2025

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2025

JUXTAPOSITION

Juxtaposition in architecture represents the deliberate integration of contrasting elements, merging science and art, functionality and aesthetics, simplicity and complexity, and the coexistence of past and present. This interplay ensures that no single aspect dominates, fostering a harmonious architectural language where differing values coexist and enrich one another. The careful balance of these dualities allows architecture to remain both rooted in tradition and open to transformation, evolving alongside cultural, environmental, and technological shifts.

As design methodologies advance, they reshape traditional practices through the incorporation of emerging technologies, computational tools, material innovations, and cross-disciplinary research. This approach respects historical precedents, aligns with contemporary spatial and environmental needs, and envisions future-oriented design strategies. By navigating the intersection of old and new, architects can develop contextually responsive solutions that honor the past while embracing progress.

This commitment to juxtaposition as a design philosophy drives both experimental innovation and the preservation of architectural heritage. Architecture, in this context, becomes a continuous dialogue between tradition and modernity, allowing for the coexistence of diverse influences that shape the built environment. Through this nuanced approach, architects contribute to a broader global discourse, fostering a more adaptive, sustainable, and meaningful architectural future.

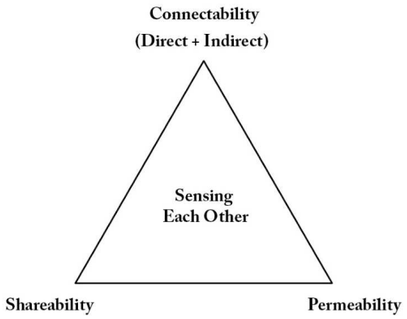
INDEX

True-Public Housing

In-Between Space Between Public and Private

01

Columbia University GSAPP, ***Core 3 Studio***
2023. 09 ~ 2023.12
Type : Architecture Design
Instructor : Prof. Christopher Leong
Team Academic Project with Seonghak Lee

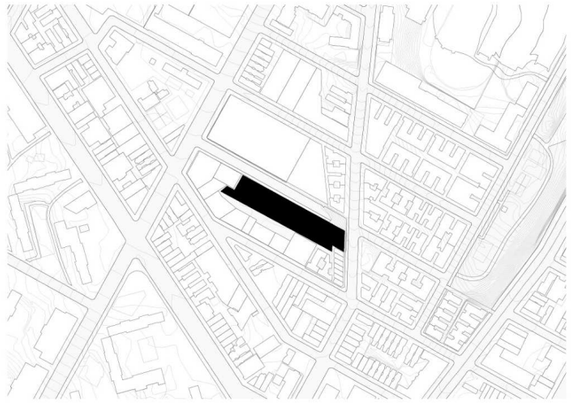


The New York City Housing Authority (NYCHA) has faced financial challenges due to federal budget cuts since the 1970s and 1980s, leading to an increasing reliance on public-private partnerships. In response, redevelopment plans have been proposed to transform Fulton and Elliott-Chelsea Houses into a mixed-use complex, raising concerns about the preservation of affordable housing.

As an alternative, a 148-unit public housing project in West Harlem has been proposed, emphasizing community-oriented living and shared spaces while maintaining the integrity of public housing. This vision aims to create a more inclusive and accessible urban environment that prioritizes public interests over privatization through in between porous space.

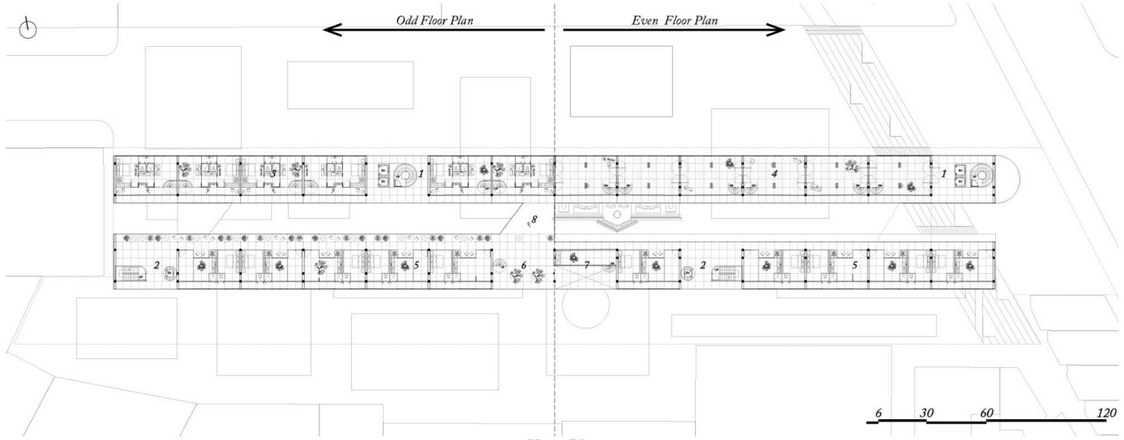
The design philosophy, “Sensing Each Other,” envisions compact yet expandable living spaces with in-between communal areas to foster connectivity and meaningful social interactions within New York City’s dense urban fabric. The project also incorporates glass facades to maximize daylight, enhance openness, and facilitate visual connections among residents.

Main Image: Model PhotWo, Bottom Left: Site Plan, Right: Model Photo



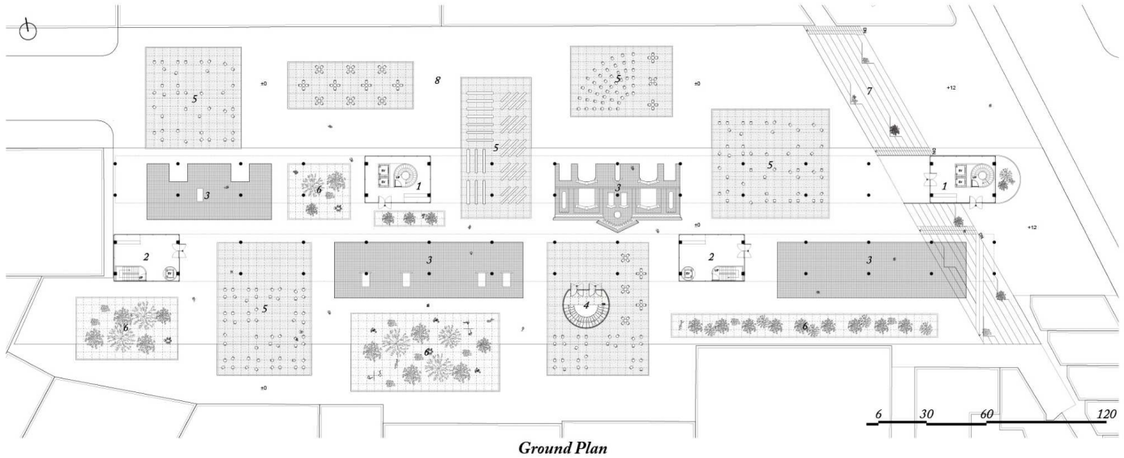
Two Massing: Public and Private

While maintaining the form of two banal long massings facing each other, the structural strategy involves sectional shifting to maximize porosity, allowing residents to share common spaces to the fullest extent possible. At the same time, this structural strategy completely clears the ground plan at a height of three floors, creating a program-agnostic public space



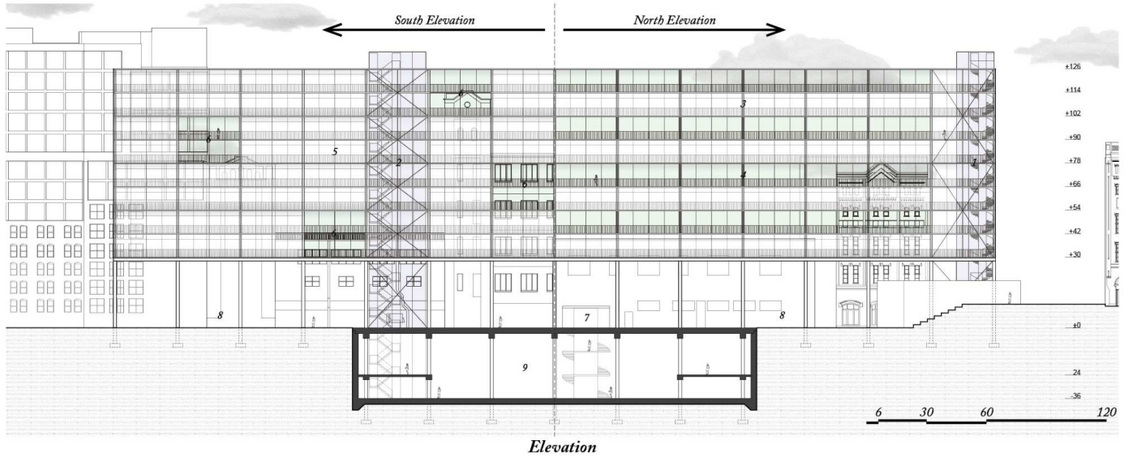
Units Plan

1.North Massing Core 2.South Massing Core 3.1st Floor of Duplex North Housing Unit 4.2nd Floor of Duplex North Housing Unit
5.Single-Story South Unit 6.1st Floor of In-Between Public Space 7.2nd Floor of In-Between Public Space 8. In-Between Bridge



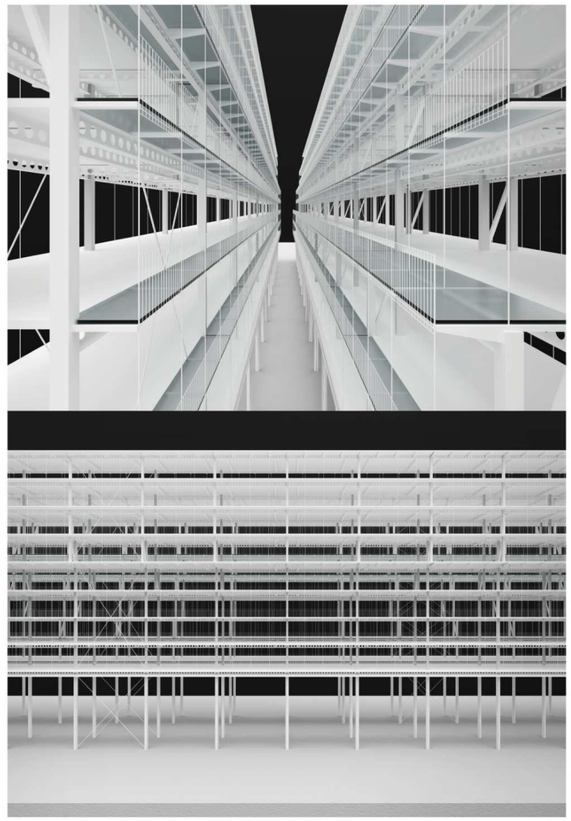
Ground Plan

1.North Massing Core 2.South Massing Core 3.Paving from Existing Building Facade 4.Entrance to Underground
5.Paving for Program-Ignostic 6.Public Garden 7.Stepped Sitting 8.Expaned Area



Elevation

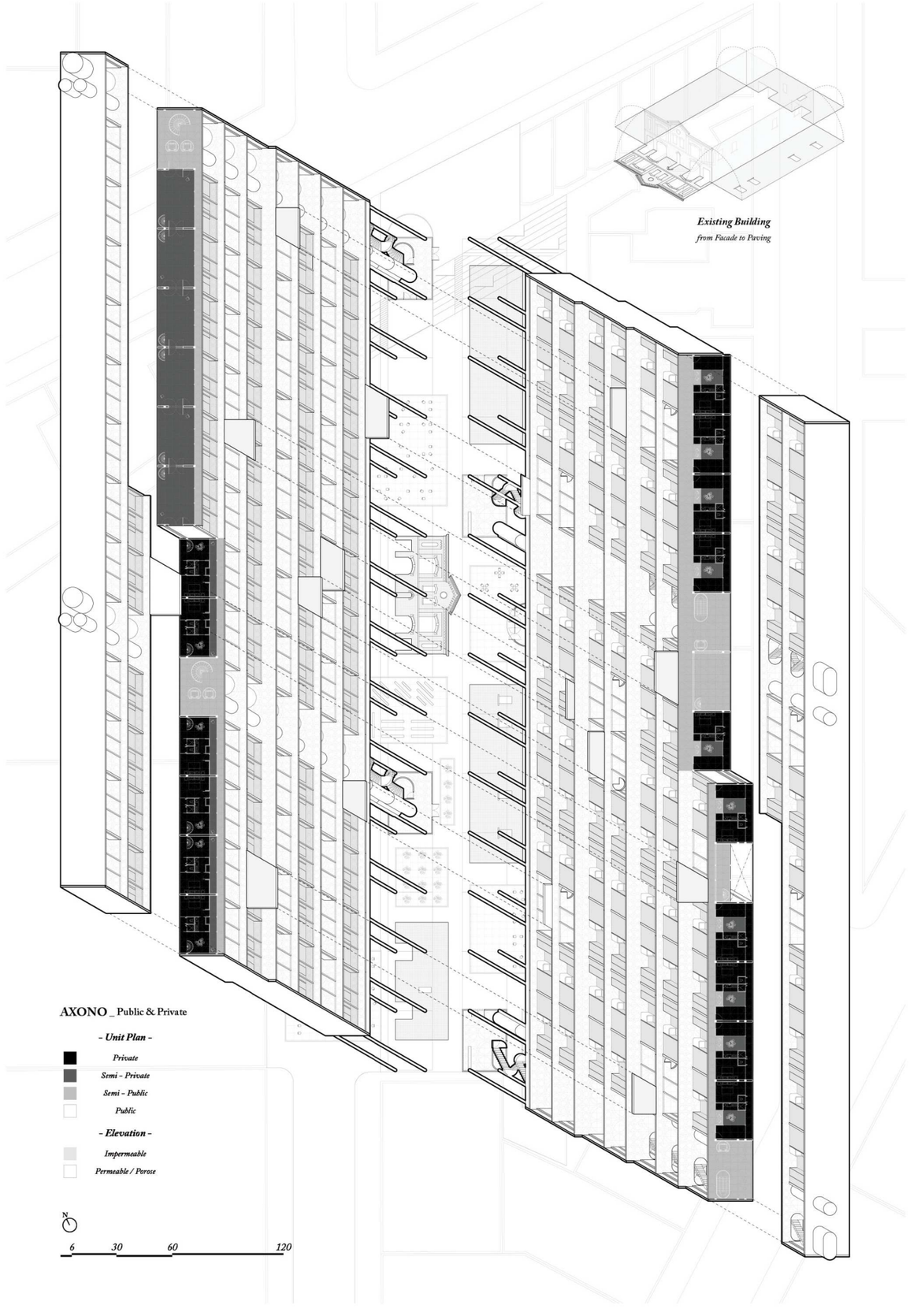
1.North Massing Core 2.South Massing Core 3.1st Floor of Duplex North Housing Unit 4.2nd Floor of Duplex North Housing Unit
5.Single-Story South Unit 6.In-Between Public Space 7.Entrance to Underground 8. Program-Ignostic Ground Space 9. Program-Ignostic Underground Space

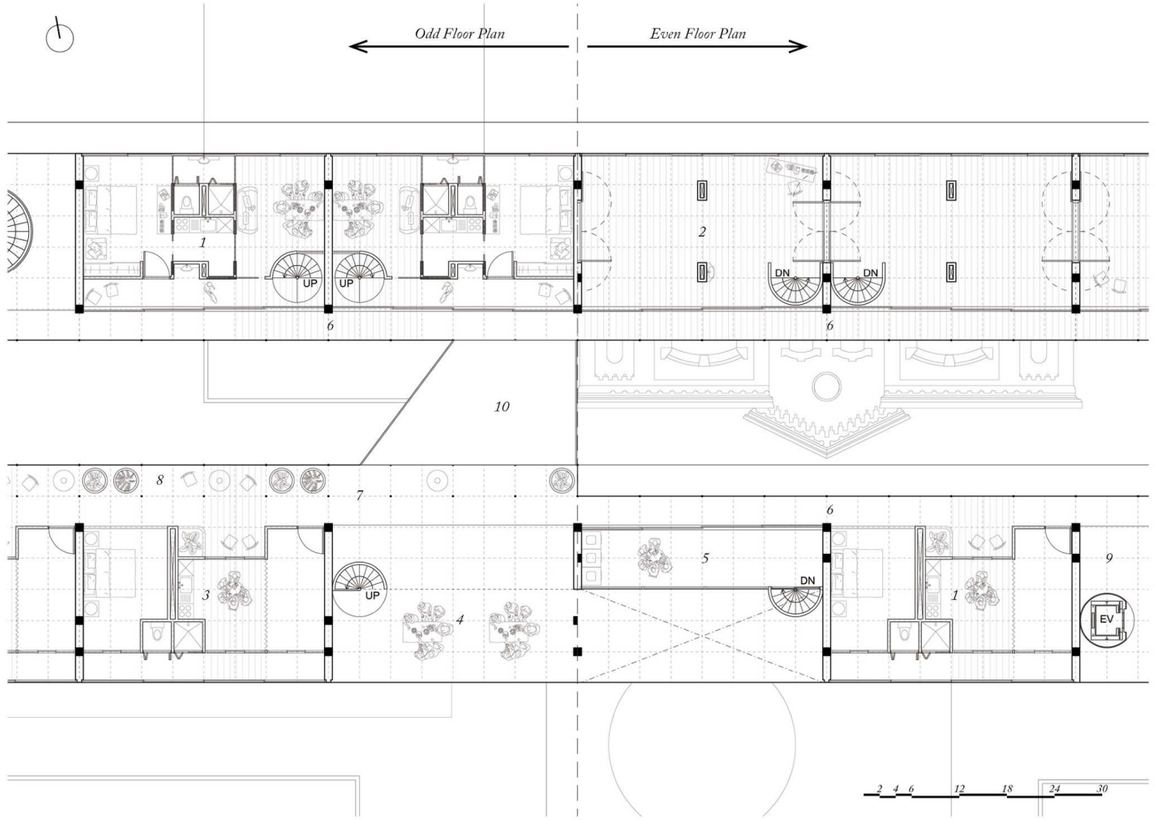


Structural Strategy_Maximizing Porosity: While preserving the basic form of two parallel massings facing each other, the structural approach introduces sectional shifts to enhance porosity, ensuring that shared spaces are fully accessible to residents. Simultaneously, this strategy elevates the structure, clearing the ground level up to three floors, resulting in a program-agnostic public space that remains open and adaptable for various communal uses.

Program-Agnostic True Public Space: The fully open ground floor and underground levels serve as architecturally neutral spaces, designed without predetermined functions. This program-agnostic environment fosters adaptability, allowing the community to shape its use organically. As a True Public Space, it remains accessible to all neighbors and accommodates a wide range of activities, from neighborhood festivals and after-school programs to polling stations, exhibitions, and other communal gatherings.

