

PORTFOLIO

Xinyi Liu | M.S. ADVANCED ARCHITECTURAL DESIGN



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01

Multi-Storage

Soil-Friendly Cohousing Community Design

Columbia 2023 Summer Studio
Individual Academic Work
Jun. - Aug. 2023

Location: Kensington
Instructor: Fuminori Nousaku, Mio Tsuneyama



Embrace a lifestyle that shares and sustains

The Soil-Friendly Cohousing Community project aims to transform the residential block and lifestyle in Kensington. The existing block structure, approximately 180 meters long and 65 meters wide, offers an ideal foundation for fostering community.

Emphasizing sustainable and soil-friendly living, the design reimagines the traditional cohousing concept. By decentralizing communal spaces into compact, functional units dispersed throughout the community, this project prioritizes greenery and encourages shared resources like gardening tools and workshops. The layout preserves existing trees as central hubs for activities, fostering a sense of unity and environmental consciousness. The small unit design promotes interaction and minimal waste, with a focus on neighborhood-built simplicity.

Jan Gudmand-Høyer reacts to the realities of late-twentieth-century life and emerging demographic changes. These realities included:

1. Moms working outside of the home
2. Fewer children per household
3. More single-individual households
4. The increasing desire for a convenient, practical, responsible, economical, interesting, and fun lifestyle
5. An easier way to live a little lighter on the planet

The Cohousing group's goal is to build a housing development with a lively and positive social environment. They wanted a place where children would live near playmates, where individuals would have a feeling of belonging, where they would know people of all ages, and where they would be able to grow old and continue to contribute positively.

The physical spaces are designed to encourage a sense of place and belonging that engenders cooperation and supports relationships.



P1: Images from Creating Cohousing: Building Sustainable Communities, Kathryn McCamant, Charles Durrett

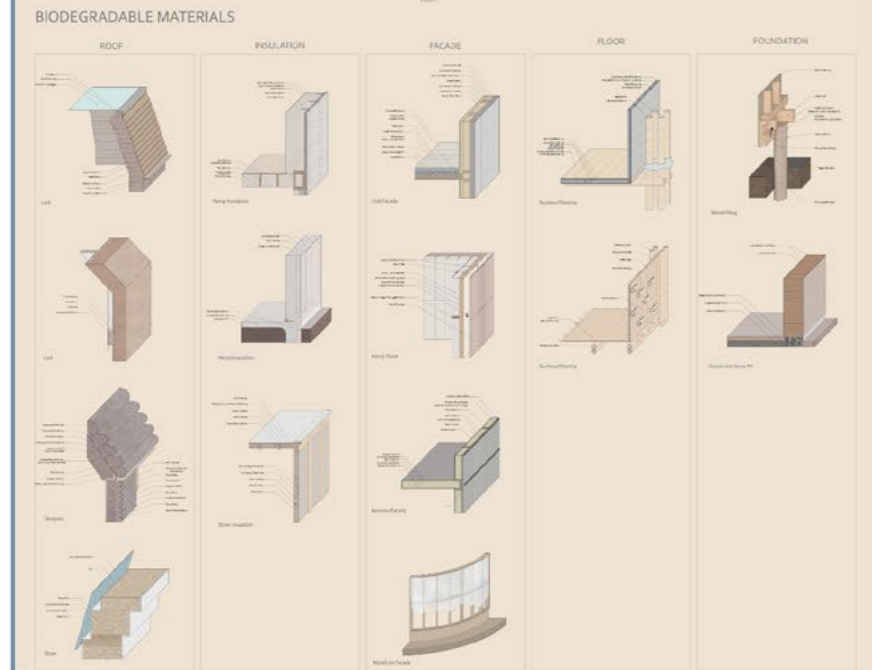
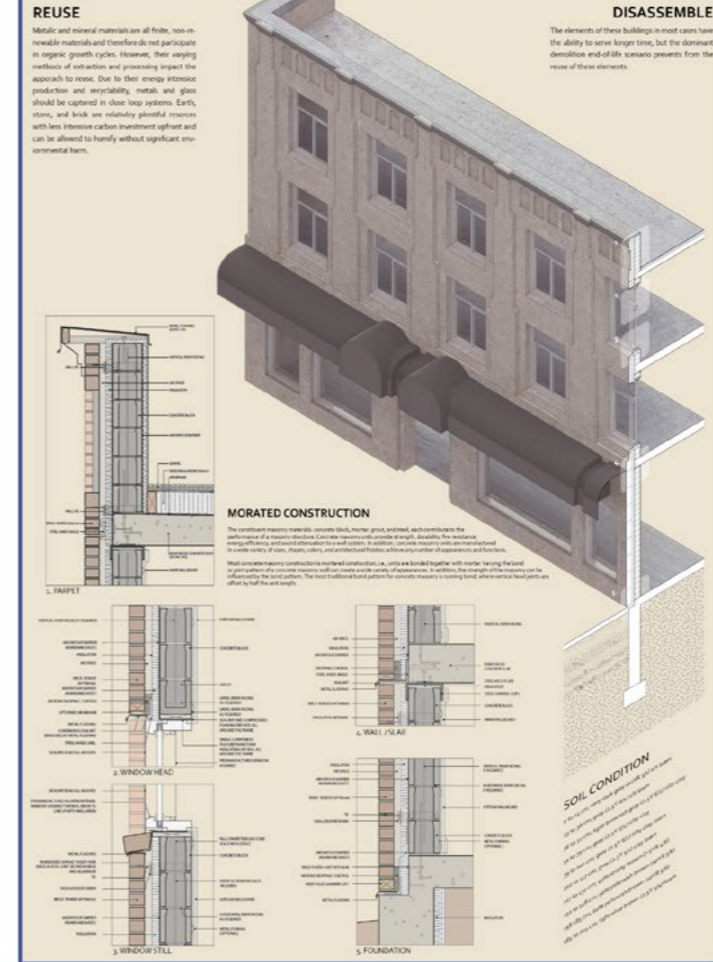
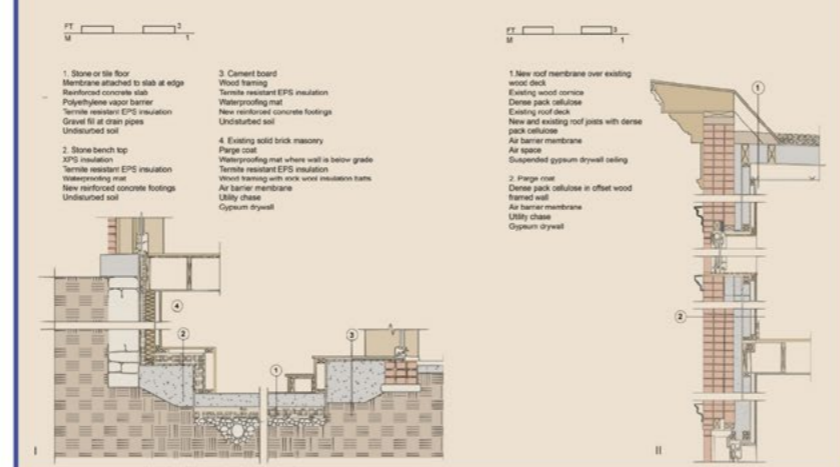
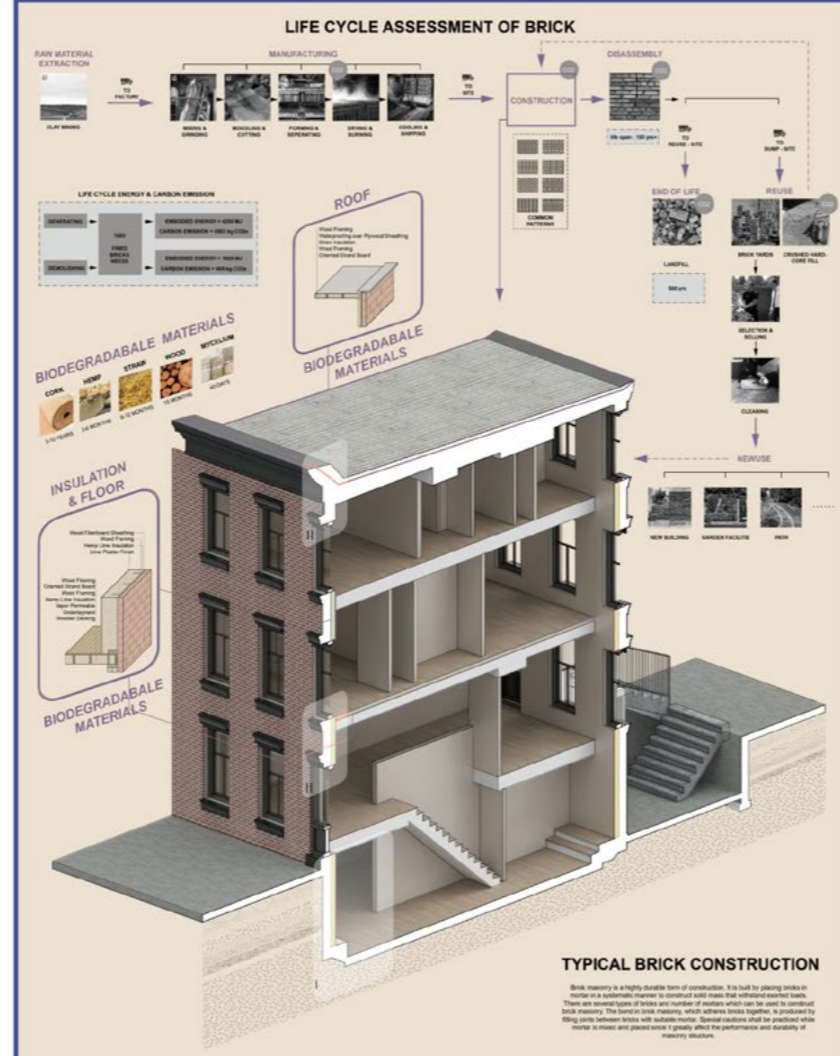
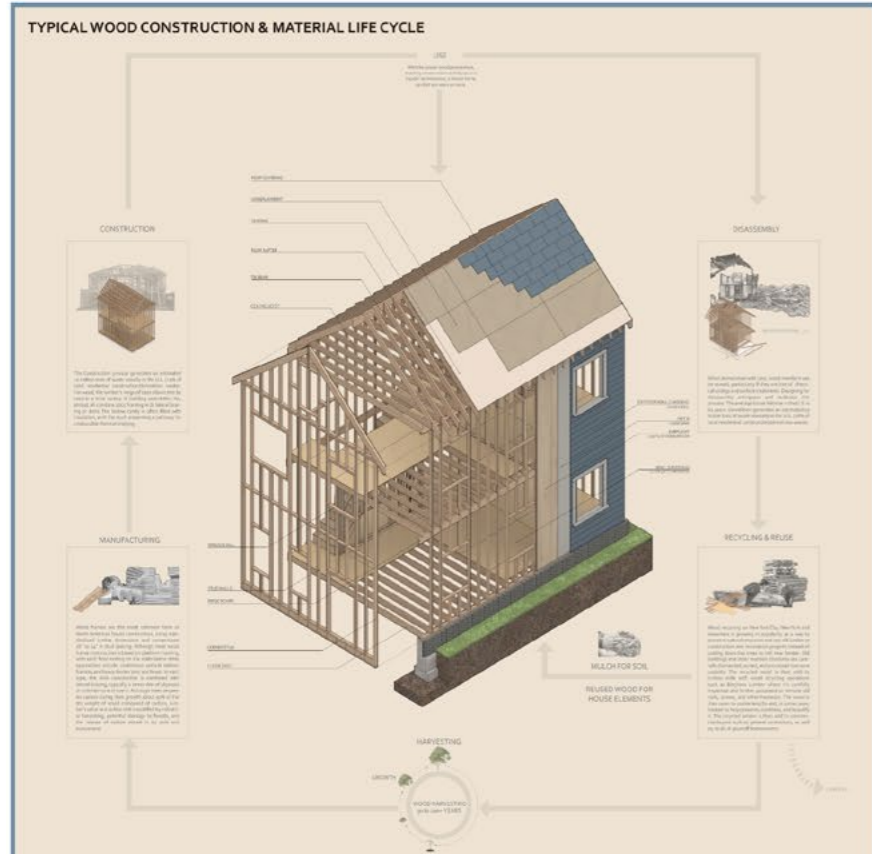
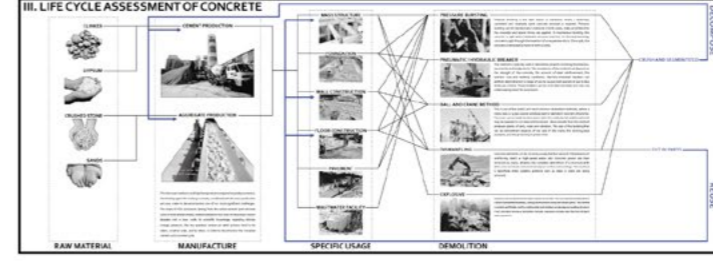
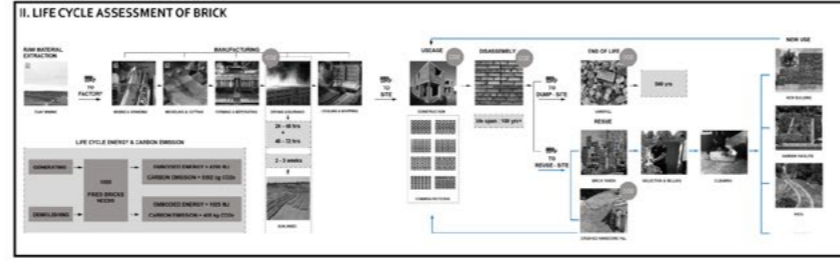
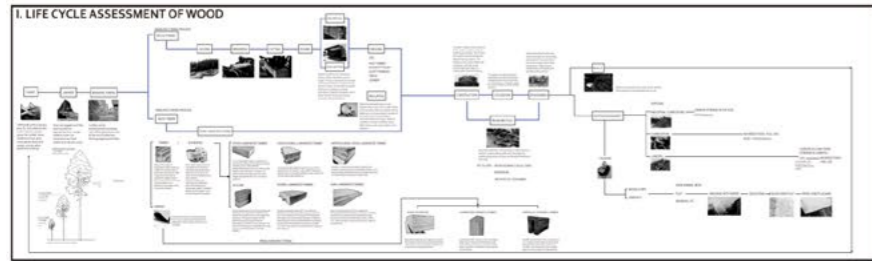


P2: Image by Haihui Zhu

Research

Typical Wood / Brick/ Concrete Construction and the Material Life Cycle

Eco Materials



CORK

Cork is a natural, renewable material that is harvested from the bark of the cork oak tree. It is a lightweight, durable material that is resistant to water, fire, and mold. It is commonly used in flooring, wall panels, and insulation.

BAMBOO

Bamboo is a fast-growing, renewable material that is harvested from the bamboo plant. It is a strong, durable material that is resistant to water, fire, and mold. It is commonly used in flooring, wall panels, and insulation.

STRAW

Straw is a natural, renewable material that is harvested from the stalks of grain crops. It is a lightweight, durable material that is resistant to water, fire, and mold. It is commonly used in insulation and wall panels.

HEMP

Hemp is a fast-growing, renewable material that is harvested from the hemp plant. It is a strong, durable material that is resistant to water, fire, and mold. It is commonly used in insulation and wall panels.

LUMBER

Lumber is a natural, renewable material that is harvested from trees. It is a strong, durable material that is resistant to water, fire, and mold. It is commonly used in construction.

MASS TIMBER

Mass timber is a natural, renewable material that is harvested from trees. It is a strong, durable material that is resistant to water, fire, and mold. It is commonly used in construction.

WOOD COMPOSITE

Wood composite is a material made from wood chips and sawdust. It is a strong, durable material that is resistant to water, fire, and mold. It is commonly used in construction.

PLYWOOD

Plywood is a material made from thin layers of wood. It is a strong, durable material that is resistant to water, fire, and mold. It is commonly used in construction.

MYCELIUM

Mycelium is a natural, renewable material that is harvested from fungi. It is a strong, durable material that is resistant to water, fire, and mold. It is commonly used in construction.

EARTH

Earth is a natural, renewable material that is harvested from the ground. It is a strong, durable material that is resistant to water, fire, and mold. It is commonly used in construction.

STONE

Stone is a natural, renewable material that is harvested from the ground. It is a strong, durable material that is resistant to water, fire, and mold. It is commonly used in construction.

BRICK

Brick is a natural, renewable material that is harvested from the ground. It is a strong, durable material that is resistant to water, fire, and mold. It is commonly used in construction.

CONCRETE

Concrete is a material made from cement, sand, and aggregate. It is a strong, durable material that is resistant to water, fire, and mold. It is commonly used in construction.

GLASS

Glass is a material made from sand and other minerals. It is a strong, durable material that is resistant to water, fire, and mold. It is commonly used in construction.

GYPSUM BOARD

Gypsum board is a material made from gypsum and paper. It is a strong, durable material that is resistant to water, fire, and mold. It is commonly used in construction.

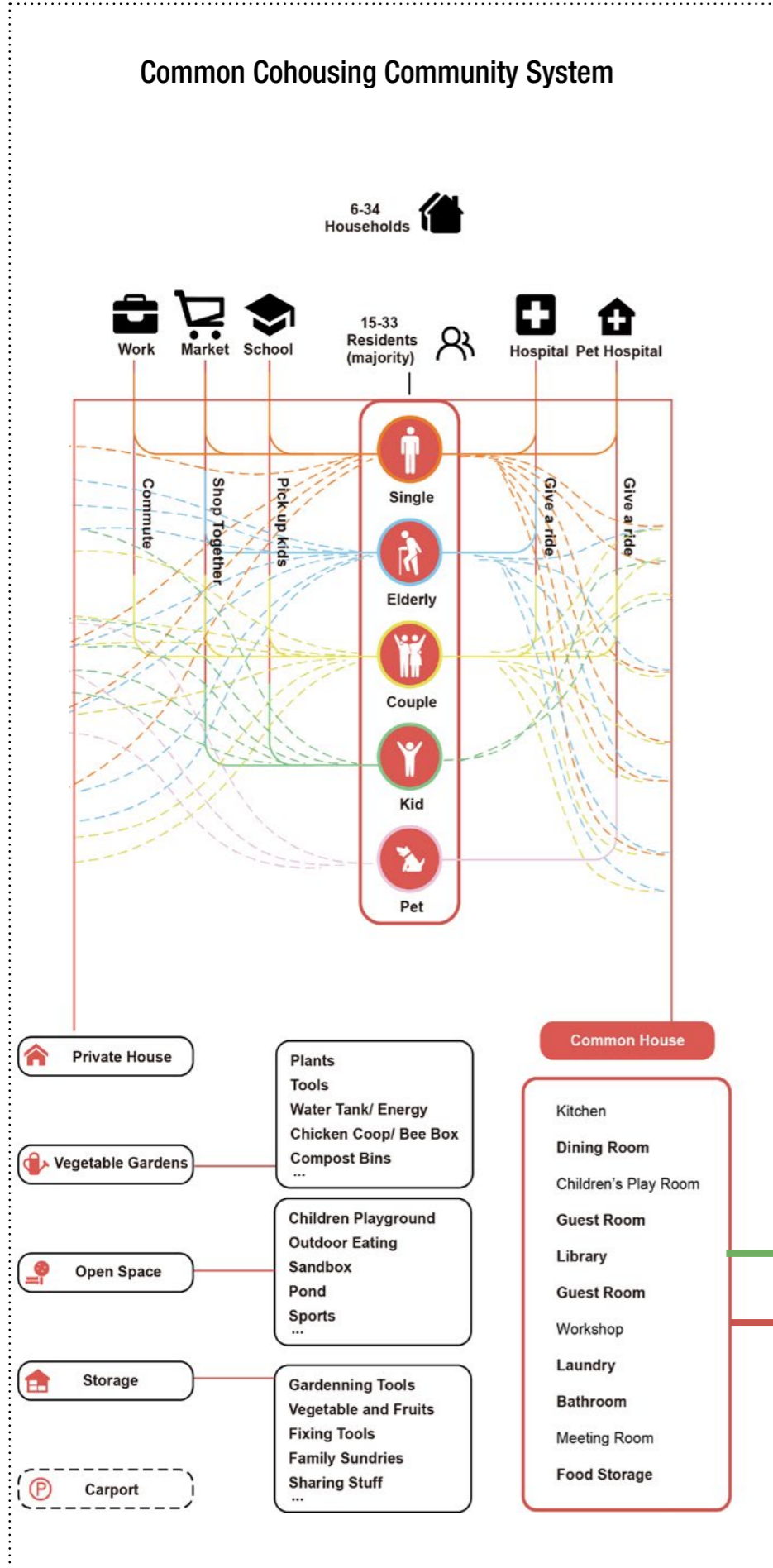
STEEL STRUCTURE

Steel structure is a material made from iron and carbon. It is a strong, durable material that is resistant to water, fire, and mold. It is commonly used in construction.

