Will Rose

2023

Columbia
GSAPP

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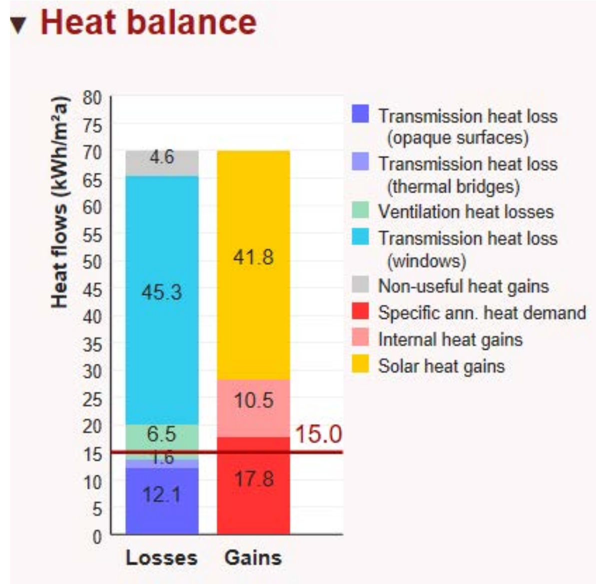

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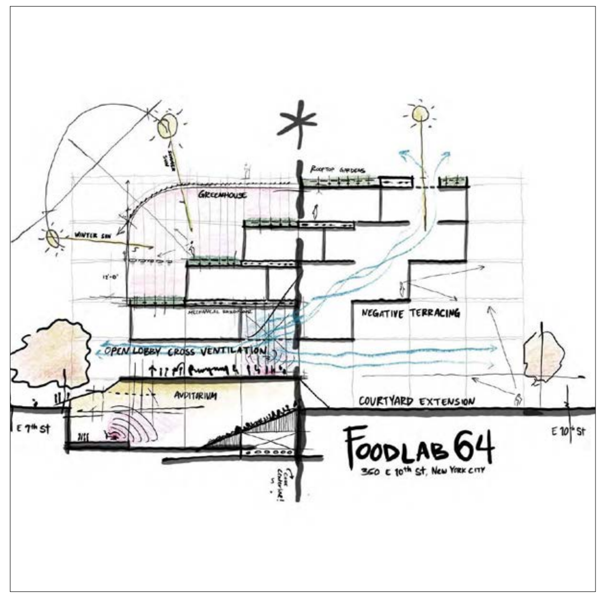

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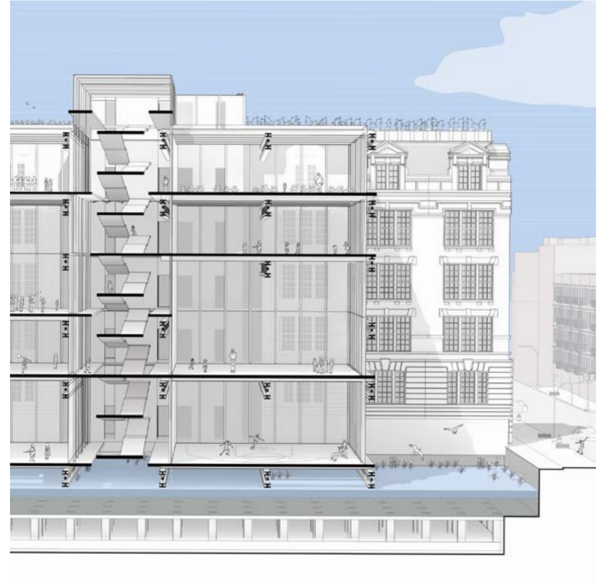

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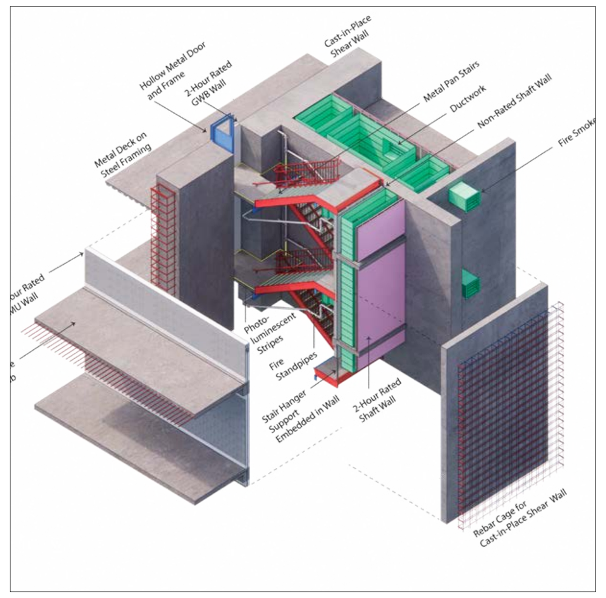

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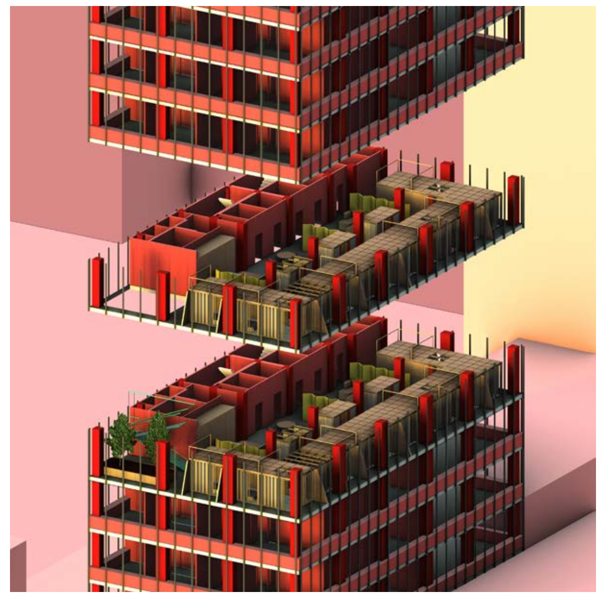

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Contents

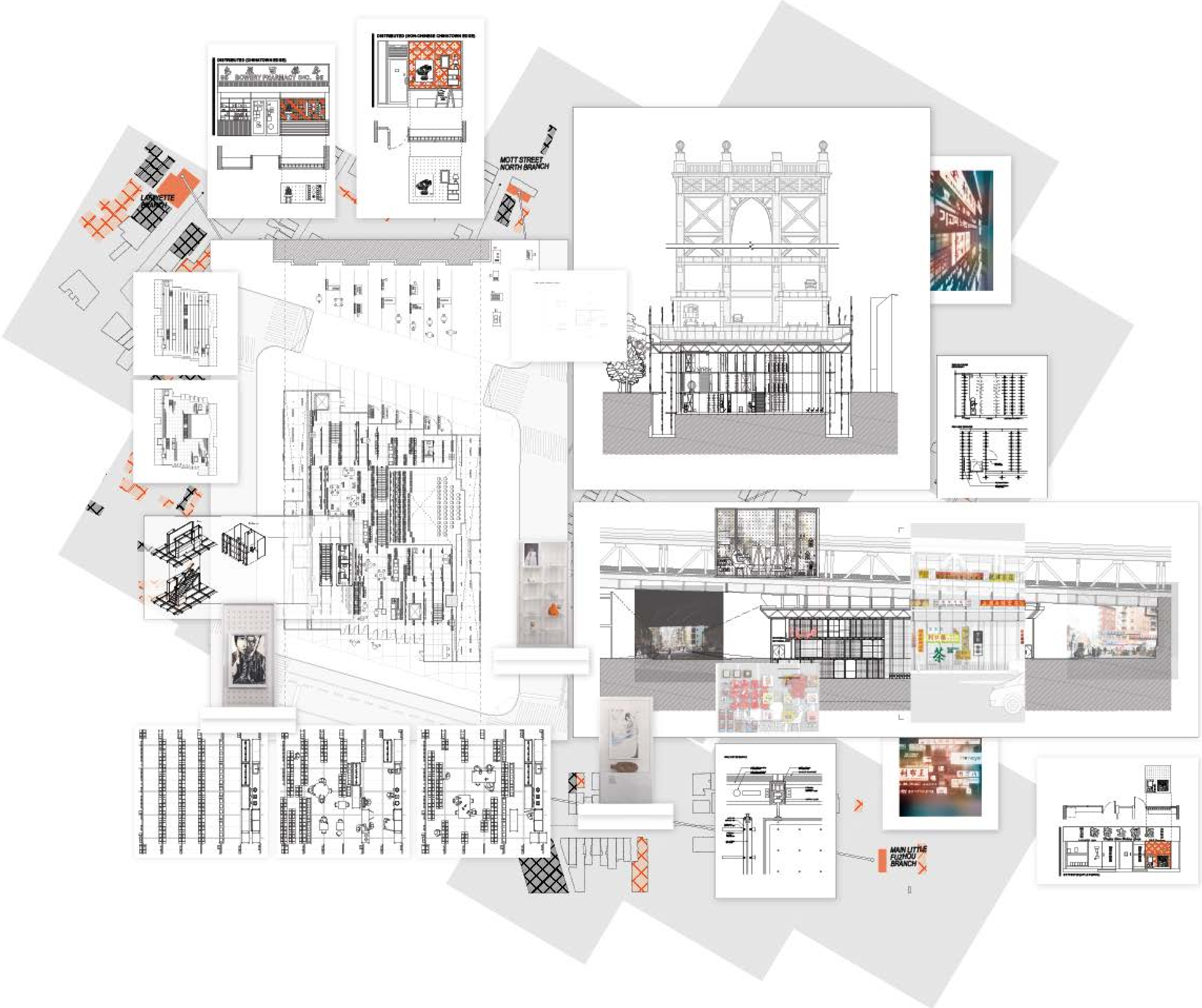
Archive (of a) Collective (Future)

Adv. VI Studio | Spring 2023
Critic: Karla Rothstein
With Daniel Chang

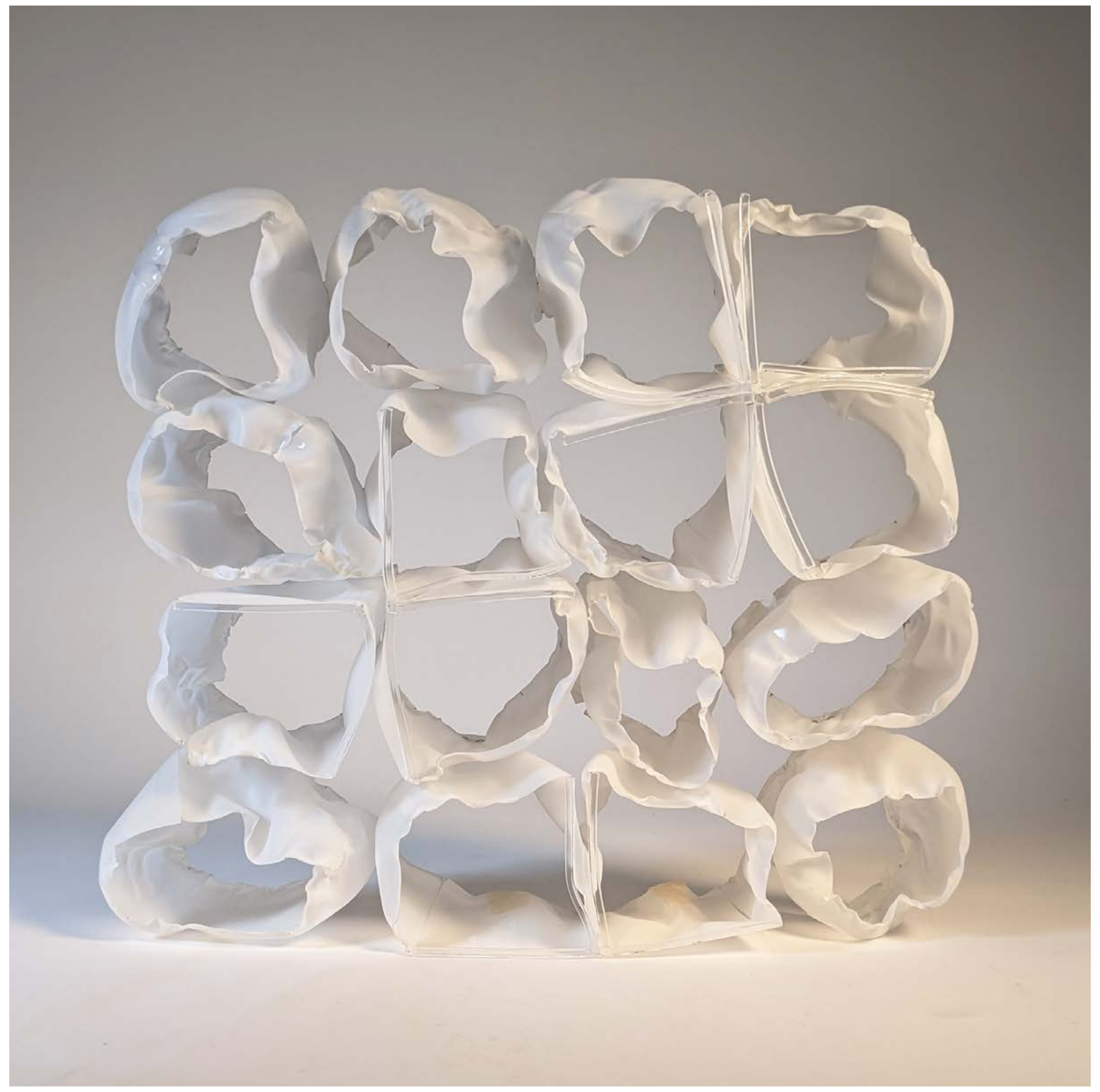
The Archive of a Collective Future resists the erosion of collective cultural memory and practices in Manhattan's Chinatown caused by the threats of generational death and internal and external gentrification. The population of Chinatown continues to age and die, and many are leaving due to high rents and displacement by new arrivals. As a result, the traditions and relationships that have enabled this neighborhood to create a unique identity and hold out against gentrification are at risk of fading away. Even as old businesses pass to newer generations, owners are forced to negotiate between their passions and a nostalgic orientalized image.

A joint archive and workshop provide spaces that draw from Chinatown's unique cultural identity to think about the future by continuously evaluating the neighborhood's relationships to the rest of NYC and Chinese culture. The archive records Chinatown's past through a series of temporary and permanent storage and display spaces. Movable storage panels open clearings throughout the archive where workshop and community gathering spaces engage with and speculate on the neighborhood's future. Workshops draw inspiration and resources from the archive while enabling artists, researchers, performers, cooks, and activists to share skills and cultural activities among generations.

Collected artifacts and created objects are juxtaposed to form a speculative lens viewing the production spaces, classrooms, and a performance space as well as the rest of NYC; through the integration of archive and workshop, community members are empowered to recontextualize these artifacts and traditions with new creations. A distributed network of display spaces overlaps with existing storefronts within and outside of the neighborhood, creating a means to evaluate the intersection of the current Chinatown and an emergent collective vision of the future.

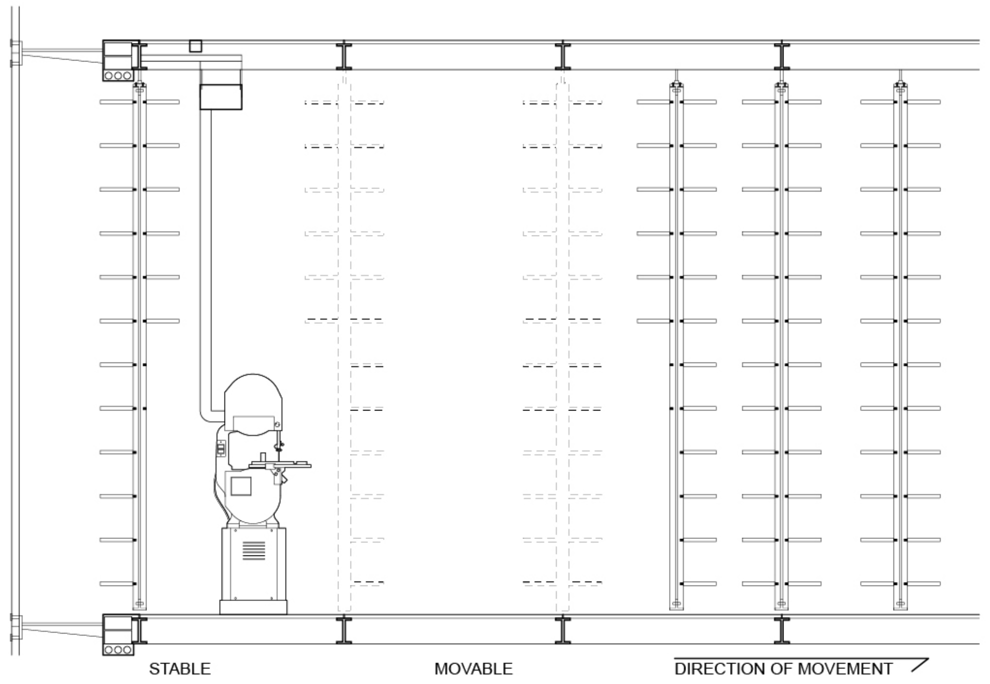


An initial material study used heat to deform a network of mylar tubes and examined how adding acrylic rods helped reduce deformation.

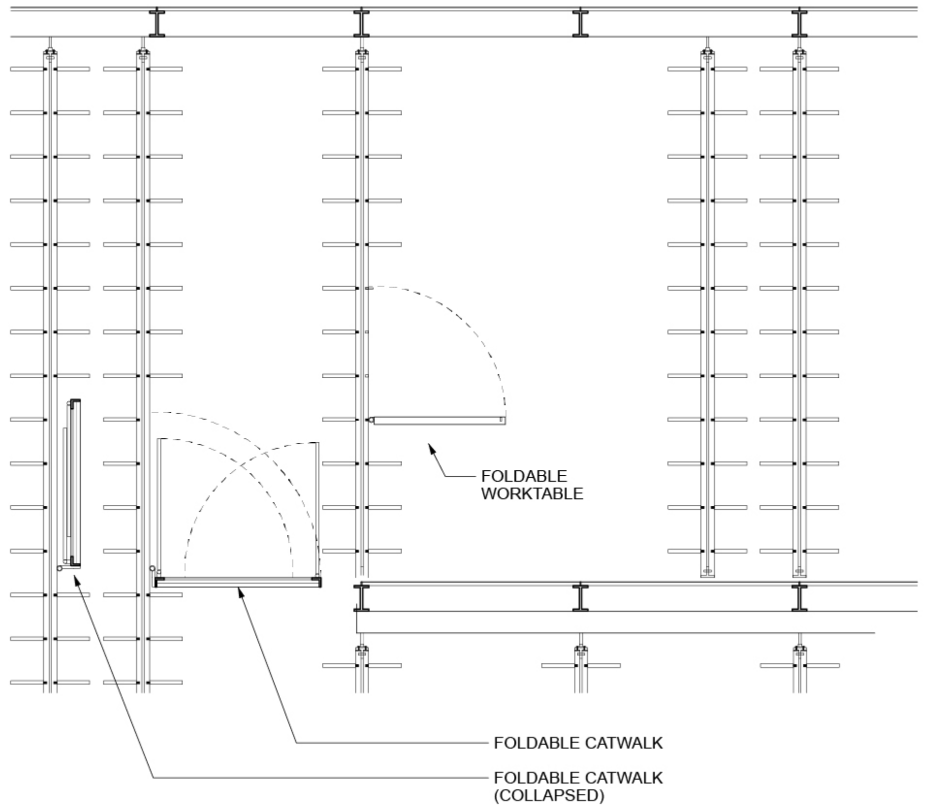


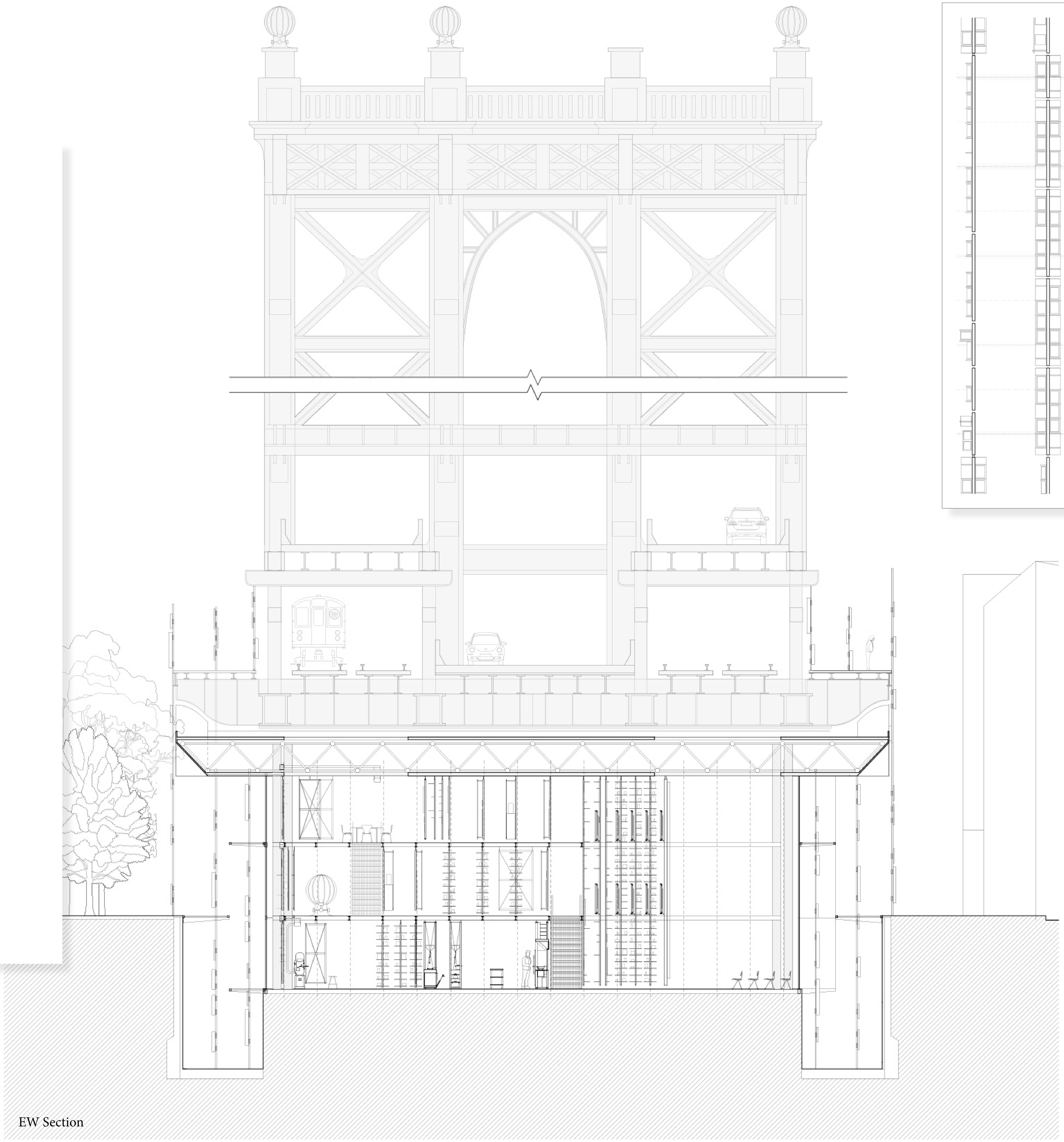
Research map showing positive community anchors vs. negative erosion