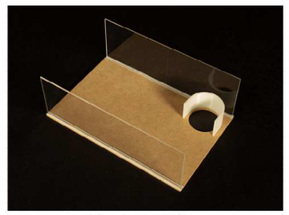
Top Left: Structural Model,
Bottom: Ground Level Rendering





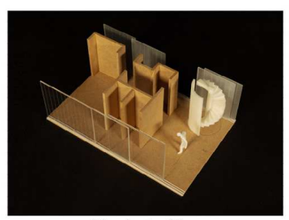
Enlarged Unit Floor Plan

1.1st Floor of North Duplex Housing Unit 2.2nd Floor of North Duplex Housing Unit 3.South Single-Story Unit 4.1st Floor of In-Between Public Space
5.2nd Floor of In-Between Public Space 6.Hallway 7.Double-Wide Hallway 8.Hallway Pocket Space 9.Core 10. Bridge

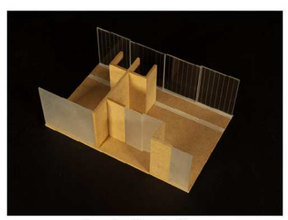


***North**, 2nd Floor*

North / South Housing Unit

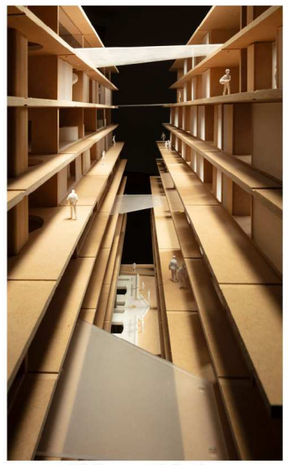


***North**, 1st Floor*



***South**, Single Story*

In-Between Space



Hallway with Bridges

Units with Four Different In-Between Space: Sensing Each Other

'True-Public Housing' units envisions compact yet expandable living spaces with four different in-between space, promoting connectivity and meaningful interactions among residents. The varied scale of these in-between spaces enhances porosity, encouraging creative activities and interaction between residents and the public.

South Side Elevation View

Adaptive Archive for Architecture

Building on Building

02

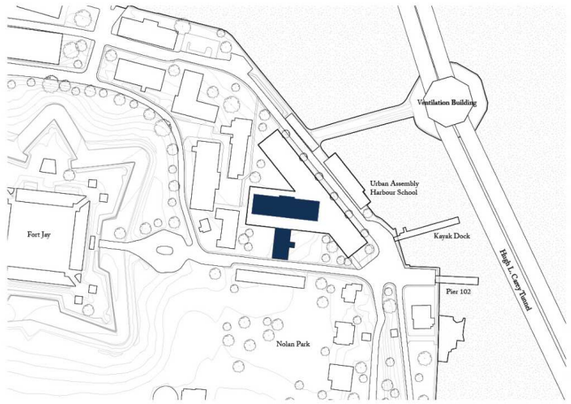
Columbia University GSAPPP, ADV 5
2024. 09 ~ 2024.12
Type : Architecture Design
Instructor : Prof. Wonne Ickx
Team Academic Project with Flora Ng

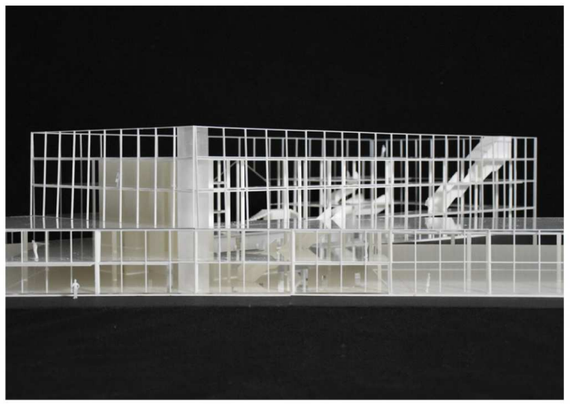
"An Adaptive Archive" explores the evolving relationship between museums, archives, and architecturew. Historically, European museums displayed their entire collections, but by the late 19th century, a division emerged between public and private collections. Today, museums struggle with storage constraints, often resorting to offsite facilities that separate objects from public engagement.

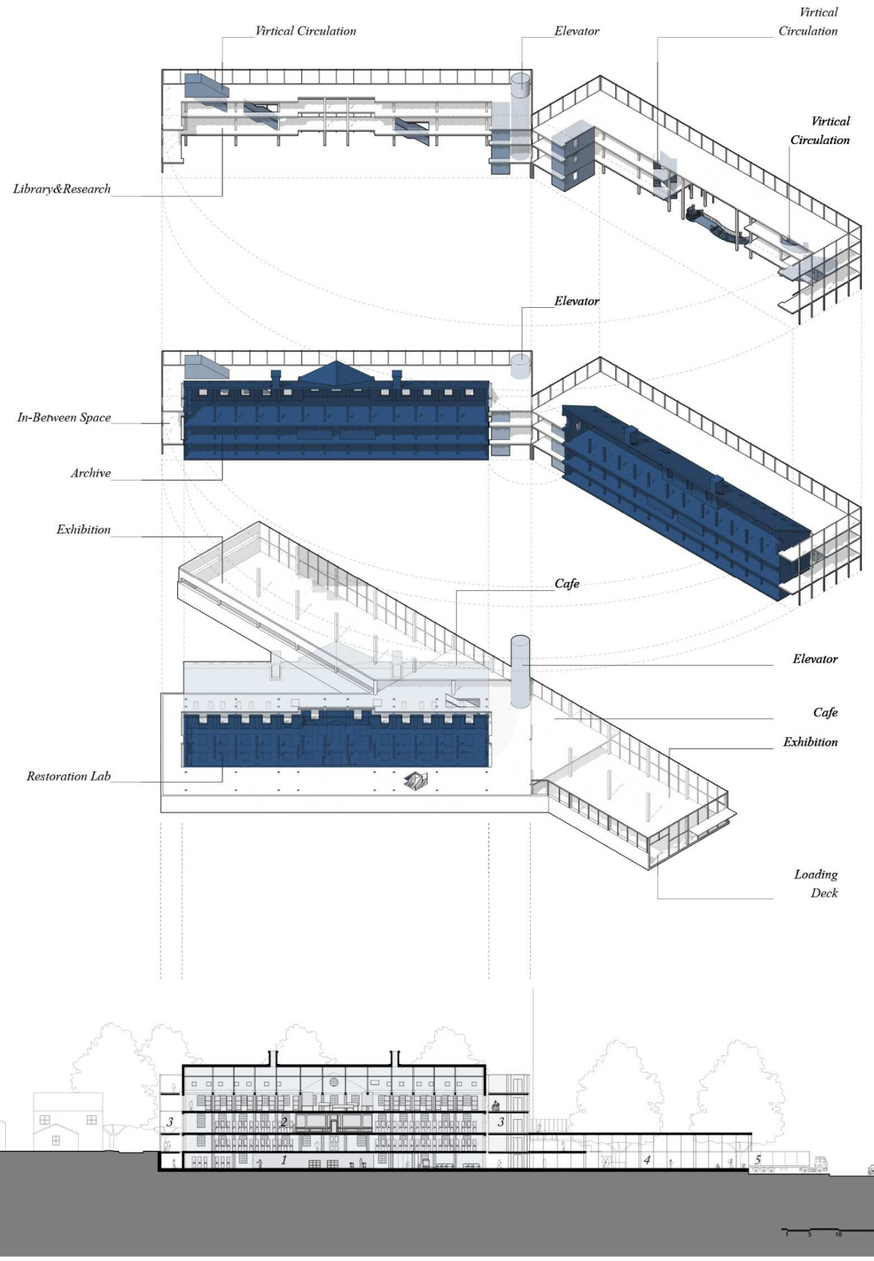
The project proposes a new architectural approach that makes archives more visible and accessible, integrating public circulation within storage spaces rather than concealing them. Through a series of gestural interventions, such as "Drawer and Display" systems, the design fosters interaction between the stored collections and visitors, offering a layered experience of history and preservation.

By embracing the reuse and transformation of existing buildings, the project aligns with the idea that architecture outlives its original function, continuously adapting over time. Ultimately, "An Adaptive Archive" proposes an alternative to traditional museum storage by integrating archives into the urban environment, making them part of the everyday experience rather than hidden repositories.

Main Image: Exterior Render, Bottom
Left: Site Plan, Right: Model Photo







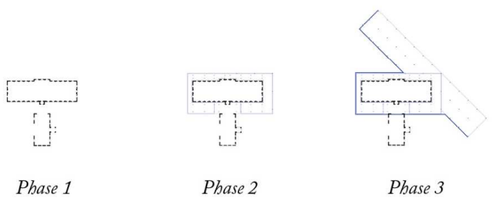
New Extention with Circulation

Existing & New Extention

Ground Floor

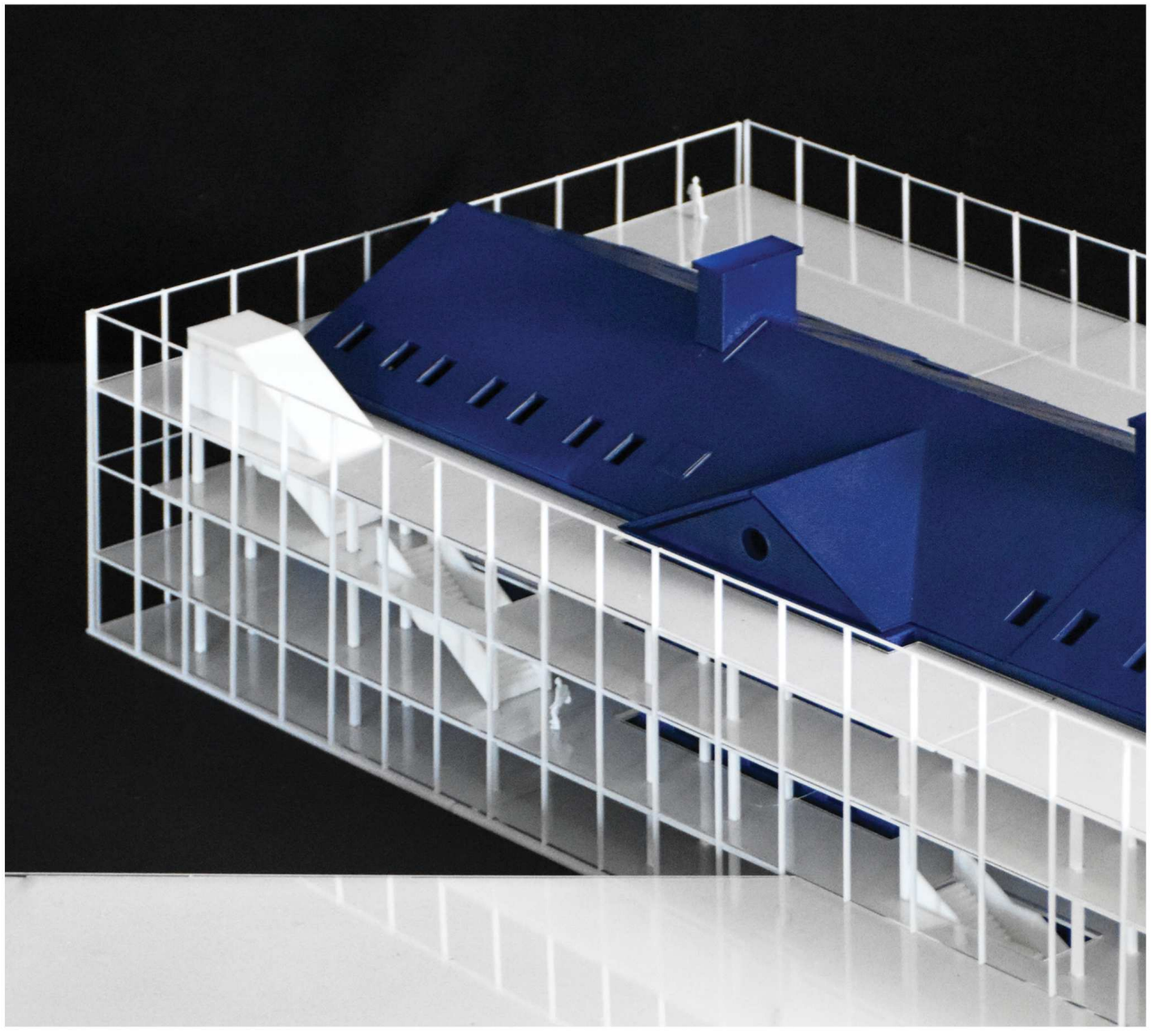
1.Restoration Lab
2.Archive
3.In-Between Space
4.Exhibition Hall
5. Loading Duck

Longitudinal Section



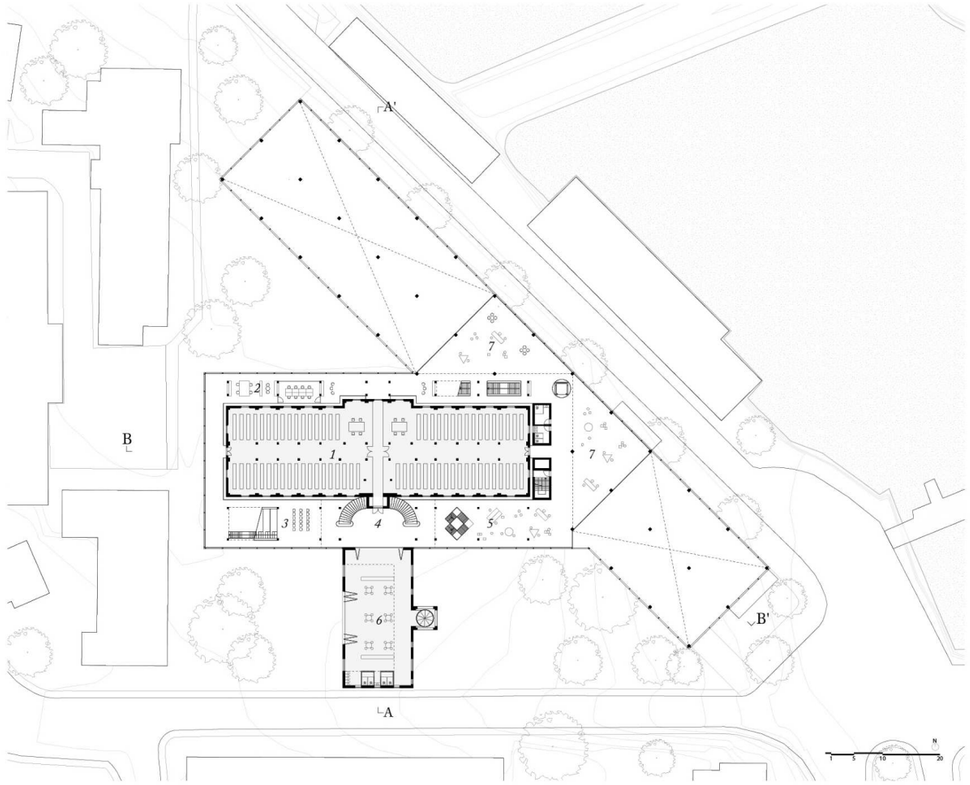
Phase 1 *Phase 2* *Phase 3*

The expansion of an adaptive archive integrates circulation, research, and public engagement. A new extension with vertical circulation connects research spaces, while an "in-between space" bridges archives and public areas. The ground floor activates the site with a restoration lab and exhibition hall, fostering interaction between visitors and archival processes.



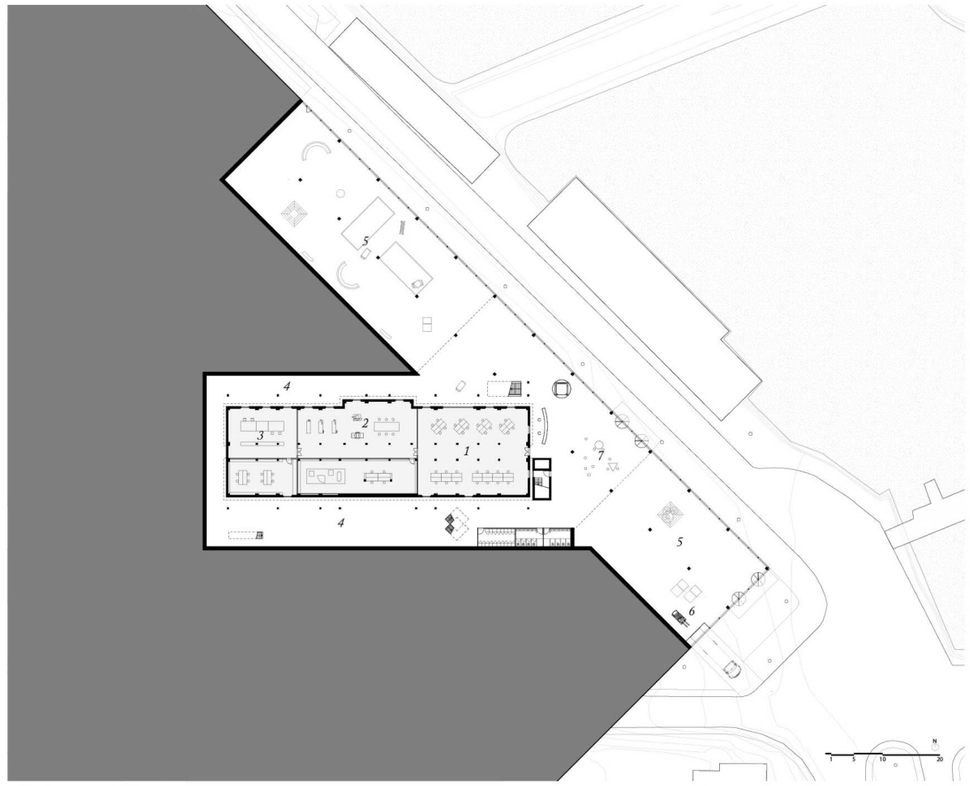
Vertical Circulation in In-Between Space

The In-Between Space functions not only as a horizontal circulation but also as a research hub, library, and public space, allowing visitors to demystify the Archive. Meanwhile, the vertical circulation plays both a functional and symbolic role, enhancing openness, connectivity, and adaptability within the historically layered architectural context.



1.Archive
2.Research Lab
3.Auditorium
4.Main Lobby
5.Public Space
6.Welcome Center
7.Cafe

Ground Plan

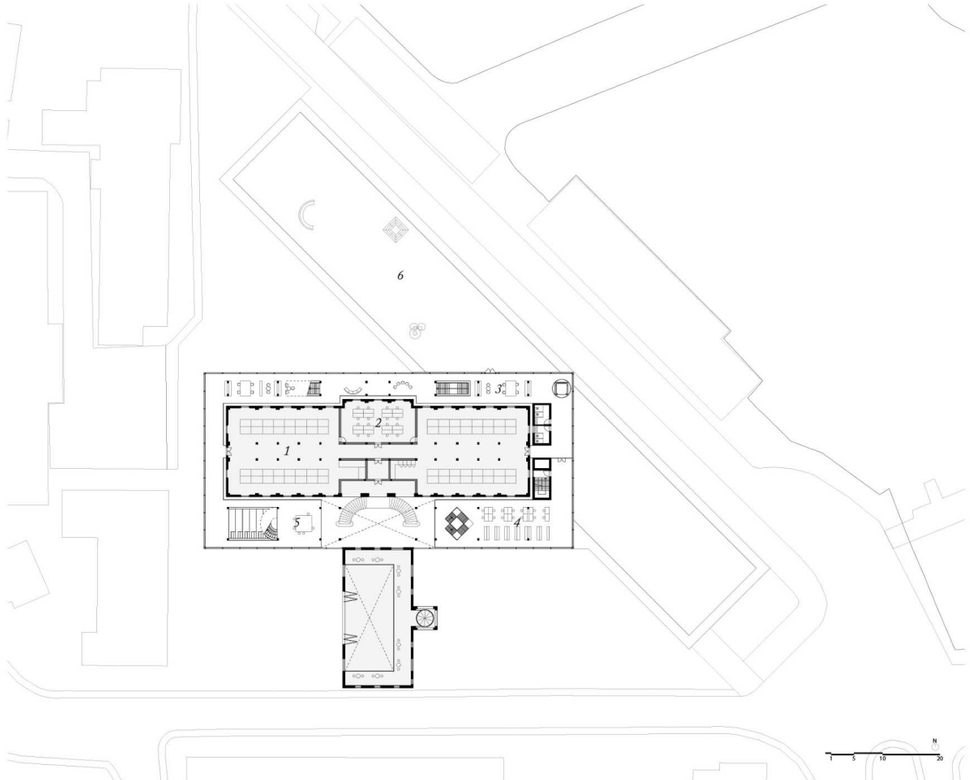


1.Research Lab
2.Restoration Lab
3.Black Room
4.Permanent Exhibition
5.Temporary Exhibition
6.Loading Deck
7.Exhibition Lobby

Underground Plan

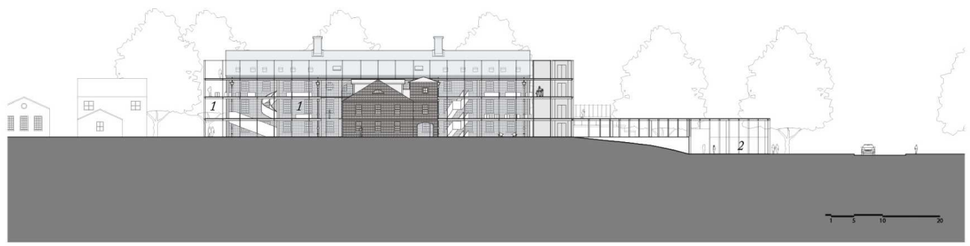
Top: Main Lobby from Second Floor, Bottom: Exhibition Space for Architecture Archive

The main lobby acts as a welcoming threshold, seamlessly connecting visitors to the archive and public spaces. It facilitates circulation while offering gathering areas. The exhibition space is designed for flexibility, showcasing archived materials with transparent and adaptable displays, ensuring accessibility and engagement with the archive's contents.