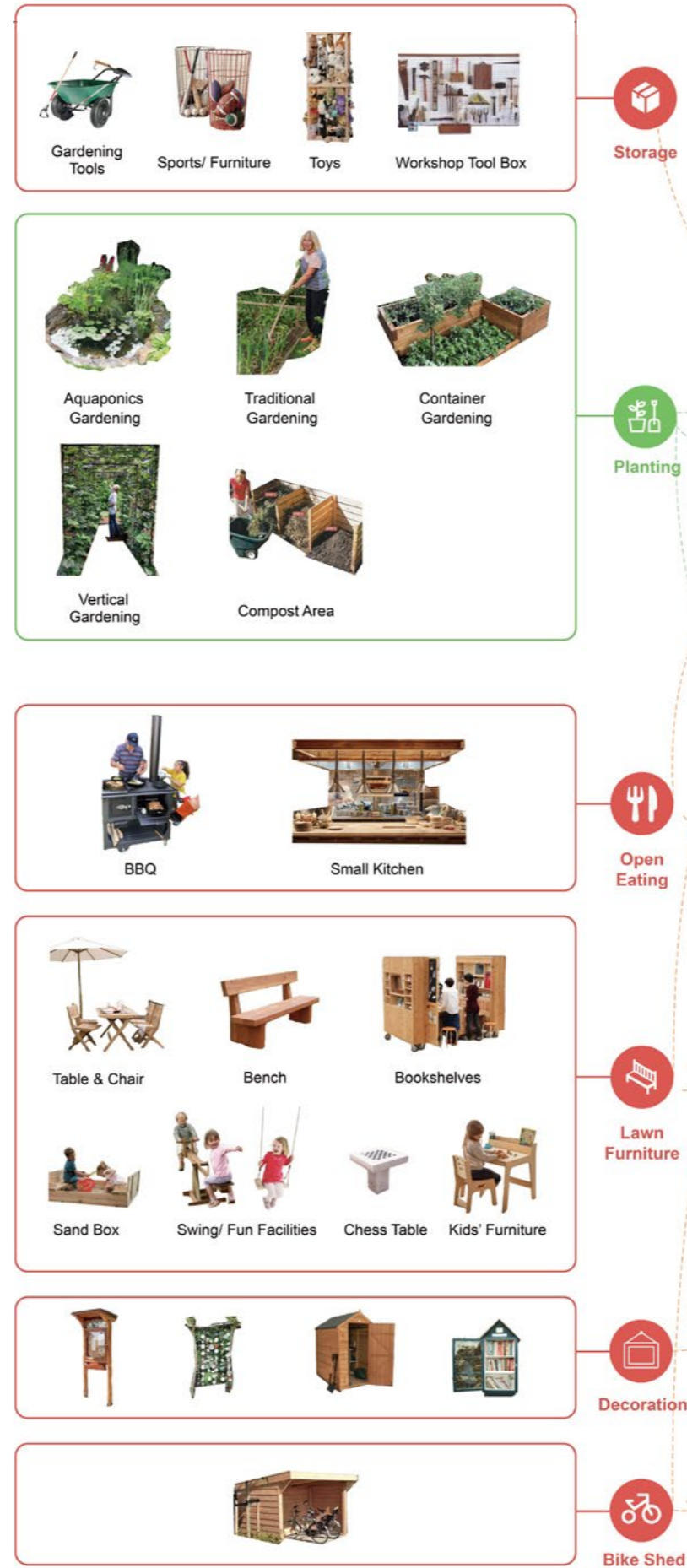
METAL PLATES, EXTRUSIONS, AND CLADDING

Metal plates, extrusions, and cladding are materials made from various metals. They are strong, durable materials that are resistant to water, fire, and mold. They are commonly used in construction.

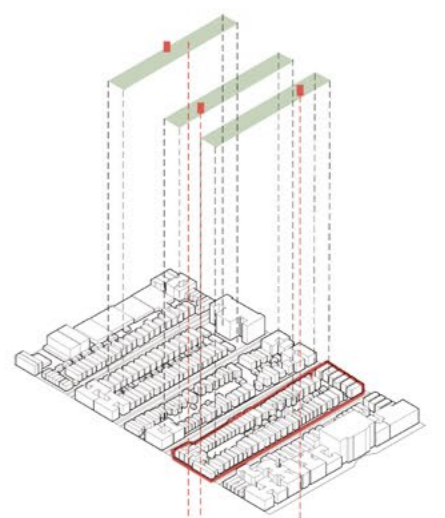
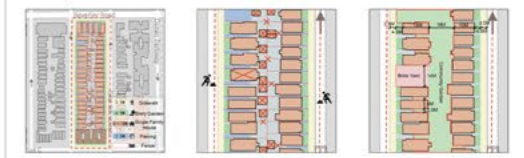
Network



More Green Decentralize



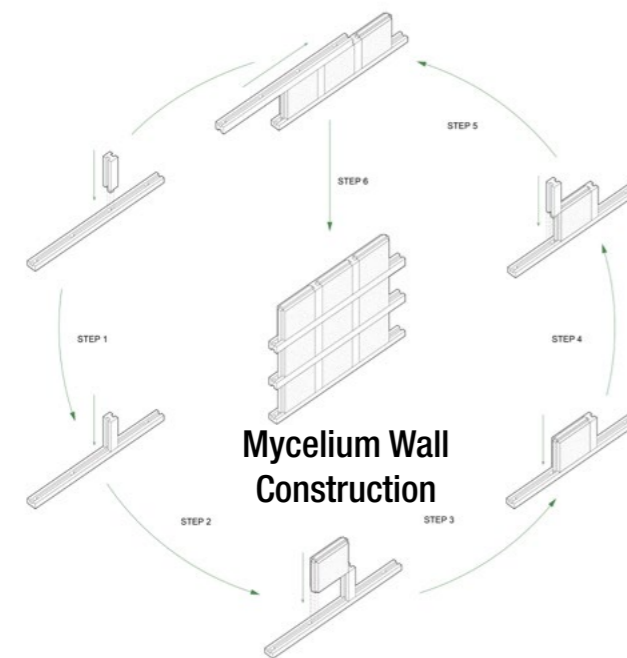
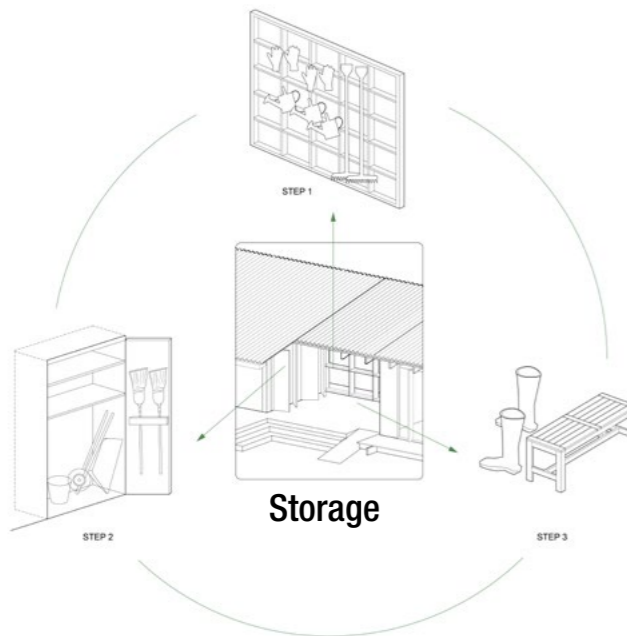
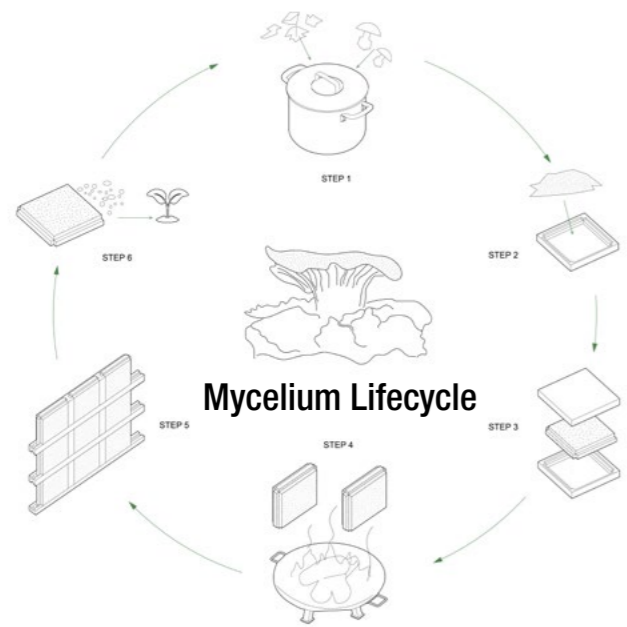
Kensington Soil-Friendly Block Cohousing Community System

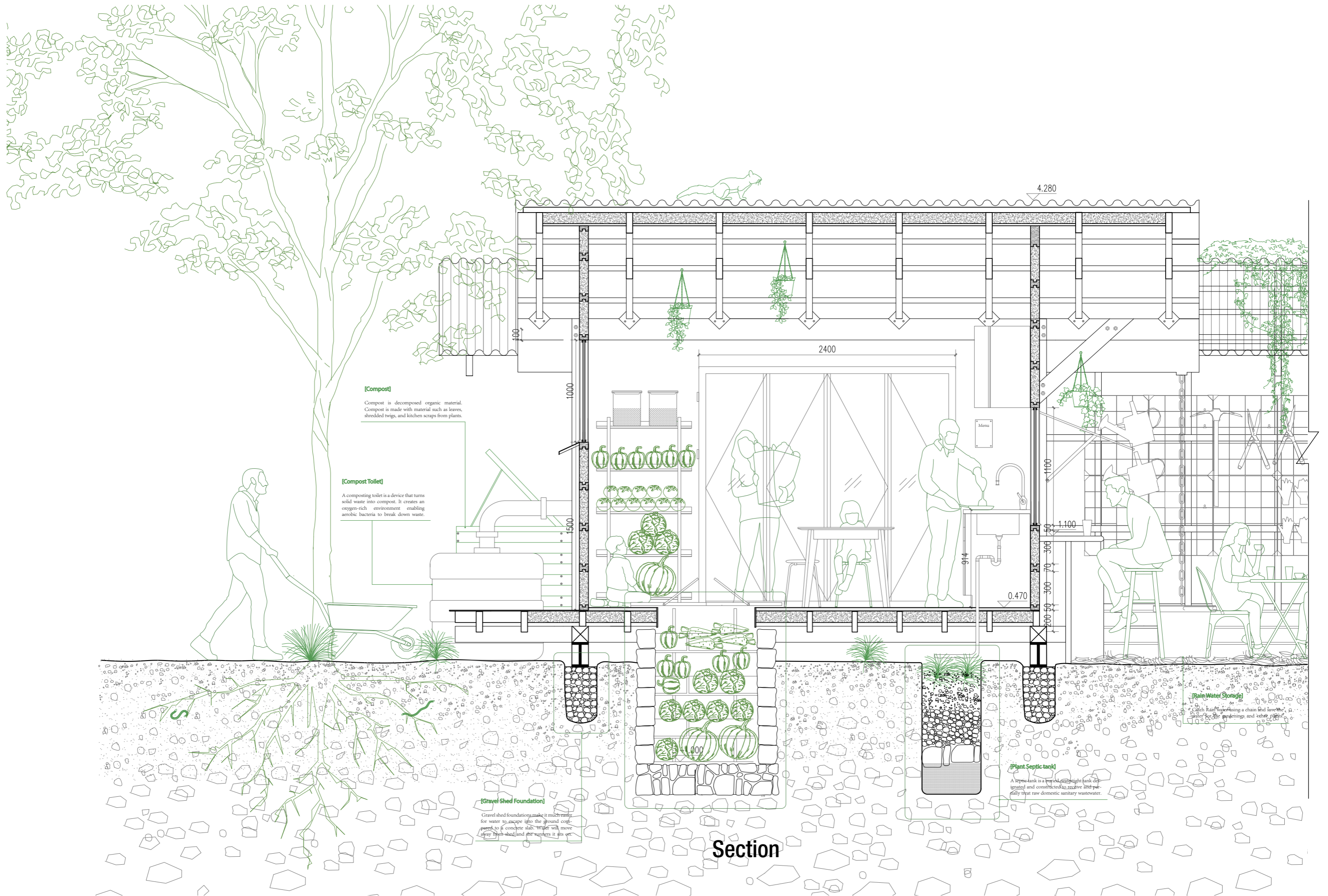


Communities Sharing









[Compost]

Compost is decomposed organic material. Compost is made with material such as leaves, shredded twigs, and kitchen scraps from plants.

[Compost Toilet]

A composting toilet is a device that turns solid waste into compost. It creates an oxygen-rich environment enabling aerobic bacteria to break down waste.

[Gravel Shed Foundation]

Gravel shed foundations make it much easier for water to escape into the ground compared to a concrete slab. Water will move away from shed and the sunners it sits on.

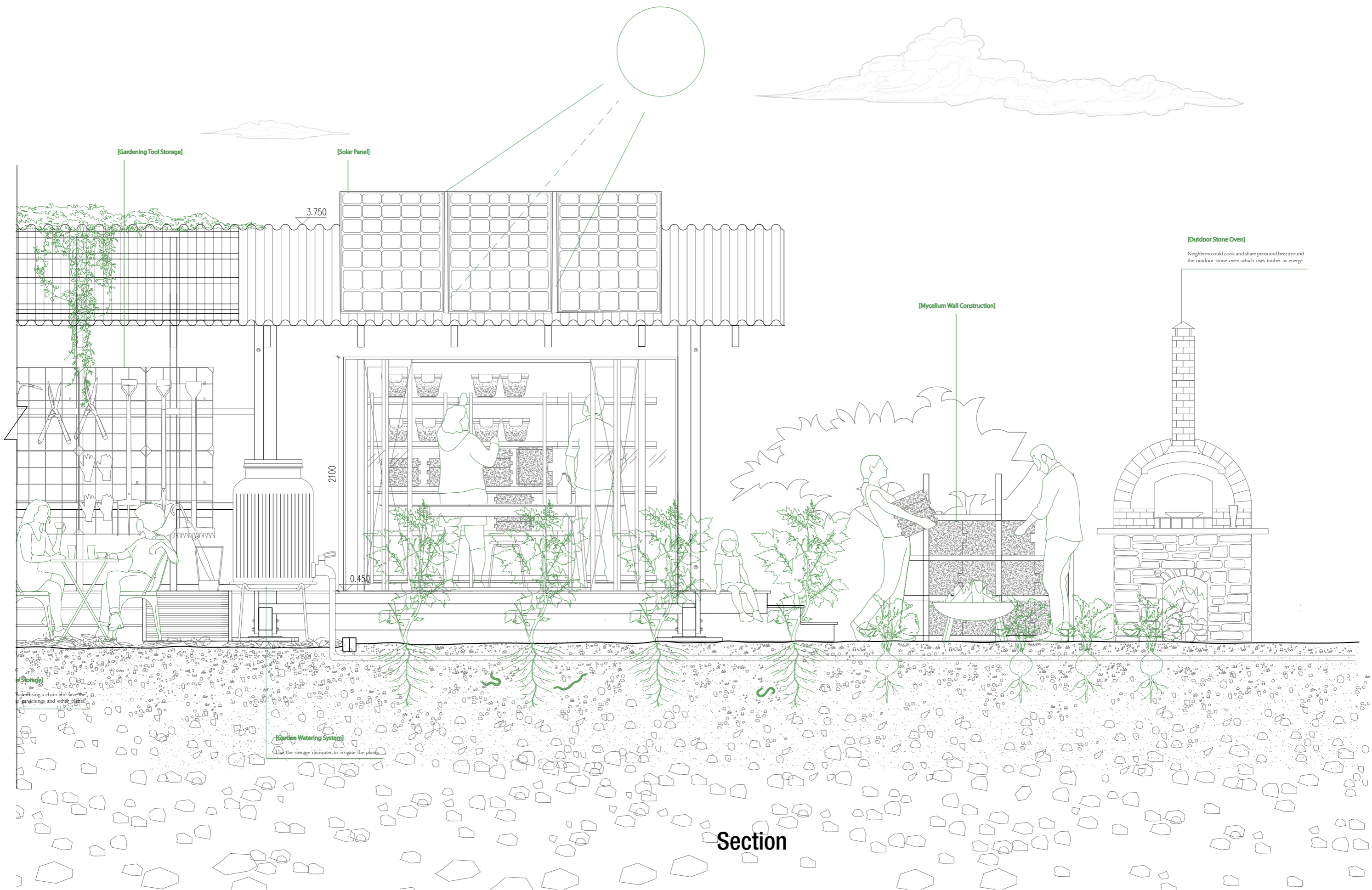
[Plant Septic tank]

A septic tank is a buried, airtight tank designed and constructed to receive and partially treat raw domestic sanitary wastewater.

[Rain Water Storage]

Catch Rain Water using a chain shed save the water for the gardenings and other things.

Section



[Gardening Tool Storage]

[Solar Panel]

3.750

2100

0.450

[Mycellum Wall Construction]

[Outdoor Stone Oven]

Neighbors could cook and share pizza and beer around the outdoor stone oven which uses timber as energy.

[Storage]
Using a chain link fence to separate the gardenings and other plants.

[Garden Watering System]
Use the storage rainwater to irrigate the plants.

Section

02

The Living Armory

Armory Renovation and Extreme Scale Design

Columbia 2023 Fall Studio

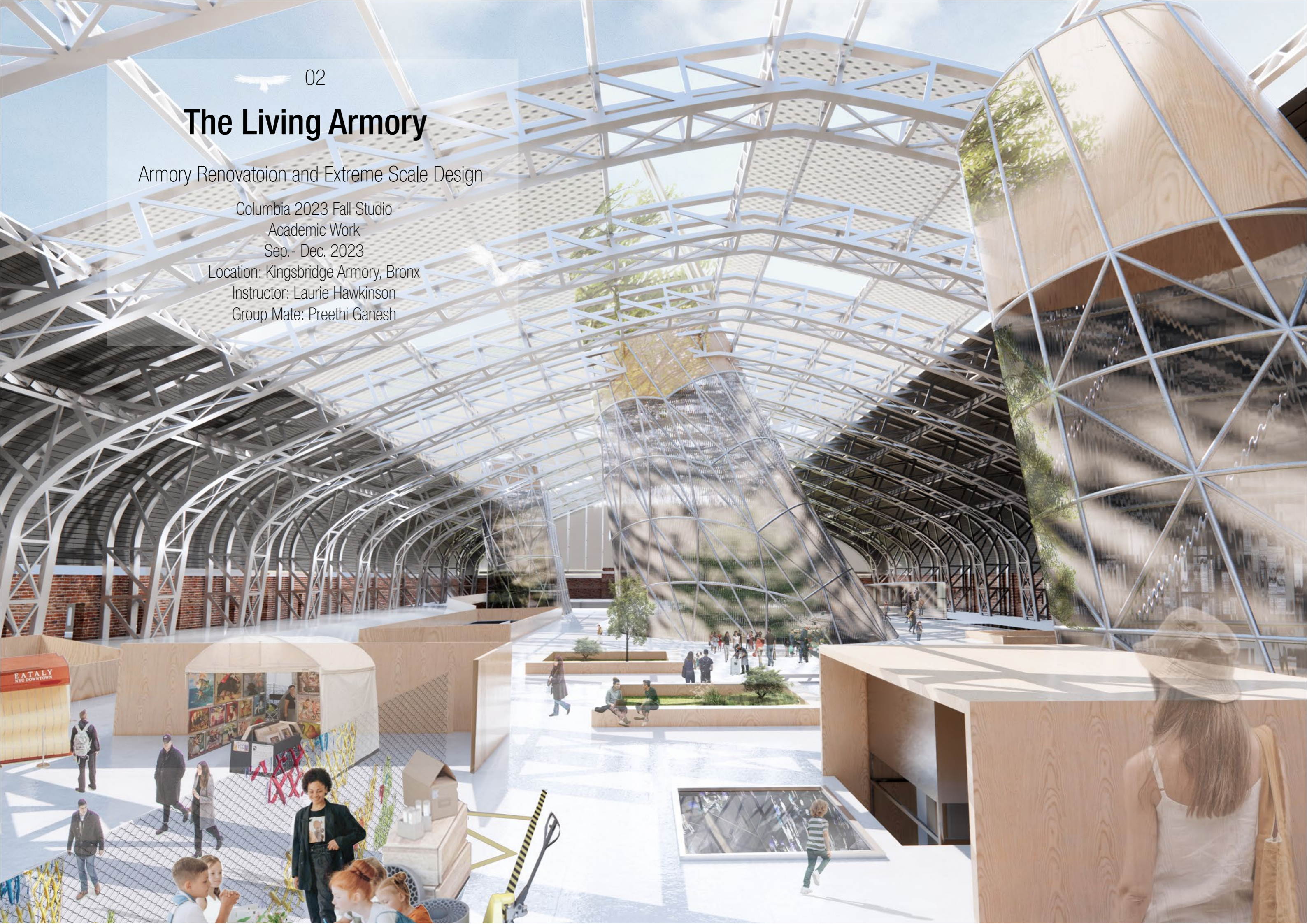
Academic Work

Sep. - Dec. 2023

Location: Kingsbridge Armory, Bronx

Instructor: Laurie Hawkinson

Group Mate: Preethi Ganesh



What if the Armory could Bring the Outside in?