HVAC AND PANEL OPERABILITY

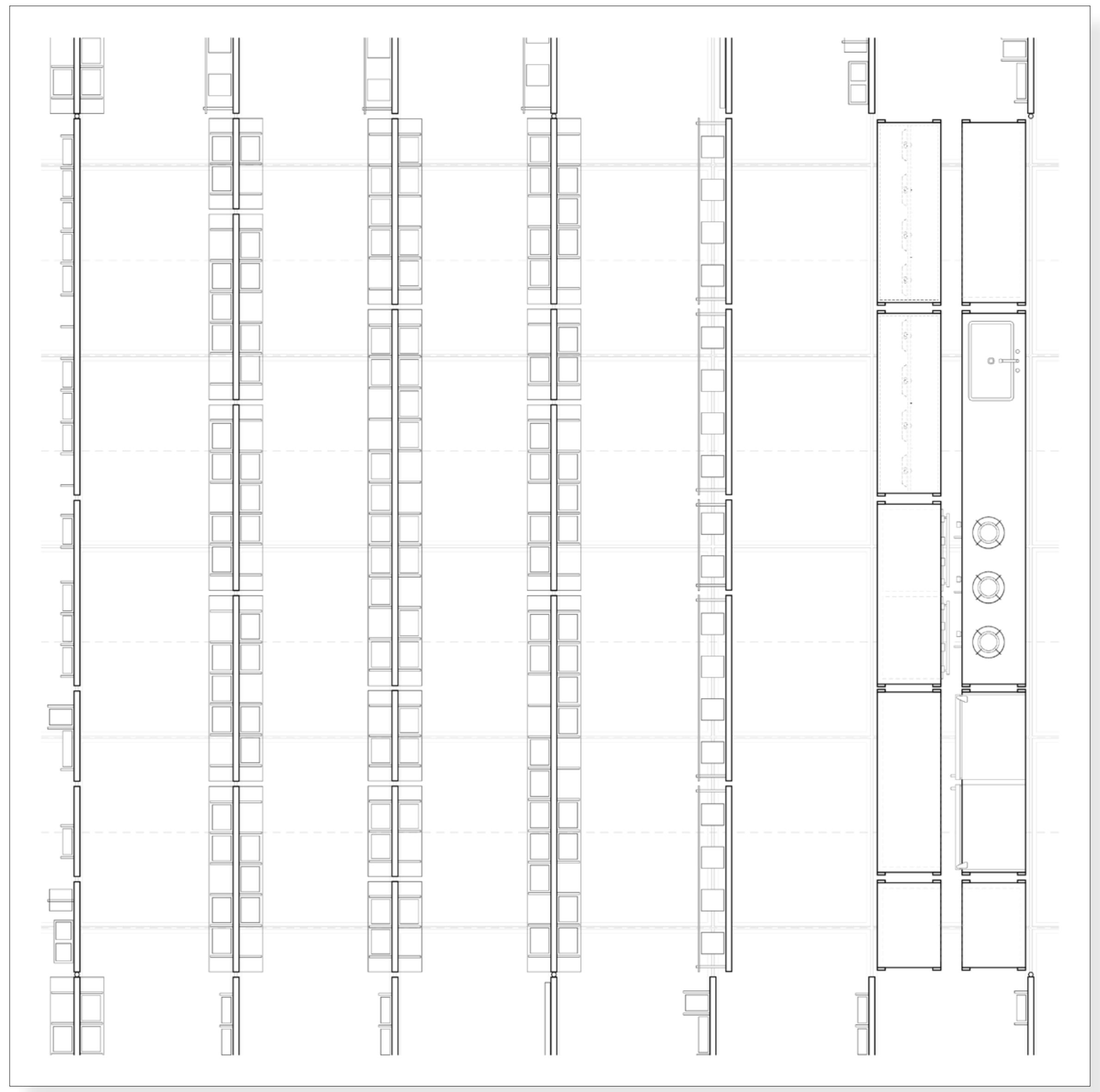


FOLDABLE SURFACES

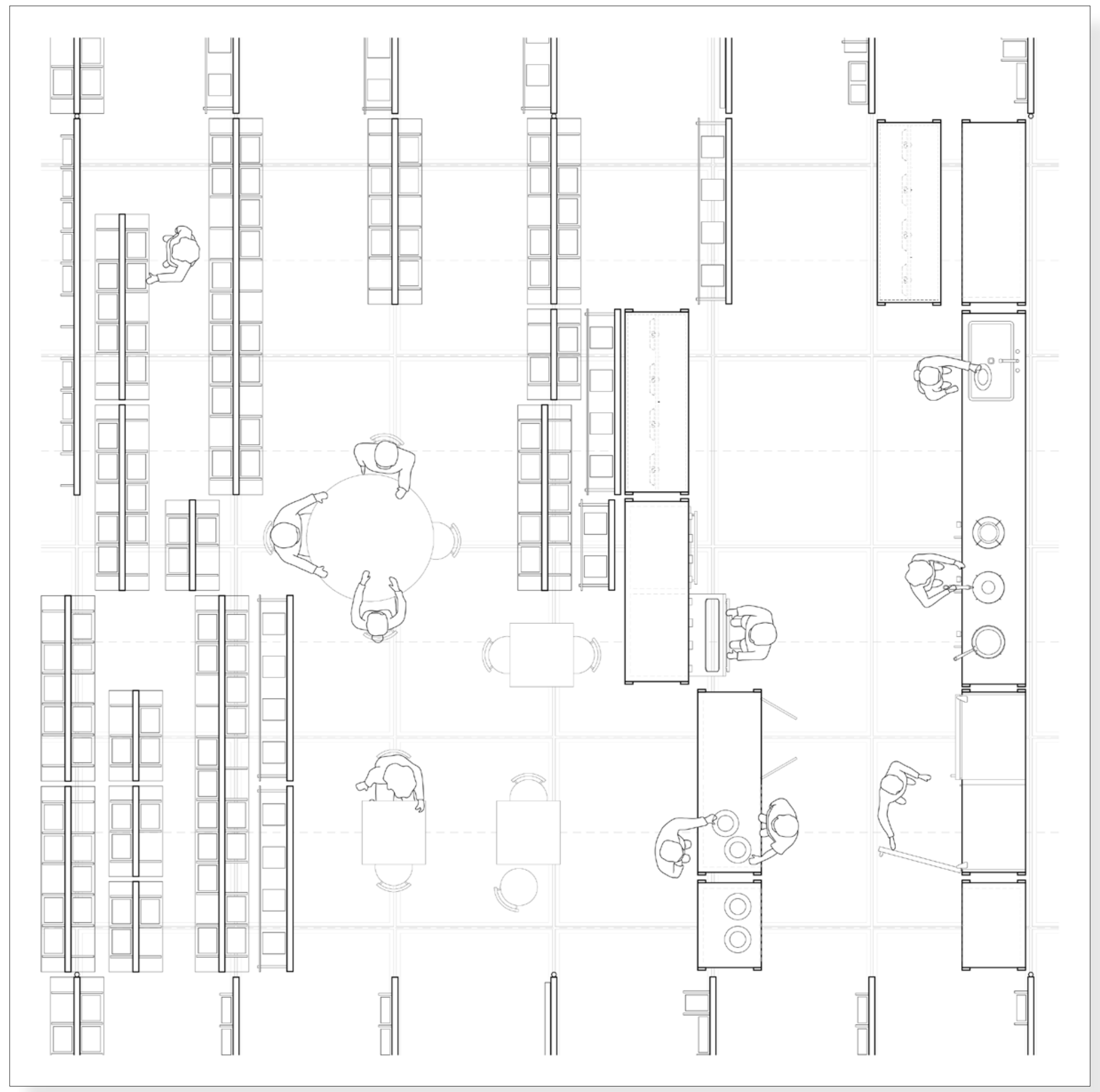




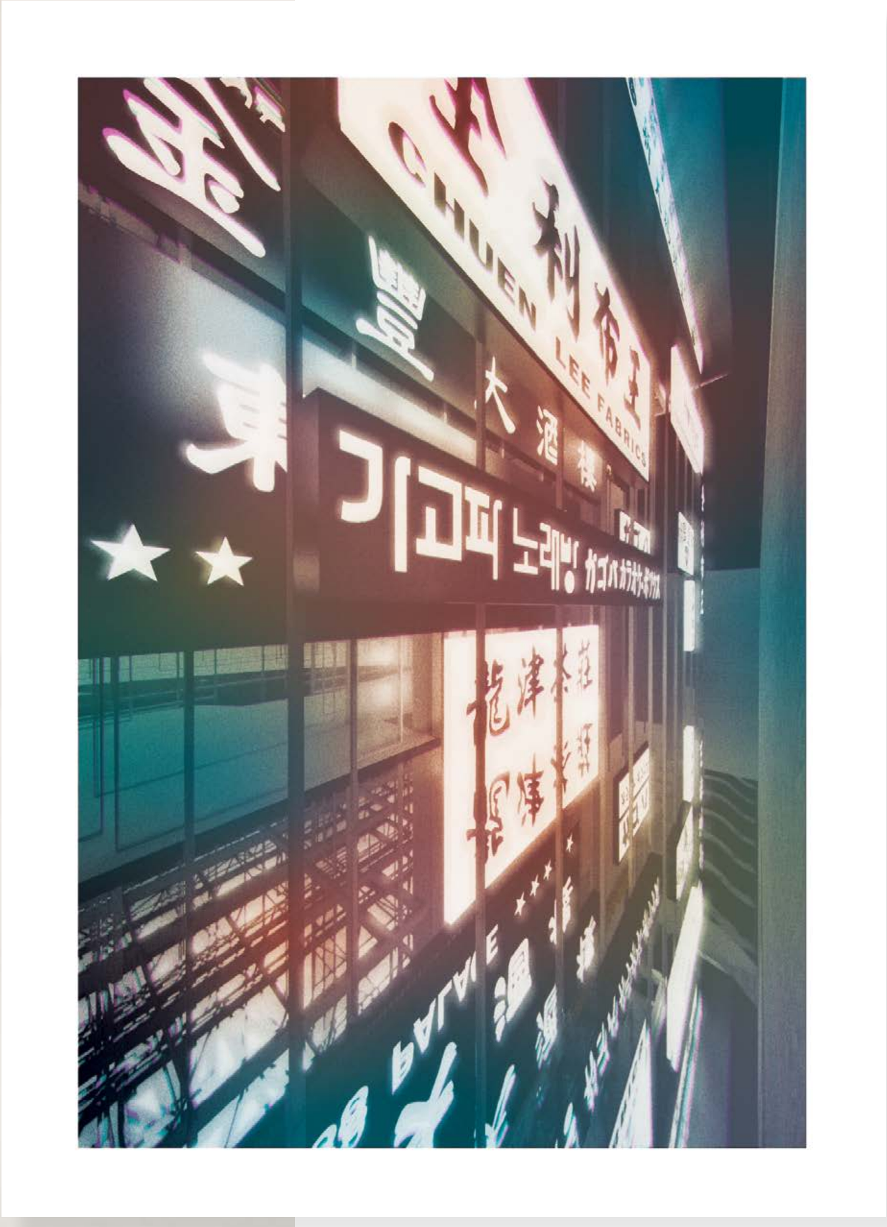
EW Section

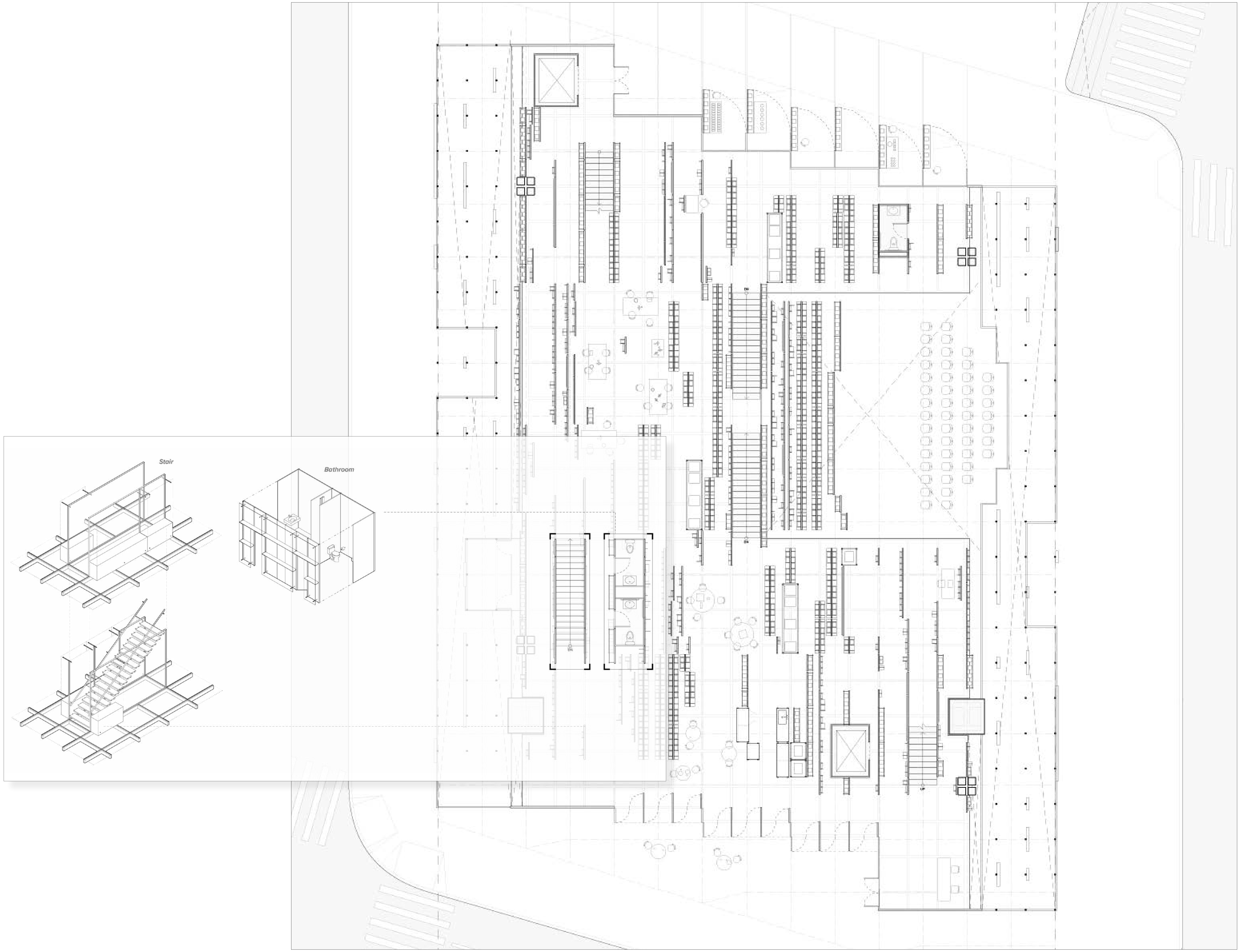


Plan Detail: Fixed Condition

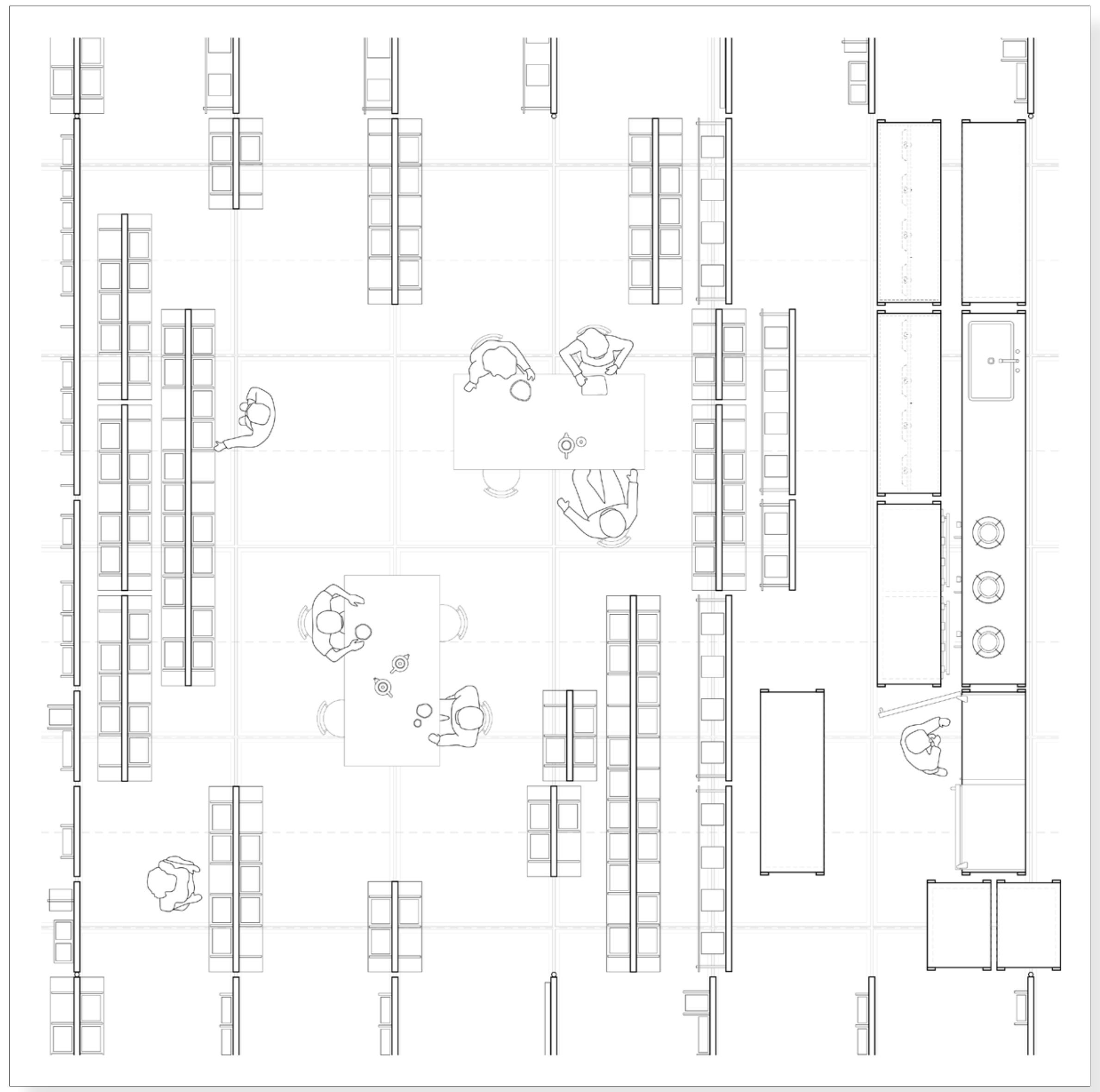


Plan Detail: Expanded Kitchen Condition

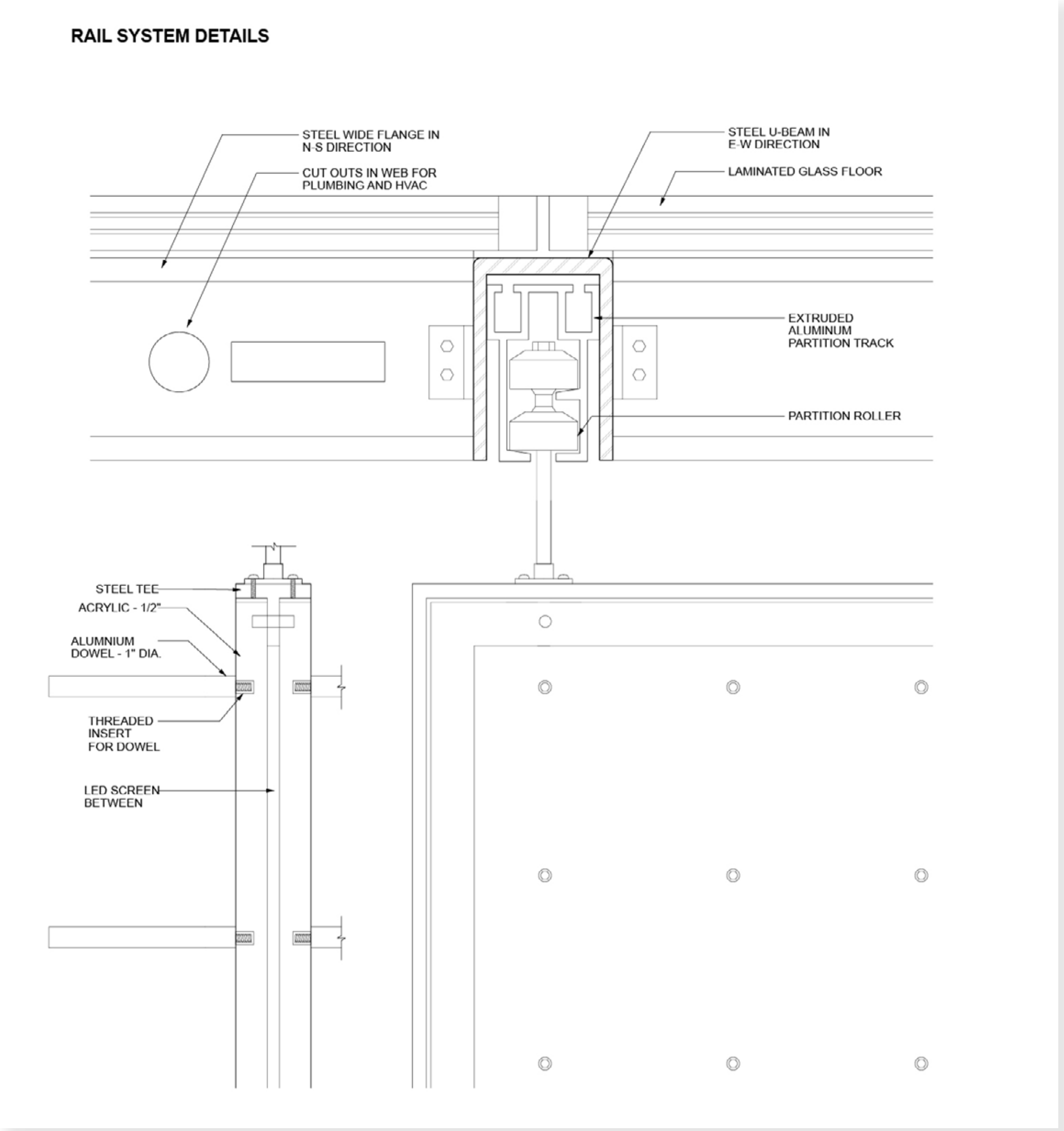


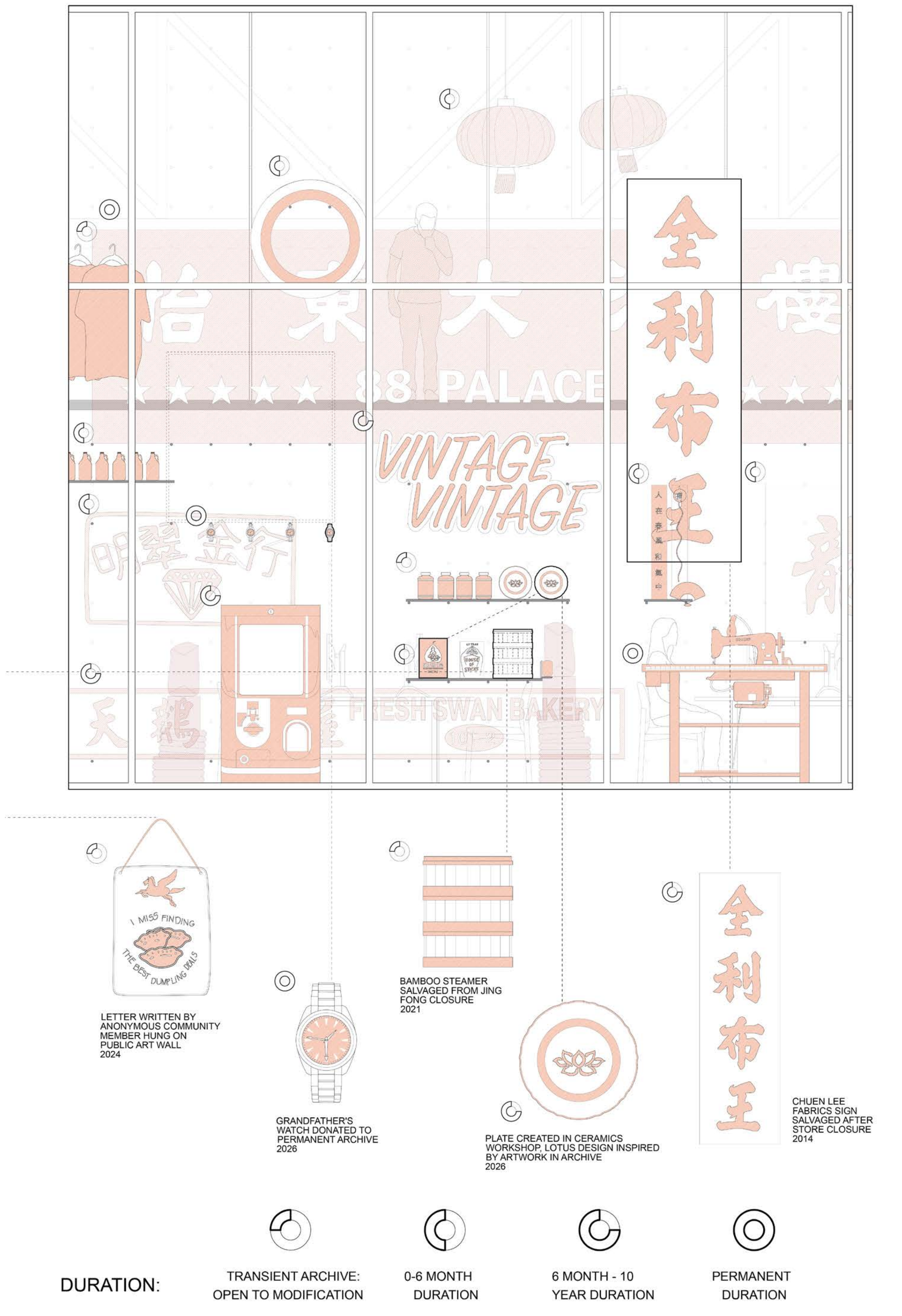


Ground Floor Plan

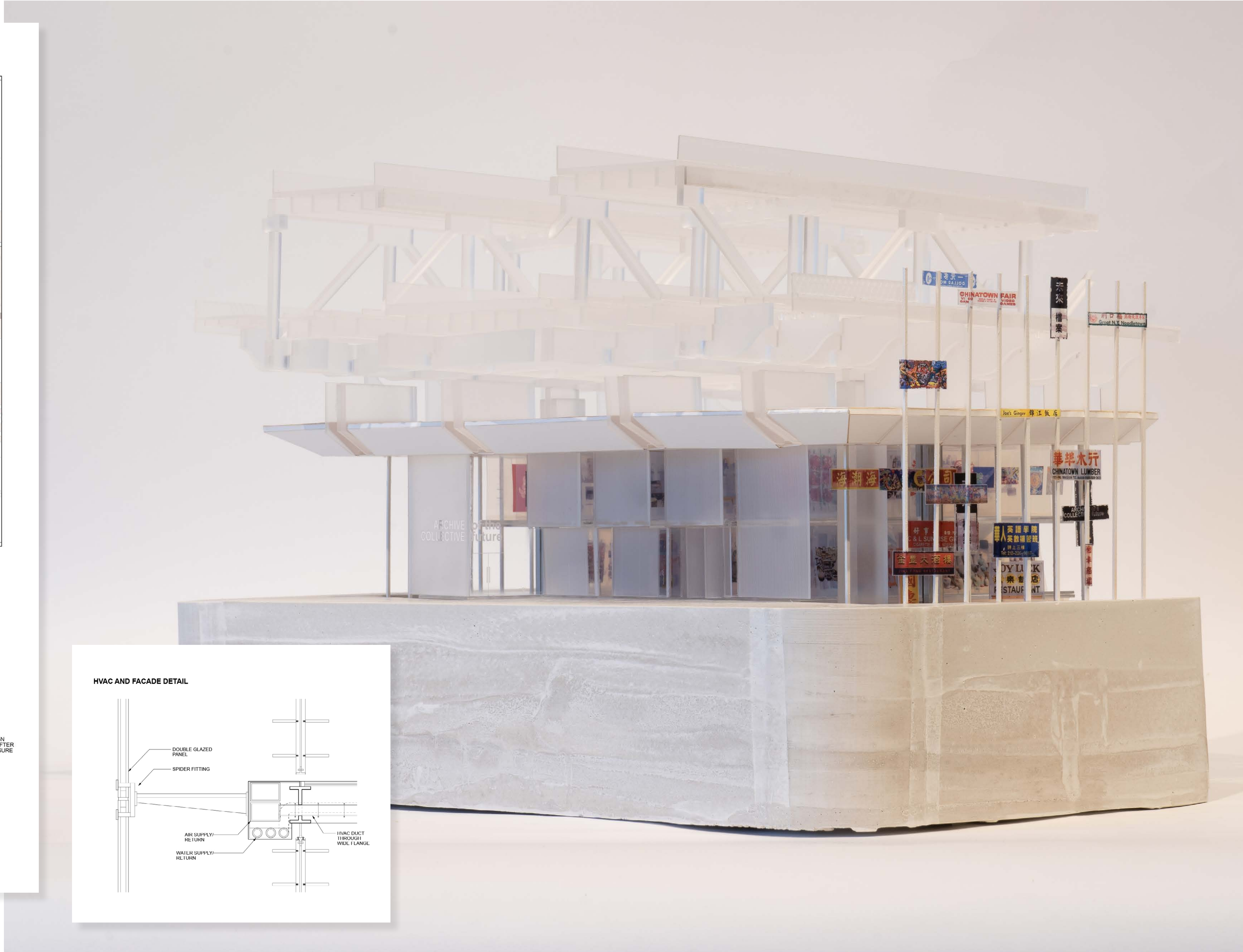


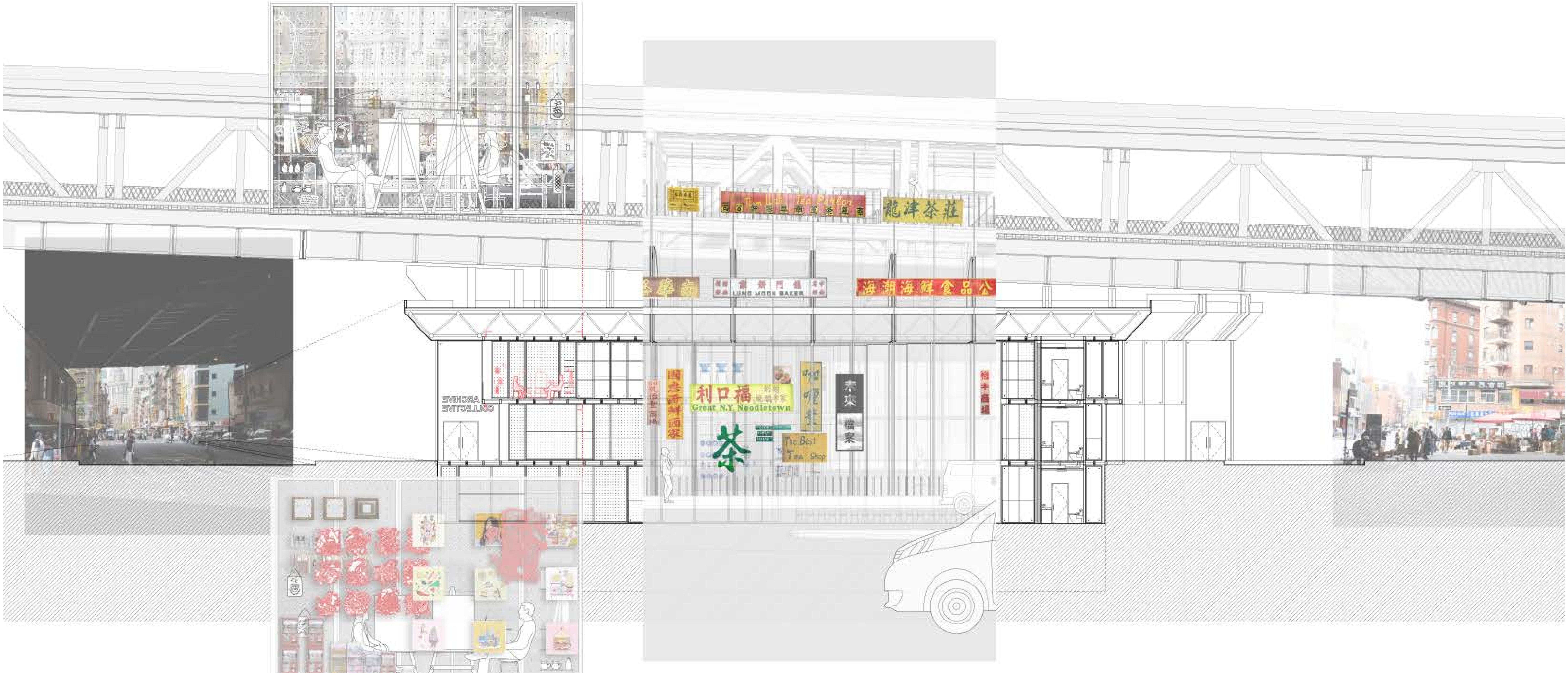
Plan Detail: Expanded Workshop Condition





Facade Detail Showing Object Temporality - Mid Review Iteration





Longitudinal Section

Archive Collective: Embodied CO2e Analysis

Footprint: Carbon & Design | Spring 2023
Critic: David Benjamin

For Footprint: Carbon & Design, I broke down my studio project into its component structural parts and materials to facilitate targeted embodied CO2e comparisons. This analysis revealed which parts of the building contributed the most to the projects' embodied CO2e footprint and therefore which elements should be reconsidered or redesigned. Alternative materials were suggested for different building components.