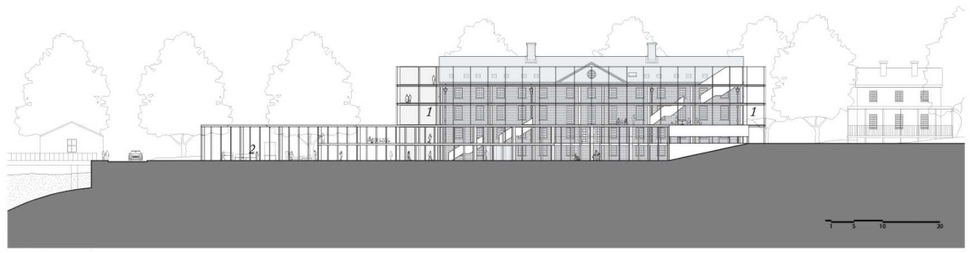
2F Plan

1.Archive
2.Archive Office
3.Research Room
4.Library
5.Community Center
6.Sculpture Park



South Elevation

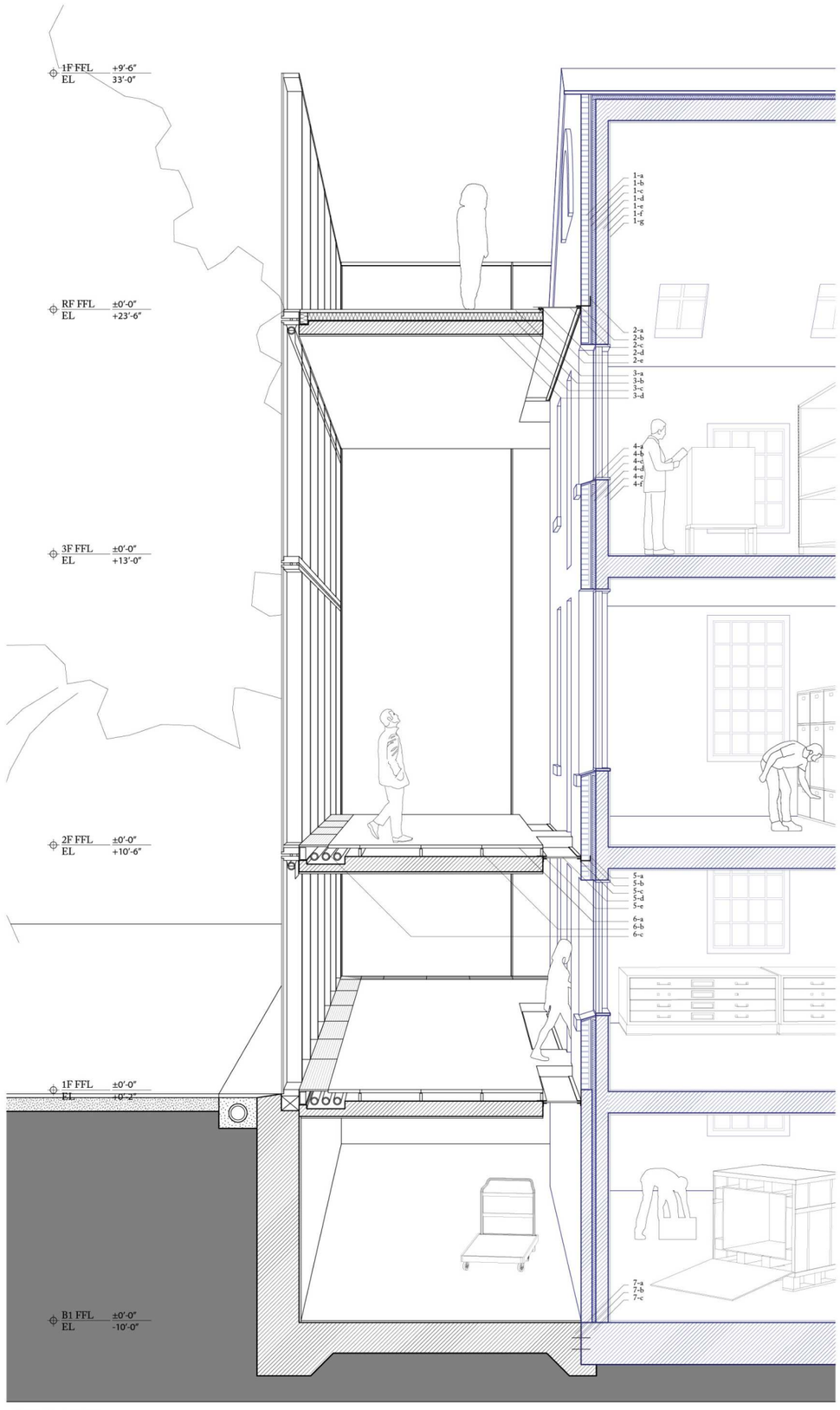
1.In-Between Space
2.Exhibition Hall



North Elevation

1.In-Between Space
2.Exhibition Hall

Top: North 2nd Floor In-Between Space, Middle Left: Restoration Lab from Underground Exhibition Room, Middle Right: Welcome Center, Bottom: Exhibition Exterior View from opposit Building



Detaill Section

1. Existing Brick Wall
a. *Brick veneer* ***b.*** *Air Cavity* ***c.*** *Weather Resistant Membrane (WRB)* ***d.*** *Insulation* ***e.*** *Concrete wall* ***f.*** *Vapor Varrier* ***g.*** *Gypsum board*

2. Exterior Glass Joint
a. *Copper Flasing* ***b.*** *1/4" Stainless Hardware with Sealant* ***c.*** *Double glazing glass* ***d.*** *1/4" Stainless Hardware with Sealant* ***e.*** *1/4" Stainless L bracket*

3. Extension Roof Slab
a. *Floor finish* ***b.*** *Waterproofing membrane* ***c.*** *Insulation* ***d.*** *Concrete* ***e.*** *Paint*

4. Inside Window
a. *Brick Tile* ***b.*** *Window Frame* ***c.*** *Weather Resistant Membrane (WRB)* ***d.*** *Insulation* ***e.*** *Concrete* ***f.*** *Gypsum Board*

5. Interior Glass Joint
a. *Sheating* ***b.*** *1/4" Stainless L bracket* ***c.*** *1/4" Stainless Hardware with Sealant* ***d.*** *Double glazing glass* ***e.*** *1/4" Stainless Hardware*

6. Slab System
a. *Raised access floor tile* ***b.*** *Pedestal* ***c.*** *Ventilation system*

7. Foundation Slab Joint
a. *Extension Foundation Slab* ***b.*** *Joint* ***c.*** *Existing Foundation slab*

North 2nd Floor In-Between Space

In-between Space

Inside of Archive

Artificial Forest

Wild / Willing: The New Urban Ecology

03

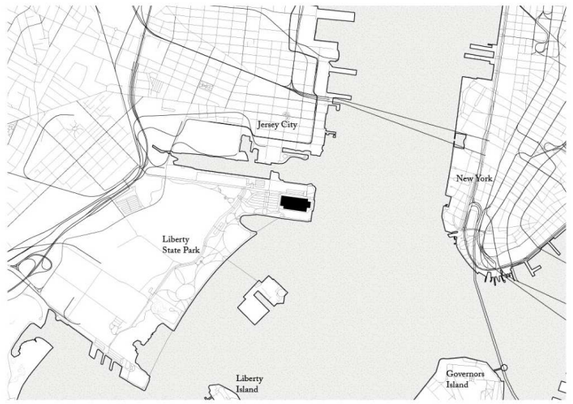
Columbia University GSAPP, ADV 4 Studio
2024. 01 ~ 2024.05
Type : Architecture Design
Instructor : Prof. Mimi Hoang
Team Academic Project with Thomas Gomez

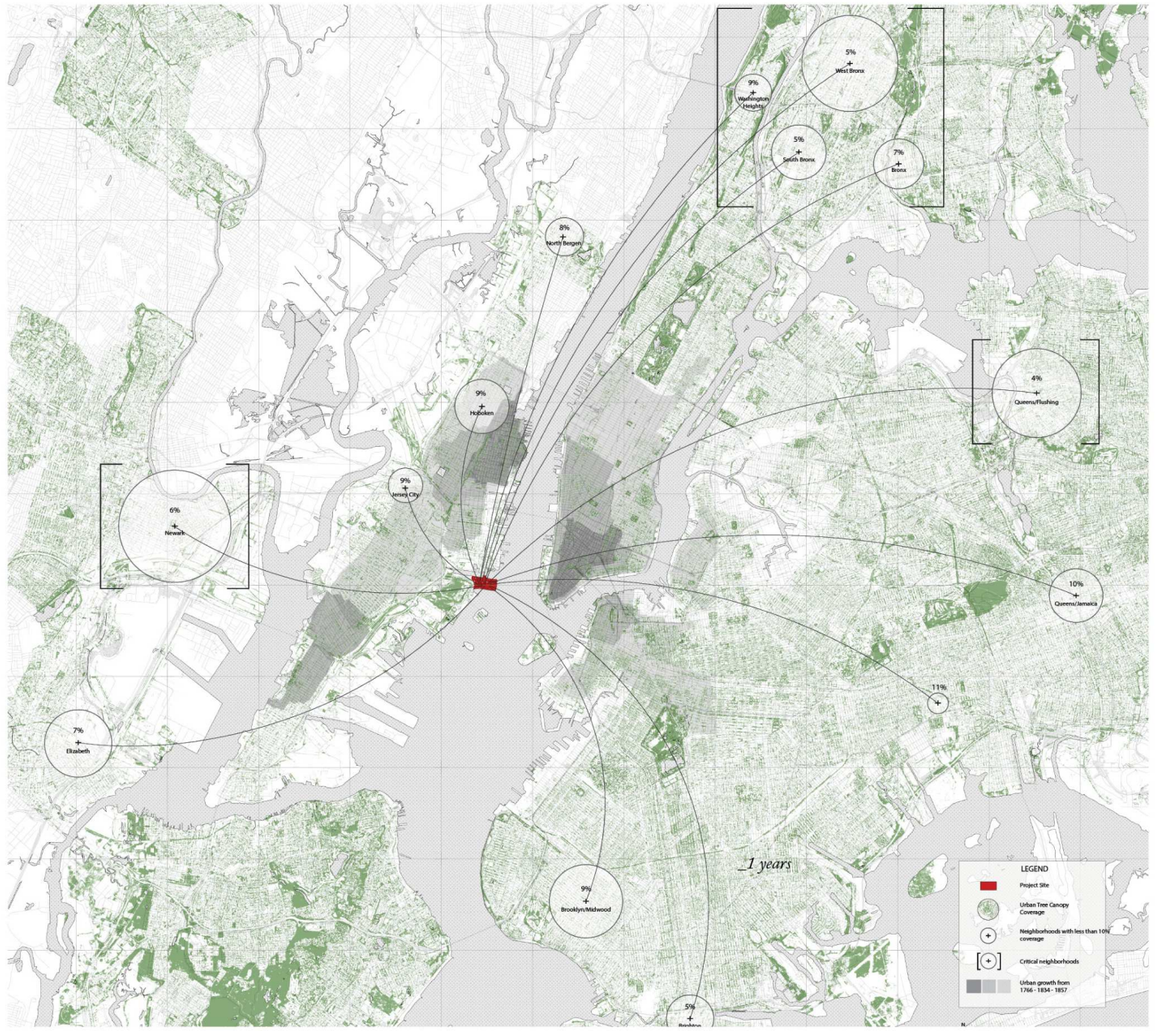
The "Artificial Forest" project delves into the intersection of architecture and nature, highlighting the dynamic relationship between human-made structures and untamed landscapes: a permanent "wild" forest and a managed "willed" sapling forest dedicated to urban tree farming. This initiative aims to mitigate the heat island effect, while simultaneously enriching the local ecosystem on reclaimed land.

In partnership with organizations such as the Sierra Club, Tree Farm, and Forest School, the project integrates expertise in conservation, forest health, and biodiversity education. Educational space for children and community engagement are central to its mission, with public exhibitions and interactive educational programs encouraging active participation and awareness.

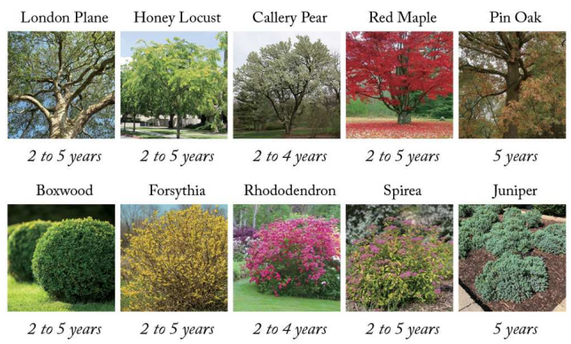
By employing the Miyawaki Method—a proven technique for rapid forest growth—the design includes dedicated educational spaces within the train shed. These spaces serve as a bridge, connecting children and the wider community to the ecological cycles and life processes of the forest, fostering a deeper understanding of and connection to the natural world.

Main Image: Concept Sketch with Shed,
Top: Site Photo, Bottom Left: Site Plan,
Bottom Right: Model Photo





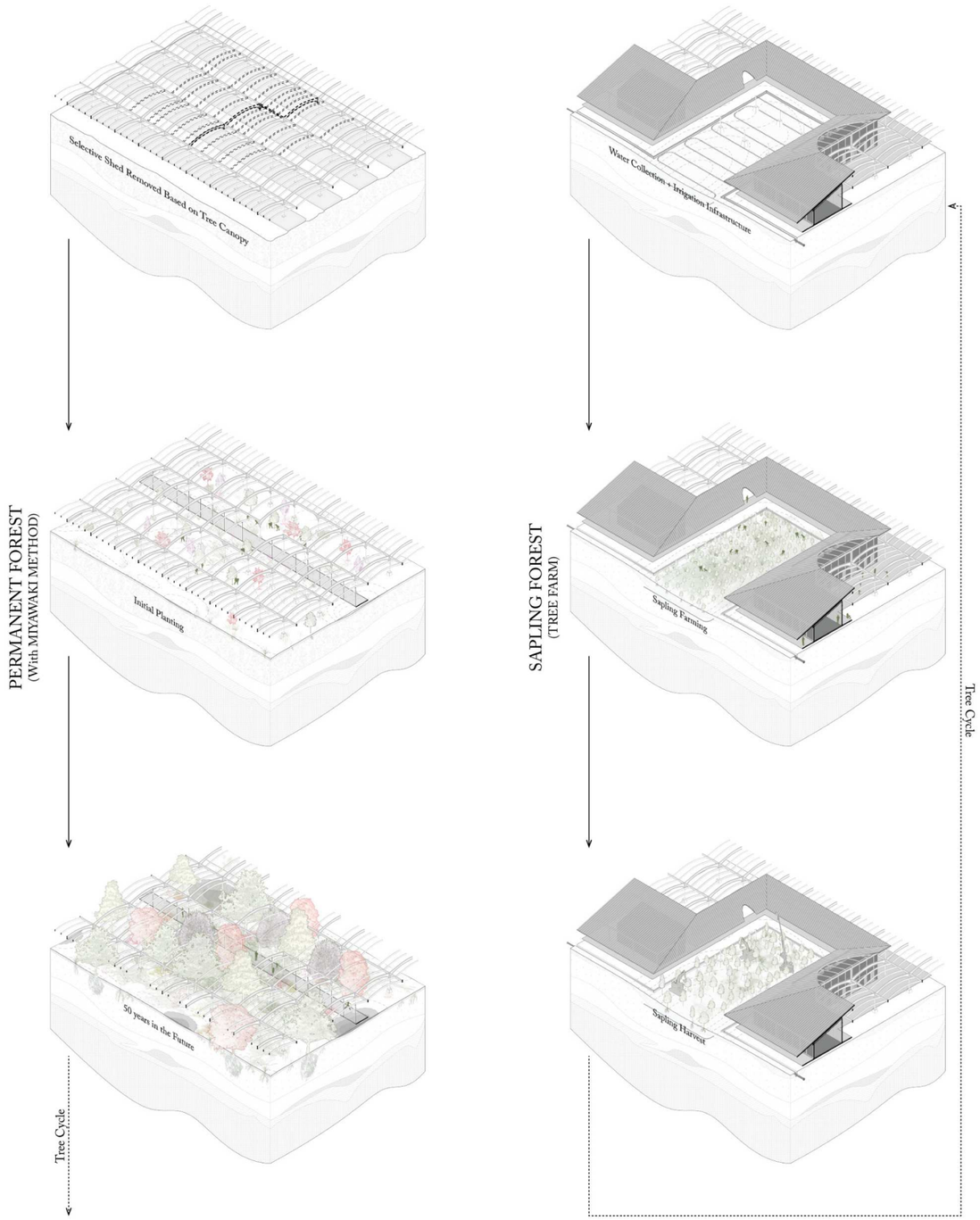
Street Plants in NYC and NJ:



A categorized list of street plants commonly found in New York City and New Jersey, including both trees and shrubs. This information is useful for urban landscaping and street greening initiatives, helping to determine appropriate plant selections based on growth timelines.