What if the armory could bring the outside in?

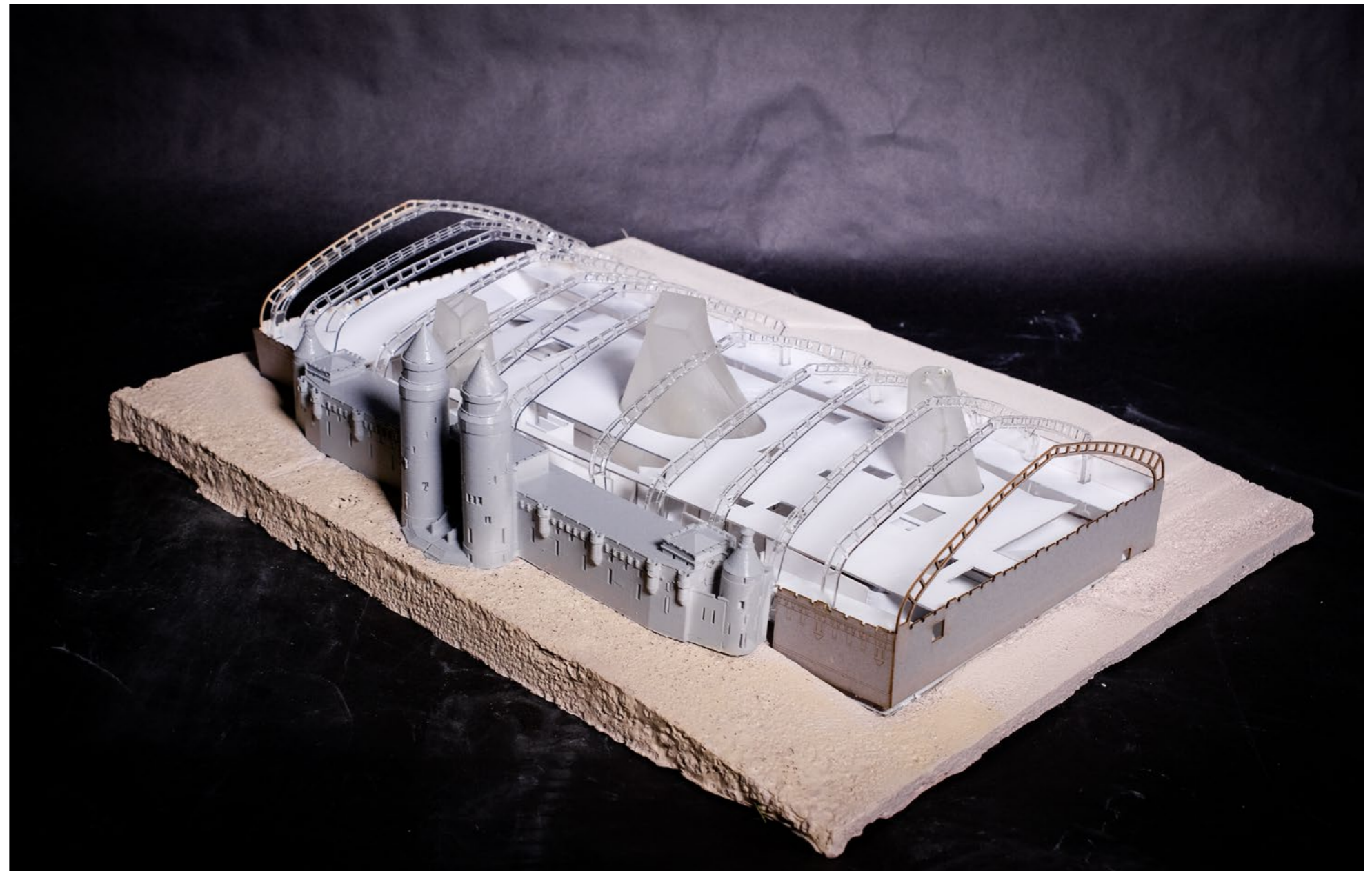
Imagine a sanctuary where the boundary between exterior and interior dissolves, revealing a harmonious coexistence between nature and architecture.

"The Living Armory" is an architectural endeavor that transforms the conventional notion of an armory into a dynamic living space.

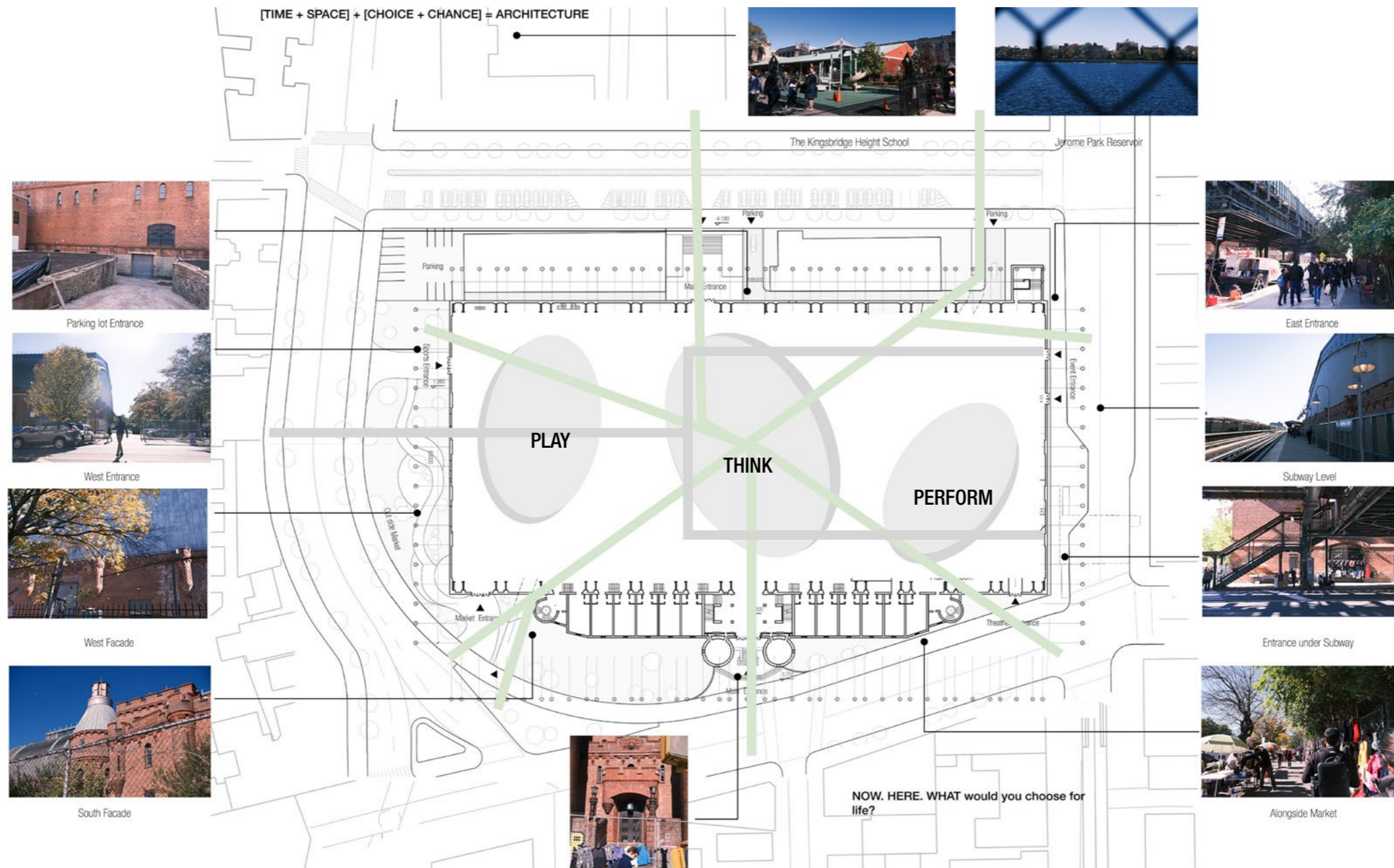
Three unconditioned vessels, inspired by organic forms, serve as immersive outdoor environments, blurring the boundaries between nature and architecture. These vessels act as extensions of the surrounding conditioned spaces, creating a seamless transition between the built environment and the outdoors.

The upper floor becomes a canvas for the unpredictable, allowing the outside city elements to infuse the spaces with life and spontaneity. Through our proposal, imagine open adaptable areas that respond to the pulse of the city, harmoniously integrating the energy of the streets with the tranquility of the surrounding natural vessels.

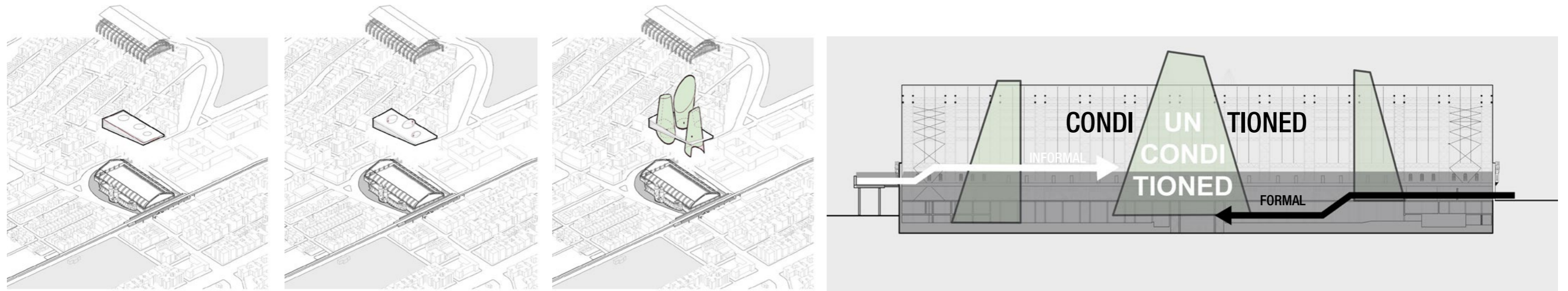
Meanwhile, underground spaces host formal programs, creating a juxtaposition between the organic above-ground vessels and the structured belowground spaces. What if the armory could bring the outside in? This project seeks to answer that question by redefining the boundaries of traditional architecture, offering a transformative experience where nature becomes an integral part of the architectural narrative.



Site Research



Concept



1. Balance site heights difference

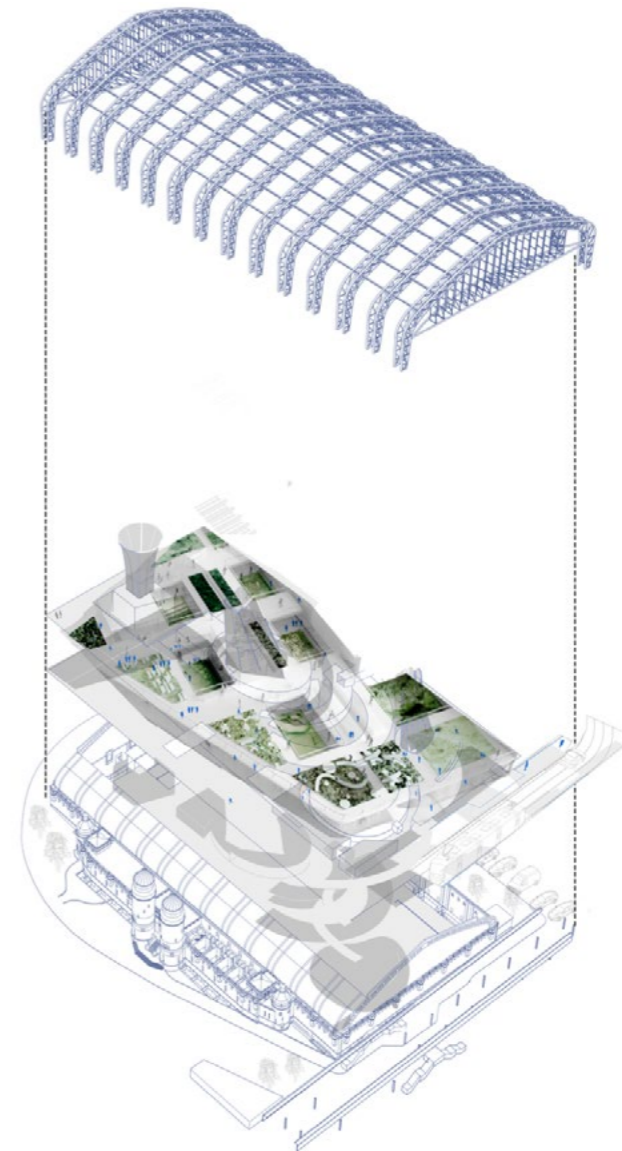
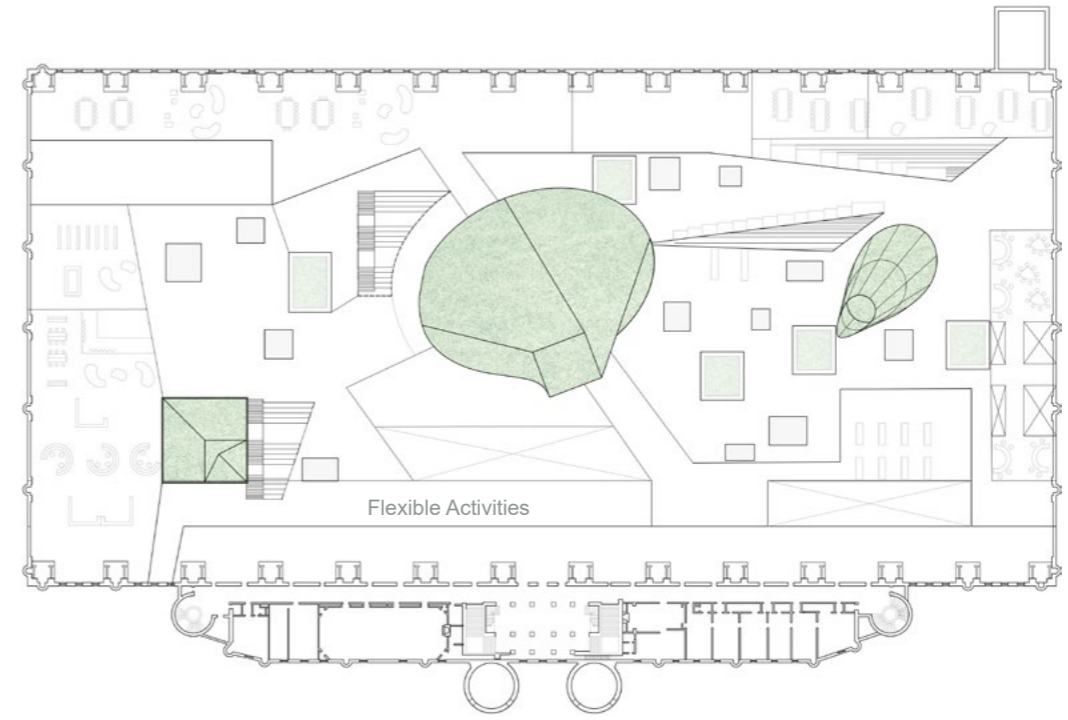
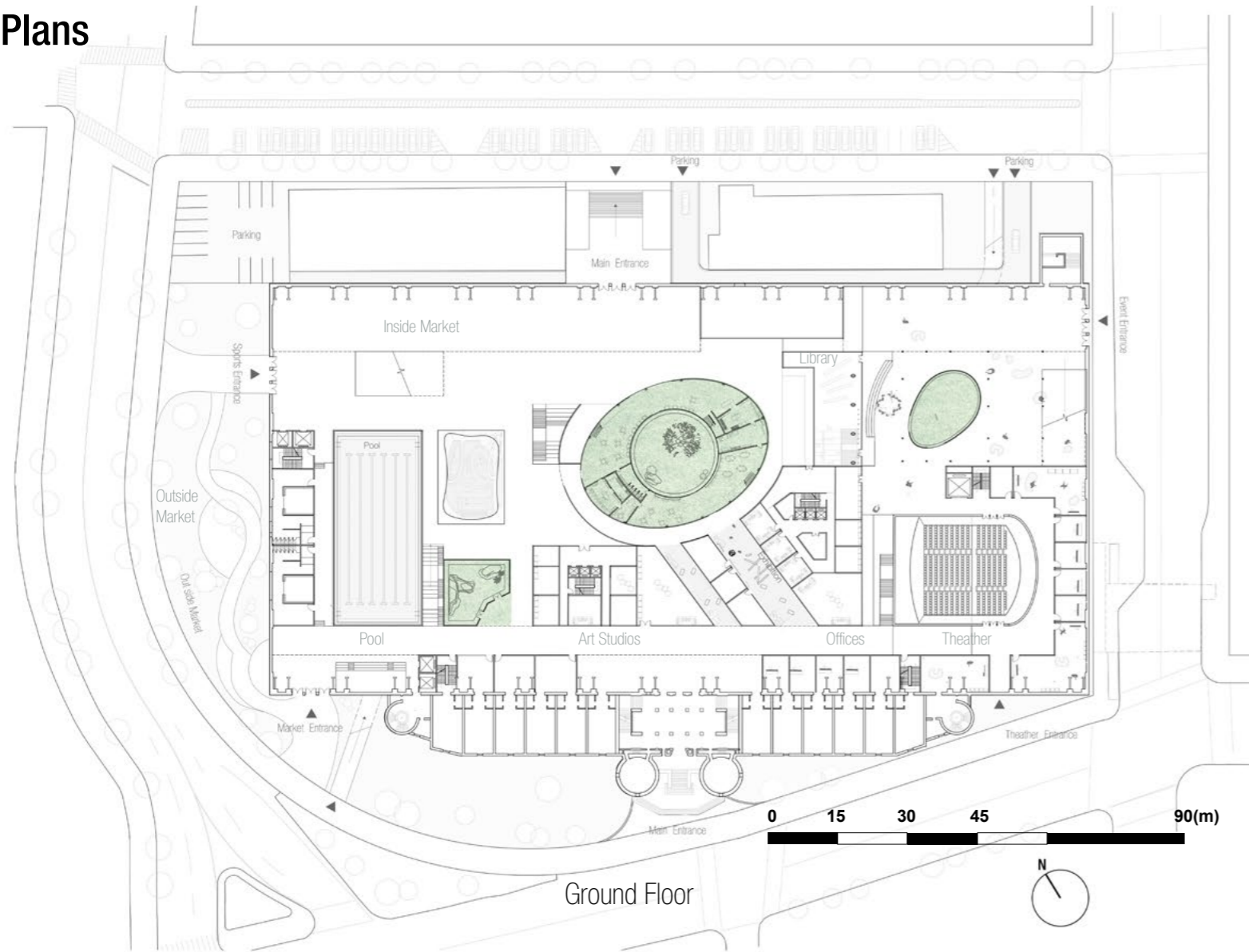
2. Three different activity zones

3. Three unconditioned vessels

4. Informal & Formal; Conditioned & Unconditioned

Formal programs are placed under the "informal plane", where the local community has great flexibility to arrange different activities according to their need. "Vessels" bring the outside in to adapt to the inside weather.

