

**Columbia GSAPP**

**M.S. Advanced Architectural Design**

**Graduation Portfolio**

**HyunSeung Moon**

Columbia GSAPP

M.S. Advanced Architectural Design

Graduation Portfolio

HyunSeung Moon

**WHAT IS TO BE ASKED**

**Columbia GSAPP**

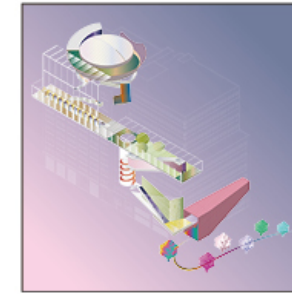
**M.S. Advanced Architectural Design**

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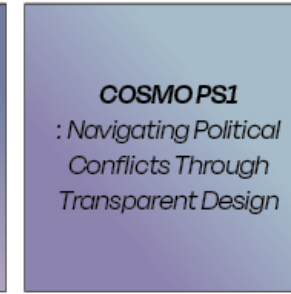
**HyunSeung Moon**

# INQUIRY

What should architects ask in the Anthropocene?



Advanced Studio Tutorial  
Summer 2024



**COSMOPSI**  
*: Navigating Political  
Conflicts Through  
Transparent Design*

Transscalarities  
Summer 2024



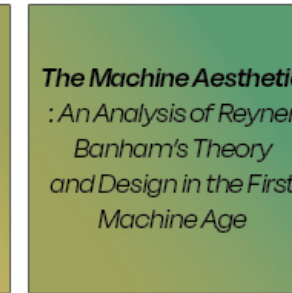
Edible Summit  
Spring 2025

# AGENCY

Can materials and systems serve as catalysts for social transformation?



Advanced Studio V  
Fall 2024



**The Machine Aesthetic**  
*: An Analysis of Reyner  
Banham's Theory  
and Design in the First  
Machine Age*

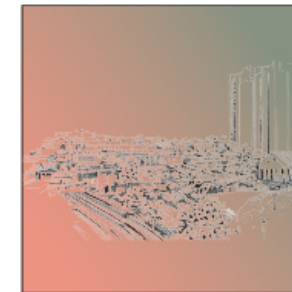
The History of Architectural Theory  
Fall 2024



Seed Bombs  
Fall 2024

# REDRESS

How can we heal the wounds of discriminatory histories embedded in our cities?

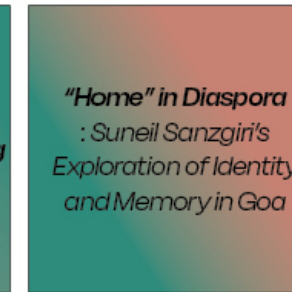


Advanced Studio VI  
Spring 2025



**Variations in Fire  
Escape-Related Building  
Components**

Architecture & Development of NYC  
Spring 2025



**"Home" in Diaspora**  
*: Suneil Sanzgiri's  
Exploration of Identity  
and Memory in Goa*

Arguments  
Summer 2024



**INQUIRY-1****Data Mourning Promenade**

: How to Memorialize Both Digital and Physical Bodies Through Trees

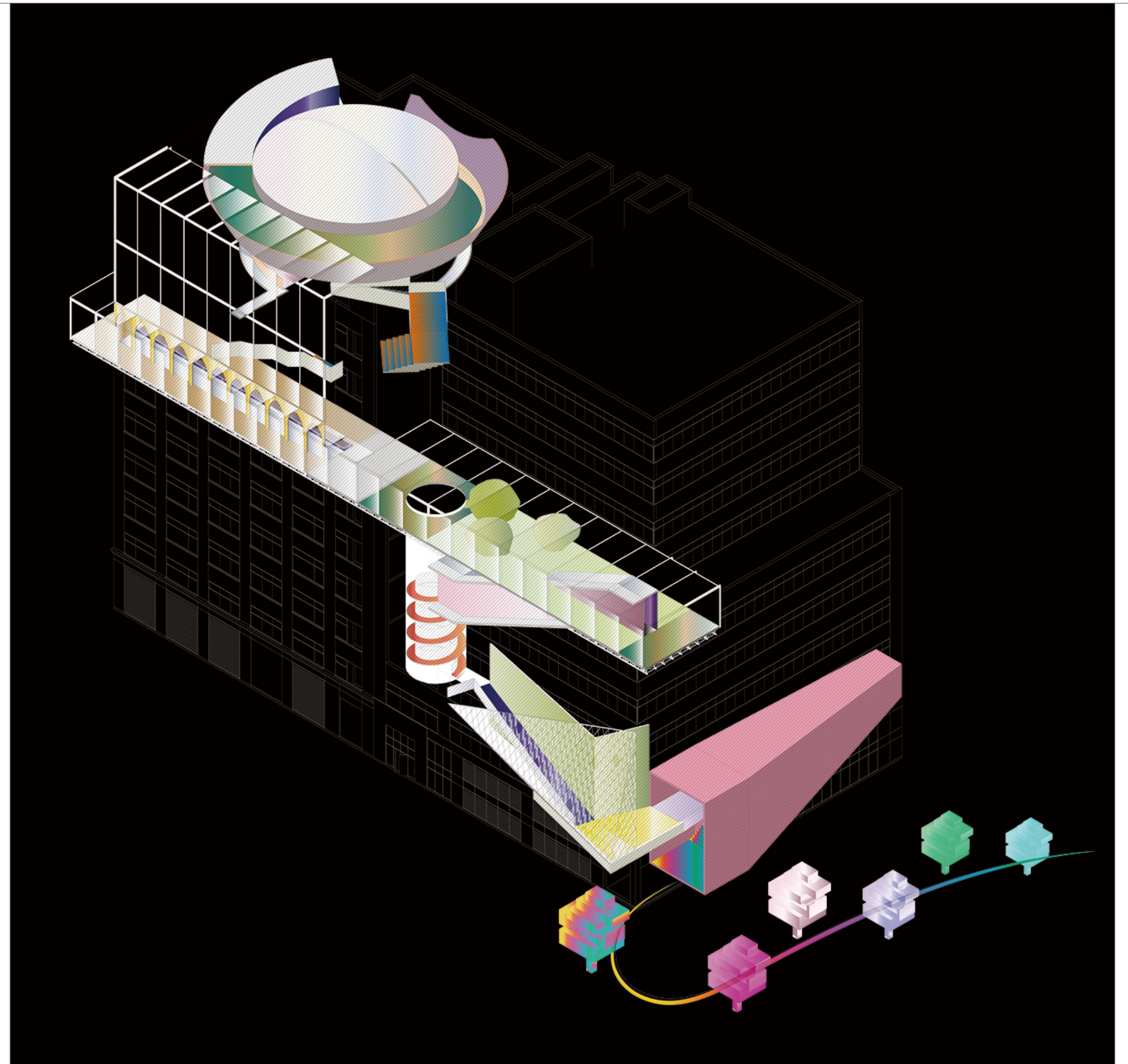
*Sexy Apocalypse, Embracing the End*

Advanced Architecture Tutorial / SUMMER 2024

INSTRUCTOR : Uriel Fogué

LOCATION : New York, NY

The project proposes a sustainable way to store and commemorate data by converting the deceased's data into plant DNA and their bodies into nutrient-rich soil. This process reflects ancestral worship practices, where earlier generations are naturally forgotten, and aligns with the value of memory in various cultures. With nearly 70% of data in current data centers never being used again, this approach utilizes 70% of the area occupied by these centers to create continuous memorial spaces throughout cities. The deceased's data stored in plant DNA is theoretically a million times more efficient than traditional data storage but has a less than 1% chance of biological mutation. As the body decomposes into soil, it nourishes a tree where the person's memories are stored, symbolizing the relationship between death and data. This cycle connects the "Physical Body" and "Digital Body" after death.





### From Personal Experience to the Proposal

In Korean funerals, it is customary to burn the deceased's belongings three days after death. After that, the family commemorates them every year through Ceremony named "Jae-Sa", based entirely on their memories.

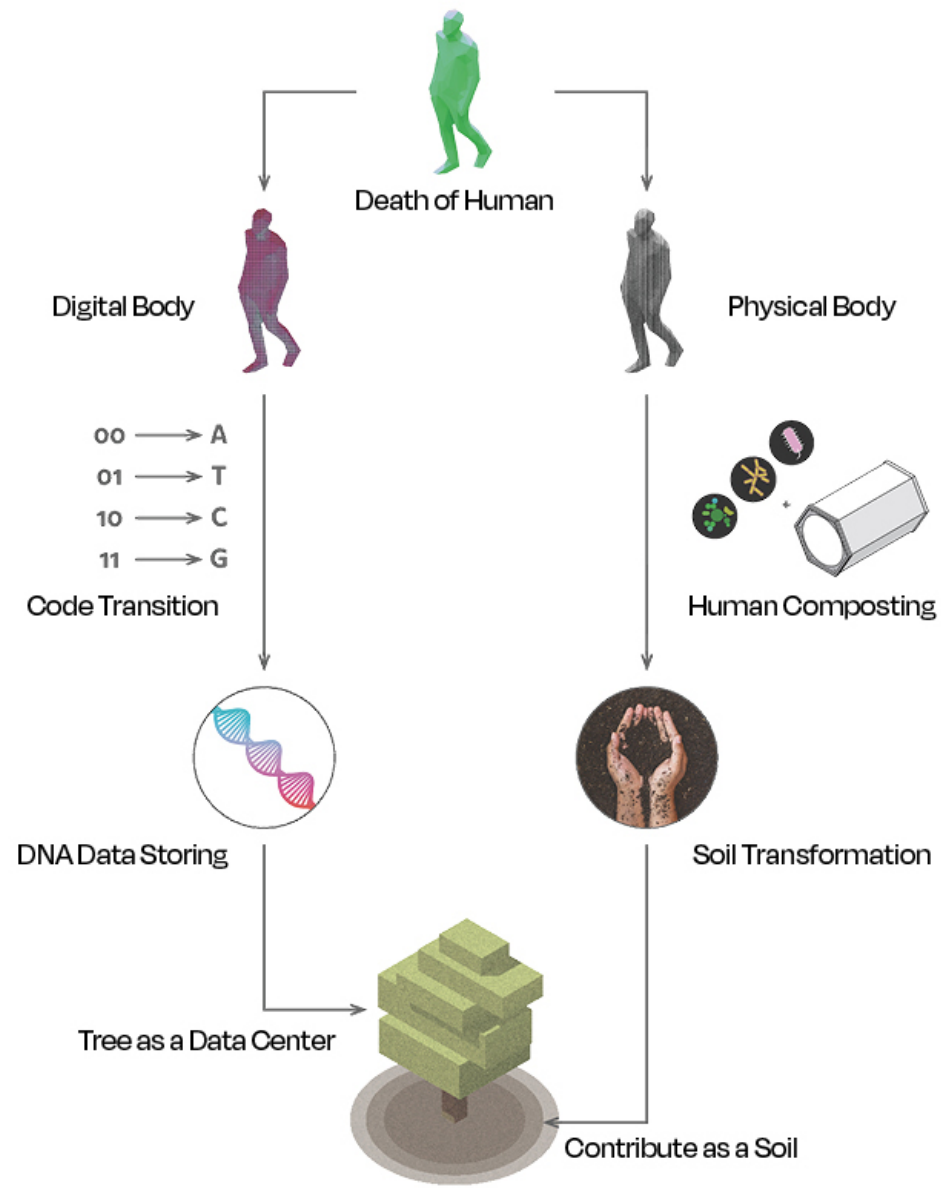
The picture shows the scene of my family three days after my grandmother passed away. Because she passed away during the summer semester, I decided to think more about death and the way to memorialize in this project.



"Data After the Death" Collage







**Process of Green-Data Mourning**

The project is focusing on a way to connect our death with data, recognizing that people in modern society store much of their memories in the form of data. The process involves converting the deceased's data into plant DNA after death, while simultaneously converting the body into soil to contribute to the growth and survival of the plant.



Various Ritual Space for Citizen

How can the Project can change Cityscape



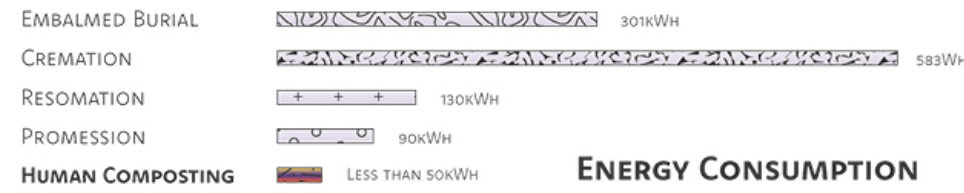
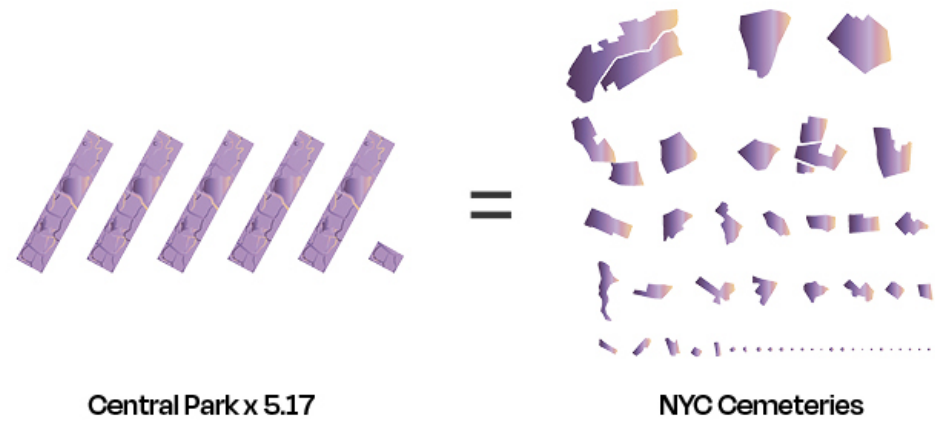
Before



After



**Problems with the Current Funeral Culture**



The project is focusing on a way to connect our death with data, recognizing that people in modern society store much of their memories in the form of data.

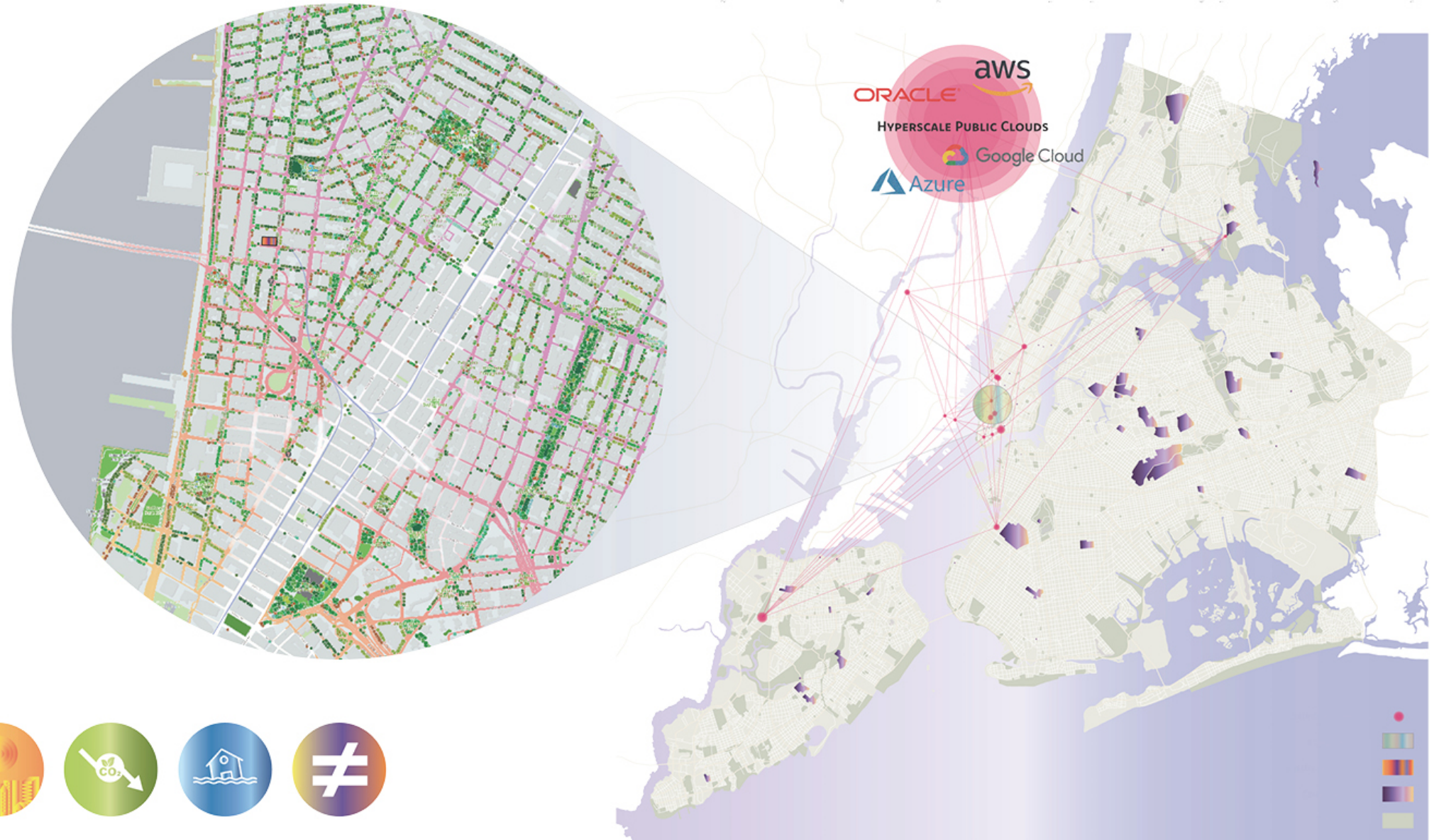
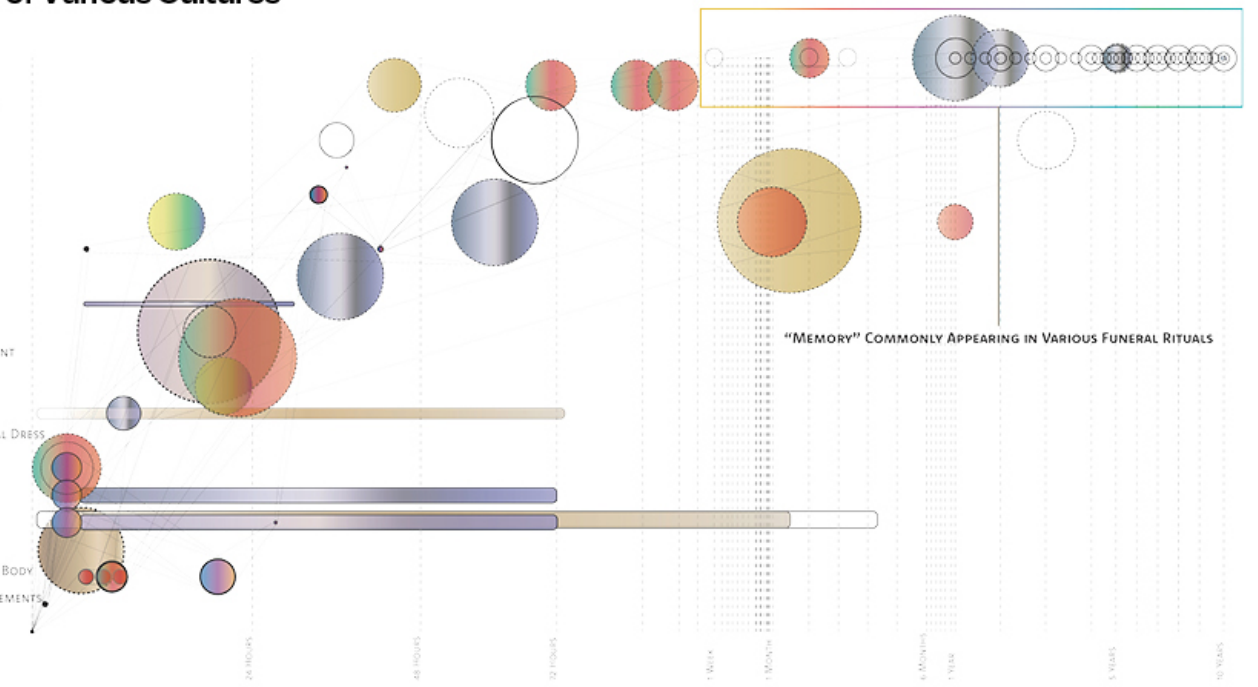
This proposal stems from the fact that in many cultures, memory has long been valued in funeral rituals. A key point here is that memories gradually deteriorate and fade away. Thus, this project addresses how we can naturally forget and erase data while commemorating both our physical and digital selves.



