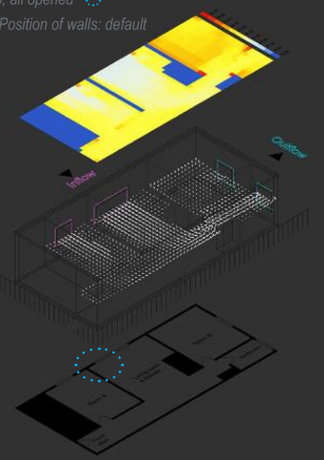
This class challenges and interrogate the very meaning of design instruments to produce a critical understanding of how workflows, algorithms and software influence the built environment and how designers can interact, subvert and repurpose technology for new means. From observing my body movement, yawning, and altering various elements of my surroundings, I developed analytical drawing of the airflow in my house.

1. Variation of the wall positions and width of the windows

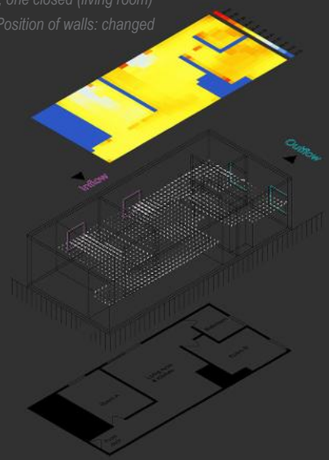
Type 1
1. Width of doors: default
2. Number of windows opened
4, one closed (living room)
3. Position of walls: default



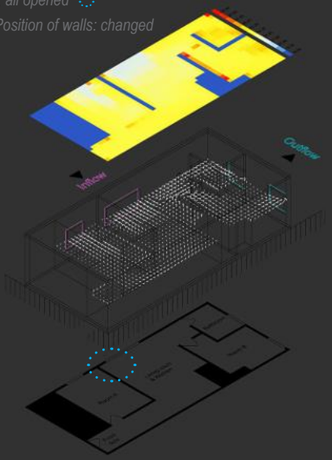
Type 2
1. Width of doors: default
2. Number of windows opened
5, all opened
3. Position of walls: default



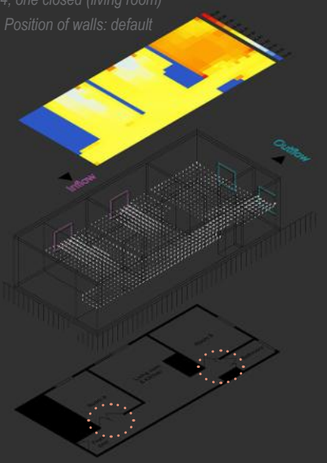
Type 3
1. Width of doors: default
2. Number of windows opened
4, one closed (living room)
3. Position of walls: changed



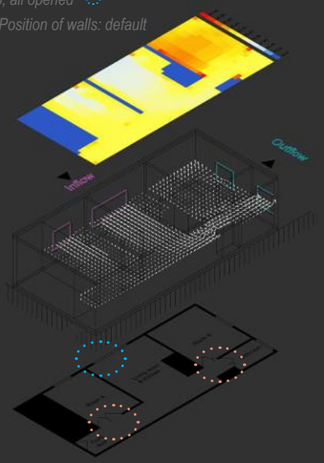
Type 4
1. Width of doors: default
2. Number of windows opened
5, all opened
3. Position of walls: changed



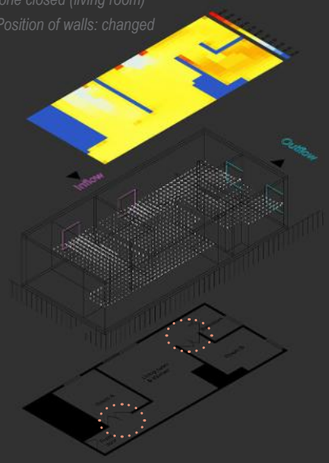
Type 5
1. Width of doors: wide
2. Number of windows opened:
4, one closed (living room)
3. Position of walls: default