Plans



Programs

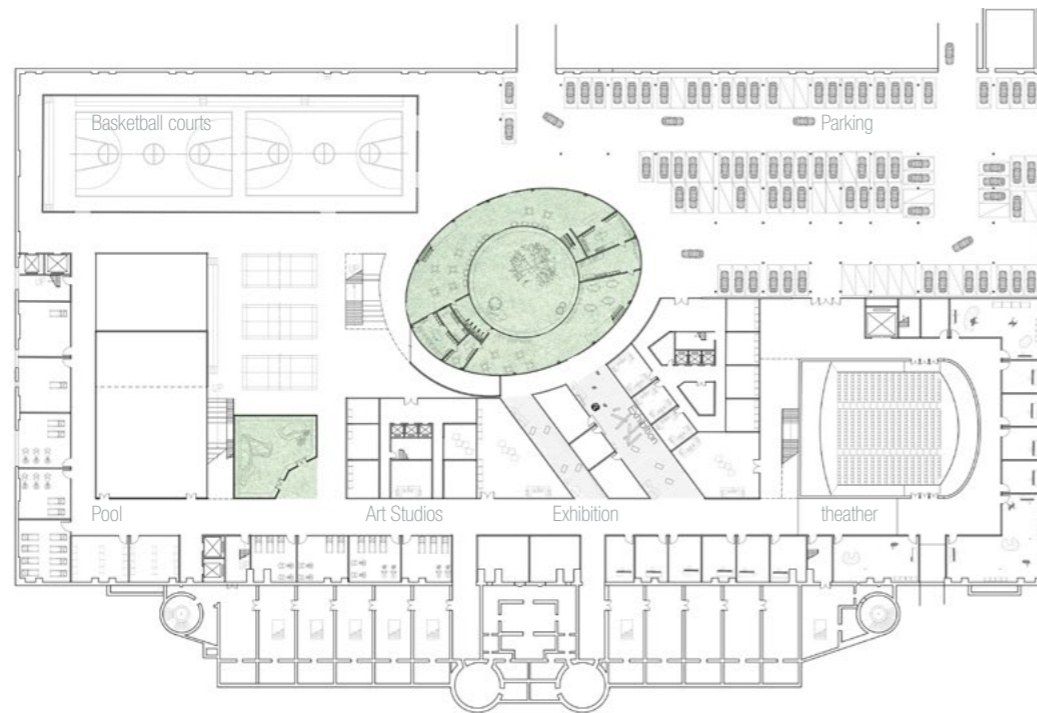
Sports Block
 Swimming pool (pool + deck): 1500 m²
 Dancing: 1000 m²
 Sports: 1000 m²
 Locker rooms + showers: 500 m²

Health Care
 Waiting rooms + medical cubicles: 1000 m²

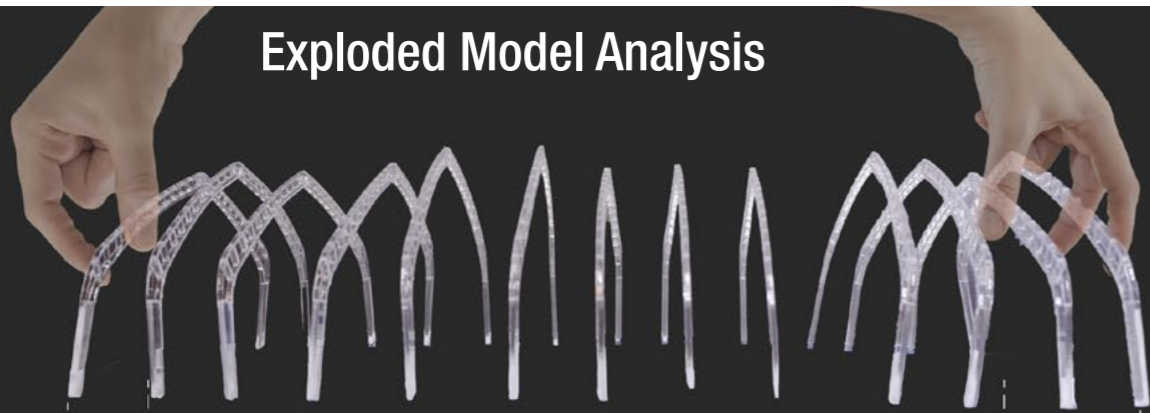
Cultural Block
 Art studios: 1000 m²
 Exhibition: 1000 m²
 Library: 1000 m²
 Theatre: 1000 m²

Collective
 Café / living ("3rd space"): 1000 m²
 Restaurant: 500 m²
 Large event space 3,000+/- people

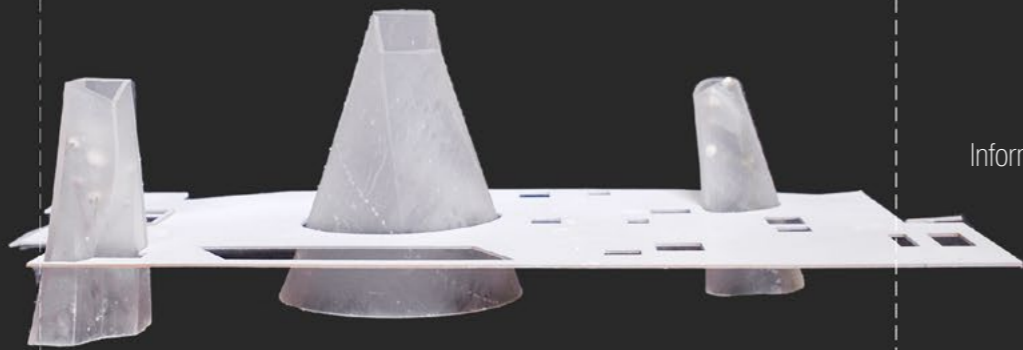
Other
 Offices: 500 m²



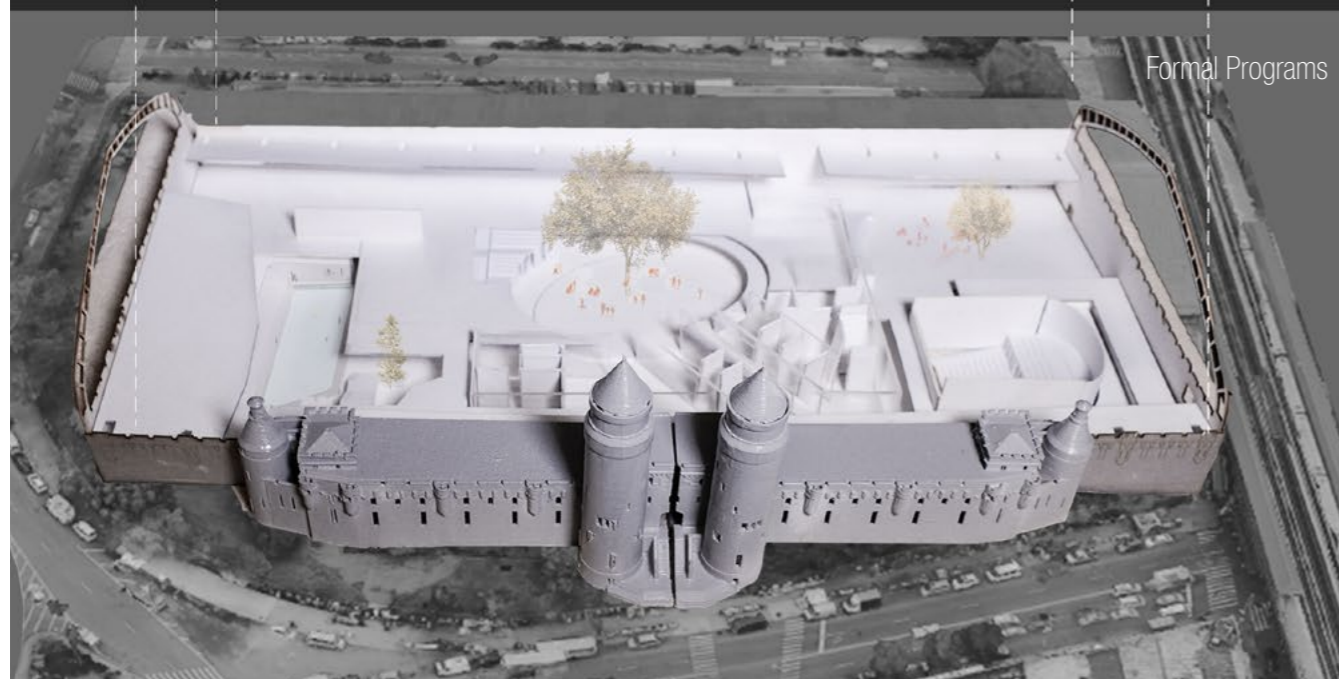
Exploded Model Analysis



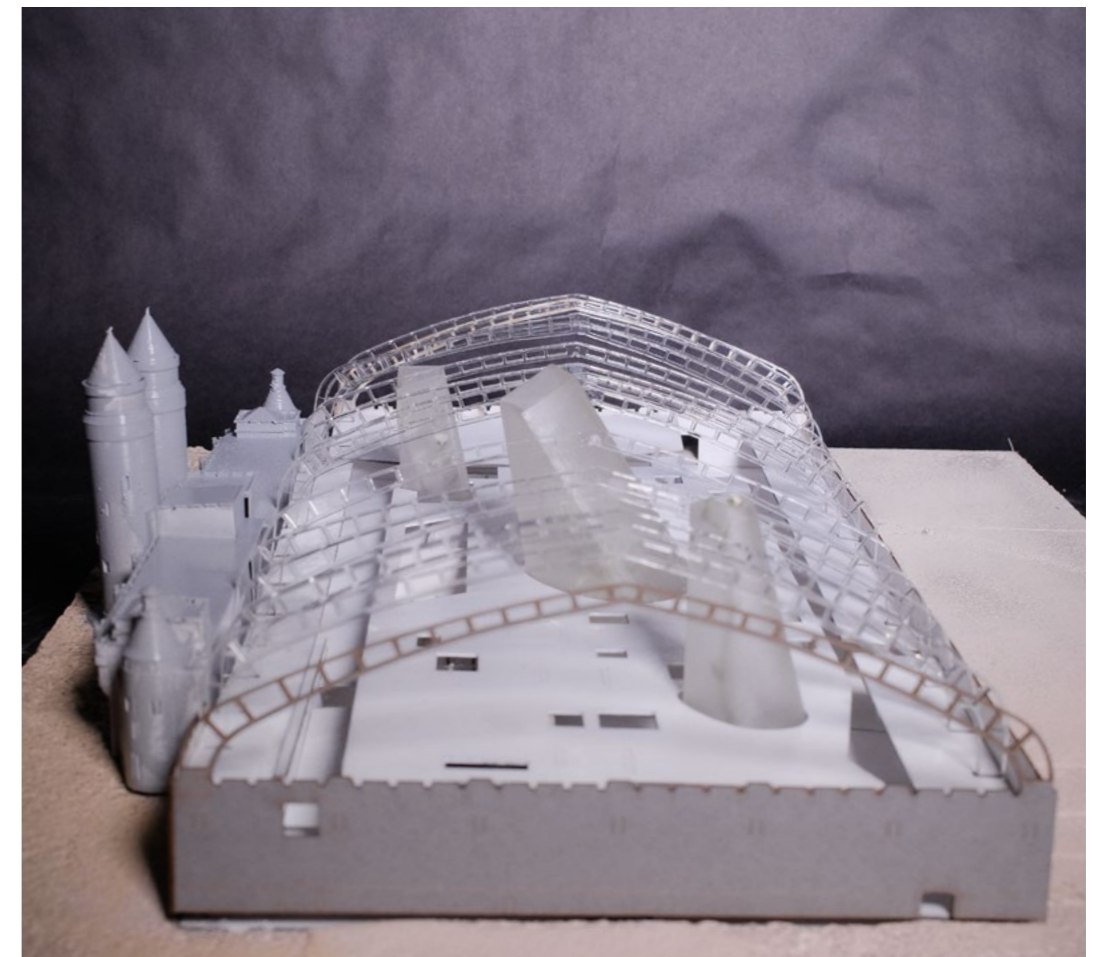
Big Trusses



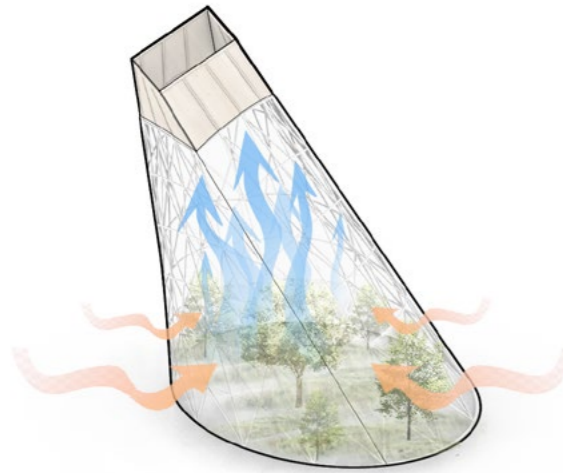
Informal Plane



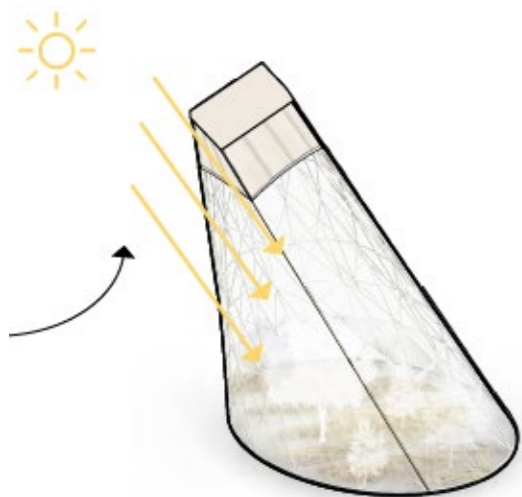
Formal Programs



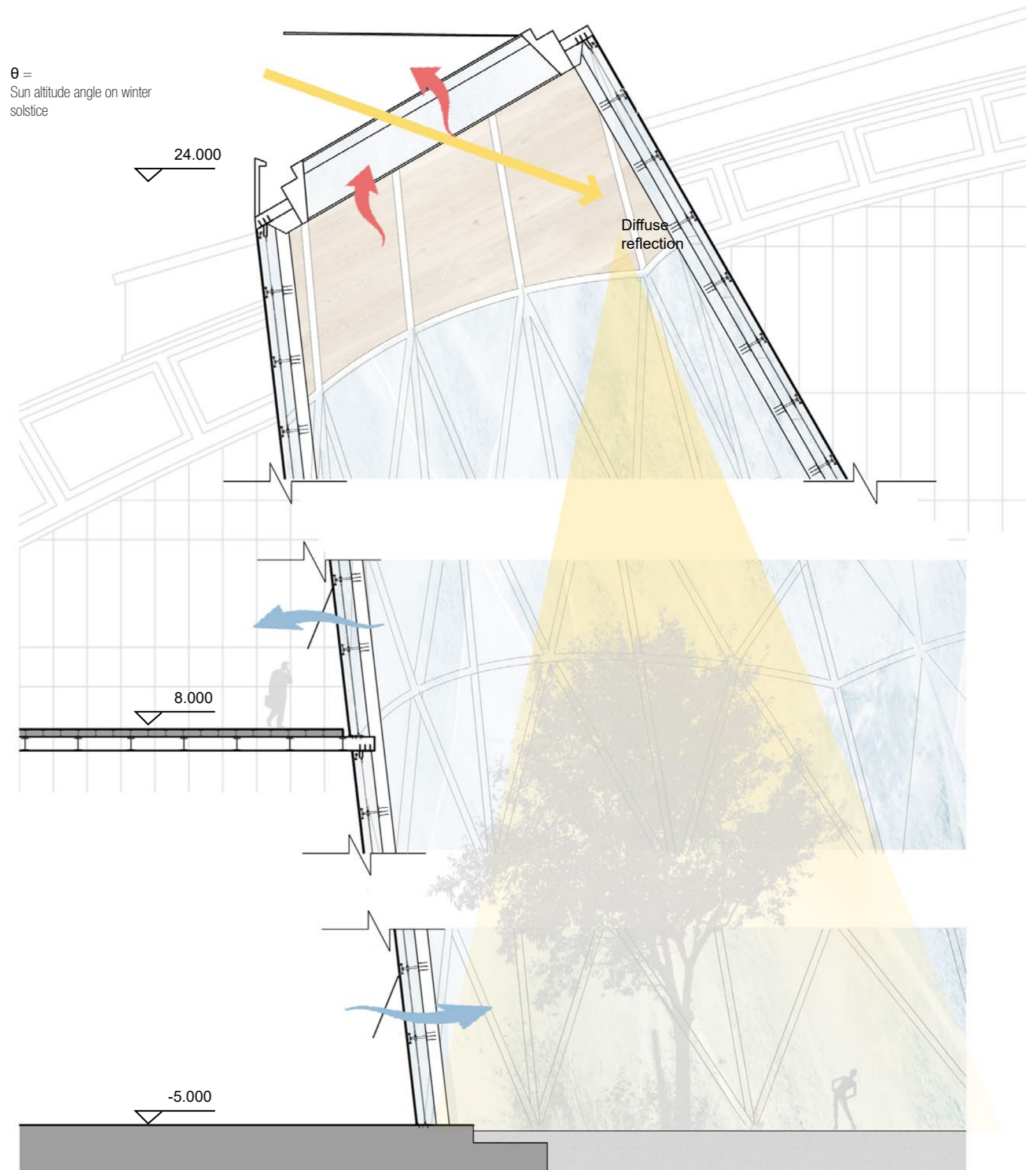
Sustainability Analysis & Detail Section of the "Vessel"



Summer: Stack effect
The vessels help to drive natural ventilation and cool down the large space



Winter: Greenhouse
The vessels get covered by a cap and help to capture the light and heat of the sun.



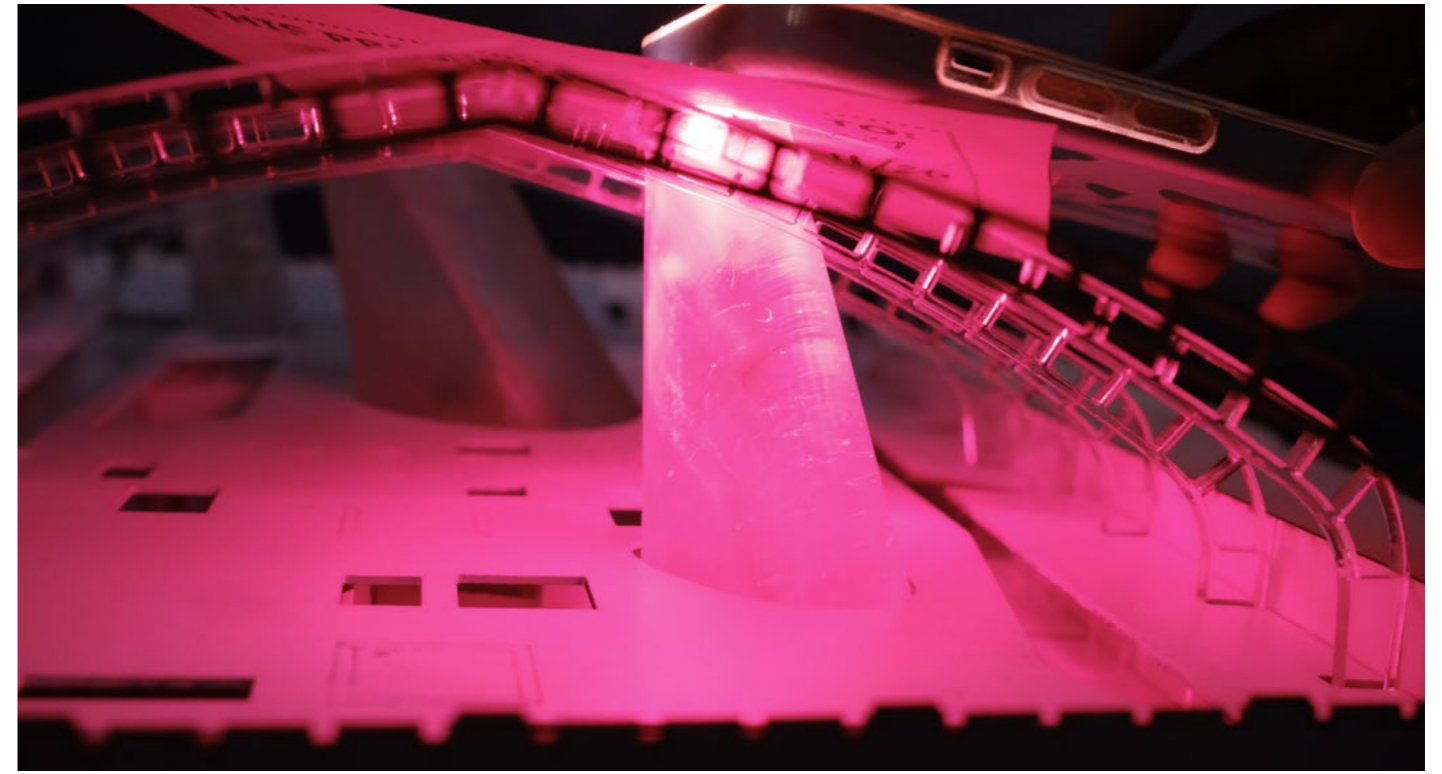
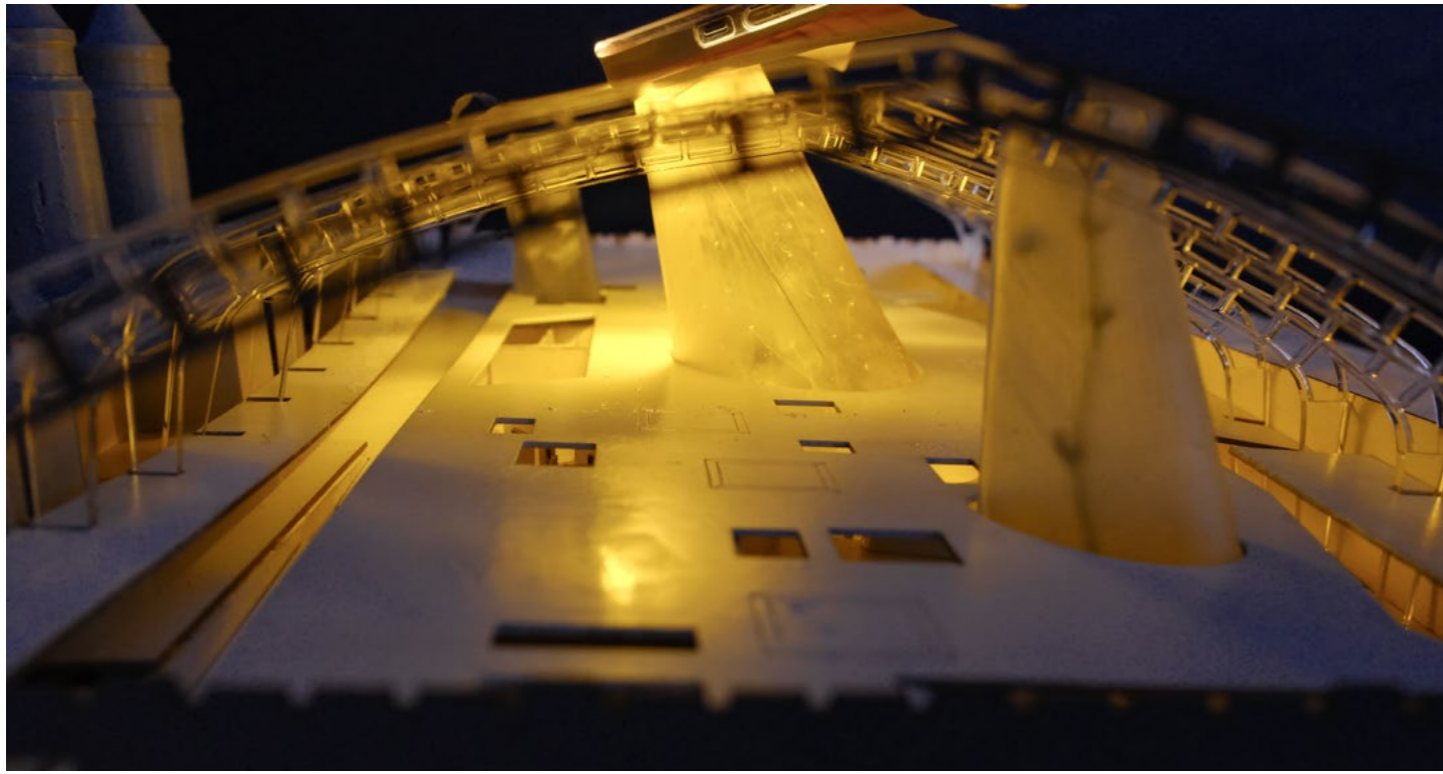
θ =
Sun altitude angle on winter
solstice

