

**Columbia GSAPP
M.S. Advanced Architectural Design
Graduation Portfolio 2025-2026
Hee Leong Lim**

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Rethinking Ground

Urban Park Design & Adaptive Reuse

Course	ADVANCED STUDIO VI, SPRING 2026
Studio	Layered Urbanism
Location	George Washington Bridge Bus Station
Instructor	Galia Solomonoff
Collaborator	Hobin Lee, Seungwon Lee

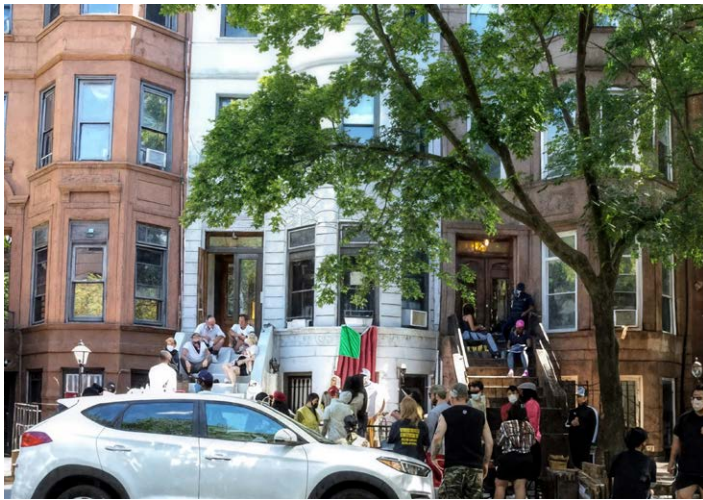


Extraction & Addition

Rethink Ground reconnects fragmented urban infrastructure and housing by expanding the “ground” both vertically and horizontally. Historically, the pedestrian environment in Washington Heights has been severed by the Cross-Bronx Expressway and four isolated residential towers. Our project focuses on the social agency of the New York ‘Stoop’ and seeks to recover the inherent value of the ground that has been lost in vertical high-rise living.

The strategy of Extraction selectively carves out units within the towers to open up the mass. These resulting voids meet the park, generating a new internal flow. In response, Addition introduces new residential volumes within and around these gaps. The existing towers and the newly added structures open toward one another, creating a continuous living environment directly linked to the park.

While Extraction opens the space, Addition occupies it. The expressway and towers—once symbols of urban disconnection—are integrated with the park and transformed into a new civic centerpiece. By reconnecting the severed planes of the earth and the building, the Ground is redefined as a single, continuous, and expansive social landscape.



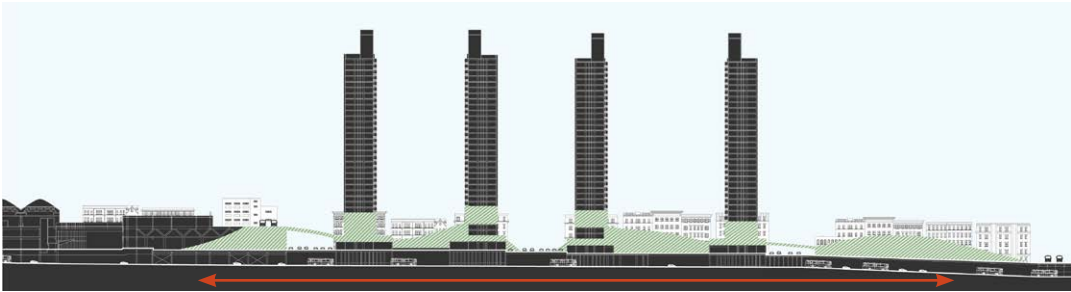
George Washington Bridge / 1932



Google Earth / 2025



Existing Site Section



Horizontal Ground, Park



Vertical Ground with the Existing Apartment Core



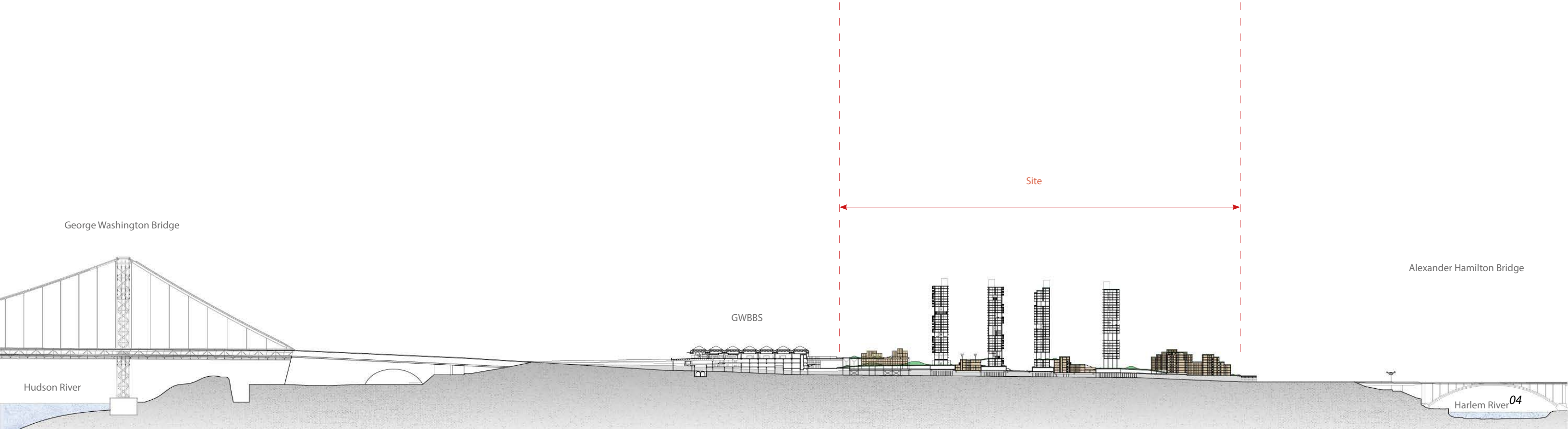
Subtraction, Addition



Subtraction, Addition



Ventilation Duct

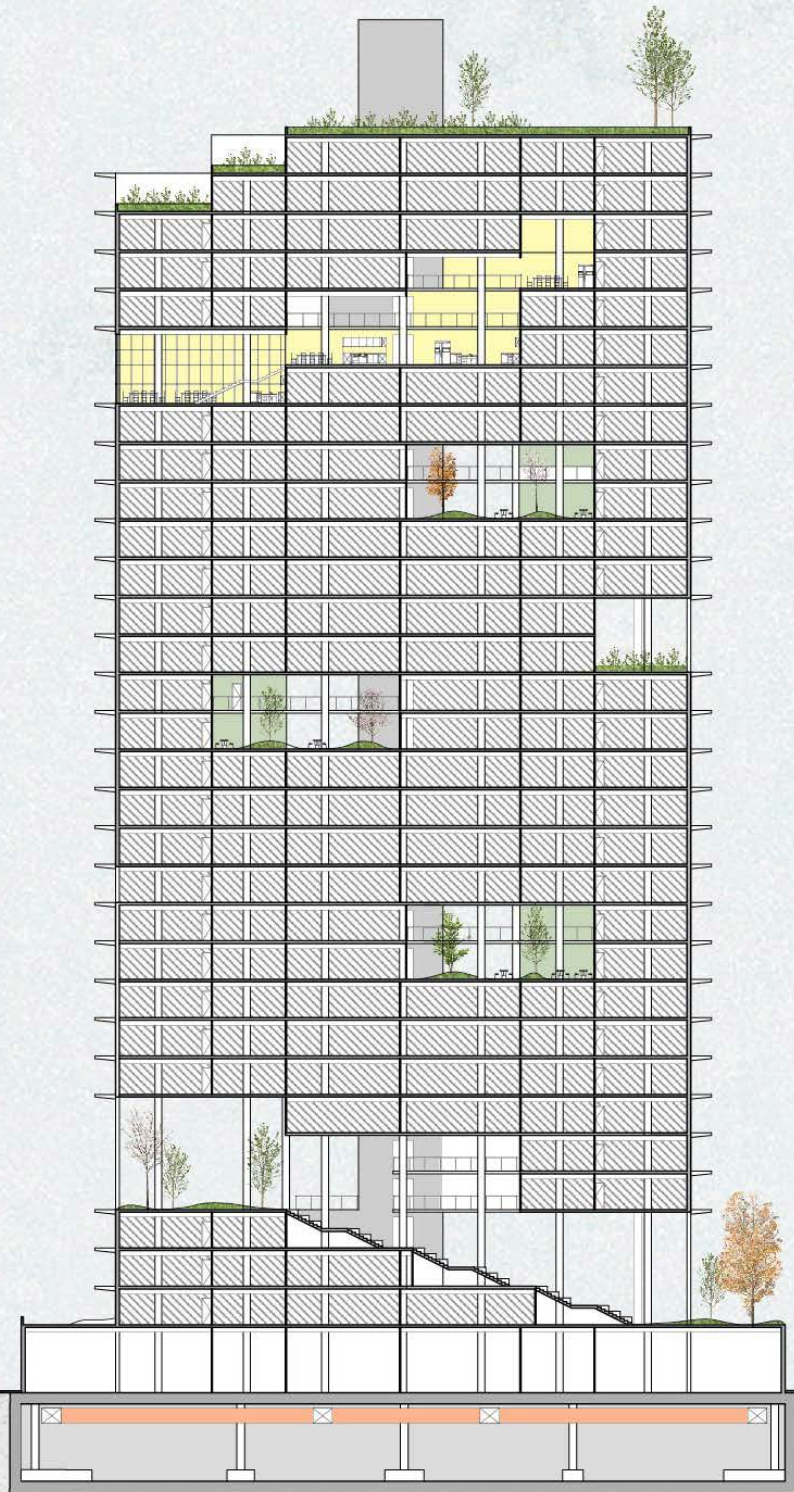
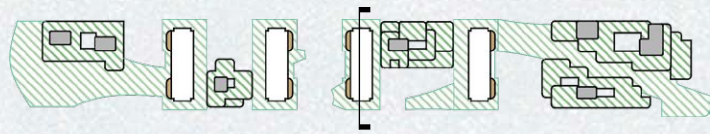




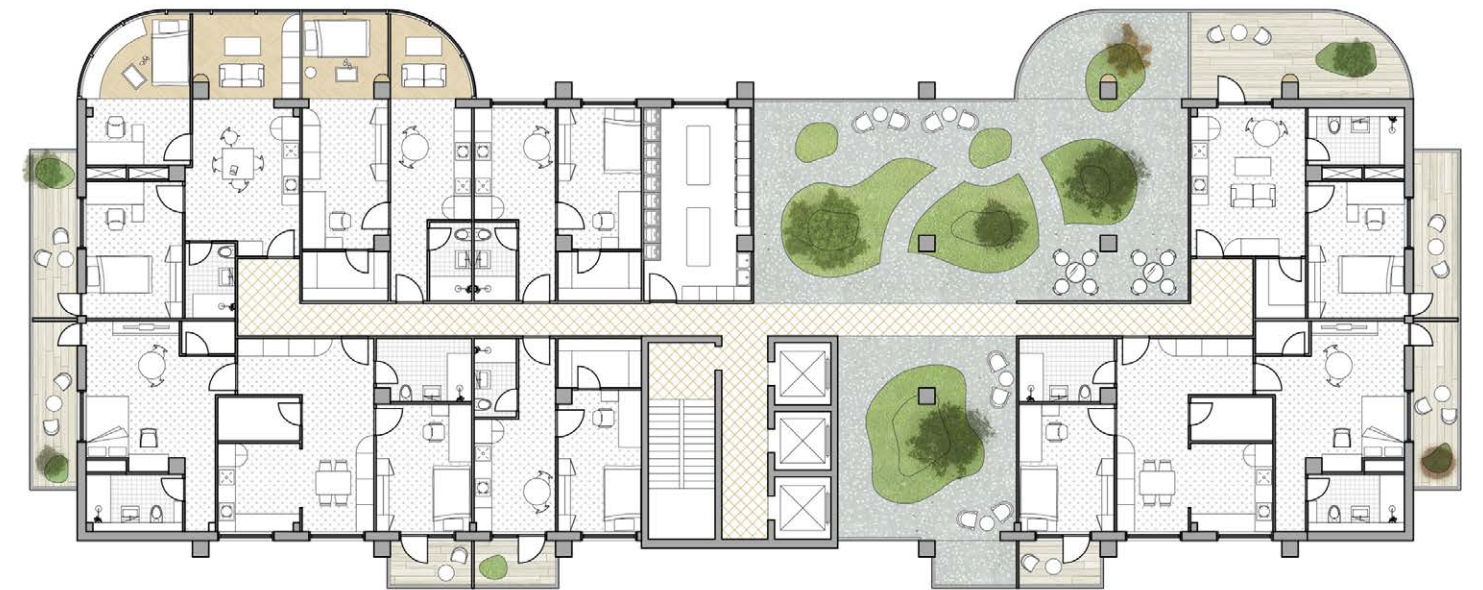
The park acts as the "connector" for the entire site. Our primary architectural approach is centered on the preservation and strategic reuse of the existing structures. By maintaining the core structural integrity while selectively removing non-structural walls, we've blurred the boundaries between interior and exterior, effectively transforming enclosed spaces into open public voids .