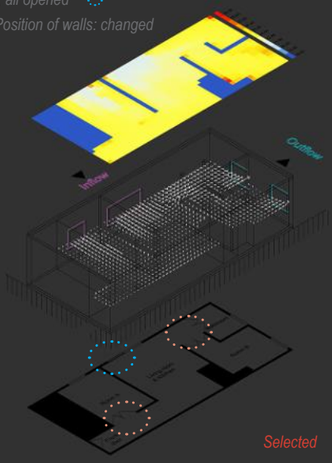
Type 6
1. Width of doors: wide
2. Number of windows opened
5, all opened
3. Position of walls: default



Type 7
1. Width of doors: wide
2. Number of windows opened:
4, one closed (living room)
3. Position of walls: changed

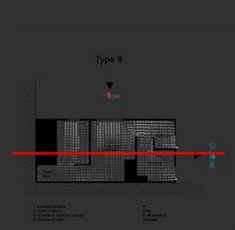


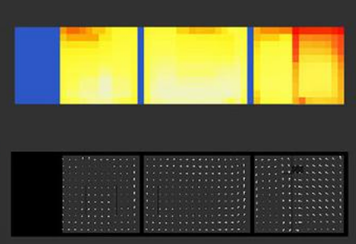
Type 8
1. Width of doors: wide
2. Number of windows opened:
5, all opened
3. Position of walls: changed