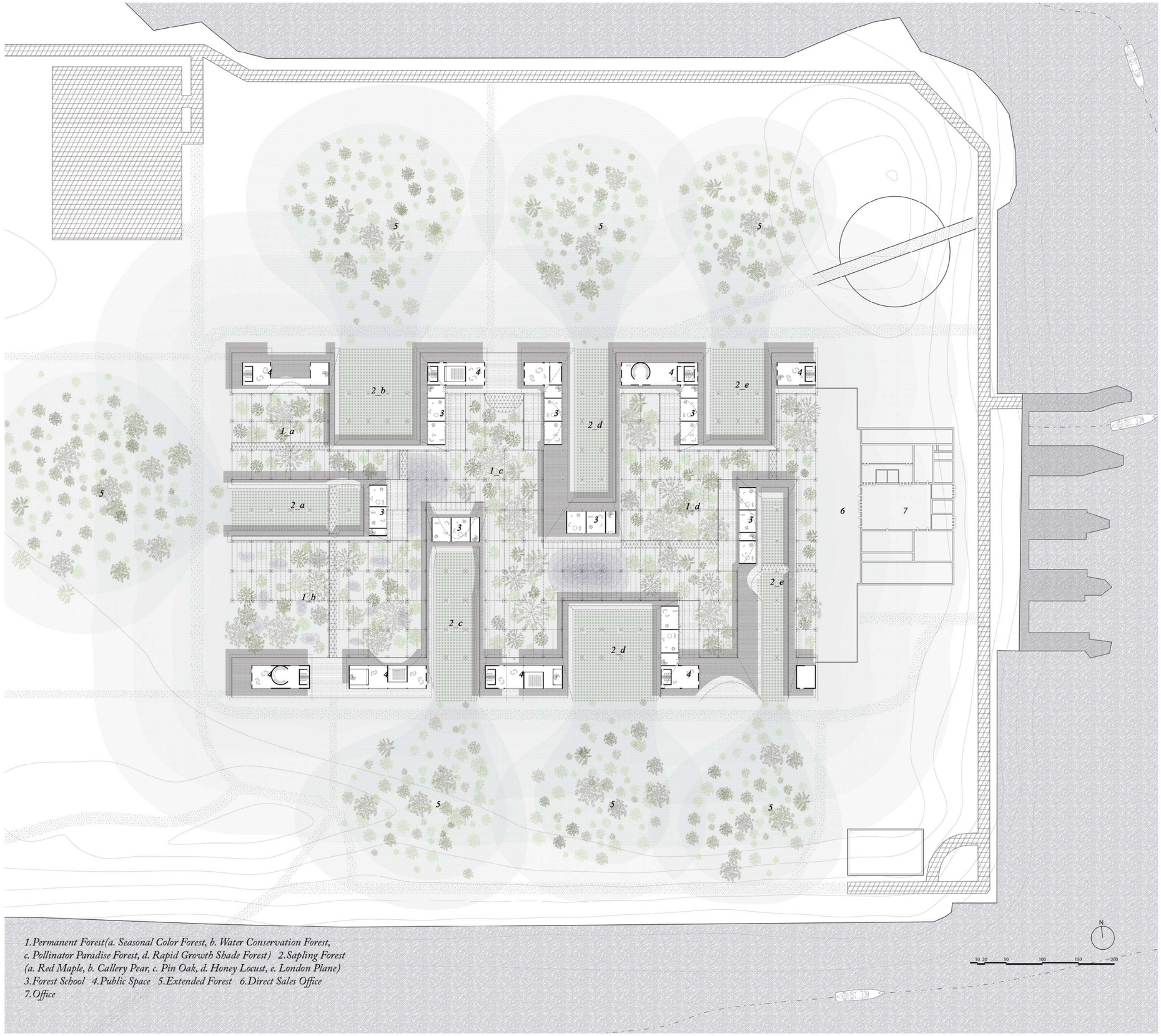
Smithson Floating Island, Balmori Associates, 2005

Tree Migration to Heet Island Regions: This train shed historically served as a point of immigration from New York City to other locations and vice versa. In this project, the artificial forest is not merely a man-made green area within urban spaces; it also functions as a cultivation hub for street trees that will be relocated throughout the city.

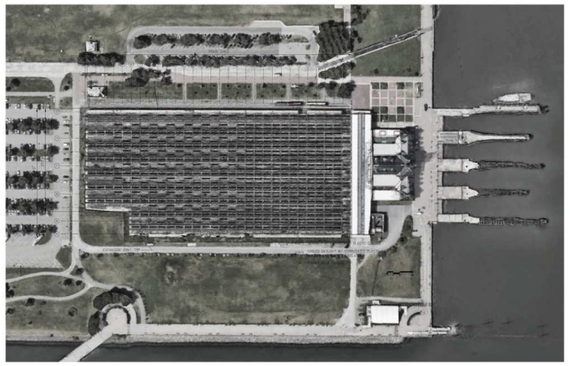


Artificial Forest = Permanent Forest + Sapling Forest

A Permanent Forest, created using the Miyawaki Method, fosters a self-sustaining ecosystem with areas for education and relaxation. In contrast, a Sapling Forest integrates the Miyawaki Method with a specialized structure and shed system, cultivating street trees for eventual transplantation into urban environments.



1.Permanent Forest(a. Seasonal Color Forest, b. Water Conservation Forest, c. Pollinator Paradise Forest, d. Rapid Growth Shade Forest) 2.Sapling Forest (a. Red Maple, b. Callery Pear, c. Pin Oak, d. Honey Locust, e. London Plane) 3.Forest School 4.Public Space 5.Extended Forest 6.Direct Sales Office 7.Office



Site Aerial View

Public

SIERRA CLUB

Supervisor (Sierra Club)

Producer, Tree Farm (American Tree Farm System)

Educator, Forest School (The Scandinavian School)

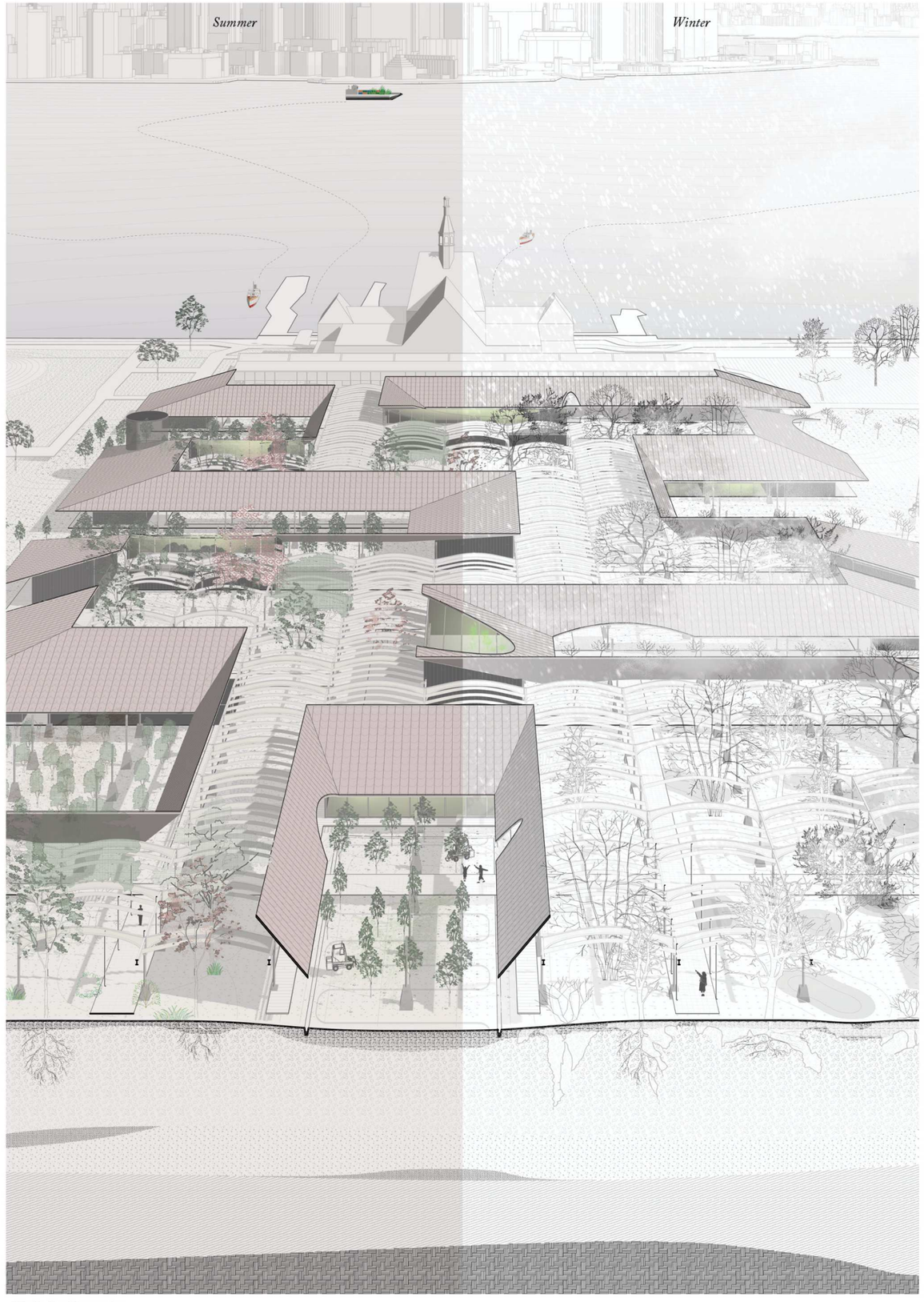
Collaborative Partnership

from Train Shed to Artificial Forest

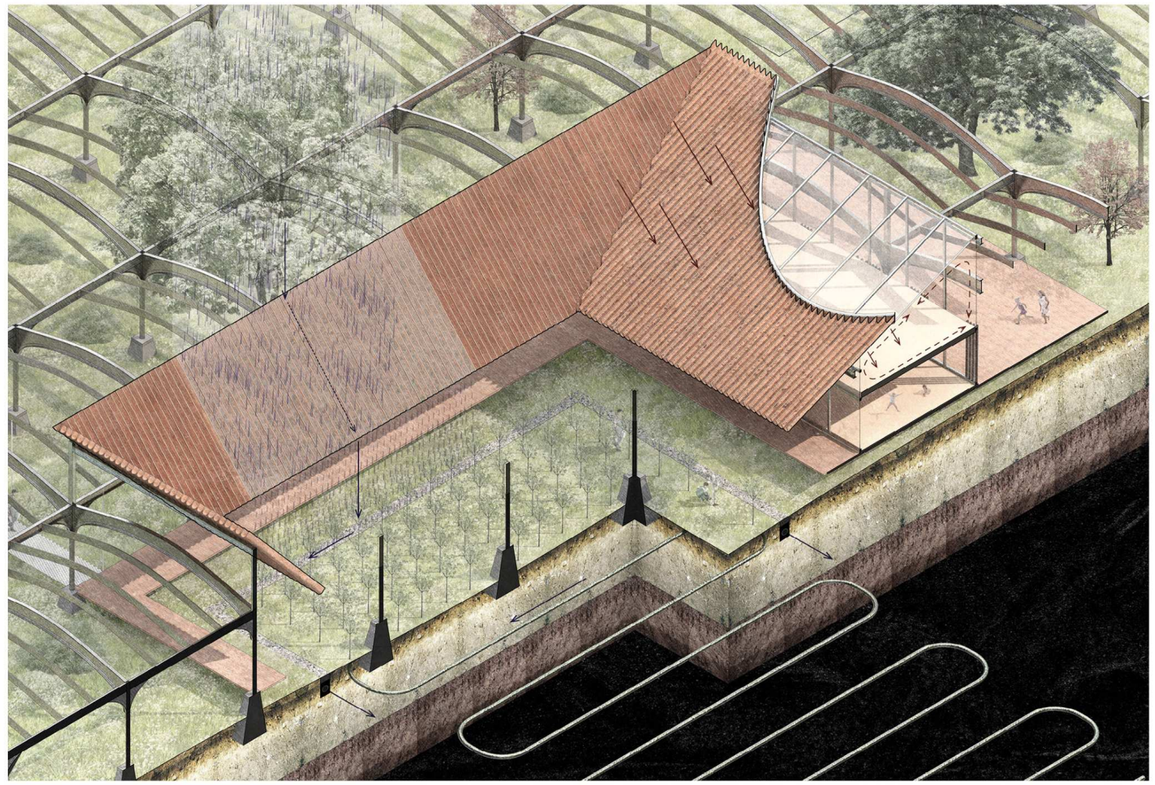
The transformation from a train shed to an artificial forest represents a shift from an industrial past to an ecologically regenerative future. This process involves the integration of natural systems, sustainable forestry, and environmental education, redefining the site as a space for both biodiversity and public engagement.

At the heart of this transformation is the Forest School, strategically located between the permanent forest and the sapling forest (tree farm). This positioning allows students to experience the full ecological cycle, witnessing both mature ecosystems and the growth of newly planted trees. The transparent elevation of the school enhances this connection, providing uninterrupted views of the surrounding landscape and fostering a learning environment that is deeply immersed in nature.

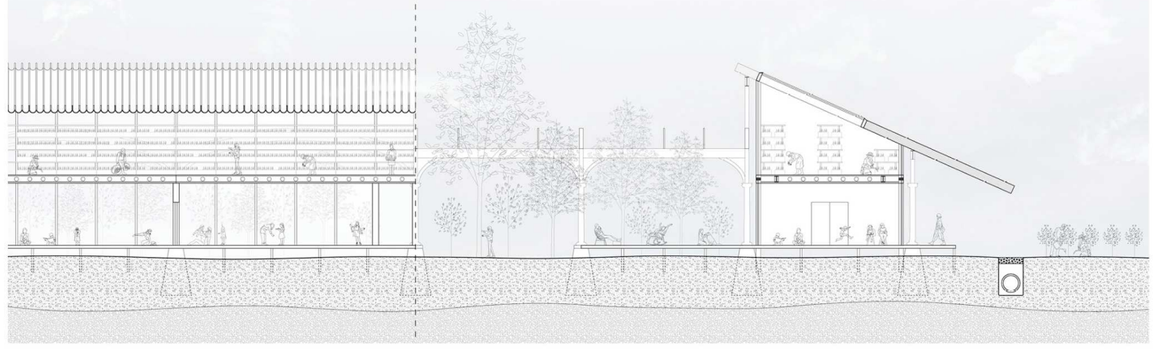
Through this approach, the project not only restores ecological balance but also creates an educational framework, where the next generation can engage with the environment, understand forest dynamics, and actively participate in sustainable practices.



Bird's Eye Perspective

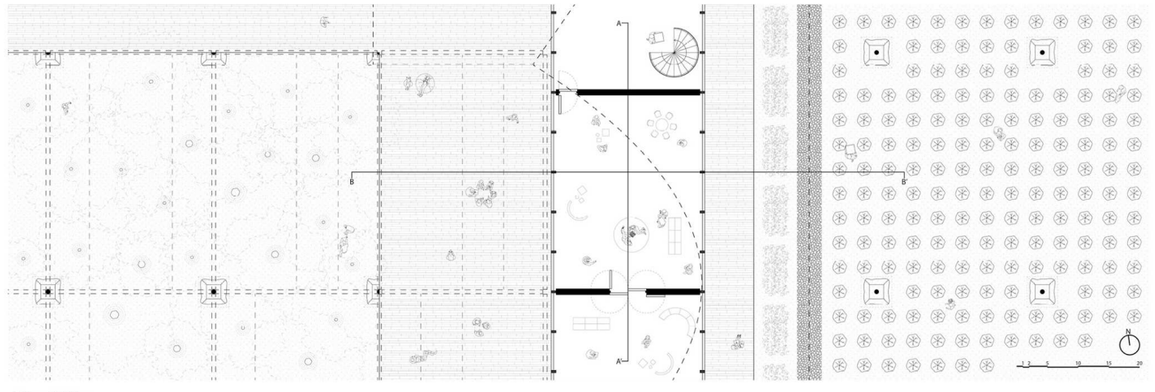


Emerging Ecologies, Architecture and the Rise of Environmentali

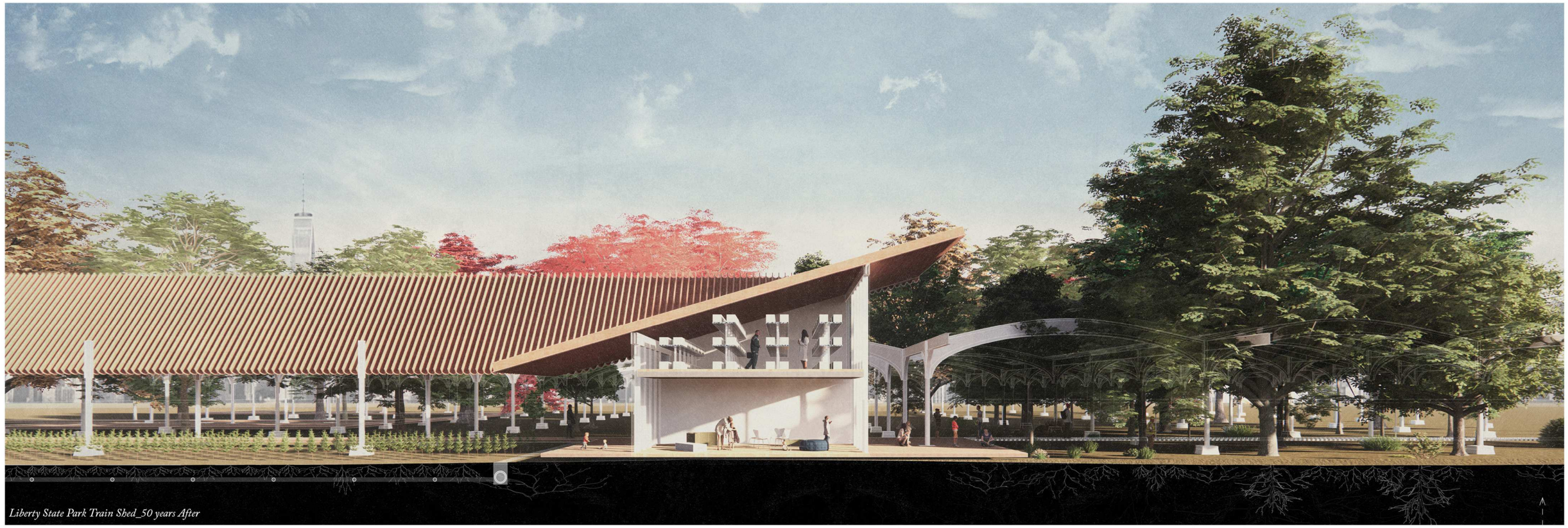


Detail Section A-A'

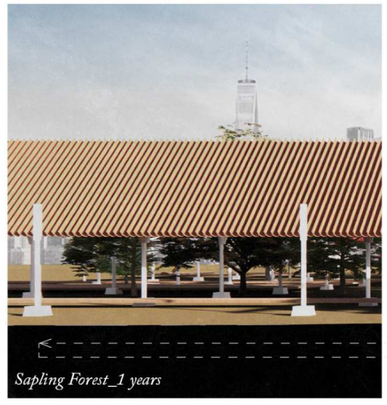
Detail Section B-B'



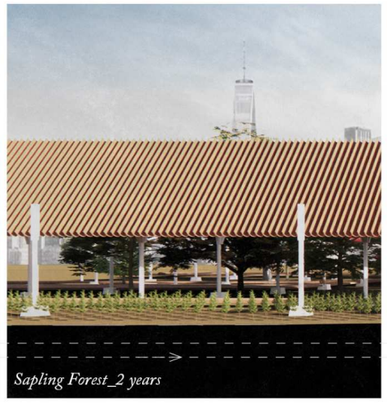
Detail Plan



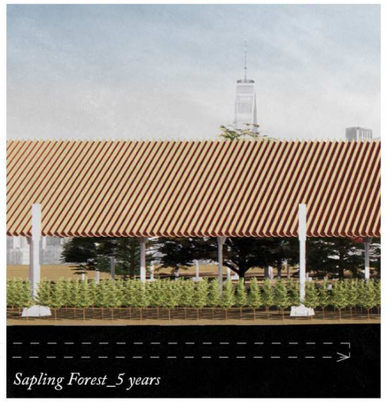
Liberty State Park Train Shed_50 years After



Sapling Forest_1 years



Sapling Forest_2 years

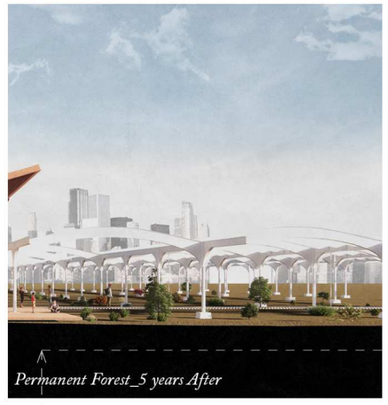


Sapling Forest_5 years

Artificial Forest

= Permanent Forest + Sapling Forest

Change with Time Frame: As the sapling forest undergoes continuous cultivation, the permanent forest matures, fostering biodiversity and shaping microclimates within the site. Integrated educational programming, featuring classrooms and learning spaces for children within the existing shed, becomes deeply connected to the spatial and temporal rhythms of the forest.