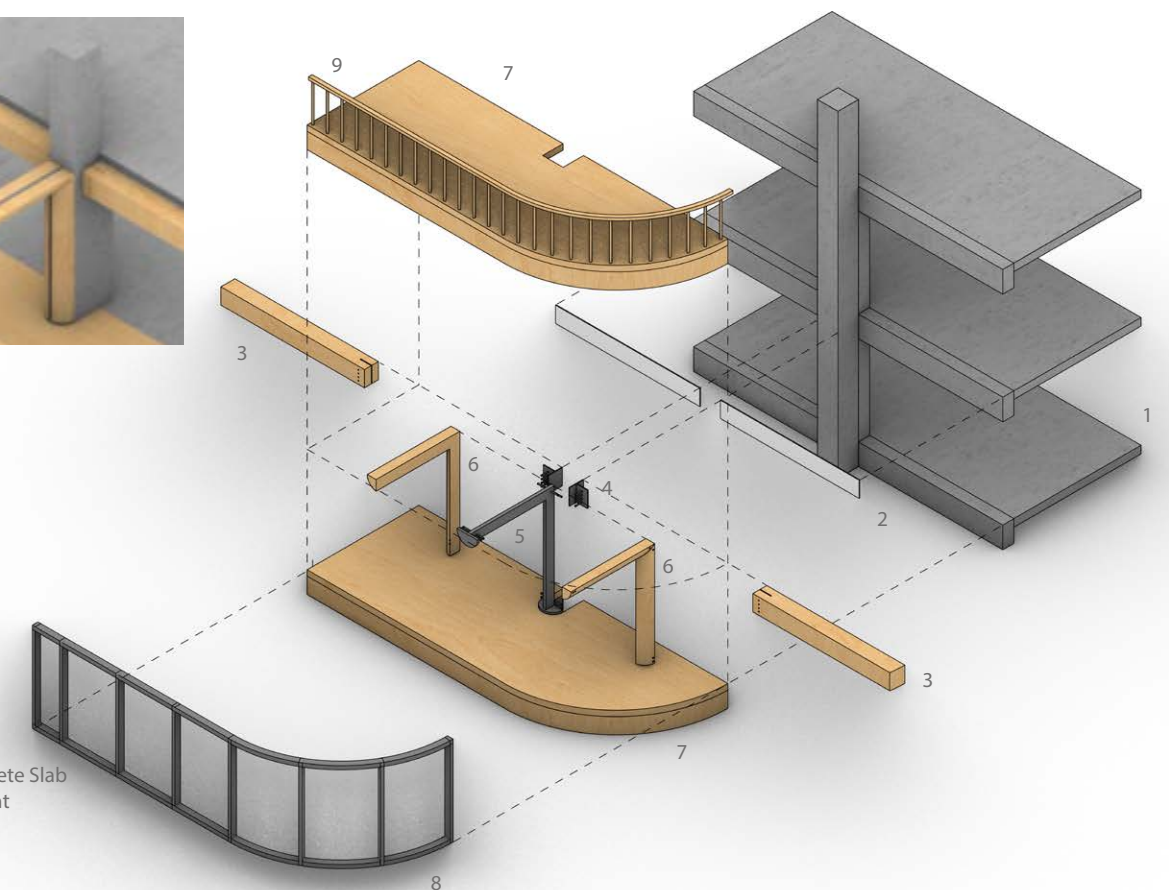
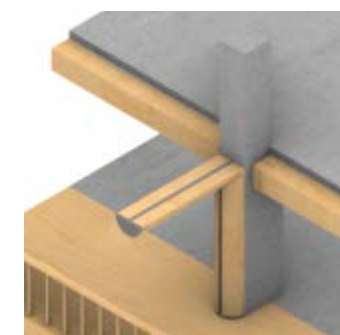




Apartment Typical Plan



Wood Extension Strategy



- 1.Existing Concrete Slab
- 2.Expansion Joint
- 3.Wood Beam
- 4.Steel Joint
- 5.Steel Plate
- 6.Wood Column + Beam
- 7.Wood Slab
- 8.Curtain Wall
- 9.Wood Handrail





In the new residential building, we provide a “Ground” on every floor while allowing more light to enter through a central courtyard. By forming community spaces, we aim to provide single-person households with “Stoop-like” areas, effectively integrating a social layer into the building. We have established a connection at the ground level to bridge a site that was previously disconnected north-to-south. The circulation leading from the street to the building is designed to flow through rather than being blocked by the building block. The path between the newly built residences serves as a link to the existing apartments. It is designed to be a social space where interaction occurs between residents of the two separated wings. The intersection where the GWBBS structure meets the timber residential space offers a unique multi-level “Ground” experience. In this high-traffic area, it will serve as an “Active Park” for the public, becoming a new centerpiece for the neighborhood.

From Altar to Sacred Cloth

Adaptive Reuse – Garment Sanctuary

Course ADVANCED STUDIO V, FALL 2025
Studio Sacred Turn
Location 656 6th Ave, New York, NY
Instructor Ziad Jamaledine

An adaptive reuse of a deconsecrated church that reintroduces sacredness as a new ritual of care through clothing donation, transformation, and redistribution.

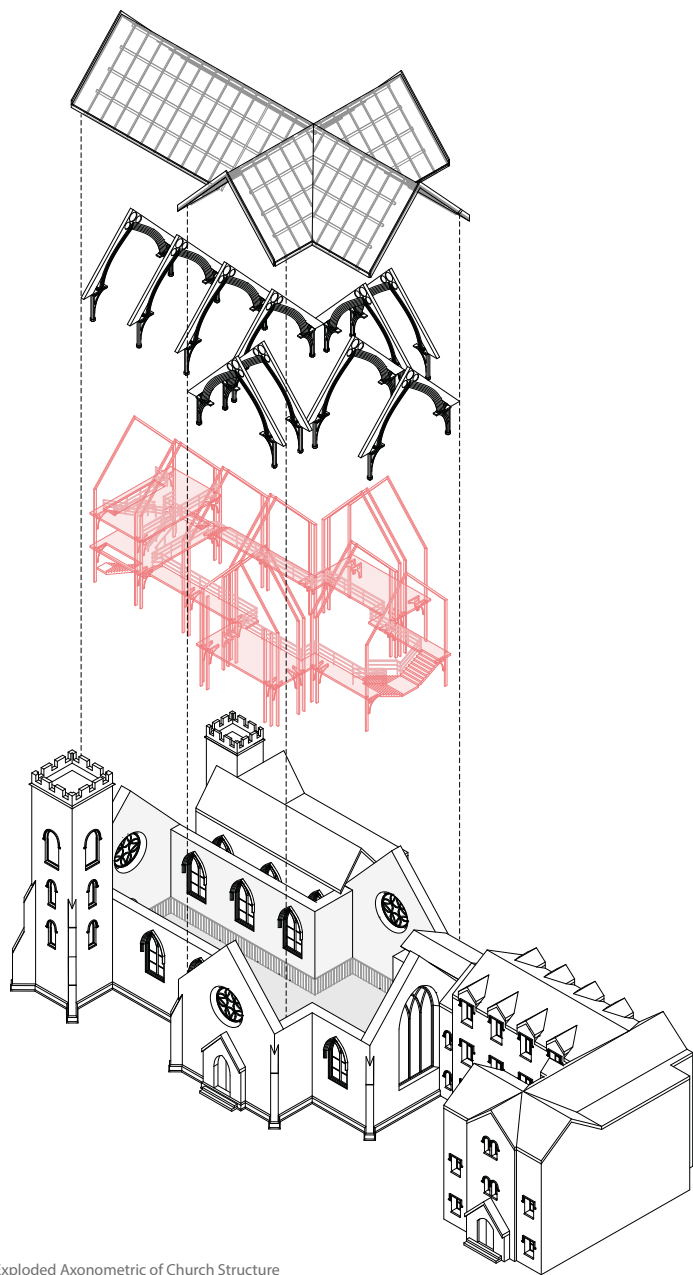
Located in Midtown Manhattan, the Church of the Holy Communion is a historic Gothic Revival church that once functioned as a central space of faith and care. Over time, as church attendance declined and urban priorities shifted, the building lost its religious and social role. Although architecturally preserved, it remains largely inactive, reflecting a broader condition in which sacred spaces are absorbed into commercial environments and stripped of their original meaning.

This project proposes the adaptive reuse of the deconsecrated church as a garment-based urban sanctuary. Through a new ritual centered on clothing donation, transformation, and redistribution, the project reintroduces sacredness as an act of care rather than belief. Donated garments are collected, remade by nearby fashion students, and freely redistributed to people in need, including the surrounding unhoused population. By reusing the church’s liturgical spatial structure, the project transforms the building into a permanent charitable infrastructure that restores care, dignity, and social engagement within the contemporary city.