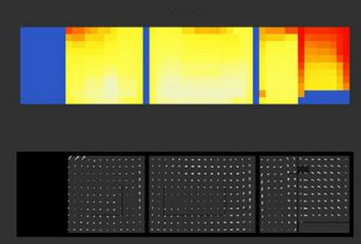
Selected

2. Decision for optimal air flow

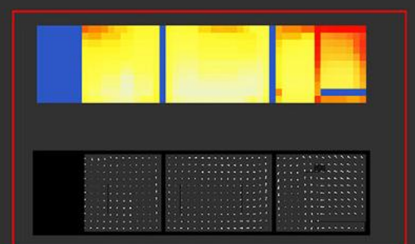




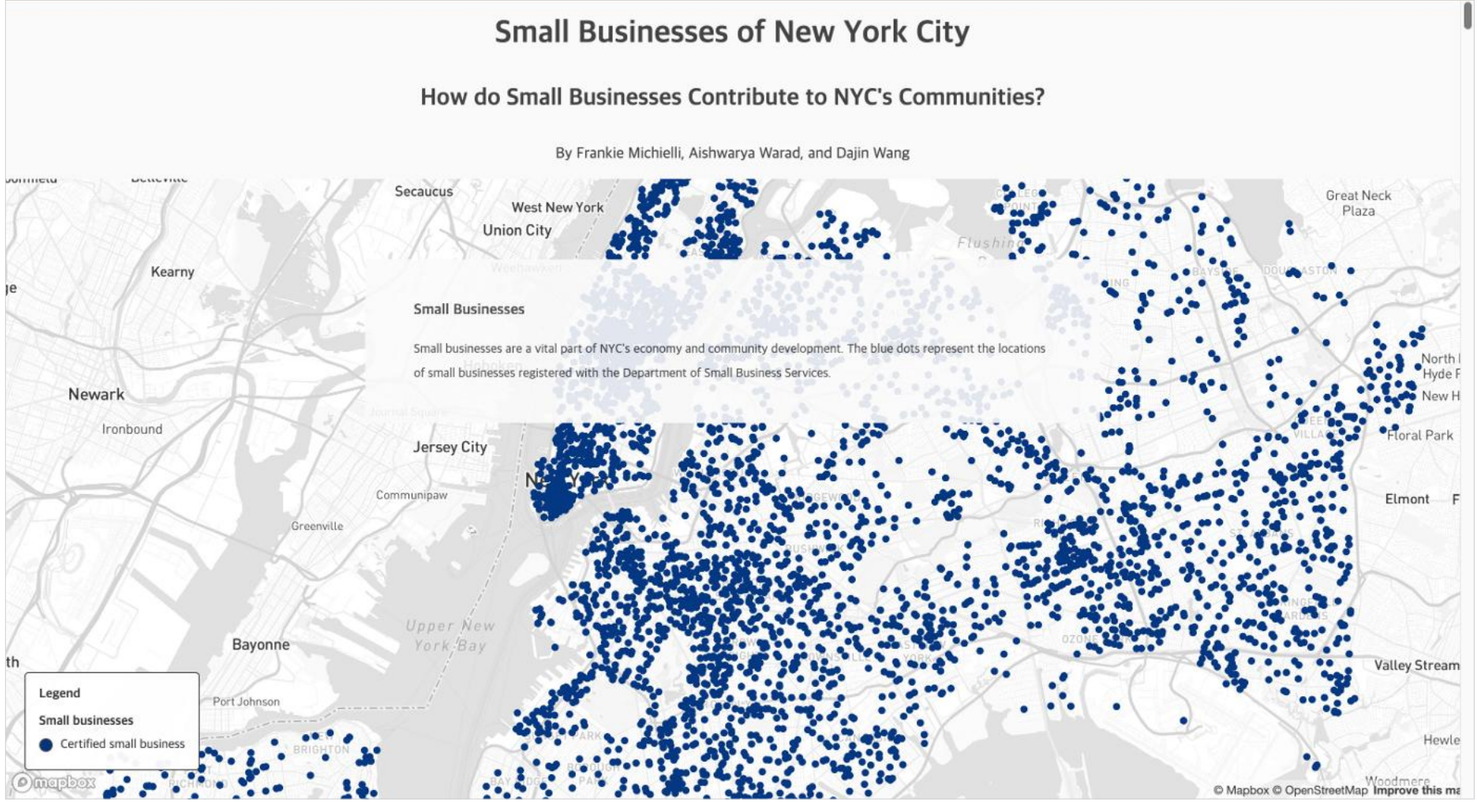
Section - Type A. Defalut



Section - Type B. with bed (without any space underneath)



Section - Type B. with bed (witth space underneath)



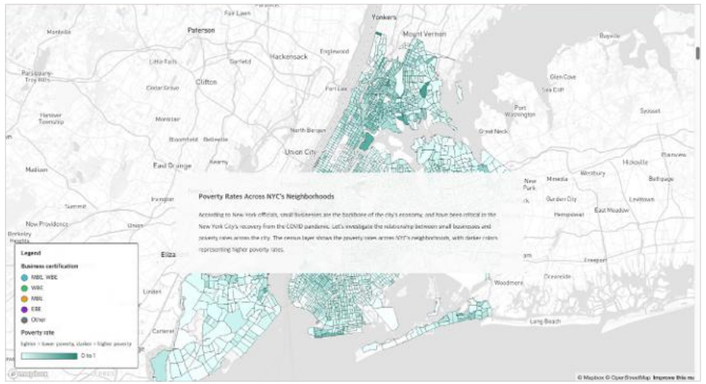
10. Mapping the Small Business Ownership

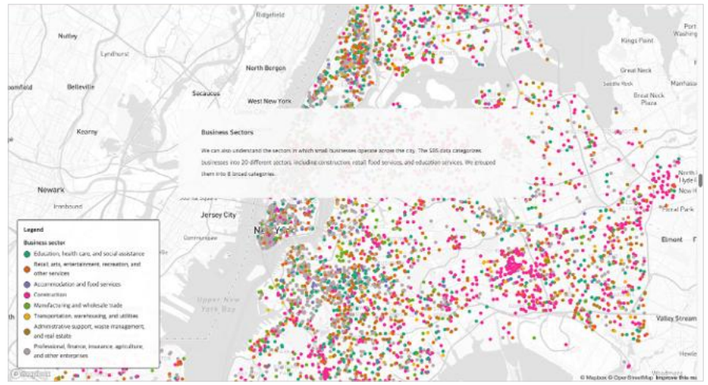
How Small Businesses Contribute to NYC's Communities