**Funeral Ritual of Various Cultures**

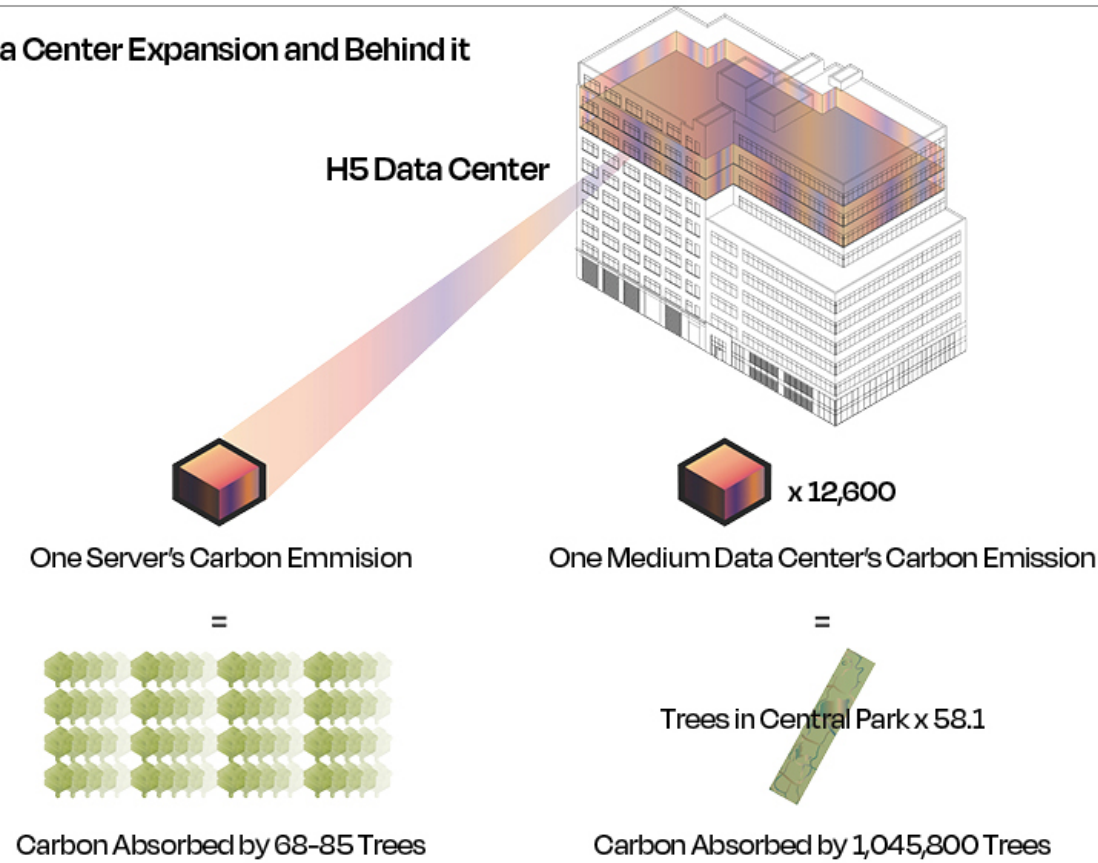
**REMEMBRANCE CEREMONY**

- DINNER
- ASHES SCATTERED TO THE GANGES
- BURIAL OR FINAL PLACEMENT
- OBTAIN CERTIFICATE OF DEATH
- ENCOFFINING CEREMONY
- FUNERAL SERVICE
- CREMATION
- VISITATION
- EMBALMING OF THE BODY
- COMMUNITY PRAYER
- PERFORMANCES AND ENTERTAINMENT
- ENTOMBMENT OF THE BODY
- WAKE
- BEREFT CHANGES INTO TRADITIONAL DRESS
- PREPARE FOOD
- DECORATE WITH FLOWERS
- WEAR MOURNING CLOTHES
- GATHER AT MOSQUE
- CEREMONIAL PREPARATION OF THE BODY
- IMMEDIATE FAMILY MAKES ARRANGEMENTS
- DEATH

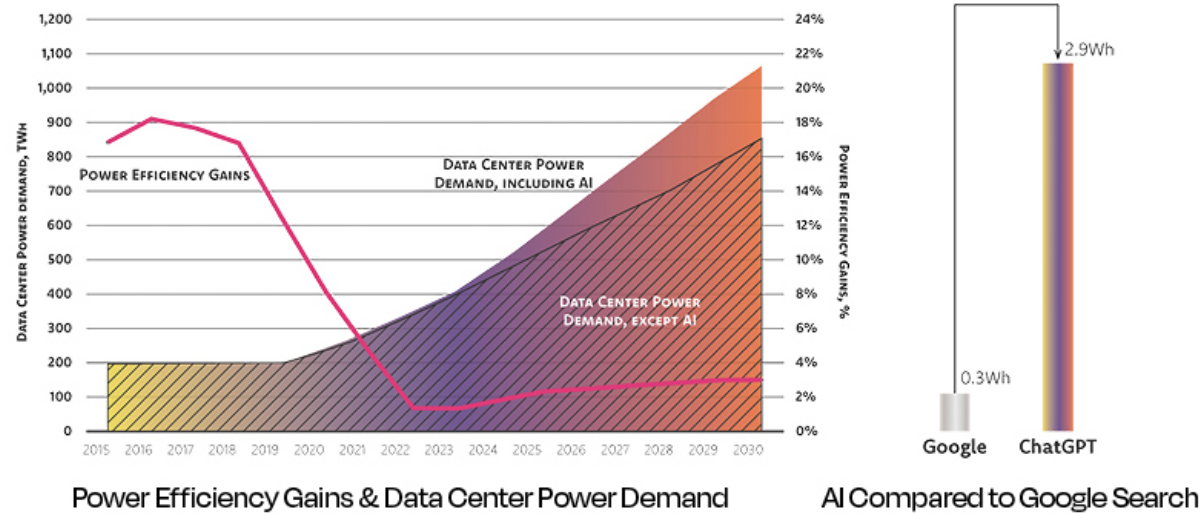




### Data Center Expansion and Behind it



### How AI will Affect Data Center

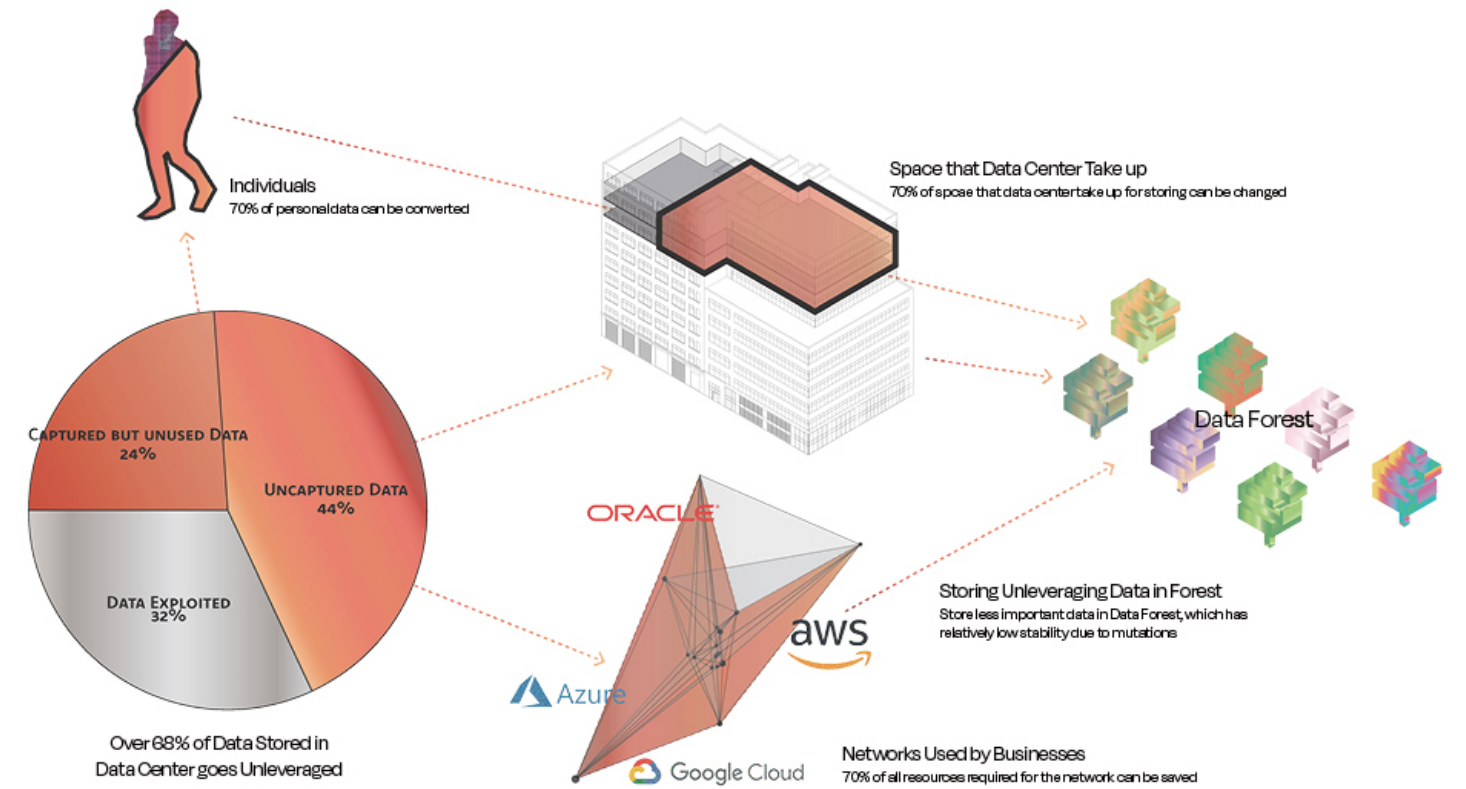


The project begins by questioning the capitalist mindset that sees the continuous advancement and expansion of technology as the ultimate answer. It takes inspiration from Marina Otero Verzie's lecture, "Data Mourning," which discusses sustainable ways to use data.

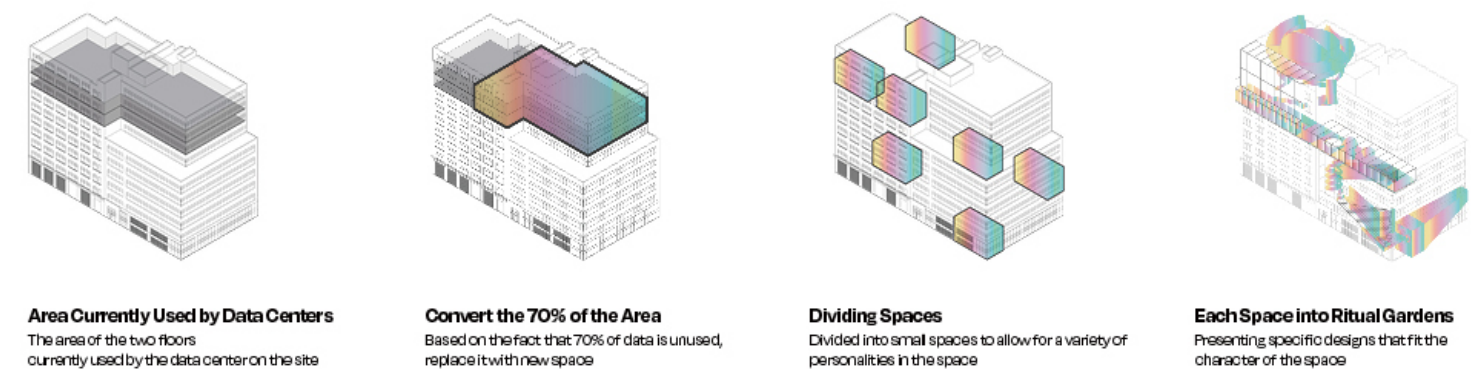
Nearly 70% of the data we store in the cloud is never accessed again after being saved. For relatively less important data that we are unlikely to use again, I suggest storing it in DNA, allowing it to live and die naturally with the tree's life cycle.

Specifically, based on data showing that nearly 70% of the data stored in the cloud is never used again, we aim to utilize 70% of the area currently occupied by data centers. These areas will continuously link different memorial spaces, which will also serve as backup spaces for data stored in street trees.

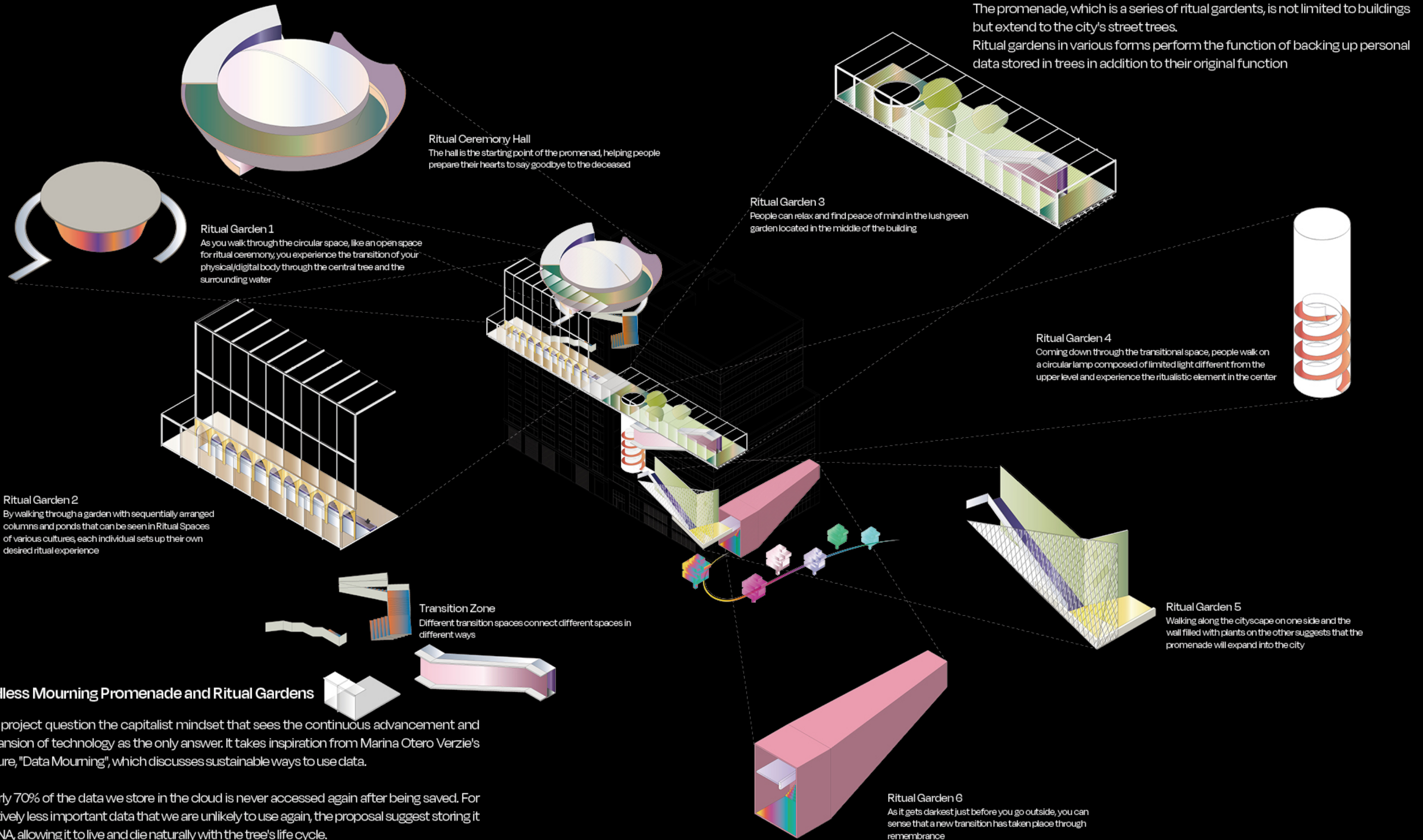
### The Potential of 70% of Less Important Data



### Massing Process of a Promenade







**Endless Mourning Promenade and Ritual Gardens**

The project question the capitalist mindset that sees the continuous advancement and expansion of technology as the only answer. It takes inspiration from Marina Otero Verzie's lecture, "Data Mourning", which discusses sustainable ways to use data.

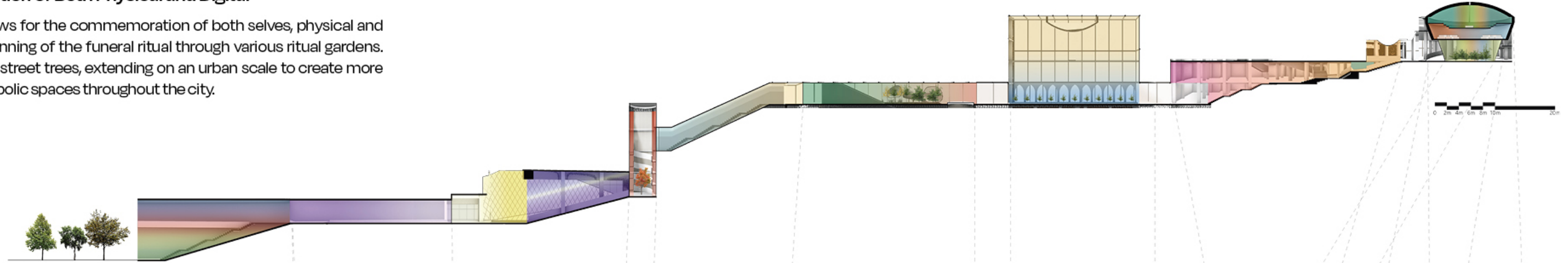
Nearly 70% of the data we store in the cloud is never accessed again after being saved. For relatively less important data that we are unlikely to use again, the proposal suggest storing it in DNA, allowing it to live and die naturally with the tree's life cycle.



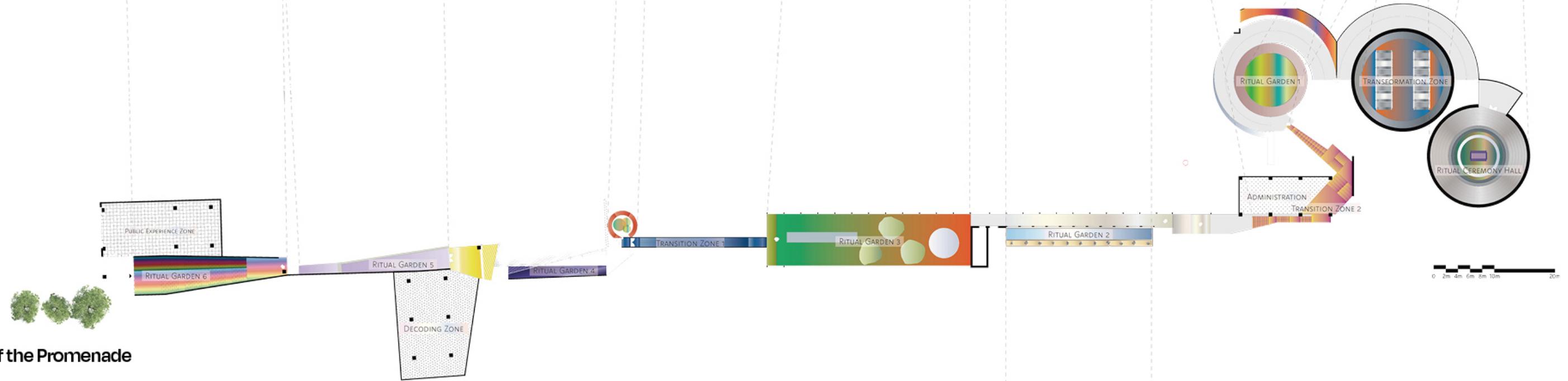
### The Commemoration of Both Physical and Digital

This promenade allows for the commemoration of both selves, physical and digital, from the beginning of the funeral ritual through various ritual gardens. This data is stored in street trees, extending on an urban scale to create more meaningful and symbolic spaces throughout the city.

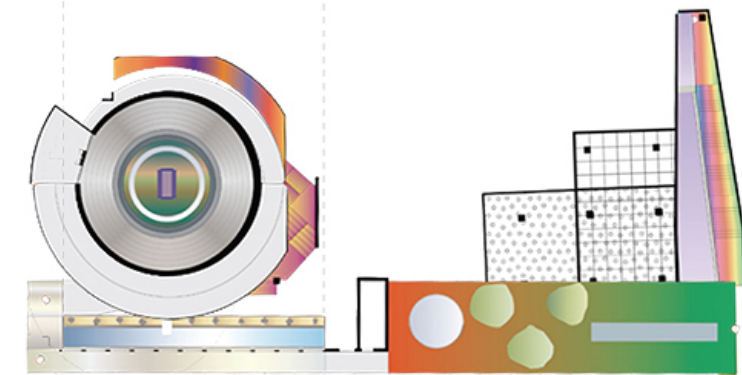
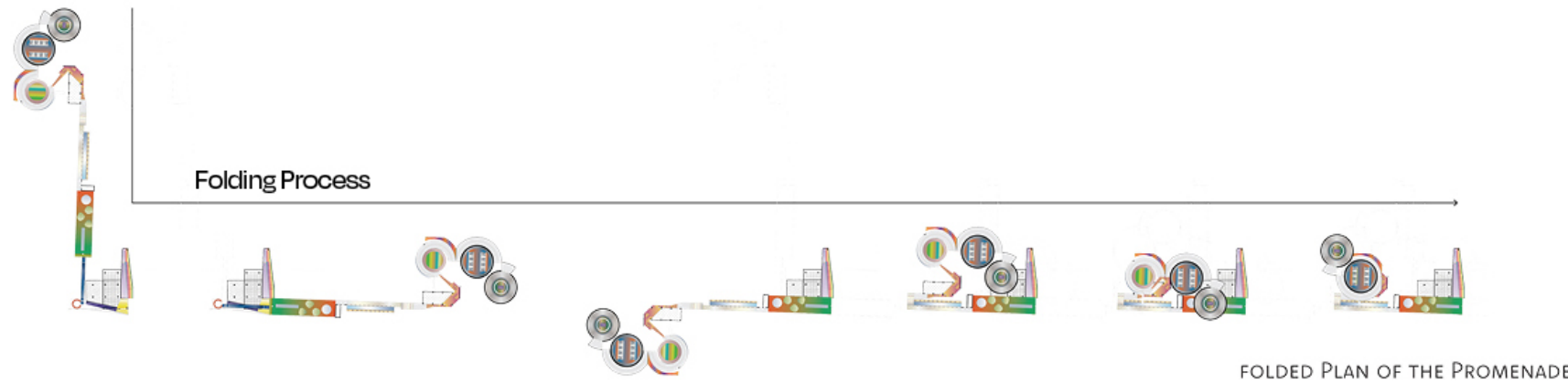
Unfolded Section of the Promenade



Unfolded Section of the Promenade



Folding Process





## INQUIRY-2

### COSMO PS1

: Navigating Political Conflicts Through Transparent Design

Transscalarities / SUMMER 2024

INSTRUCTOR : Andrés Jaque, Bart-Jan Polman, Marie de Testa



Andrés Jaque's COSMO PS1, the pavilion installation work that won the Young Architects Program 2015, addresses significant political conflicts and controversies. Particularly, the project started in response to the global issue of water scarcity. The issue gained global attention in 2000 with the Cochabamba Water War, triggered by water privatization and shortages affecting Bolivia's low-income communities. On the other hand, the project points to the difficulty of public participation in developments and discussions related to infrastructure. New York City's extensive but concealed underground water system circulates billions of gallons daily, but often excludes public engagement and awareness. By revealing this hidden system, COSMO PS1 promotes greater civic engagement and transparency in discussions around urban infrastructure.

The design specificities of COSMO PS1 are deeply entangled with historical political processes and evolutions concerning environmental awareness and sustainable practices. The sustainable process of water purification employed, using ultraviolet rays, algae, and various plants reflects that water has been recognized as a precious resource requiring proper management since the early 21st century. This shift was catalyzed by events like NASA's glacier surveys in 2001 which made us aware that the potable water is decreasing rapidly because of global warming. In addition, the Environmental Protection Agency's regulations on pesticide use in 2006 to prevent groundwater contamination also strengthen the social public opinion on environmental protection.

The design of COSMO PS1 embodies these historical evolutions by demonstrating an eco-friendly, transparent method of water purification that not only cleans water but also creates a visually and climatically appealing public space. This transparency in "process" and "purpose" aligns with the historical trend towards environmental sustainability and the social issues of transparency of urban infrastructure and public accessibility to it.