Material Quantities:

Floor Plate:

Steel: 244 cubic feet @ 222 kg per cubic foot ? 54,168 kg steel
@ 1.55 kgCO2e/kg = 83,960 kgC02e

Glass: 1069 cubic feet @ 71 kg per cubic foot ? 75,899 kg glass
@ 1.44 kgCO2e/kg ? 109,295 kgCO2e

Total: 193,255 kgCO2e

Structural Columns:

Steel: 248 cubic feet @ 222 kg per cubic foot ? 55,056 kg steel
@ 1.55 kgCO2e/kg = 85,337 kgC02e

Concrete Fill(?): 499 cubic feet @ 68 kg per cubic foot ? 33,932 kg concrete
@ 1.66 kgCO2e/kg = 56,327 kgC02e

Total: 141,664 kgCO2e

Space Frame:

Steel: 669 cubic feet @ 222 kg per cubic foot ? 148,518 kg steel
@ 1.55 kgCO2e/kg = 230,203 kgC02e

Total: 230,203 kgC02e

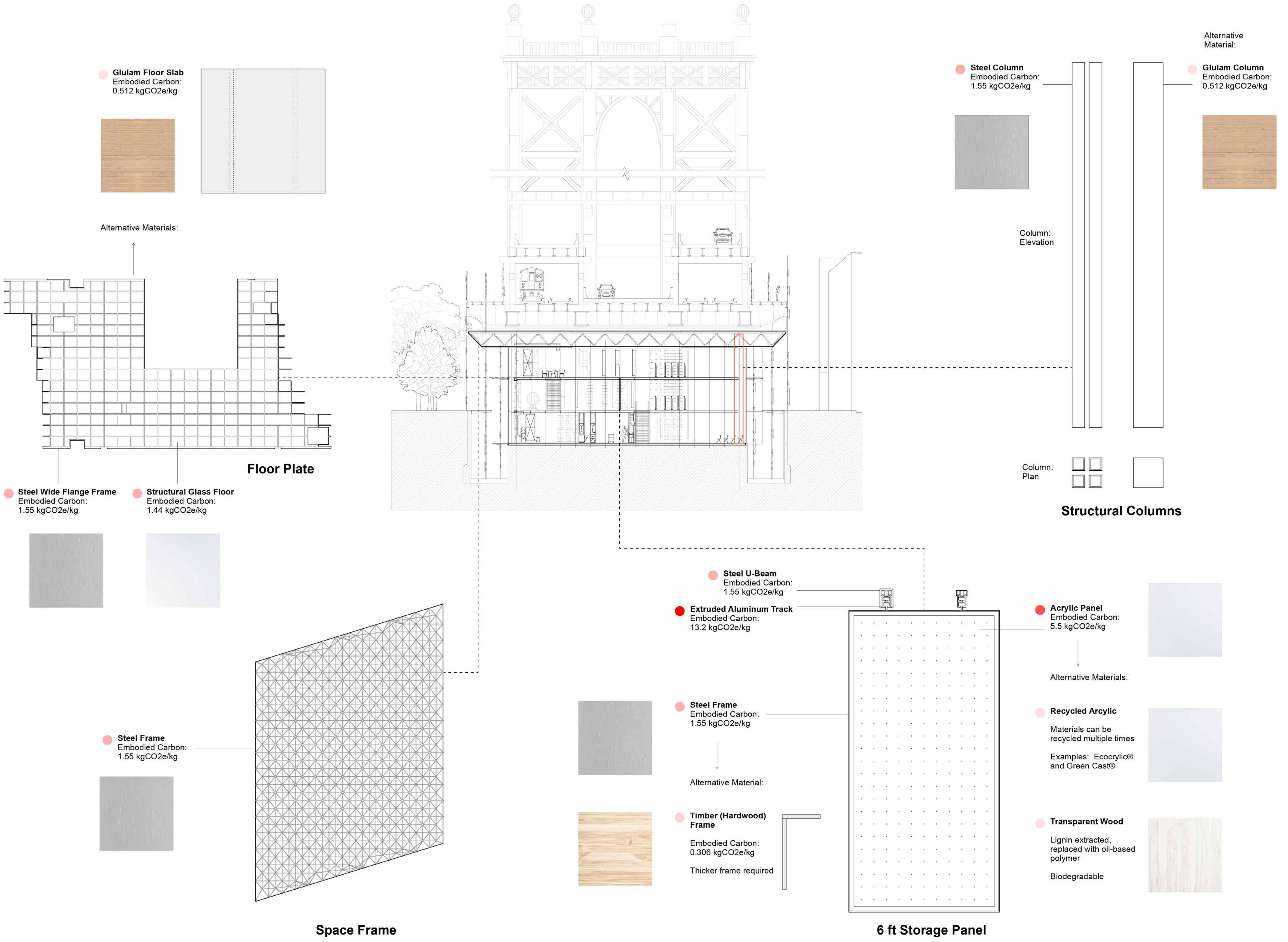
Storage Panel (per panel):

Steel: 0.47 cubic feet @ 222 kg per cubic foot ? 104 kg steel
@ 1.55 kgCO2e/kg = 162 kgC02e

Acrylic / Plexiglass: 5.95 cubic feet @ 33 kg per cubic foot ? 197 kg plexiglass
@ 5.5 kgCO2e/kg = 1,082 kgCO2e

Total per panel: 1,244
For approx. 864 panels,

Total: 1,074,816 kgCO2e



De-Mining Tomkins Cove

Adv. V Studio | Fall 2022
Critic: Lindy Roy

De-Mining Tomkins Cove transforms a defunct quarry into a site for soil reconstruction and remediation. This proposal draws from research into the geological history of the site, a landscape where human activity in the past century has cut into 460 million years of limestone strata. Responding to a proposed plan by the site's owner to dump construction and demolition (C&D) waste into the quarry, I quantified and visualized that waste as new strata (right). This plan to turn the quarry first into a C&D dump and later into a green space raises environmental concerns and has been criticized by Riverkeeper as "a landfill masquerading as a park."

My project instead explores new ways of thinking about waste disposal by using materials such as C&D wood waste, waste soils, and gypsum to create new soil mixtures. Waste concretes and aggregates form new pathways around the site and retaining walls that hold back the soil. Different zones have been identified across the site to test different soil mixtures and remediation methods, such as using fungi (mycoremediation) and plants (phytoremediation) to filter toxins from the soil, and existing site infrastructure is adapted to move people and materials around the site.

A new structure, created with recycled concrete, provides space to process waste that arrives on the site from a reused conveyor and barge landing. In the future, when the quarry pond fills, the site will convert into a public park and the structure will bring people into the site. A long staircase cutting into the limestone will provide access and bring visitors into direct contact with the site's geology and strata.

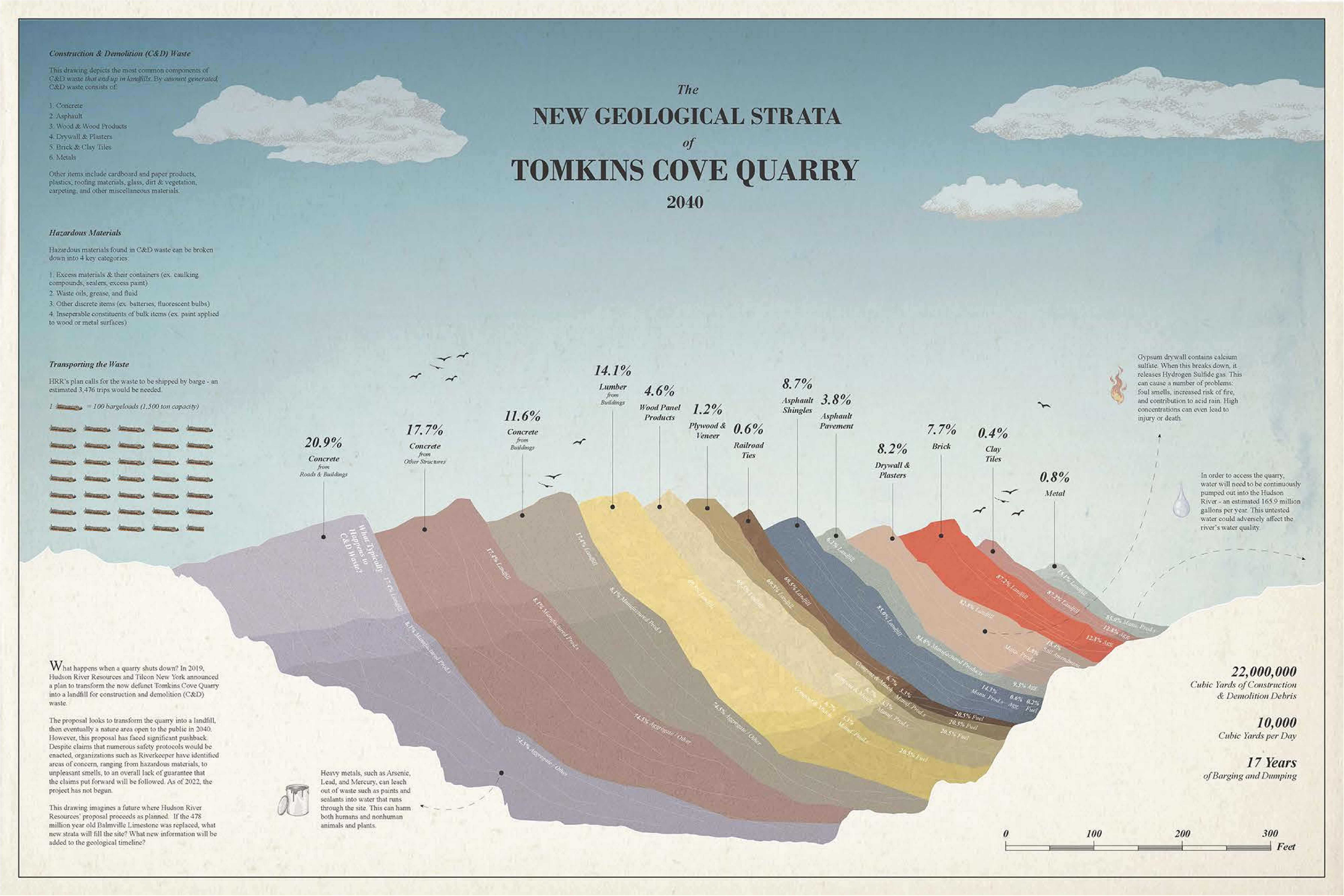
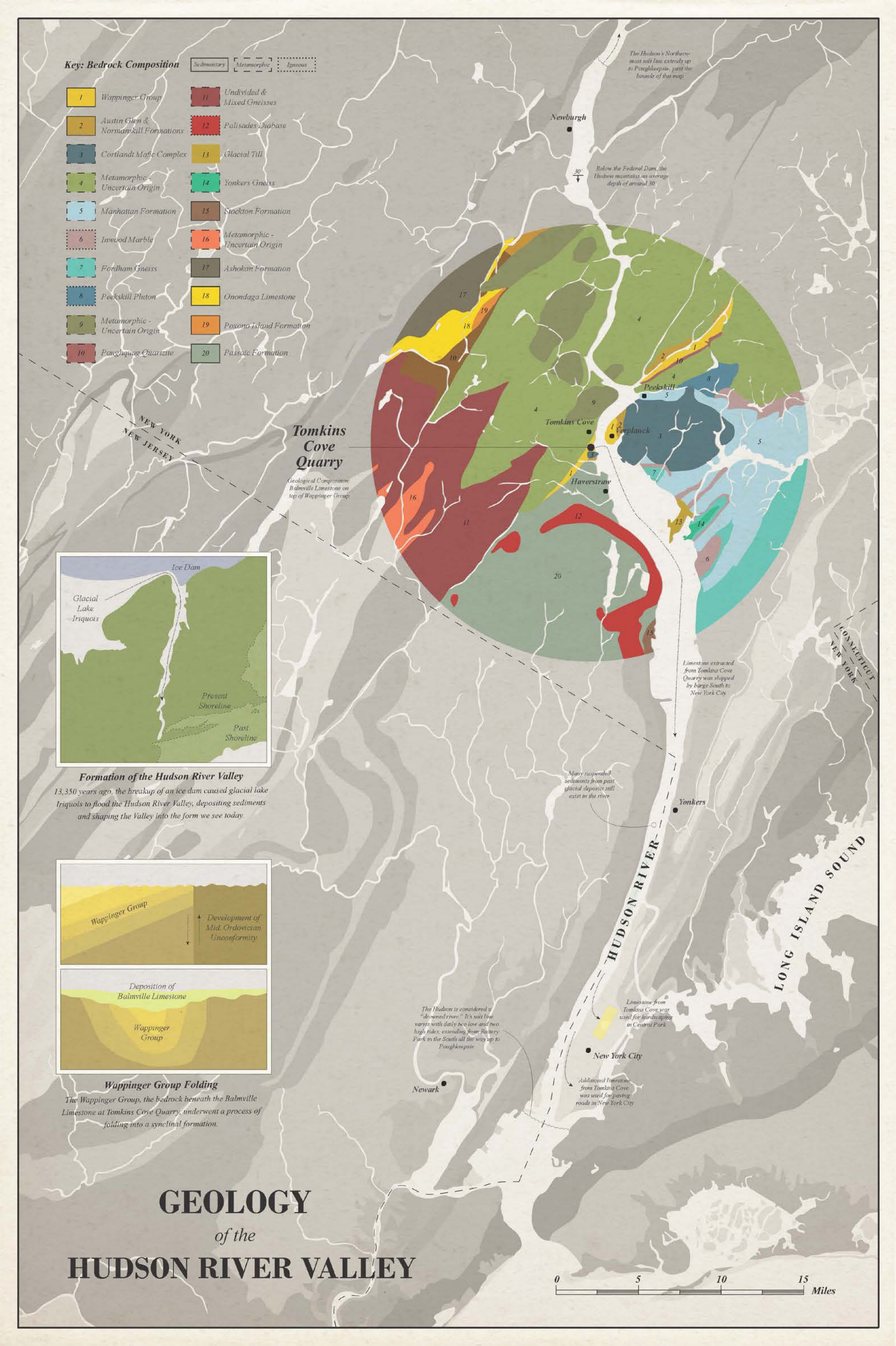
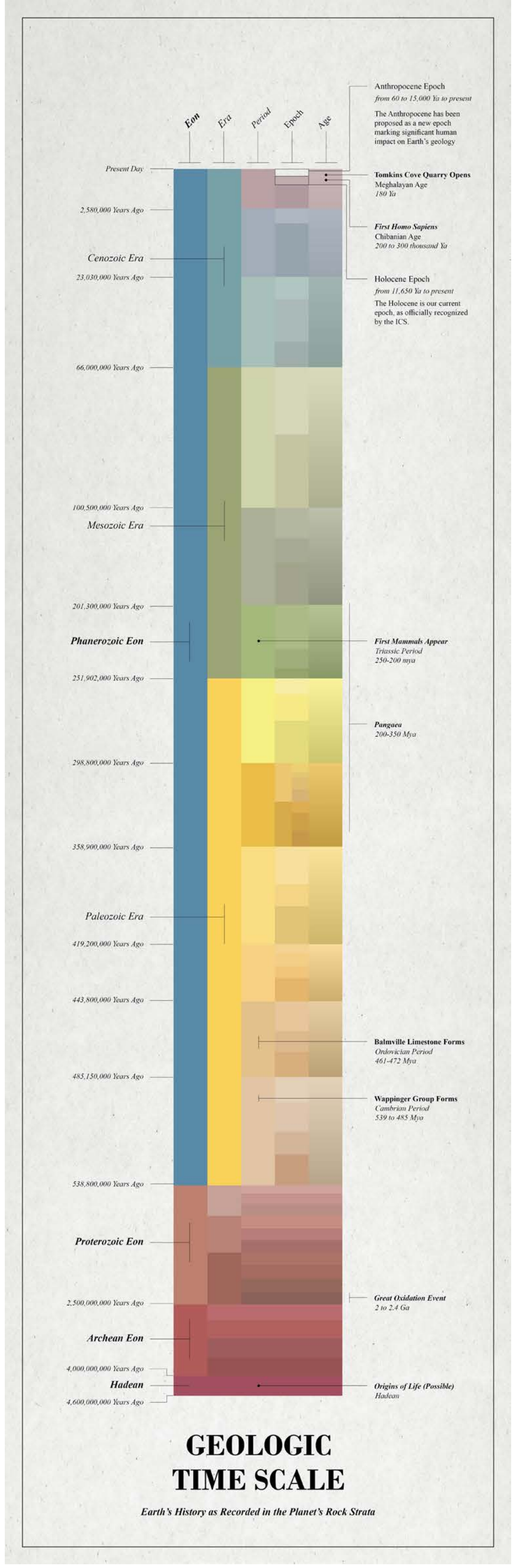
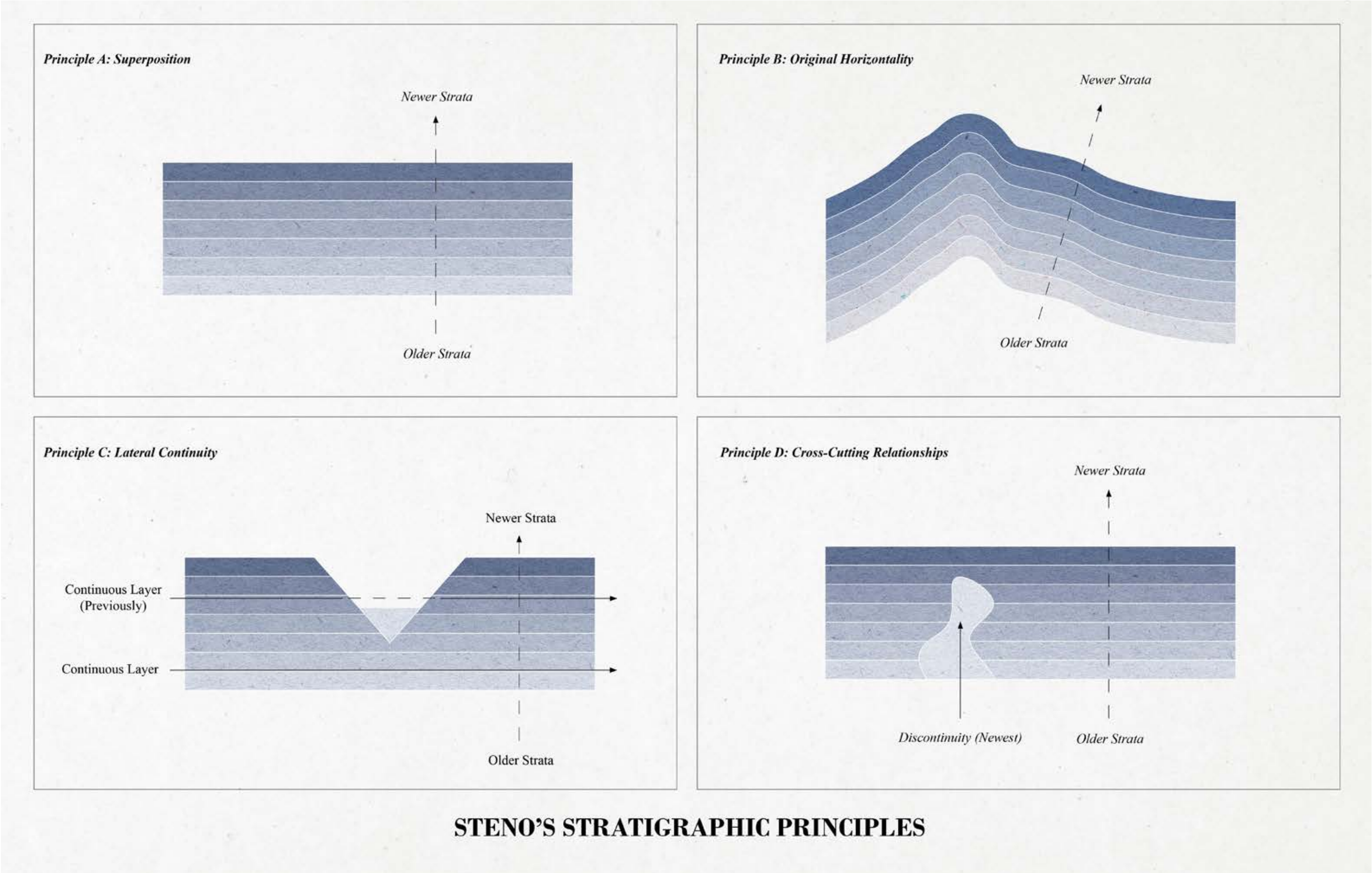
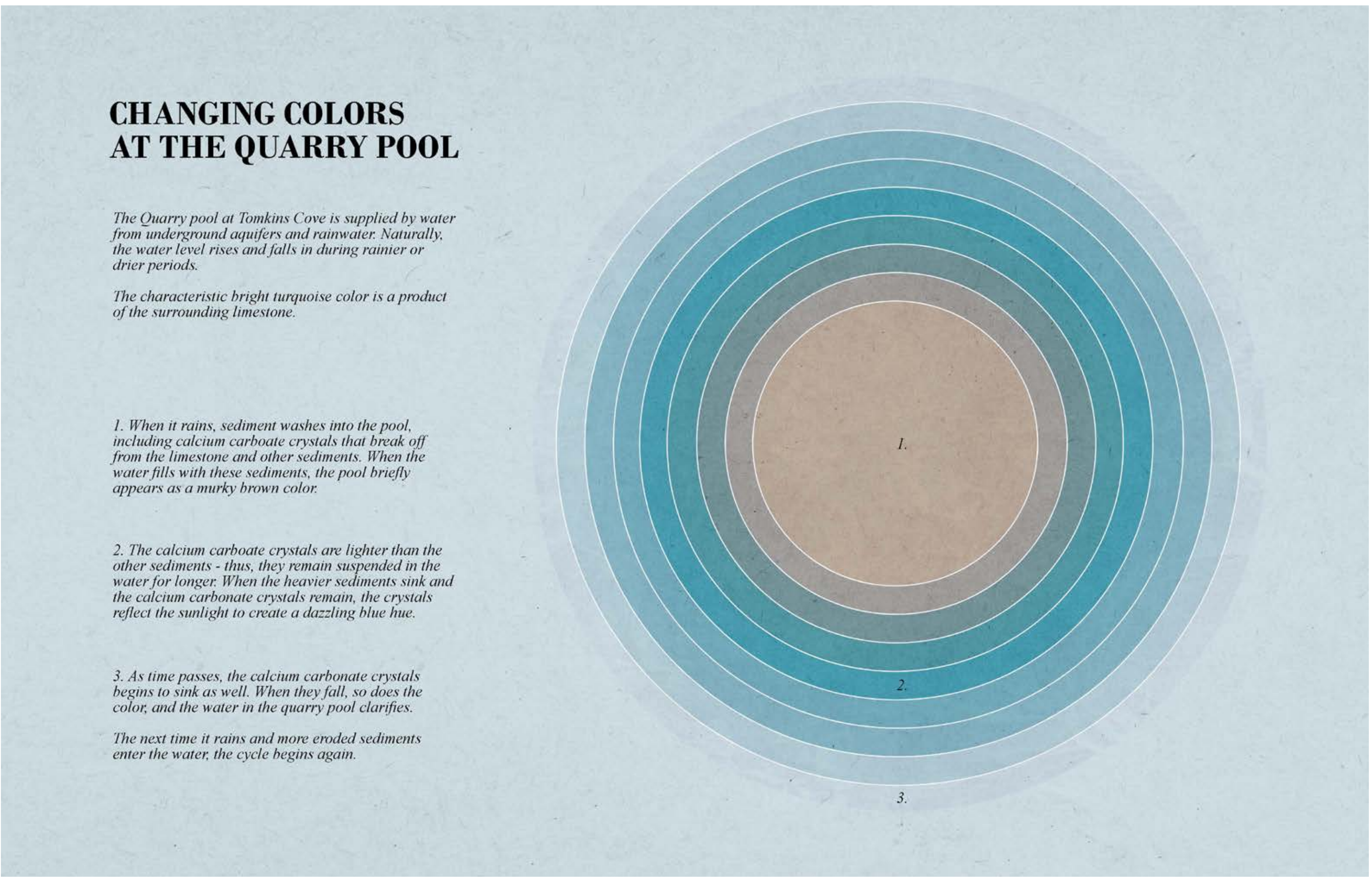


Diagram imagining Tomkins Cove Quarry filled with C&D Waste

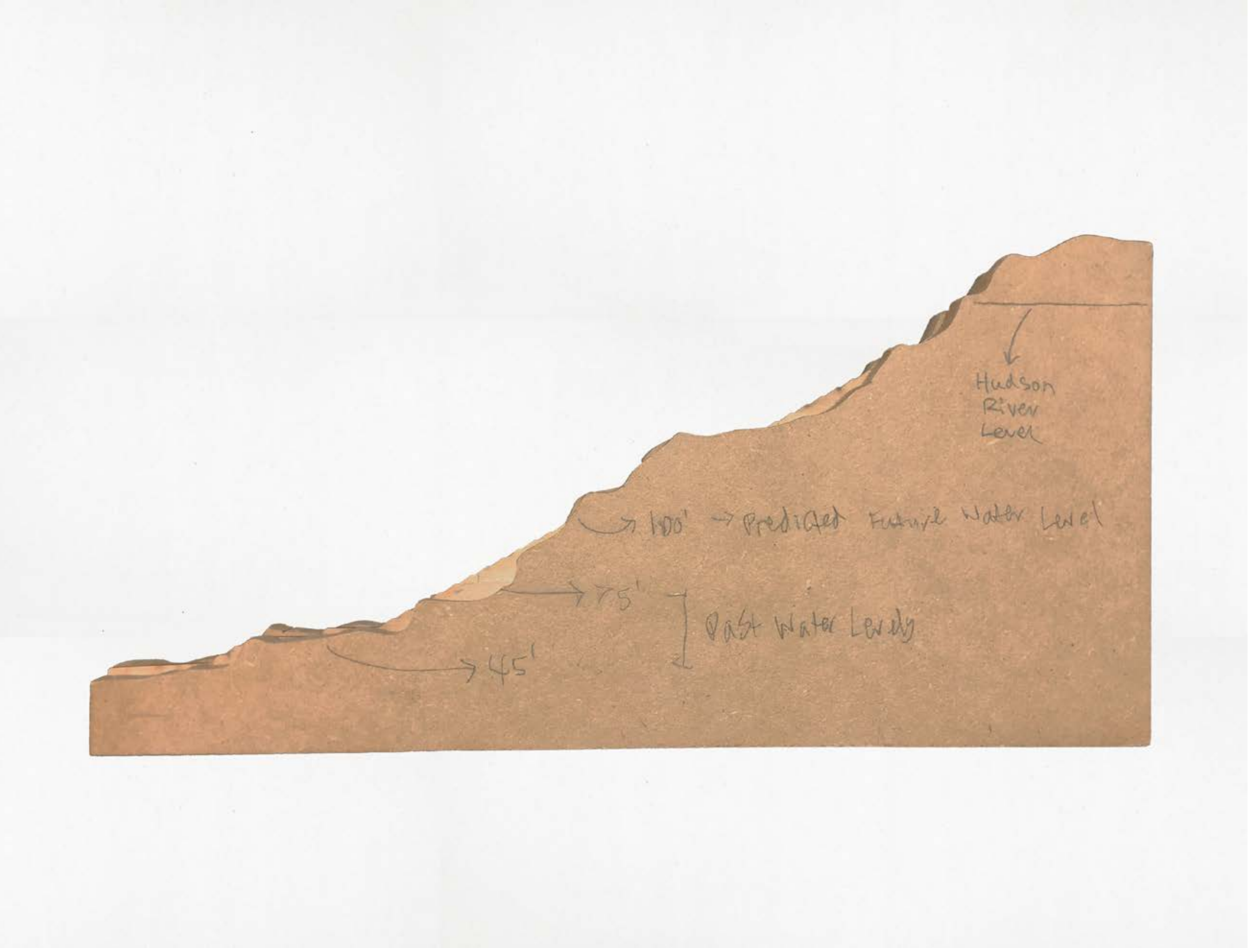








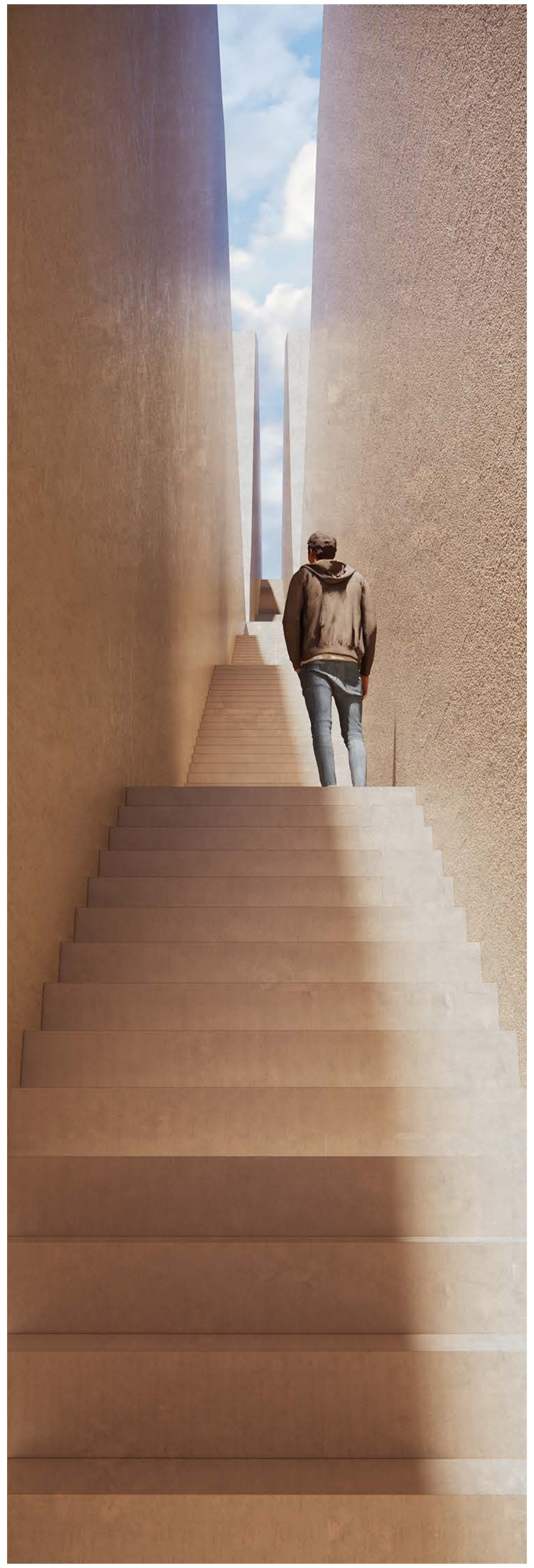
Research Diagrams: Site Analysis & Geologic History