24.000

Diffuse
reflection

8.000

-5.000



Night View: "The vessels" would be lit up with different vibrant colors at night.



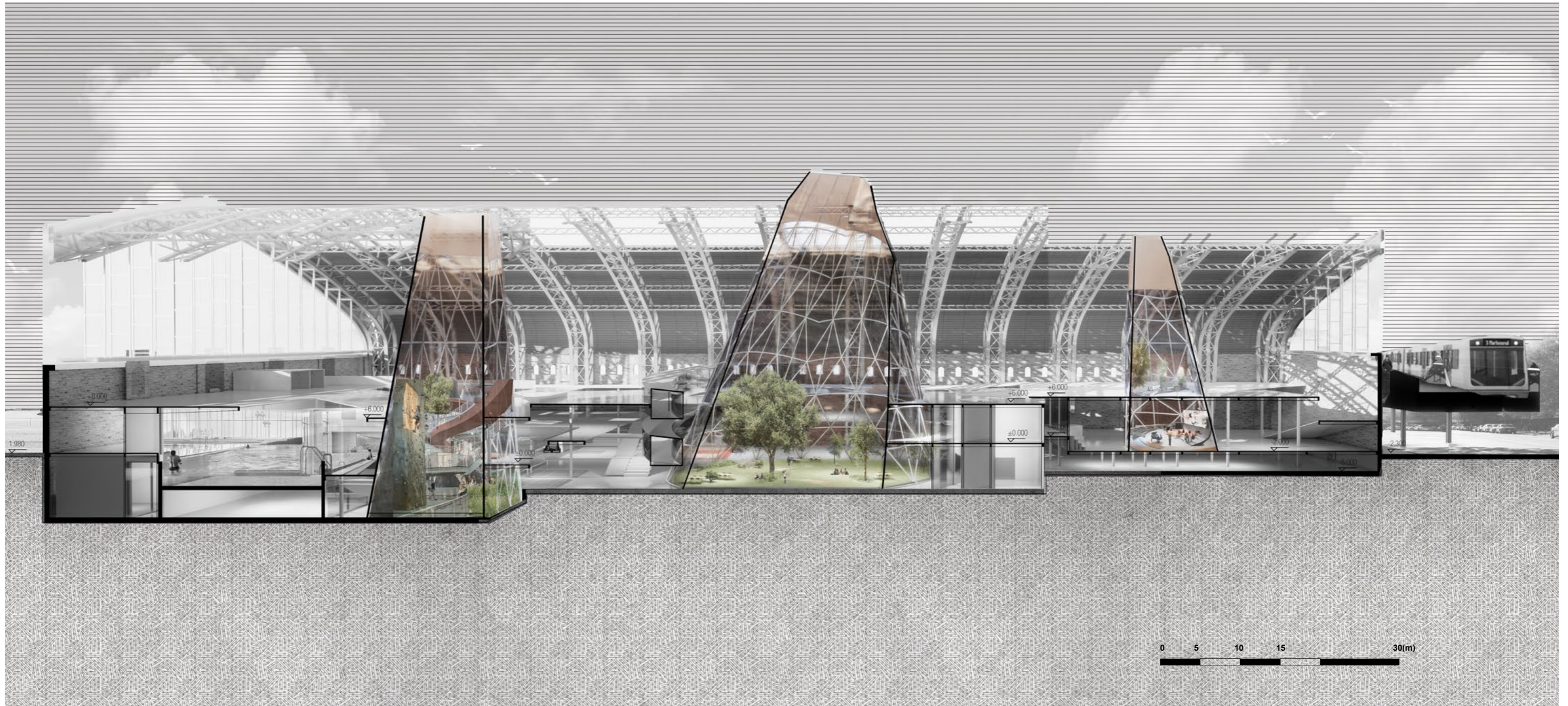
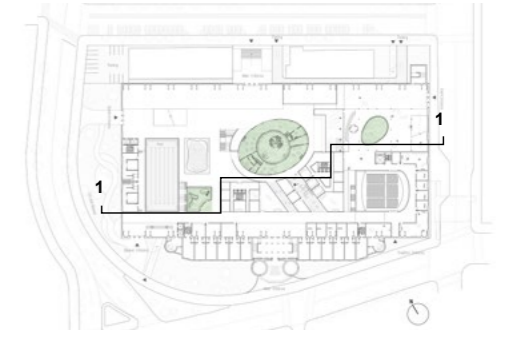
a.Perspective view of the open performance vessel.



c.Perspective view of the main pool.



b.Perspective view of the central vessel from the parking lot.



1-1 Section

03

Captioned Island

Dis/Abling Architecture: States of Play

Columbia 2024 Spring Studio

Academic Work

Feb. - May, 2024

Location: Nordhavn, Copenhagen

Instructor: Irina Verona, Jennifer Carpenter, Jerron Herman

Group Mate: Luna Han



Embodied Mapping _ An Approach to Explore Differing Embodiments and Material Relations

How could EM, in a way, conduct the disabled place design and trigger play?

When collecting data or researching for further design, we sometimes prioritize some of the sensories and adopt a homogeneous view of experience, limiting and neglecting diversity in design.

Embodied mapping/s is a novel methodology that braids together threads of sensorial and multimodal data that goes beyond language and pushes against the well-established methods of data collection and analysis.

Embodied mapping/s as an approach is not specifically about working with people with disability but rather inclusive of differing embodiments of self and others and understanding these relations to non-human actors.

The embodied approach is not about a single body but a work of co-constitution. The idea of embodiment about process and enactments emphasizes process as something open, ongoing, and inhabited.

Design

Embodiment mapping offers a visionary design approach that transcends the confines of individual bodies and subjective prototypes. By exploring diverse behaviors and activities – encompassing sitting, moving, observing, resting, and presenting – it unveils myriad manifestations of these actions. This holistic perspective fosters a collective, enriching experience that liberates from the constraints of a singular body, facilitating a collaborative process of co-creation.

Moreover, Embodiment Mapping design has the potential to intersect with other design methods such as Multisensory storytelling, which ushered in a new era of immersive narrative experiences. Multisensory storytelling transcends traditional modes of storytelling, going beyond mere verbal or written narratives. Through its engagement of multiple senses, it offers inclusive experiences that open up a realm of possibilities for engagement and connection.

Overview of Doing of Mapping/s

M
Multimodal & Multisensorial in the research design, data collection and data analysis

A
Altering in the approach to qualitative data analysis by resisting translation of the sensorial and multimodal data into language

P
Performative and inclusive of an embodied criticality

P
Pressing, which pushes against the reliance on prescriptive qualitative methods

I
Inclusive of differing embodiments of self and others and understanding these relations to the non-human actors

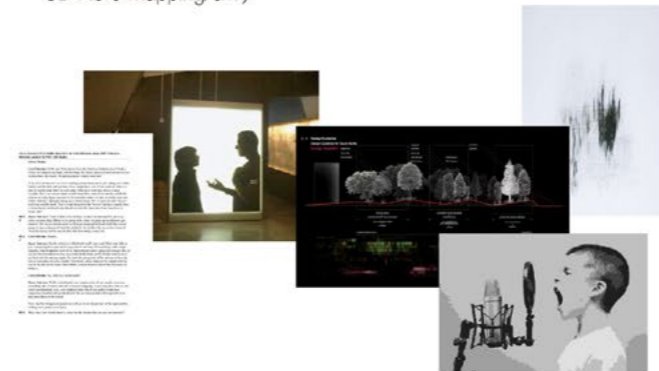
N
Navigating & Narrating in the collection of the data through Dialoguing while Wandering and co-constituting data with/through others and through encounters

G
Generative of a co-constituted creative process with creative outputs

S
Surrendering of the unknown and taking risks at moments of unknowingness by following processes and materialities to become undone

Multimodal Data Type

(Photographs, Soundscapes, Videos, Interview transcripts, Interview audio recordings, Audio walk recordings, Drawings and Mapping/s, 3D Fibre Mapping/s...)



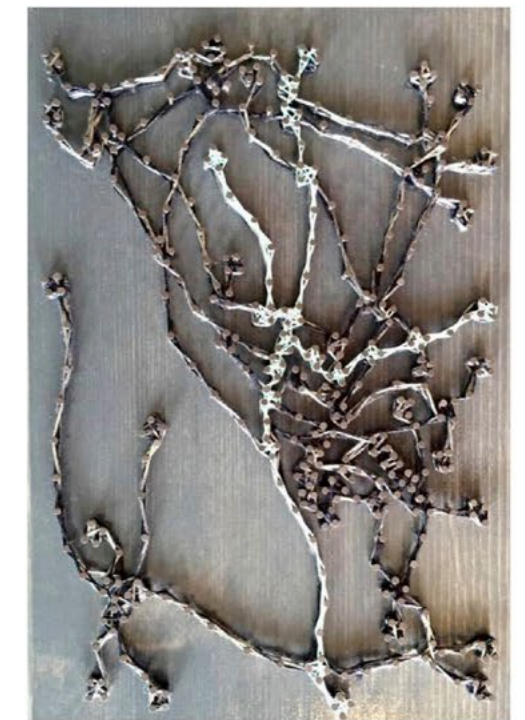
Consider Different Embodiments



Potential for Further Design

3D Fibre Mapping

Fibre Mapping/s of the Canadian Museum for Human Rights (CMHR)



- Sight Lines,
- Dis/ordinary Lines,
- Site Lines,
- Entry Lines,
- Resting Lines,
- Servicing Lines,
- Swirling Vertical Lines,
- Exhibiting Lines,
- Seated Lines,
- Observational Lines,
- Constructed but Moving Lines,
- Enshrined Lines,
- Meandering Lines,
- Wheeling Lines,
- Exiting Lines,
- Traced and Retraced Lines,
- Mediated Lines,
- Bias Lines

Diagram analysis about how the Embodiment Mapping research approach could be transferred to conduct the design process based on Janice Rieger's definition of Embodiment Mapping

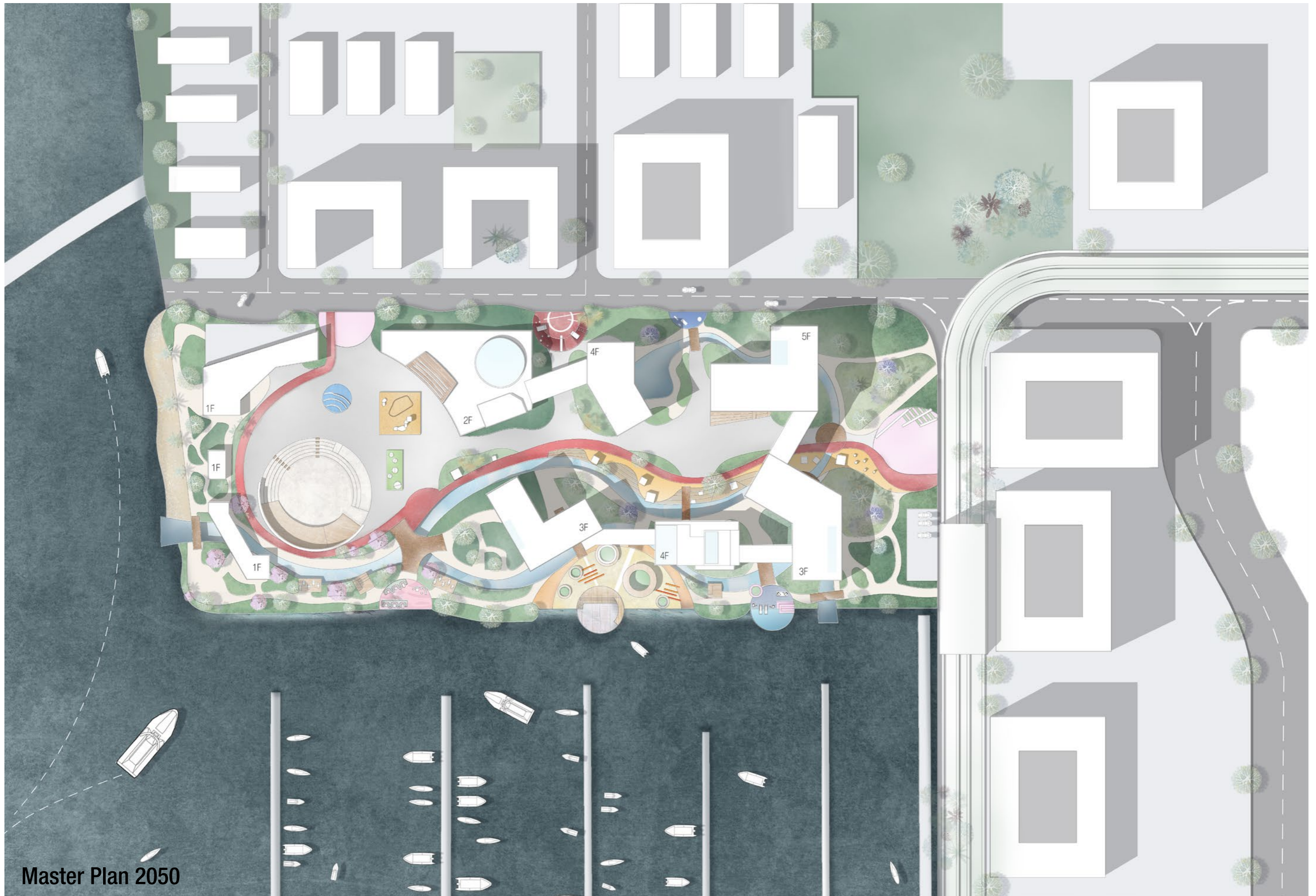
Disability

We have explored and delved more into what a disabled space is and possibly how to meet that criteria. A disabled space provides clear and abundant choices and experiences, showing more consideration and love. People could choose their engagement with the space by feeling its vibe and knowing whether their access could be met or not at that time.

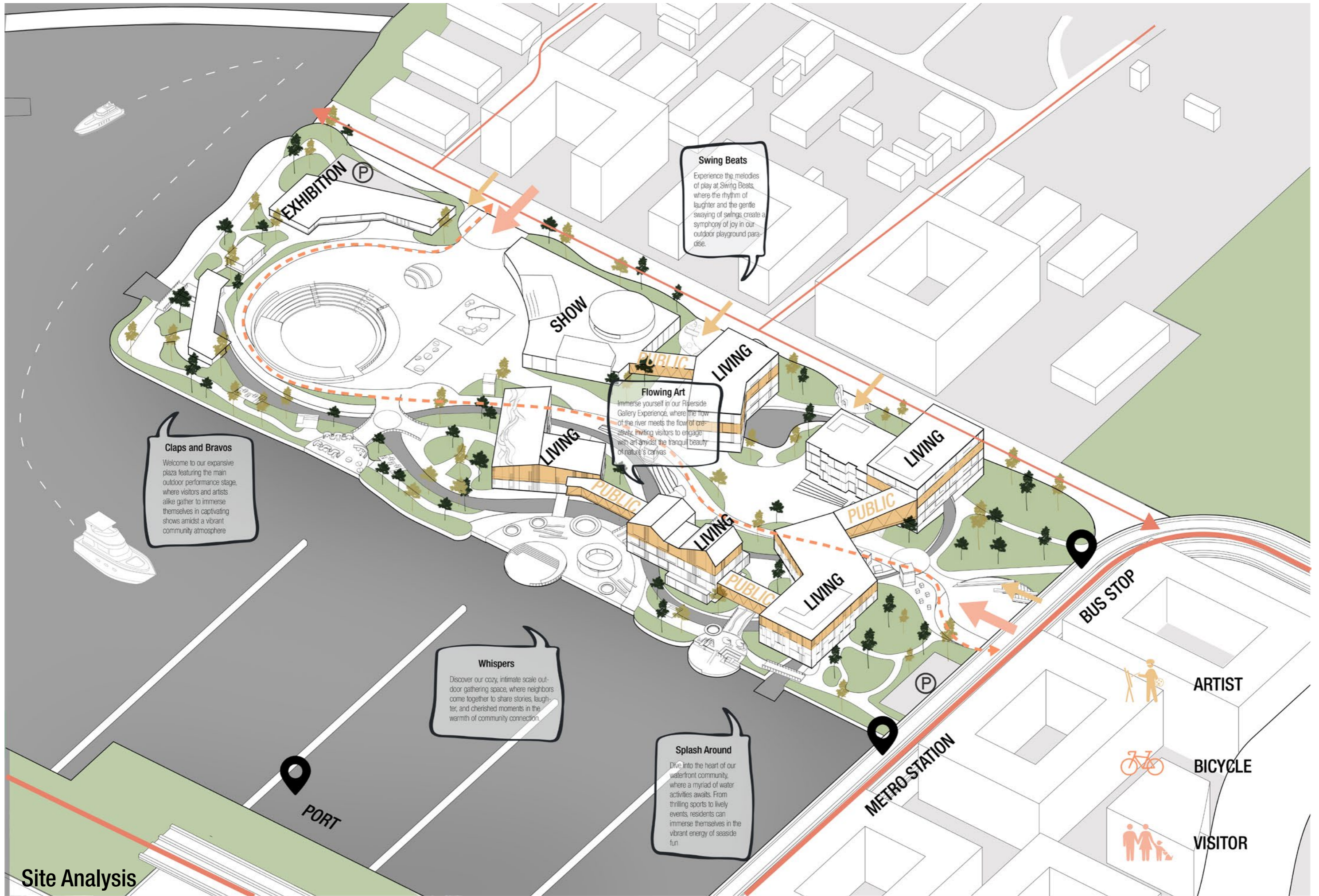
Embodiment Mapping revolutionizes our approach to everyday activities like sitting by expanding our understanding beyond fixed forms and criteria. Rather than imposing a singular standard, it embraces diverse embodiments, redefining the very concept of sitting. Consequently, each space offers a unique array of seating options, fostering a landscape of choice and flexibility.