Permanent Forest_5 years After

Permanent Forest_10 years After

Permanent Forest_30 years After

Liberty State Park Train Shed_Before Design

Vermi-Scape

Shaping Living Landscapes within The Polykatoikias

04

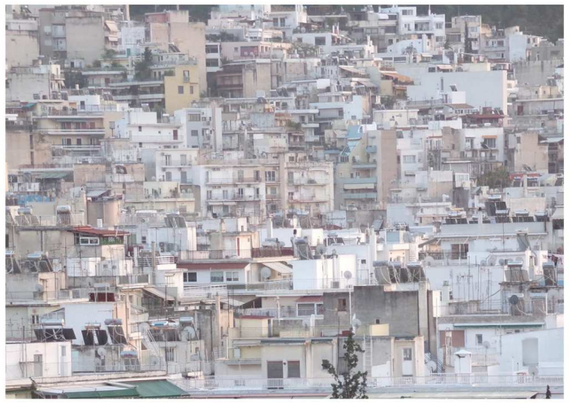
Columbia University GSAPP, ADV 6 Studio
2025. 01 ~ 2025.05
Type : Architecture Design
Instructor : Prof. Lydia Kallipoliti
Individual Academic Project

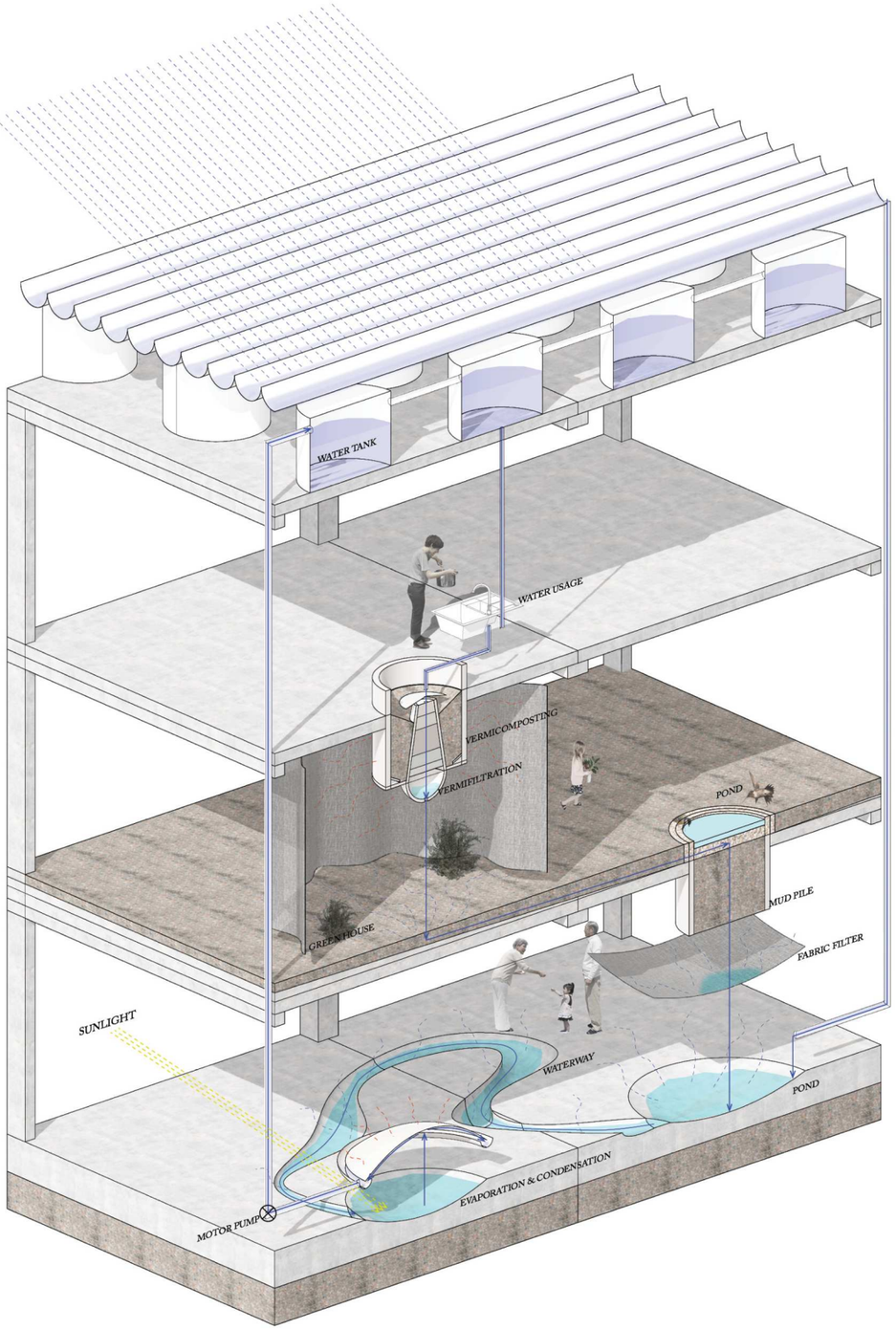
VERMI-SCAPE is a living architectural system that integrates worms, water, and microbial ecosystems into the everyday environment of Athens' polykatoikias. By embedding vermicomposting and vermifiltration processes within domestic and communal spaces, the project reimagines waste and water cycles as regenerative agents for both ecological repair and thermal comfort in dense urban housing.

This layered system uses gravity to vertically organize soil, plants, and filtration processes. Gray water is collected, filtered through fabric and earthworm biofilms, then redistributed for irrigation and cooling. Mud piles, ponds, and condensation membranes together support a feedback loop between human activity and natural decomposition, forming a responsive infrastructure for circular resource use.

Beyond sustainability, VERMI-SCAPE redefines how architecture can host symbiotic relationships. Spaces for birds, insects, and microbial life are interwoven with human dwellings, turning balconies, rooftops, and courtyards into active biotopes. The project proposes a future where climate adaptation, thermal performance, and environmental care converge in the material and spatial fabric of urban housing.

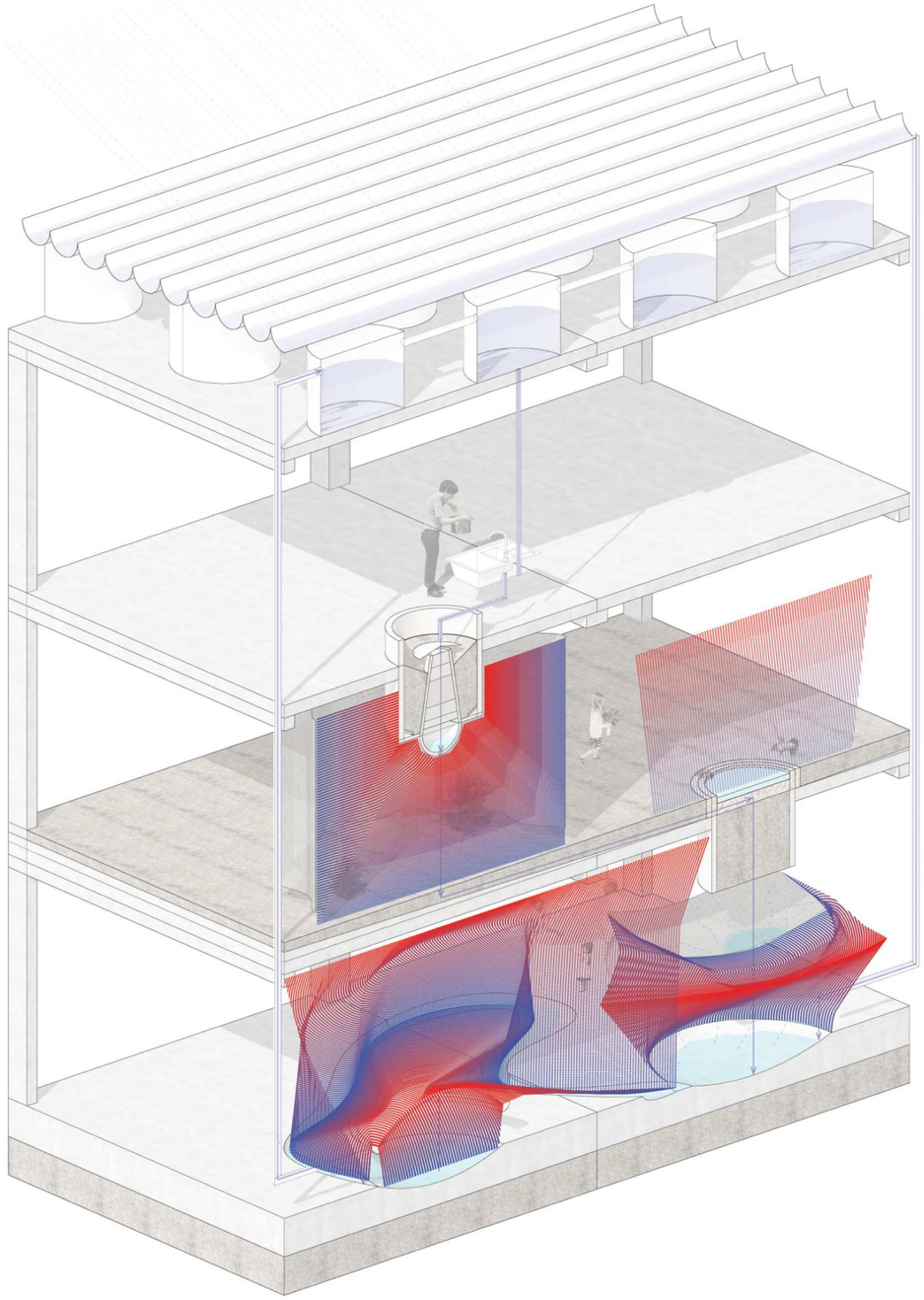
Main Image: 1 to 1 Paper Casting Study Model, Top: Before and After Building Facade, Bottom Left: Site Plan





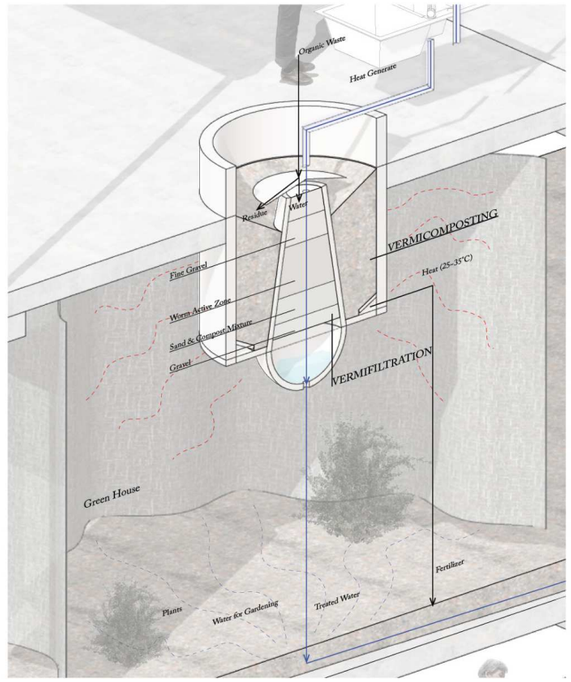
Ecological Living through Vertical Integration

VERMI-SCAPE embeds composting, filtration, and cooling systems into housing infrastructure, transforming everyday waste into ecological resources. This layered environment fosters sustainable living while inviting residents to participate in visible cycles of soil, water, and plant regeneration.

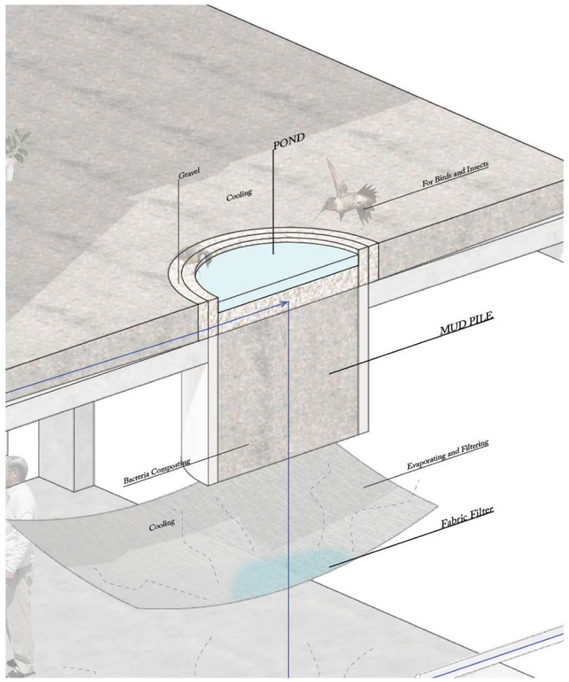


Thermal Flow and Water Circulation

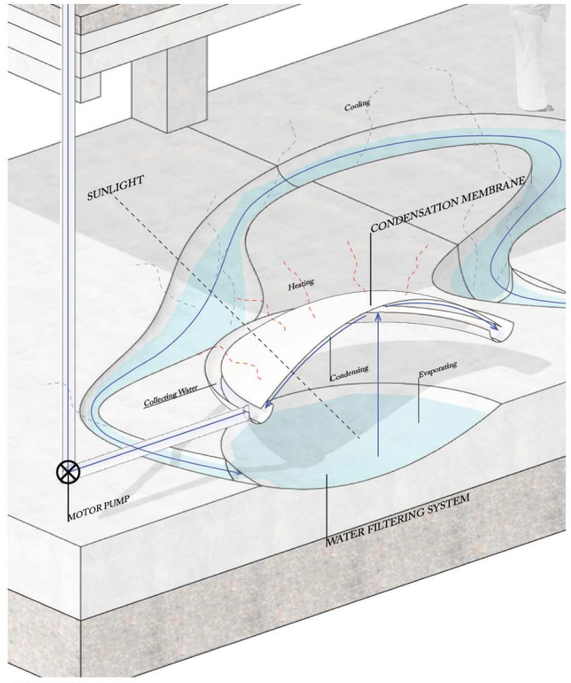
Water evaporates, filters, and circulates through layered soil and fabric membranes. These passive systems cool living spaces, reduce heat gain, and produce clean water, turning architecture into a self-regulating organism powered by environmental processes.



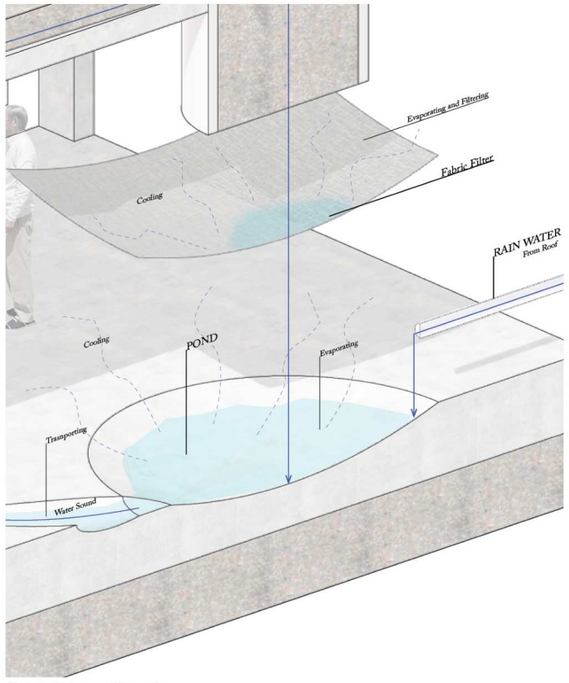
Vermicomposting + Vermifiltration *Worm, Biofilm, Tomato, Basil*



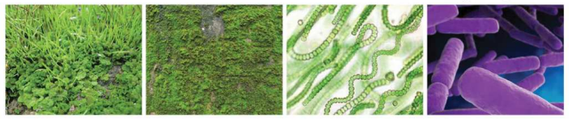
Pond with Mud Pile *Eurasian Magpie, Armadillidium, Purple Bacteria, Lacticaseibacillus rhamnosus*

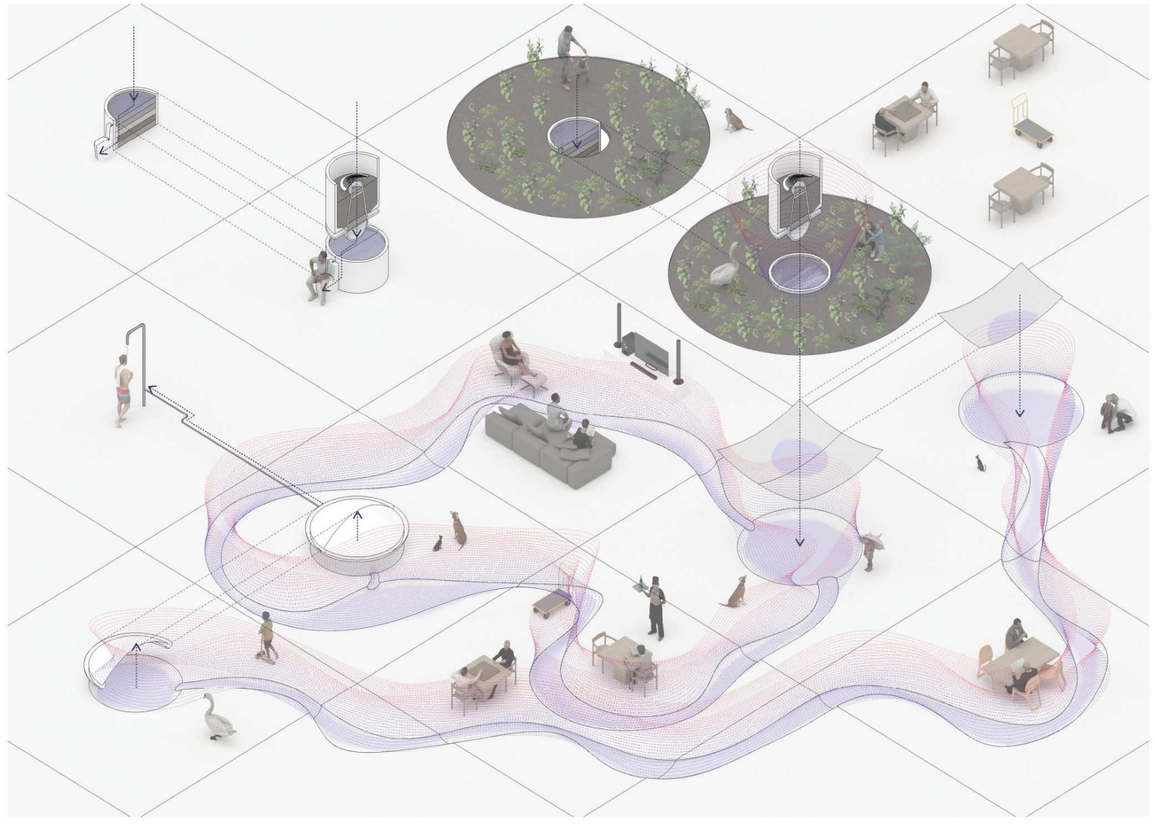


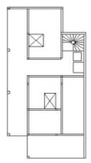
Solar Still *Hornwort, Moss, Algae, Purple Bacteria*