Lastly, COSMO operates on both a local and global territorial scale, addressing water scarcity as an international issue that transcends geographical boundaries. The project's design as a prototype allows it to be reproduced and adapted to various environments worldwide. Through its online presence, COSMO PS1 facilitates global collaboration and information sharing, enabling communities and experts around the world to engage with and learn from its water purification processes. This connectivity and adaptability underscore the project's relevance to territorial concerns, as it can be implemented in diverse contexts to address local water issues while contributing to a broader, global dialogue on water sustainability. The project's capacity to move and be reassembled elsewhere further highlights its potential to impact different territories, making it a versatile tool in the global fight against water scarcity.

In conclusion, COSMO PS1 is a multifaceted project that engages with critical political issues of water scarcity and infrastructure transparency, reflects historical shifts towards environmental sustainability, and while specifically sited at MoMa PS1 potentially operates on a global territorial scale. The fact that the project addressed citizen participation and the international scalability of solutions to water-related challenges is why this project remains important even though it was a pavilion project that existed for a short period of time in a localized place.

### Bibliography

Abrahams, Harriet, et al. "Interview with Andrés Jaque, Office for Political Innovation." *Architects After Architecture*, Routledge, 2021, pp. 69-75.

Andrés Jaque / office for political innovation. COSMO, Pabellón MoMA PS1 (nueva york): Water purification artifact for leisure and fun. *Arquitectura Viva*, (176), 2015, pp. 64-67.

Vimeo. "COSMO MoMA PS1." Vimeo, uploaded by Office for Political Innovation, <https://vimeo.com/118853150>. Accessed 8 July 2024.

Office for Political Innovation. "COSMO MoMA PS1." Office for Political Innovation, <https://officeforpoliticalinnovation.com/work/cosmo-moma-ps1/>. Accessed 8 July 2024.

Office for Political Innovation. "COSMO MoMA PS1 Exhibitions." Office for Political Innovation, <https://officeforpoliticalinnovation.com/exhibition/cosmo-moma-ps1-exhibitions/>. Accessed 8 July 2024.

The Museum of Modern Art. "Young Architects Program 2015: Andrés Jaque / Office for Political Innovation." MoMA, <https://www.moma.org/calendar/exhibitions/1520>. Accessed 8 July 2024.



**INQUIRY-3****What is Food?: deCORNstruction**

*AAD Edible Summits / SPRING 2025*

AAD Student Organized Initiative / Open Call

COLLABORATOR : Sungjun Baek, Pimchid Chariyacharoen, Adnan Kasubhai, Dongjae Ko

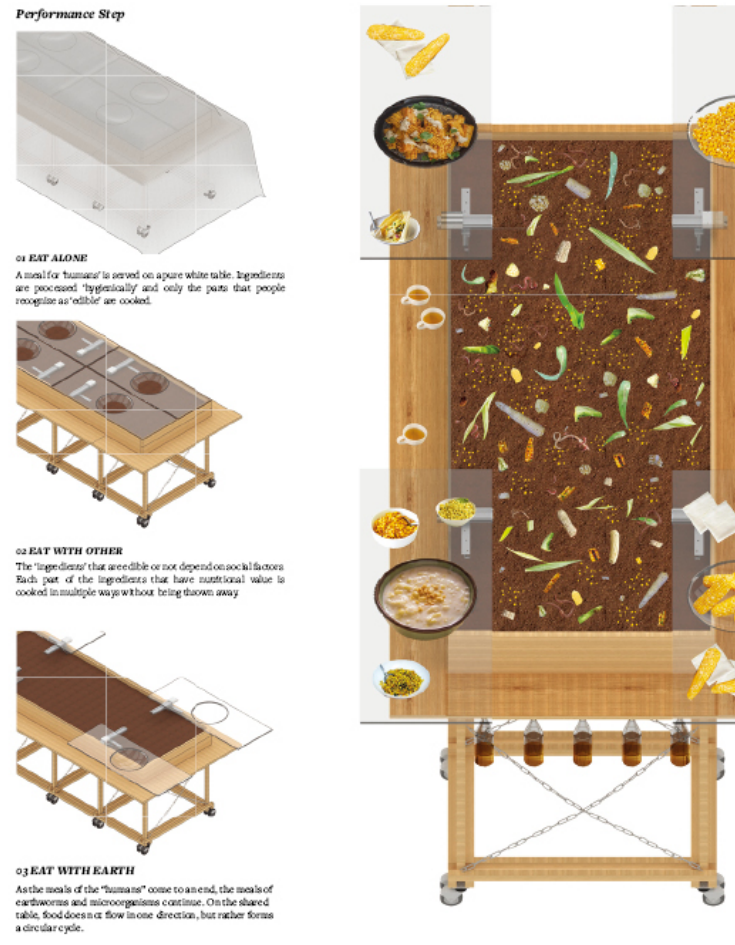
LOCATION : Avery 100

What is food? A ritual, a system, a cycle, or just consumption?

deCORNstruction Project unpacks the layers of corn to explore the perception and boundaries between food and waste, from cob to husk, from rural fields to urban tables, from tiny seeds to tangled trade routes. At the center is a dining table that acts as a living system: food is shared, scraps are fed to worms beneath, and soil is regenerated. This continuous cycle invites us to rethink what we eat, what we discard, and what might begin again.







Materials for submission of the Opencall

The event "What is Food" challenges the way we define and perceive food, presenting the question in two interconnected layers—one cultural, one ecological.

First, we question the boundary of what is considered edible. Who decides what food is? Cultural norms, personal habits, and media influence shape what we accept as nourishment and what we discard as waste. A banana peel, a corn husk, a watermelon rind—deemed inedible in one context, delicacies in another. By sharing meals made from ingredients often dismissed in Western food culture, we confront this constructed border between food and waste.

Second, we expand this question beyond human consumption. If we include the nonhuman actors in the food cycle—microbes, worms, fungi, soil—what else is food? Today, only 2% of food byproducts and organic waste is upcycled or composted. The rest piles up in plastic bags, suffocated in landfills, severed from the cycle of renewal. But what if waste never truly existed?

This table does not forget. It does not simply hold food; it participates in its transformation. Beneath its surface, earthworms churn scraps into nourishment. What was once discarded is metabolized into soil, sustaining life unseen. This is a closed-loop system, where bacteria in our stomachs mirror the microbes in the dirt, and the moon's pull on the tides echoes its influence on crops. Food and waste are not opposites; they are phases of the same process.

Throughnew this dual-layered lens, our table becomes more than a place to eat—it becomes a site of exchange. Human and microbial communities coexist, dissolving the straight lines of consumption into a continuous circuit. The system does not end when the meal is over. The worms continue their work, returning nutrients to the soil, while the conversation lingers—reshaping how we think about food, waste, and the balance between urban and rural spaces. So, what is food? Perhaps, it has never been just what we eat—but everything we allow to return, transform, and sustain.

**What is Food?**

This performance is a digestion. Not of food alone, but of perception, waste, and architecture.

We ask

Who decides what is edible?

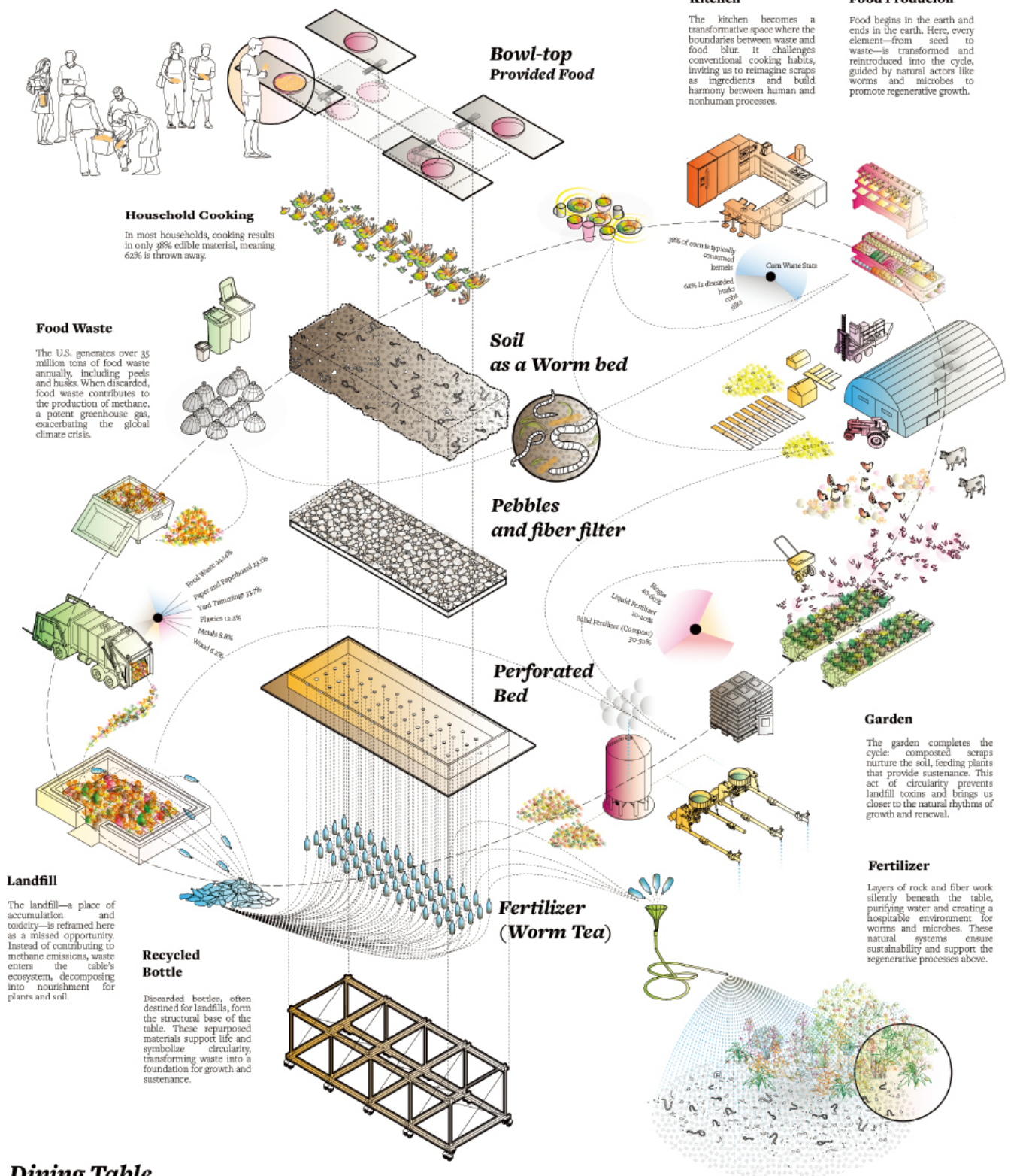
What gets thrown away?

And what systems are invisible beneath the table?"

"Our project explores food as more than nourishment.

We examine it as a cultural boundary, a waste system, and a design question.

**I Remember That Waste...**



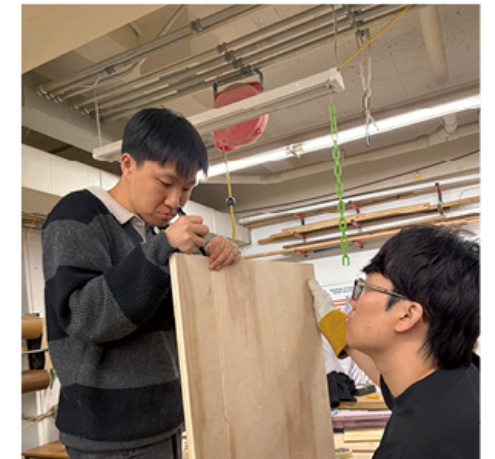
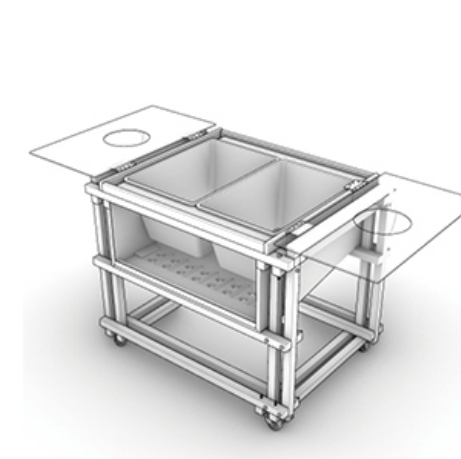
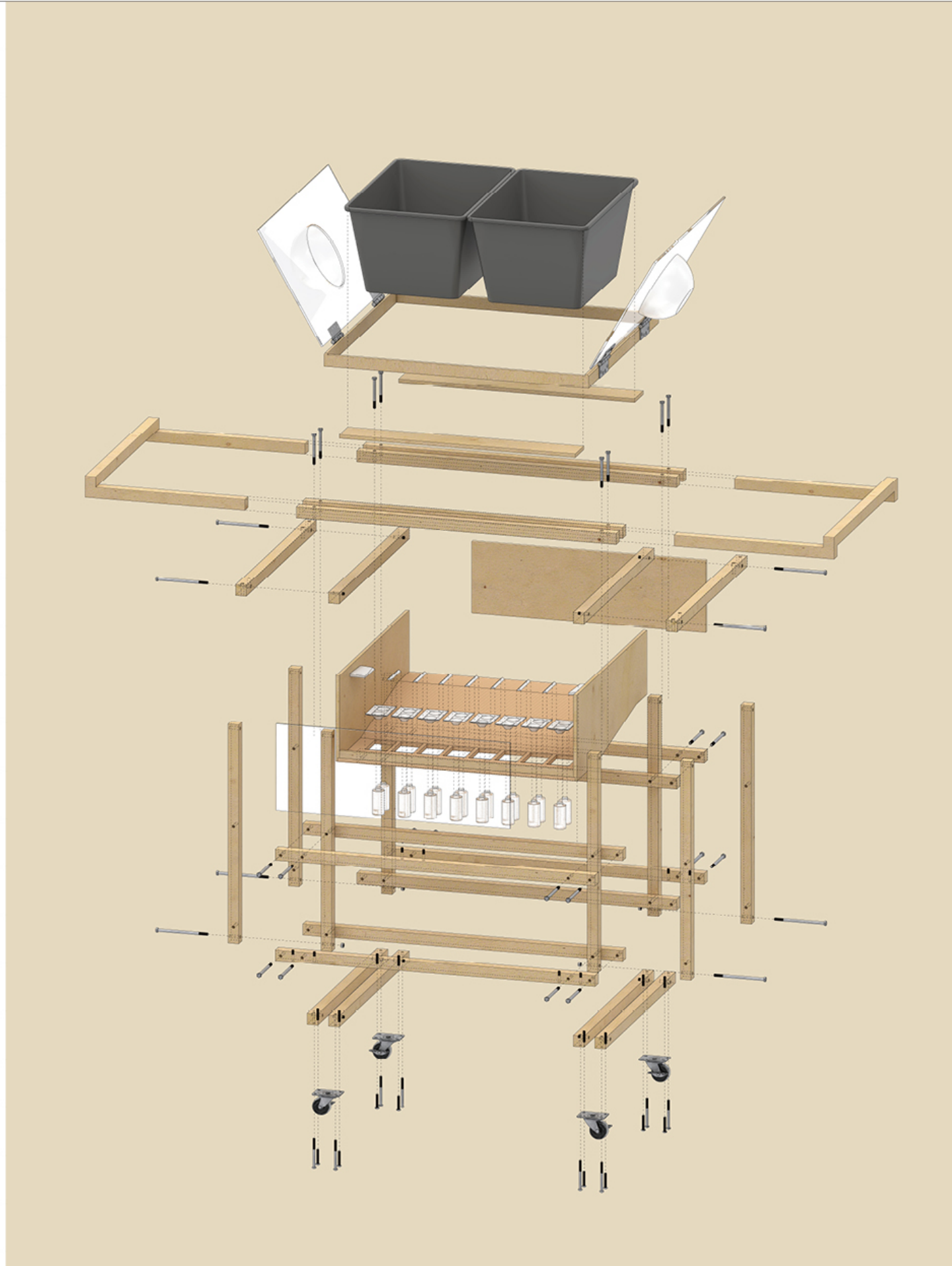
**Dining Table**  
A multi-layered living system, the dining table features opening and extending tops that create a sense of drama and discovery. It invites diners into a shared world where humans, microbes, worms, and plants coexist and collaborate in cycles of regeneration.

"Architecture can be considered as a closed world where all these elements [air, water, energy, and labour] circulate and recirculate in different feedback loops inside structures seen in terms of truly ecological systems." - Lydia Kallipoliti

Kallipoliti, Lydia. "Raussenbühn." In *Cycles: The Architects Who Never Throw Anything Away*, Lisbon Architecture Triennale, 2022.

Eddle Summit  
WHAT IS FOOD





**Process of Fabrication**

Not just designing and proposing the table, every process of fabrication also lead by student. Through the fabricating, we can keep refine the narrative of the performance.





### deCORNstruction

The tables fragment, yes  
 But in that splitting,  
 we expose systems:  
 rural and urban,  
 edible and inedible,  
 human and more-than-human.

What people see moving is not just  
 wood on wheels, it is the transition  
 from a closed, singular narrative to a  
 living, entangled, plural ecology.  
 As we dock the tables, they stop  
 being tables.  
 They become stations of exchange,  
 of labor, of decay, of ritual.

Each station asks a question:  
 What is food?  
 What is waste?  
 And who gets to decide?"





**AGENCY-1****Caputring Light, Liberating Lives**

: New Façade System Using New Material for Energy and Housing Equity

*New Programs, New Technologies + New Topologies*

Advanced Studio V / Fall 2024

INSTRUCTOR : Michael Bell

LOCATION : Palmdale, CA

Can the Current Housing System be Maintained?

This project addresses the current serious housing problem while at the same time reinterpreting the buildings of the past, in order to find a new approach and a new typology.

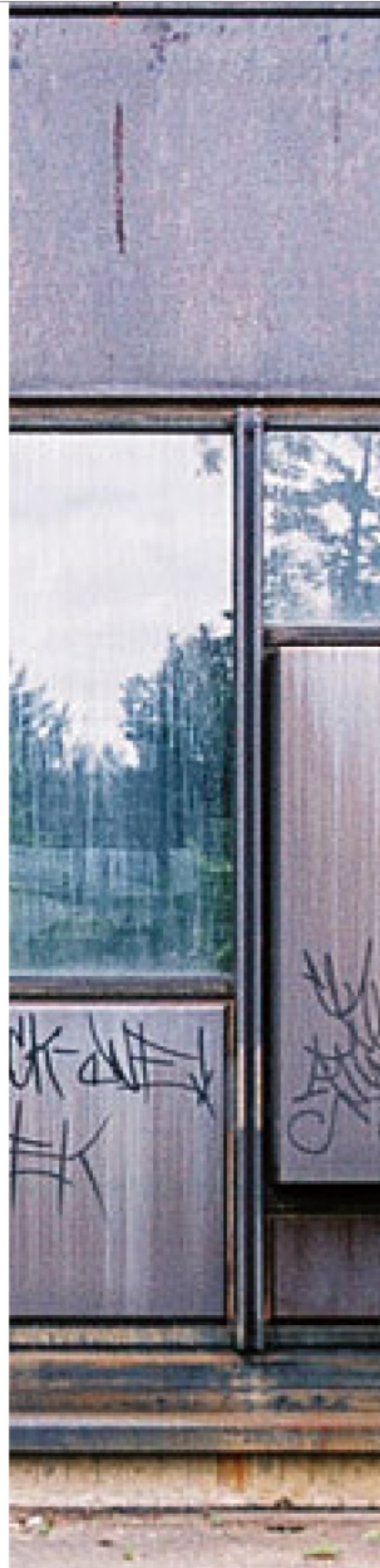
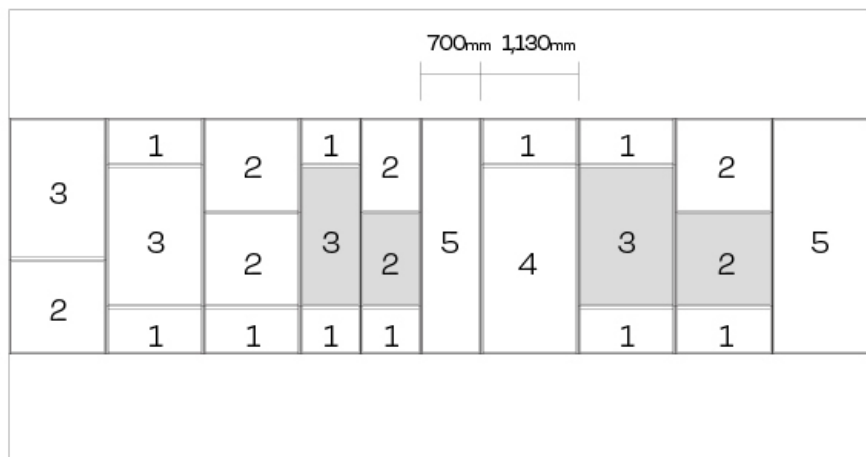
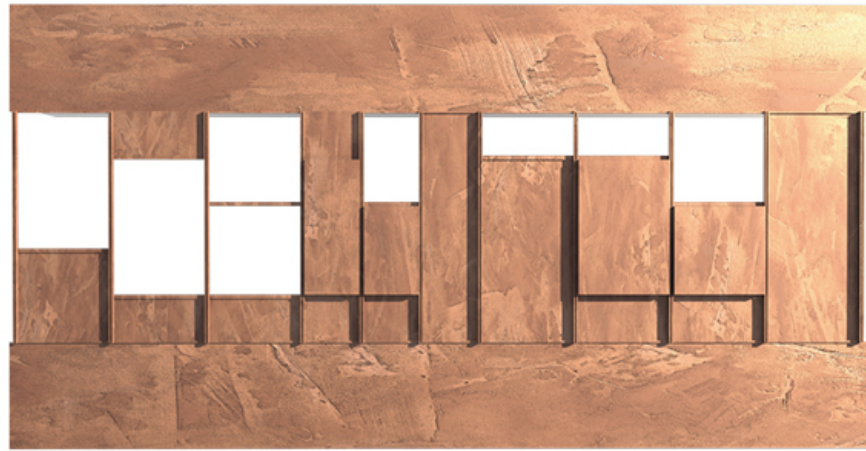
The project is addressing new possibilities to change fundamental structure of housing system through maximizing the use of solar energy.