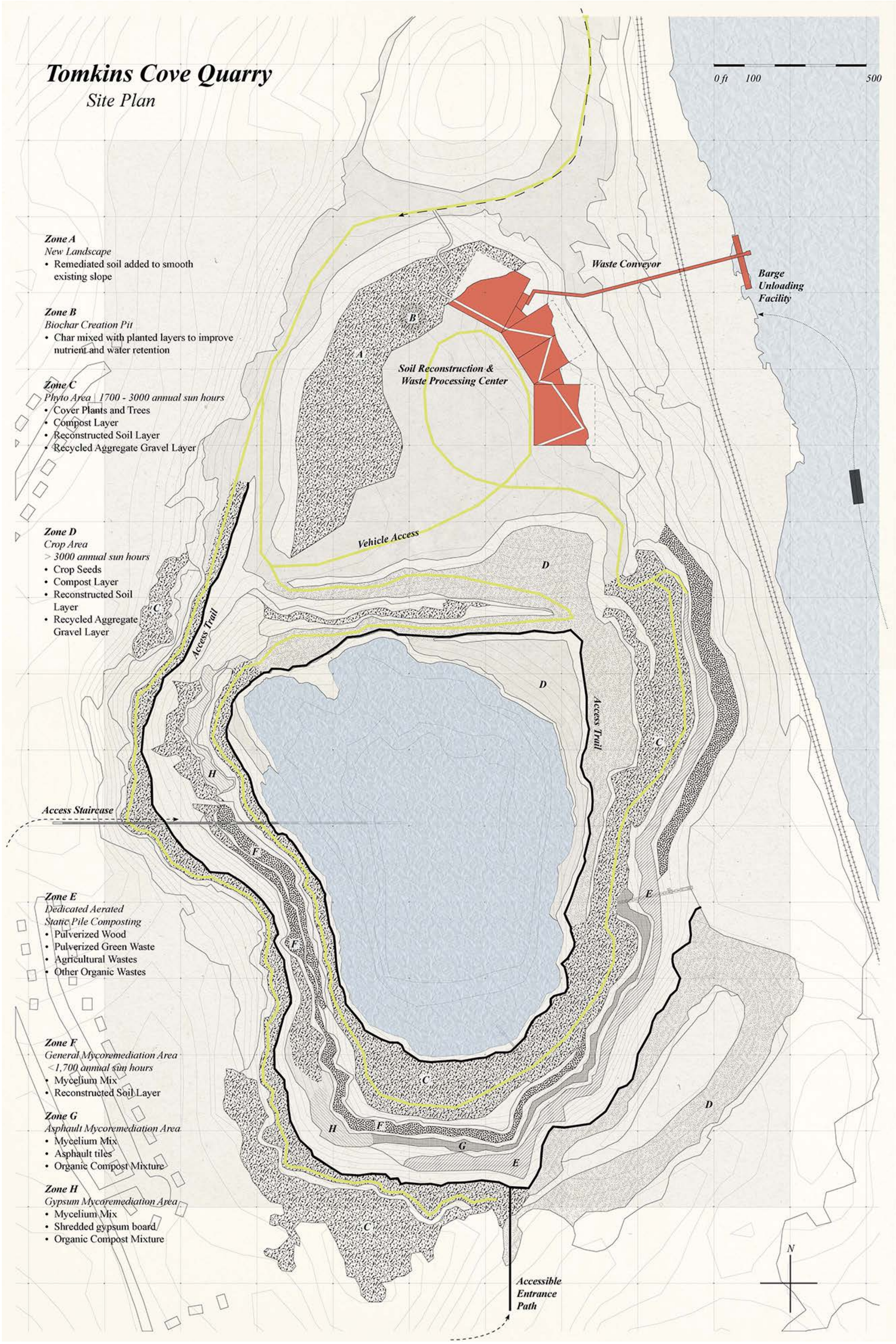
This exploratory site model imagines four staircases descending into the quarry from the upper edge to the bottom. On the sides, annotations mark elevation change, rock age, step count, water level, and other data. *Each step descends over 700,000 years into geologic history.*

Soil Reconstruction & Remediation Diagram

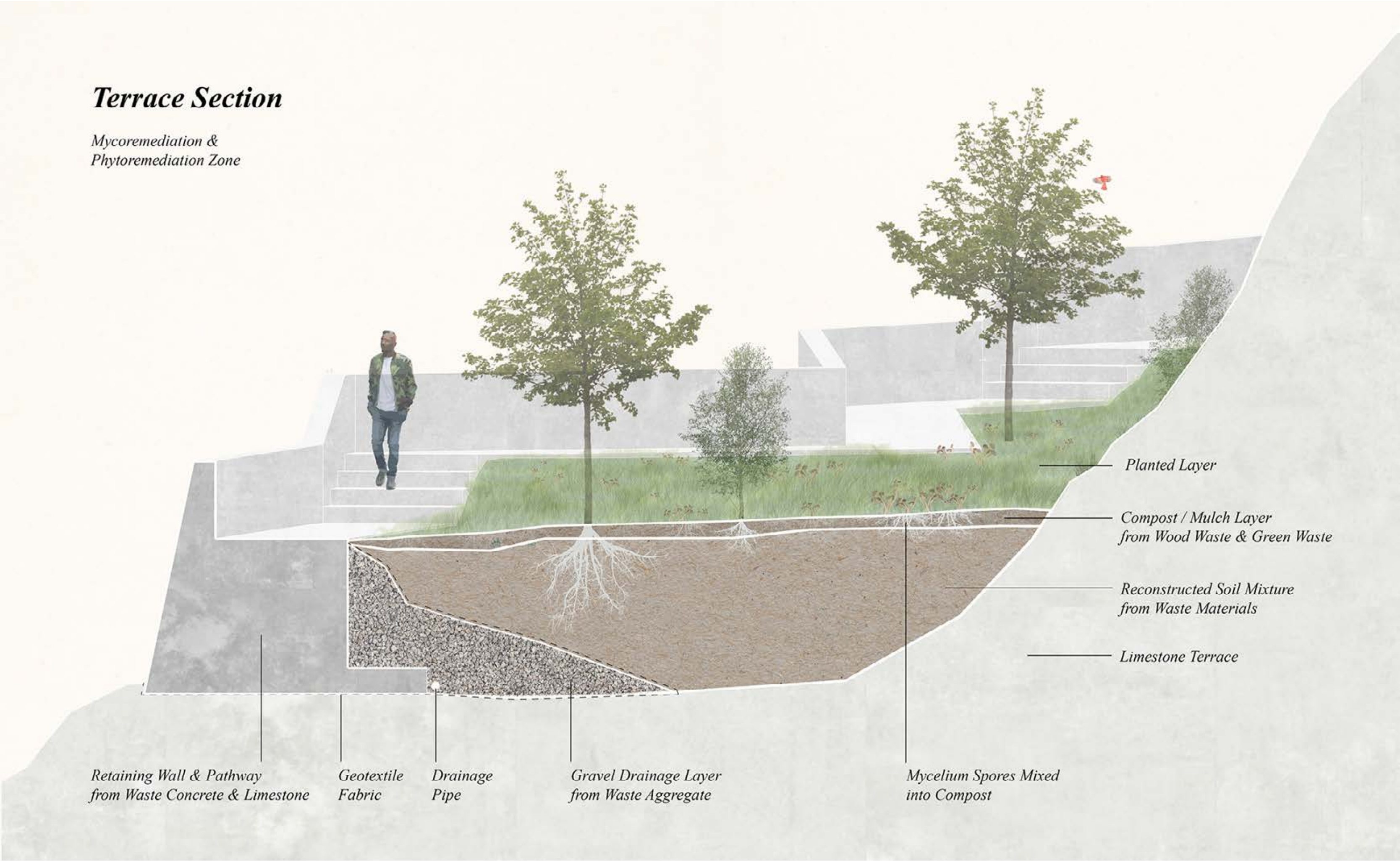
Axonometric View



Site Access Staircase



Site Plan



Section: Phyto/Mycoremediation Zone

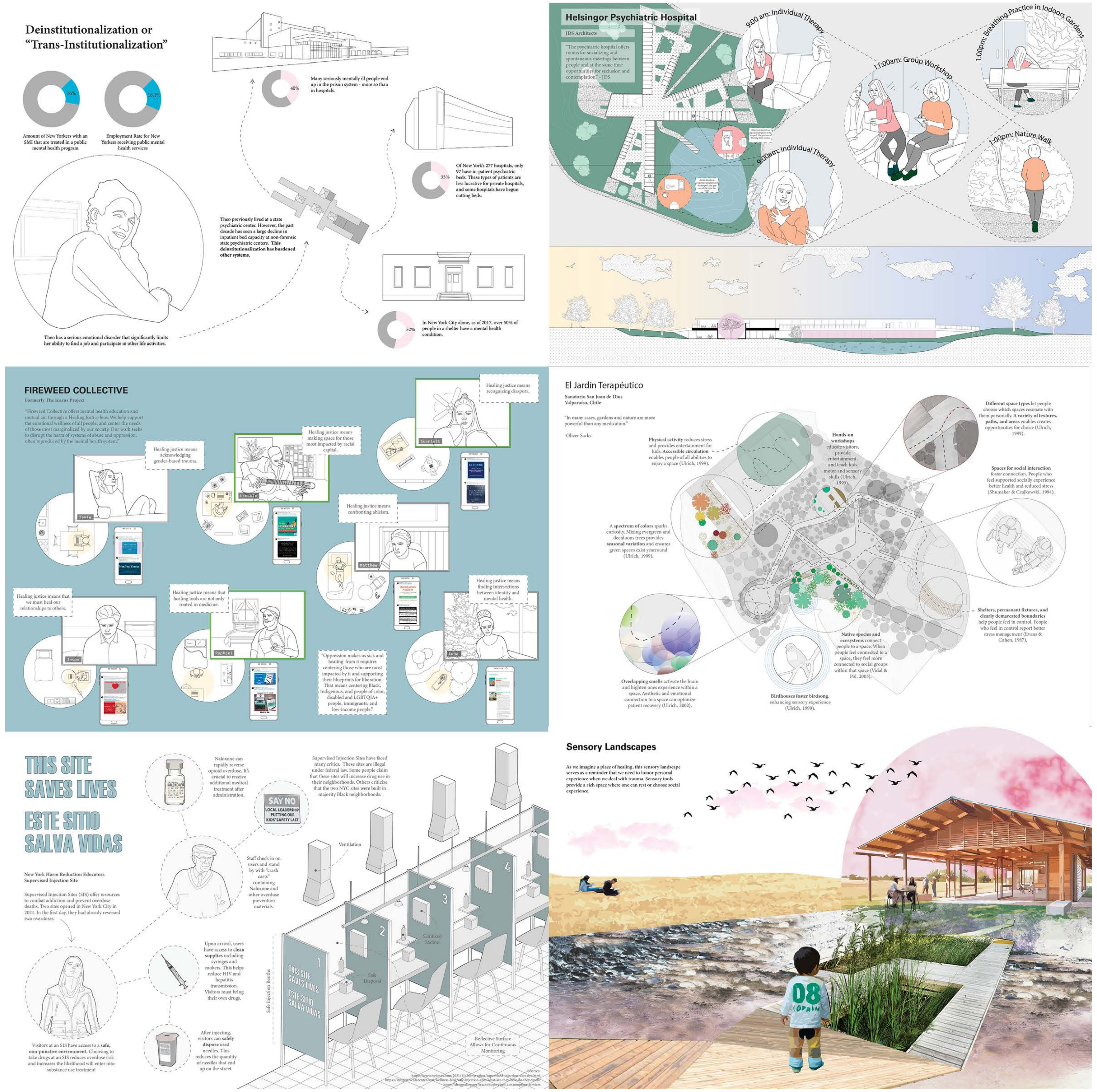
View from Trail to Entrance Structure / Park

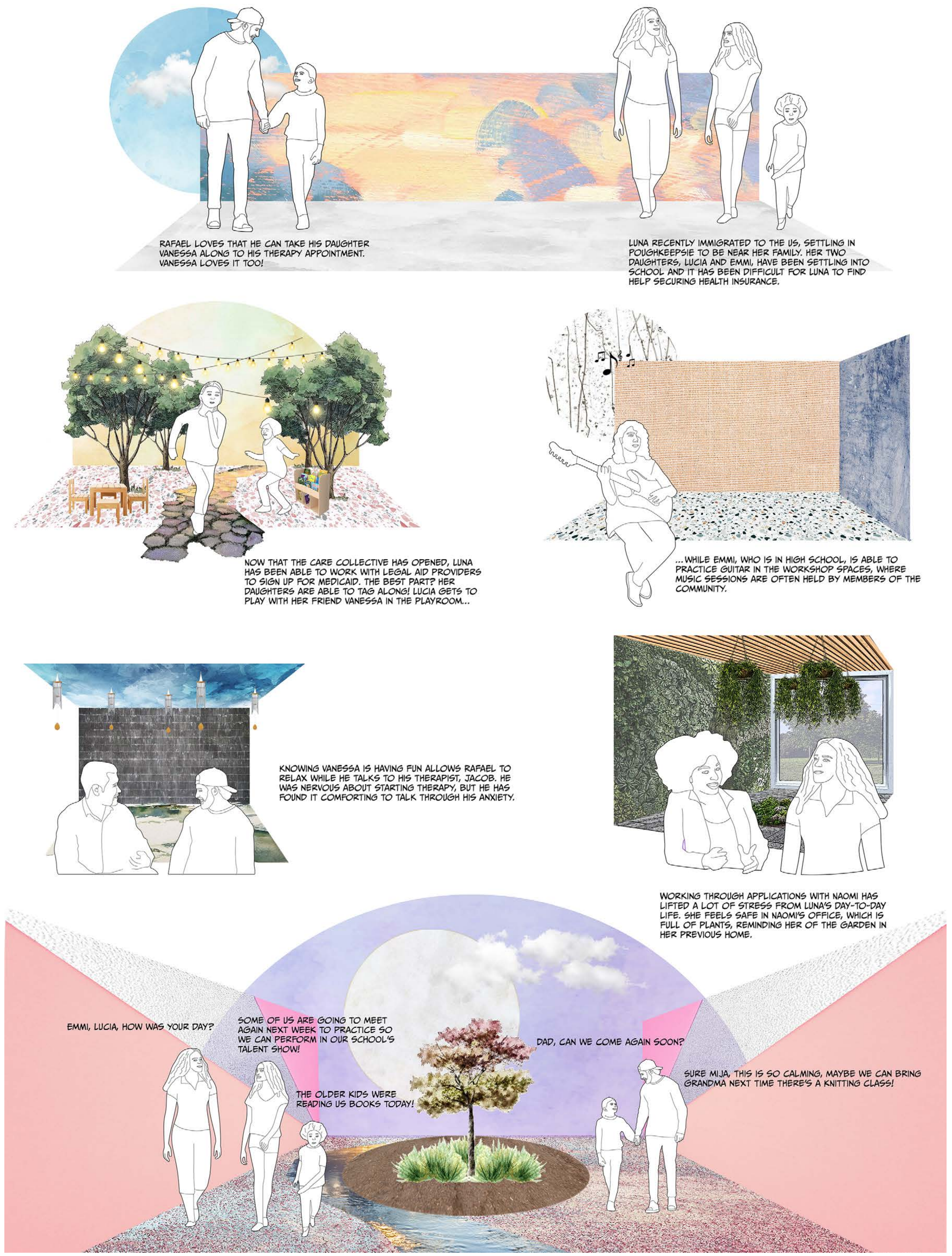
The Care Collective

Adv. IV Studio | Spring 2022
Critic: Bryony Roberts
With Sam Velasquez

The Care Collective developed from the idea that our senses never turn off and continue to absorb stimuli that can trigger trauma. Combined with the knowledge that our site in Poughkeepsie had a high percentage of families living below the poverty line and a high percentage of immigrant communities, we wanted to address systemic barriers that prevent people from accessing care. Our center's programming, in addition to medical care, provides childcare, legal aid, job training, and food access.

Four nodes of massing carve and cantilever across the landscape – these nodes include a community center, a healthcare center, in-patient housing, and a cafe with an attached greenhouse. All of these spaces surround and encourage interaction with a healing garden. The form of the buildings invites the landscape in, puncturing the buildings with pockets of greenery. Ultimately, this proposal and the programming imagine how healing can move beyond typical forms of medical care to create a new, equitable model of wellness.





Research into contemporary approaches to mental wellness treatment shaped our model of care and the experiences we created in our project

Site Plan: Program Distributed around Central Garden

Sensory Garden

Upper Floor Plan

Site Axon

Medical Building Section

Medical Building - Study Model

Inpatient Care Building

Childcare Building

Site Section

Crossroads Housing

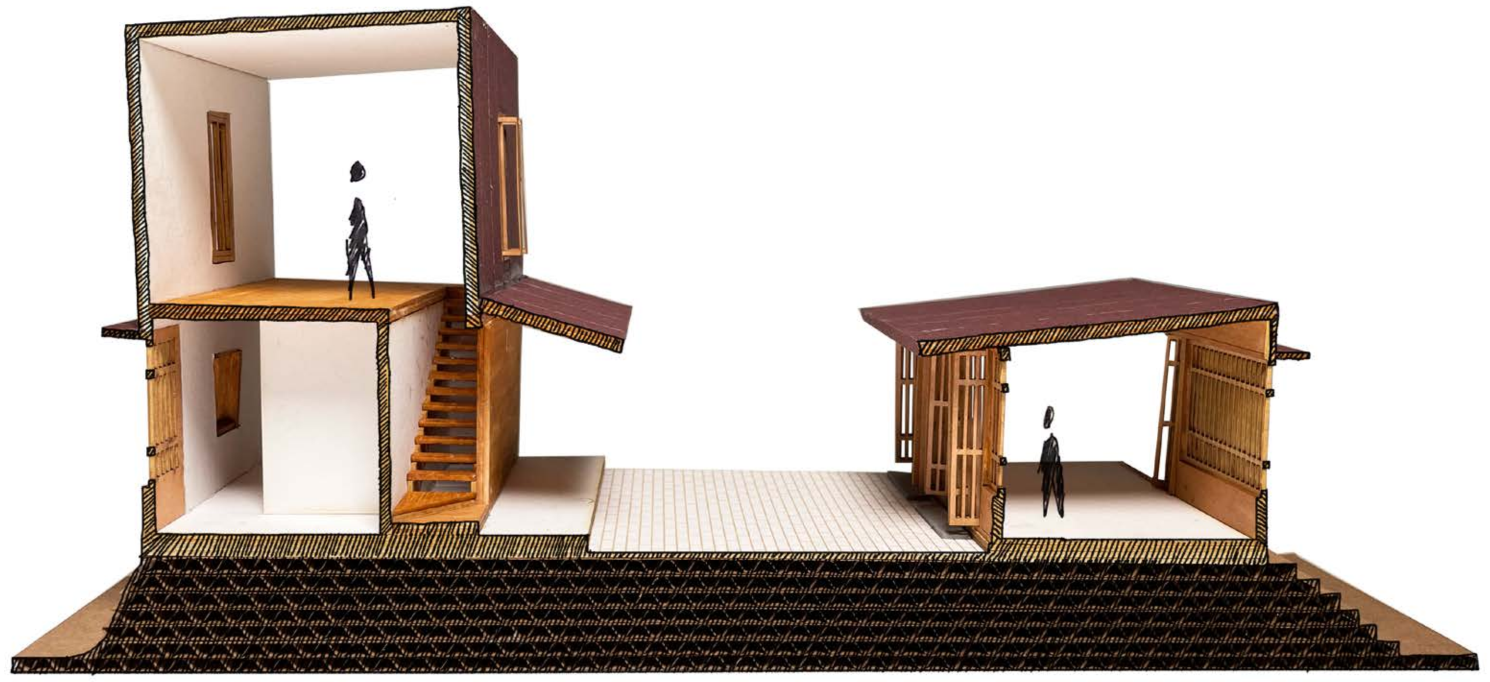
Core III Studio | Fall 2021
Critic: Erica Goetz
With Jordan Trager

The Crossroads Housing synthesizes existing housing typologies to create a new form of multigenerational living. Vertical layers of units, circulation, and utility cores that house risers for geo-source energy and plumbing create community at different scales. All the units face a lush, communal courtyard, and many units are aggregated in multigenerational clusters. Vertical stacks of units share semi-private rooftop spaces.

The building's facade creates layers of operability. Operable sliding windows and shutters allow occupants to control their own thermal and visual comfort, and a floor-through scheme enables cross ventilation. In the winter, geo-sourced heat radiates from the thermal core walls.

The building is mostly made of simple materials to produce a realistic scheme. Short spans between cores allow a structure of CMU blocks, c-joists, and sheet material for most of the building. Within the multigenerational clusters, the dining area sits across a public corridor in sunny, double height space that encourages interaction. Adjustable curtains and windows let residents control their privacy and comfort. Each unit abuts one thermal core and one circulation core. These circulation cores house semi-public staircases that connect to units above and below the dining floor.

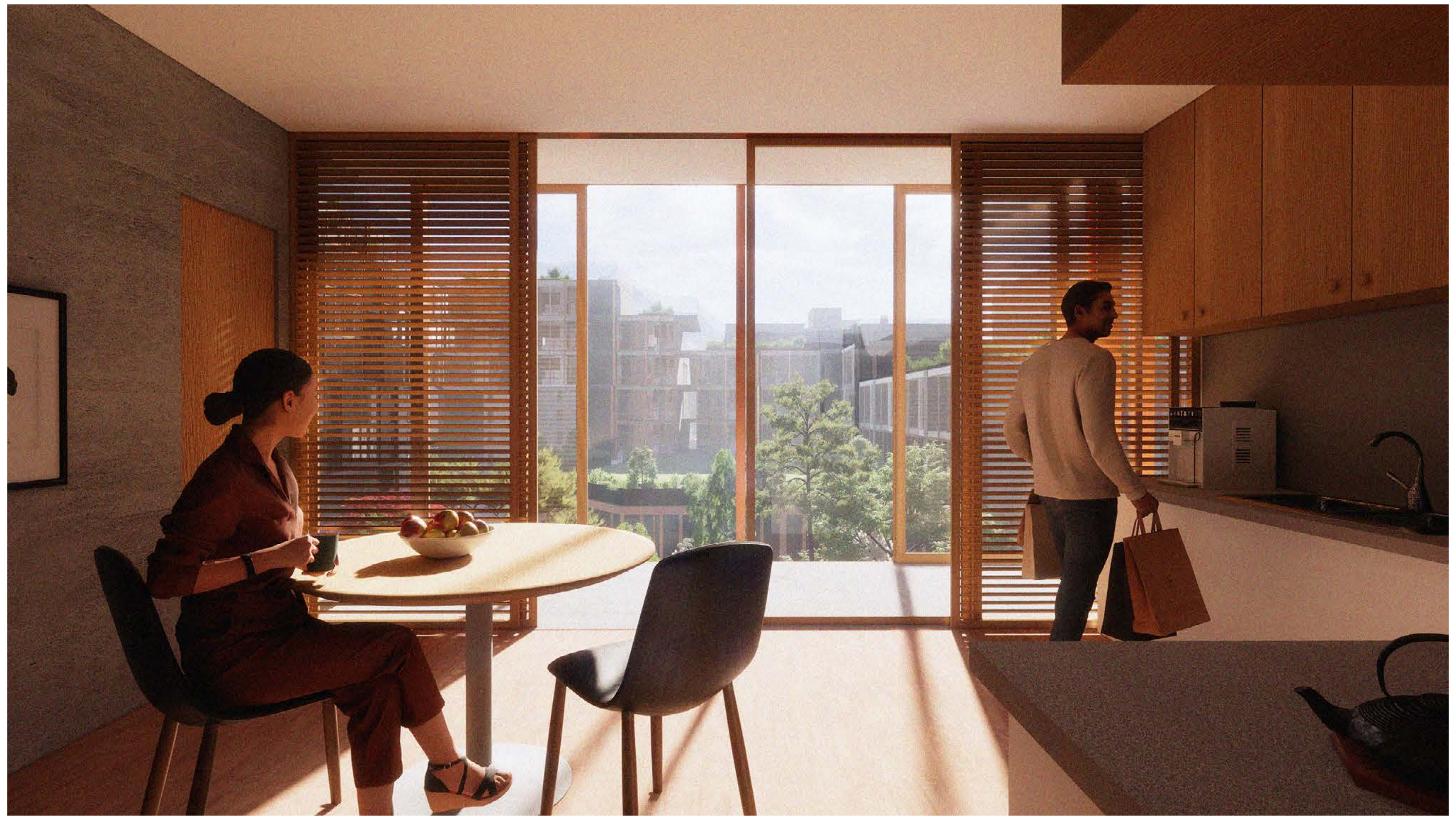
On the floor above the dining floor sits a floor of 3-bedroom units. The dining and kitchen space below belongs to these residents. Below the dining space sits a floor of floor-thru units. Each of these units is configured so that it can stand on its own or can connect with the dining space above. Drawing from a skip stop typology, staircases connect each unit cluster and allow families to stay connected across generations while maintaining personal private space. Select staircases also extend upwards to the occupiable green roof, and others provide egress to the ground.



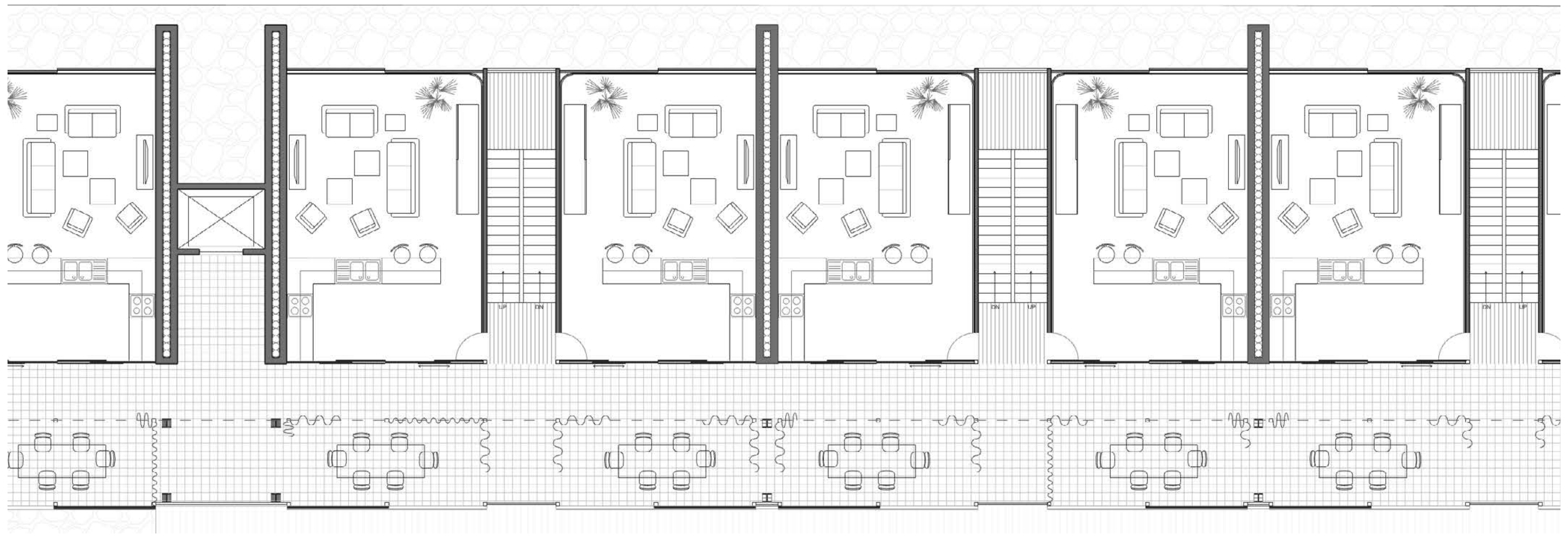
Our process began with a precedent analysis of Saat Rasta and Copper House II by Studio Mumbai. We modelled sections of these projects (shown above) to explore themes of operability and privacy.