Fabric Filter + Water Stream *Hornwort, Moss, Algae, Purple Bacteria*







A 90m² D 95m² G 62m² J 104m²
B 95m² E 95m² H 95m²
C 90m² F 104m² I 112m²

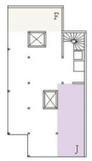
PUBLIC

1F

2F

3F

4F



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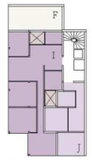

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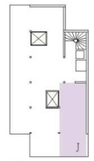

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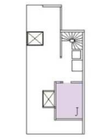

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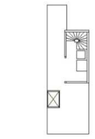
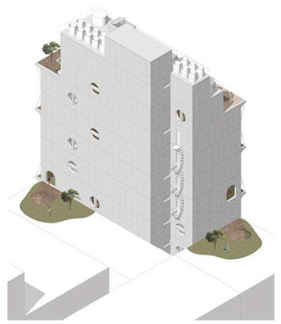
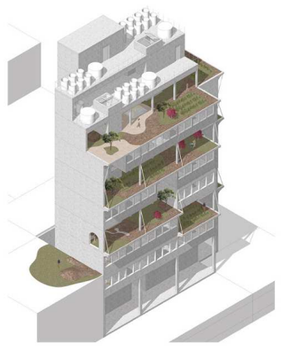


Roof

Vertical Unit F



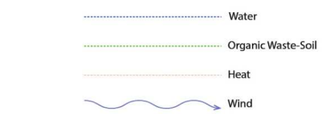
Axonometric_NE

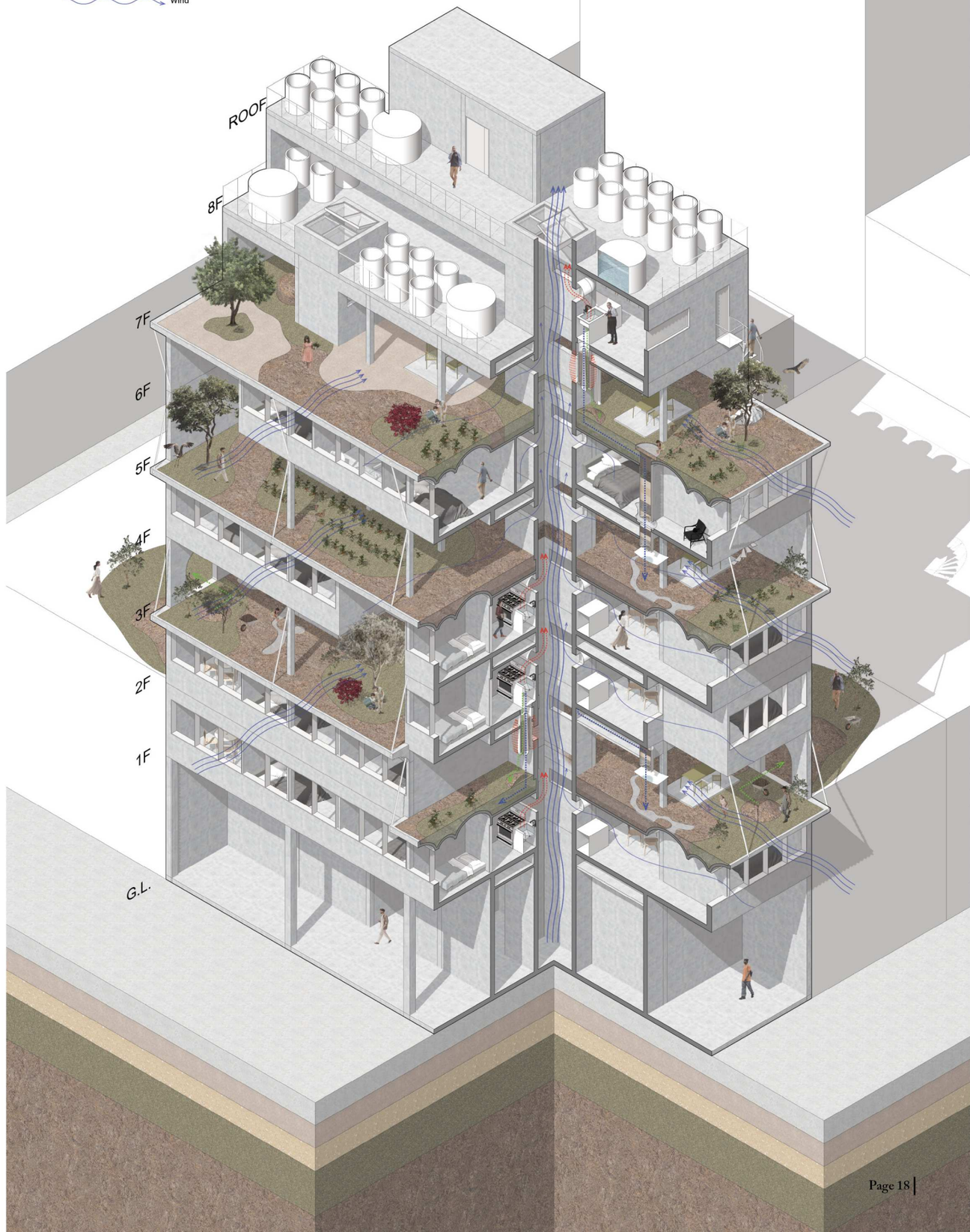


Axonometric_NW

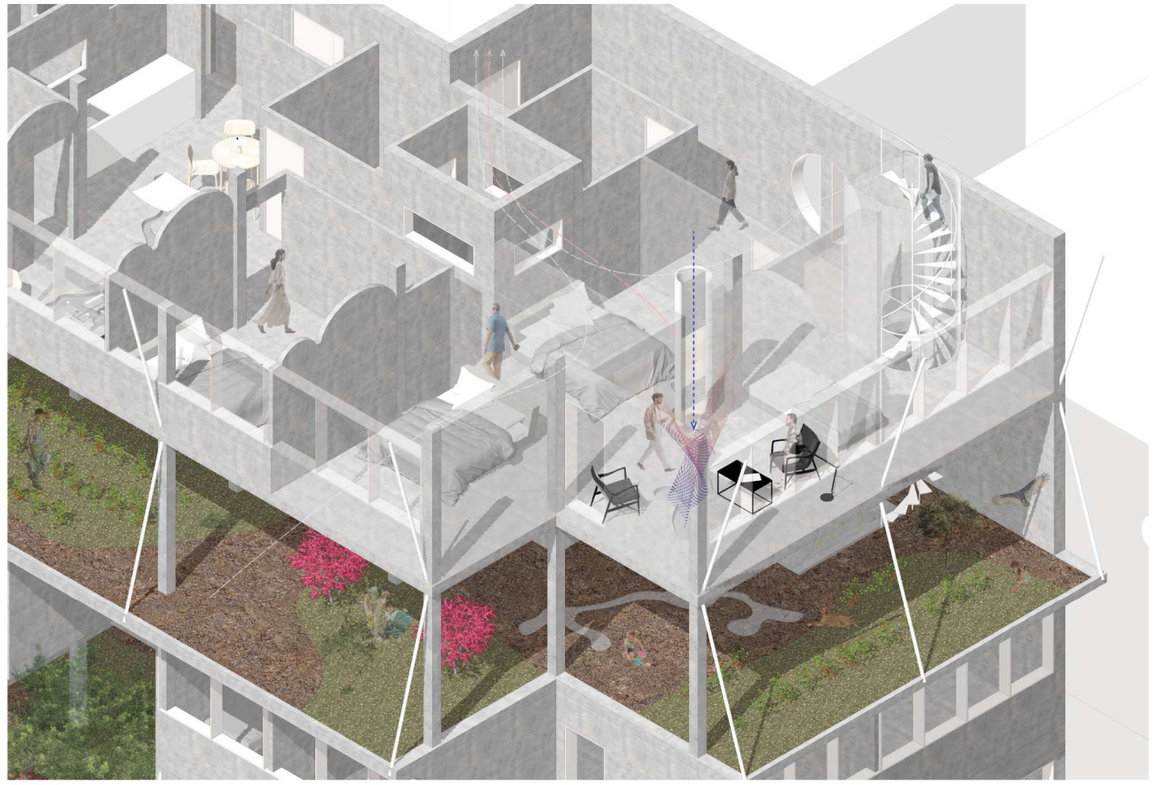
Axonometric_SE

Axonometric_SW





'VERMI-SCAPE' _ Layer of Soil with Vermi-composting and filtration



'VERMI-SCAPE' _ Layer of Living with Water Stream

'VERMI-SCAPE' _ Layer of Living with Water Stream

'VERMI-SCAPE' _ Layer of Soil with Mud pile and Water Stream

Excess Stone on Wall Street

Reimagining The Over-Engineered Stone Building on Wall Street

05

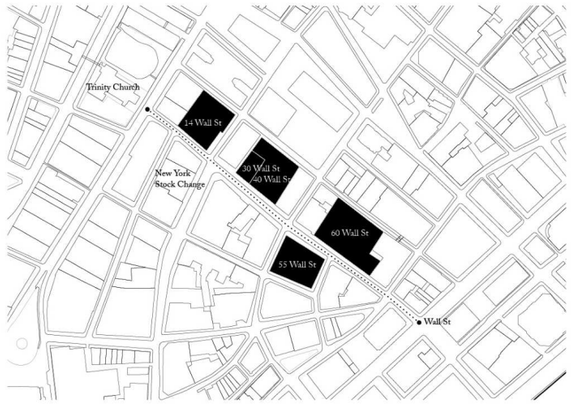
Columbia University GSAPP, Core 1 Studio
2022. 09 ~ 2022.12
Type : Architecture Design
Instructor : Prof. Lindsey Wikström
Individual Academic Project

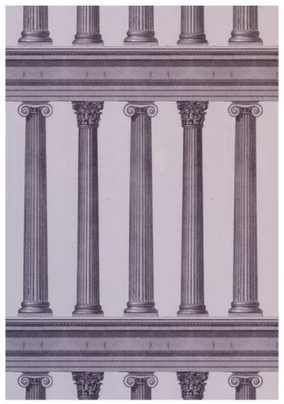
Wall Street, once a symbol of financial power, is defined by neoclassical stone buildings that conveyed stability and grandeur. This project critiques the material excess of stone and explores the shifting dynamic between finance and the public. With institutions relocating and online trading reducing Wall Street's influence, the project proposes a sustainable strategy to reuse its abundant stone resources.

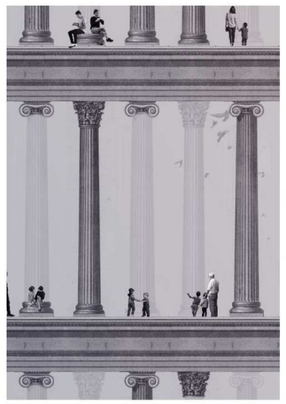
By reclaiming excess stone from these facades, the project reimagines Wall Street as an urban quarry—transforming surplus material into assets for public space. This circular strategy reduces the impact of stone transportation and weaves reused material into new streetscapes. Through dismantling, storing, and reconfiguring stone, the proposal fosters openness, accessibility, and engagement with the urban context.

This approach not only reduces material waste but also renews Wall Street's architectural identity—promoting sustainability and redefining its role within the evolving city. By integrating salvaged stone into the urban fabric, the project bridges past and present, restoring relevance to historic materials while creating opportunities for inclusive and adaptive public space.

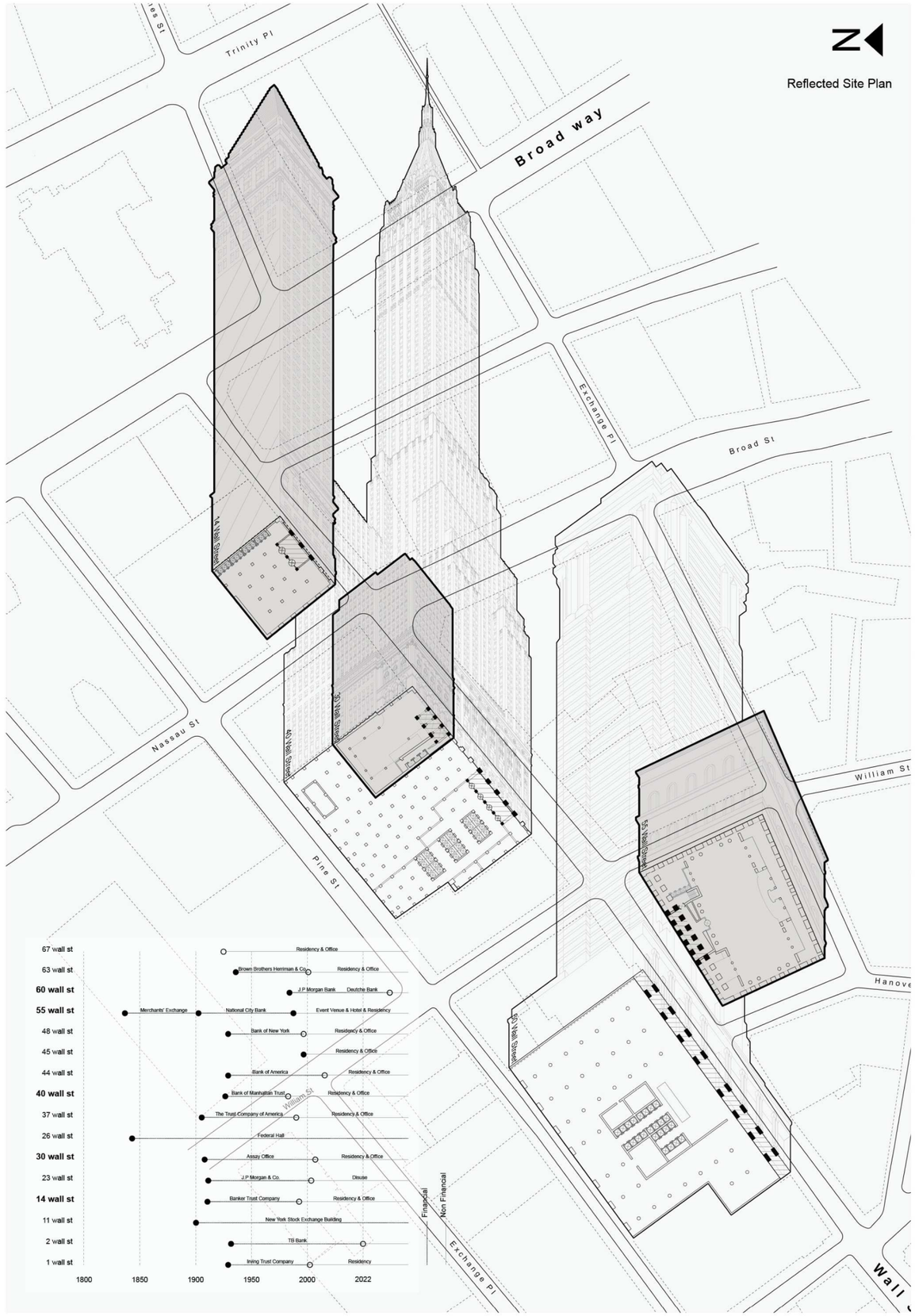
Main Image: 1 to 1 Paper Casting Study Model, Top: Before and After Building Facade, Bottom Left: Site Plan

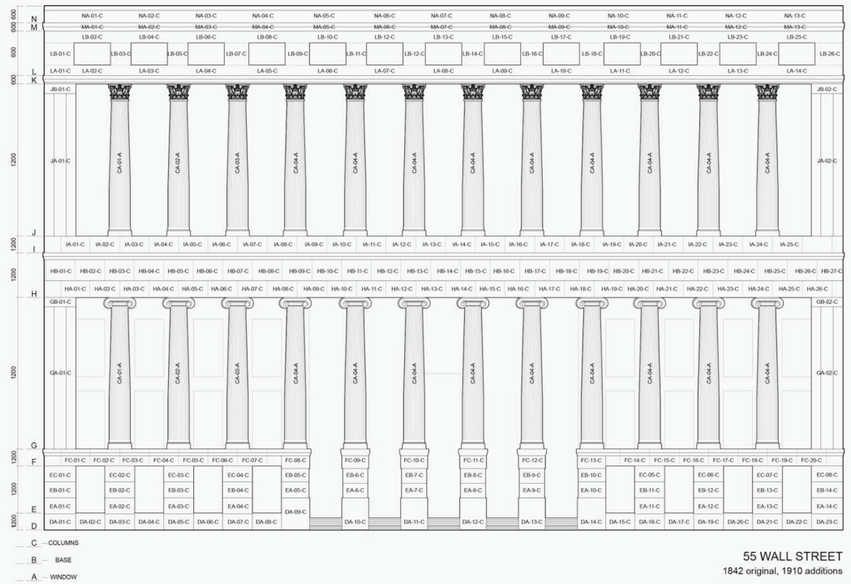




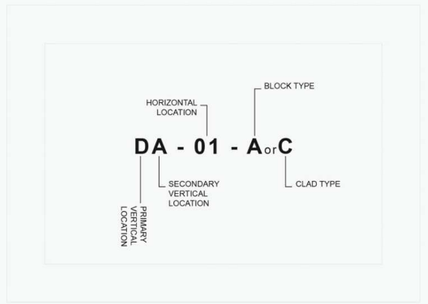


Reflected Site Plan

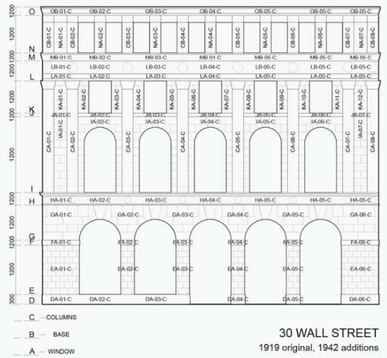




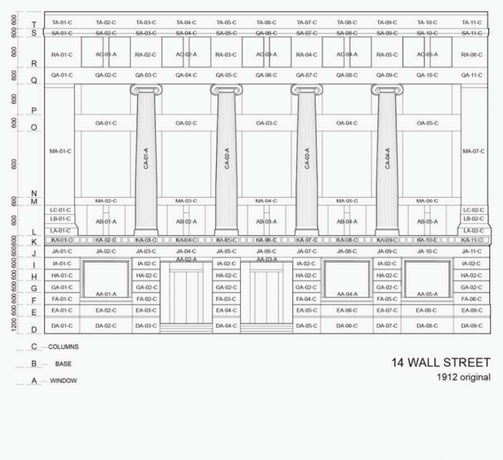
55 WALL STREET
1842 original, 1910 additions