**Facade Analysis and Detailed Drawing of the Free University**

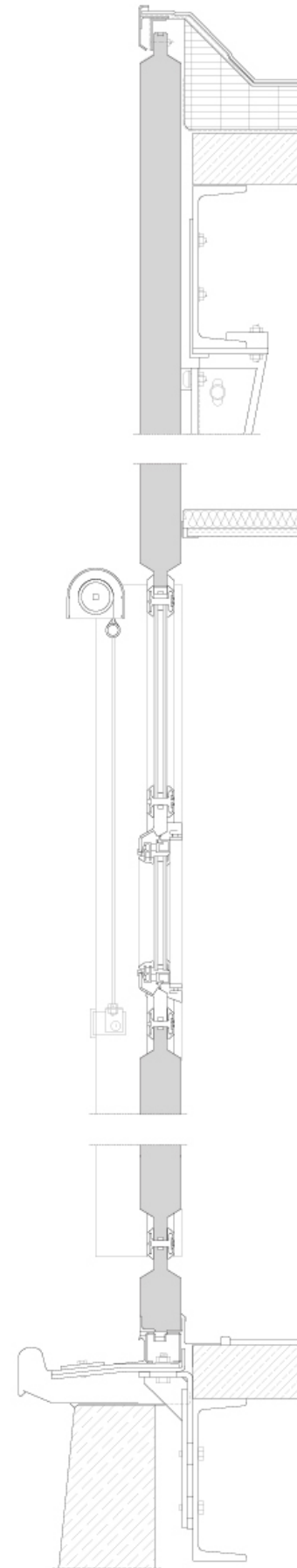
At the beginning of the project, the constantly changing façade of the Free University of Berlin and the coexistence of different façades were understood and analyzed as a way of reinterpreting and transcribing it.



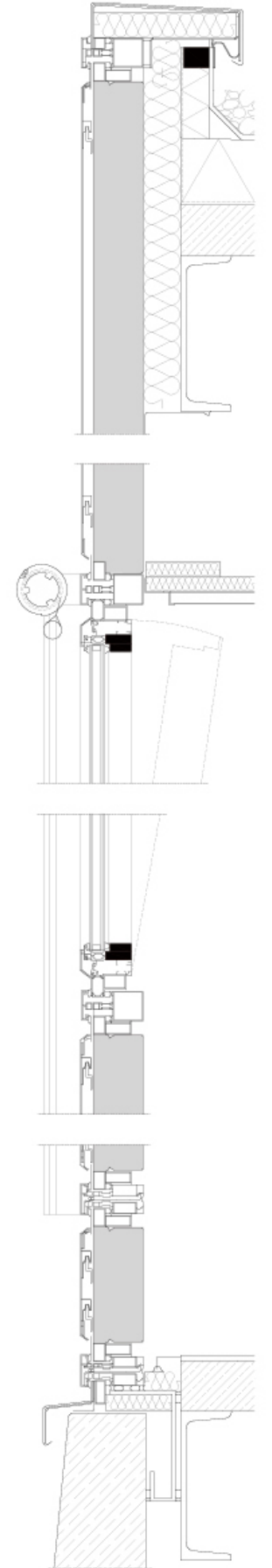
WHAT IS TO BE ASKED



AGENCY: Can materials and systems serve as catalysts for social transformation?

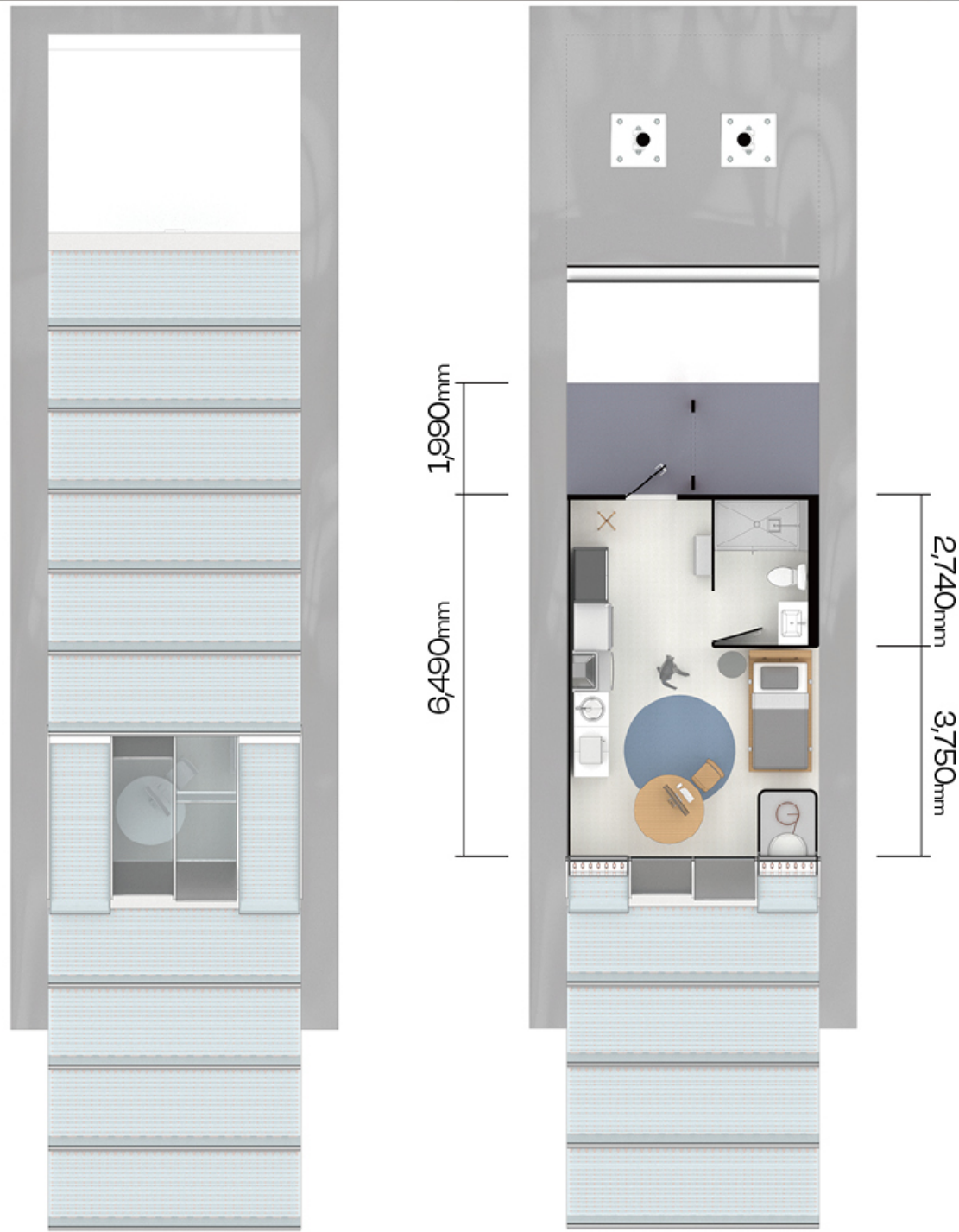


Original Facade



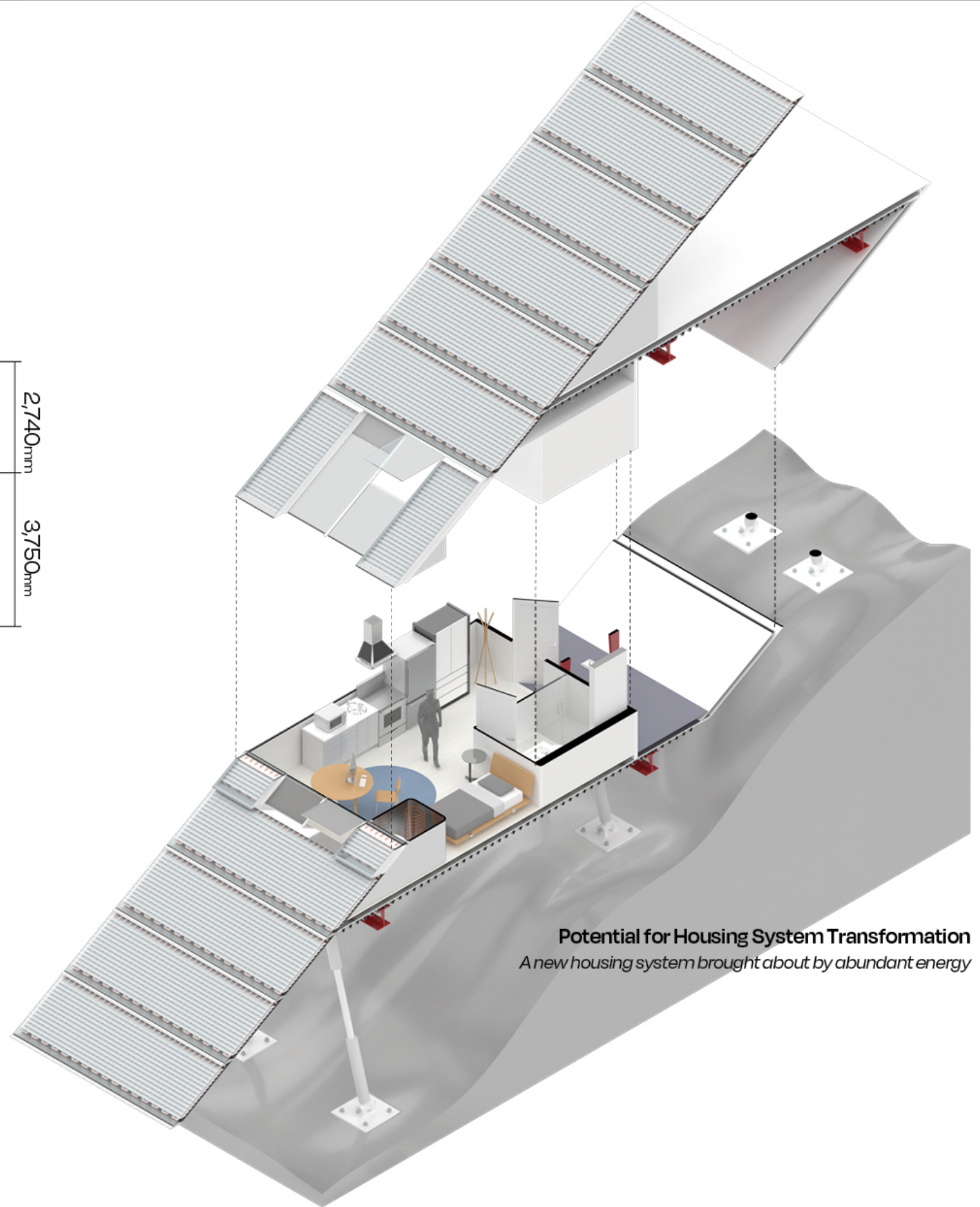
"Transcribed" Facade





**Elevation and Plan of Single Housing Module**

The Single Housing Module is the smallest module with a new façade. It provides living space behind a system that produces its own asset in the form of "energy," which is presented as a solution to the terrible rent.

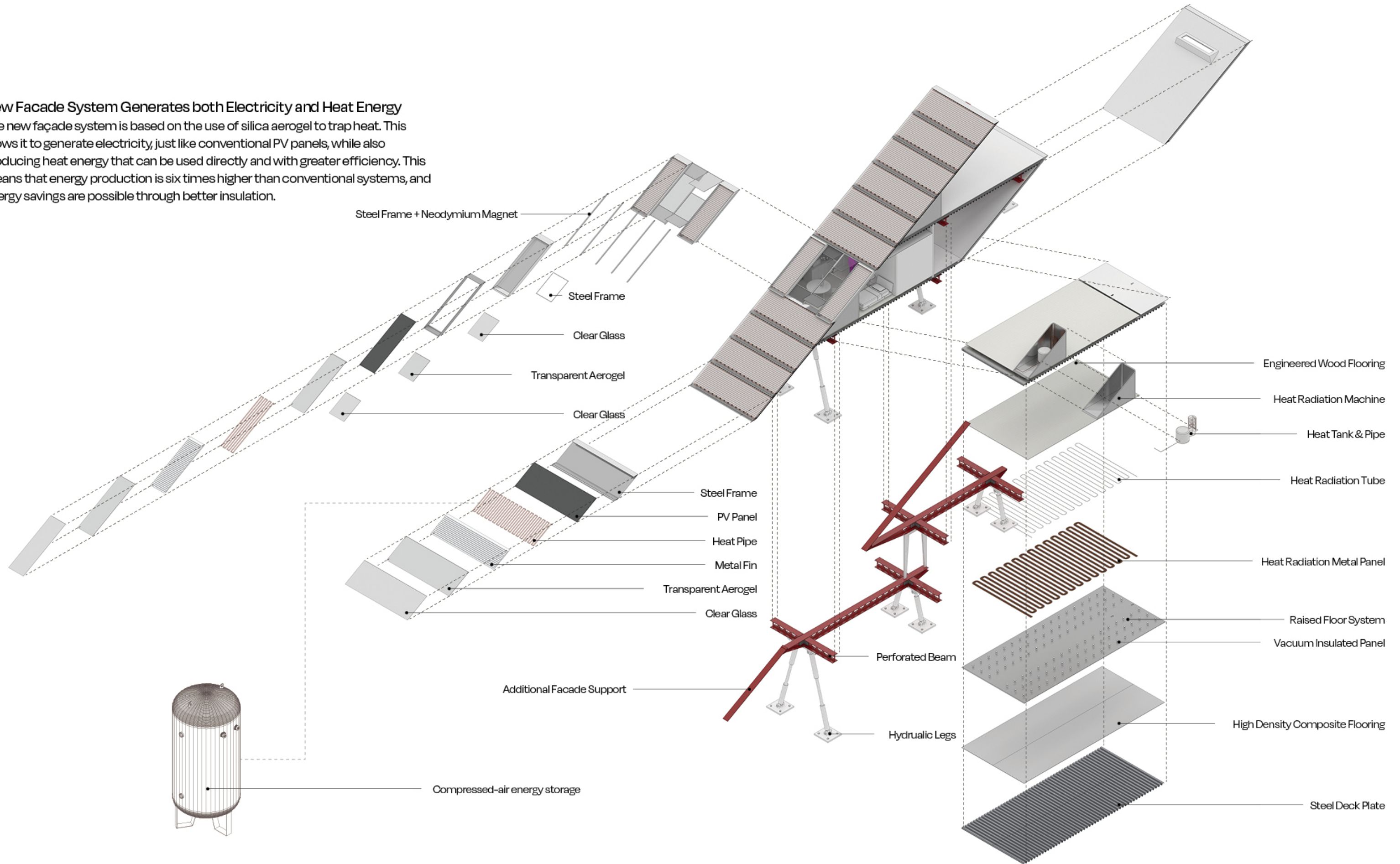


**Potential for Housing System Transformation**  
*A new housing system brought about by abundant energy*

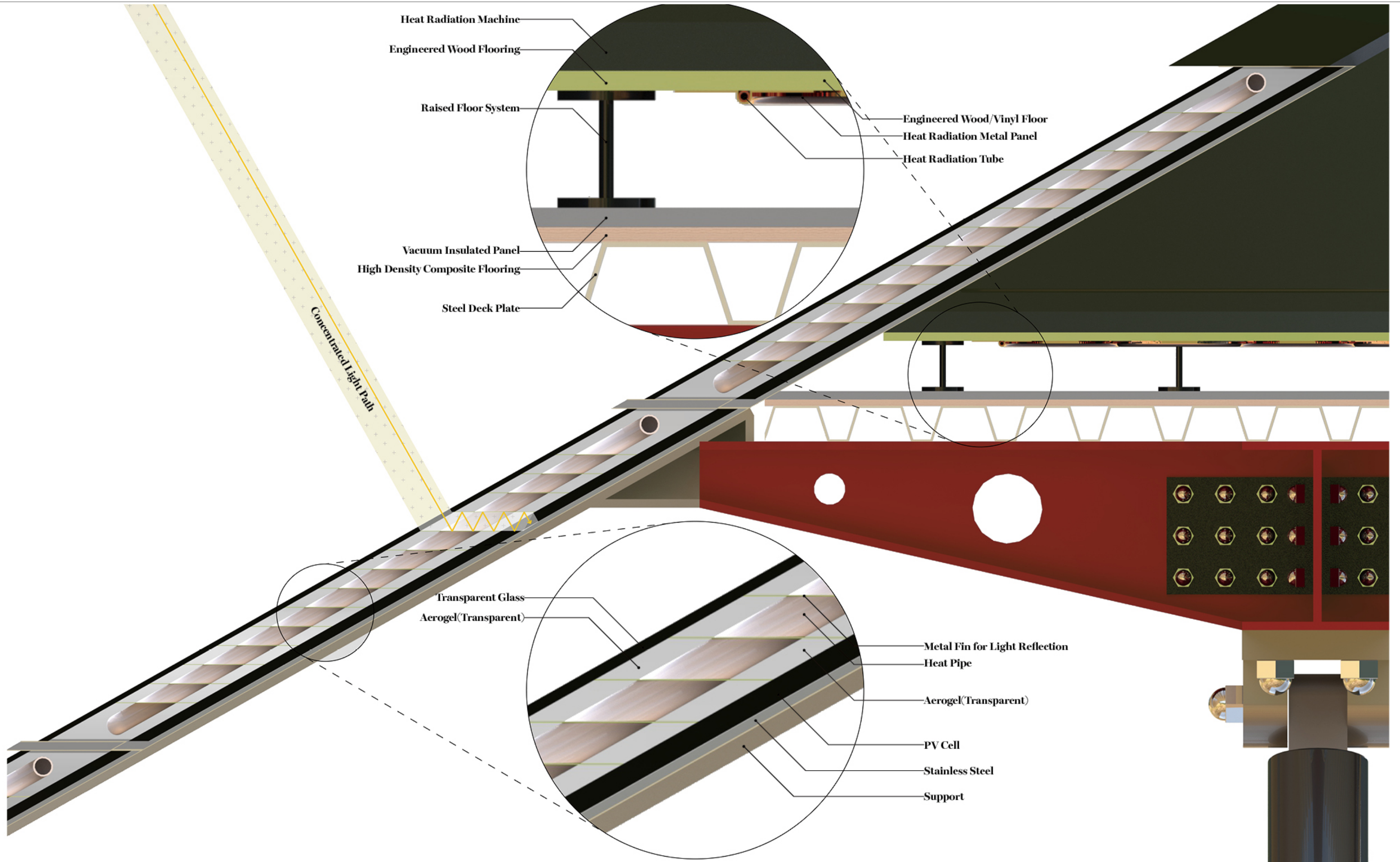


### New Façade System Generates both Electricity and Heat Energy

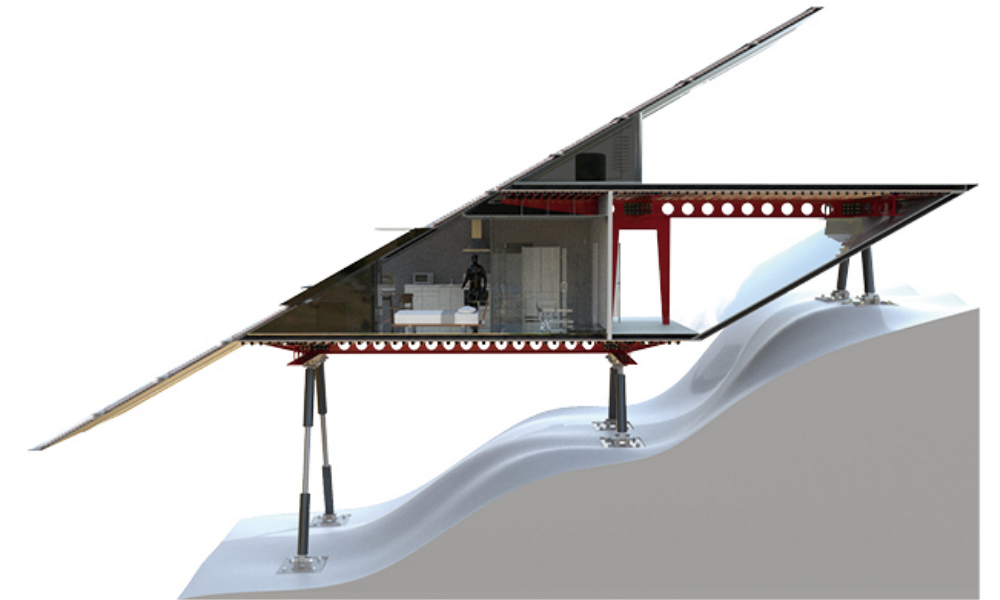
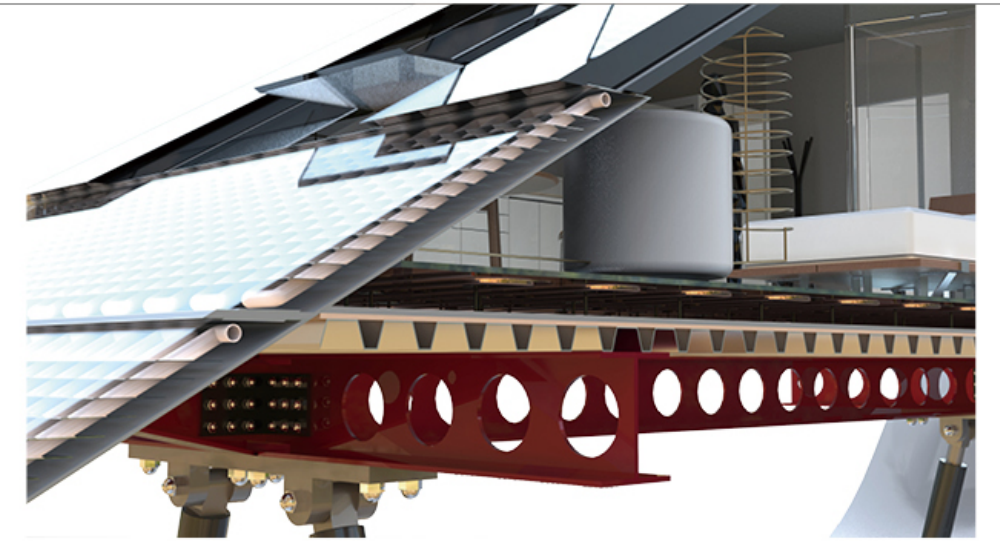
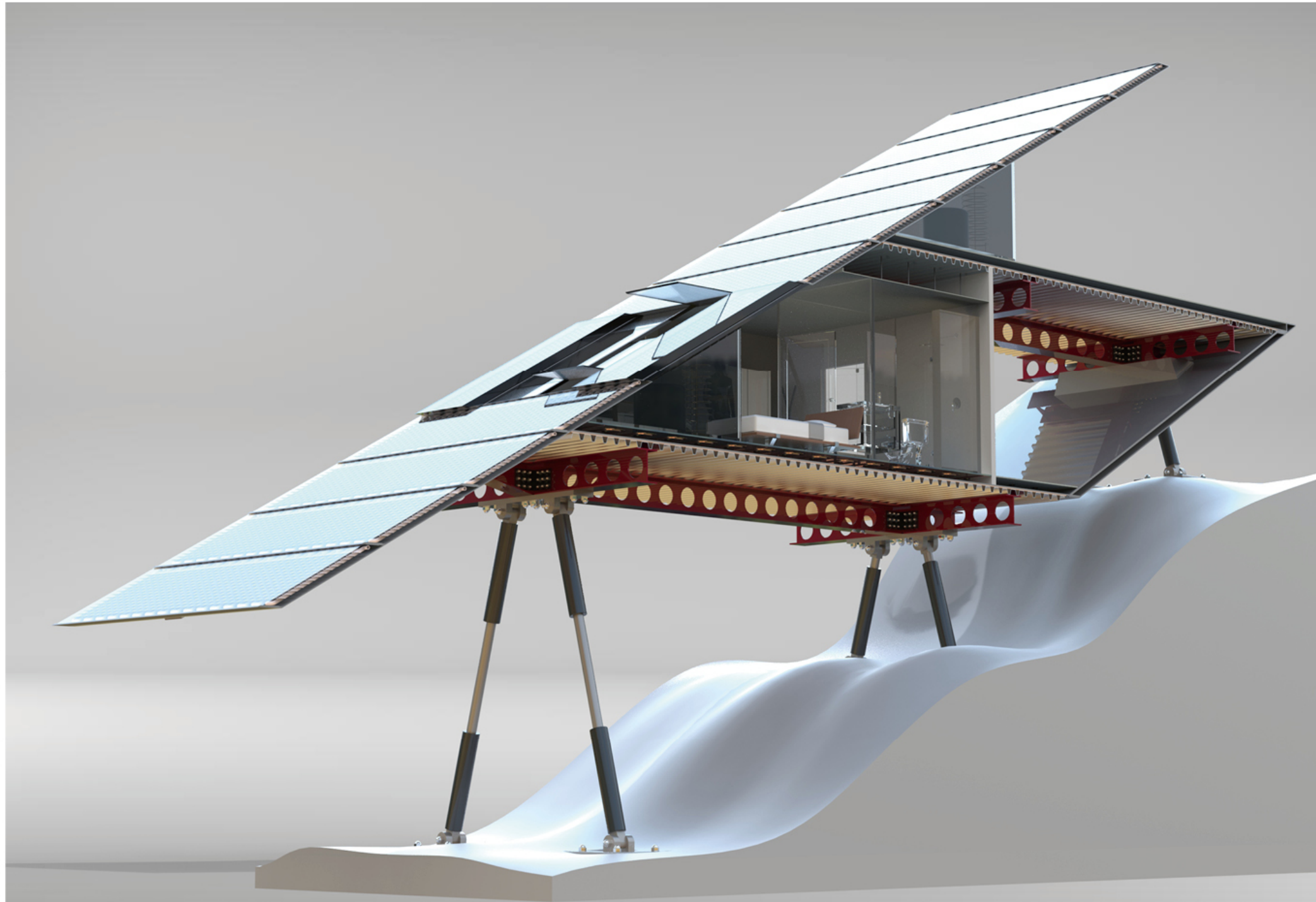
The new façade system is based on the use of silica aerogel to trap heat. This allows it to generate electricity, just like conventional PV panels, while also producing heat energy that can be used directly and with greater efficiency. This means that energy production is six times higher than conventional systems, and energy savings are possible through better insulation.