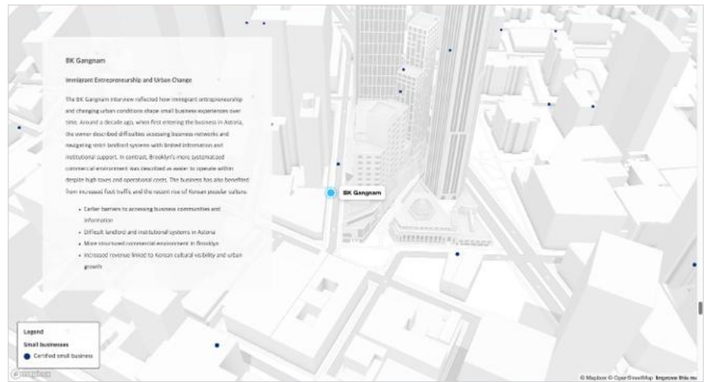
Work type: *Academic Work (Columbia University GSAPP, NY, US)*
Work period: *Spring 2026 (Methods in Spatial Research)*
Collaboration: *Francesca Michielli, Aishwarya Anil Warad*
Contribution: *Ideation of the research, activating in-person Interviews and making content for Mapbox*
Instructor: *Adam Vosbourgh*
Programs: *Mapbox, Qgis*

Small businesses are the cultural and economic anchors of New York City. Developed at Columbia GSAPP, this project translates complex spatial data into a narrative of community identity. By merging Mapbox visualizations with local interviews, we look beyond the data to understand how ownership shapes neighborhood stability. This map is not just a study—it is a tool for advocating and preserving the local entrepreneurship that defines the NYC streetscape.