LABELING CONVENTION



30 WALL STREET
1919 original, 1942 additions

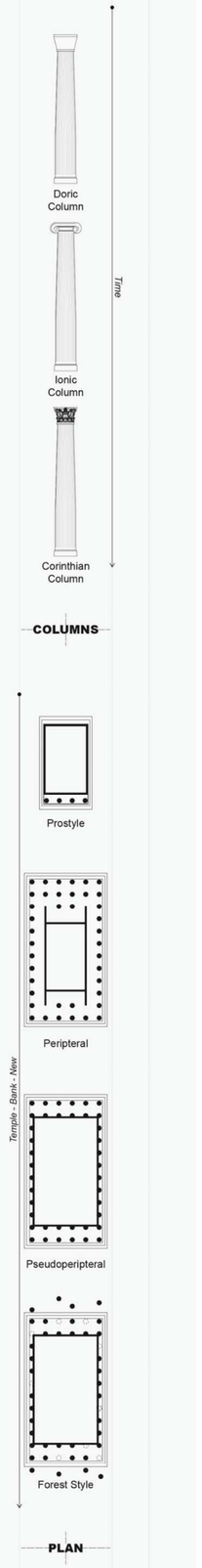


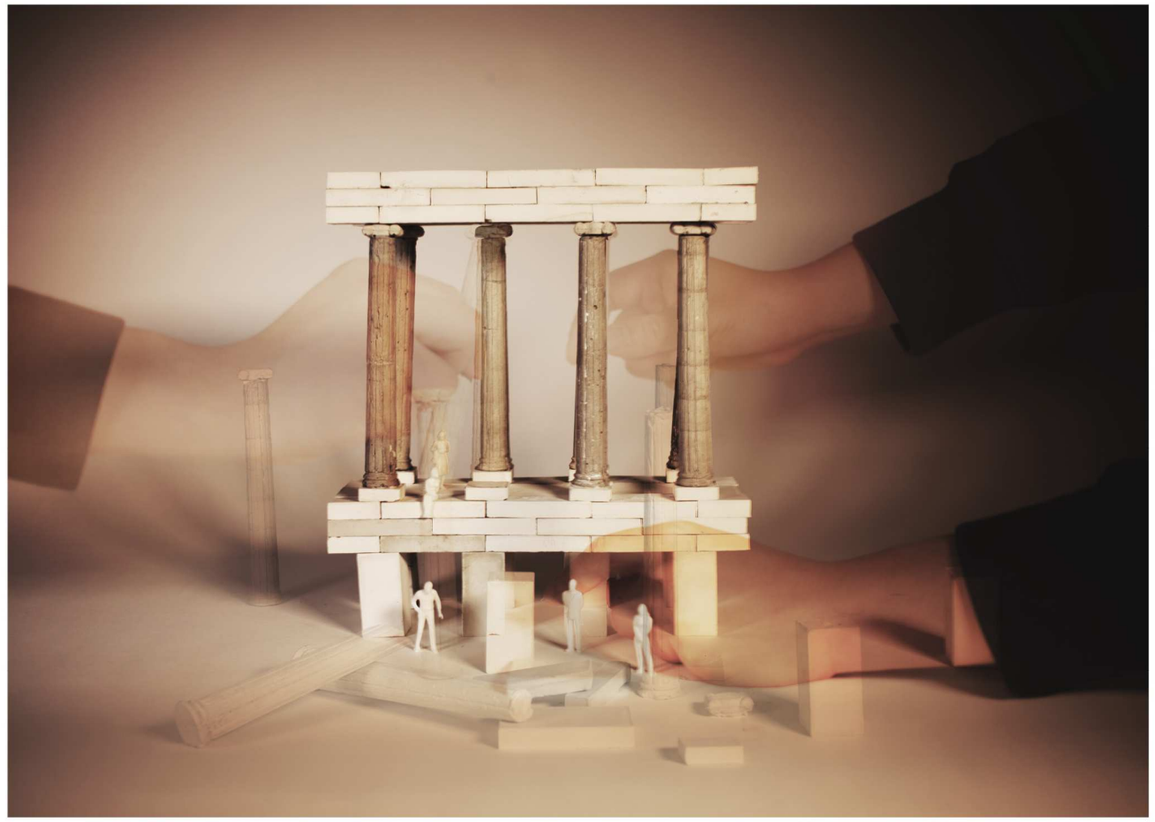
14 WALL STREET
1912 original

ELEVATION

	55 WALL ST.	30 WALL ST.	14 WALL ST.
COLUMNS	24	21	4
CLADED	208	87	122
BLOCK	24	0	14
TOTAL	256	108	140

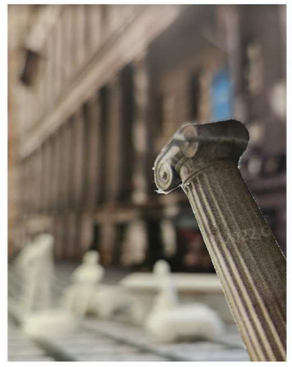
STONE INDEX



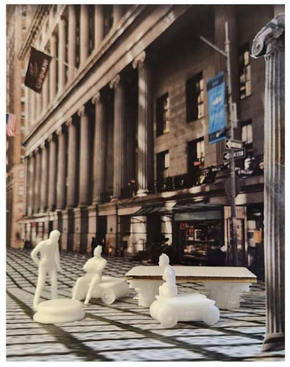


Structural Analysis to Replace the Excess Columns

Stone buildings on Wall street can be a Sequence quarry, Urban Quarry. There is no need to carry heavy stones long distances. From a material and environmental perspective, this strategy also has sustainability and increases circularity. By removing stone from the building, the building becomes more open to the public. This stone is redistributed on the street. Additionally, the replaced excess stone creates a new streetscape, enhancing the overall environment for public enjoyment.



Extracting Columns



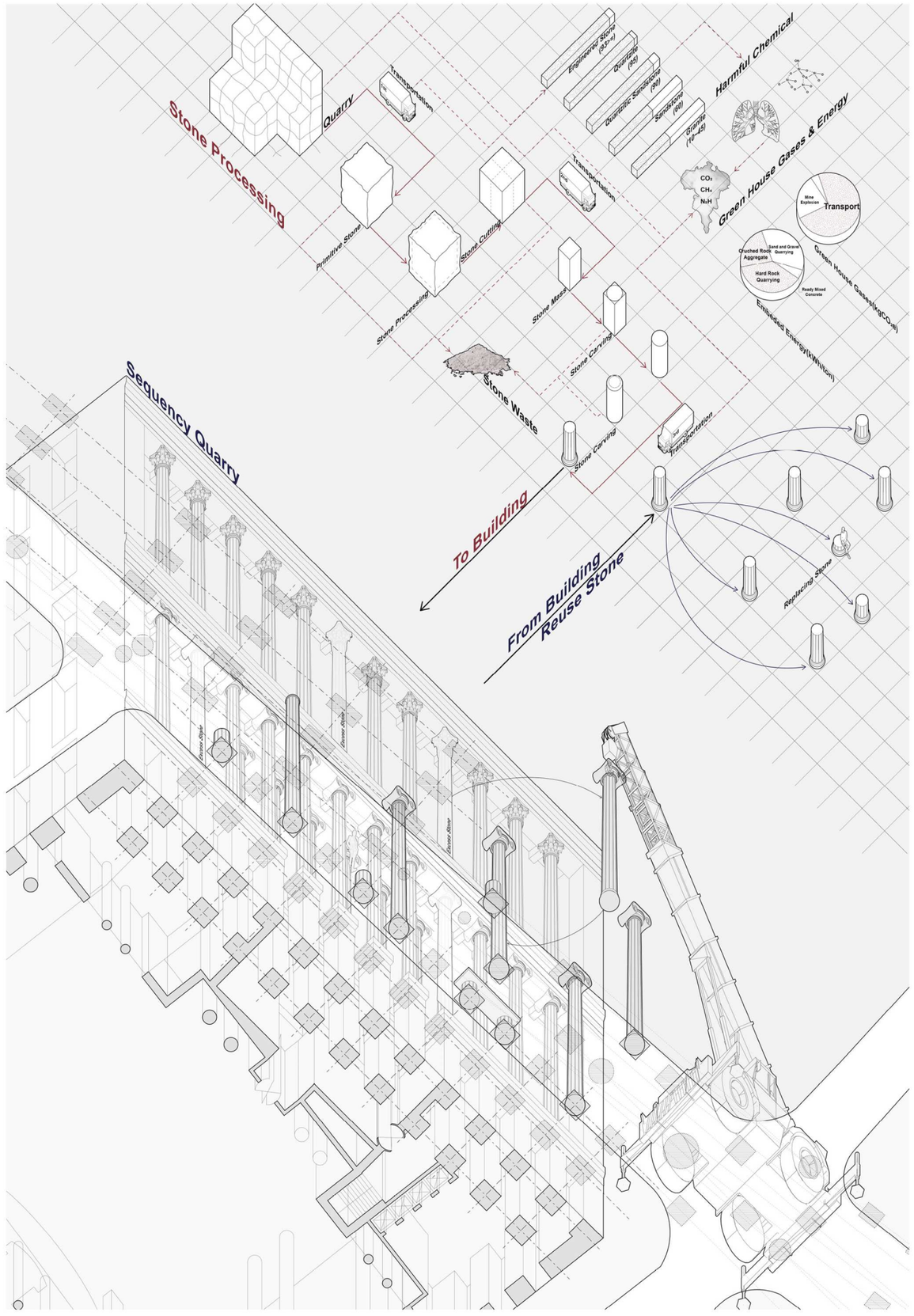
Columns on the Street

Zoom In

Redesign Street

Streetscape with 55 Wall Street Columns

Replacing Excess Stones move upside down and occupy wall street, and making new streetscape by putting street furniture on this narrow street such as chairs and tables. On this streetscape, financial groups and social groups make strong relationships on the street by sharing their inner space of the building and expanding their area to the street.



Scarred City_Essex Fwy

Scars on Urban Fabric, Stitching the Scars

06

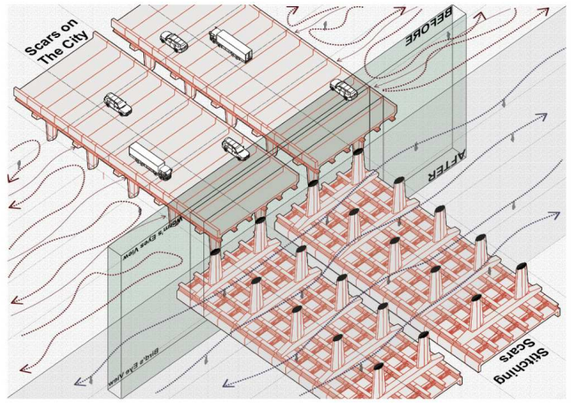
Columbia University GSAPPP, Core 2 Studio
2023. 01 ~ 2023.05
Type : Architecture Design
Instructor : Prof. Joshua Uhl
Individual Academic Project

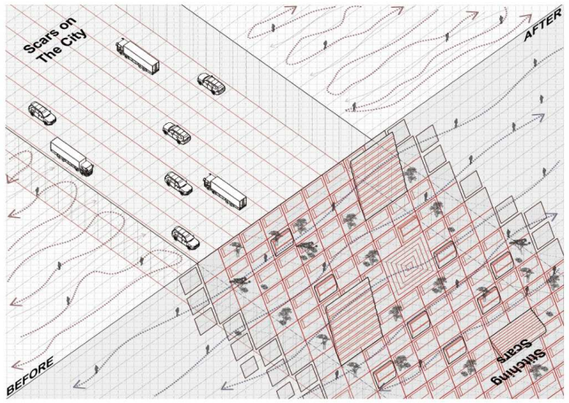
In the 20th century, highway construction reshaped American cities. While improving mobility, projects like the 1956 Interstate Highway Act devastated communities. Newark's Route 280 carved through neighborhoods, displacing residents, shuttering businesses, and eroding social and political power. The city's urban fabric was left fractured by infrastructure prioritizing cars over people.

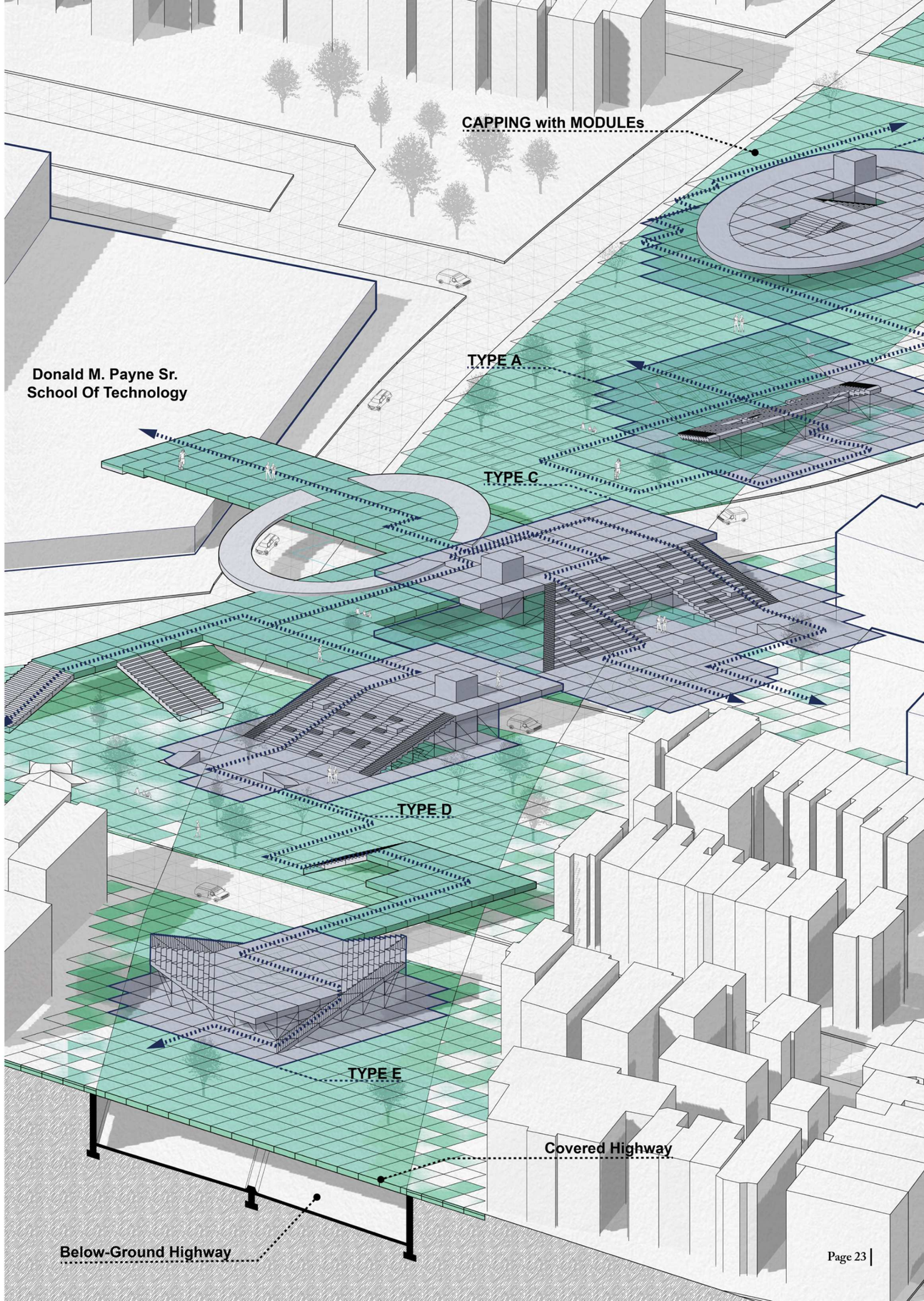
This project proposes healing Newark's "urban scars" by capping the sunken highway with a modular 4m x 4m diamond-grid system. The cap becomes a new civic landscape, offering gardens, sports areas, public gathering spaces, and classrooms. These programs reconnect communities and transform a divisive void into an accessible, community-driven platform.

The modular system integrates air filtration, sound absorption, and spatial programming to enhance environmental and social conditions. Beyond surface-level repair, the proposal envisions long-term urban regeneration by layering ecology, education, and recreation. It reclaims lost space and reimagines highways not as barriers, but as opportunities for inclusive urban renewal.

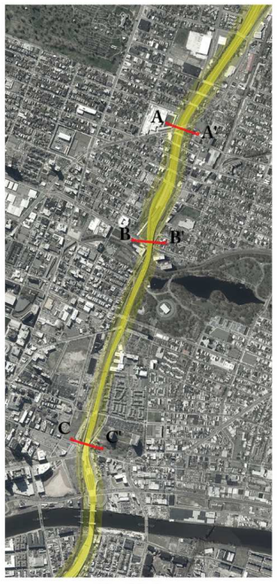
Main Image: 1 to 1 Paper Casting Study Model, Top: Before and After Building Facade, Bottom Left: Site Plan



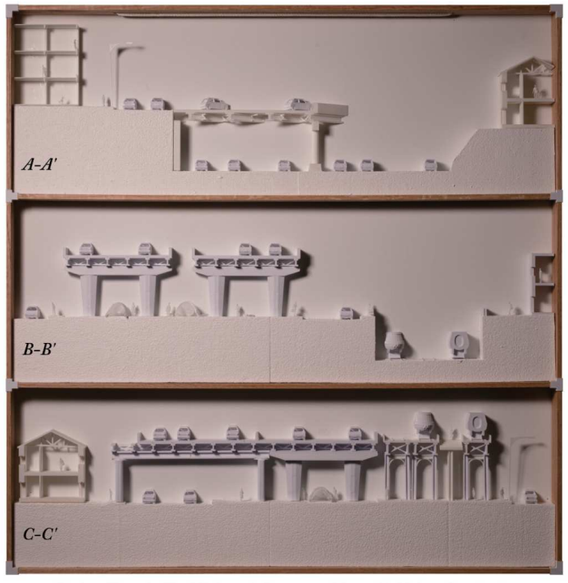




Before Highway



After Highway



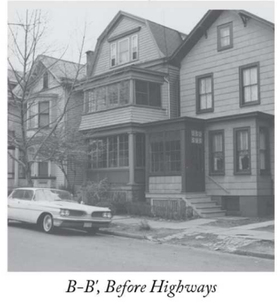
Broken Threads: The Highway's Impact on Newark's Urban Continuity

Fractured Threads: When a Highway Ruptured Newark's Urban Fabric

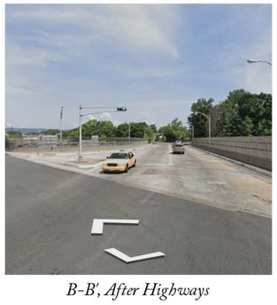
The highways, designed to connect cities, ironically fracture the urban context, creating physical barriers that disconnect neighborhoods in Newark. To clear the land for the path of highways, at least 5,000 Newark residents were displaced, hundreds of small businesses were closed, and hundreds more homes were demolished.

A-A', Before Highways

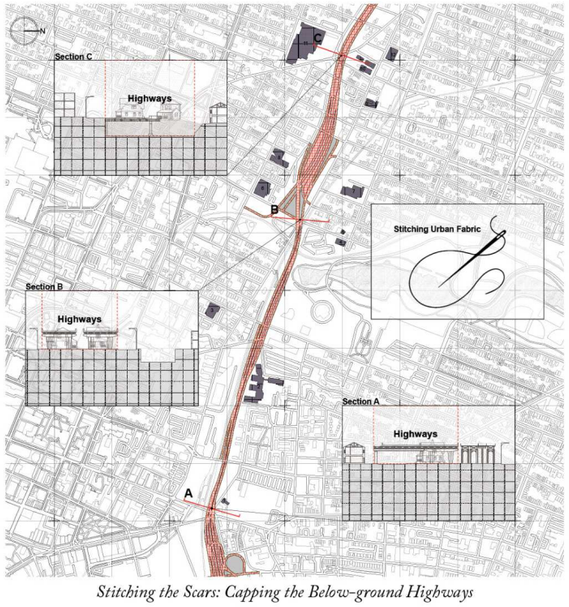
A-A', After Highways



B-B', Before Highways



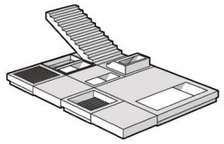
B-B', After Highways



Stitching the Scars: Capping the Below-ground Highways

Stiching the Scars Caused by Highways

Newark ruptured through interstates highways: Route 280 was carved through the Central and North Wards c.1960. To clear the land for the path of highways, at least 5,000 Newark residents were displaced, hundreds of small businesses were closed, and hundreds more homes were demolished. Highways destroyed more than homes along their paths.