Play

To spark spontaneous and playful experiences, a combination of form, multisensory engagement, and abundance is essential. Embodiment Mapping serves as a catalyst for cultivating playful encounters. By encompassing a wider range of activities, including exercise and interaction with installations, it enriches the landscape of experiences, fostering overlaps and interactions among diverse groups of people



Master Plan 2050



Claps and Bravos
 Welcome to our expansive plaza featuring the main outdoor performance stage, where visitors and artists alike gather to immerse themselves in captivating shows amidst a vibrant community atmosphere.

Whispers
 Discover our cozy, intimate scale outdoor gathering space, where neighbors come together to share stories, laughter, and cherished moments in the warmth of community connection.

Swing Beats
 Experience the melodies of play at Swing Beats, where the rhythm of laughter and the gentle swaying of swings create a symphony of joy in our outdoor playground paradise.

Flowing Art
 Immerse yourself in our Riverside Gallery Experience, where the flow of the river meets the flow of creativity, inviting visitors to engage with art amidst the tranquil beauty of nature's canvas.

Splash Around
 Dive into the heart of our waterfront community, where a myriad of water activities awaits. From thrilling sports to lively events, residents can immerse themselves in the vibrant energy of seaside fun.

- ARTIST
- BICYCLE
- VISITOR

Site Analysis

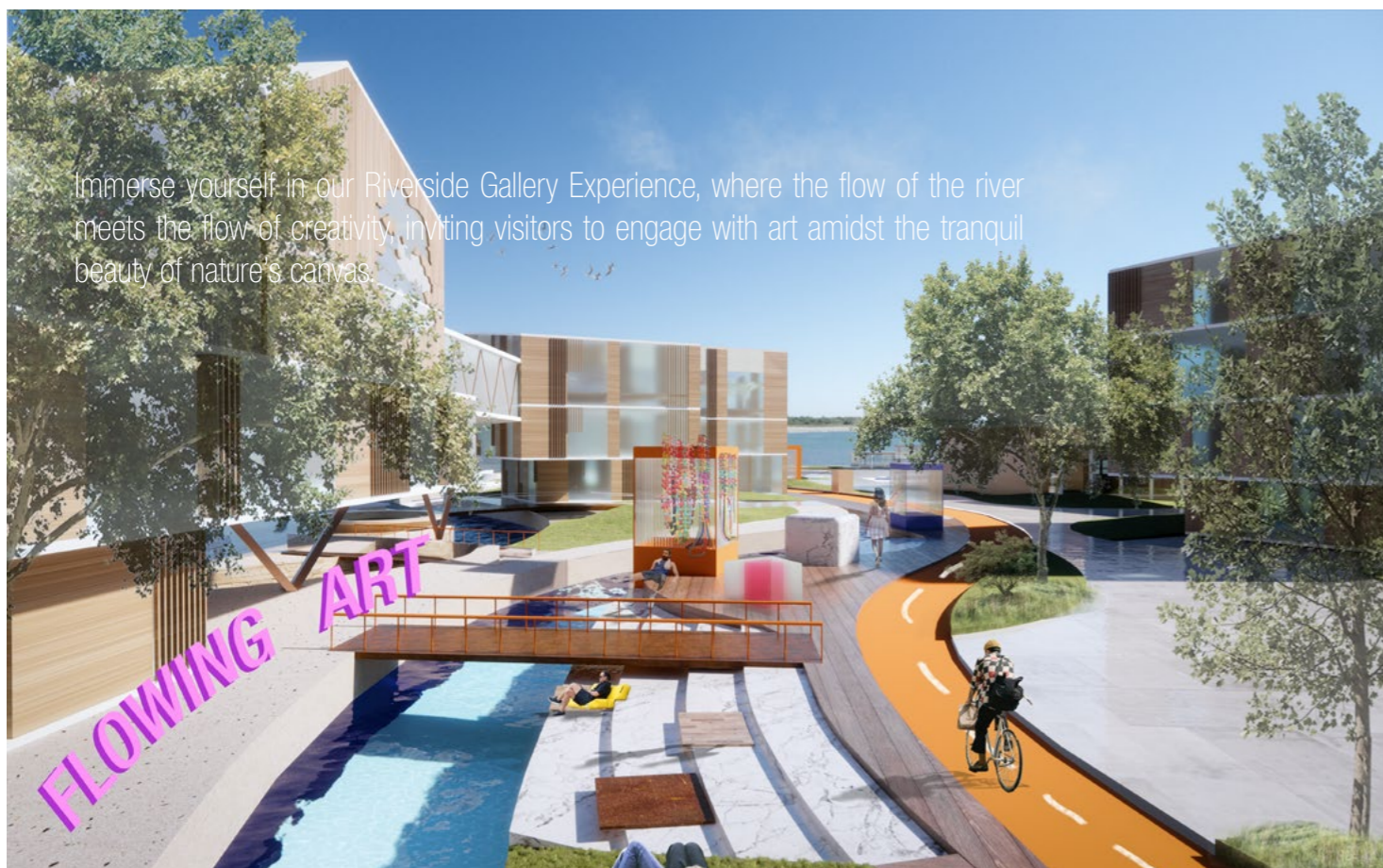
Welcome to our expansive plaza featuring the main outdoor performance stage, where visitors and artists alike gather to immerse themselves in captivating shows amidst a vibrant community atmosphere.



Step into the heart of our waterfront community, where a myriad of water activities awaits. From thrilling sports to lively events, residents can immerse themselves in the vibrant energy of seaside fun.



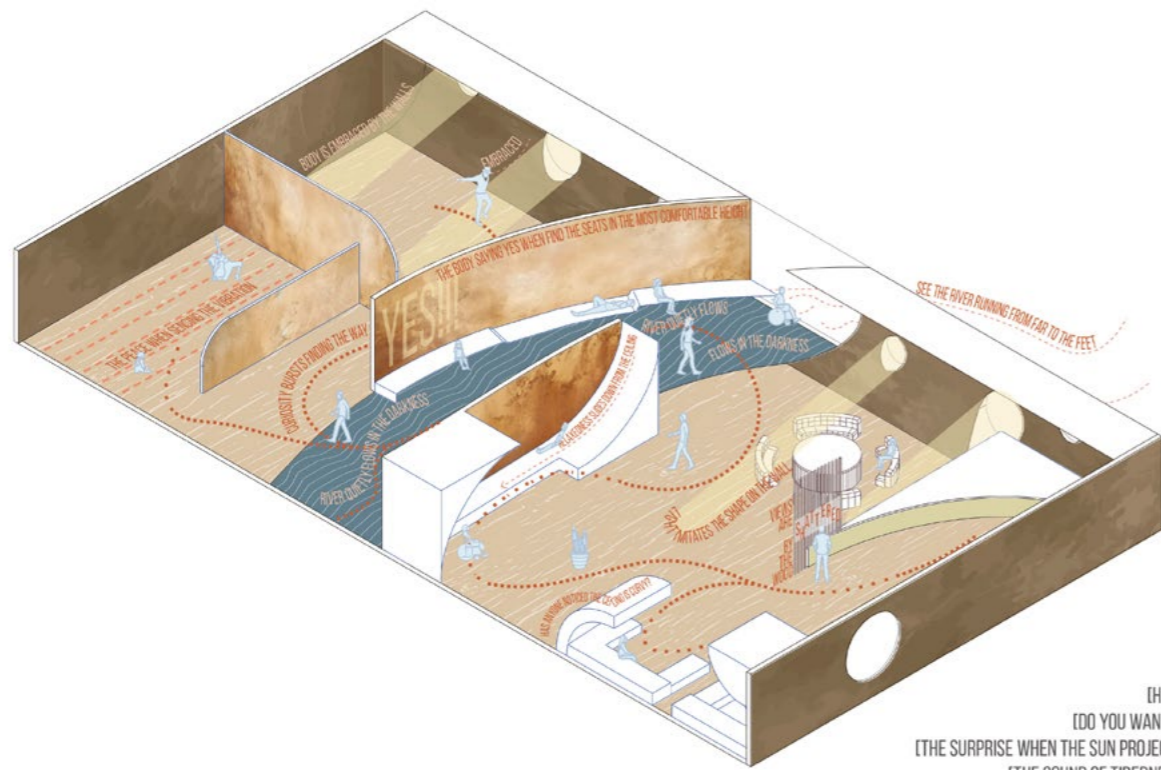
Immerse yourself in our Riverside Gallery Experience, where the flow of the river meets the flow of creativity, inviting visitors to engage with art amidst the tranquil beauty of nature's canvas.



Experience the melodies of play at Swing Beats, where the rhythm of laughter and the gentle swaying of swings create a symphony of joy in our outdoor playground paradise.



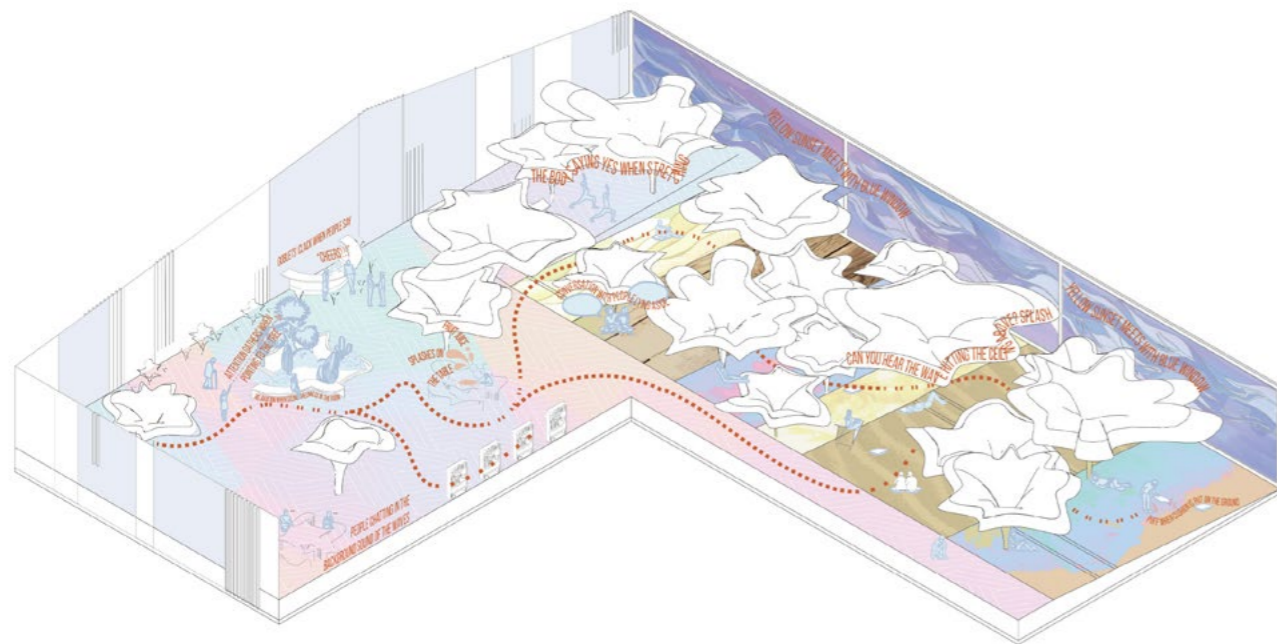
Outside Captioned Plazas



[HUG STRANGERS BLINDLY]
 [DO YOU WANT A CUP OF TEA?]
 [THE SURPRISE WHEN THE SUN PROJECTS ON THE PERFORMER]
 [THE SOUND OF TIREDDNESS CLIMBING THE WALL]
 [THE APPRECIATION WHEN SEEING OTHERS' ARTWORK]



DAWN • THE BALLROOM
 [THE VOICE OF THINKING OUT LOUD ABOUT WHY WE CAN'T BE PART OF THE CURVE]

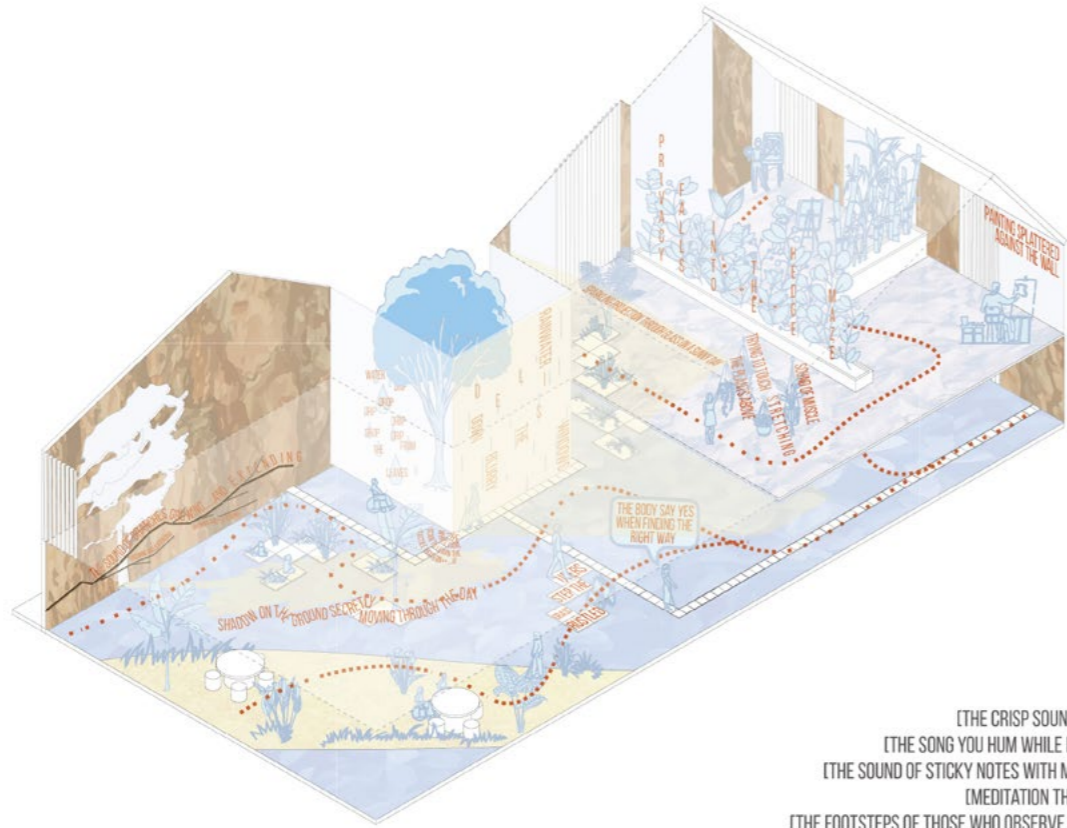


[USING INSTALLATIONS AS SOUND AMPLIFIERS FOR MUSICAL INSTRUMENTS]
 [THE SOUND OF SYMPHONY HARMONY]
 [THE DRIP-DROP OF WATER DRIPPING DURING SUMMER SHOWER]
 [THE SOUND OF WHEELCHAIR WHEELS ROLLING OVER WOODEN TACTILE]
 [THE SOUND OF BOOKS BEING PUT BACK ON THE SHELF]



SUNSET • THE BEACH
 [THE SPLASH OF SEA WAVES HITTING THE CEILING AND THE WALLS]

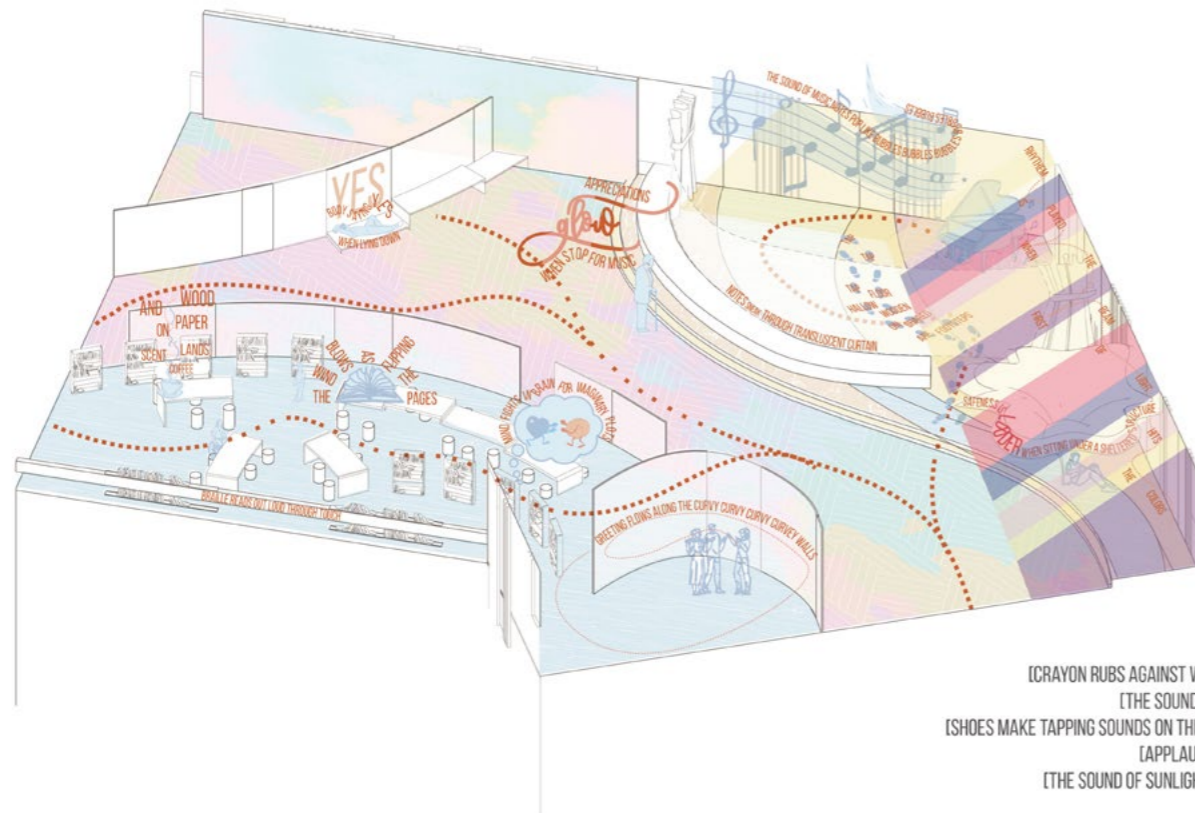
Interior Public Space



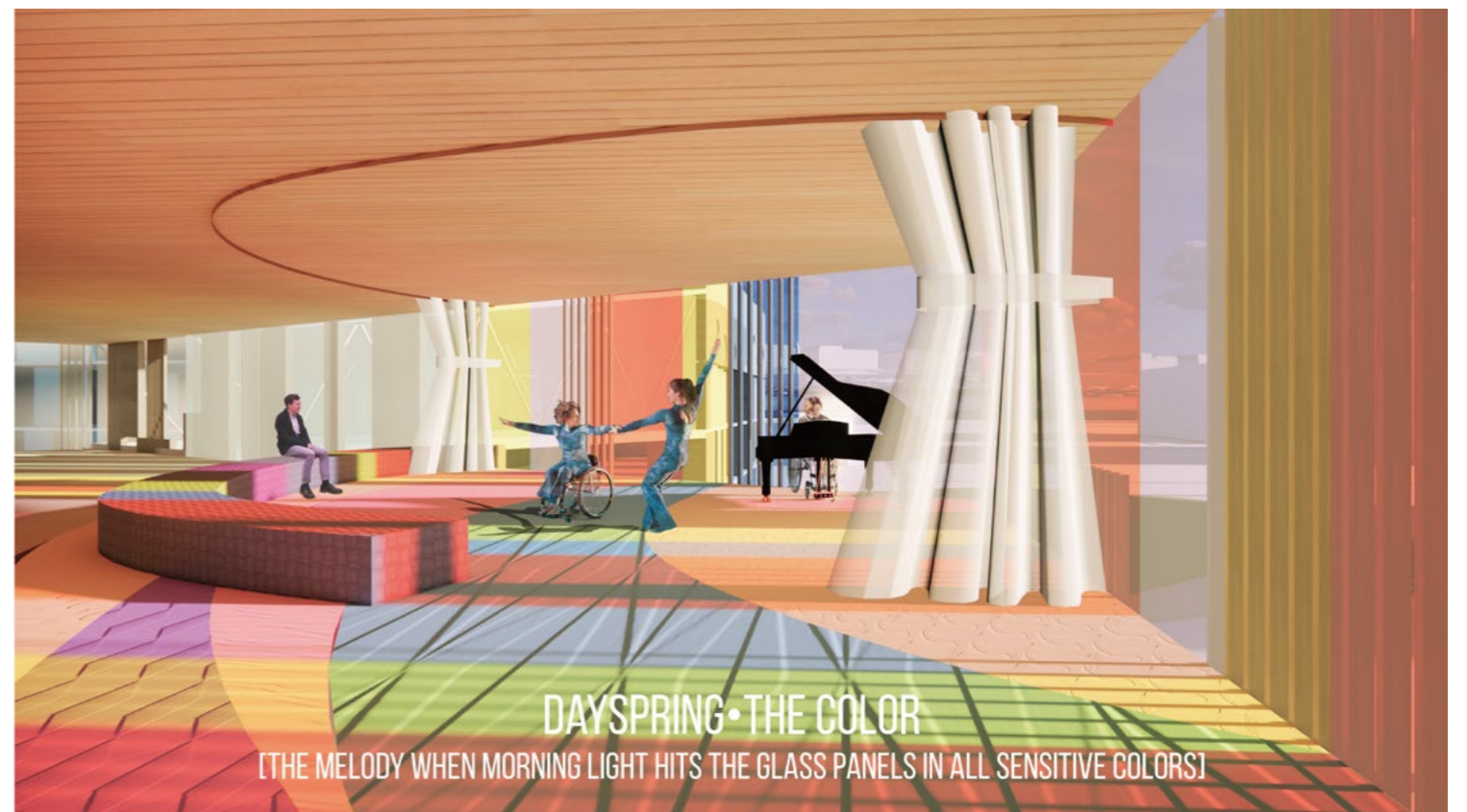
[THE CRISP SOUND OF STEPPING ON DRY LEAVES]
 [THE SONG YOU HUM WHILE HARVESTING YOUR OWN CROPS]
 [THE SOUND OF STICKY NOTES WITH MESSAGES STUCK TO THE WALL]
 [MEDITATION THOUGHTS TO THE WATER SOUND]
 [THE FOOTSTEPS OF THOSE WHO OBSERVE TREES THROUGHOUT THE YEAR]