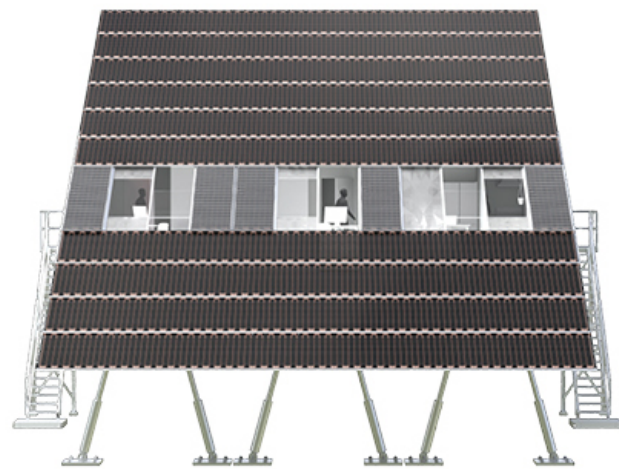










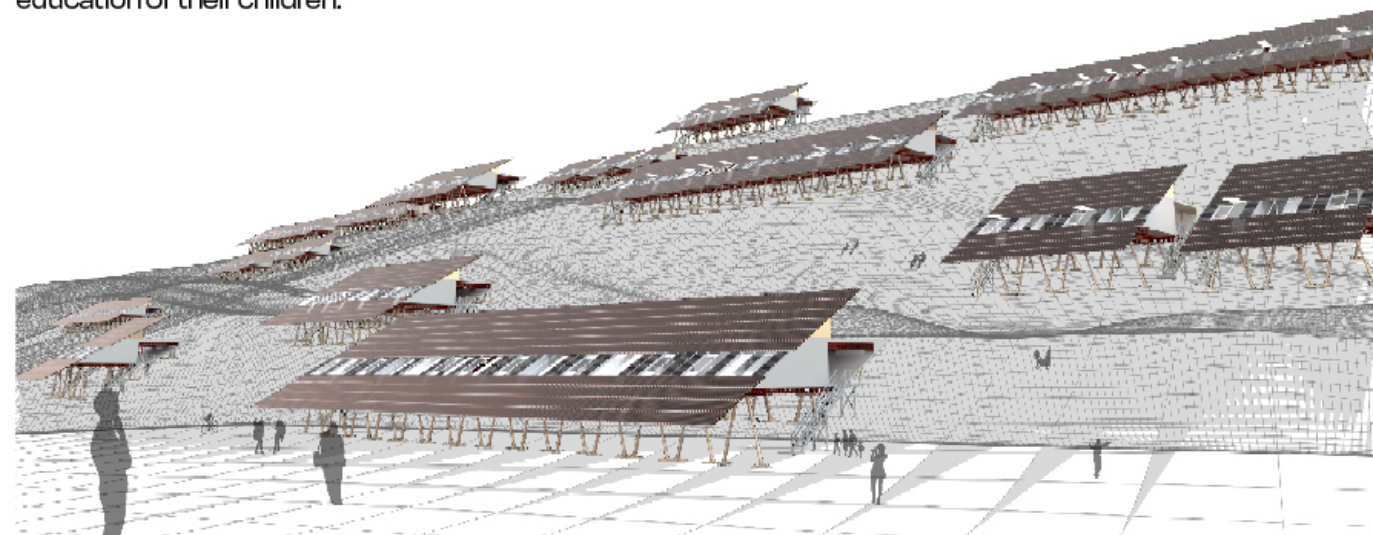


Flexibility in Expansion

The image on the right shows a single housing unit and a two-person housing unit connected together. People organize their spaces and surfaces to suit their lifestyles.

Infinite Potential to Imagine through Expansion

Now that we've looked at how the façade system works and its detailed layers, we can imagine what it might look like if it were expanded further. Ultimately, the project imagines an expansion of how people who have been completely excluded from the protection of the housing system can achieve economic freedom, at least in terms of housing, through a new form of asset called energy. This means that in an expanded space, they can receive medical care, spend more time with their families, and devote more attention to the education of their children.



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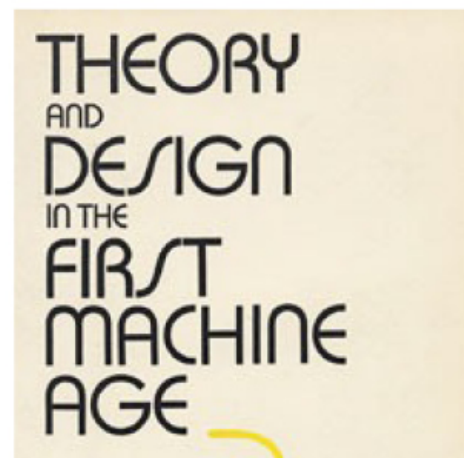
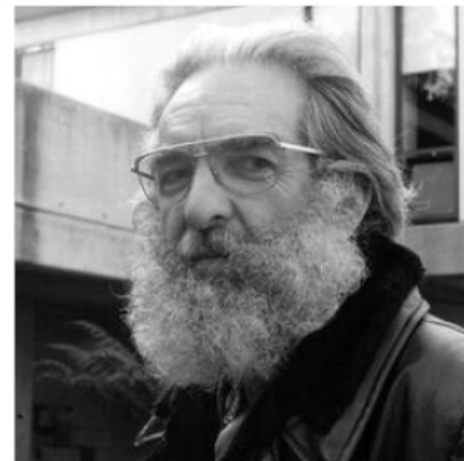
### AGENCY-2

#### The Machine Aesthetic

: An Analysis of Reyner Banham's Theory and Design in the First Machine Age

The History of Architectural Theory / Fall 2024

INSTRUCTOR : Mark Wigley



### Conclusion

Reyner Banham's Theory and Design in the First Machine Age is a book that redefines the relationship between architecture, technology, and modernity in a way that provides a real exploration of how the machine aesthetic reshaped design principles. By framing the Machine Age as a transformative moment in architectural history, Banham invites readers to consider how technological progress can inspire new approaches to form, function, and purpose. In particular, his more than abundant analysis of the Futurist, De Stijl, and Bauhaus movements constitutes extremely valuable documents concerning how the most insightful early 20th-century architect strove both with problems and possibilities thrown out by industrialization.

Indicating both a critique of the epigons of pre-1950s traditions, and a sketch for future possibilities, the machine was more than a vision in Banham's book. Denying any decorative scheme of historical imitation, he illustrated how mechanics take on a functional solution to provide current architecture with the adaptability that would allow for a rather functional engagement with both social and technological transitions. However, emphasis on technological determinism still remains debatable over what it proposes when it comes to balancing on the edge of drilling an old agenda of tradition and maintaining humanist or environment-gearred focuses in this new age for design.

The lasting importance of Theory and Design in the First Machine Age is essentially in the ability to insert themselves into a critical discussion regarding the cultural and material forces that shape architecture. Although written in a time specific to the physical form of the Machine Age, Banham's insights remain timely today in contemporary discussions, such as those concerning sustainability, digital fabrication, and socially responsible consequences of technological progress. Theory and Design in the First Machine Age allows for a powerful conceptualization that guides these architects and theorists through the confusion of the present in envisioning new pathways forward.

In conclusion, Banham's exploration of the machine aesthetic underlines the potential of architecture to evolve in response to technological and cultural change. His work challenges practitioners and scholars to rethink the role of design in an ever-changing world, fostering a vision of architecture that is both forward-looking and deeply attuned to the realities of modern life.



**AGENCY-3**

**Corkcrete**

: Floating Landscape Made from Green-Floating Concrete

Seed Bombs: Technologies in Ecological Design / Fall 2024

BUILDING SCIENCE & TECHNOLOGY ELECTIVE

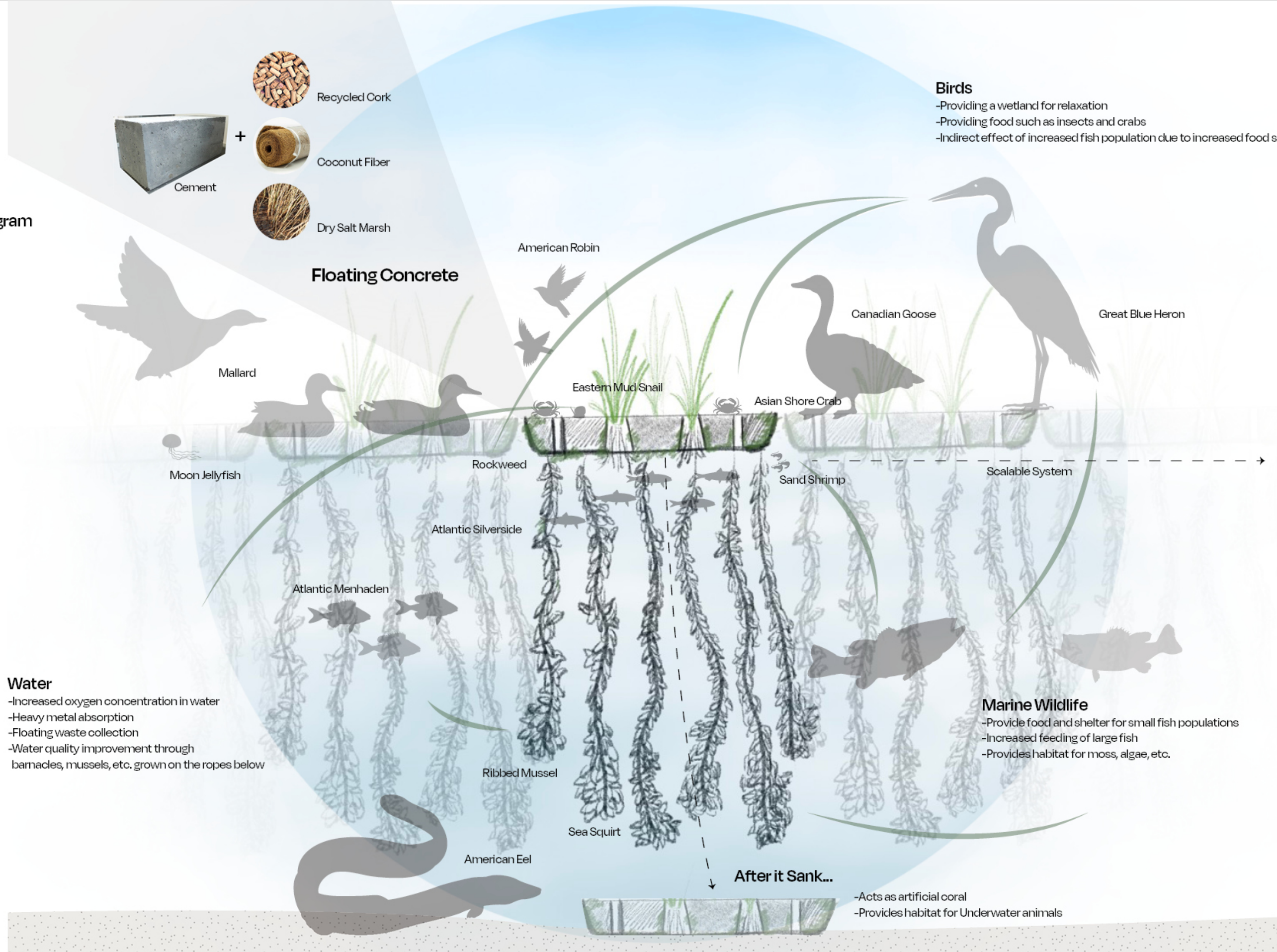
INSTRUCTOR : Emily Bauer

COLLABORATOR : Wooseok Jang



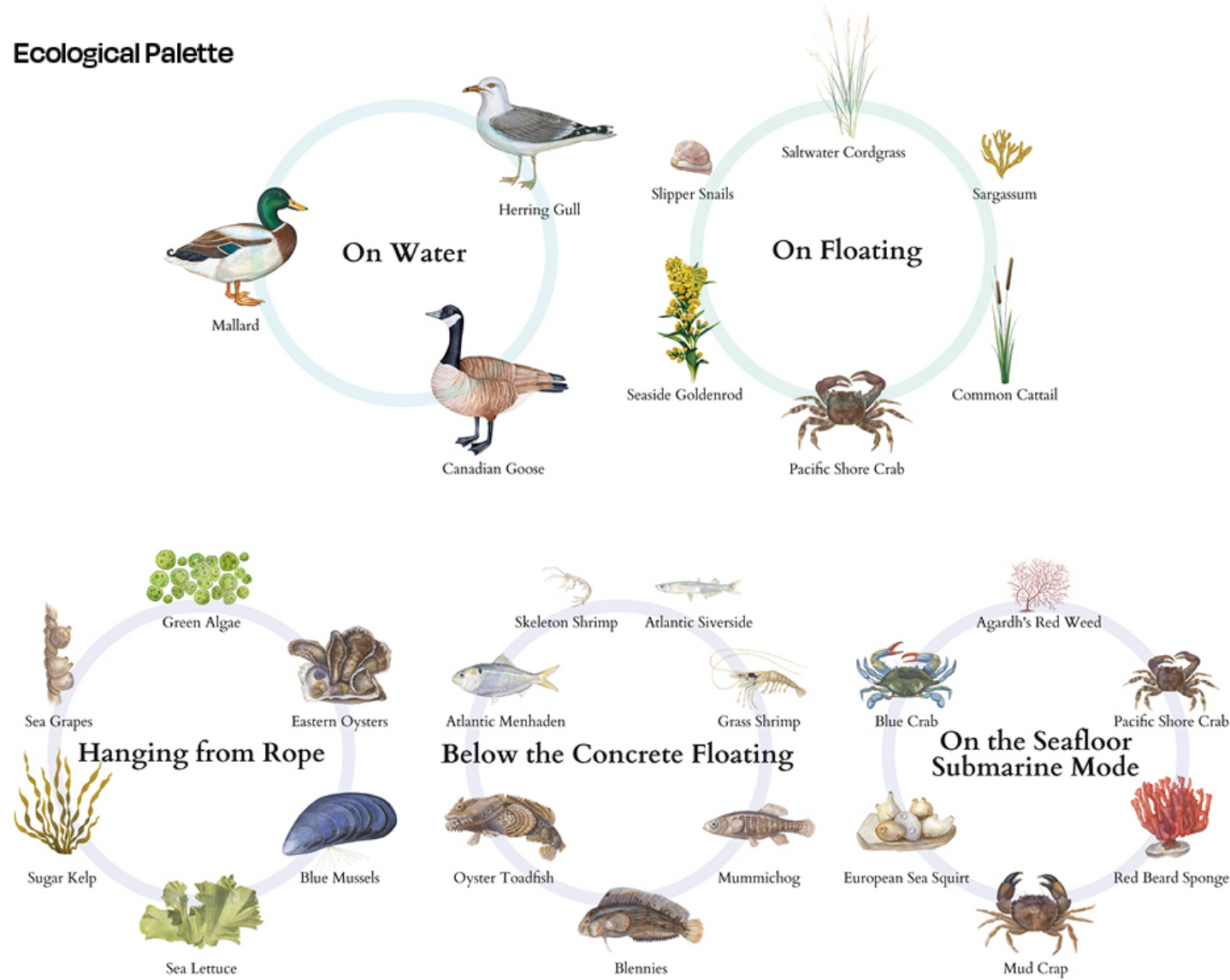


Site System Diagram





**Ecological Palette**



**Salt Marsh**

Species	Type of Habitat	Impact on the Ecosystem
Spartina(Cordgrass)	Intertidal (Salt Marshes, Coastal Wetlands)	Habitat for wildlife, produce oxygen and absorb heavy metal
SeaSide goldenrod	Coastal Areas (Dunes, Sandy Shores)	Supports pollinators and provides food for insects and birds
Common Cattail	Wetlands (Marshes, Swamps, Shallow Ponds)	Filters pollutants from water, provides habitat for wildlife

**Seaweed & Porifera**

Species	Type of Habitat	Impact on the Ecosystem
Sugar Kelp	Submerged Aquatic (Coastal Waters)	Absorbs excess nutrients while providing habitat and oxygen
Rockweed	Intertidal (Rocky Shores)	Stabilizes shorelines and provides habitat for small organisms
Sea Lettuce	Intertidal (Mudflats, Rocky Shores)	Absorbs excess nutrients, improving water quality
Sea Grapes	Submerged Aquatic (Coral Reefs, Seagrass Beds)	Offers shelter and food for marine animals
Sagassum	Submerged Aquatic (Coastal Waters)	Provides floating habitat for a diverse marine organisms
Red Beard Sponge	Submerged Aquatic (Coastal Waters, Docks)	Provides floating habitat for a diverse marine organisms
Agardh's Red Weed	Submerged Aquatic (Shallow Coastal Waters)	Absorbs excess nutrients from water, provides shelter

**Crustaceans & Mollusks & Invertebrates**

Species	Type of Habitat	Impact on the Ecosystem
Pacific Shore Crab	Intertidal (Rocky Shores, Tidal Pools)	Aids in detritus breakdown and nutrient cycling
Slipper Snail	Intertidal (Attached to Shells or Rocks)	Helps recycle nutrients by feeding on organic matter
Eastern Oysters	Intertidal (Estuaries, Coastal Marshes)	Filters water and creates reefs that support biodiversity
Blue Mussels	Intertidal to Subtidal (Rocky Shores, Piers)	Improves water quality through filtration and creates habitat
Grass Shrimp	Submerged Aquatic (Shallow Coastal Waters)	Serves as food for larger predators, supporting food webs
Mud Crab	Intertidal (Estuaries, Mudflats)	Controls populations of small invertebrates
Blue Crab	Submerged Aquatic (Estuaries, Coastal Bays)	Acts as both predator and prey, supporting biodiversity
Sea Squirt	Submerged Aquatic (Coastal Waters, Harbors)	Filters plankton and particles from the water

**Fish Species**

Species	Type of Habitat	Impact on the Ecosystem
Atlantic Silverside	Submerged Aquatic (Coastal Waters, Estuaries)	Provides a critical food source for larger fish and birds
Atlantic Menhaden	Submerged Aquatic (Estuaries, Coastal Waters)	Filters plankton from water and supports fishery food chains
Oyster Toadfish	Submerged Aquatic (Shallow Coastal Waters)	Controls populations of benthic organisms
Blennies	Submerged Aquatic (Rocky Reefs, Coral Reefs)	Contributes to algae control and acts as prey for predators
Mummichog	Intertidal (Salt Marshes, Estuaries)	A key prey species, supporting estuarine food webs

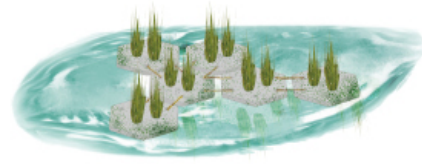
**Bird Species in Coastal Area**

Species	Type of Habitat	Impact on the Ecosystem
Canadian Goose	Wetlands, Freshwater Lakes, and Fields	Spreads seeds and contributes to nutrient cycling
Mallard	Freshwater Lakes, Rivers, Ponds	Promotes seed dispersal and nutrient distribution in wetlands
Herring Gull	Coastal Areas, Beaches, Estuaries	Acts as scavenger, cleaning up organic waste in coastal areas

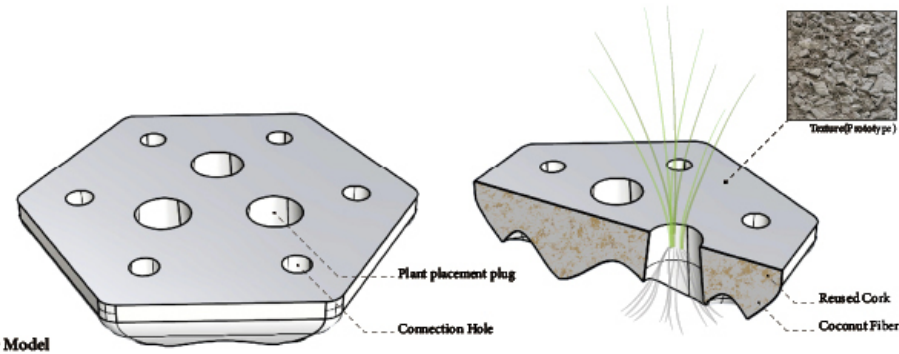
■ Absorbs excess nutrients / Purify water
 ■ Can use the floating landscapes as their habitat
 ■ Balancing the ecosystem with a role as a predator