https://fmichielli.github.io/methods_final_project/





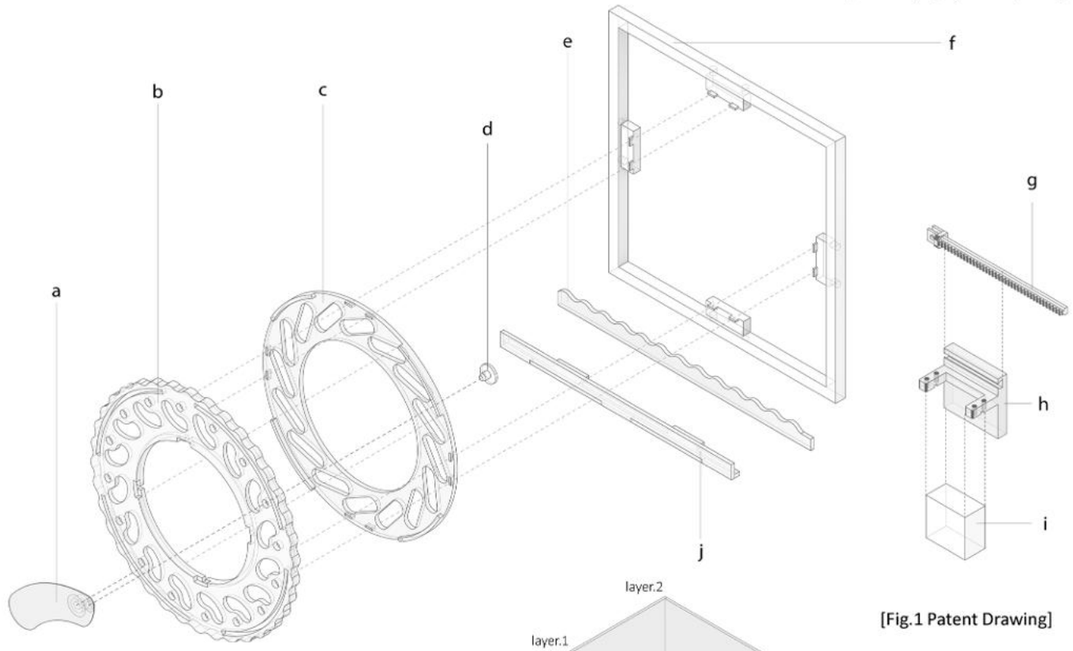


11. Iris Facade

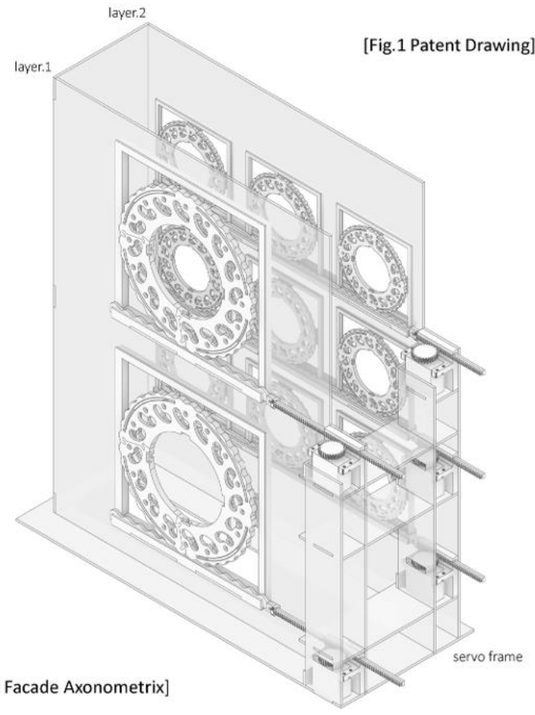
Kinetic architectural envelope

Work type: *Academic Work (Columbia University GSAPP, NY, US)*
Work period: *Spring 2026 (Making senses)*
Collaboration: *Minjae Kim, Hyunyoung Kim*
Contribution: *3D modeling, 3D printing, testing assembly*
Instructor: *James Nanasca*
Programs: *Adafruit, Bambu*

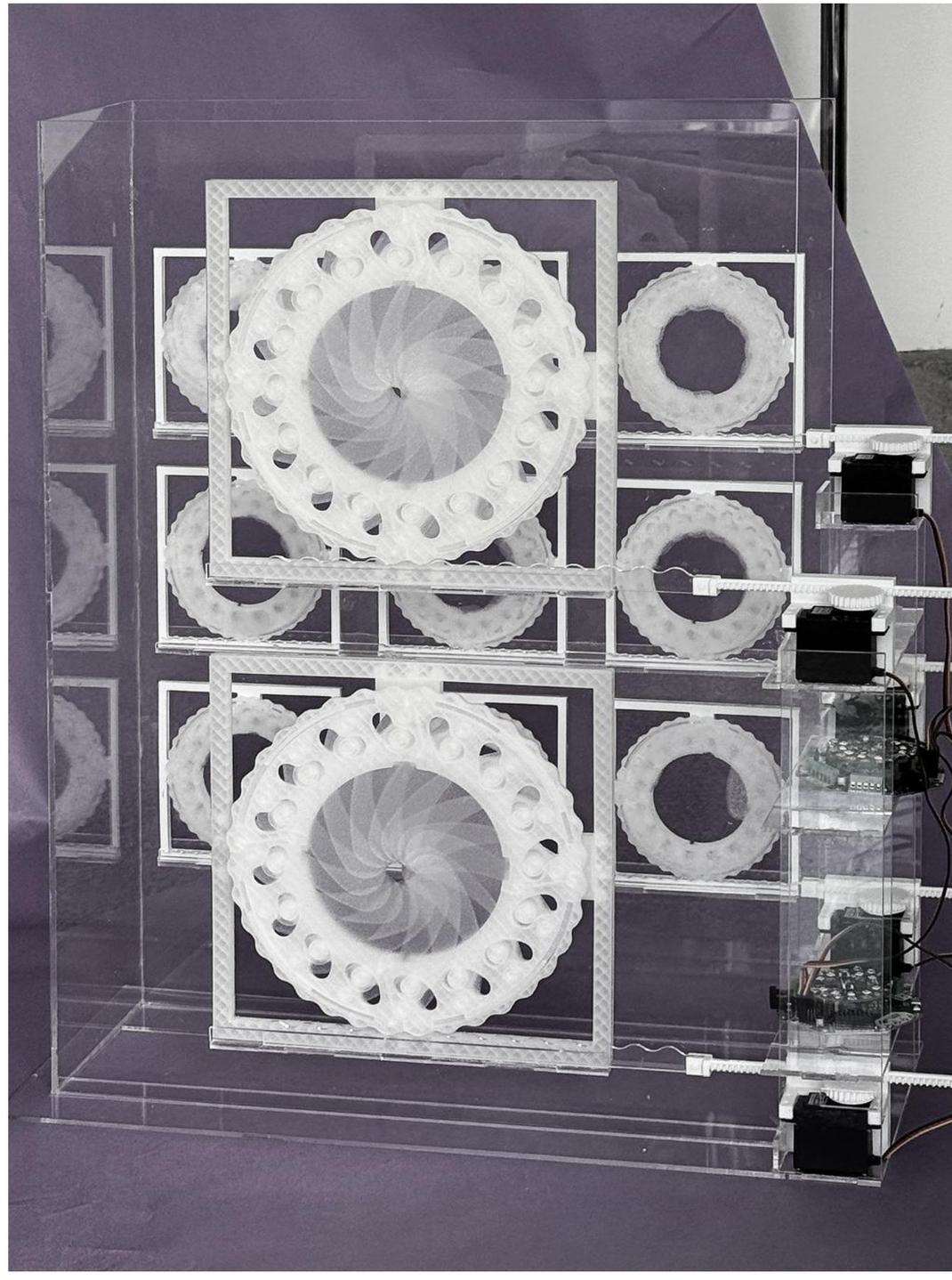
The Iris Facade is an experimental research project that explores the potential of building envelopes as active, responsive systems rather than static barriers. Inspired by the biological mechanics of the human eye, this kinetic system adjusts its aperture in real-time to optimize natural light, thermal performance, and occupant privacy.