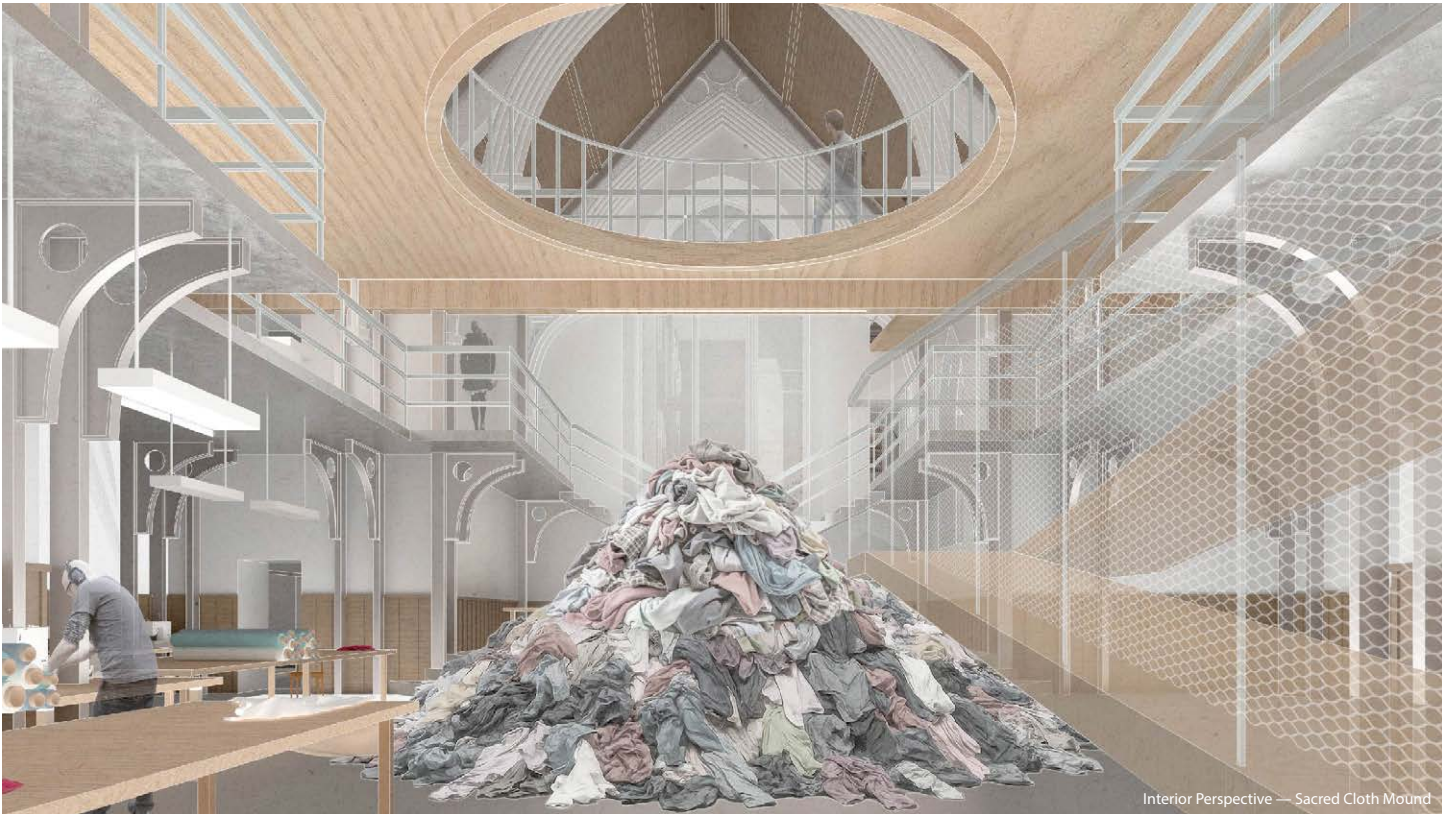
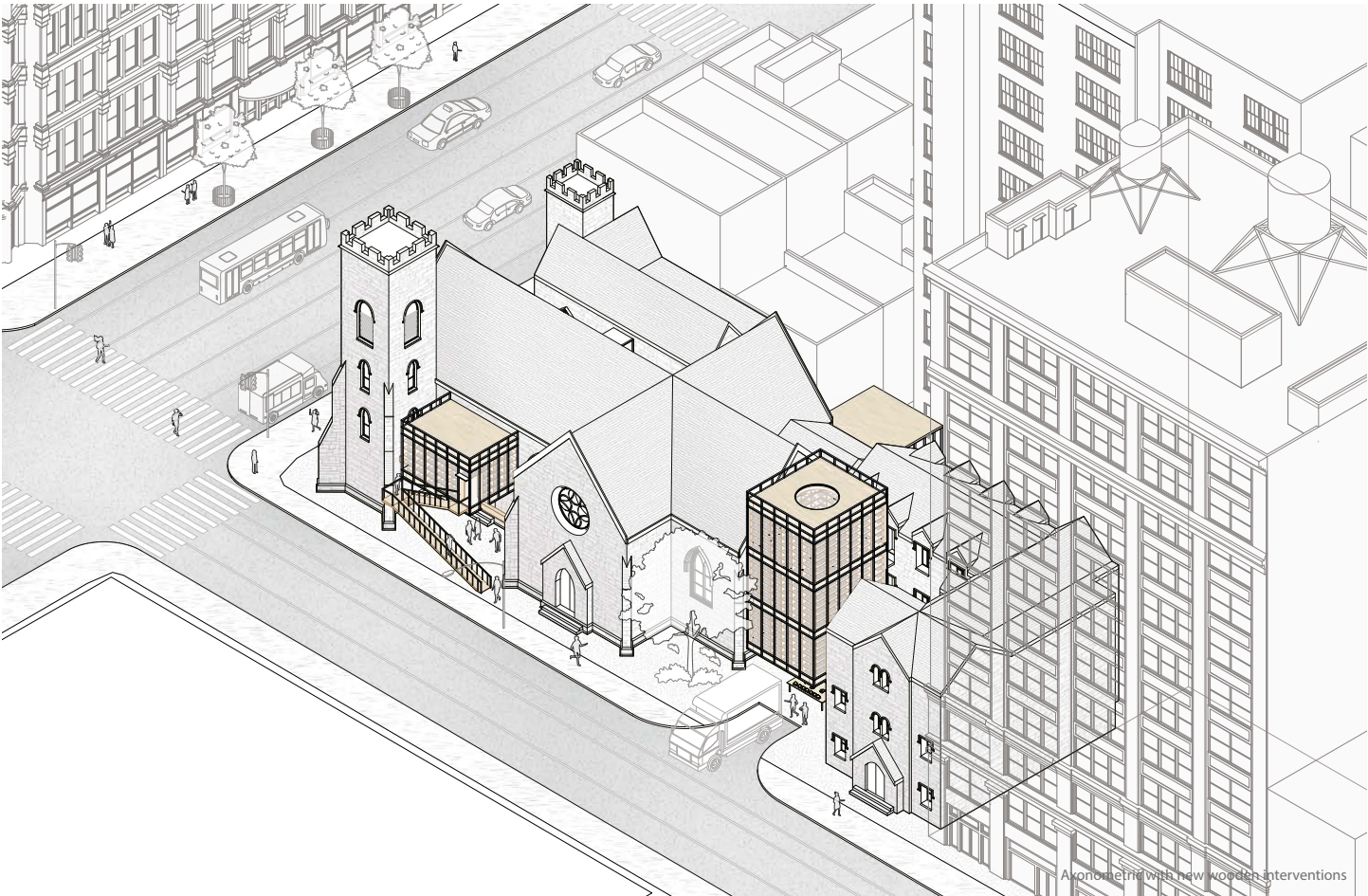


Timeline of the Church of Holy Communion

The building evolved from a church to a club, then to commercial use, gradually losing its sacred and social role. This project responds to that loss by reintroducing care as a new form of sacredness.



■ Existing Structure (1844)
■ Balcony Structure (1983)

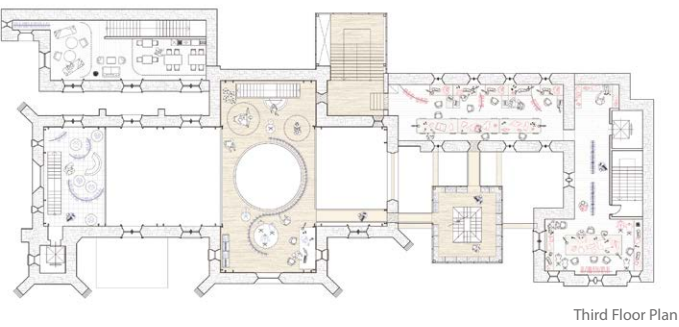
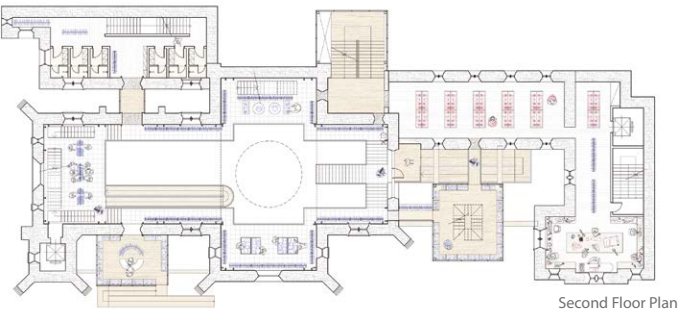
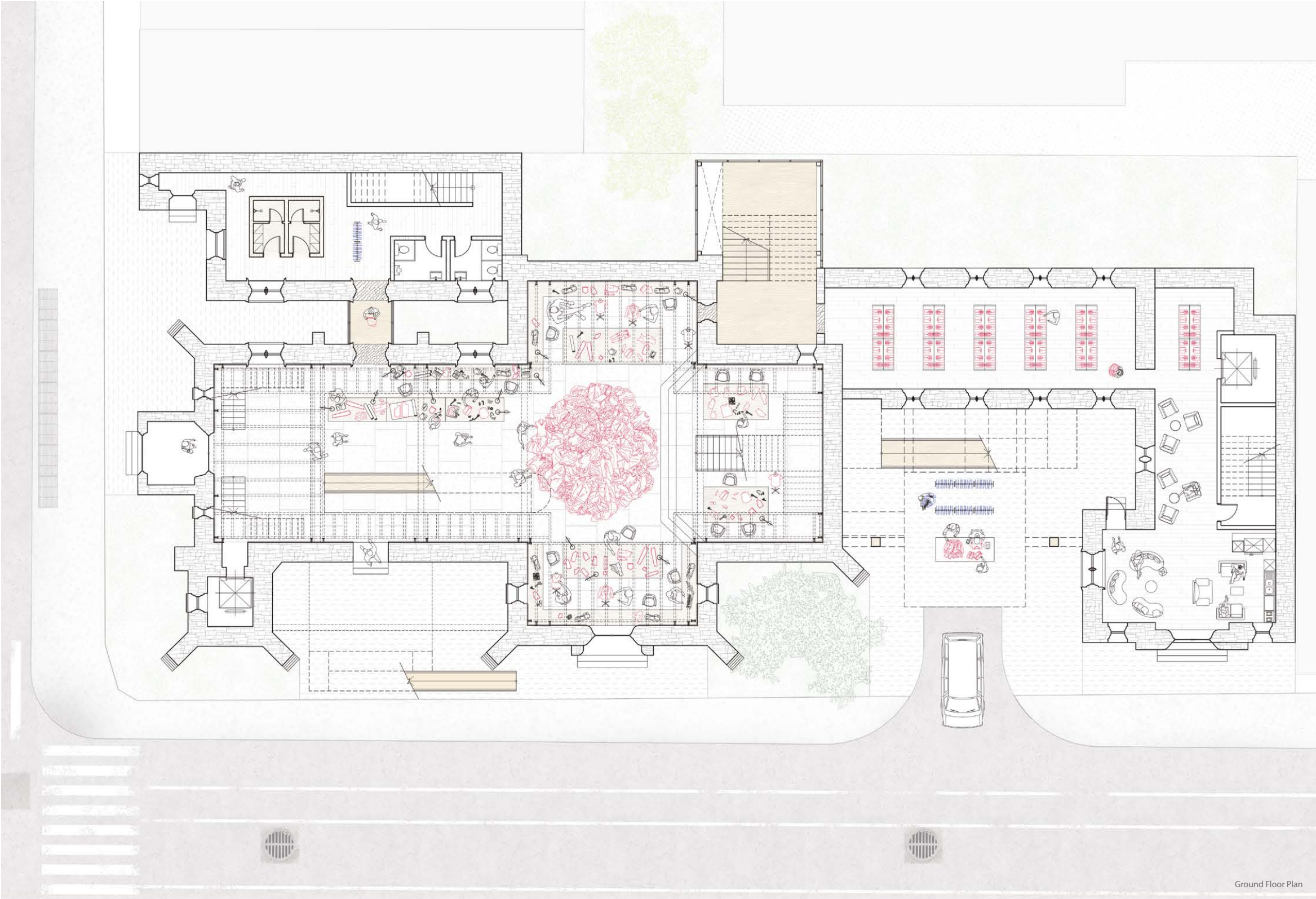


At the center of the former nave, a mound of second-hand clothing replaces the altar as the new ritual focus of the church. Visitors deposit garments, students work around the mound, and care is enacted through everyday acts of making and taking. The old church structure and new wooden insertions coexist, framing a new, non-religious ritual of care.

Exploded Axonometric of Church Structure

The Sacred Cloth Mound

The ground floor reclaims the crossing of the cruciform church as the new ritual center of the project. Located directly in front of the former altar, the sacred cloth mound becomes the first point of contact for all donated garments. This act of depositing replaces the church's original liturgical ritual with a new, non-religious ritual of care. Here, second-hand clothes enter the system as unfinished material, initiating the cycle of transformation and redistribution. Both visitor and student circulations originate from this shared center, making the mound the spatial and symbolic core of the project.



Transformation, Display, and Free Redistribution

The upper floors host the transformation and redistribution of garments. On the second floor, finished clothes are stored and displayed, allowing visitors to choose and take garments freely as part of the new ritual of care. The third floor provides a more private environment for students, where garments are disassembled, remade, and customized. Together, these floors complete the vertical cycle of clothing, linking production and taking back to the sacred cloth mound below.

Vertical Ritual of Clothing

The church section is reorganized around a new ritual of clothing.
At the crossing, directly in front of the former altar, the sacred cloth mound anchors the entire spatial sequence.
From this center, garments move vertically through the building—from deposit, to transformation, to storage and redistribution.
Visitors and students occupy different levels, yet remain spatially and visually connected through the mound.
The former liturgical section is reactivated as a continuous infrastructure of care, where donating, making, and taking unfold simultaneously.