SIESTA • THE TREE
 [THE SOUND OF LEARNING AND EMBRACING NATURAL LIVES AND OURSELVES]



[CRAYON RUBS AGAINST WALL TO DRAW PAINTINGS]
 [THE SOUND OF PROJECTOR HUMMING]
 [SHOES MAKE TAPPING SOUNDS ON THE GROUND WHEN DANCING]
 [APPLAUSE FOR THE PERFORMERS]
 [THE SOUND OF SUNLIGHT COLORING EVERYTHING]



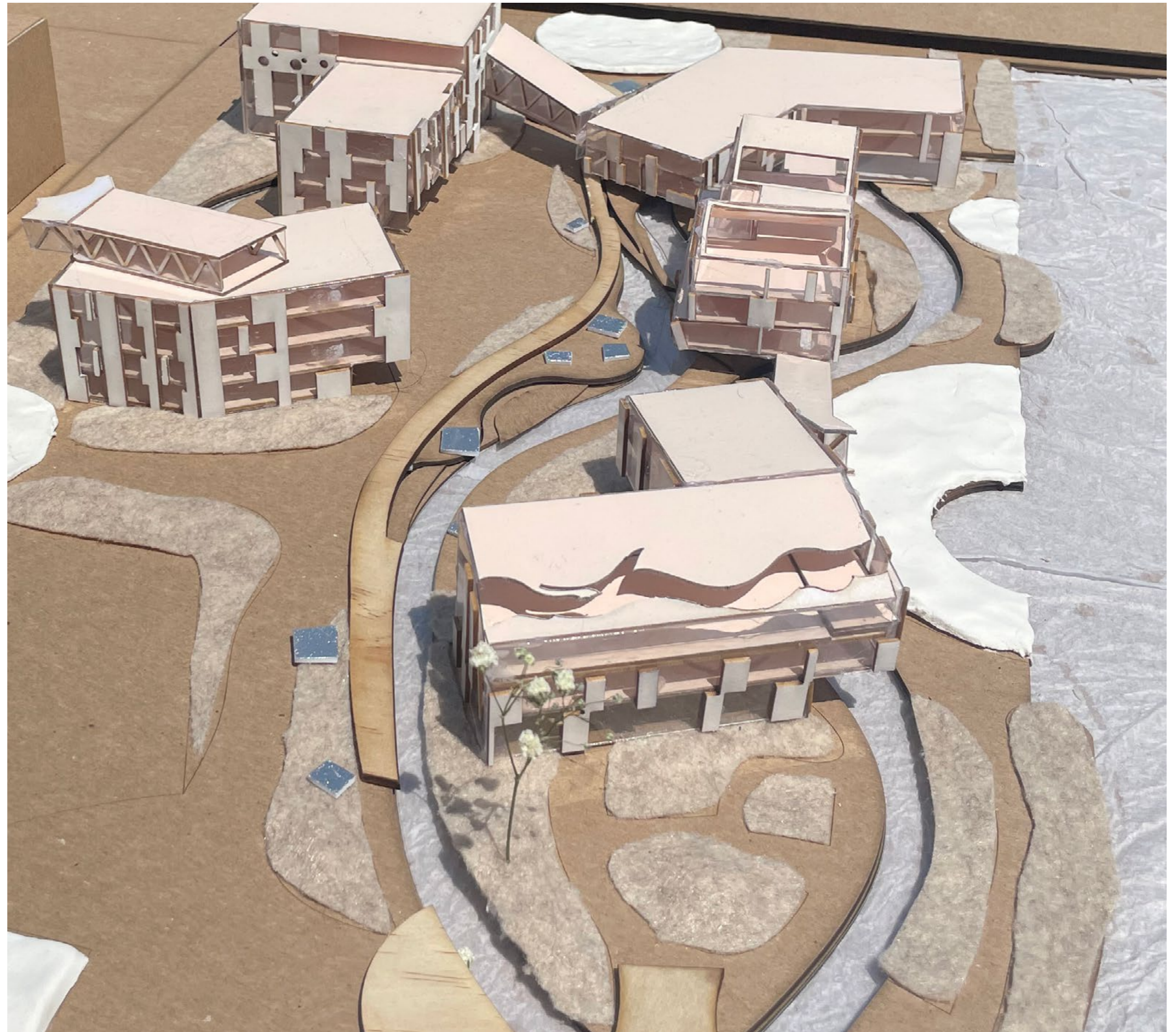
DAYSPRING • THE COLOR
 [THE MELODY WHEN MORNING LIGHT HITS THE GLASS PANELS IN ALL SENSITIVE COLORS]

Interior Public Space

Disabled Space

Disabled spaces are designed to be inclusive and accessible to all individuals, regardless of their abilities or disabilities, by creating environments that can be experienced and appreciated by everyone. This inclusivity is achieved through multi-sensory design strategies that cater to a diverse range of sensory experiences.

Since we respect disabled people's different preferences in feeling comfortable in spaces and atmospheres, rather than categorizing spaces based on traditional functions, such as 'reading room' or 'workspace,' we advocate for an approach that encourages artists to explore and engage with spaces based on their unique body characteristics and qualities. By naming spaces according to these characteristics, we aim to create an environment that is welcoming and comfortable for all. These public rooms serve as gathering spaces for artists, fostering interdisciplinary communication and inspiration, while trying to form a sense of community and belonging.



Model Photos

04

Garlic

Tensile Surface

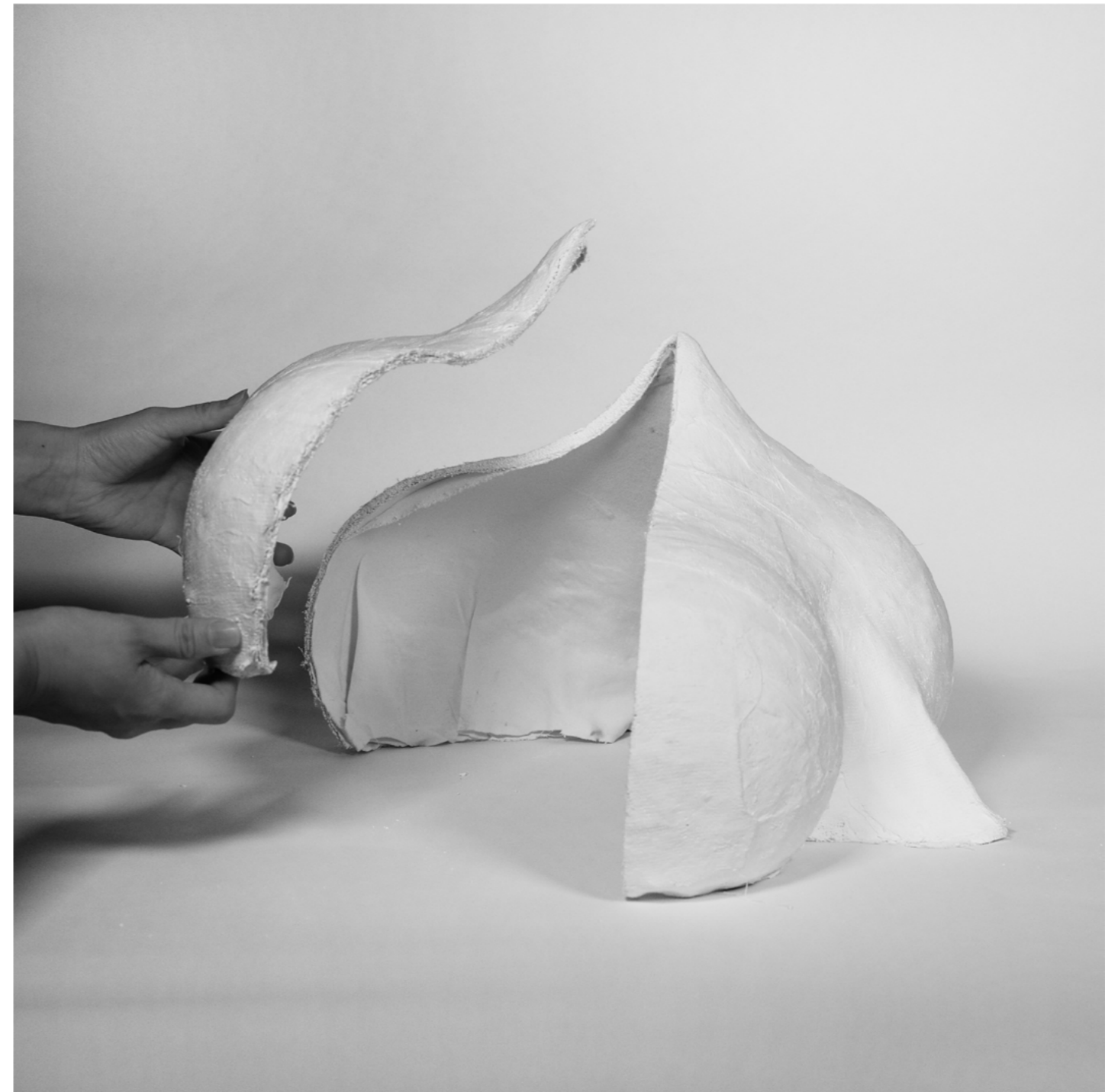
Columbia 2023 Fall

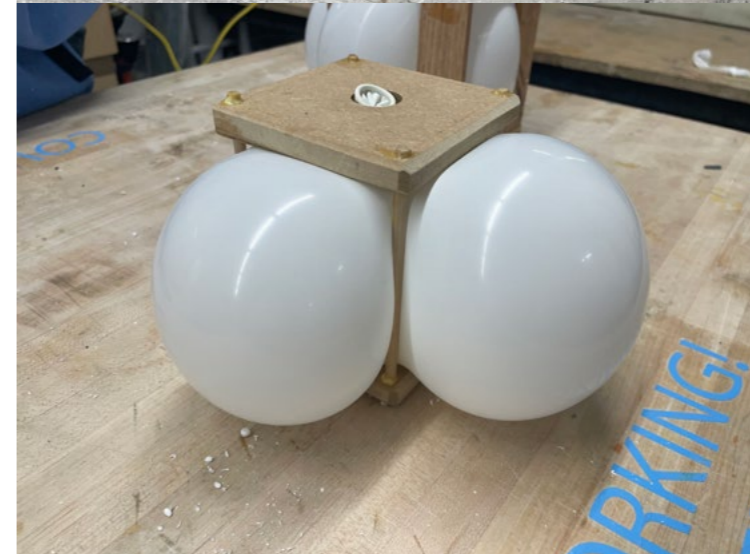
TENSILE/COMPRESSION SURFACES IN ARCHITECTURE: TACTILE METHODS FOR
ARCHITECTS

Sep.- Dec. 2023

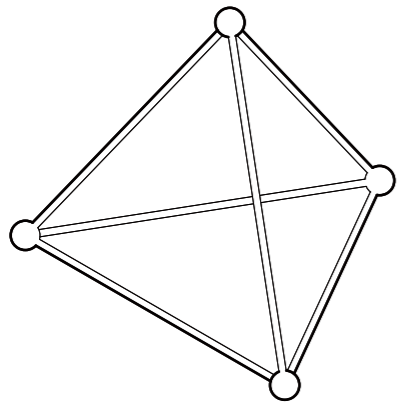
Instructor: Robert Marino

Group Mate: Kim Anna, Minjeong Song

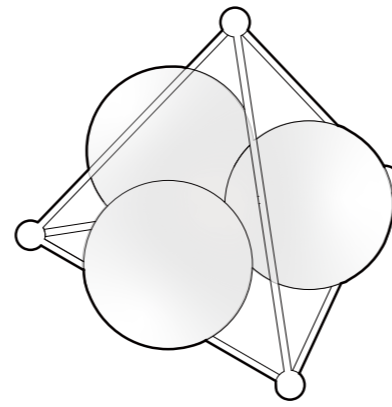
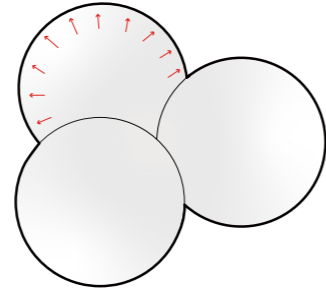




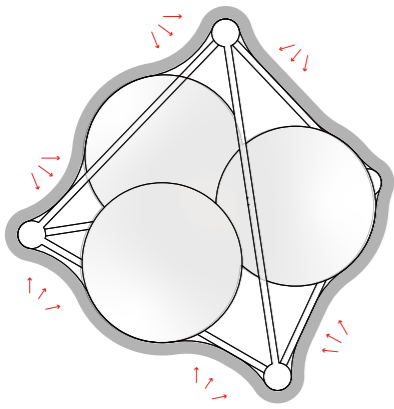
Iterations



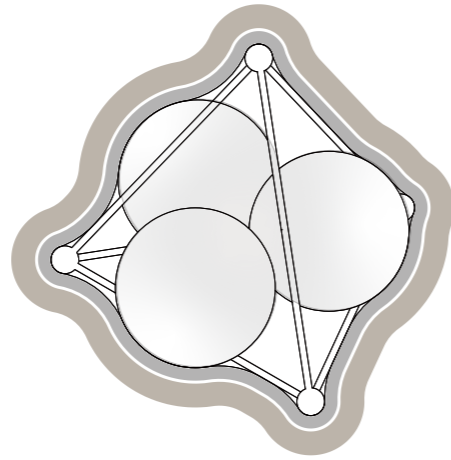
Boundary condition



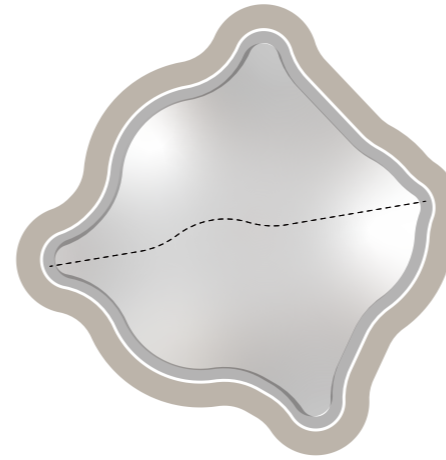
Inflatable balloon



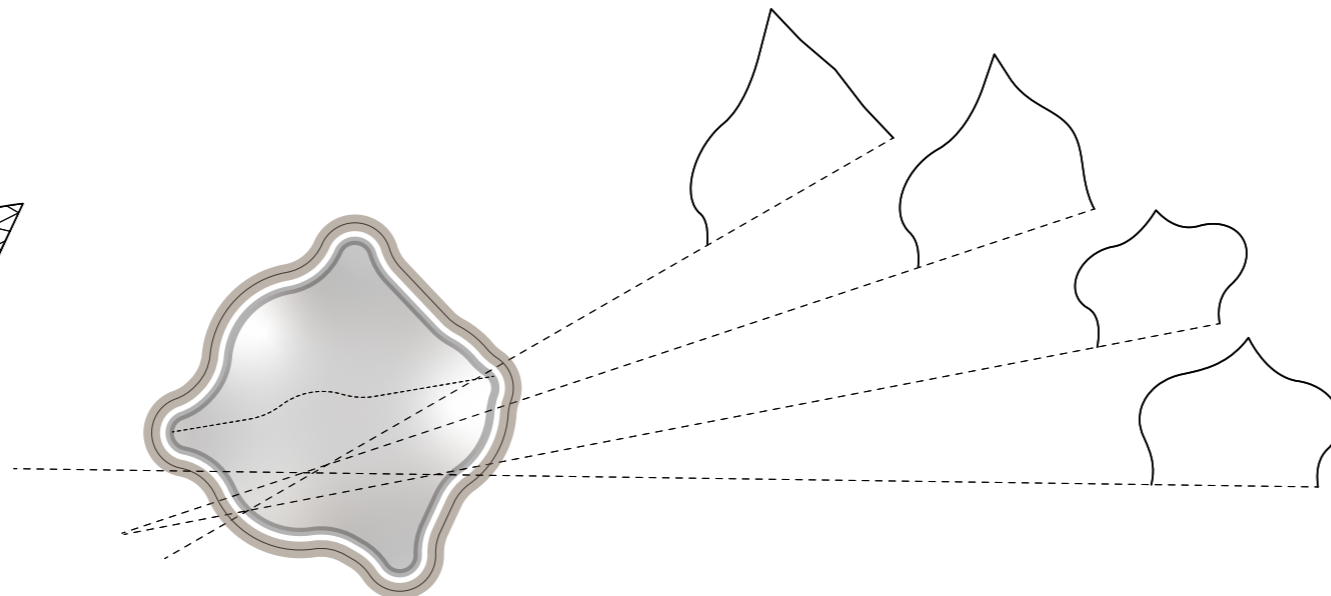
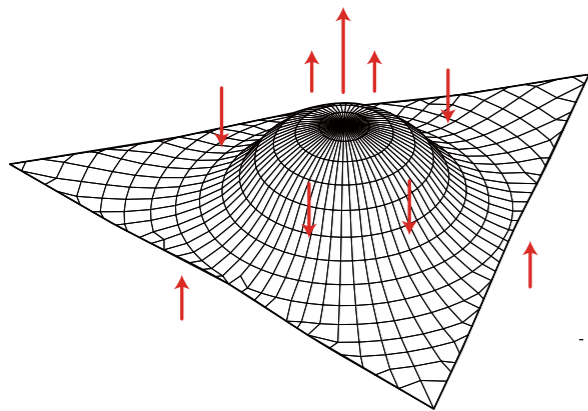
Wrap with Fabric