[Fig.1 Patent Drawing]



[Fig.2 Iris Facade Axonometrix]



12. Confusion

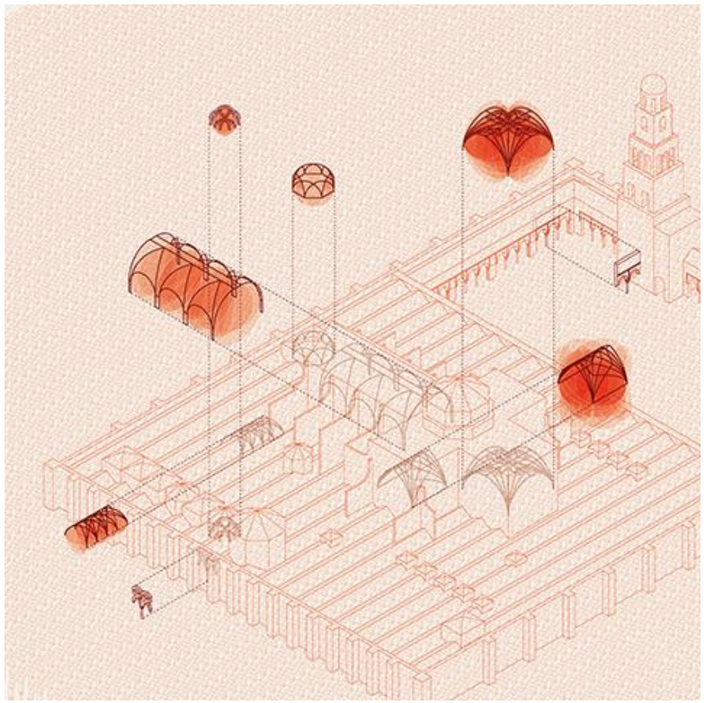
Case Study of the “Mezquita-catedral de Córdoba”

Work type: *Academic Work (Columbia University GSAPP, NY)*
Work period: *Fall 2023 (ADR I)*
Instructor: *Genevieve Mateyko*
Programs: *Rhino, Vray, Enscape, 3Ds Max, Photoshop, Illustrator, After Effects*

This project is case study. I expressed infinite and disoriented moments in Mezquita Cordoba and hidden logics, circle and arch, which is perfect geometry and the symbol of the god.