The End of Mortality / From Rack to Root

Cosmogram & Adaptive Reuse

Course	ADVANCED ARCHITECTURE TUTORIAL, SUMMER 2025
Studio	APOCALYPSE ECSTASY. COSMOTECHNICS AND ECOLOGIES OF DESIRE
Location	Newtown Creek, AT&T Data Center (New York)
Instructor	Uriel Fogu�
Collaborator	Kaushik Parashar

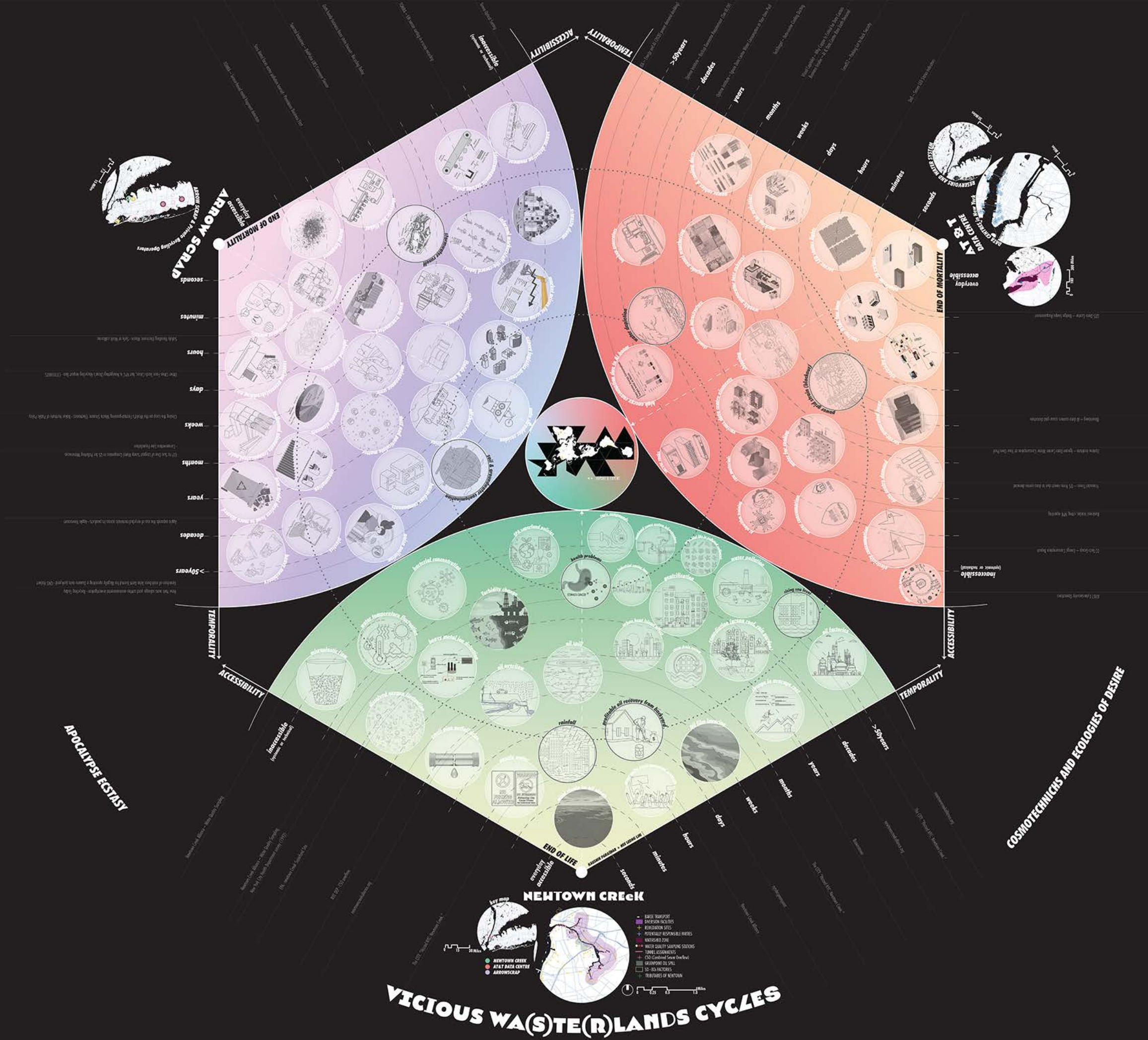
The cosmogram investigates the deep infrastructural entanglements between three urban sites in New York City: Arrow Scrap Corporation in Holbrook and West Babylon, Newtown Creek at the Brooklyn-Queens boundary, and the AT&T Data Center in Hell’s Kitchen. Though physically dispersed and operating under distinct logistical regimes—waste management, water purification, and data storage—they form a tightly interwoven metabolic circuit, wherein material, ecological, and digital flows are continually reprocessed, reabsorbed, and redistributed. By tracing these connections through the lens of transcalar urbanism, this cosmogram reveals how small infrastructural actants—such as the Greenpoint Oil Spill’s residual toxicity, a single outdated server in AT&T, or a discarded smartphone crushed at Arrow Scrap—have planetary consequences. These micro-entities collapse the scale of local impact and global risk, making them potent agents in rethinking the end of life and end of mortality—not only of objects, but of systems, species, and futures.

Arrow Scrap, a metal and e-waste recycling hub, extracts residual value from the decaying edge of consumer and infrastructural cycles. Here, lifeless servers and stripped copper wiring are crushed and sorted for global redistribution. Yet these “end-of-mortality” objects are not inert. They leak toxicity into groundwater, release particulate matter into the air, and return their chemical imprint to the Earth’s metabolism. The runoff generated—laden with lead, mercury, and PCBs—enters stormwater systems that flow toward Newtown Creek, a site already saturated with the historic trauma of the Greenpoint Oil Spill. The creek, whose sediments preserve centuries of pollution, temporarily absorbs these substances through its wastewater treatment mechanisms, only to release them during overflow events. Each overflow becomes a minor planetary event—a gesture toward irreversible contamination, into rivers, oceans, and bio-networks.

At the same time, the AT&T Data Center appears as a silent, high-security digital organ of the city, hosting the nervous system of communication. Yet its own lifecycle is tightly bound to obsolescence. Servers are retired and ejected in 3- to 5-year cycles, many ending up at Arrow Scrap. The matter that once held millions of human memories, transactions, and state functions becomes metal dust—resold, remelted, and sometimes lost to landfill. The transformation of data into debris reveals a collapse between digital mortality and ecological permanence. These small deaths are not isolated—they echo outward.

Together, these three sites demonstrate that infrastructures once thought to be static or separate are in fact metabolically and symbolically entangled. Their operations reveal a violent continuity between the end of devices, the end of ecosystems, and the slow death of planetary systems. From micro-leaks in Greenpoint to the global movement of toxic metals, this project maps how end-of-life and end-of-mortality processes in infrastructure operate across vast, asynchronous scales—where the expiration of one server, one battery, one pipe, folds into the prolonged, entropic arc of planetary mortality. This cosmogram proposes that architecture must learn to see not only structure and form, but also decay, leakage, death, and disappearance. To understand infrastructure is to understand endings—not as failures, but as ongoing events that structure the living present.





Floating Microhabitat

Micro Habitat Island

Course	SEED BOMBS : TECHNOLOGIES IN ECOLOGICAL DESIGN, FALL 2025
Location	Bushwick Inlet in Brooklyn
Instructor	Emily Bauer
Collaborator	Hyunju Kim

Our Seed Bombs are not just planters; they are small ecological islands that support multiple layers of habitat on the water.

Upland Zone - A circular aluminum mesh container is filled with recycled cork to provide stable buoyancy. The upper portion is wrapped in jute to prevent soil loss and planted with native flowering species such as Echinacea, Daisy, Amaranth, Primrose, Mallow, and Beach Plum. These plants store rainwater and regulate their own moisture through evaporation–condensation processes, while attracting pollinators such as bees, butterflies, and birds, thereby expanding ecological diversity at Bushwick Inlet.

Submerged Zone – Floating Layer: Multiple mesh containers are linked by marine rope. Over time, the rope develops a roughened surface that promotes the attachment of algae and microorganisms, while the spaces between act as safe nurseries for small fish and crustaceans seeking refuge from predators.

Submerged Zone – Artificial Reef Layer: Stainless steel mesh bags filled with oyster shells are suspended beneath, functioning as artificial reefs. Here, algae, shellfish, and invertebrates colonize, enhancing water quality while providing additional habitat.

As a whole, the Seed Bombs function simultaneously as a flower garden above, an underwater network in the middle, and an artificial reef below, forming a multi-layered ecosystem that connects the surface and subsurface. In alignment with Bushwick Inlet Park’s pollinator restoration efforts, this design proposes a sustainable Microhabitat Island—a platform that can be maintained and monitored collectively by the community.



Detail Drawings

microhabitat in Bushwick Inlet
Hee Leong Lim & Hyunju Kim

Clay Balls + Soil Mix
final planting bed for vegetation.



2"

Jute Wrap (2nd protective layer)
natural, biodegradable fiber
prevents soil washout, strengthens root anchorage.



0.25"

Coir Mat (from coconut fiber)
biodegradable root protection layer
stabilizes soil and prevents erosion.



0.25"

Clay Balls
lightweight aggregate for plant roots
ensures aeration and drainage.



1"

Cork containment
capped by aluminum mesh screen so cork fragments
don't escape into water.



Recycled Cork (wine corks, collected & reused)
sustainable buoyant material,
prevents use of synthetic foams
absorbs shock and provides floatation.

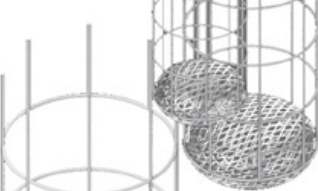


4"

**Recycled Aluminum Mesh Screen
(discarded window screen)**
formed into cylindrical structure
lightweight, corrosion-resistant, and fully recycled.



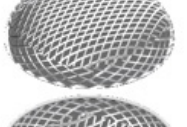
Aluminum Wire
lightweight, flexible, fully recyclable
connects and secures modules.



Marine Rope (woven as net)
saltwater-resistant, provides tensile strength
woven in net pattern to allow seaweed
and algae colonization.



Aluminum Mesh (fruit/root protectors, recycled)
flexible protective wrap
prevents debris loss
reuse of discarded orchard/agriculture materials.