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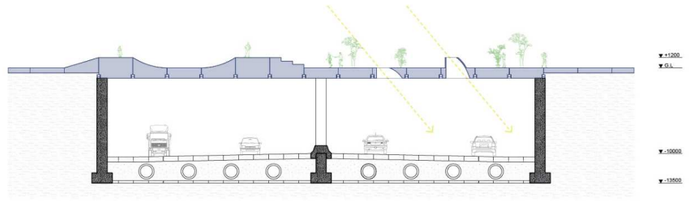

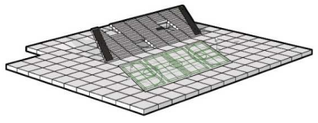

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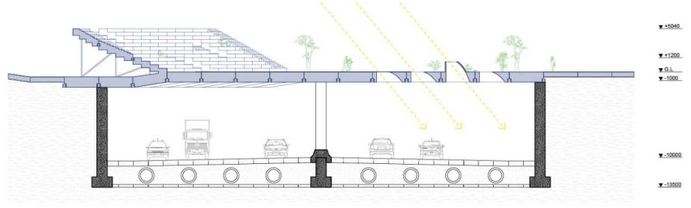
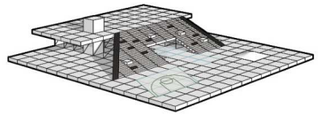
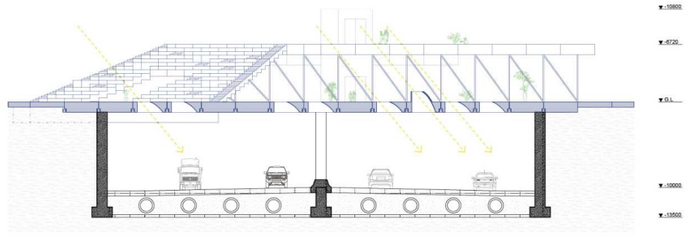
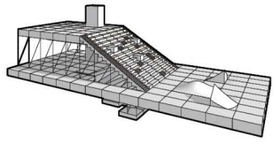




TYPE C





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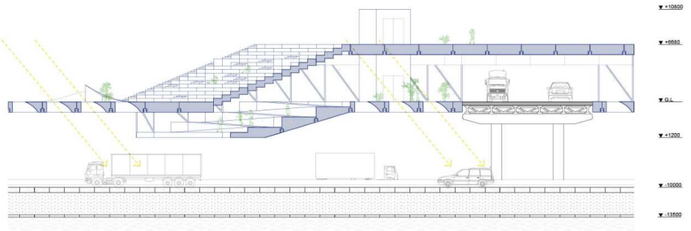

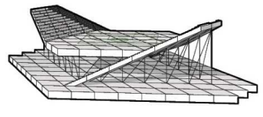

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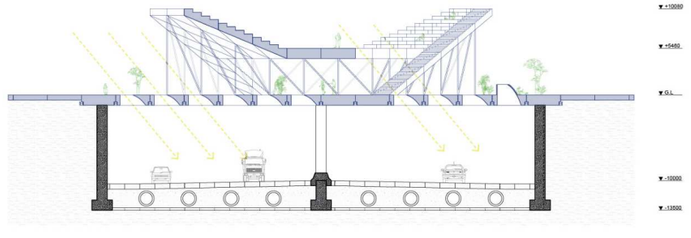
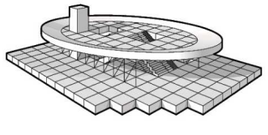
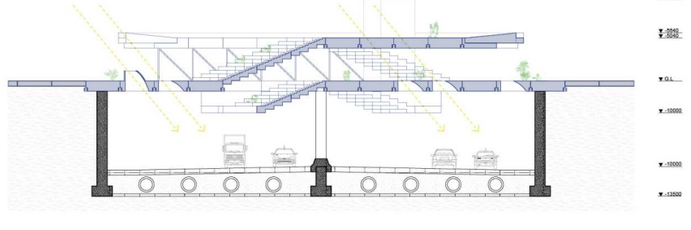




TYPE F



Double Balloon Concrete Surface

Tensile / Compression Surface

07

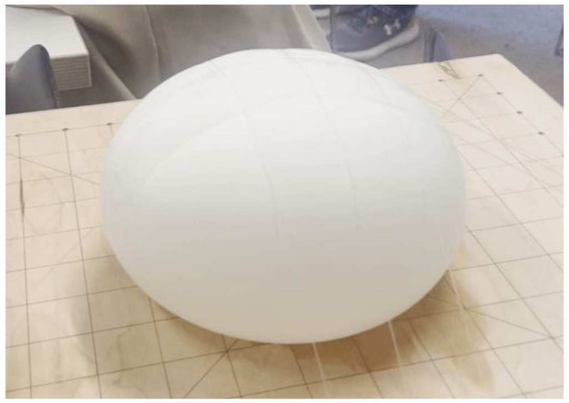
Columbia University GSAPP, Tension/Compression Surfaces
2024. 09 ~ 2024.12
Type : Architecture Design
Instructor : Prof. Lindsey Wikström
Team Academic Project with DJ Fan

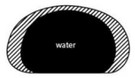
This project explores tension-based form finding through balloon-based casting. Starting with experiments in corn flour and single balloon molds, we gradually developed methods to capture gravitational force and material deformation. These tests laid the groundwork for our final form, a double balloon system suspended to harness tension from within and compression from concrete weight.

The double balloon technique involved filling the inner membrane with concrete while the outer balloon constrained its expansion. This process generated an anticlastic surface through equilibrium between hydrostatic pressure and tensile resistance. Inspired by Frei Otto's surface models, the resulting shape exemplifies efficiency, structural integrity, and elegance emerging from material behavior.

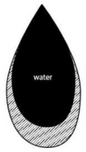
Upon demoulding, the surface revealed a hybrid of softness and strength, with fluid geometry solidified into compression. Our method bridges architectural theory and hands-on construction, resonating with principles from Isler and Candela. This project redefines shell aesthetics by embedding structure and form within the physical logics of tension and gravity-driven design.

Main Image: Double Balloon Concrete Surface, Bottom Left: Making Diagram, Bottom Left: Tasting Balloon

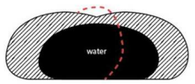




On the Ground without String



Hanging without String



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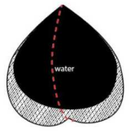

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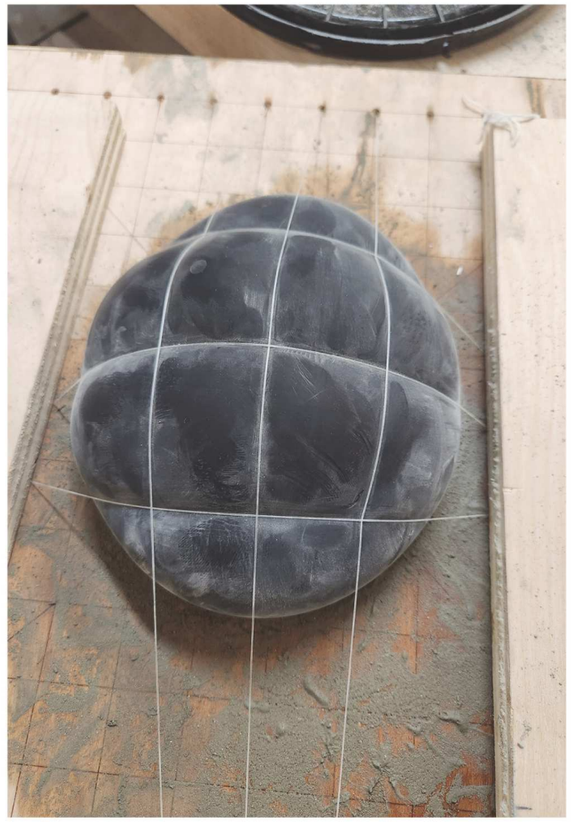


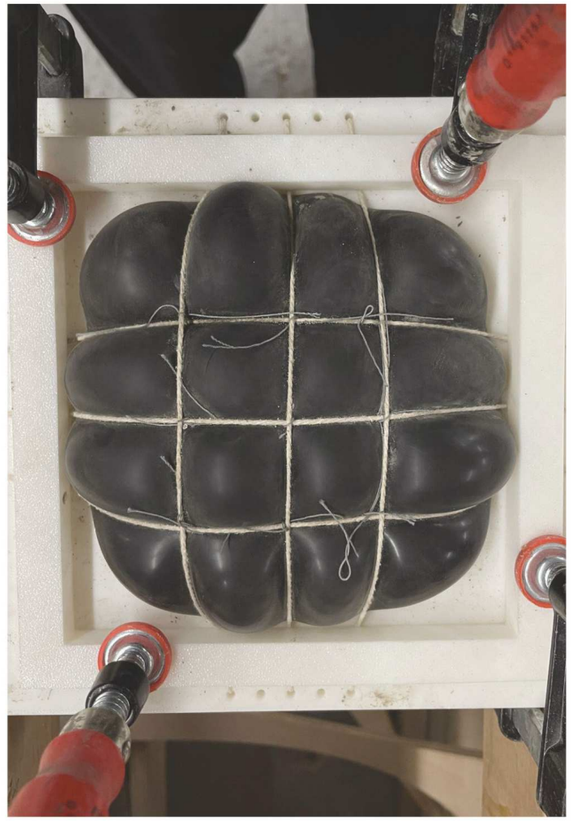
On the Ground without String

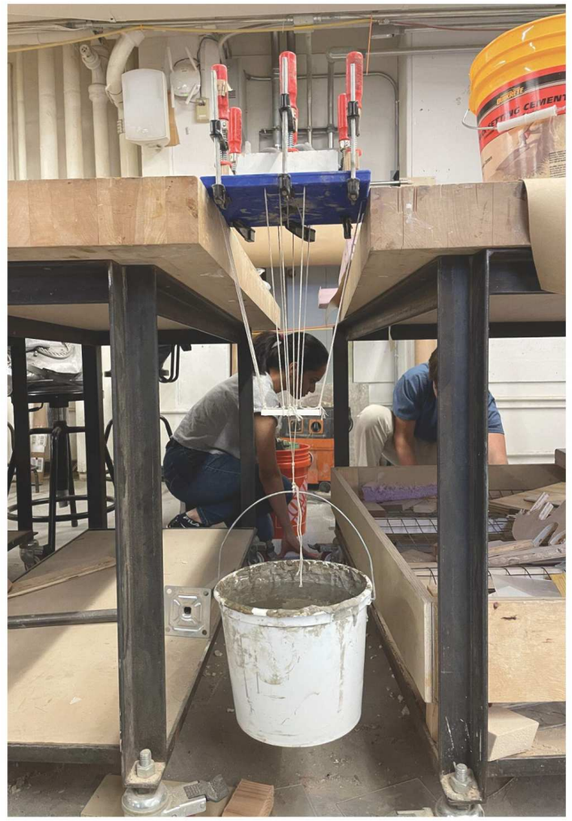
Hanging without String

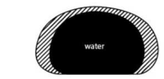
On the Ground with String

Hanging with String

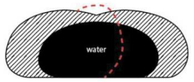
Top Left & Bottom Left & Bottom Right: Single Balloon Concrete Mold, Right: Single Balloon Concret







On the Ground without String

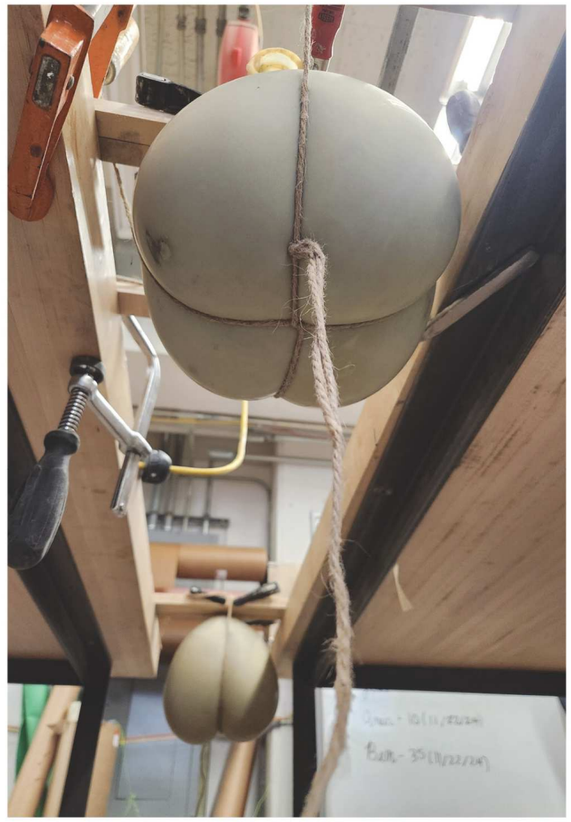


On the Ground with String

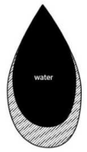
Hanging without String

Hanging with String

Top Left & Bottom Left & Bottom Right: Double Balloon Concrete Surface on The Ground Making Process, Right: Double Balloon Concrete Surface

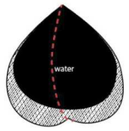


On the Ground without String



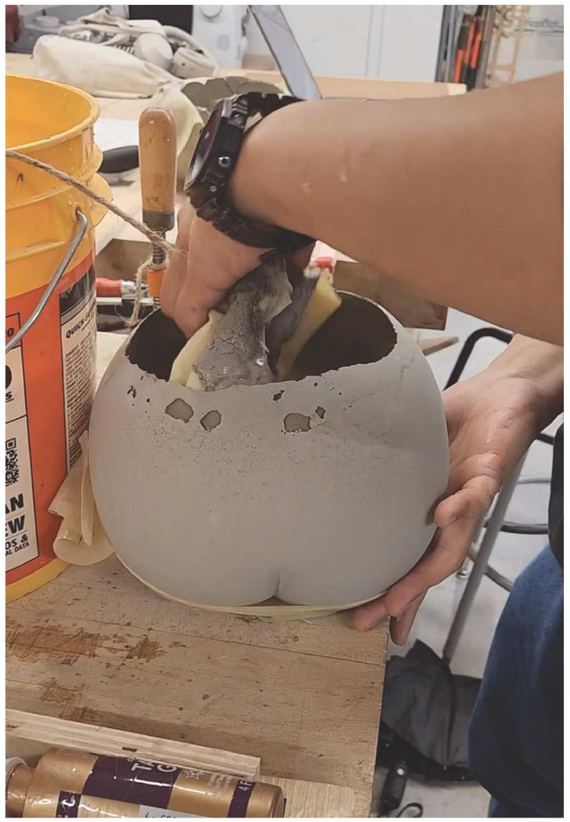
Hanging without String

On the Ground with String



Hanging with String

Top Left & Bottom Left & Bottom Right: Hanging Double Balloon Concrete Surface Making Process, Right: Double Balloon Concrete Surface

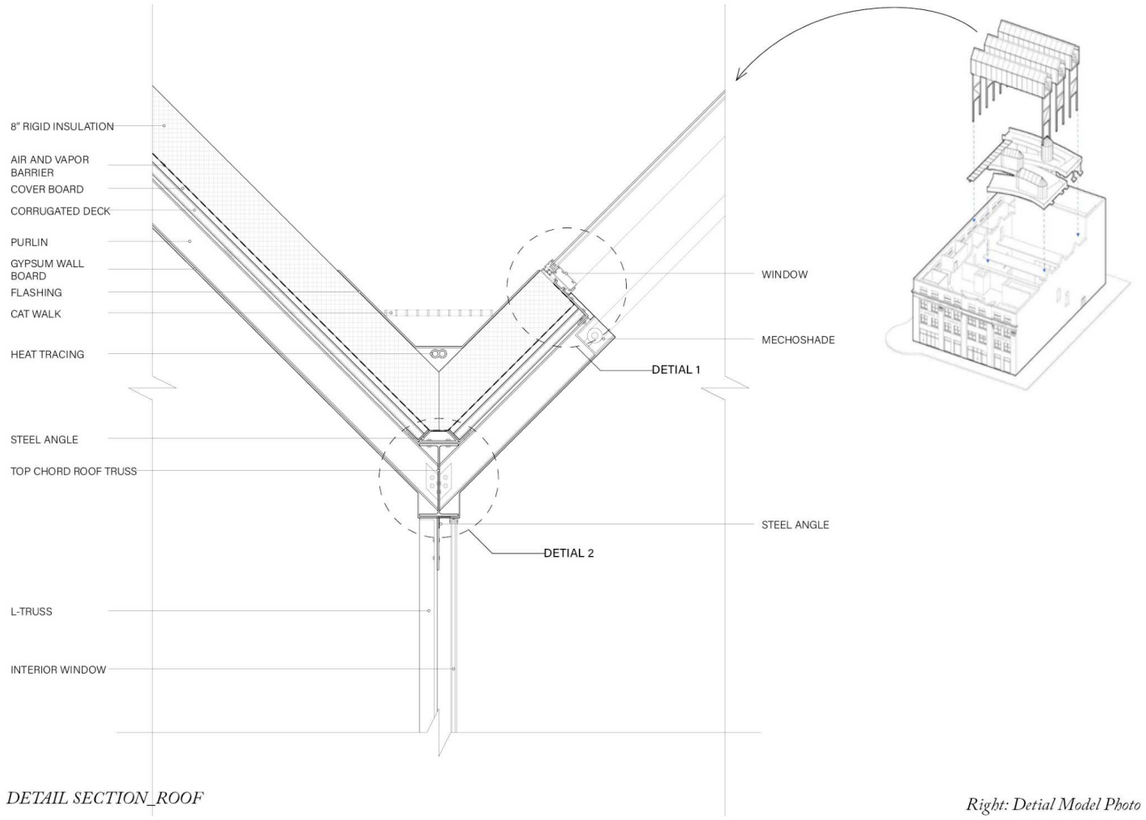


Great Falls Green Center

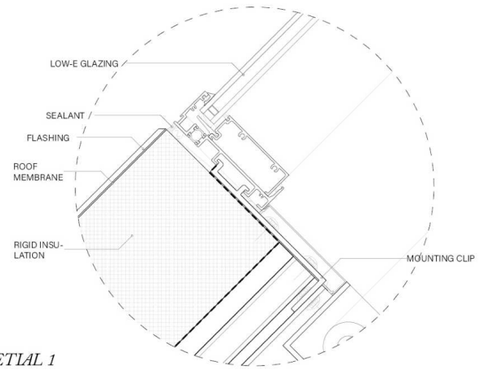
Enclosure_Sawtooth Roof System Detail

08

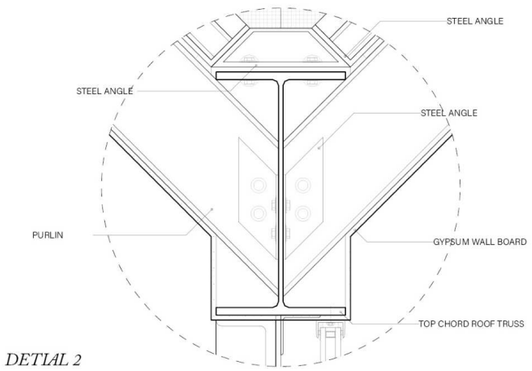
Columbia University GSAPPP, TECH 3 & 4
2023. 09 ~ 2023.12
Type : Architecture Technology
Instructor : Prof. Berardo Matalucci
Team Project with Jerry Schmit, Dj Fan, Seonghak Lee, Seonghyun Leem



DETAIL SECTION_ROOF



DETIAL 1



DETIAL 2

Right: Detial Model Photo