**Illustrative Technical Drawings**

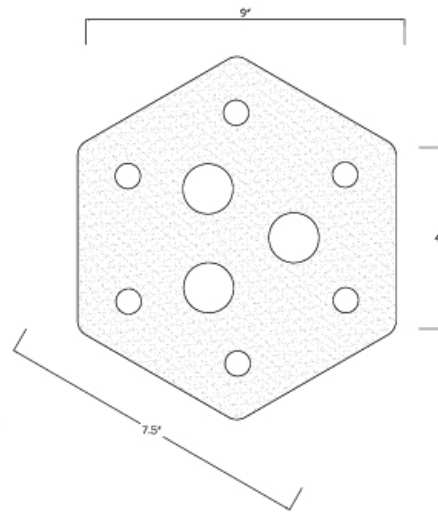
Seed Bomb Fall 2024 / Prof. Emily Bauer  
 WooSeok Jang / wj2368  
 Hyunseung Moon / hm3066



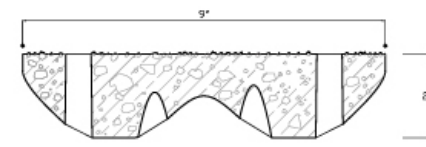
Expected Image



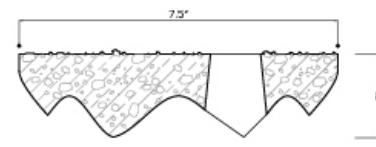
3D Model



Plan

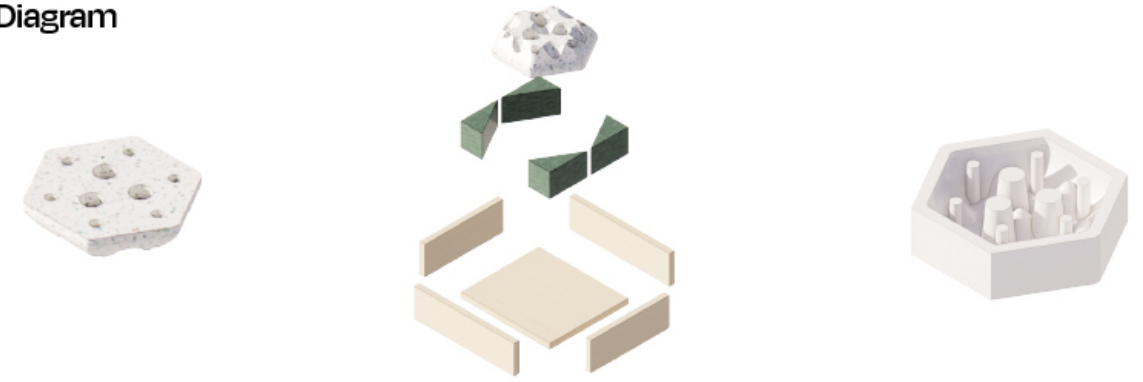


Section A-A'



Section B-B'

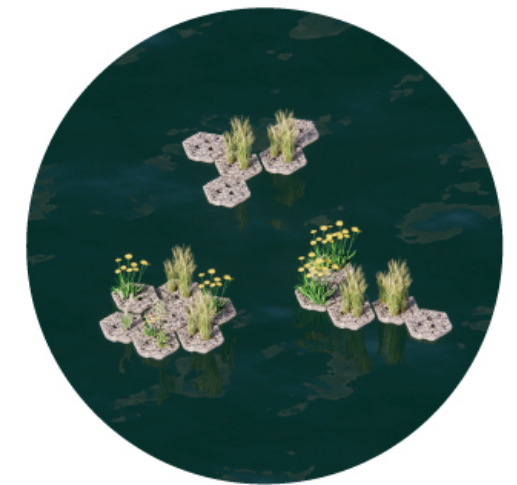
**Scalability Diagram**



Corkrete can be mass-produced using silicone molds. A prototype form is created using a 3D printer, and then a frame is made for casting the silicone mold. After attaching the 3D-printed prototype form to the frame, silicone is poured to produce the mold. (Silicone specification: A30)



Corkrete allows plants to be planted on individual units.



Corkrete units can be connected to one another, allowing you to create the desired arrangement according to the required shape or scale, while also securing greater stability as they interlock.



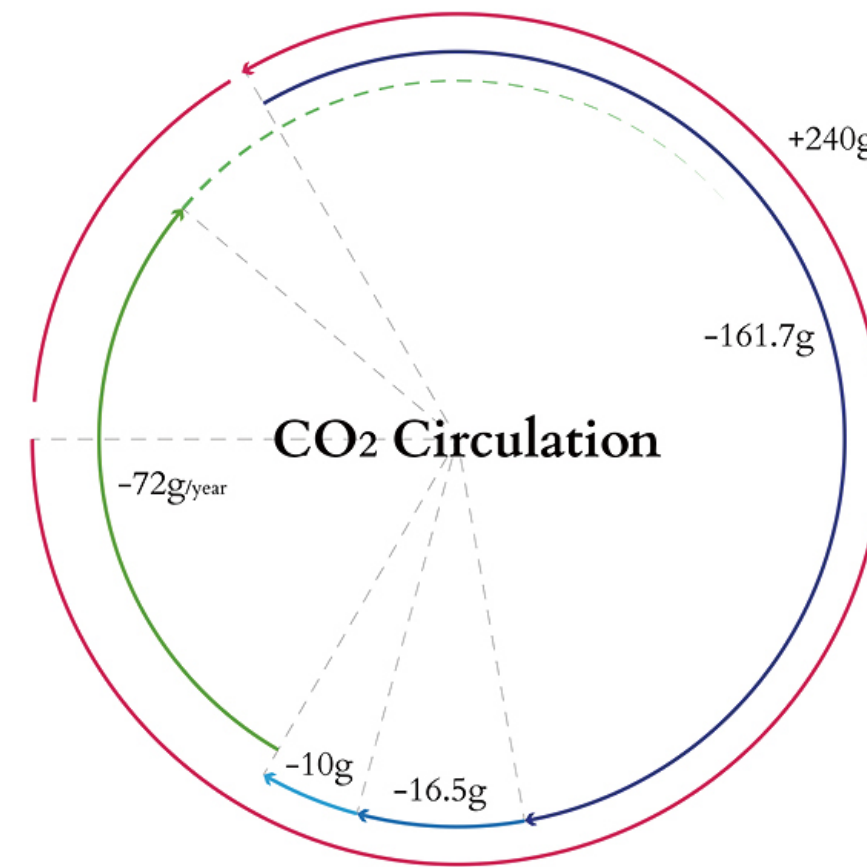
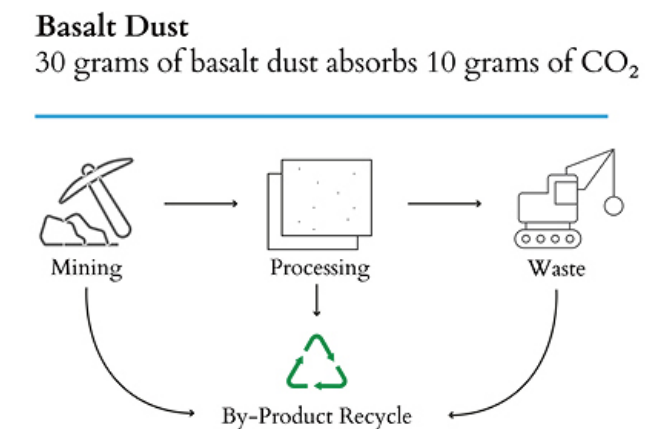
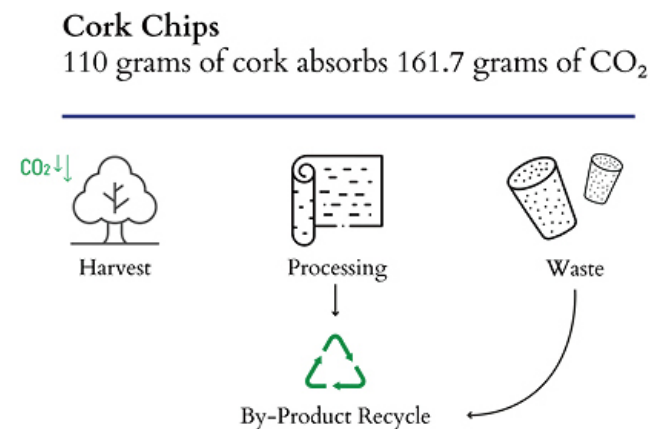
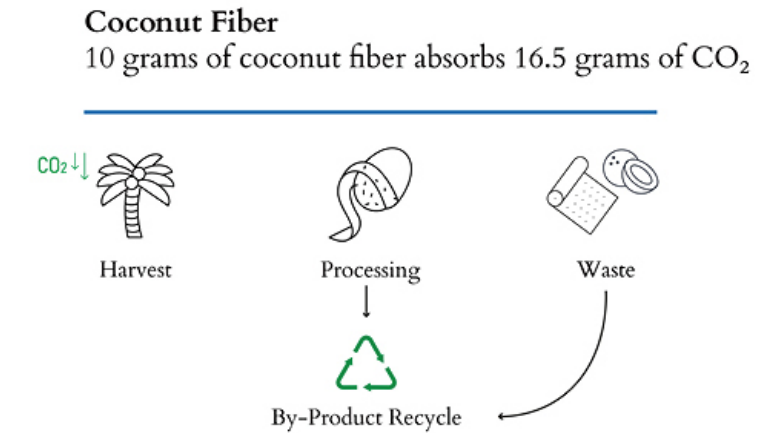
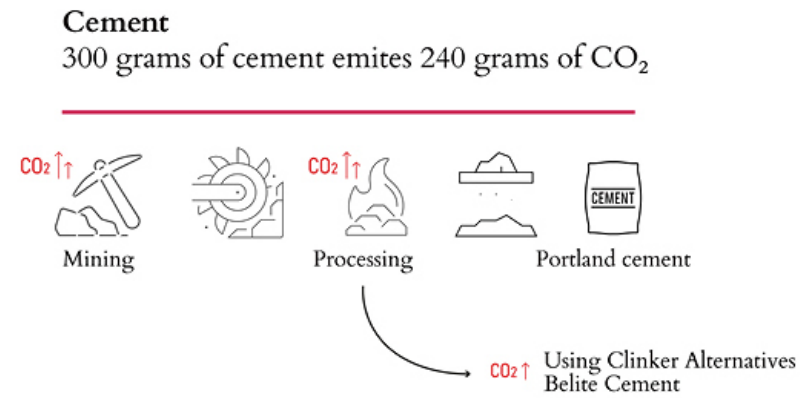
### The Circulation of Materials and the Cycle of CO<sub>2</sub>

Eco-friendliness: The materials needed for Corkrete are geared towards the use of recycled and industrial by-products. Coconut fiber, cork granules, and basalt powder can be sourced as by-products from industrial processes.

Negative CO<sub>2</sub> Emission Effect: Each unit of Corkrete contains 190 grams of cement, emitting approximately 150 grams of CO<sub>2</sub>. However, coconut fiber and cork granules included in Corkrete contribute to CO<sub>2</sub> absorption during their production processes. Specifically, 5 grams of coconut fiber absorbs around 8 grams of CO<sub>2</sub>, while 65 grams of cork captures approximately 100 grams of CO<sub>2</sub>. Additionally, 30 grams of basalt

powder, which improves Corkrete's surface and hardness, can absorb about 10 grams of CO<sub>2</sub>. This basalt powder, used in Enhanced Rock Weathering, reacts with acid rain or acidified water to capture CO<sub>2</sub>. Halophyte plants growing in each unit of Corkrete absorb approximately 72 grams of CO<sub>2</sub> annually as they grow.

In the final stage of Corkrete's life cycle, the submerged unit settles beneath the waters of Red Hook, eventually becoming buried in riverbed sediment, which permanently sequesters CO<sub>2</sub>. Altogether, each unit of Corkrete emits 150 grams of CO<sub>2</sub> while effectively absorbing 190 grams, achieving a Negative CO<sub>2</sub> Emission Effect.



30-50% less CO<sub>2</sub> emitted  
When using low-carbon cement

The total CO<sub>2</sub> emissions of Floating Concrete Unit  
Cement 300g, Cork 110g, CocoFiber 10g, Basalt dust 10g



**Fabrication Process & Lessons - Prototype**

To create concrete that can float while supporting the weight of plants and organisms and maintaining its shape, we experimented with various materials and ratios. Coconut fiber was added to enhance the concrete's cohesion and durability. Coconut chips and perlite were used as aggregates to reduce the weight. Through nine prototype tests, we found an optimal ratio and observed that, while perlite provided temporary buoyancy, it eventually absorbed water and caused the concrete to sink over time.

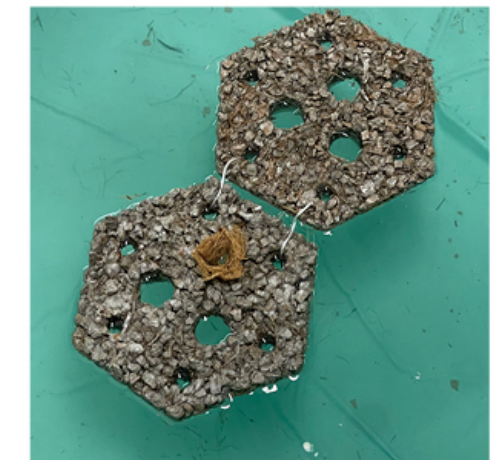
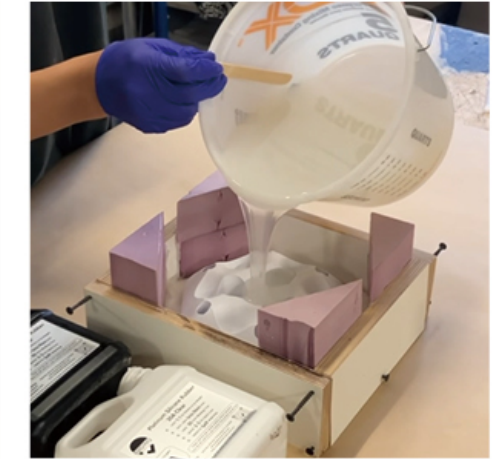
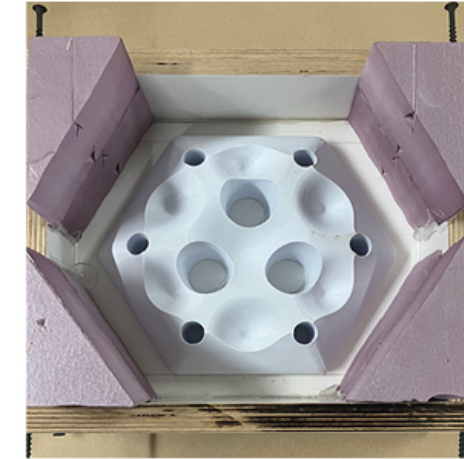
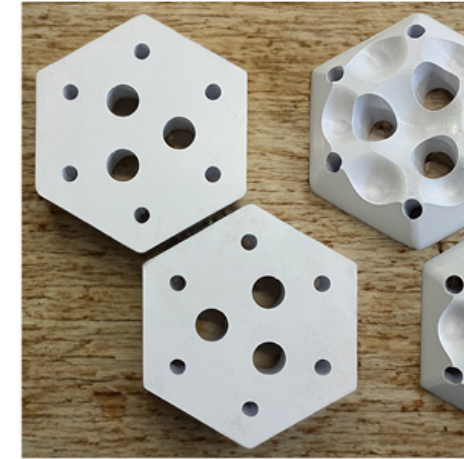


**Material Ratios**

Cement 190g, Cork chips 65g,  
Coconut fiber 5g,  
Basalt dust 30g (Excludable),  
Water 75g