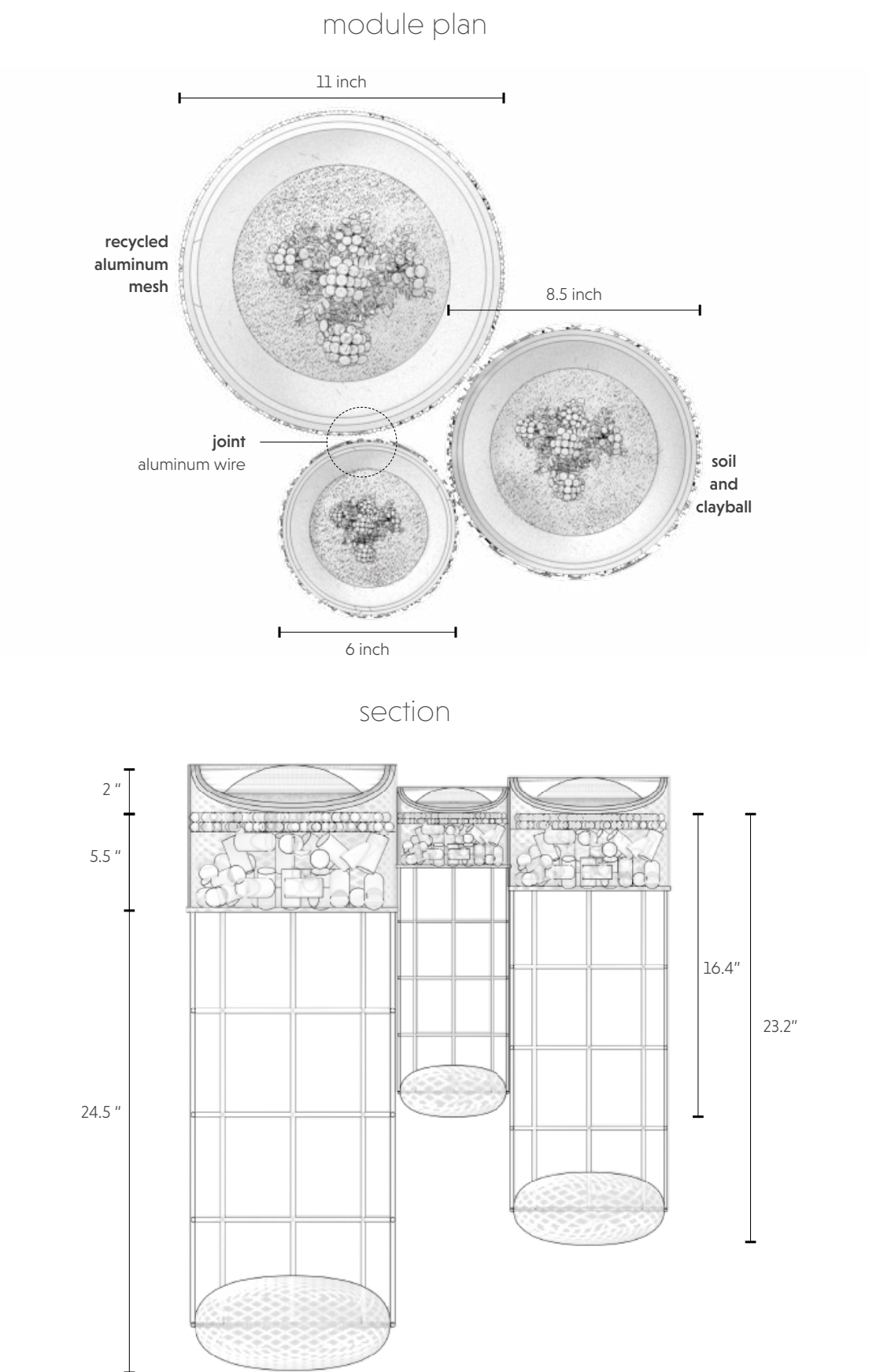


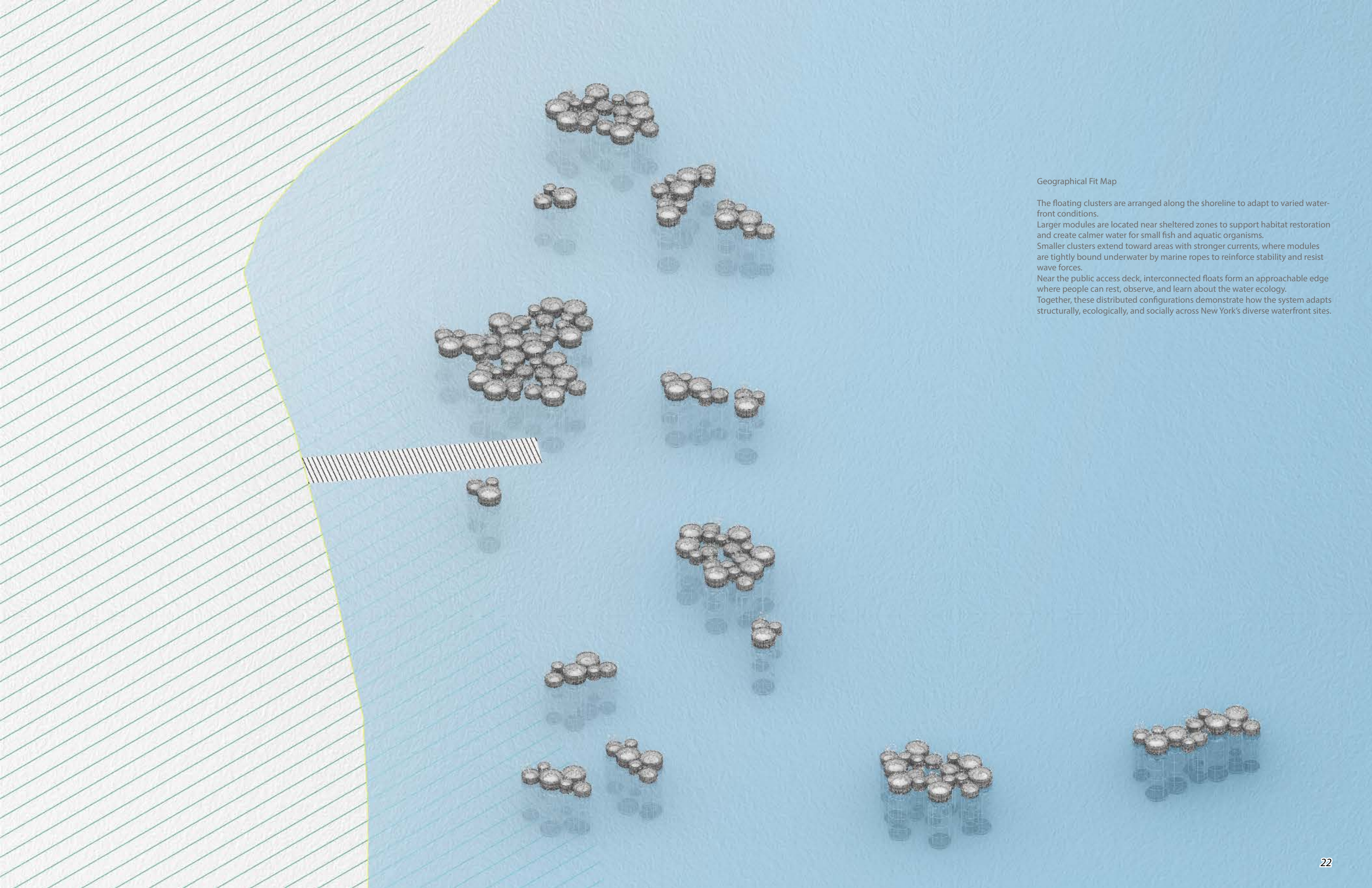
2.5"

Oyster Shells
natural, porous barrier
add weight + ecological symbolism
(filtering & resilience)



2.5"





Geographical Fit Map

The floating clusters are arranged along the shoreline to adapt to varied water-front conditions.

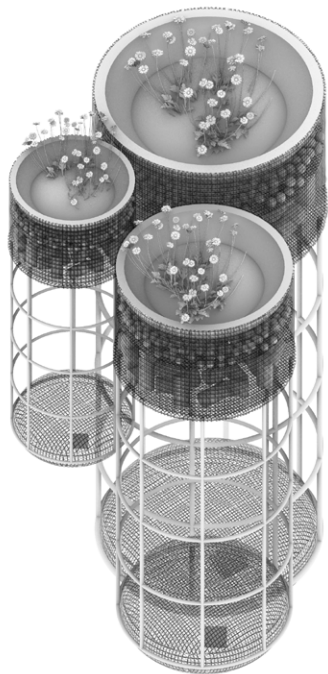
Larger modules are located near sheltered zones to support habitat restoration and create calmer water for small fish and aquatic organisms.

Smaller clusters extend toward areas with stronger currents, where modules are tightly bound underwater by marine ropes to reinforce stability and resist wave forces.

Near the public access deck, interconnected floats form an approachable edge where people can rest, observe, and learn about the water ecology.

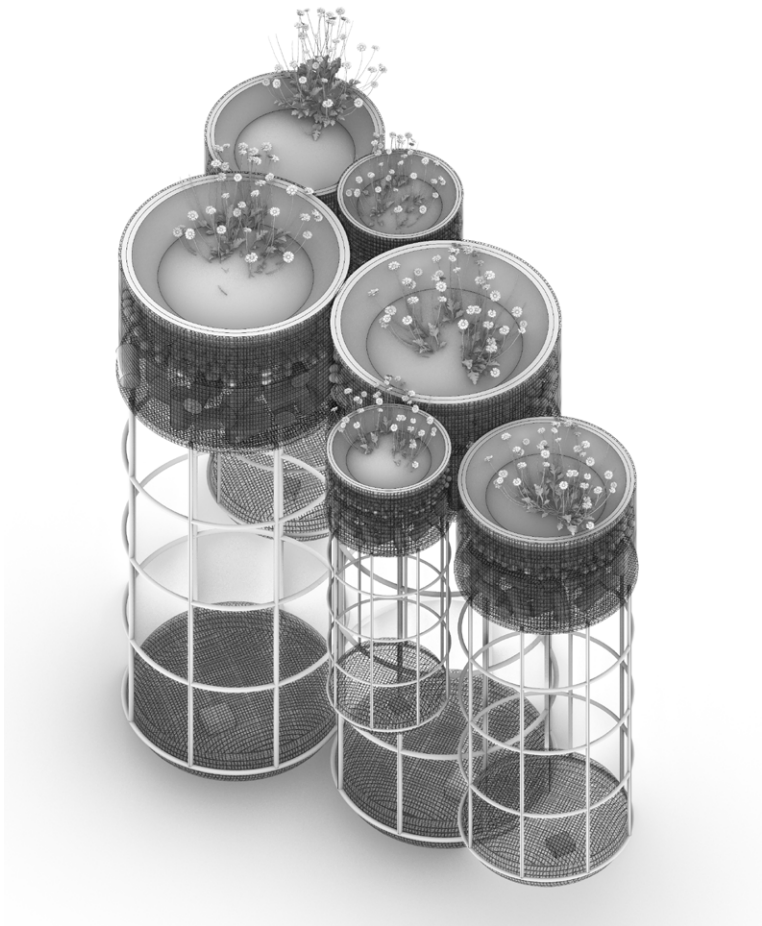
Together, these distributed configurations demonstrate how the system adapts structurally, ecologically, and socially across New York's diverse waterfront sites.

Stage 1
Unit Composition



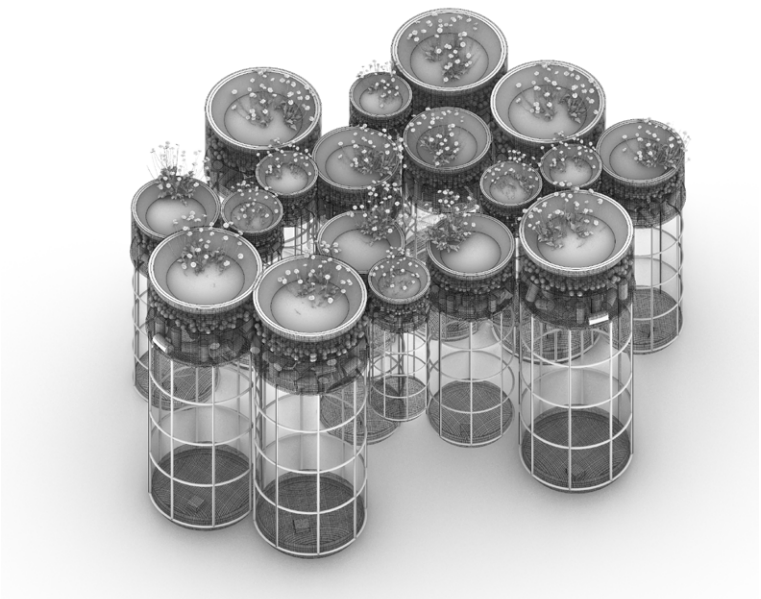
Three floats of different sizes are grouped and linked underwater by marine ropes and aluminum wires to form one basic unit.

Stage 2
Cluster Formation

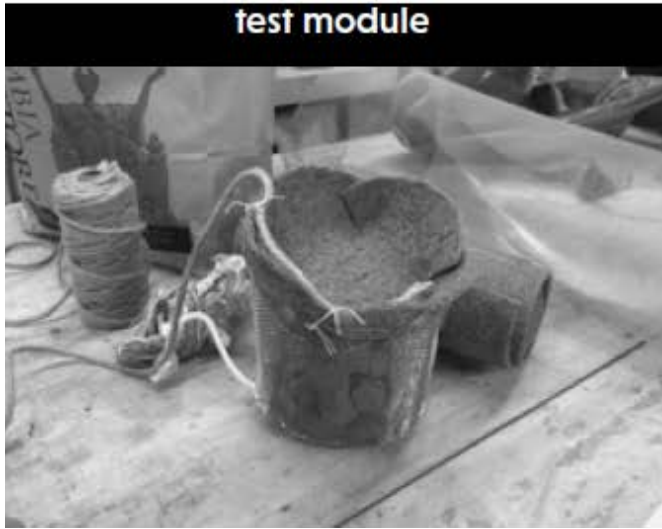


Units connect underwater to reinforce stability against waves, forming small adaptive clusters.