Facade Elevation Strip

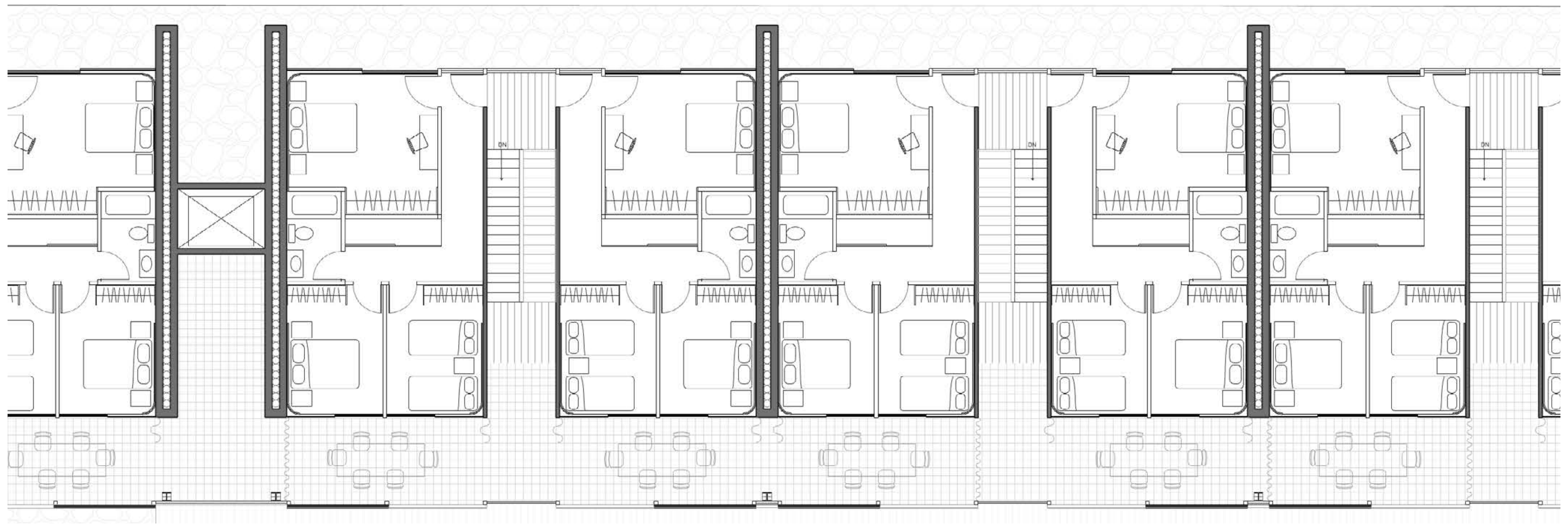
View from 3-bedroom unit into semi-public dining area



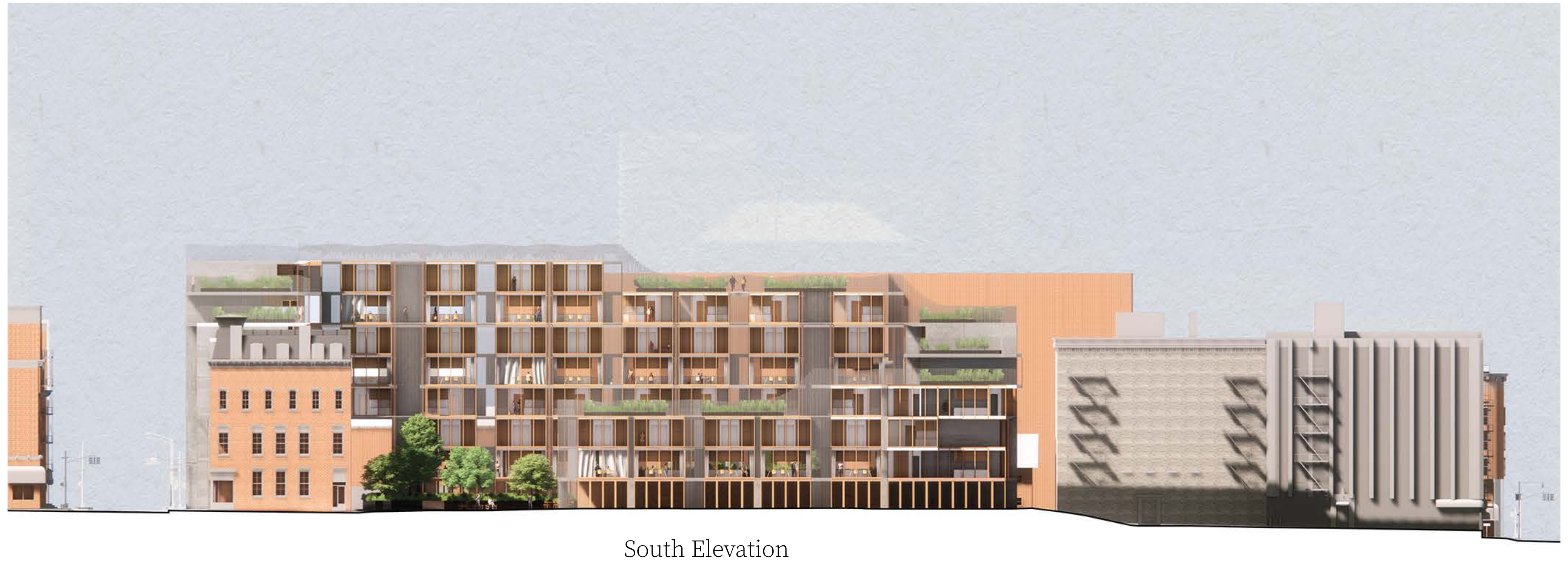
Interior of 1-bedroom unit



5th Floor



6th Floor



South Elevation

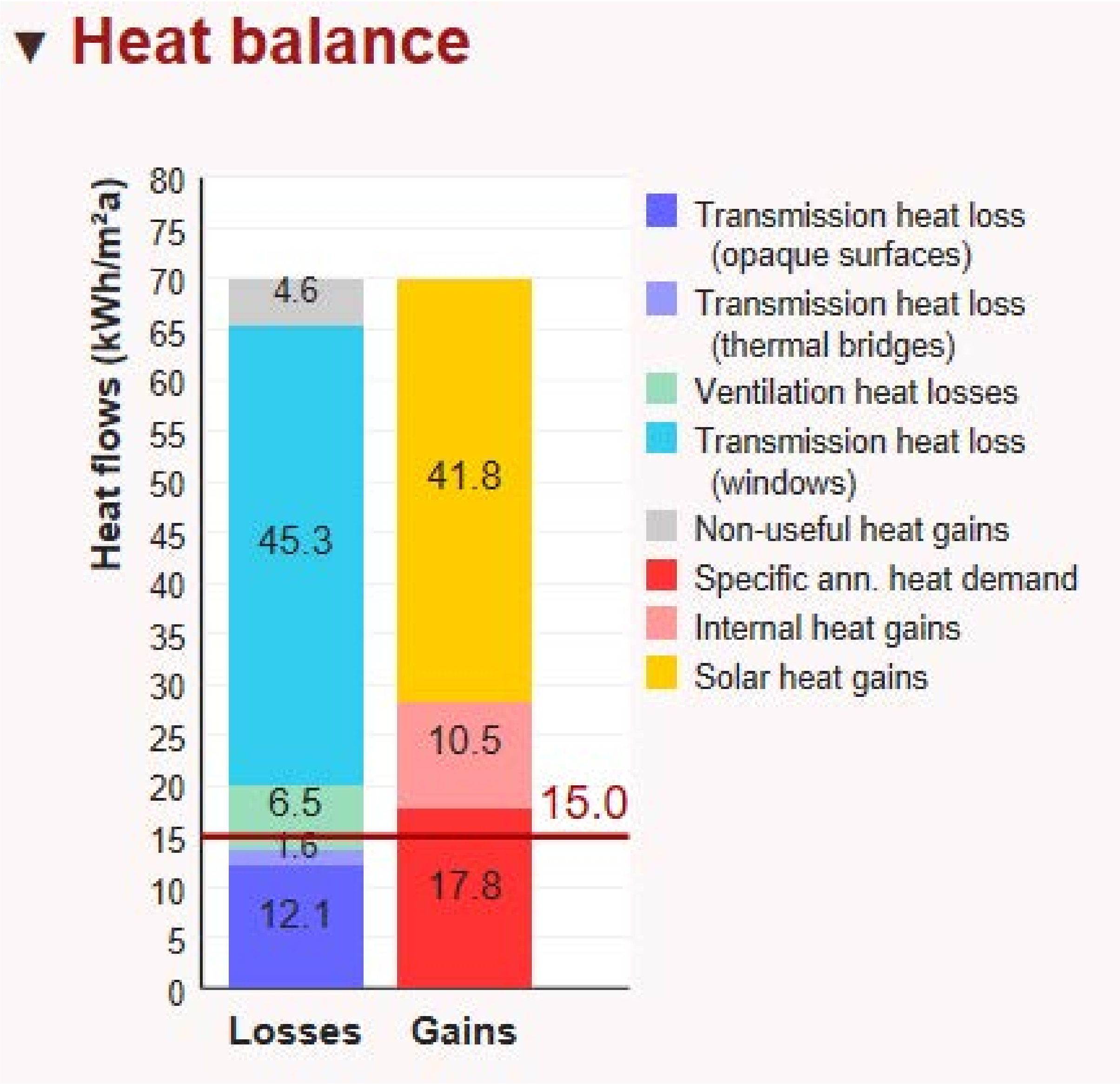
Section Perspective

173 Perry Net Zero Transformation

Net Zero Housing | Fall 2022
Critic: Andreas Benzing

Beginning with Richard Meier's 2002 West Village apartment building, 173 Perry Street, this project explored ways to transform the building and lower its energy usage. The existing building features a glass façade that provides excellent views but poor thermal performance. Utilizing Passive House principles such as insulation, high-performance glazing, and management of thermal bridges, I designed a new cladding and new wall, roof, and floor assemblies to improve thermal performance.

Utilizing designPH software, I tested iterations to develop a building that lowered annual heat demand. The new glazing preserves views while limiting transmission heat losses, and window placement responds to orientation, internal constraints, and the shade from surrounding buildings. Annual energy usage is then compared to potential site PV energy generated in a push for a net zero energy usage building.

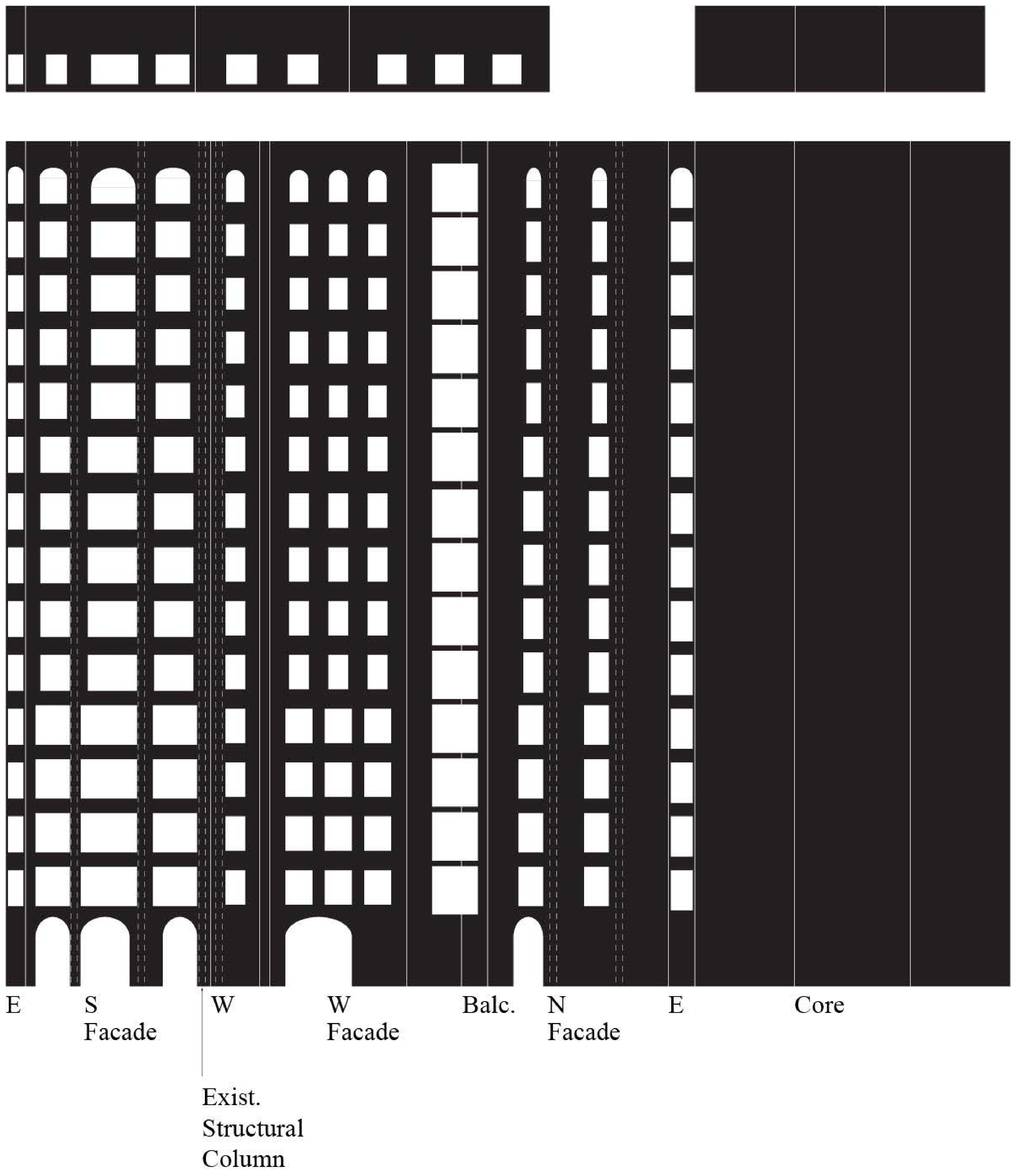


Final designPH Heat Balance

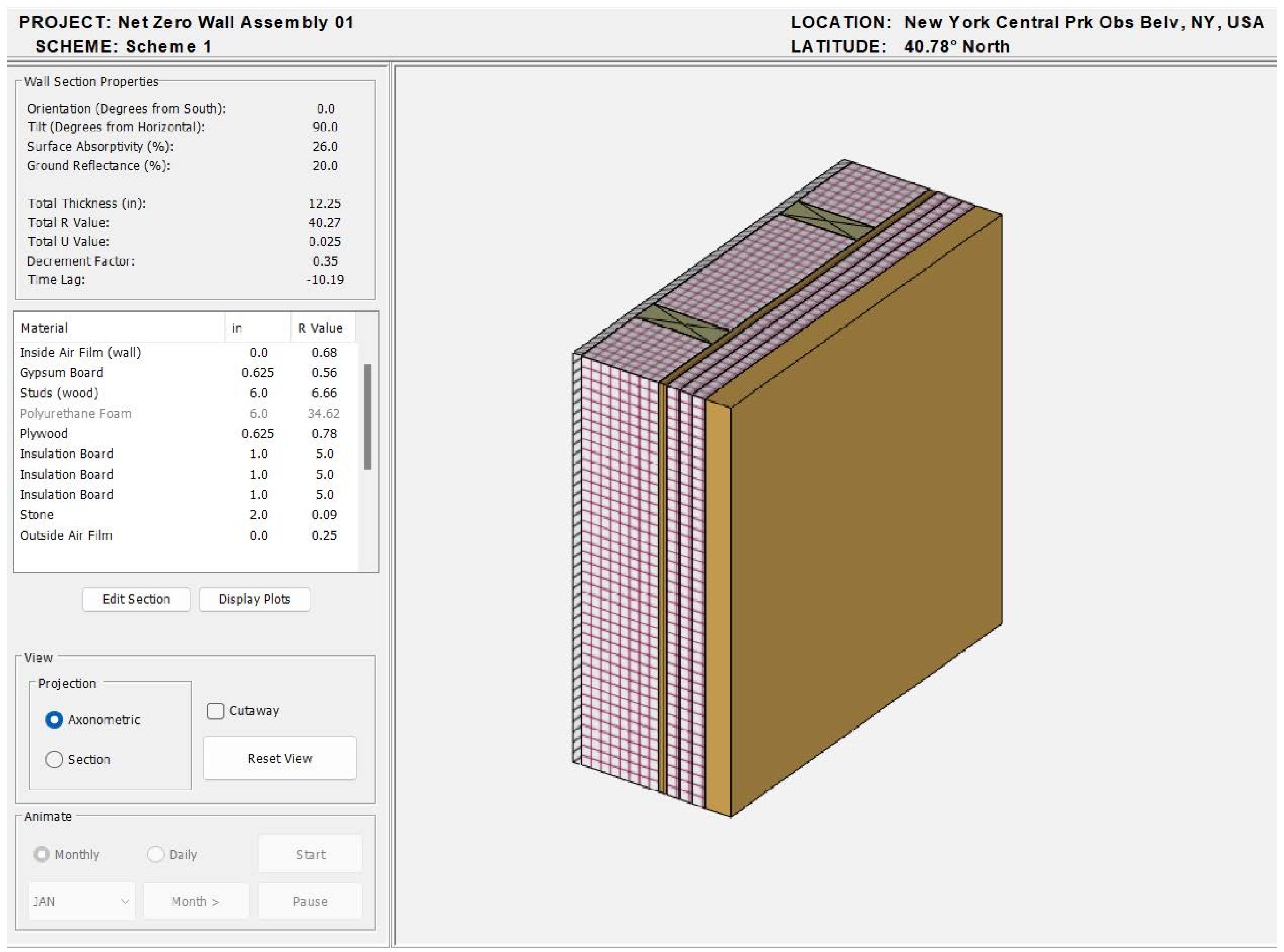
Exterior Render

Interior Render: Living Area

Interior Render: Bedroom



Facade Figure-Ground Study



▼ Transmission heat loss (opaque surfaces)

Area group	Total area (m^2)	Area weighted U-value (W/m^2K)	Av. temp. factor	Ann. htg. degree hours (kKh/a)	Transmission heat losses (kWh/a)	Q_t (kWh/m^2a)
7 - External Door	0.00			64.00		
8 - External Wall - Ambient	2798.92	0.11	1.00	64.00	19704.40	9.65
9 - External Wall - Ground	0.00			64.00		
10 - Roof/Ceiling - Ambient	193.99	0.11	1.00	64.00	1365.72	0.67
11 - Floor slab / Basement ceiling	193.99	0.50	0.60	64.00	3724.68	1.82
12 -	0.00			64.00		
13 -	0.00			64.00		
14 - Temperature zone X	0.00			64.00		
18 - Partition Wall to Neighbour	0.00			64.00		
	3186.91				**24794.79**	**12.15**

▼ Transmission heat loss (windows)

Area group	Total area (m^2)	Area weighted U-value (W/m^2K)	Av. temp. factor	Ann. htg. degree hours (kKh/a)	Transmission heat losses (kWh/a)	Q_t (kWh/m^2a)
2 - North Windows	123.03	1.38	1.00	64.00	10892.05	5.34
3 - East Windows	145.77	1.58	1.00	64.00	14753.29	7.23
4 - South Windows	549.64	1.01	1.00	64.00	35421.06	17.35
5 - West Windows	319.81	1.53	1.00	64.00	31314.88	15.34
6 - Horizontal Windows	0.00			64.00		
	1138.25				**92381.28**	**45.26**

▼ Transmission heat loss (thermal bridges)

Area group	Total length (m)	Average Psi-value (W/mK)	Av. temp. factor	Ann. htg. degree hours (kKh/a)	Transmission heat losses (kWh/a)	Q_t (kWh/m^2a)
15 - Thermal Bridges Ambient	90.22	0.55	1.00	64.00	3175.64	1.56
16 - Perimeter Thermal Bridges	0.00			64.00		
17 - Thermal Bridges Floor Slab / Basement Ceiling	0.00			64.00		
	90.22				**3175.64**	**1.56**

Insulated Wall Assembly & Transmission Heat Loss Results

Interlocked

1:1 Crafting and Fabrication of Details | Spring 2023
Critic: Zachary Mulitauaopele
With Sam Velasquez and Sky Zhang

This set of wood constructions can detach into three distinct pieces: two stools and one table, or combine into one unit. Using the CNC as well as hand cutting, we crafted box joints and channels to connect each component. When combined (top left), cuts into the outer piece provide glimpses to the pieces within and provide space to grasp and pull out the inner pieces.

Foodlab 64

ATIII / ATIV | Fall 2021
Critics: Aaron Campbell, Steven Potts, Teel Riggs, and Michael Esposito
With Nara Radinal, Myungju Ko, Min Soo Jeon, and Jordan Trager

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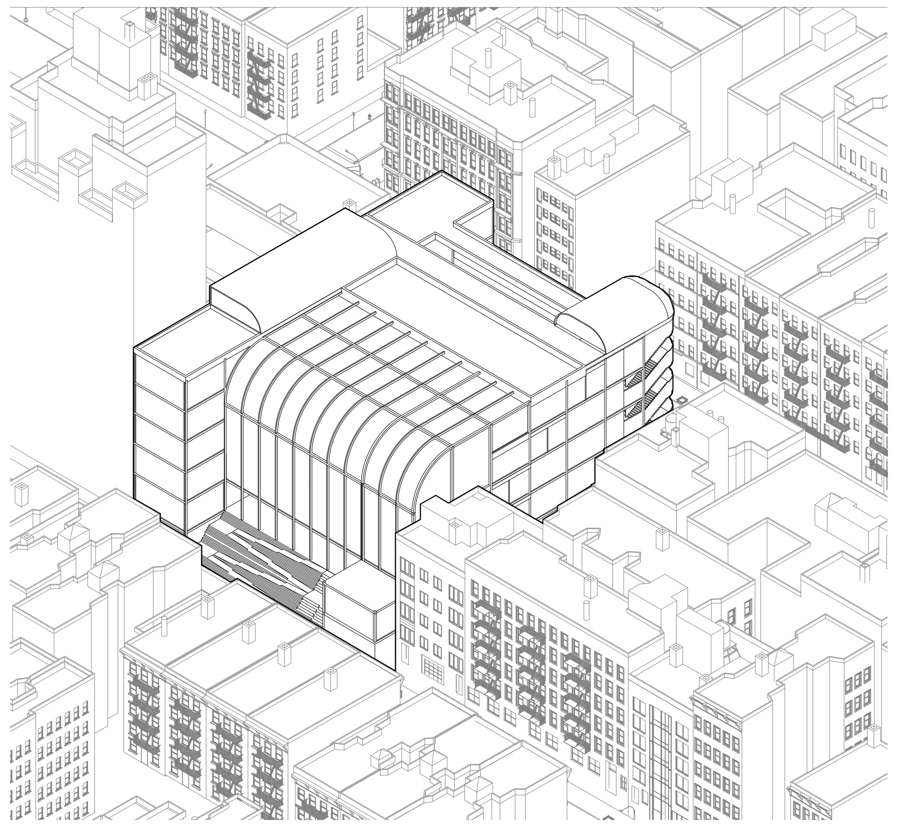
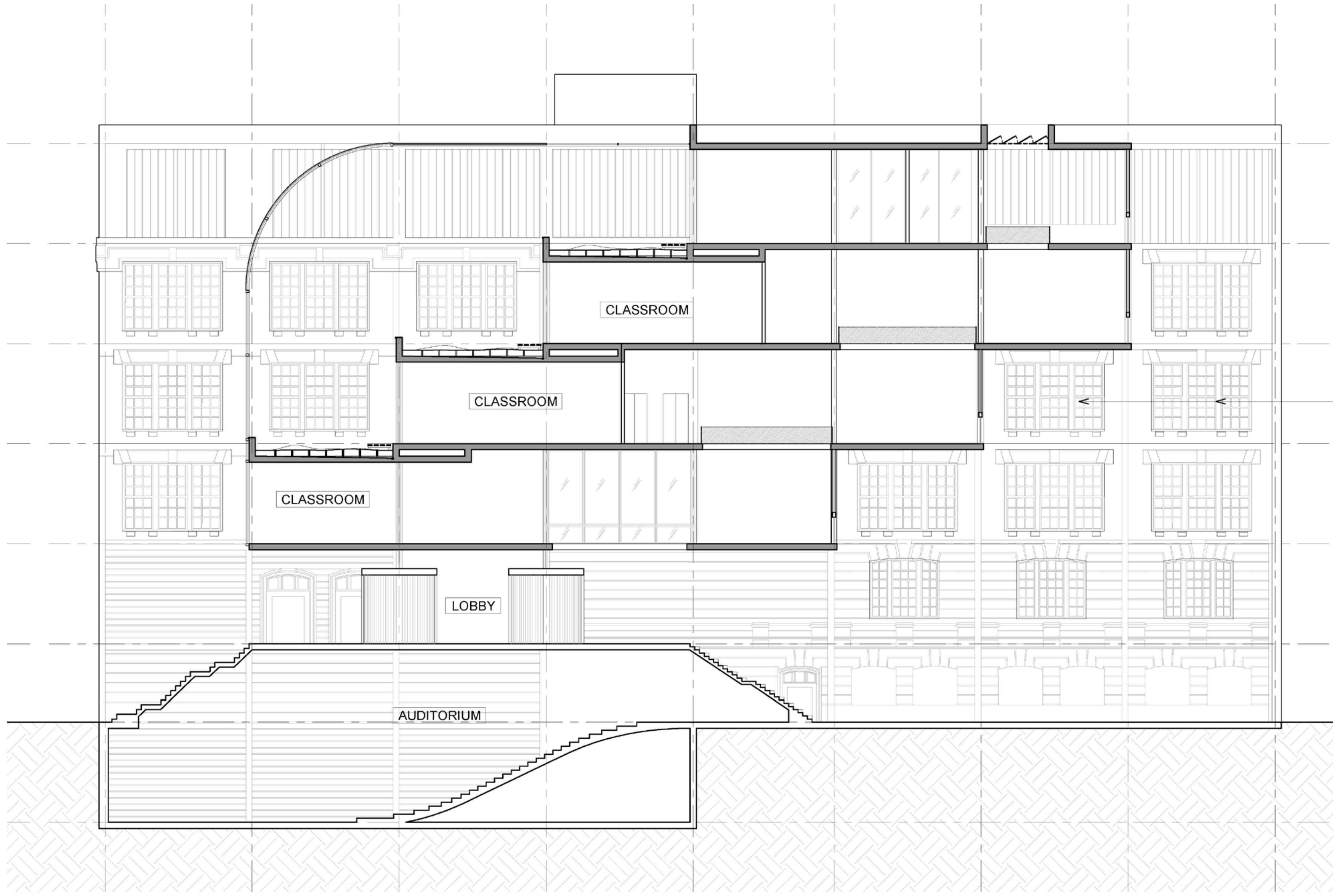
The Foodlab 64 creates opportunities to learn about food production and sustainability by embedding a series of terraces greenhouses within a middle school.

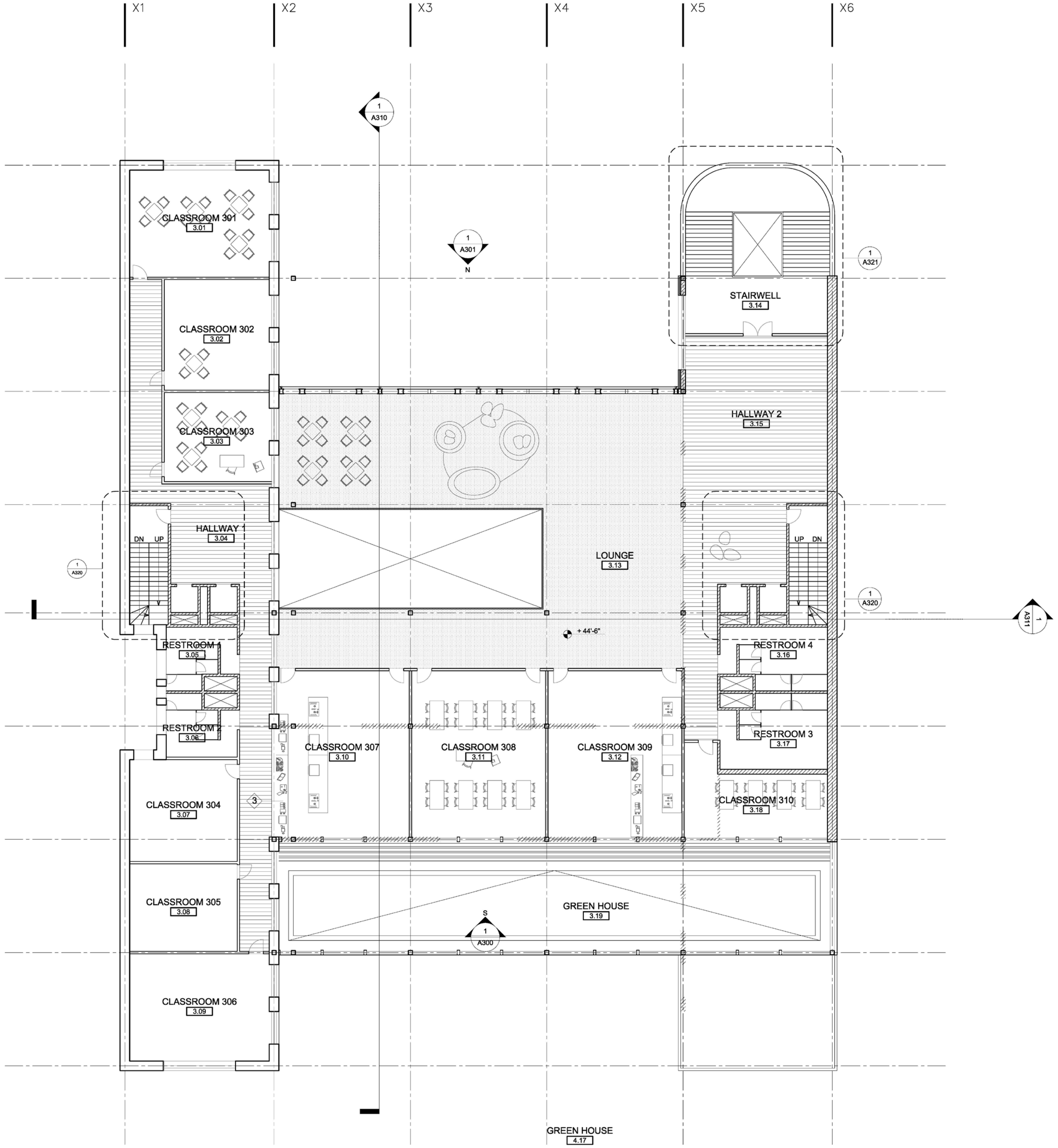
Our group drew from Nara Radinal's Core II project and our collective Core II experiences to push this project through a design development and construction documentation stage, creating a realistic structural system and drawings of key construction details and assemblies. We compiled these documents into a comprehensive drawing set.