**Fabrication Process & Lessons - Final "Corkrete"**







Unit Photo & After Launch at Redhook





*Layerd Urbanism*

Advanced Studio VI / Spring 2025

INSTRUCTOR : Galia Solomonoff

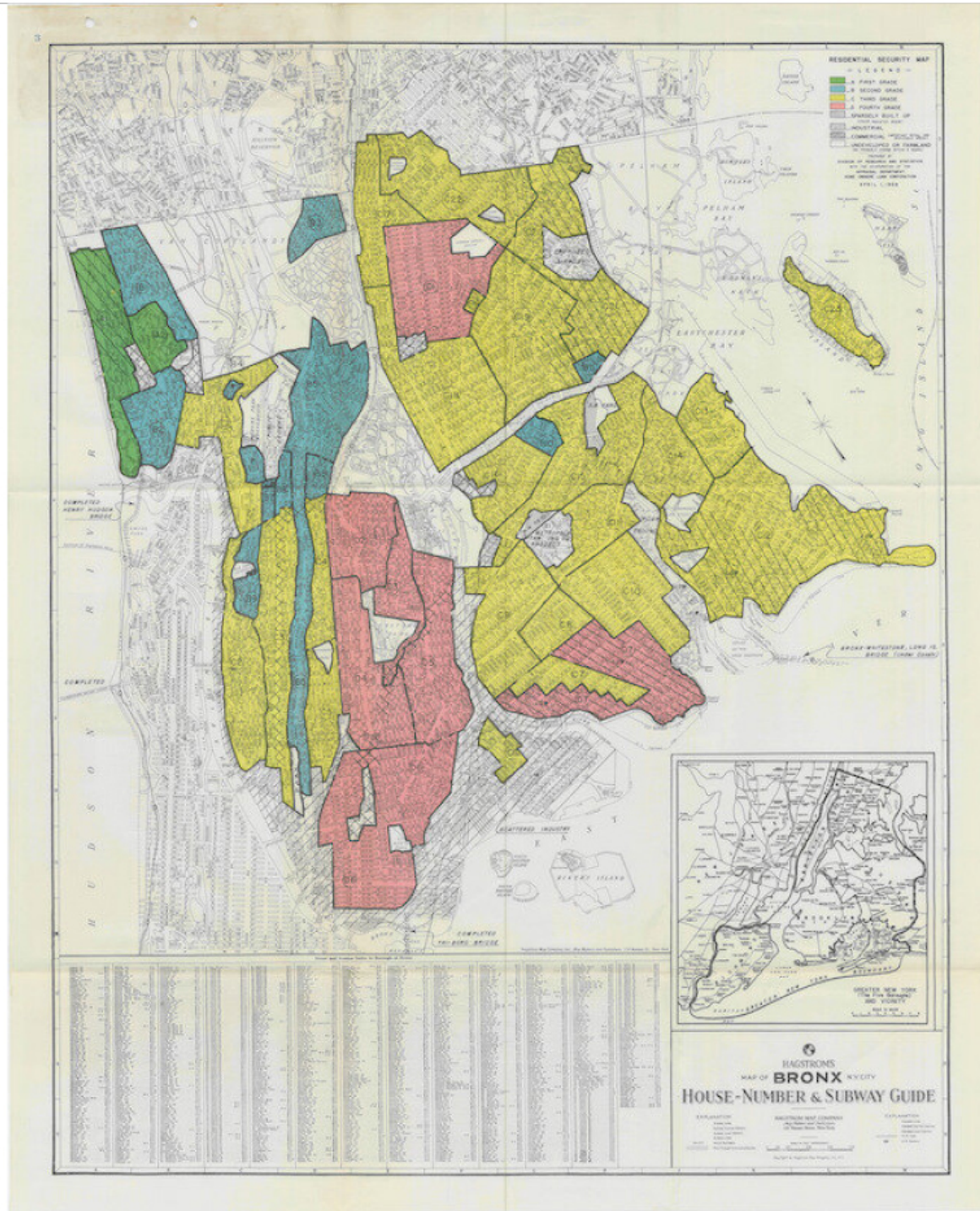
COLLABORATOR : Dongjae Ko

## **REDRESS-1**

Rewoven Layers



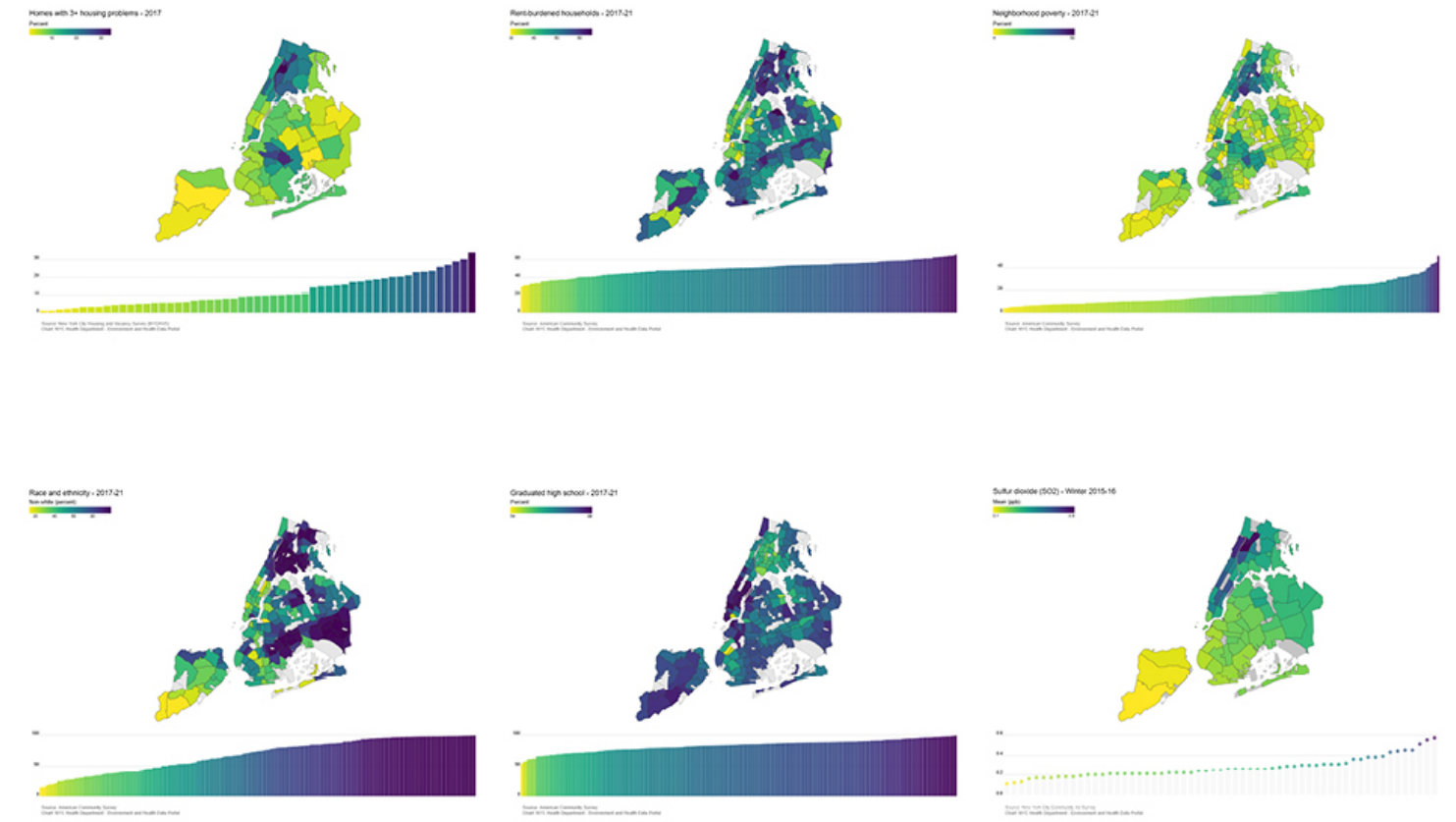




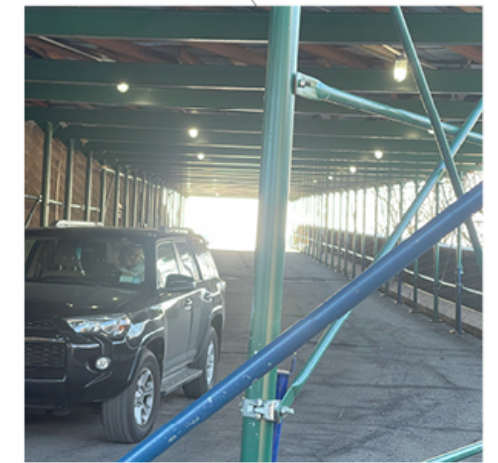
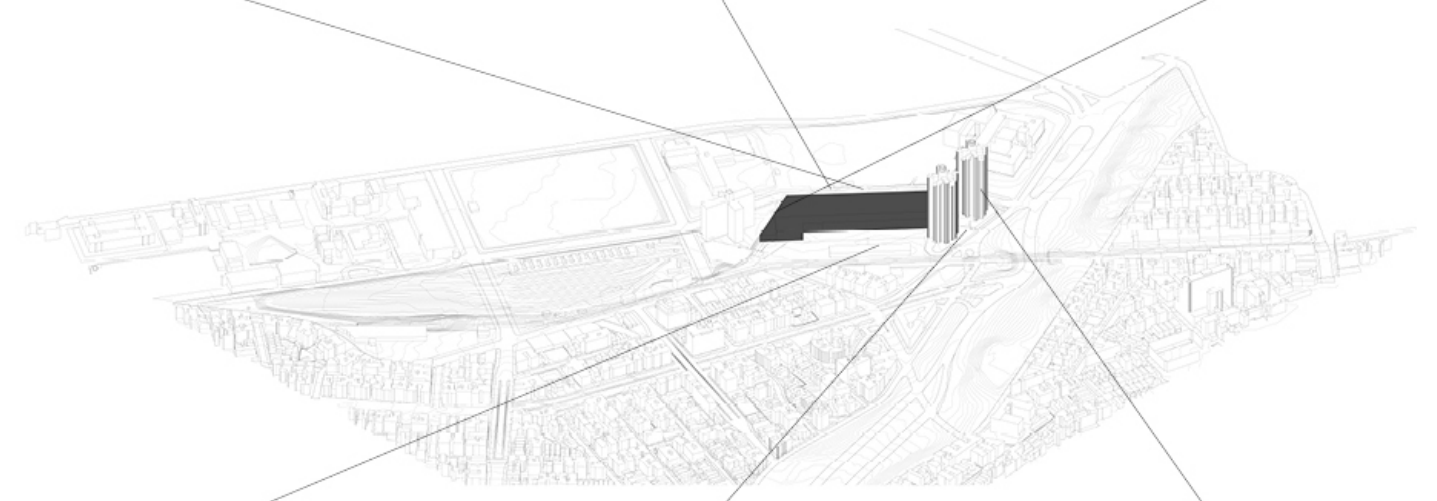
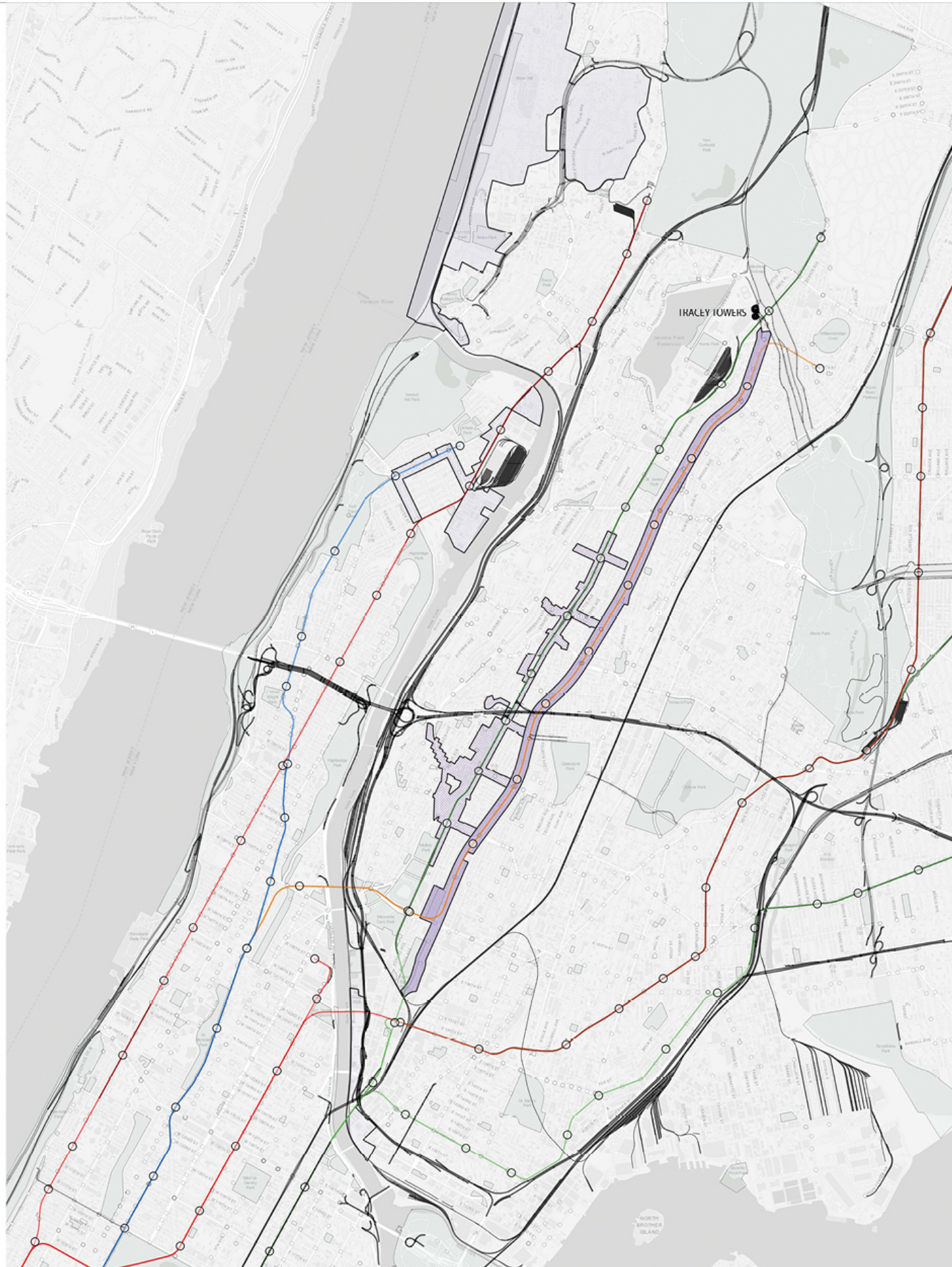
Redlining is the most tangible example of the scars that history has left on a city. The map above clearly shows how society at the time perceived and treated the Bronx, where the site is located, and its citizens.



We read "Paradise Bronx" to learn more specifically about the scars and traces left by urban planning/history, etc. And at the same time, we looked at various statistics, and found that the area where the site is currently located has the highest rate of citizens experiencing three or more housing-related problems at the same time in New York City, and the rent-burden rate is also among the highest.



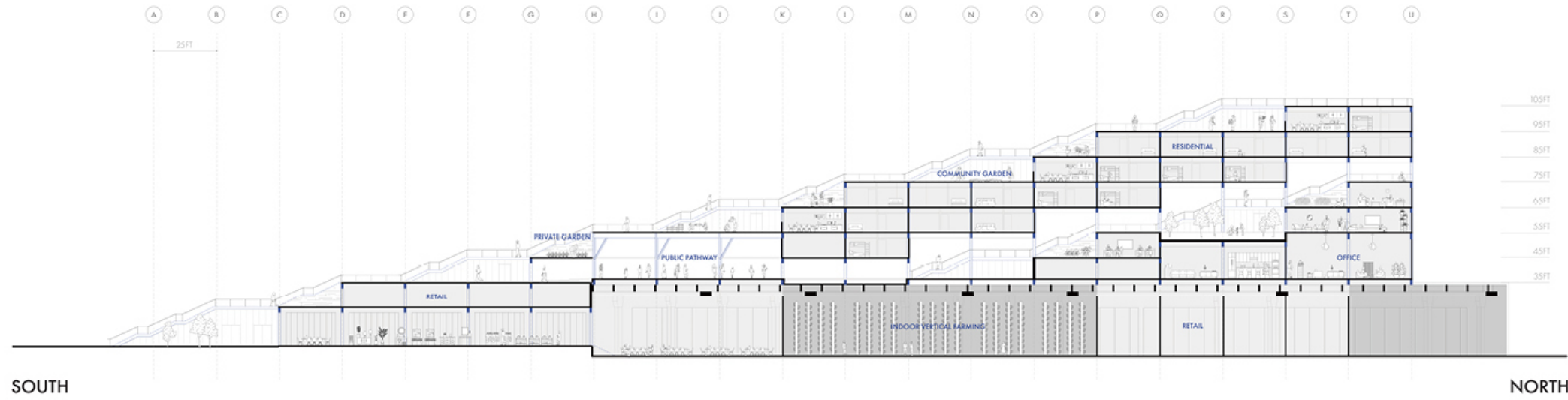




The biggest problem we felt at the current site was that the huge structure cut off both north and south, east and west. The building itself was acting as a huge wall, and we could see that it was having a serious negative impact on the pedestrian environment around the building.

At the same time, the lobby of the current building was not designed to be centered on vehicles, which was another factor that worsened the pedestrian environment.





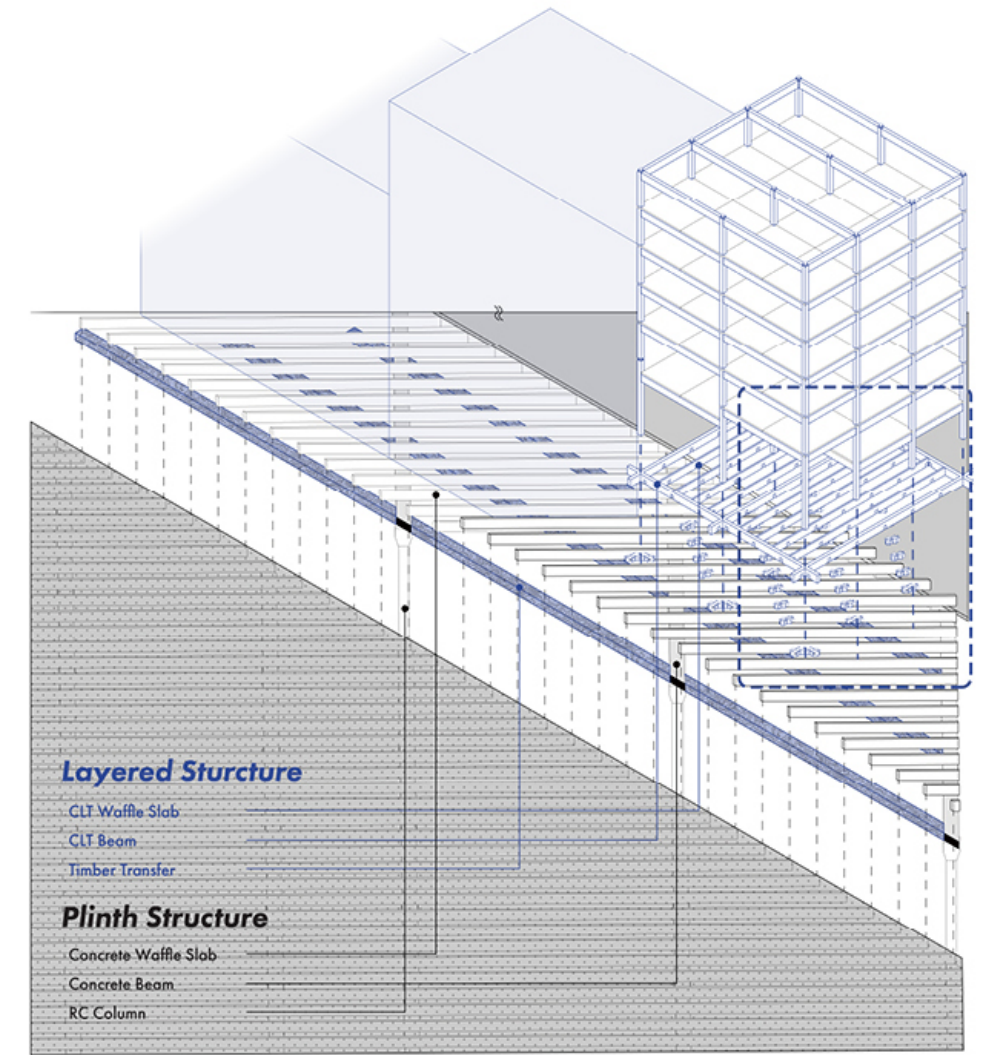
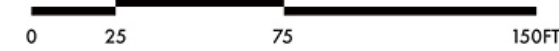
SOUTH

NORTH

## LAYERED URBANISM

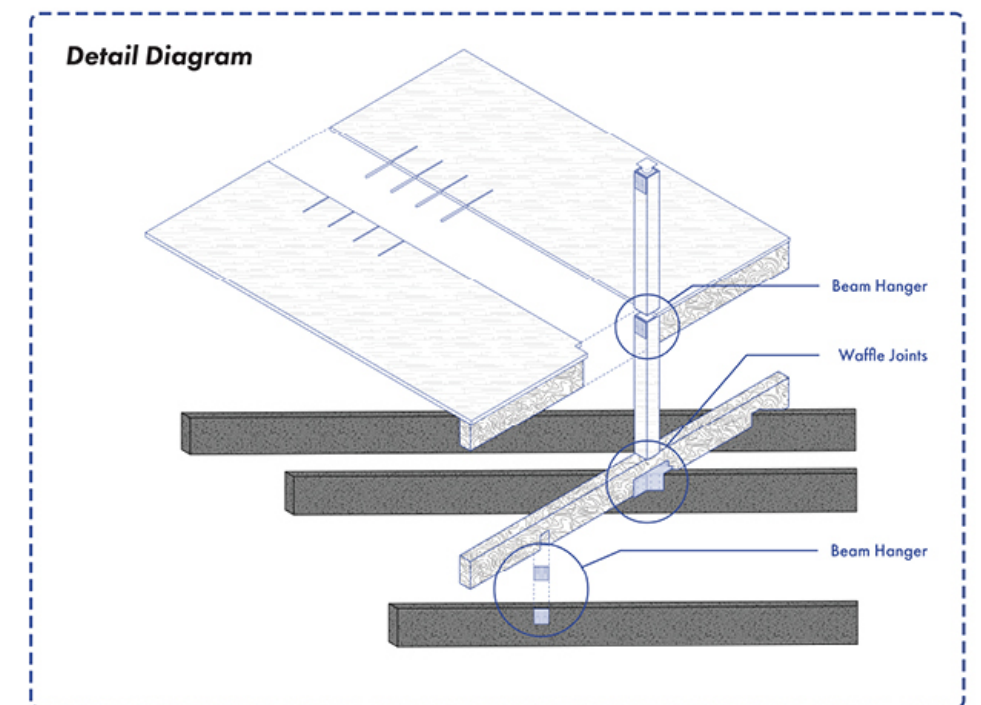
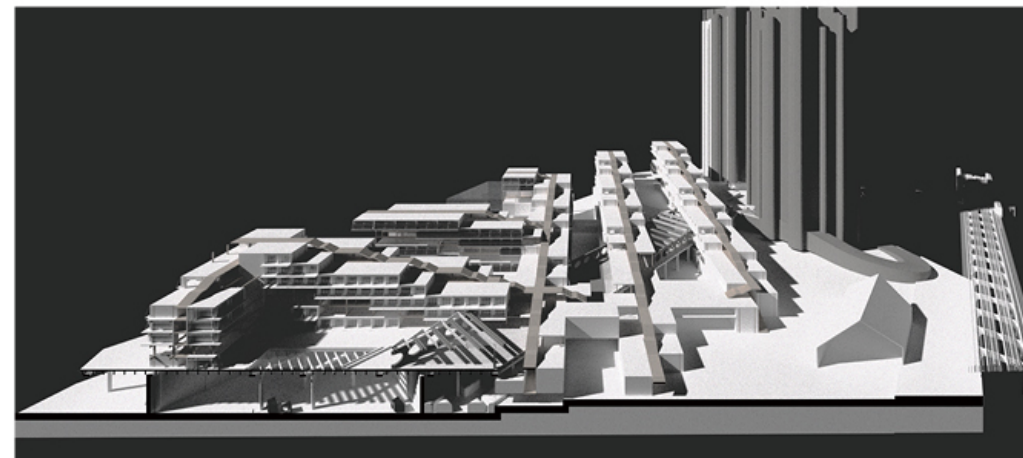
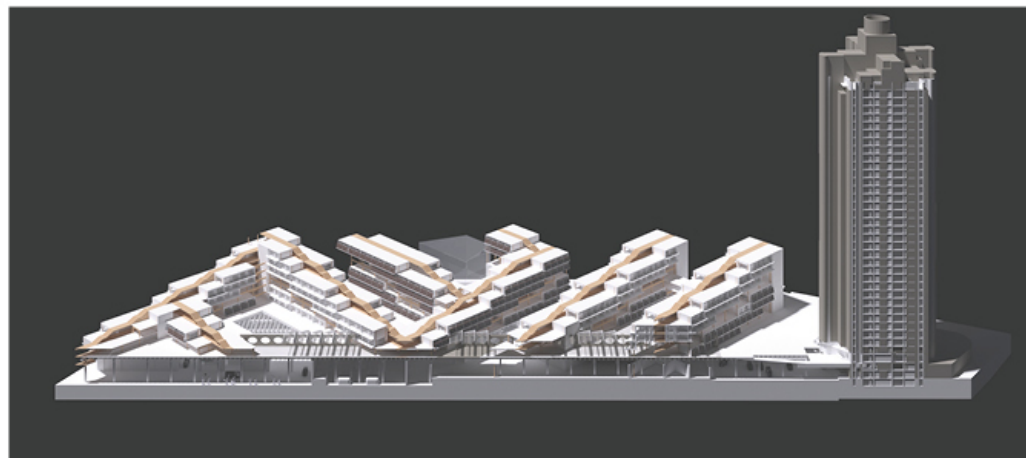
COLUMBIA GSAPP SPRING 2025  
 ADVANCED STUDIO VI PROF. GALIA SOLOMONOFF  
 DONGJAE KO / HYUN SEUNG MOON

Beyond architecture that simply improves the surrounding environment, we propose architecture that embraces the public in the building itself. This can be confirmed by looking at the cross-section of the building where gardens open to the public in some part on multiple levels are continuously repeated.

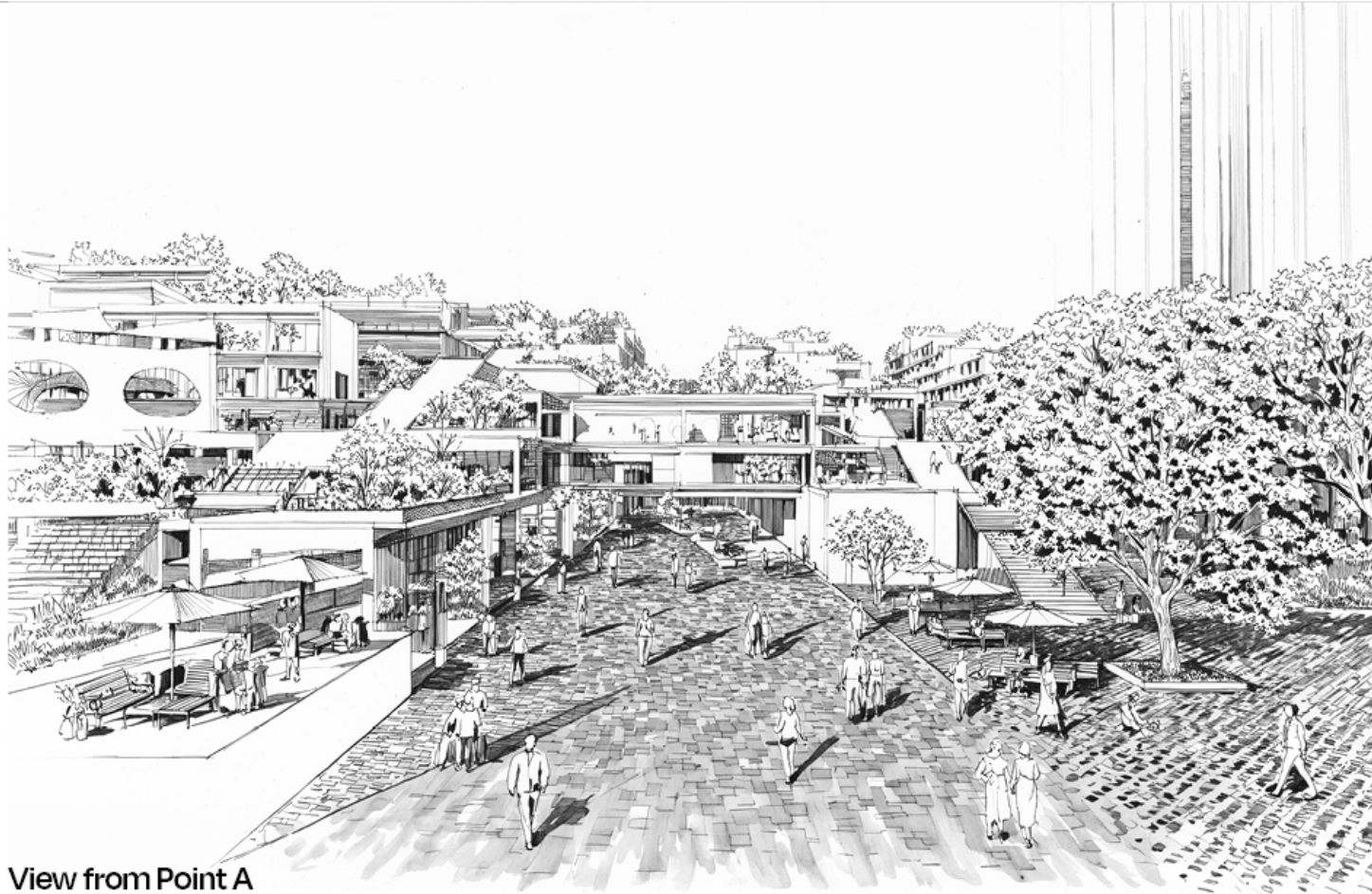


On the other hand, in order to maximize the concept of adaptive reuse, we propose a system that can utilize the existing structure to the maximum extent, and we also designed details for this.