Stage 3
Horizontal Expansion



Clusters scale horizontally, their varied sizes enabling flexible growth across different waterfront conditions.









During the first trials, we tested the float as small individual modules, but they often tilted to one side. We decided to combine several modules together for greater stability. Once the cavities were filled with cork, the larger float remained buoyant and balanced. However, when multiple modules were connected, we realized that unequal distribution of cork inside each module caused slight leaning toward one direction.

In retrospect, reducing the amount of cork slightly—so the float would sit lower in the water—and adding more weight below could have created a more even balance. To prevent soil loss, we carefully wrapped the upper surface with multiple layers of jute fabric. This layer not only held the soil securely in place even during strong movement on the water, but also provided a breathable and degradable skin that allowed plants to root and drain naturally. The combination of soil, jute, and mesh became an unexpectedly effective system of containment and protection.

When we connected the three main modules together for the final launch, we tied them rather loosely to allow for flexibility in movement. However, this looseness caused the whole system to twist slightly under uneven tension. If we had tightened or cross-woven the connections more firmly, the modules could have stayed flatter and more cohesive as a single surface. This was an important lesson about how even small structural details influence the float's ecological and visual balance.

We also received feedback that the small openings in the aluminum mesh could appear threatening to smaller organisms. Covering those circular holes with soft jute or capsule-like guards would make the habitat safer and more comfortable for species settling around it. With such refinements, the float could evolve into a more stable, balanced, and ecologically responsive microhabitat that better integrates with the rhythms of the inlet.

Calibrated Comfort

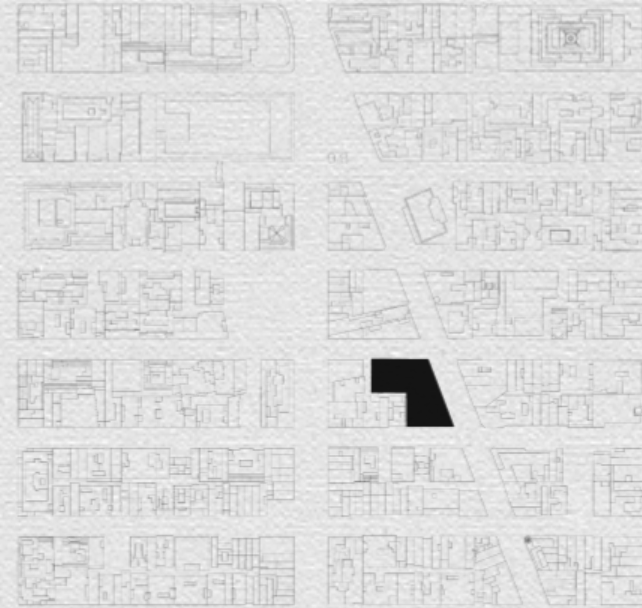
Environmental Equity

Course RE-THINKING BIM, SPRING 2026
Location 1227 Broadway, New York, NY 10001
Instructor Joseph Brennan
Collaborator Hyunju Kim, Yoon Ah Kim, Hobin Lee



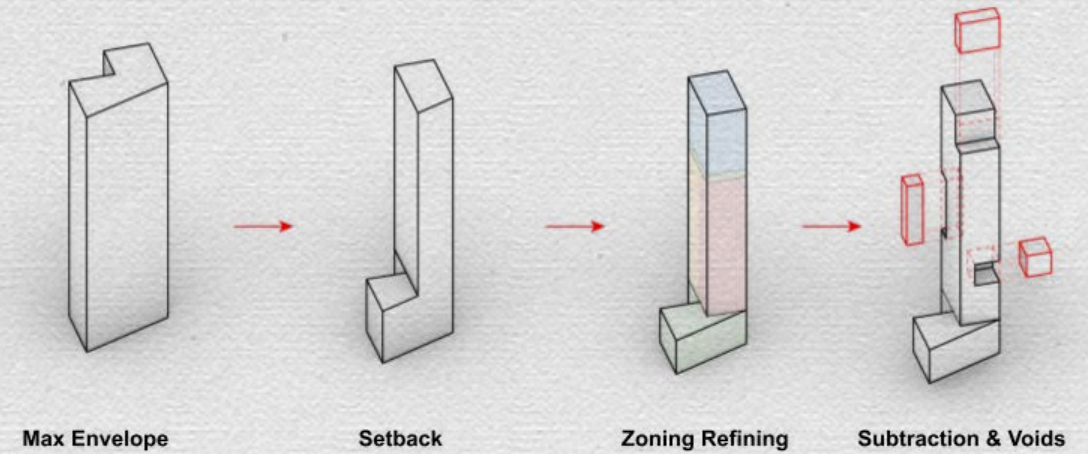
M1-8A / R12

1227 Broadway, New York, NY 10001

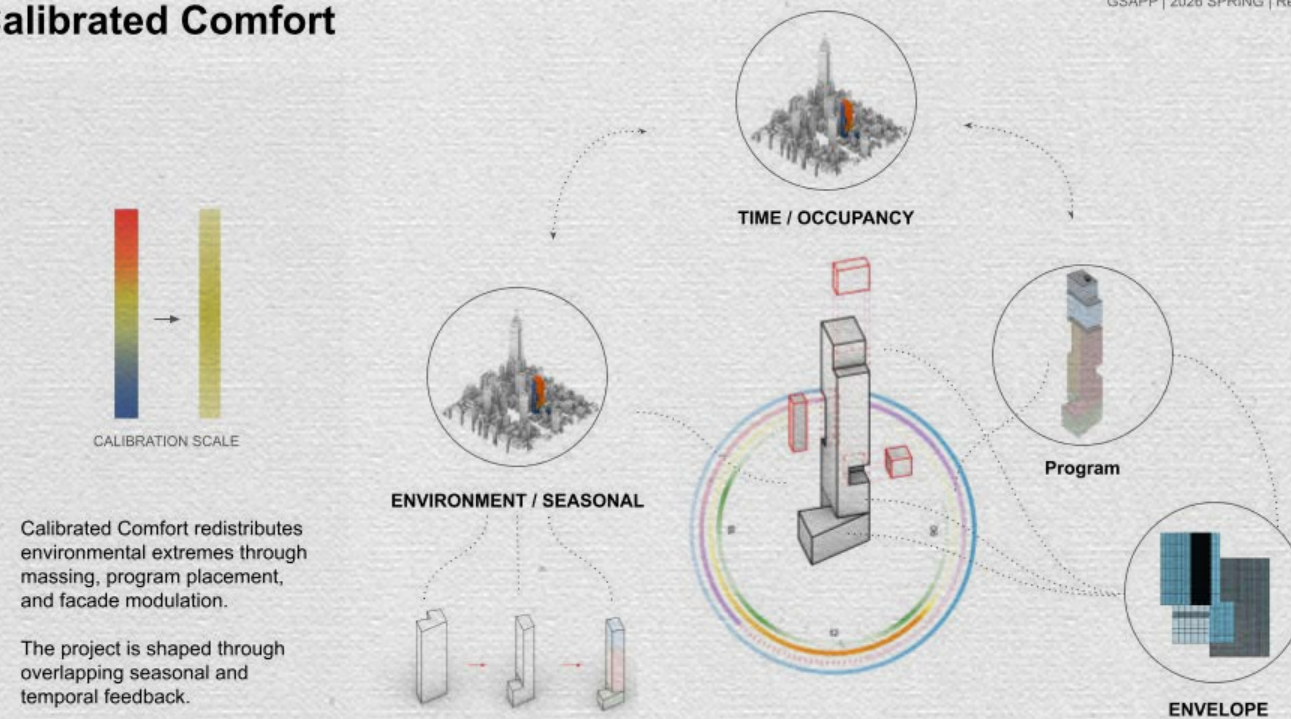


Program Lot Area	Retail Office Hospitality Residential 29,990 ft²
Zoning Uses & FAR	• Retail, office, light manufacturing, residential allowed. • Hotel requires CPC special permit. • Residential only: 18 FAR = 539,820 sf • Commercial only: 12 FAR = 359,880 sf • Mixed-use cap: total ≤ 18 FAR (539,820 sf) • With bonus: up to 21.6 FAR (647,784 sf)
Streetwall / Base	<u>Height range</u> 60–155 ft continuous streetwall along street frontage • Wide street (≥ 75 ft, Broadway): 10 ft setback • Narrow street (< 75 ft): 15 ft setback
Setbacks	<u>Above base height</u> • Wide: ~7.6:1 • Narrow: ~5.6:1
Tower Rule	<u>Effective slope equivalent</u> Floor Plate ≤ 50% lot area → ~14,995 sf max per floor Above 350 ft

Calibrated Comfort



Calibrated Comfort

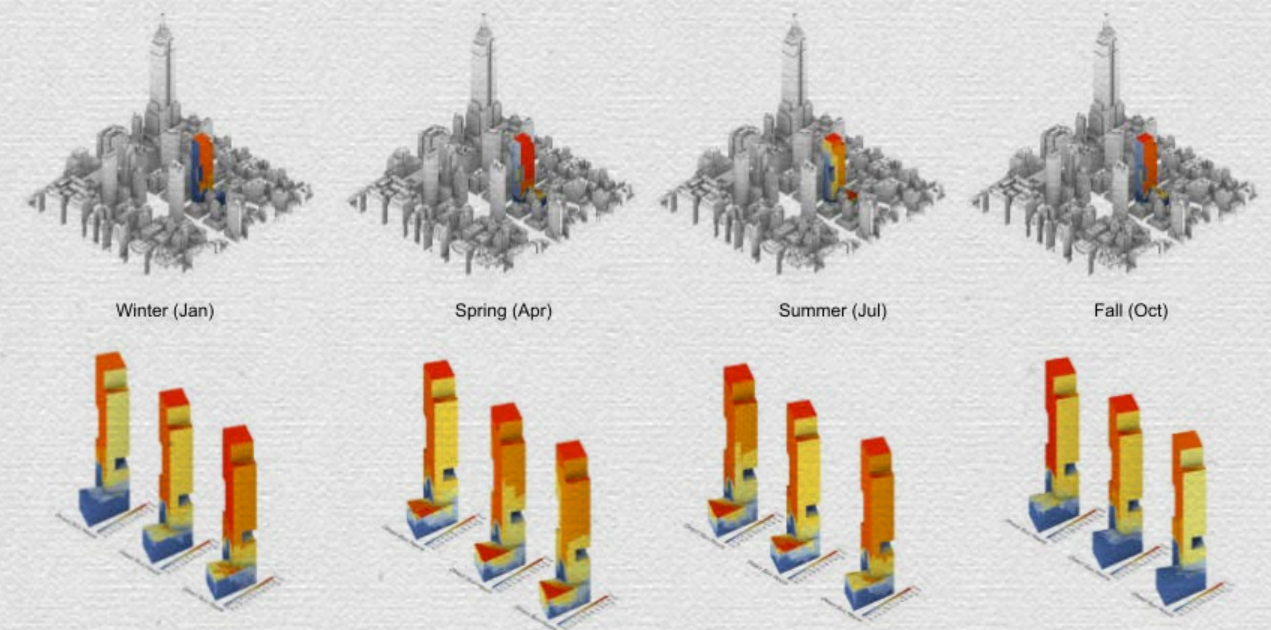


Environmental Massing

Seasonal environmental analysis for the overall massing

Thermal Comfort

Seasonal solar exposure analysis evaluates potential overheating in summer and solar gain in winter.