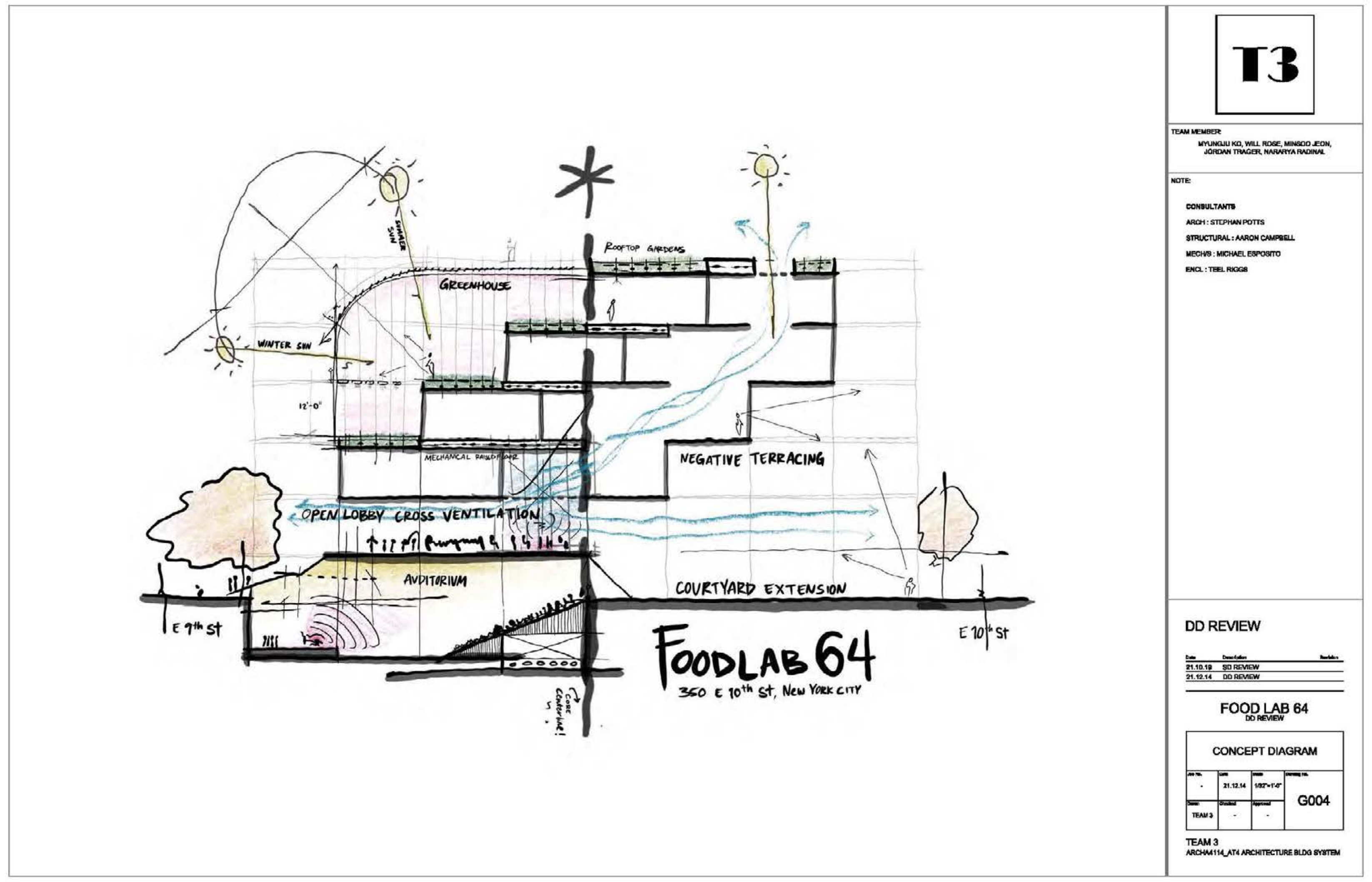
Building Axonometric

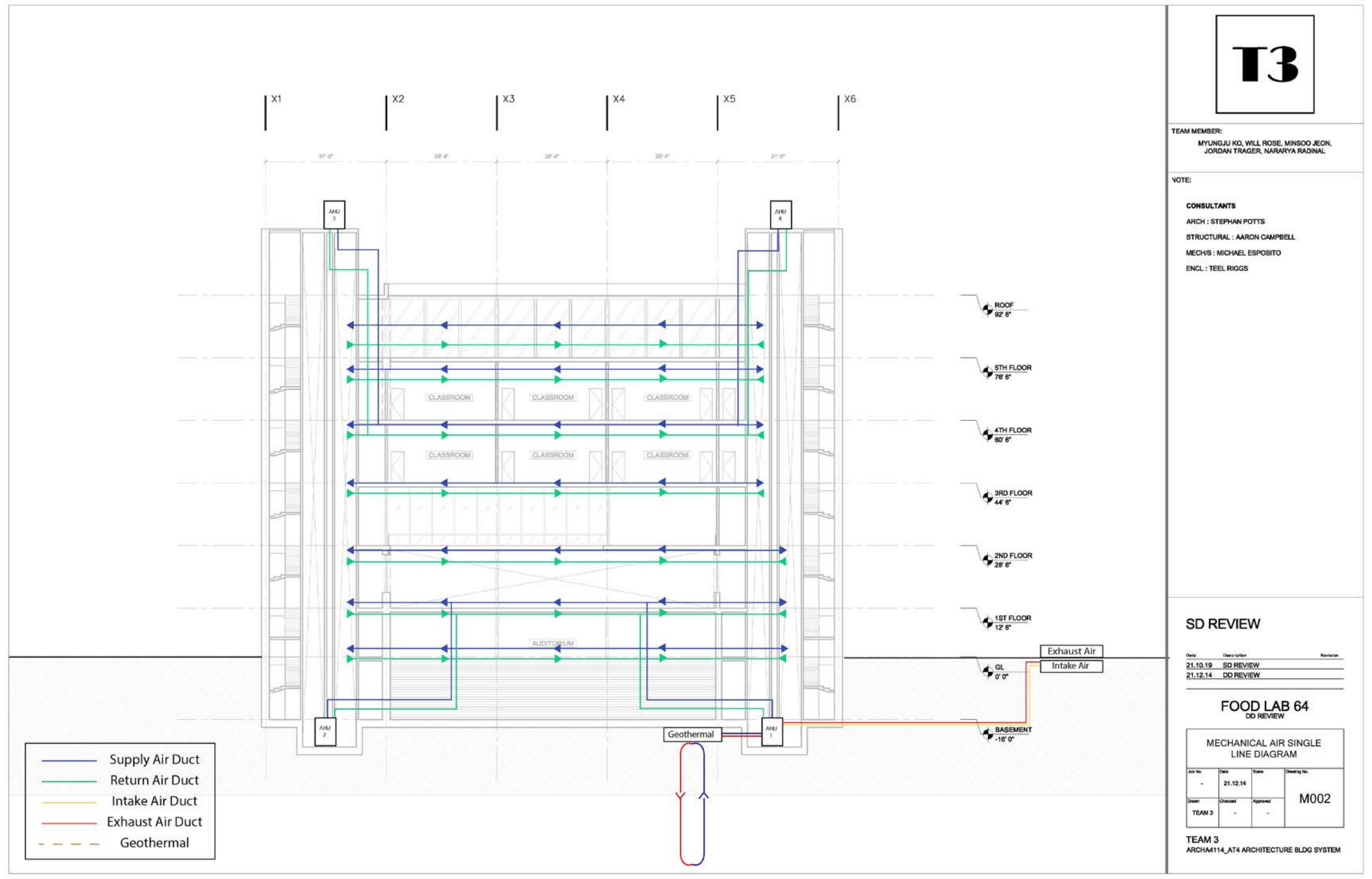


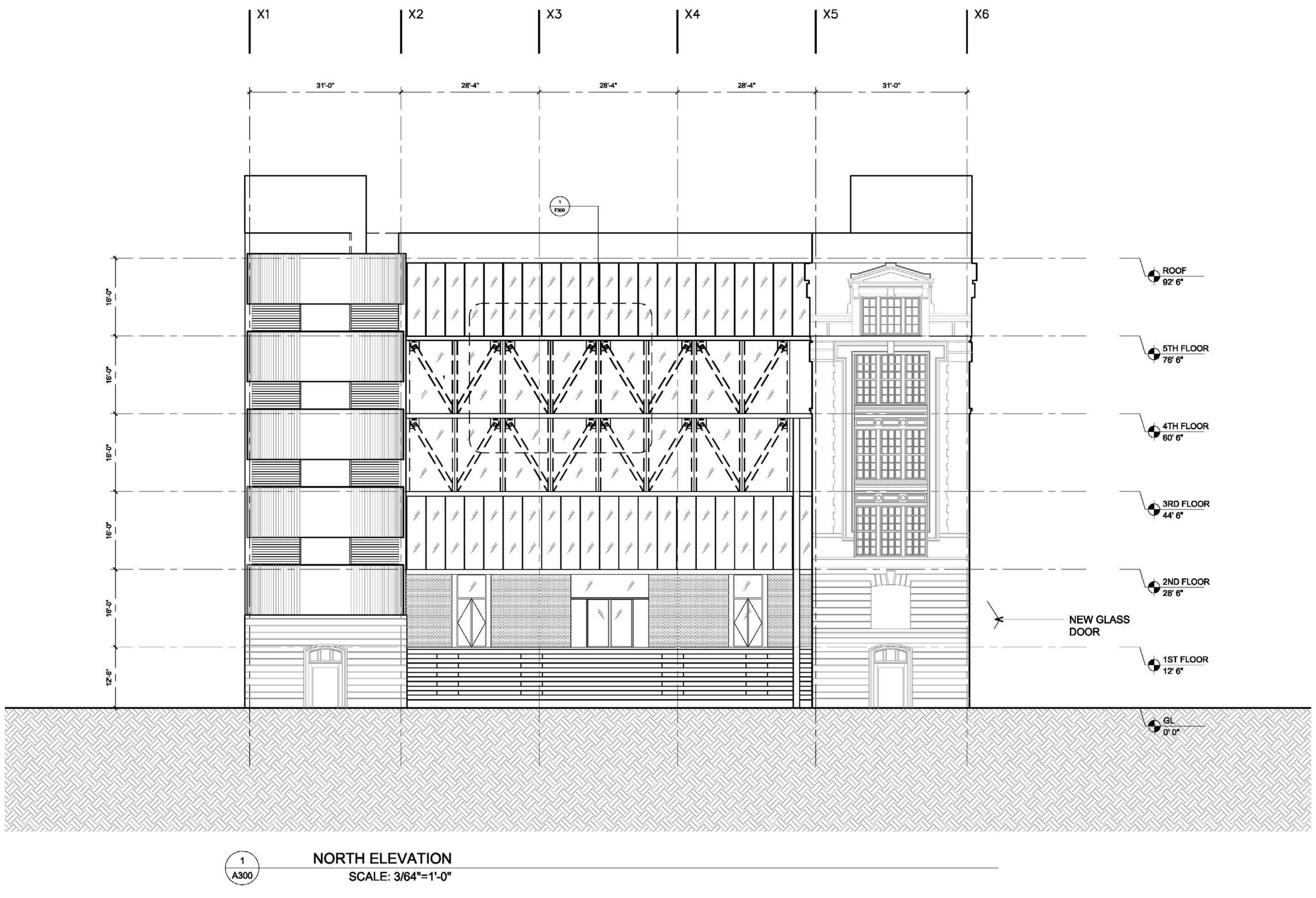
Building Section

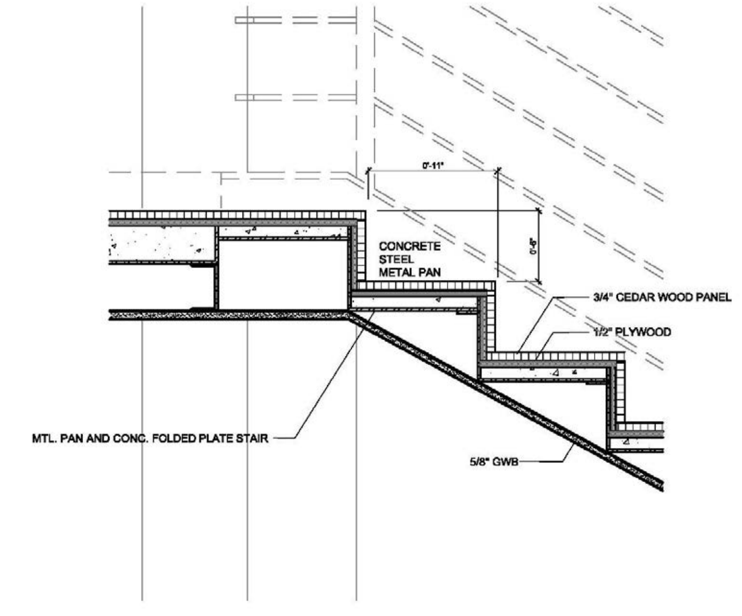


Floor 4 Plan

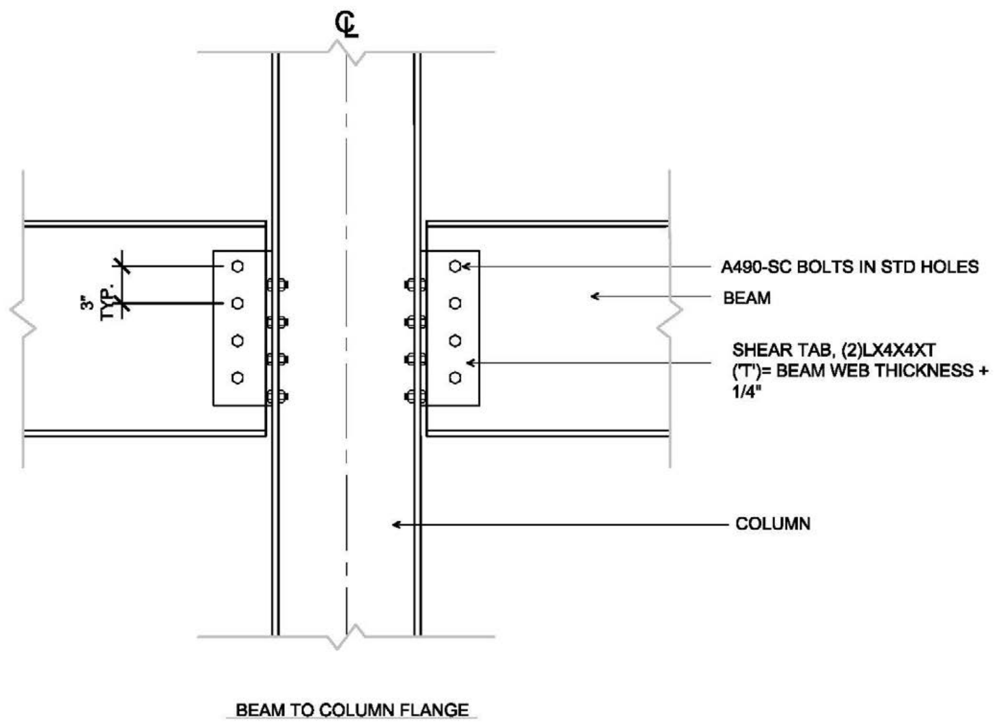

T3
GREENHOUSE
NEGATIVE TERRACING
OPEN LOBBY CROSS VENTILATION
AUDITORIUM
COURTYARD EXTENSION
FOODLAB 64
360 E 10th St, New York City
DD REVIEW
FOOD LAB 64
CONCEPT DIAGRAM
G004
TEAM 3


T3
SD REVIEW
FOOD LAB 64
MECHANICAL AIR SINGLE LINE DIAGRAM
M002
TEAM 3
Supply Air Duct
Return Air Duct
Intake Air Duct
Exhaust Air Duct
Geothermal
Exhaust Air
Intake Air

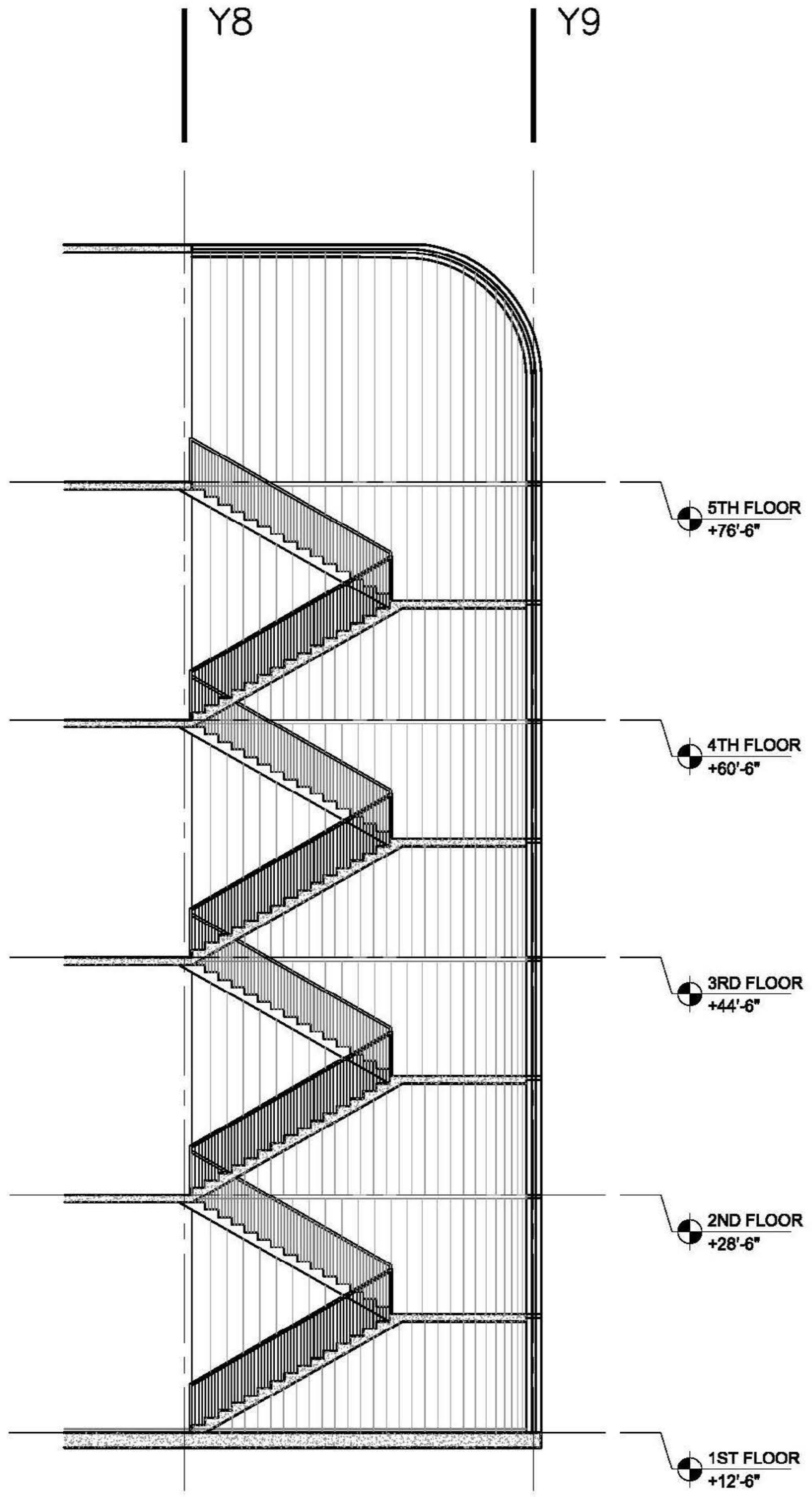

X1
X2
X3
X4
X5
X6
31'-0"
28'-4"
28'-4"
28'-4"
31'-0"
ROOF 92' 6"
5TH FLOOR 76' 6"
4TH FLOOR 60' 6"
3RD FLOOR 44' 6"
2ND FLOOR 28' 6"
1ST FLOOR 12' 6"
GL 0' 0"
NEW GLASS DOOR
16'-0"
16'-0"
16'-0"
16'-0"
16'-0"
12'-6"
1 A300
NORTH ELEVATION
SCALE: 3/64"=1'-0"



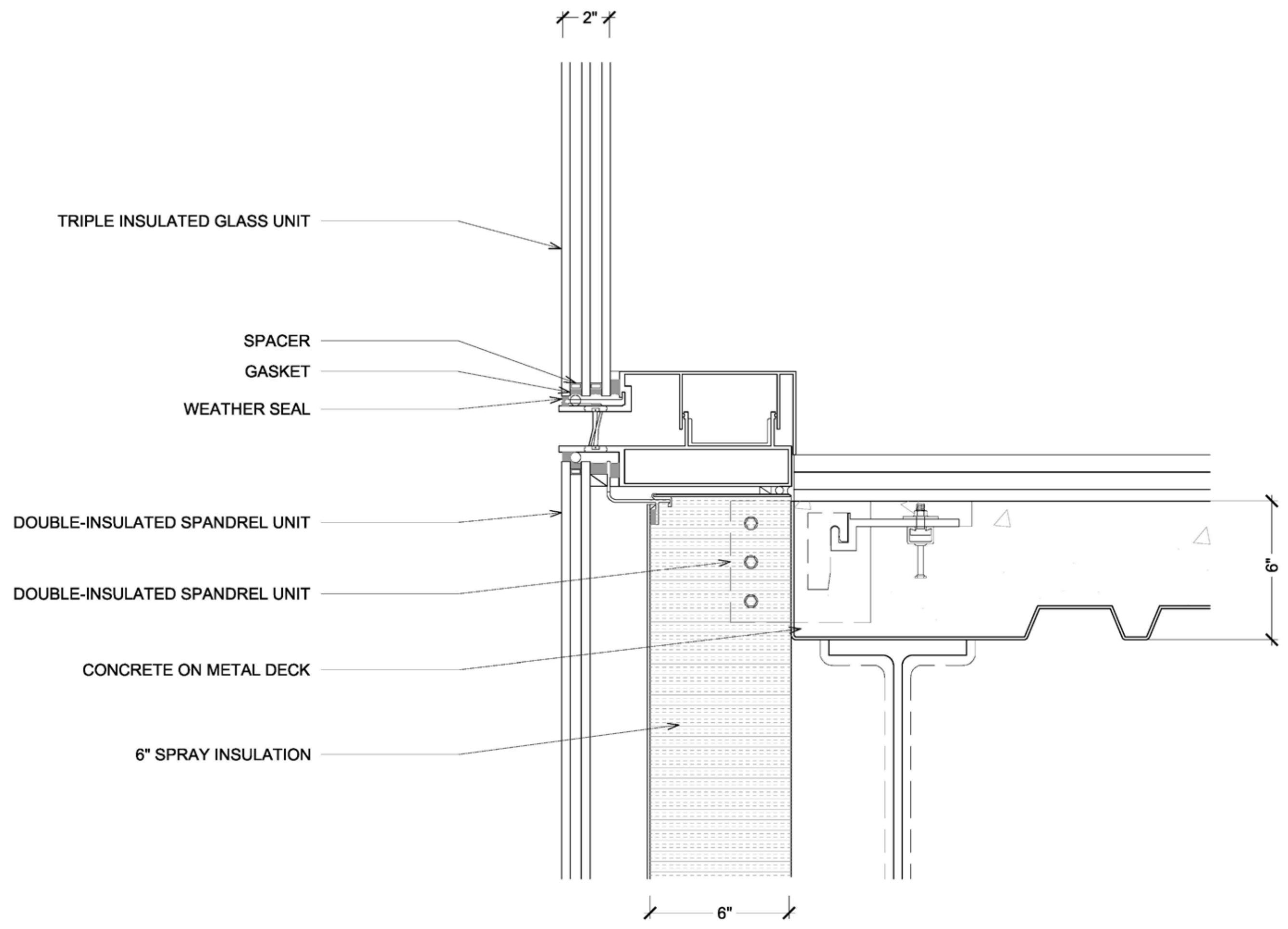
3 STAIR-B DETAIL SECTION
SCALE: 1" = 1'-0"



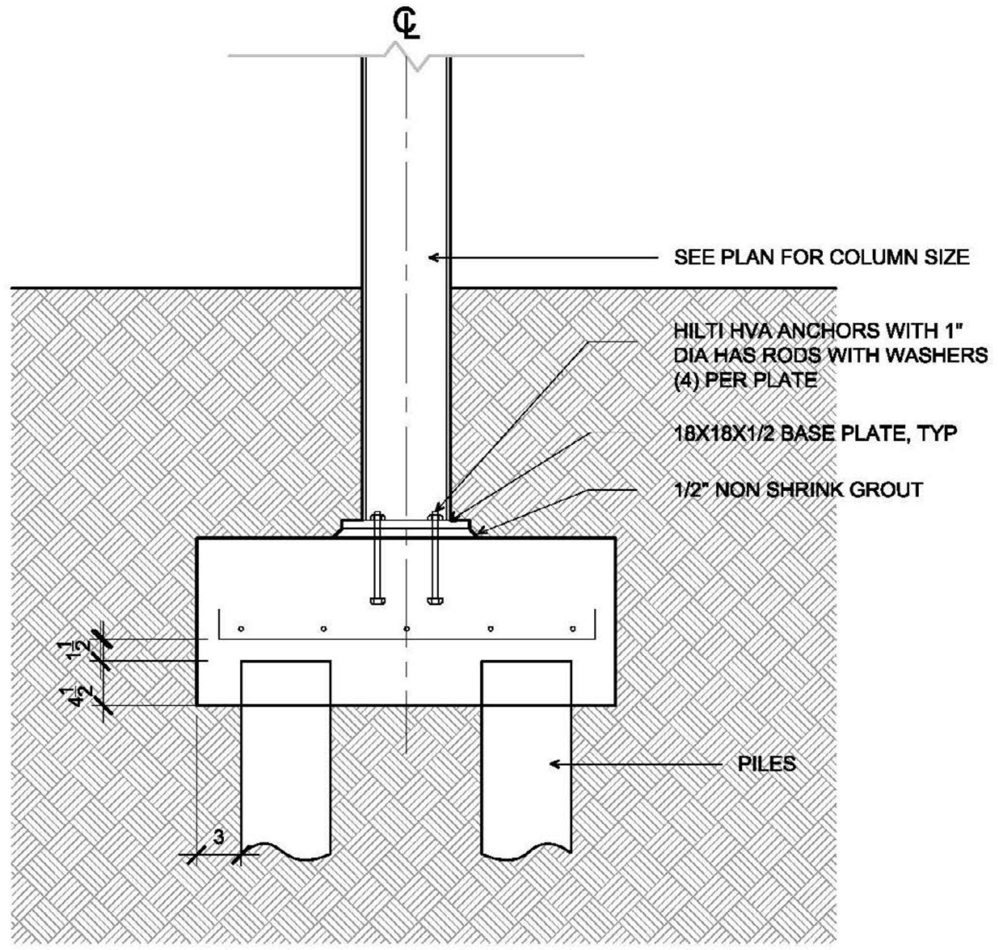
1 TYP. BEAM TO COLUMN SHEAR CONNECTION
SCALE: 3/4" = 1'-0"



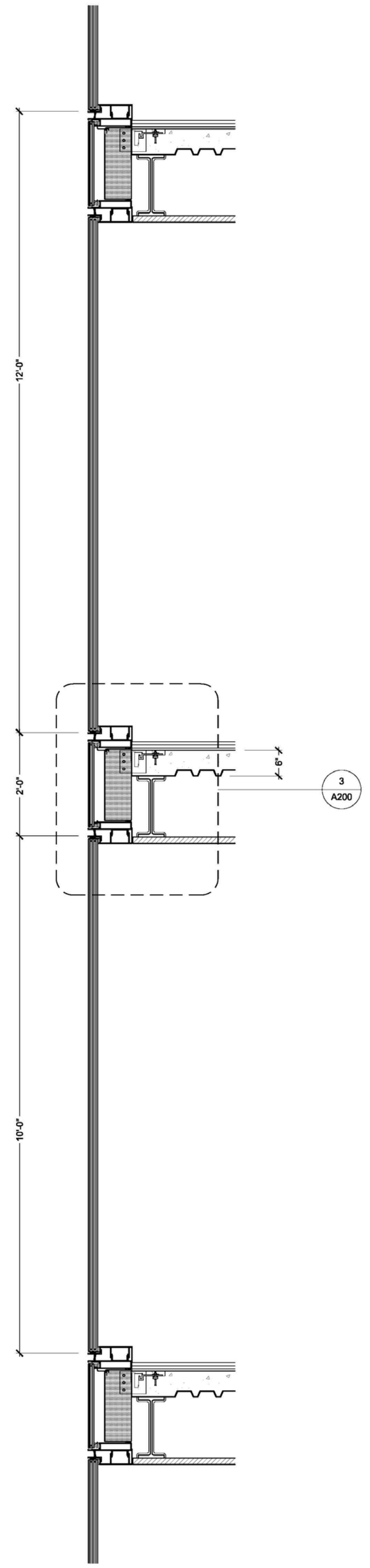
1 STAIR-B SECTION
SCALE: 1/16" = 1'-0"