The two Perspective Sections on the lower left show how the two main central axes (walking lines) work, respectively.



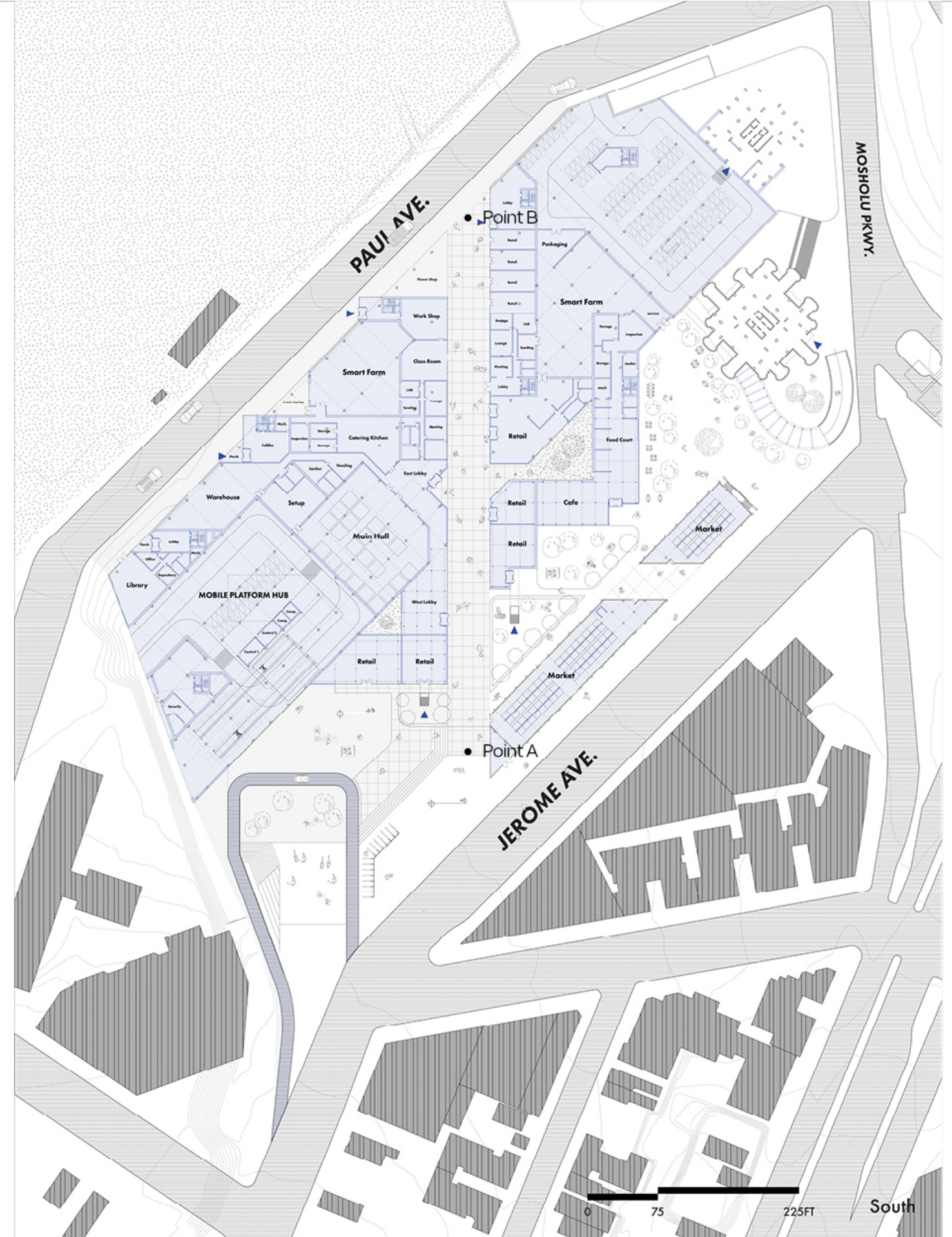




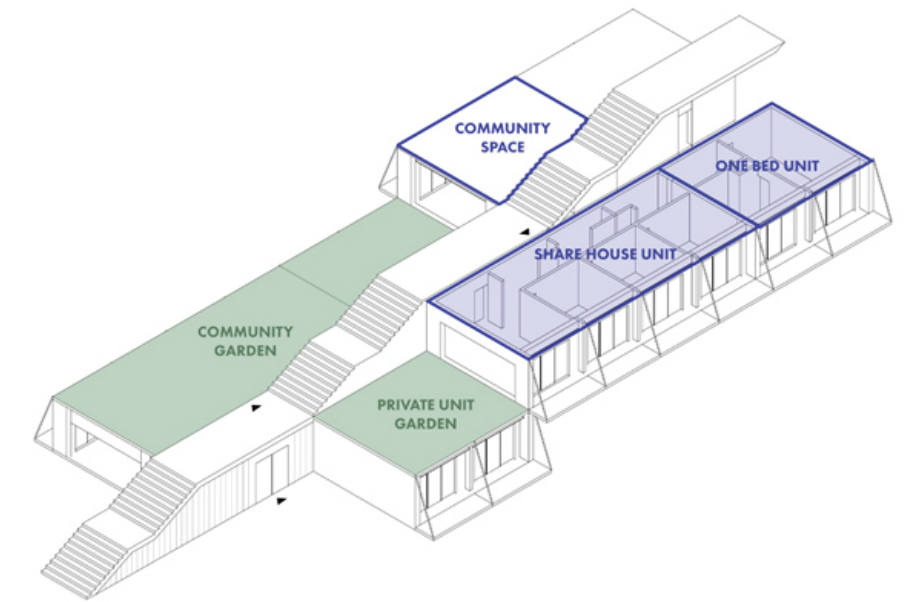
View from Point A



View from Point B



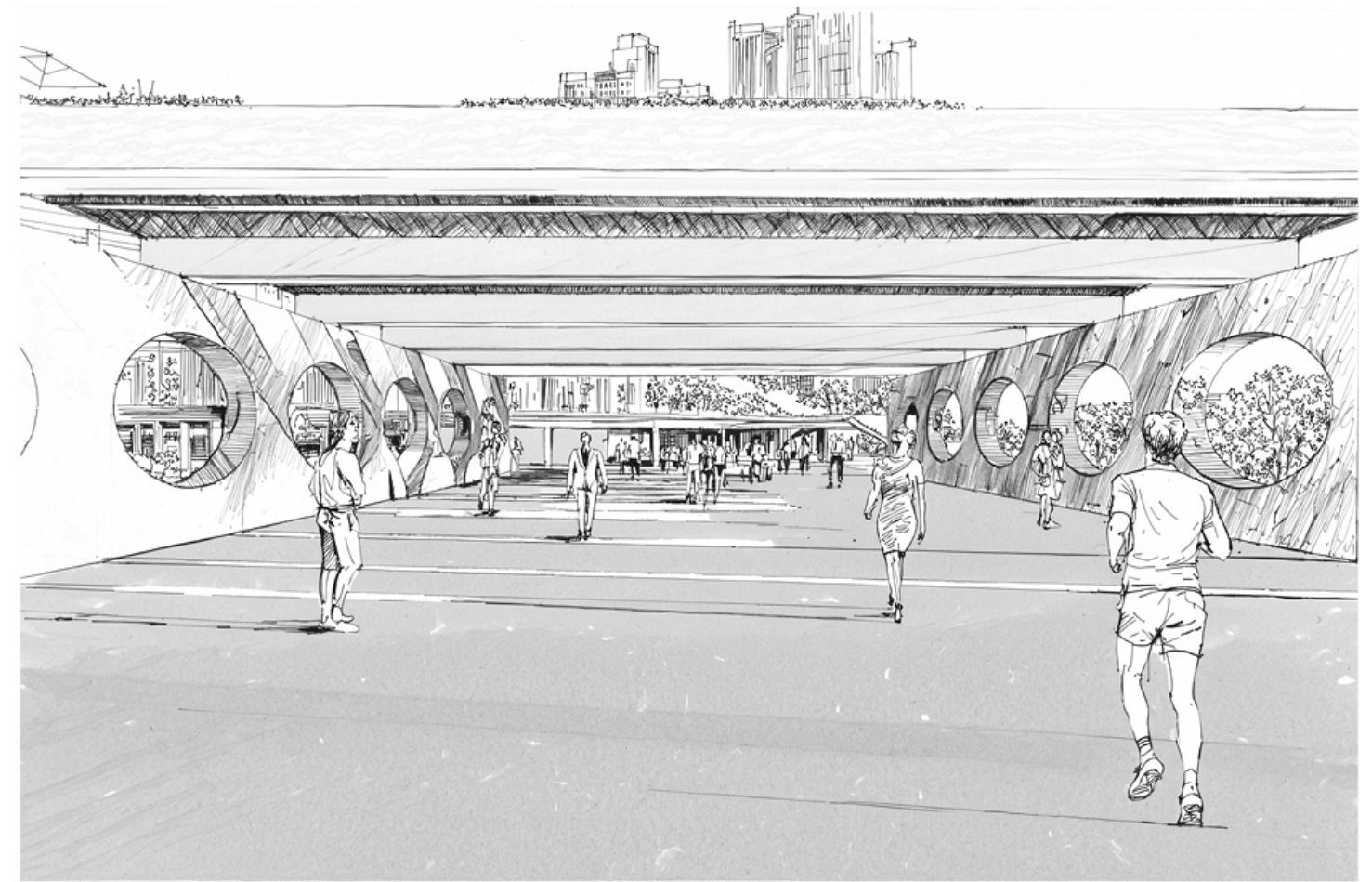




In order to place a terrace exclusively for individuals, a garden shared within the unit, a garden shared by the entire community, and a garden open to the public, all in one building, the above unit configuration/arrangement is proposed.

Through this, the gardens with various characteristics mentioned above will appear repeatedly, and through this, you will be able to encounter an architecture filled with gardens that are highly public but not uniform.

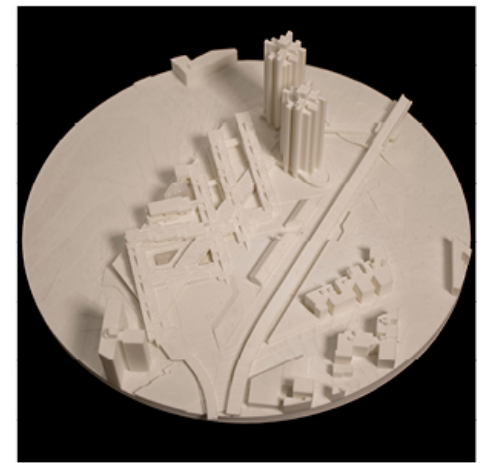
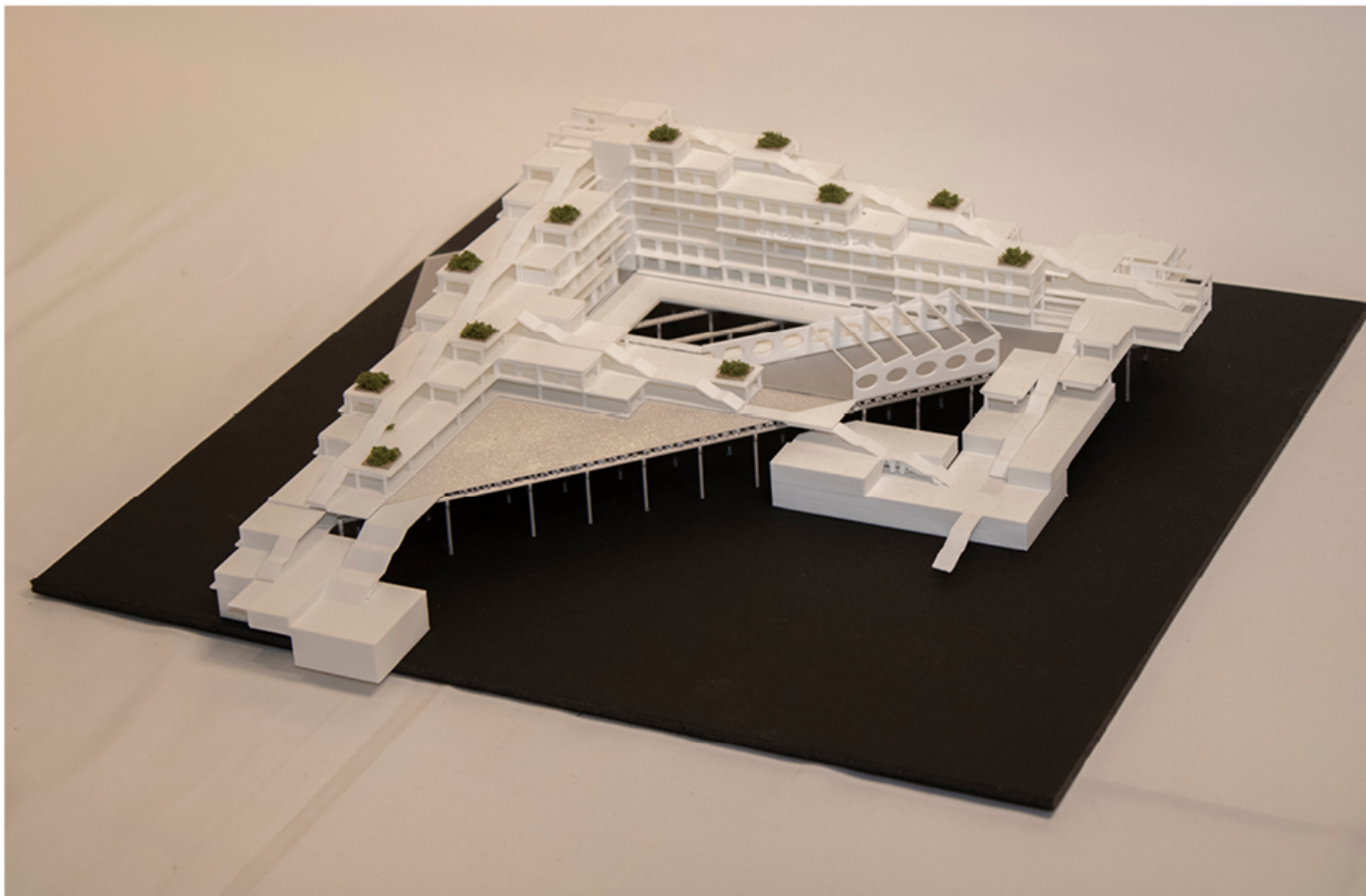






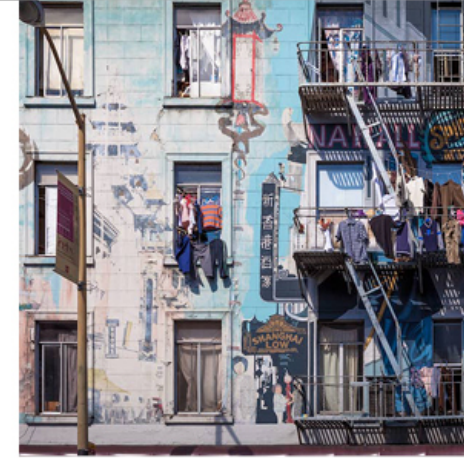


1:400 Physical Model and 1:2500 Physical Model



We conducted various mass studies and ultimately expressed the proposed architecture through physical models of two different scales.





## REDRESS-2

### Variations in Fire Escape-Related Building Components

: A Comparative Analysis of How Strengthened Fire Escape Codes Shaped Residential Floor Plans and Facades Across Different Building Types, Eras, and Neighborhoods in New York City

Architecture and Development in NYC/ Spring 2025

INSTRUCTOR : Andrew Dolkart

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#### Conclusion

The evolution of fire escape regulations in New York City offers a compelling lens through which to examine the interplay of architectural design, social change, and regulatory oversight. What began as a reactive solution to tragic tenement fires became, over time, a proactive architectural principle embedded in floor plans, facades, and entire urban blocks. While the intent of fire codes was primarily life safety, their ripple effects fundamentally altered the city's built environment.

In the Lower East Side, narrow buildings retrofitted with fire escapes bore the visual evidence of 19th-century reform. In contrast, Upper West Side apartments and Bronx walk-ups demonstrated how preemptive planning could internalize fire protection without compromising architectural aesthetics. The same codes produced rear-yard exits in Brooklyn brownstones, public stair cores in East Harlem towers, and creative reuse solutions in SoHo lofts. Each neighborhood, each typology, responded differently to a common legal mandate, producing a city of layered, adaptive forms.

Importantly, these architectural differences reflect broader patterns of social and economic inequality. Wealthier buildings often absorbed code changes with elegance and spatial efficiency; poorer districts frequently adopted visible, sometimes obtrusive, appendages. The presence or absence of a fire escape thus became a visual marker of both compliance and class.

At the urban scale, fire regulations influenced demolition decisions, preservation fights, and redevelopment strategies. From mid-century urban renewal to post-industrial adaptive reuse, fire safety codes have shaped what the city keeps, what it erases, and what it reinvents. Even today, legacy fire escapes continue to define the character of historic districts, while modern high-rises conceal their safety infrastructure in sleek, internal cores.

Ultimately, New York City's fire escapes represent more than emergency egress systems. They are material artifacts of evolving ideas about safety, responsibility, and urban form. By tracing their history and adaptations, we gain insight not only into regulatory change but into the ways that buildings negotiate risk, space, and time. Understanding these layered responses helps us appreciate how a simple safety mandate became one of the most distinctive and symbolic elements of the city's architectural identity.

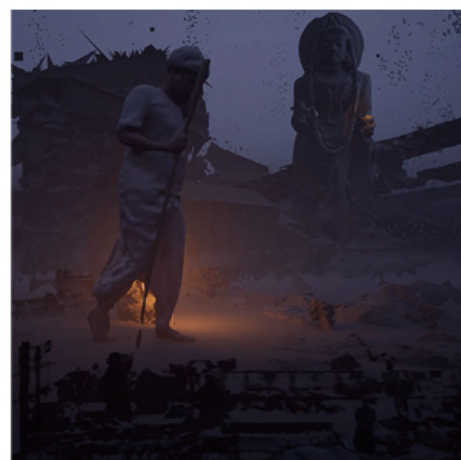
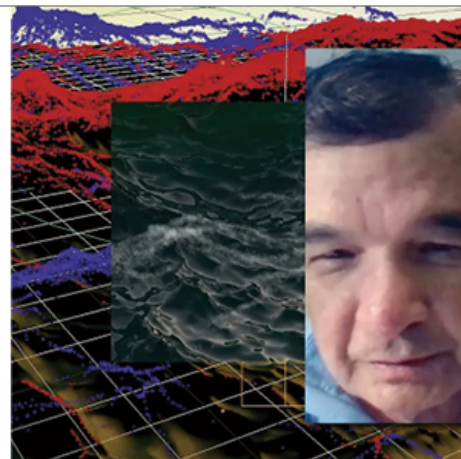


**REDRESS-3****"Home" in Diaspora**

: Suneil Sanzgiri's Exploration of Identity and Memory in Goa

Arguments / Summer 2024

INSTRUCTOR : Maur Philippe Dessauvage

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**The Aesthetic of the Fragment and the Incomplete**

At the same time, one of the most powerful aspects of Sanzgiri's work is its embrace of fragments and incomplete elements. In "Golden Jubilee," the 3D model of the ancestral home is not a perfect replica, but is full of flaws, gaps, and distortions. These imperfections become central elements of the film's aesthetic, reflecting the fragmented nature of memory and the impossibility of fully capturing the past.

Sanzgiri's use of fragments and incomplete elements as an aesthetic strategy symbolizes the diaspora experience, where "home" is often experienced as lost, fragmented, or out of reach. By embracing this imperfection, Sanzgiri creates a space for reflection and mourning, while also suggesting the possibility of finding meaning and connection even in loss.

"Diaspora is not a collapsing of identity. It is a constant evolution, expansion, becoming and unfolding. It is unstable and incoherent, fluid just as the slippery processes of chemical interaction with water that gives life to all analog images," writes Suneil Sanzgiri in his essay "Diaspora at a Distance". In this way, his use of incomplete and fragmented images to describe the identity of the diaspora and the concept of home is largely intentional and sophisticated.

At the same time, it shows his concern about how to use techniques based on colonial history, which must have had a huge impact on the formation of the concept of "home" as a diaspora, to criticize it. Specifically, the history of resource exploitation, centered around iron ore mining, along with the deep-rooted colonial history in Goa, serves as a backdrop for Sanzgiri's critique of ongoing neocolonial practices. In "Golden Jubilee," he draws parallels between colonial-era resource exploitation and today's use of technologies like photogrammetry and LIDAR for mining and surveillance.

**Notion of Home Redefined Beyond Geographical Boundaries**

Through his other work "Letter From Your Far-Off Country," he explores how the notion of "Home" is redefined beyond geographical boundaries, demonstrating his approach to highlighting his diasporic identity through a blend of personal narrative and political resistance. The letter format, along with scenes of his father reading about the Indian independence movement, indicate that 'home' is not simply a physical place, but rather a constantly reconstructed intersection of memory and narrative.

Also in a similar vein, in "At Home But Not At Home," Sanzgiri visually explores the concept of 'home' through images of India and Goa. This work cross-edits photos and video clips related to his father, and scenes of Goa taken with a drone, to express how 'home' is represented in physical reality and memory. Sanzgiri explores places he has never actually experienced through digital images, visualizing the sense of disconnection from 'home' felt by the diaspora. The film shows how fluid and imperfect the concept of 'home' is at the intersection of past and present, physical and digital spaces.



# WHAT IS TO BE ASKED

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