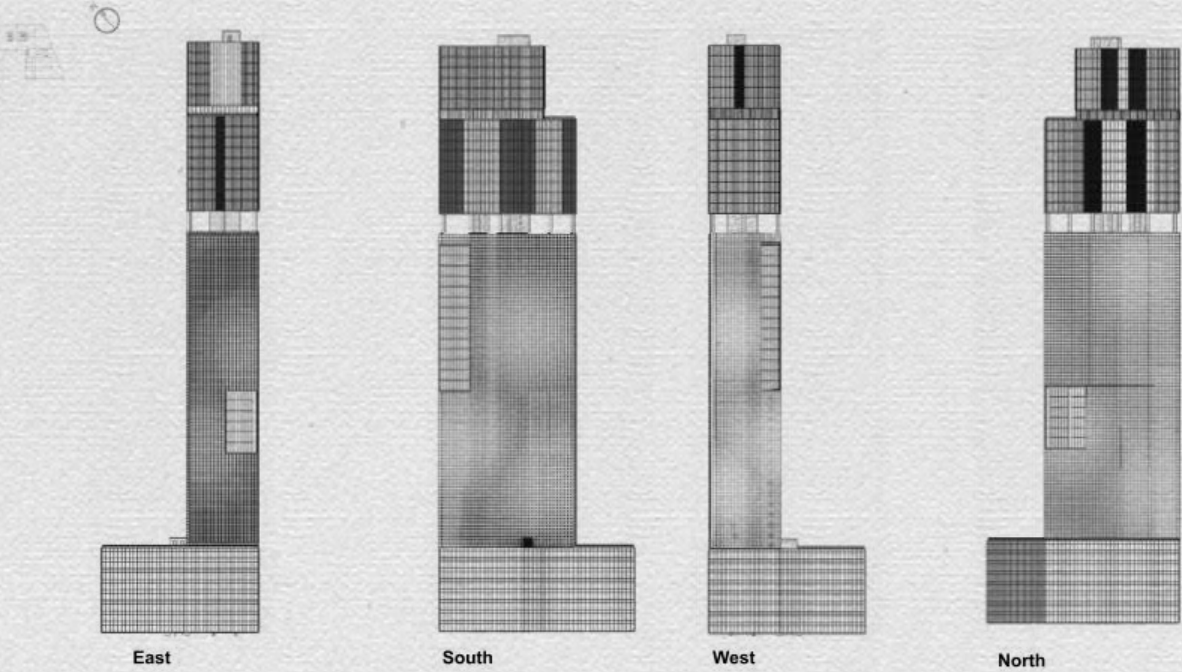
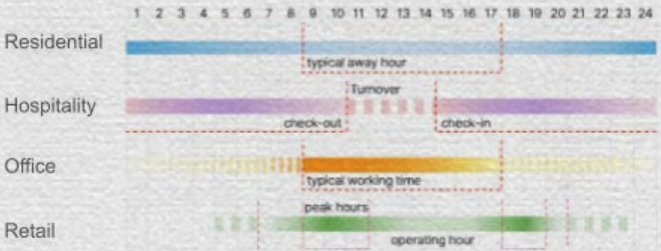


Temporal Occupation

| Temporal Patterns organize program relationships

GSAPP | 2026 SPRING | Re-Thinking BIM

Elevation Plan



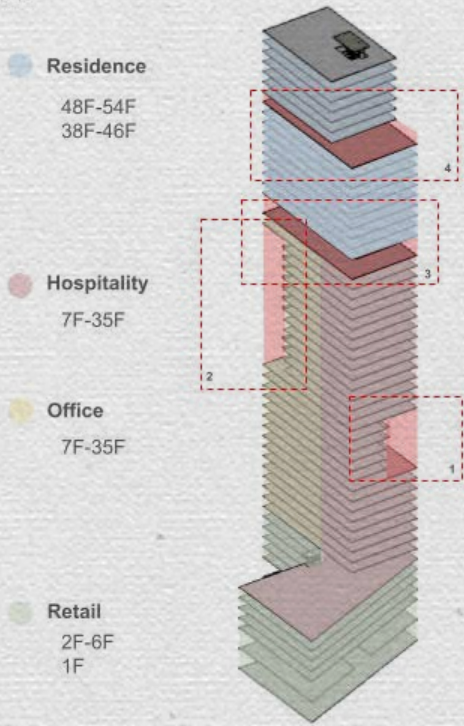
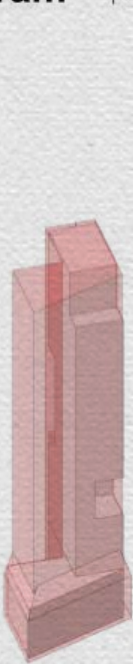
Program

| Program Distribution

GSAPP | 2026 SPRING | Re-Thinking BIM

Facade System 01

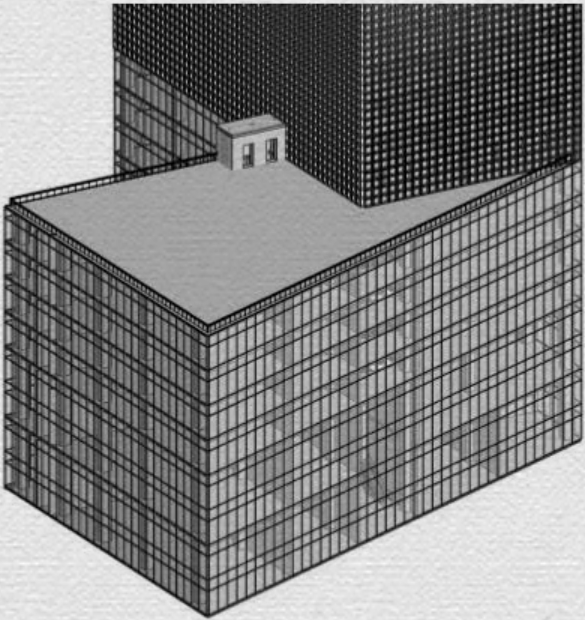
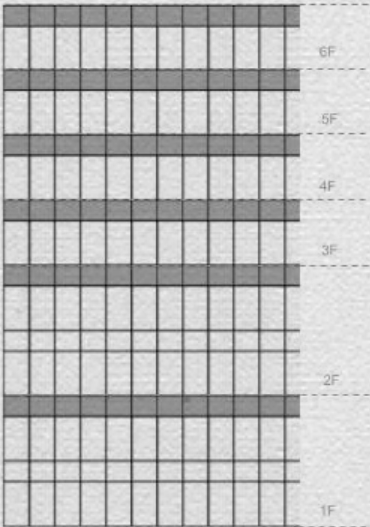
| Clear Curtain Wall



- 4 Swimming Pool 47F
Residence
Hospitality
- 3 Outdoor Garden 36F - 37F
Residence
Hospitality
Office
- 2 Indoor Garden 19F - 34F
Hospitality
Office
- 1 Restaurant 17F - 21F
Hospitality
Retail

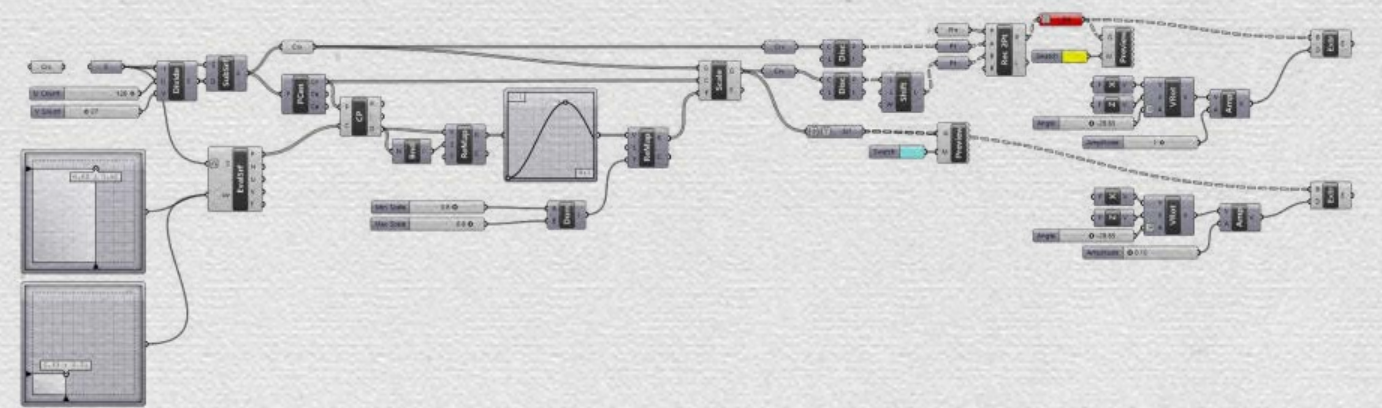


Retail



Facade System 02 | Modular Punched Window System

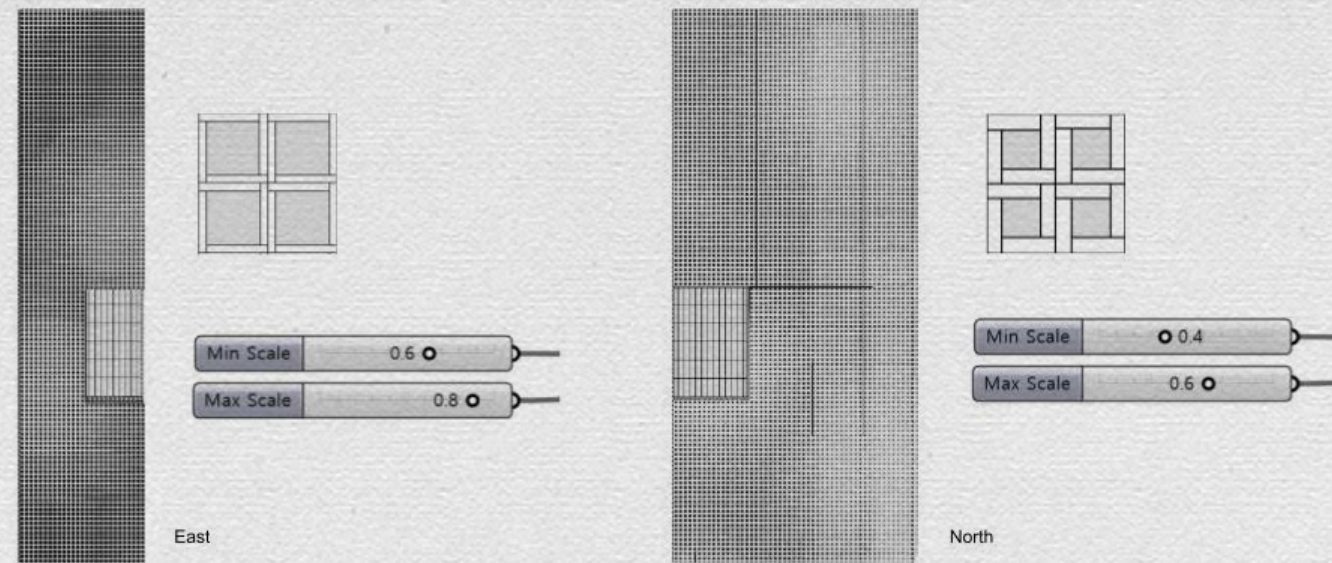
Office Hospitality



INPUT PARAMETERS		SHADING CONTROL	LIGHT CONTROL	DAYLIGHT - SHADING
Solar Radiation	Grid Density (U/V Count)	Depth	Rotation	Opening Size

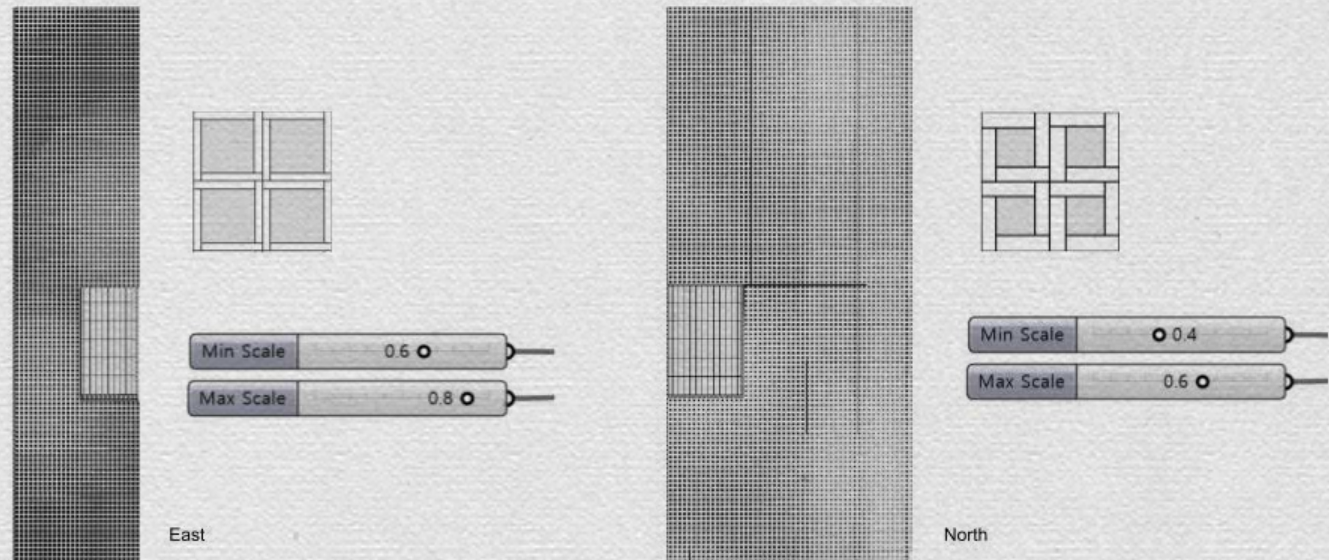
Facade System 02 | Modular Punched Window System