3 TYPICAL CURTAINWALL STACK JOINT SECTION
SCALE: 3" =1'-0"



3 TYP. BASE PLATE DETAIL
SCALE: 3/8" = 1'-0"



3 CURTAINWALL SYSTEM OVERALL SECTION
SCALE: 1/2" = 1'-0"

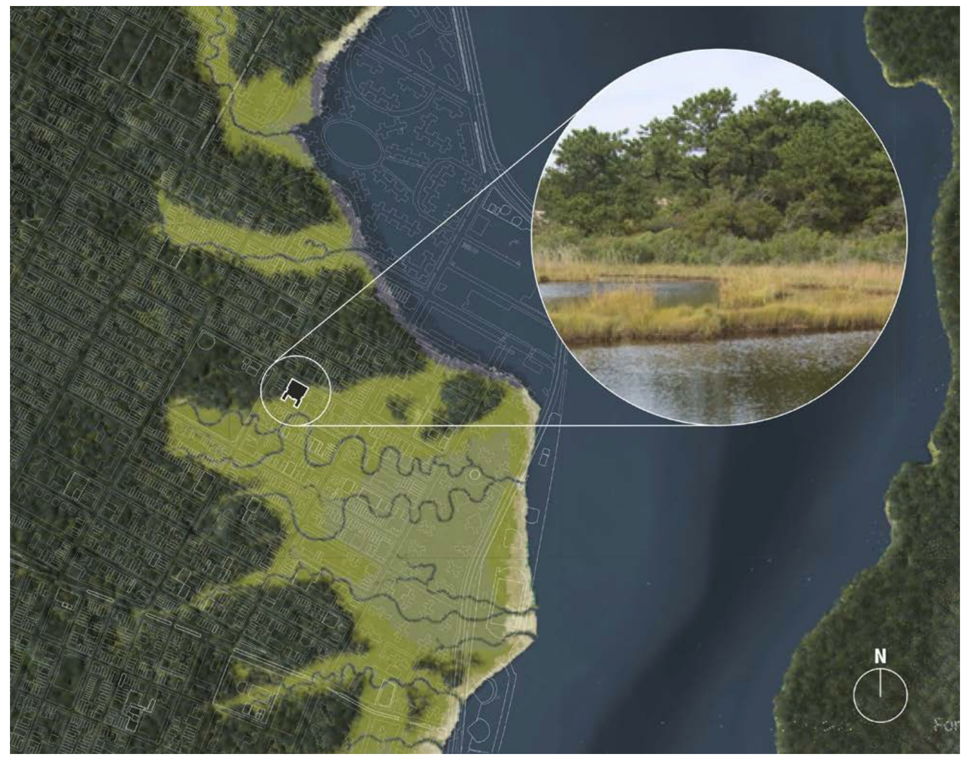
The Resiliency School

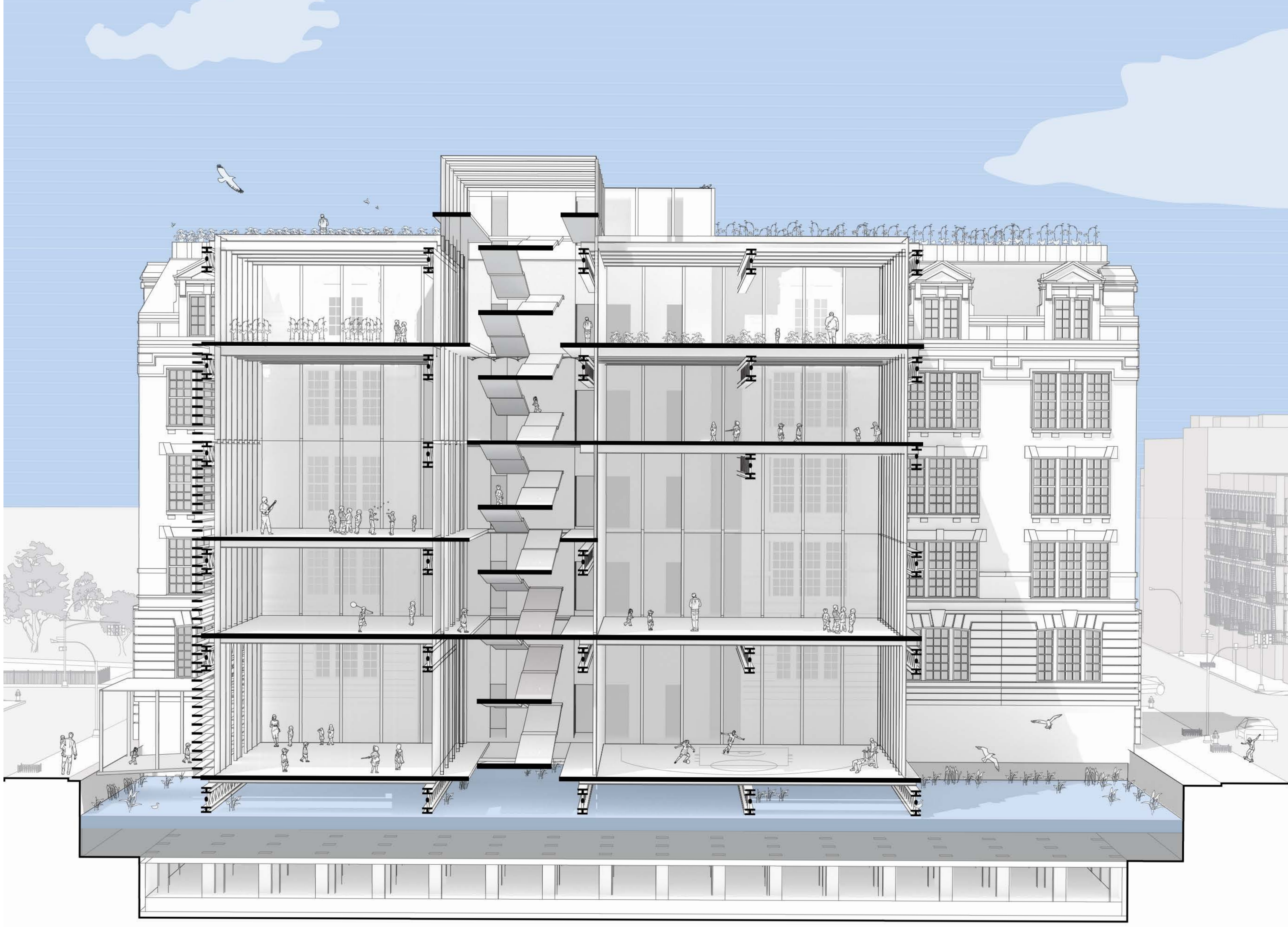
Core II Studio | Spring 2021
Critic: Gordon Kipping

How can a middle school contribute to a more resilient New York?

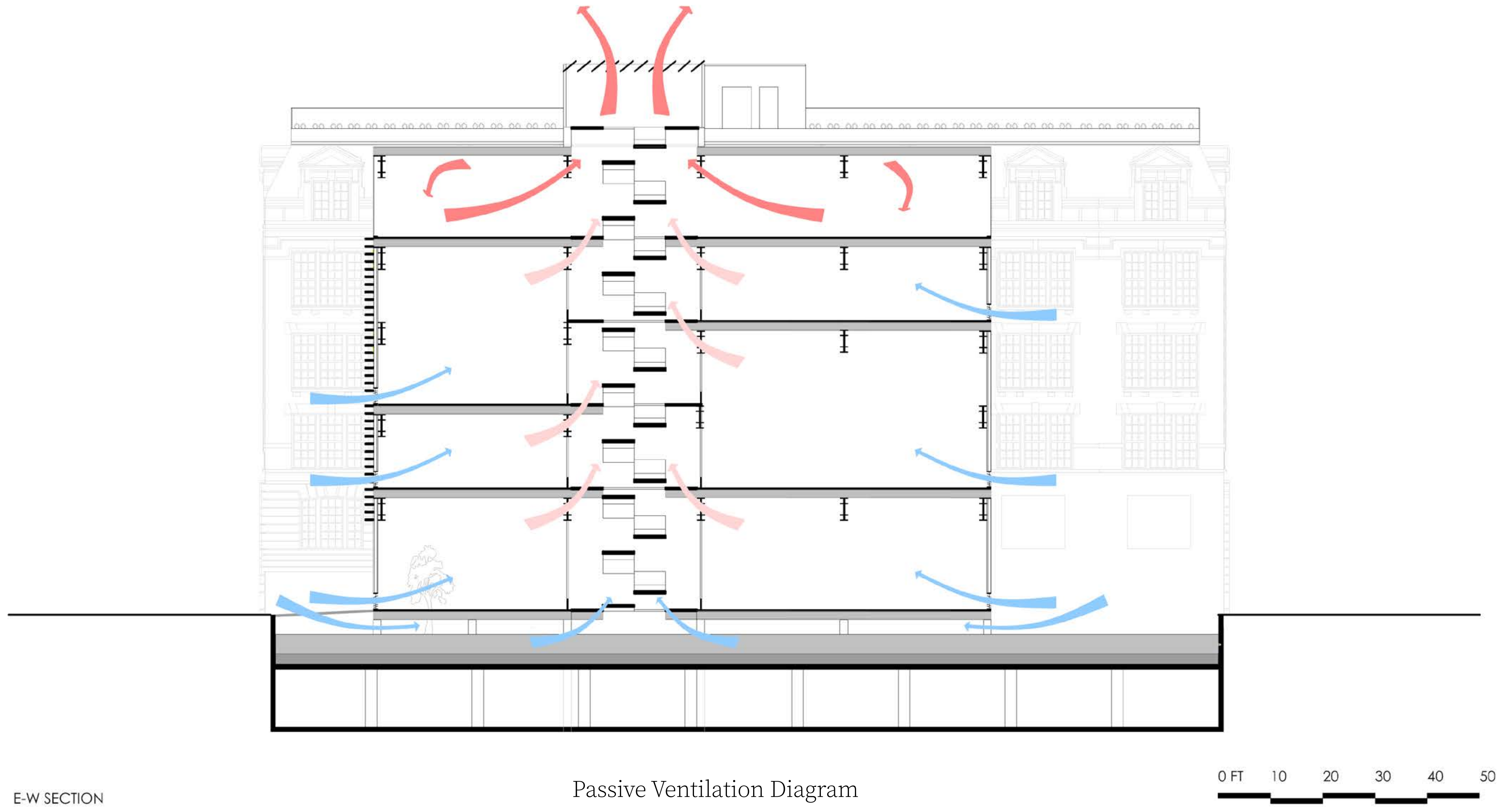
The Resiliency School provides a space for environemental education. In a move connecting the site to the wetlands of Manhattan's past, the school sits on top of a stormwater retention pond. This feature bolsters the resiliency of the neighborhood, which sits in a flood plain that continues to grow as sea levels rise. In addition, this pond, along with a rooftop garden and greenhouse, provides an educational opportunity for students to learn about ecology.

This school reused much of the existing structure of the old P.S. 64. The new central space houses a gymnasium, dance studio, and other progam space that can open to the public on the weekends and bring in the surrounding community. A central atrium passively ventilates the new space by drawing up heat through the greenhouse.

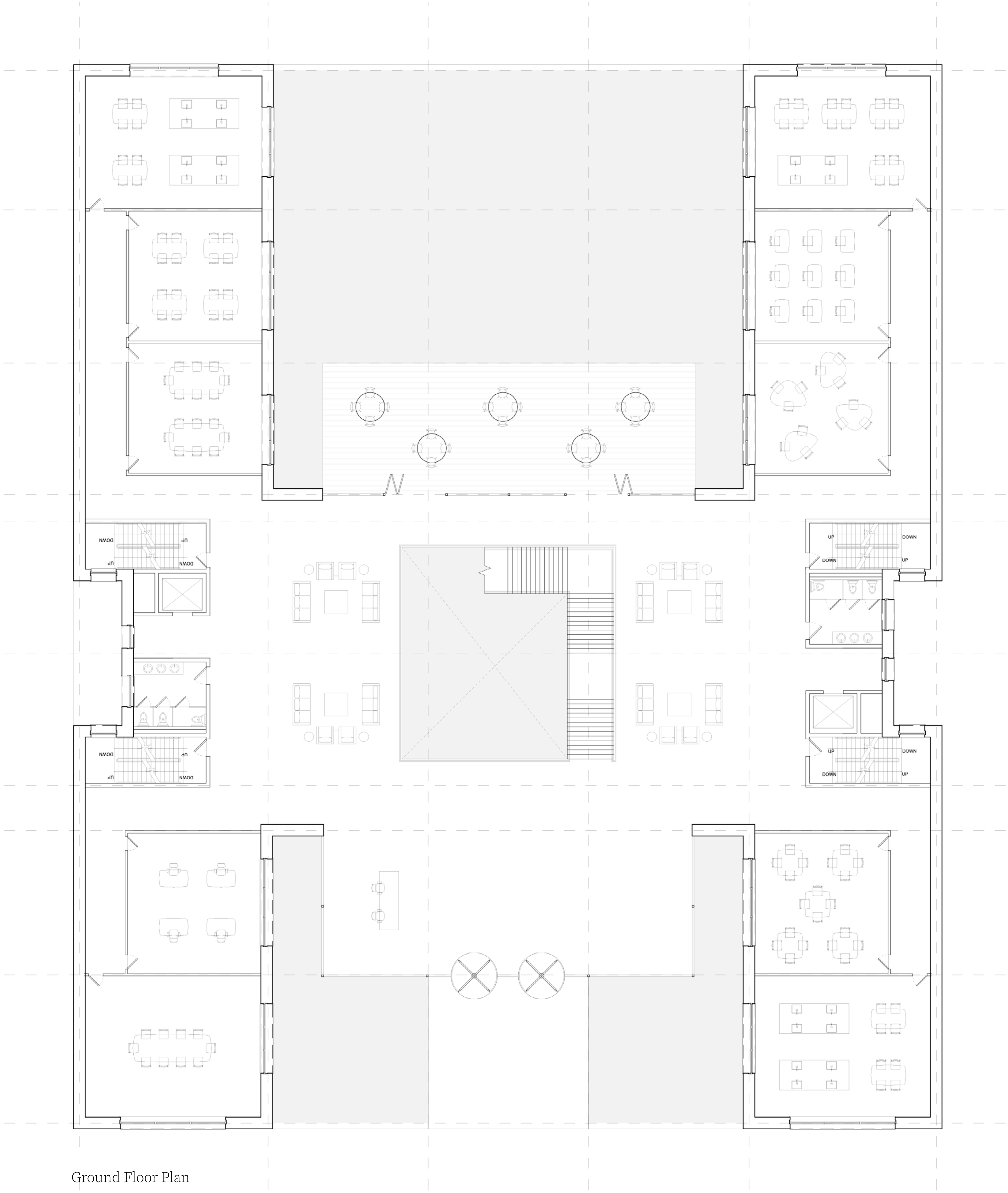




South Facade



Passive Ventilation Diagram



Ground Floor Plan

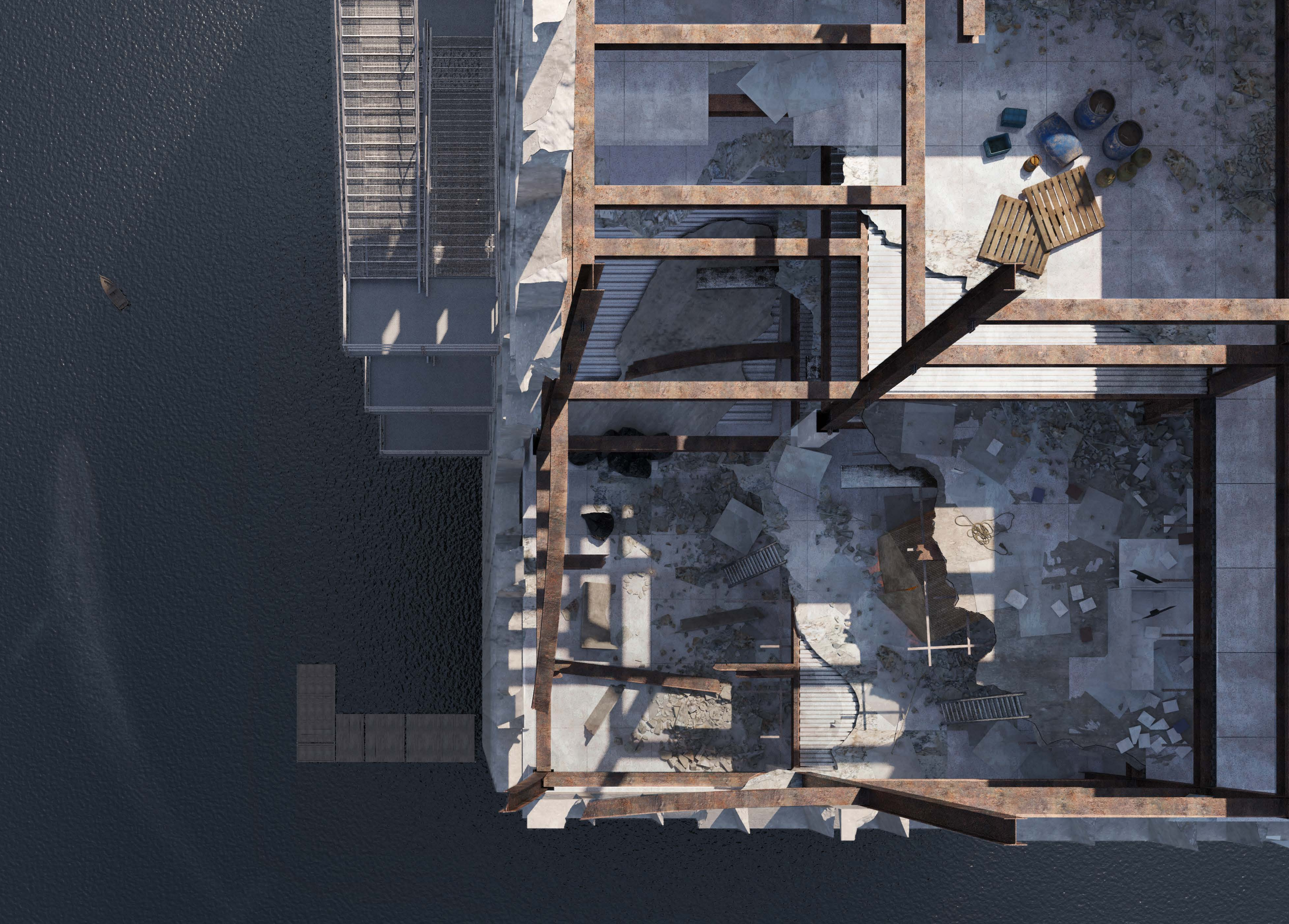
After Life

Techniques of the Ultrareal | Spring 2022
Prof. Phillip Crupi
With Younjae Choi, Isaac Khouzam, & Sky Zhang

This submerged city imagines a futuristic setting where a lone skyscraper emerges from a flooded landscape.

For this assignment, my team and I created a series of detailed renderings to showcase this scene at multiple scales. The concept arose from a shared narrative of a city facing rising sea levels. The remnants of a once-great city stand in decay, but small details point to signs of life presisting.

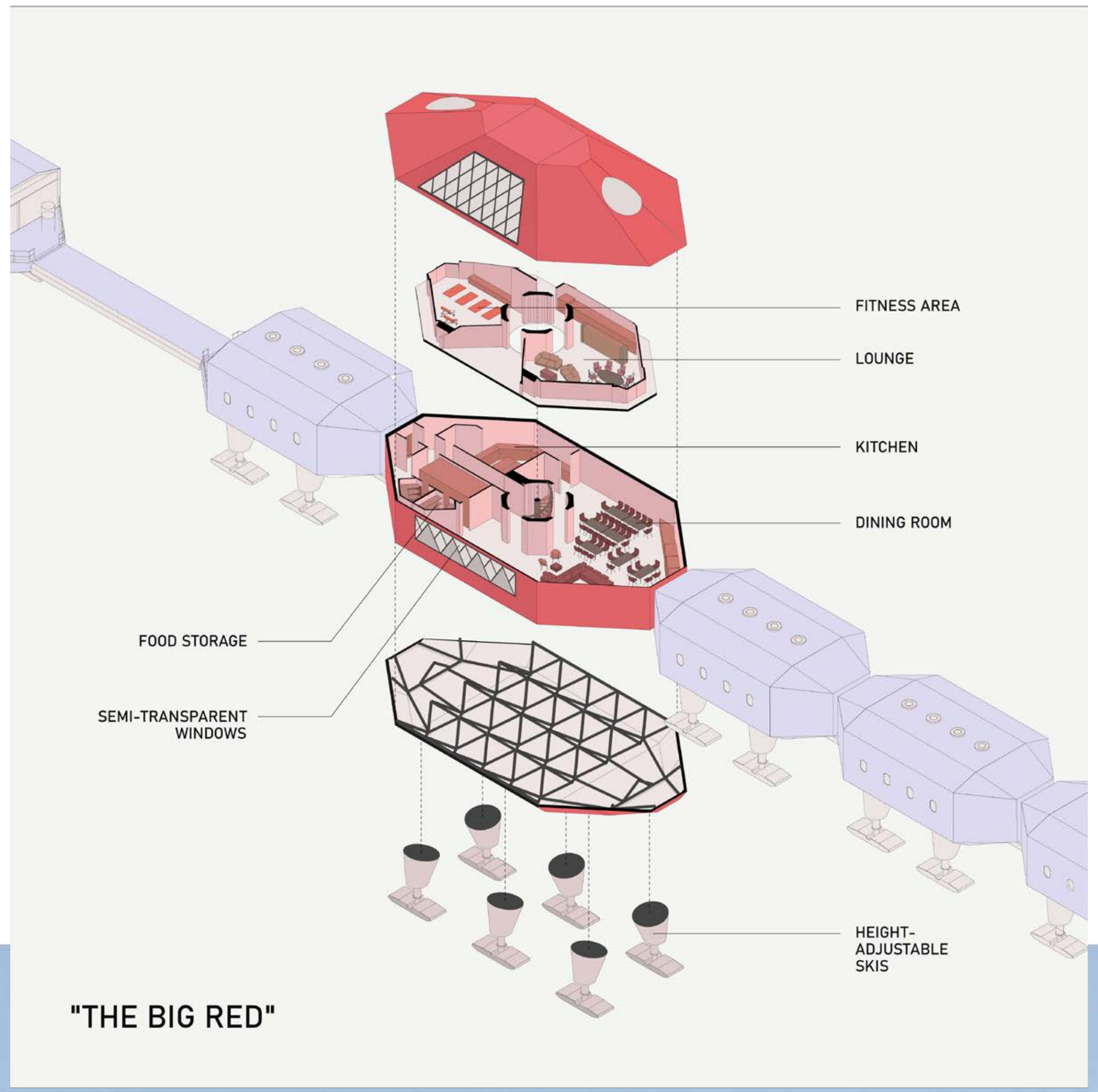
Our team used Rhino and 3DS Max to model the scene, and we used Vray to create the final renders, focusing on composition, texture mapping, and lighting to achieve realistic effects.

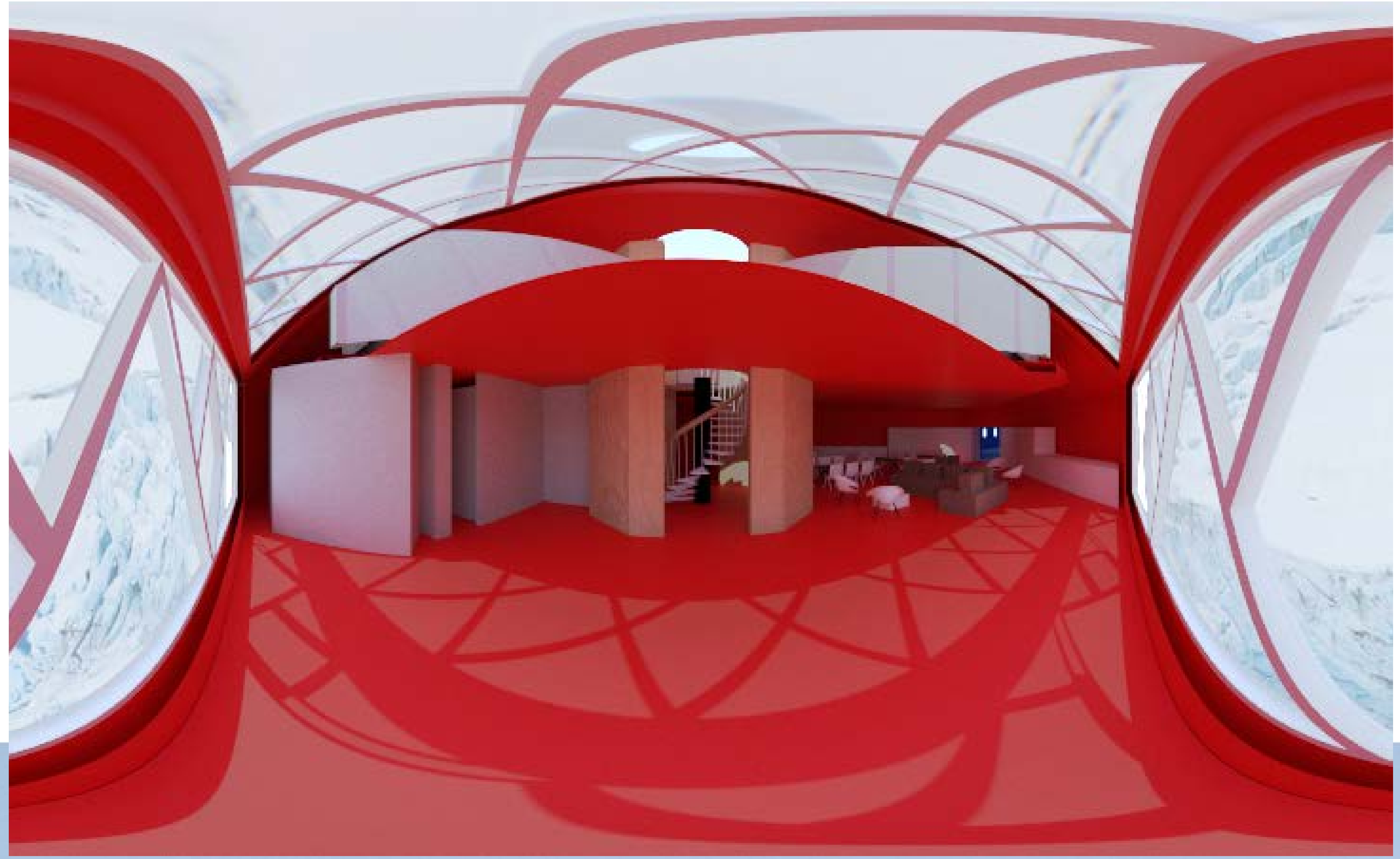


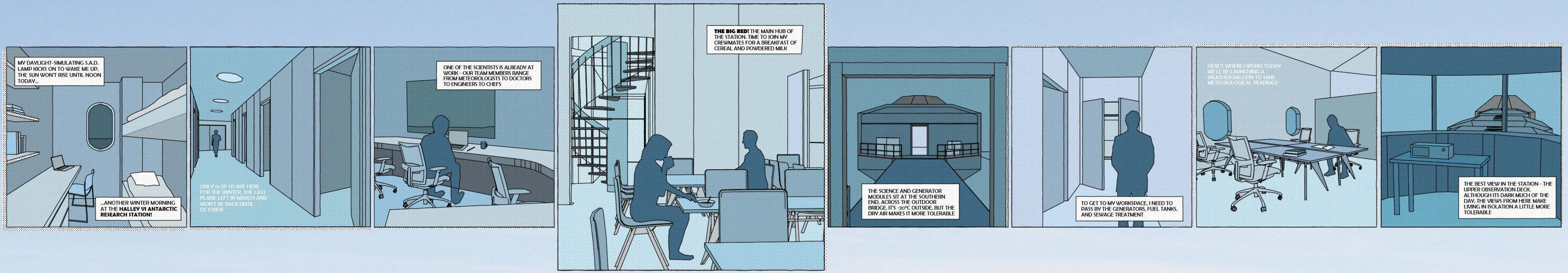
Halley VI Station: Building Analysis

ADR I | Fall 2020
Critic: Lexi Tsien

This analysis tells the story of the Halley VI British Antarctic Research Station. The structure sits in a landscape that challenges human habitation - in response, the building must work to provide a livable experience for the scientists and reseach team that reside there for months on end. The architecture provides creative solutions to the lack of sunlight and freezing conditions.