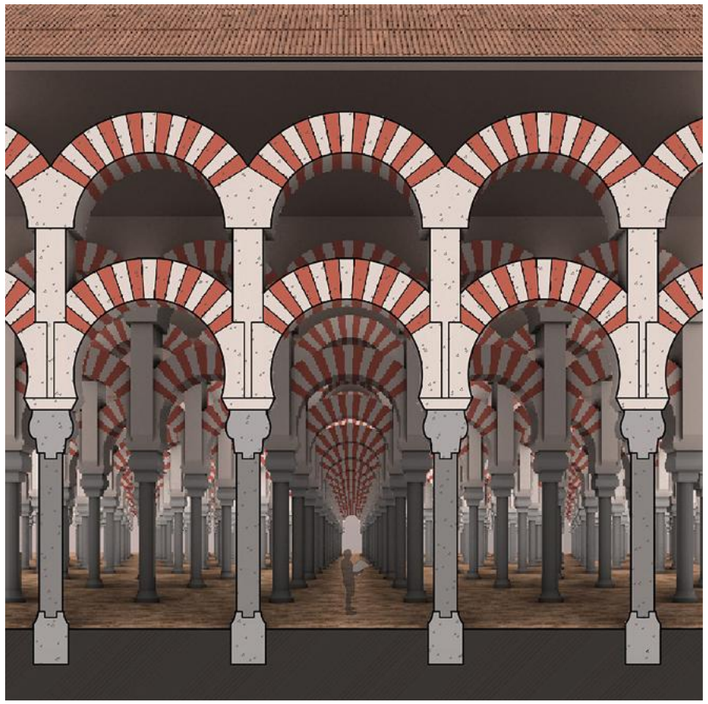
Drawing 1. Axon

Hidden circle logic inside the building arches



Drawing 2. Perspective

Mirotic moment

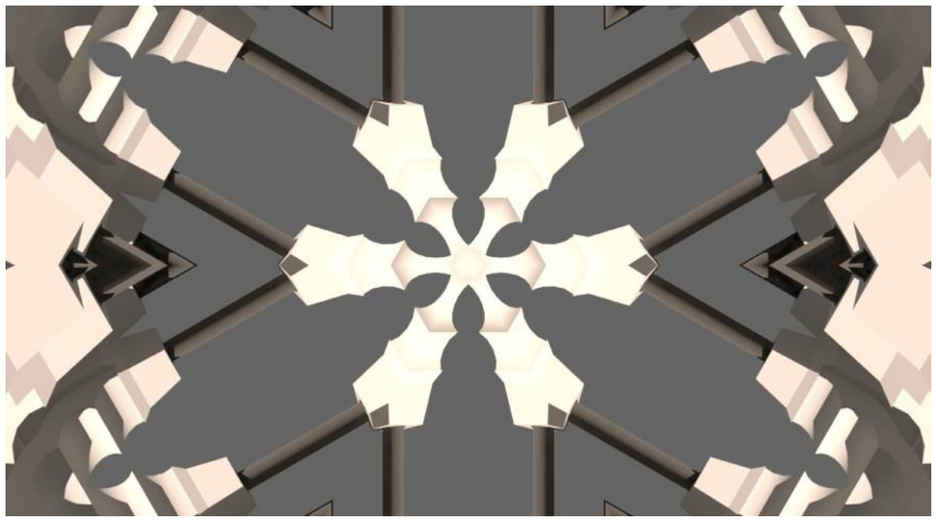


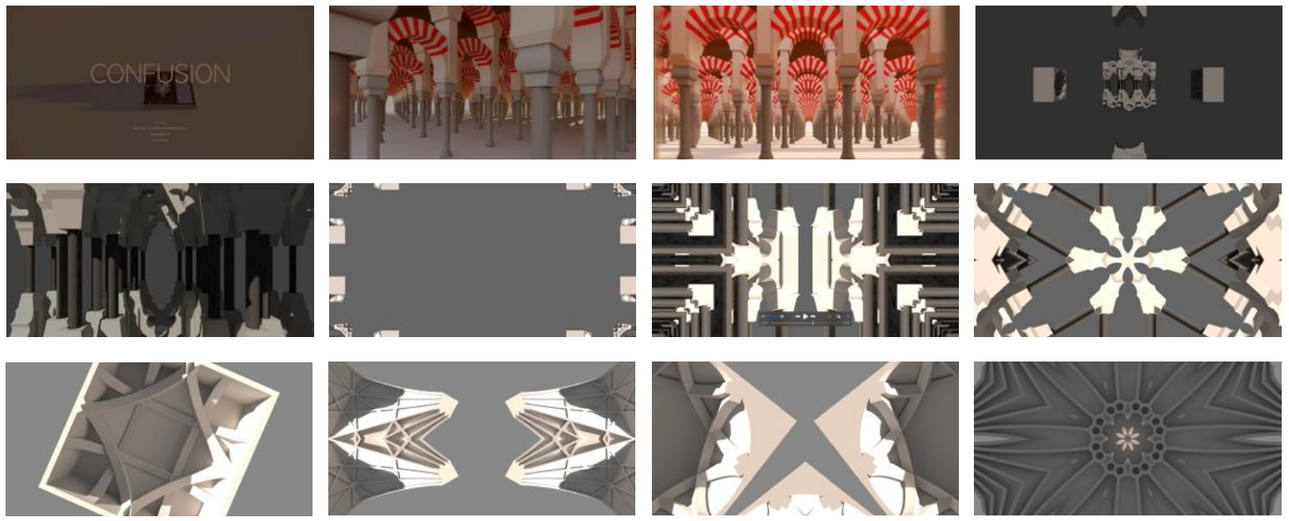
Physical Model

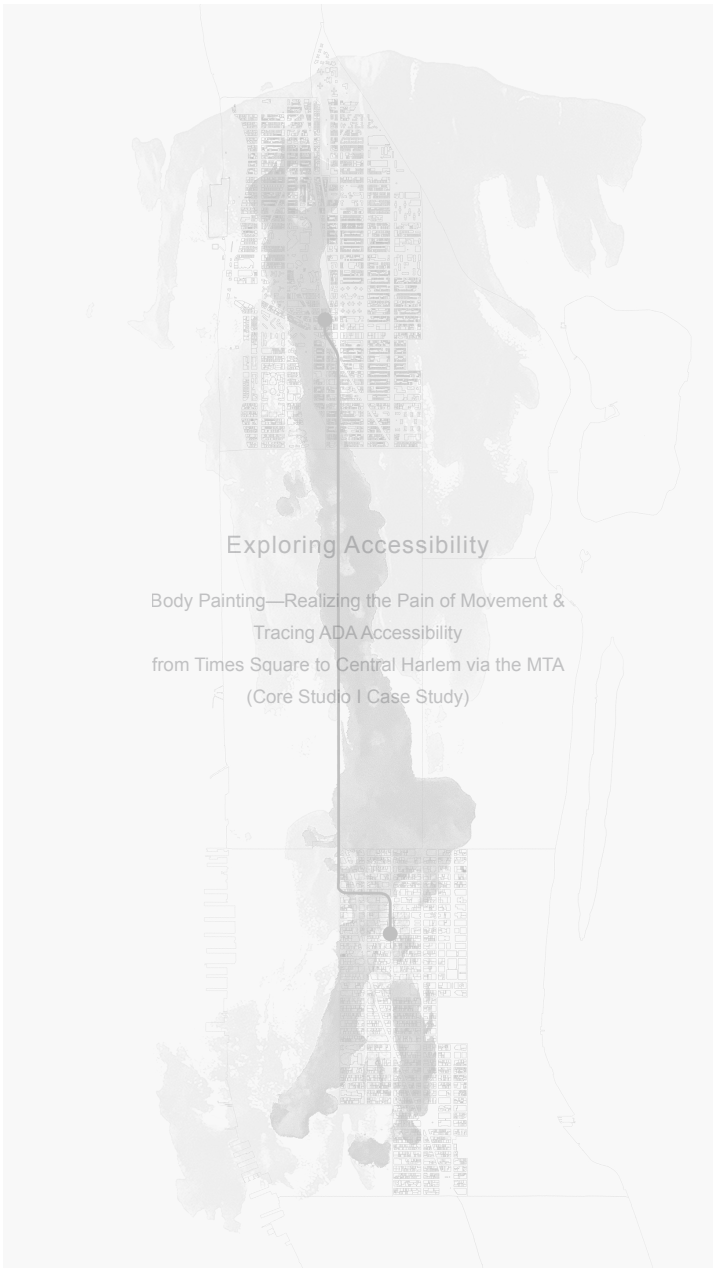
Cocnept of chaotic moment with mirrors

Animation

Climax of the chaotic moment







Exploring Accessibility

Body Painting—Realizing the Pain of Movement &
Tracing ADA Accessibility
from Times Square to Central Harlem via the MTA
(Core Studio I Case Study)

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