Office Hospitality



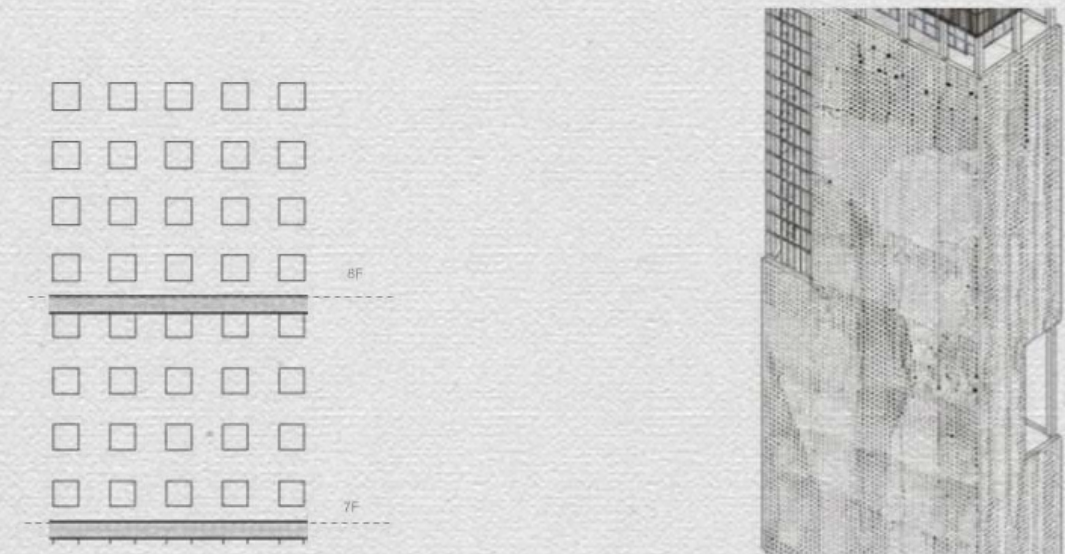
Facade System 02 | Modular Punched Window System

Office Hospitality



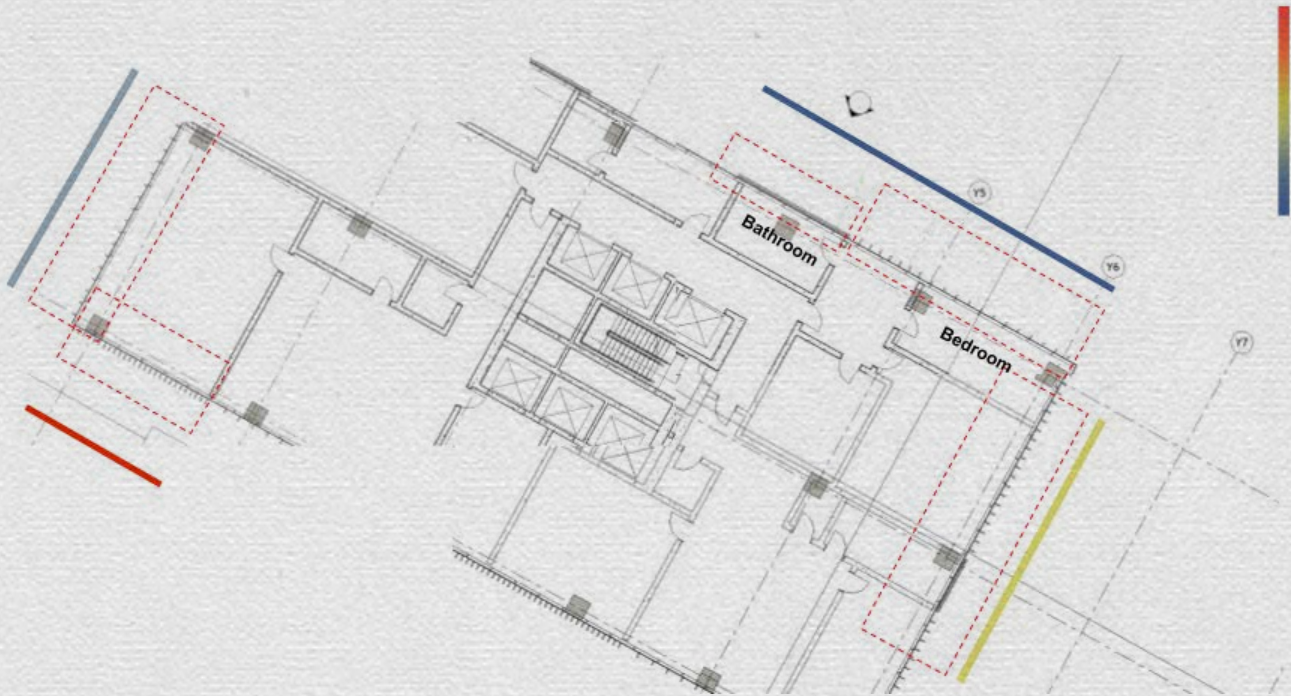
Facade System 02 | Modular Punched Window System

Office Hospitality

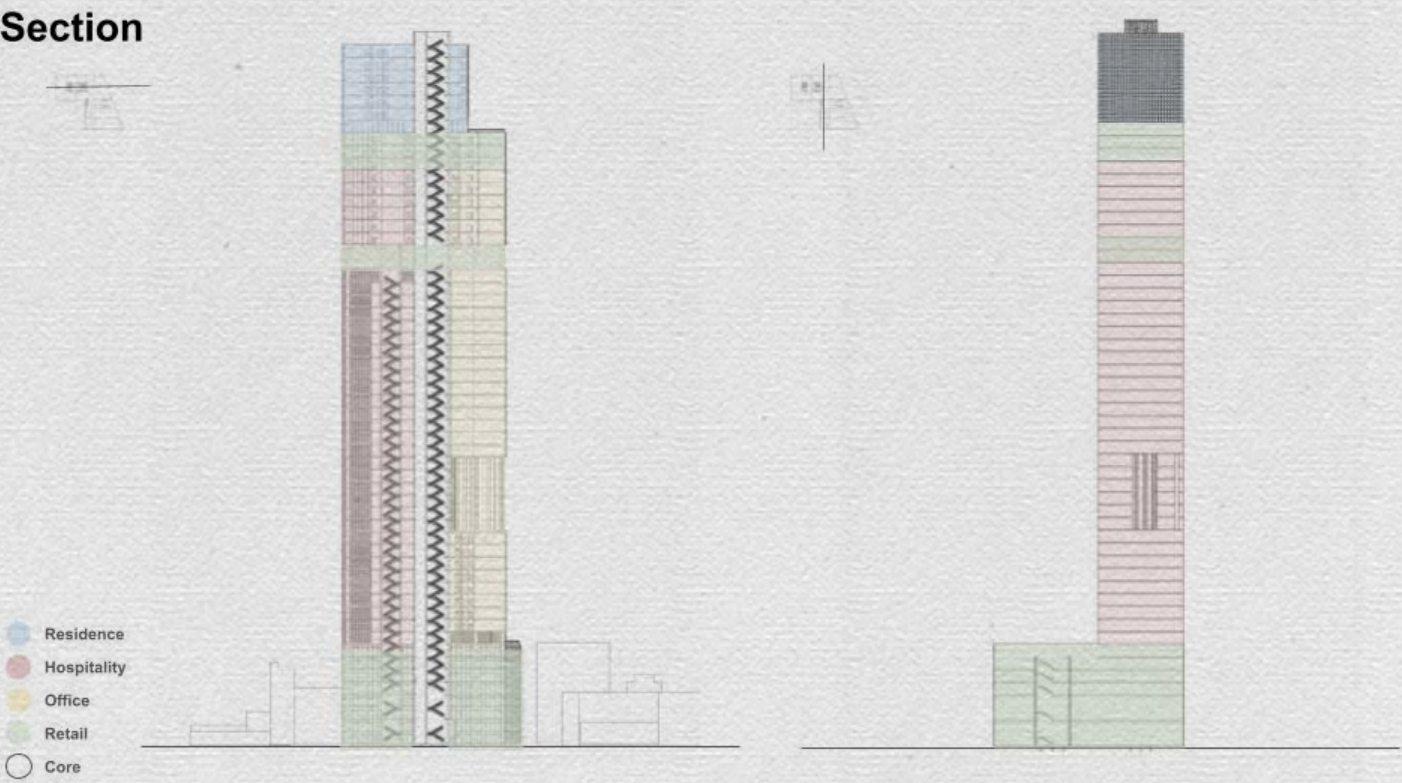


Facade System 03 | louver

● Residential

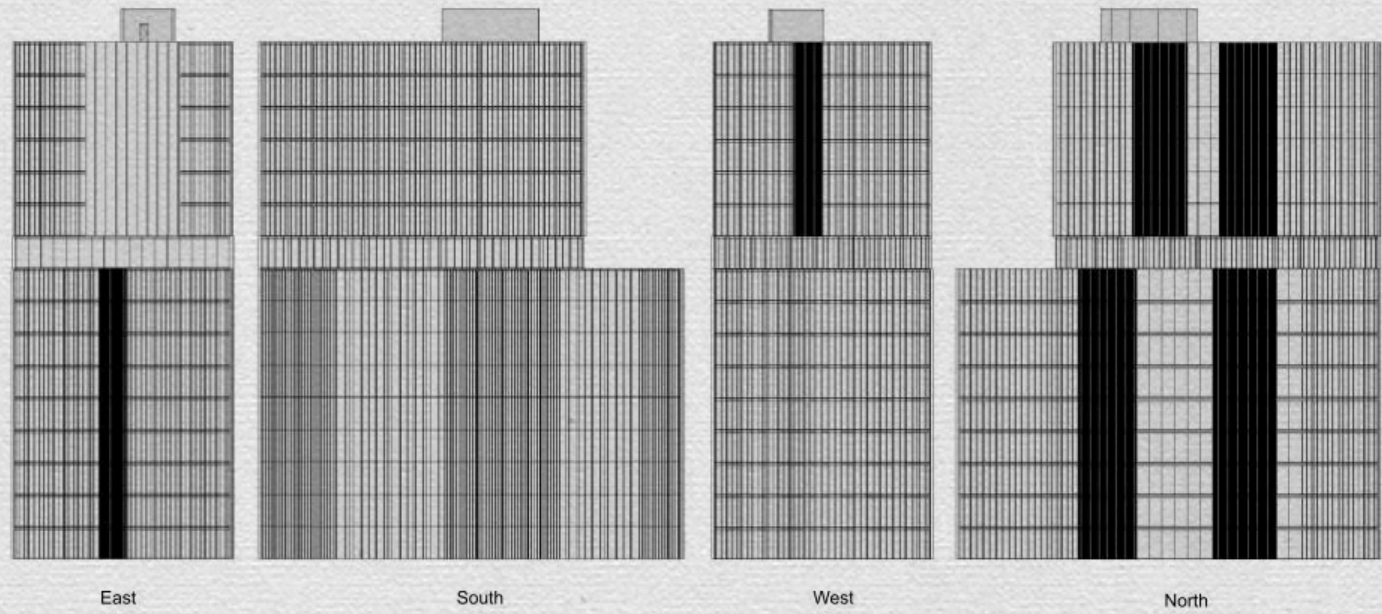


Section



Facade System 03 | louver

● Residential



Ground Floor Plan