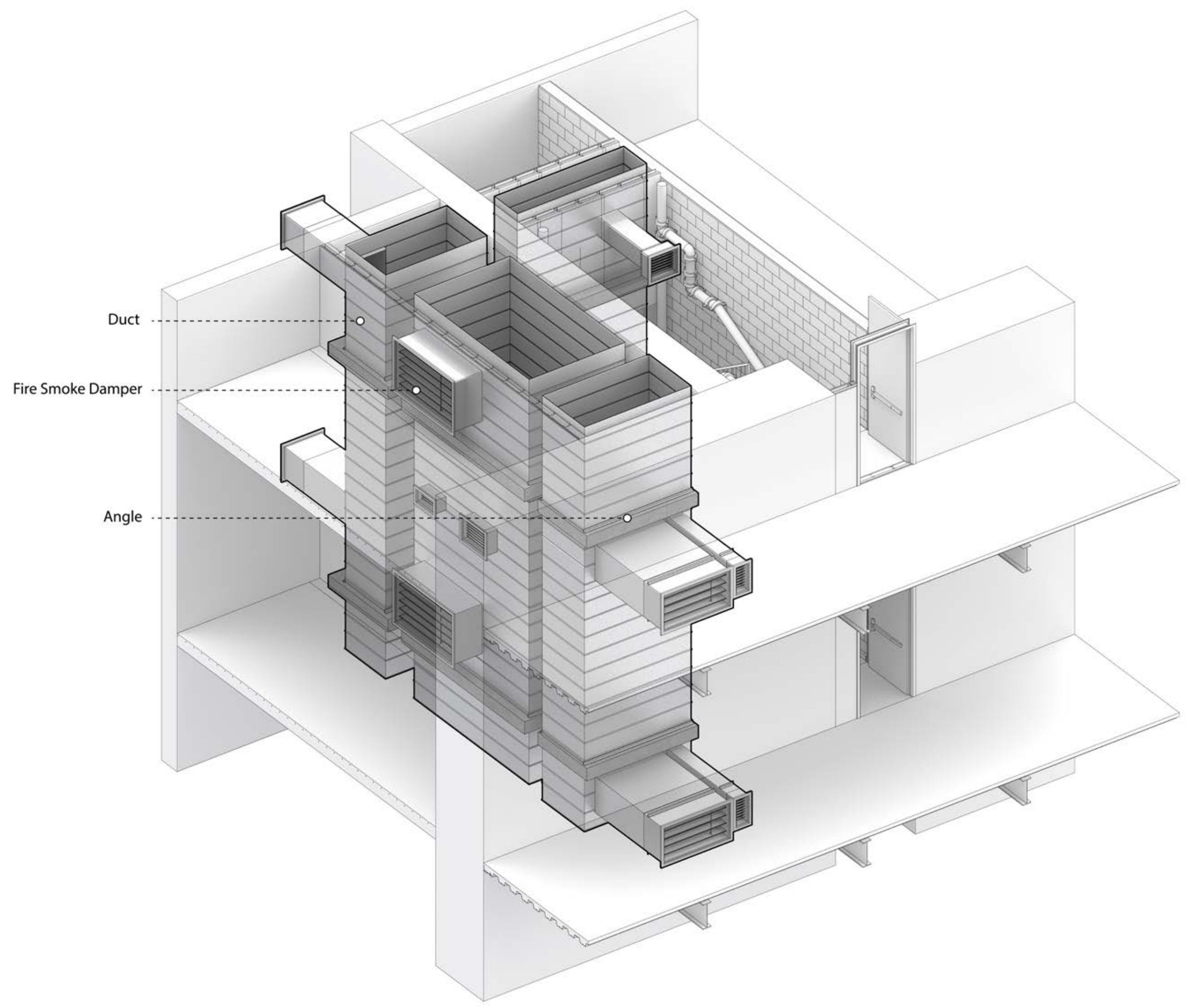


Egress Stair Analysis Model

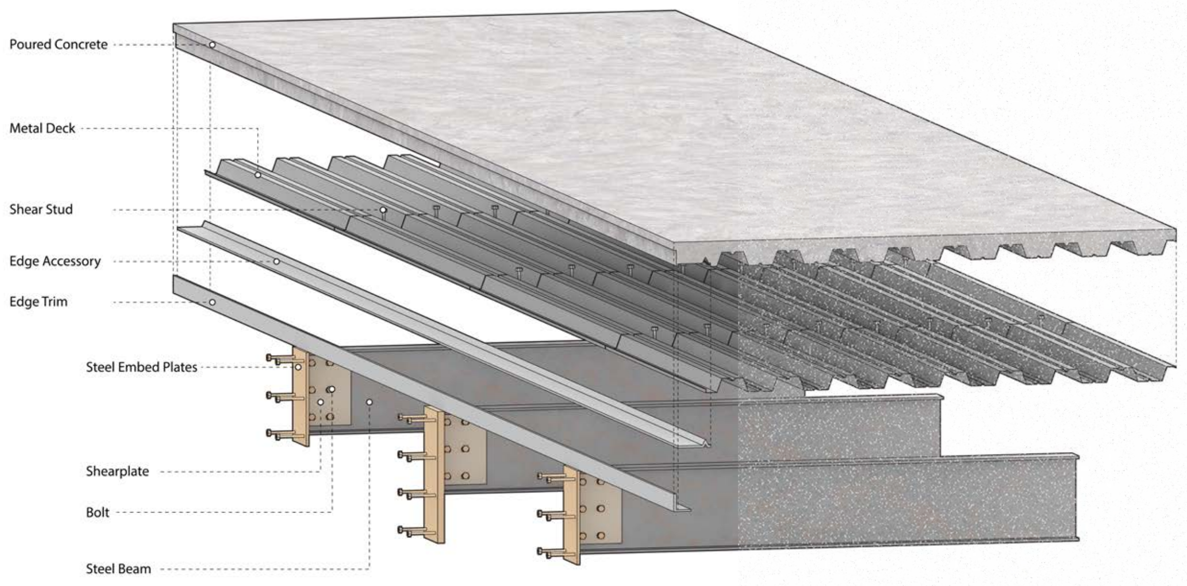
ATV | Spring 2022
Critic: Nicole Dosso
With Alex He, Shuyang Huang, & Charlie Liu

Our group analyzed a core and egress stair system by building a chunk model of the many different building systems that intersect in this crucial part of a building. We represented these systems at different scales: from the smaller scale of individual systems and materials, to the macro scale of how these different systems interact with each other.

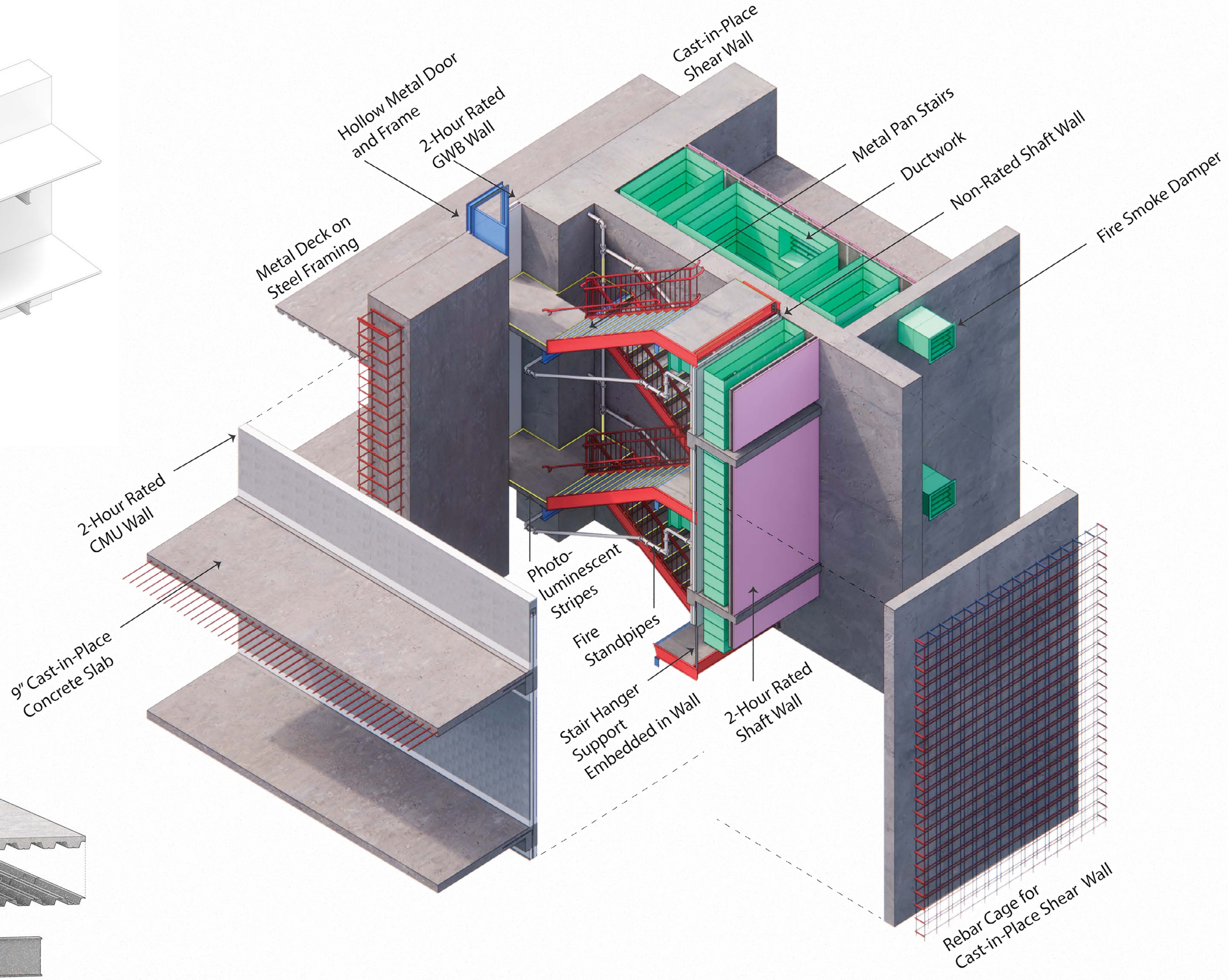
A building core plays a huge supportive role for the rest of a building. On one level, cast-in-place shear walls provide structural support by resisting lateral forces. In addition, the core creates a vertical space to house and seal off vertical circulation from the rest of the building. This vertical egress metal pan stairs are equipped to efficiently and effectively evacuate residents in the event of a fire. Other fire safety systems accompany the stair - a series of photoluminescent stripes and signage creates a clear path to the exit in low-light conditions. Fire standpipes travel vertically through the core and connect to sprinkler systems on each floor. In addition, multiple risers house ductwork that ventilates and connects to fire smoke dampers. These systems seamlessly integrated within the tight confines of the building core.



Duct & Fire Smoke Damper



Metal Deck on Steel Framing



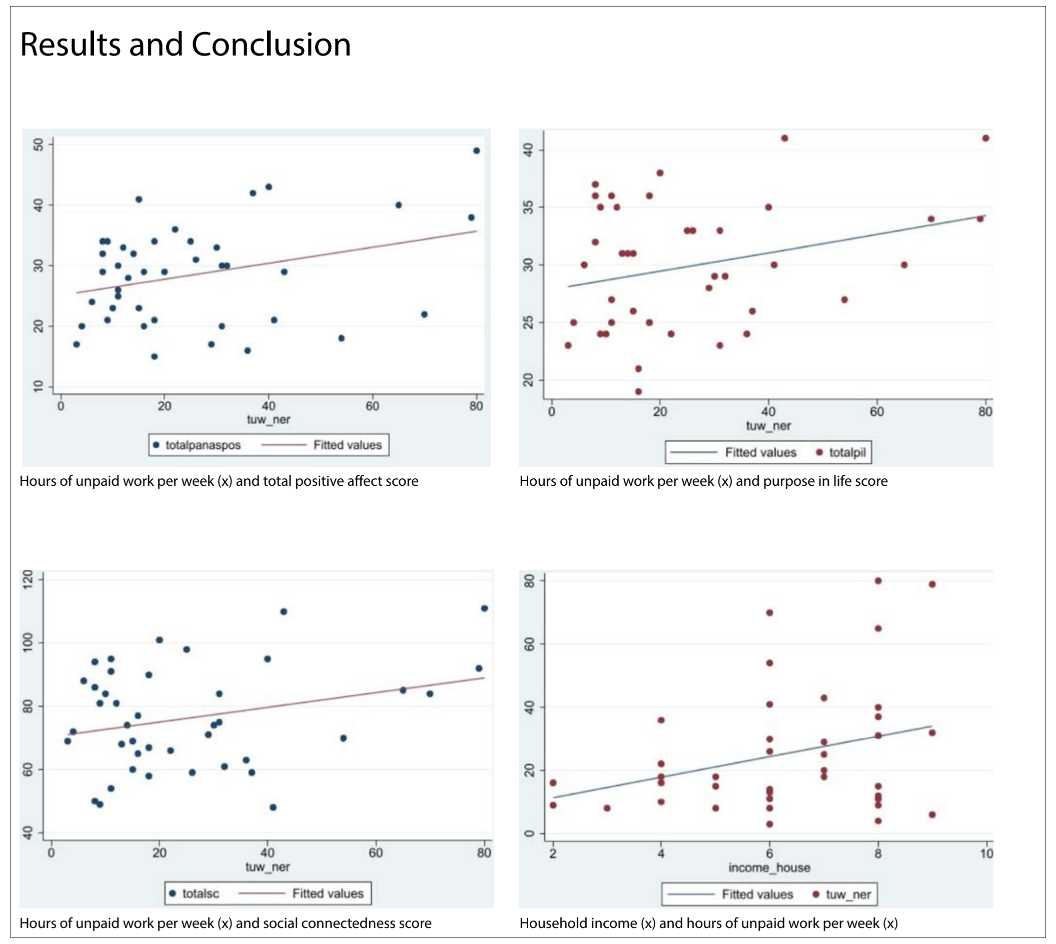
641 Lex. Modular Housing Intervention

Core I Studio | Fall 2020
Critic: Emmett Zeifman

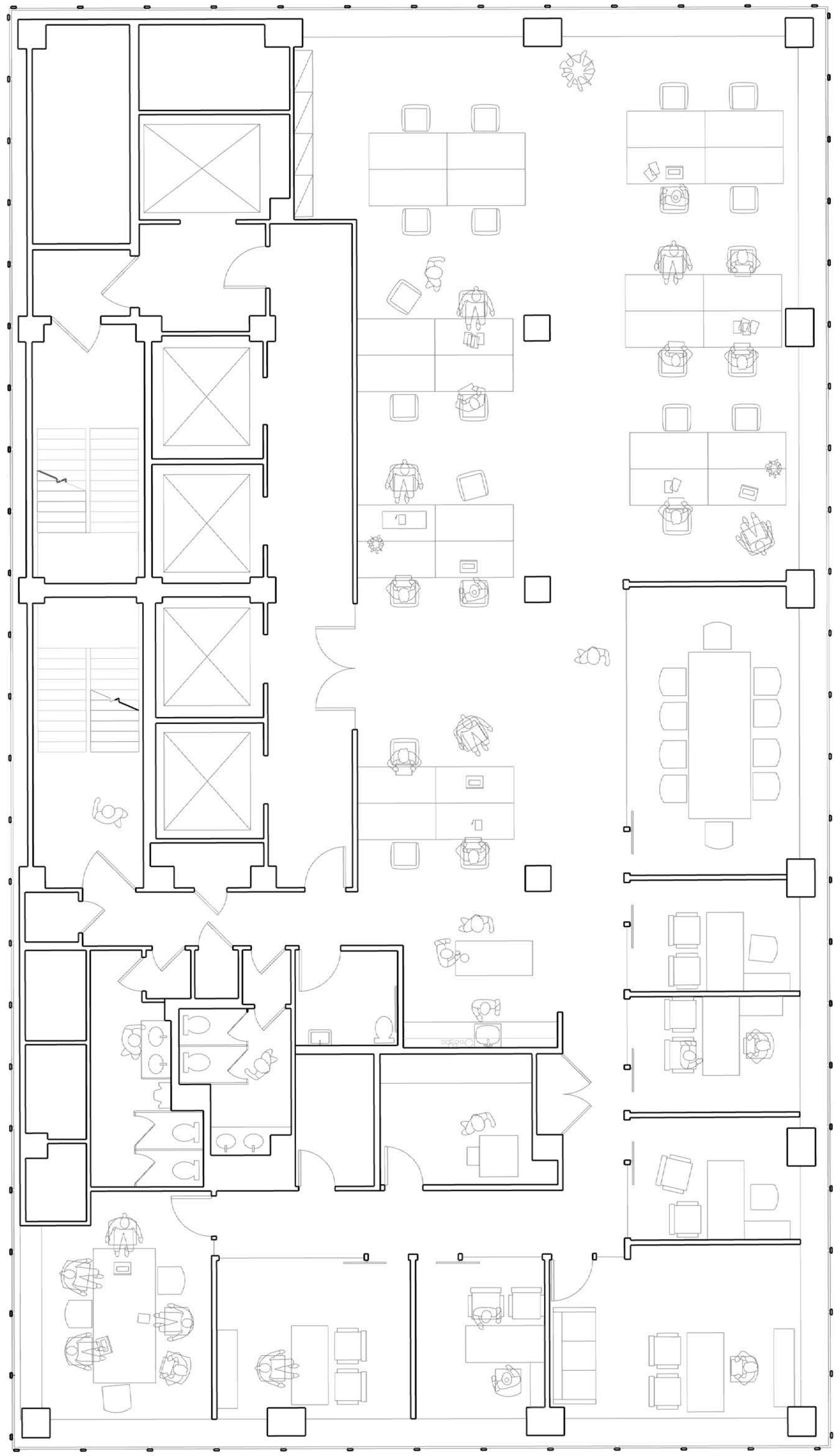
This project reimagines vacant office spaces in Midtown Manhattan as sites of collective, modular housing. For my location at 641 Lexington Avenue, I examined how modules could be inserted into an existing building with minimal structural impact and a high level of flexibility. Each unit consists of prefabricated walls, and each wall further breaks down into interchangeable panels. As a family grows or wants more space, additional modules can be connected to their existing space.

This collection of modules is arranged to create a co-living space. Centralizing bathrooms and kitchens creates greater efficiency in reconfiguring the exisitng plumbing, and shared social spaces encourage interaction and allow for the sharing of domestic labor.

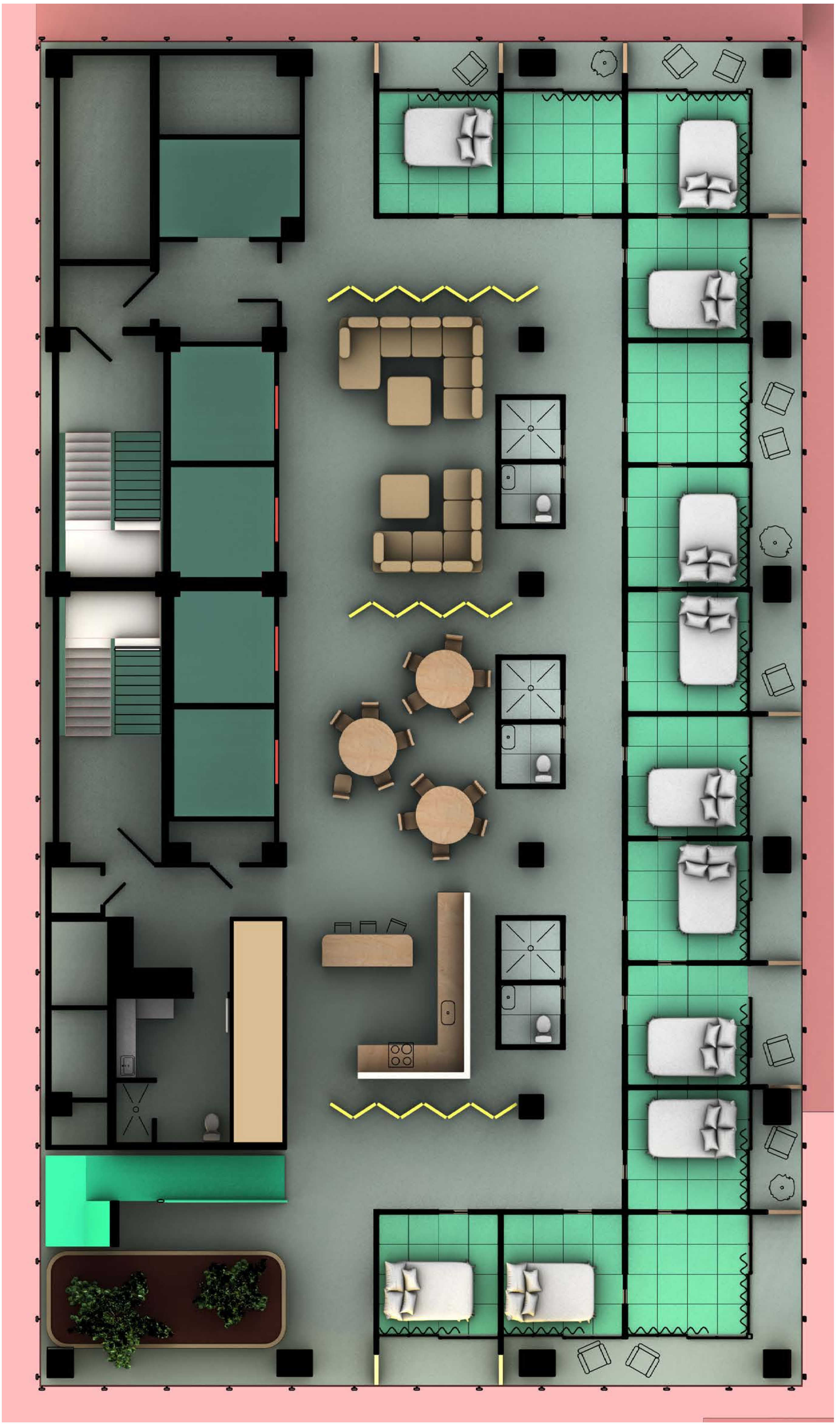
Tianyun Zhang and I began the semester with an independant study on domestic labor in Manhattan to inform the future design process. We collected data through Amazon Mechanical Turk, and used Stata to perform data analysis (results shown below).



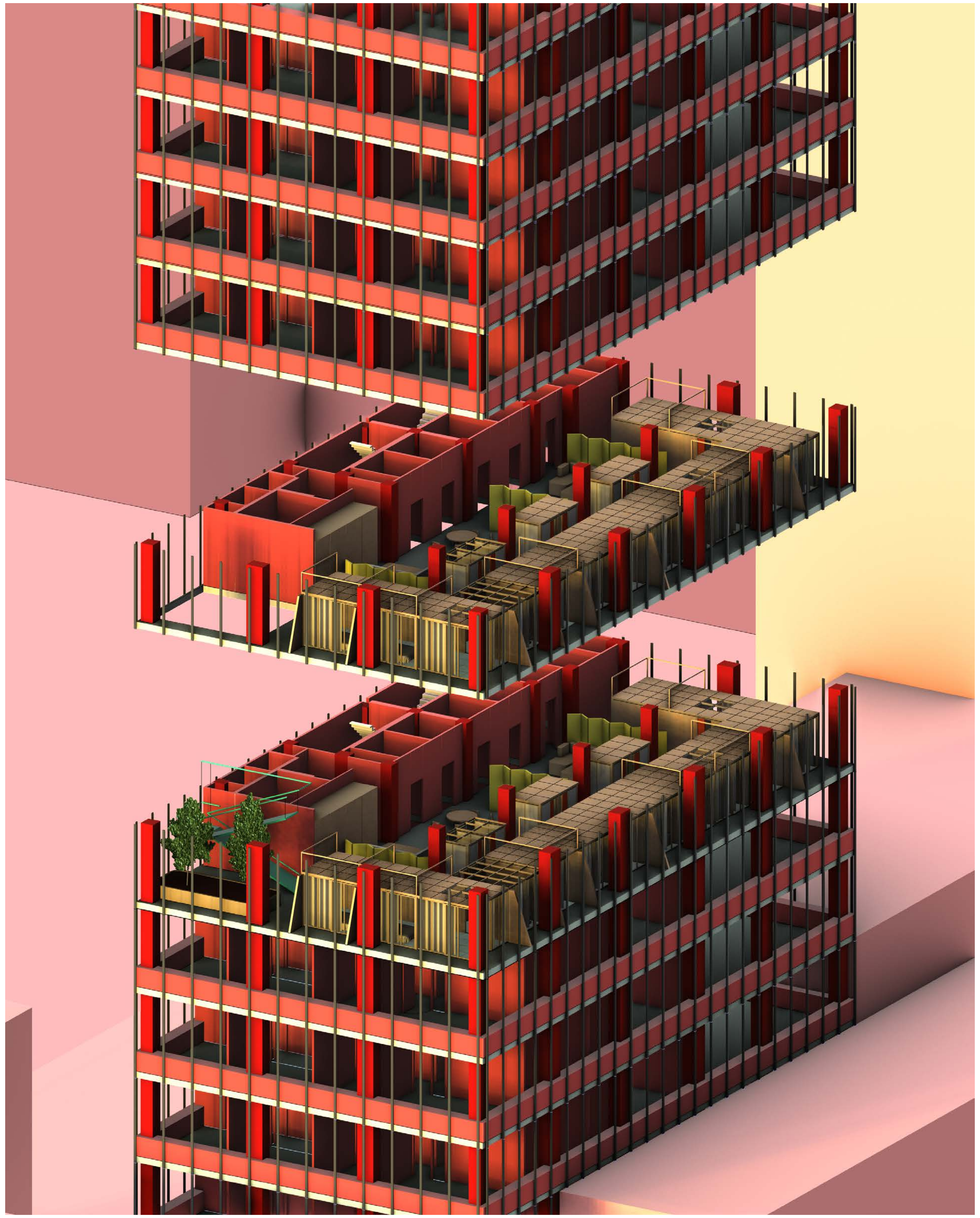
Domestic Labor Study



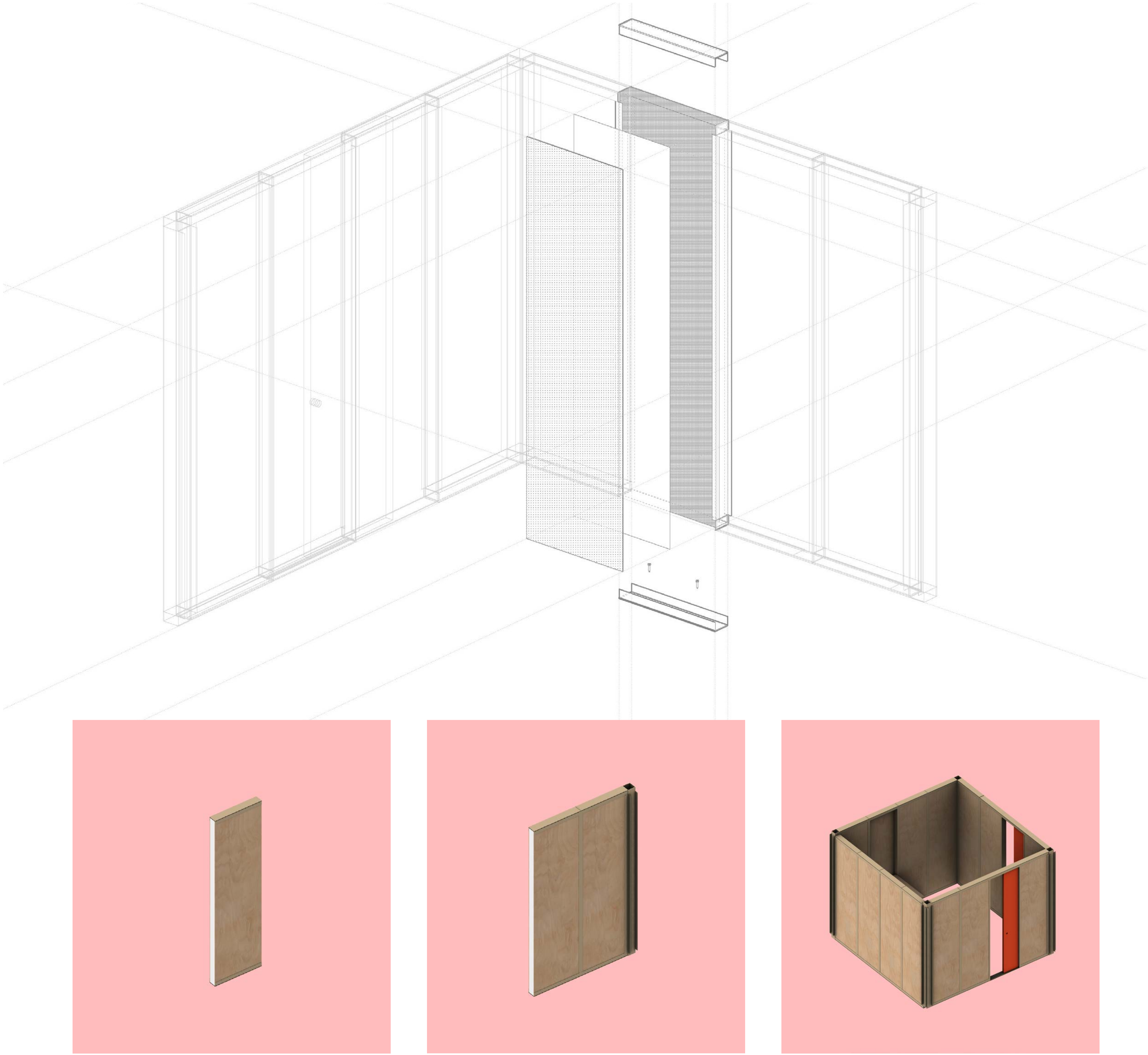
Previous Office Building



Converted Space



Building Axonometric



Modular Wall Assembly

Will Rose

M.Arch 2023

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