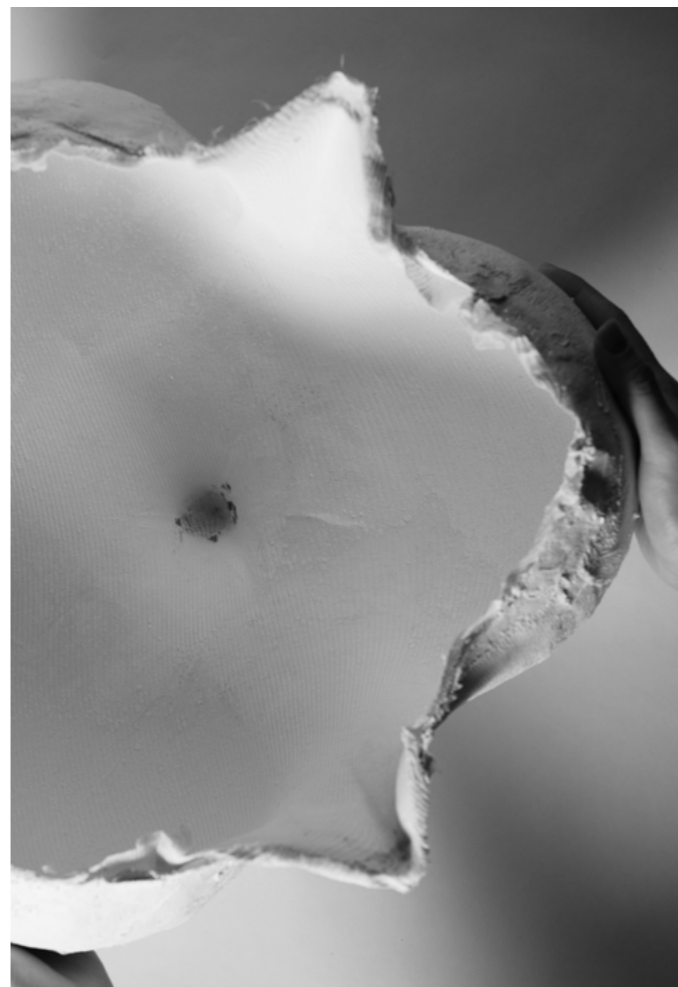
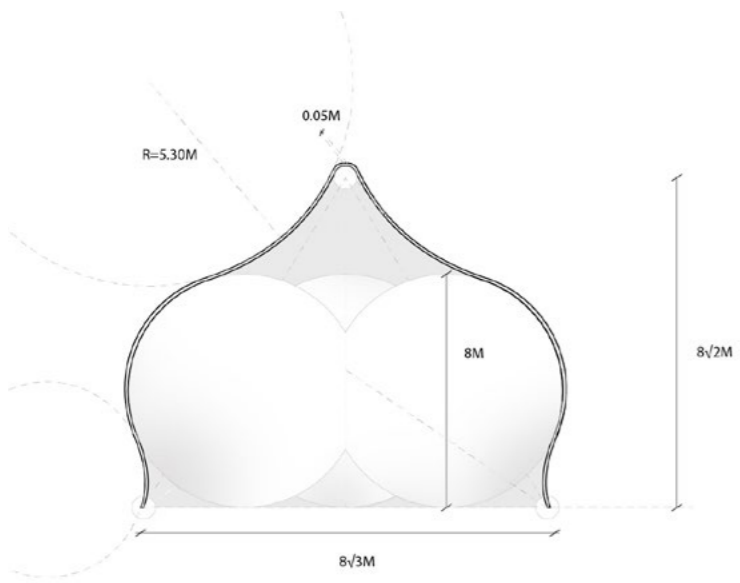
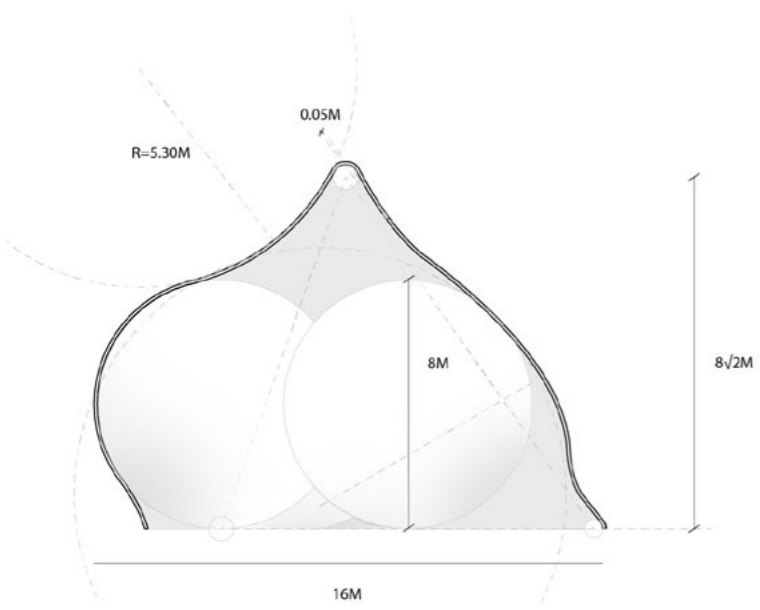
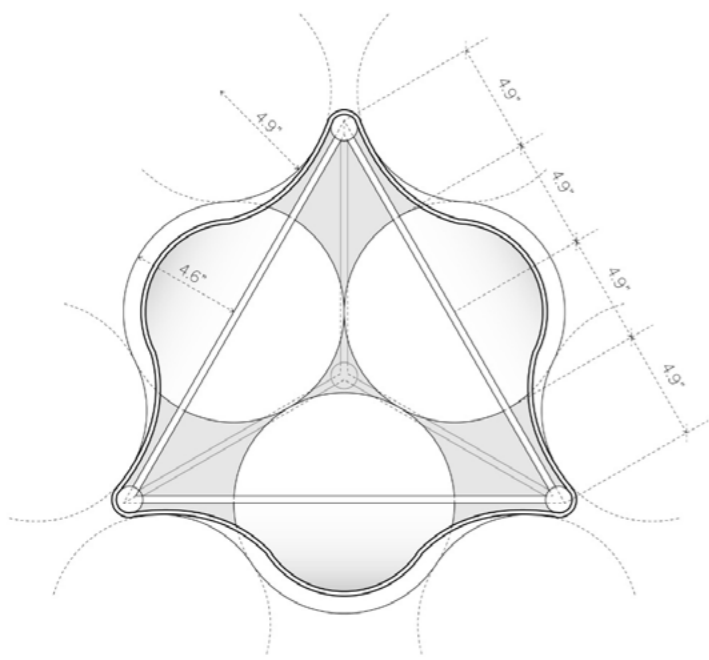


Add Plaster



Plaster Shell + Fabric






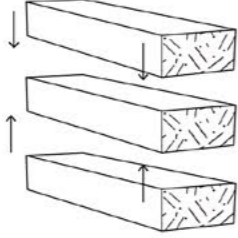

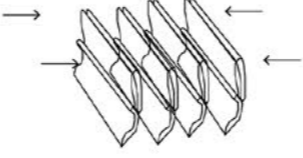

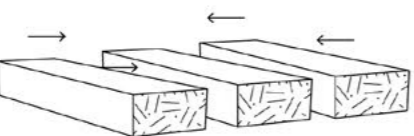

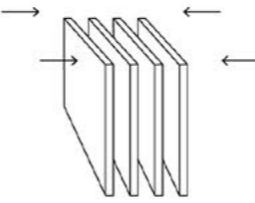

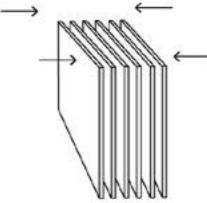

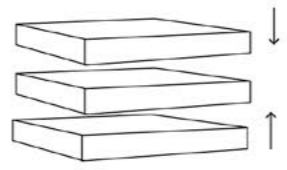

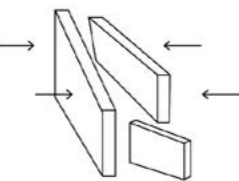

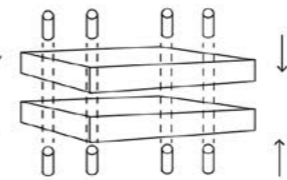
Mass Timber

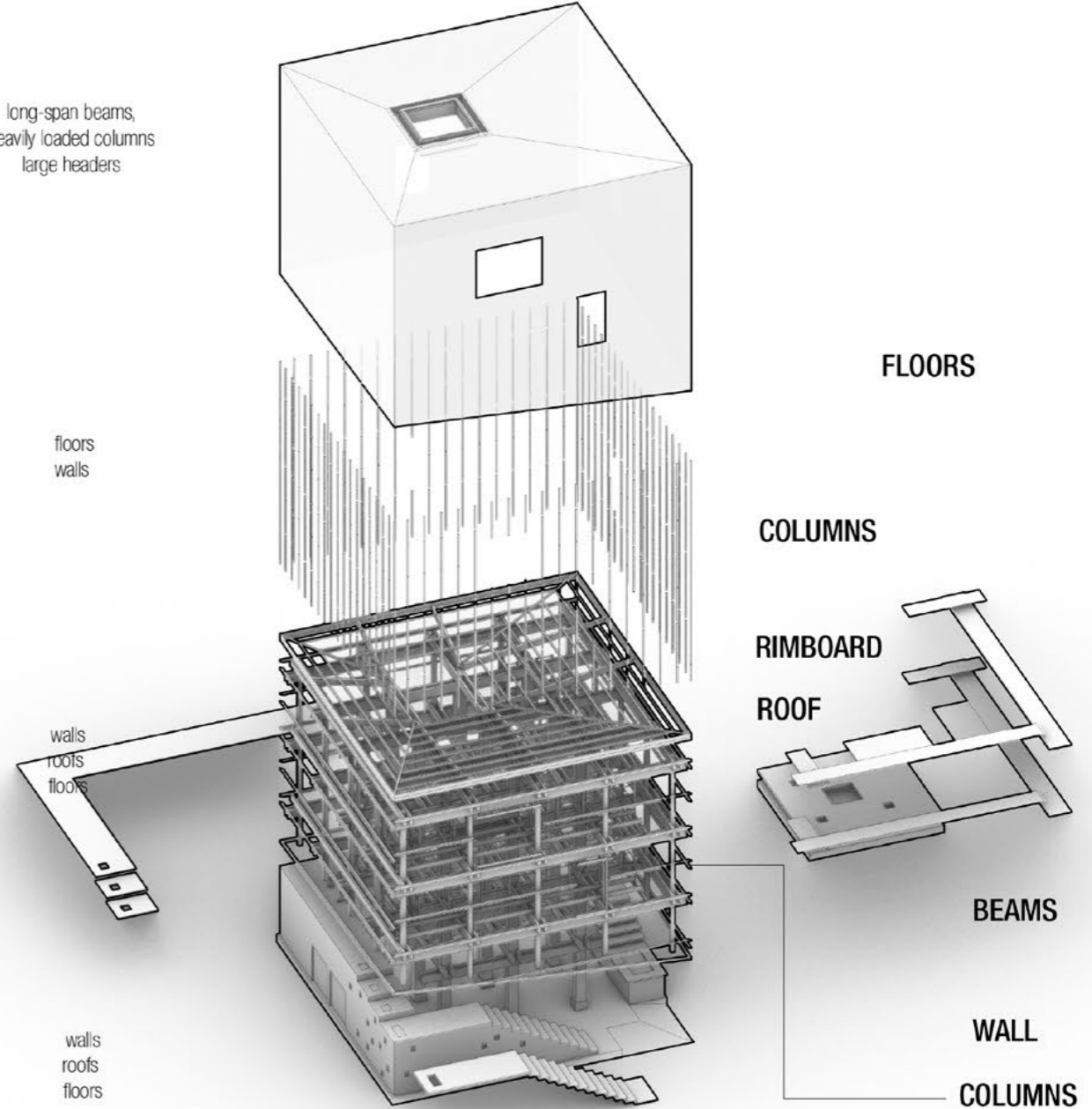
Construction Analysis

Columbia 2023 Fall
 Construction Ecologies in the Anthropocene
 Sep.- Dec. 2023
 Instructor: Tommy Schaperkötter

ENGINEERED WOOD/ MASS TIMBER PRODUCTS

EWPs are manufactured by bonding together wood strands, veneers, small sections of solid lumber or other forms of wood fibre to produce a larger and integral composite unit that is stronger and stiffer than the sum of its parts. The material that makes up engineered wood products can generally be obtained from smaller trees, and the manufacturing process enables a much greater percentage of the tree to be used than would be possible with solid sawn lumber. Because these products are manufactured under controlled conditions using a variety of bonding and pressing techniques, they can typically be produced in a range of standard thicknesses, in widths up to 2.5 or 3.0 metres, and in lengths limited only by the constraints of road transportation.

Name	Fabrication	Prodcuts	Name	Fabrication	Prodcuts
 Glue laminated timber (elulam)	 Glue-laminated timber (glulam) is fabricated by gluing individual pieces of dimensional lumber together	columns beams headers	 Parallel strand lumber (PSL)	 Parallel strand lumber (PSL) is fabricated from long strands of veneer pressed and glued into standard dimensions and lengths.	long-span beams, heavily loaded columns large headers
 Glue-laminated timber panels	 Glue-laminated timber panels have the appearance of glulam beams laid flat.	flooring	 Mass plywood panels (MPP)	 Mass plywood panels (MPP) are built up from 25mm thick lamellas. Their overall thickness can range from 50mm to 600mm	floors walls
 Laminated veneer lumber (LVL)	 Laminated veneer lumber (LVL) is fabricated by laminating and gluing multiple veneers together in the same orientation.	headers beams rimboard	 Cross-laminated timber (CLT)	 Cross-laminated timber (CLT) is created by laminating dimensional lumber in layers that are perpendicular to one another.	walls roofs floors
 Laminated strand lumber (LSL)	 Laminated strand lumber (LSL) is fabricated from flaked wood strands glued together in large billets.	floors walls vertical members	 Nail-laminated and dowel-laminated timber panels	 Nail-laminated and dowel-laminated timber panels are similar in appearance, but their members are fastened together using different methods.	walls roofs floors



FLOORS

COLUMNS

RIMBOARD

ROOF

BEAMS

WALL

COLUMNS

Nest We Grow Memu Meadows

Timber Construction On the Rise

WHY Mass Timber Construction

Irrespective of their size, mass timber buildings are instrumental in curtailing the carbon footprint of our constructed landscapes, thus playing a pivotal role in combating climate change.

“ One cubic metre of wood stores approximately 1 tonne of carbon dioxide, so responsibly managed and harvested wood offers us a natural tool to store those greenhouse gases in the fight against climate change. ”



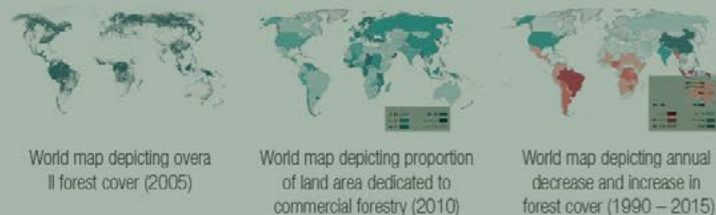
Linear path of non-renewable building materials such as steel and concrete

With the escalation of urbanization and the densification of our cities, Tall Wood buildings emerge as the most pragmatic, efficient, and eco-conscious remedy to the worldwide housing scarcity. Facilitating the extensive adoption of Tall Wood buildings requires the implementation of performance-based building codes, the enactment of laws endorsing or requiring low-carbon construction, and the utilization of market-driven incentive programs.

SUSTAINABLE FOREST MANAGEMENT

Enhancing the sustainability of the mass timber building approach primarily hinges on ensuring the sustained viability of the source — the forests.

- Maintain the vitality and health of forest ecosystems
- Conserve and maintain soil and water resources
- Maintain the forest contribution to global carbon cycles
- Maintain and enhance long-term, multiple socio-economic benefits to meet the needs of societies
- Provide legal, institutional and economic frameworks for forest conservation and sustainable management.



Vienna, Austria **HOHO WIEN**
[RLP Rüdiger Lainer + Partner]f

• **When completed in 2019, earned the title of The World's Highest Wooden**

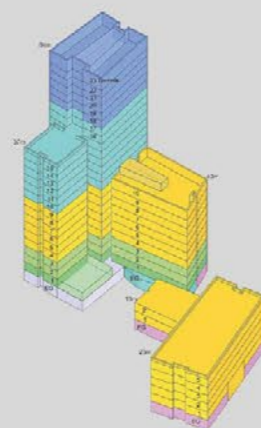
• **Hybrid Building 84m tall, 24 storeys, 4,350m³ timber**

• **Brings together as many pre-fabricated structural systems as possible**

• **Installed speed = 1 level per week**

• **75% volume of the building is made from timber**

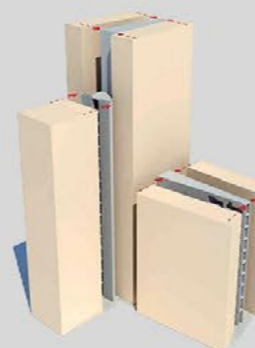
• **Volume of timber used in the project re-grown in Austrian forests within 2 hours**



- 23 Technic
- 19-22 Suites
- 10 Technic
- 9-18 Hotel
- 5-9 Business
- 4 Beauty
- 3 Wellness
- 2 Health
- 1 Fitness
- Ground Floor
- Hotel Lobby
- Restaurant
- Bakery



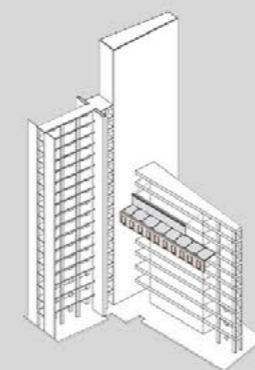
Concrete Core



Attached Wooden Structure



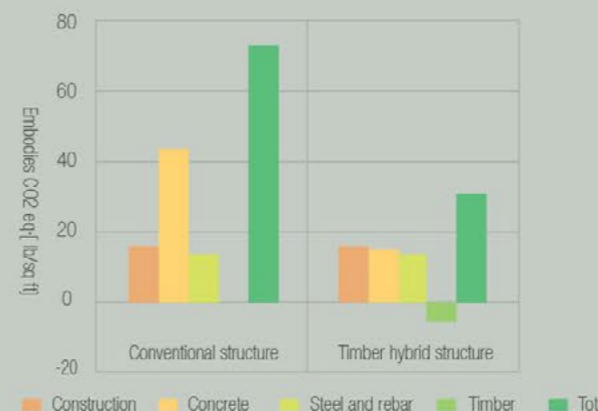
Main Structure System



Assembly

Values

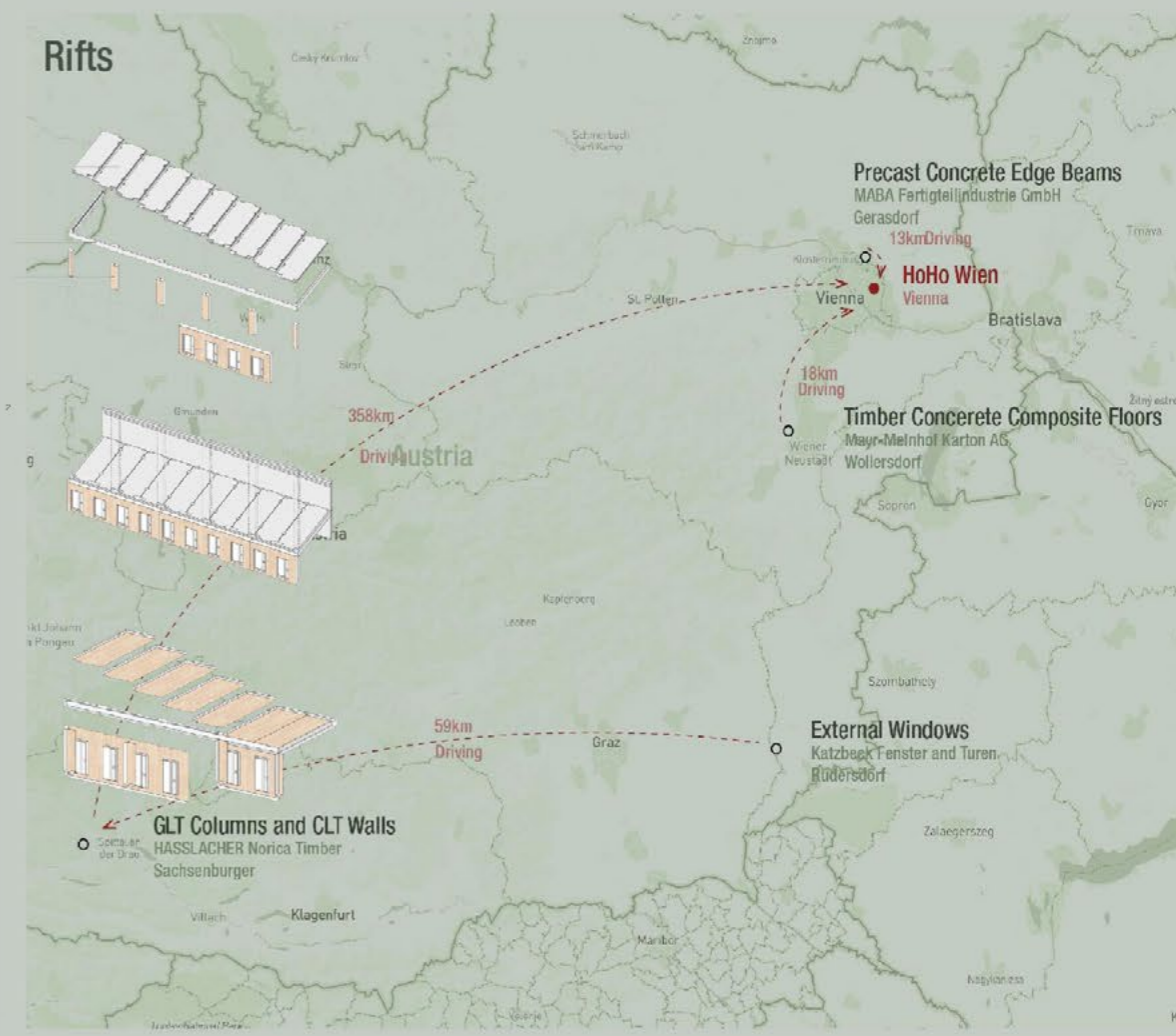
The search for balance between ecology and economy has resulted in a cost-effective and flexible structure that will maximize environmental benefits through a prolonged service life.



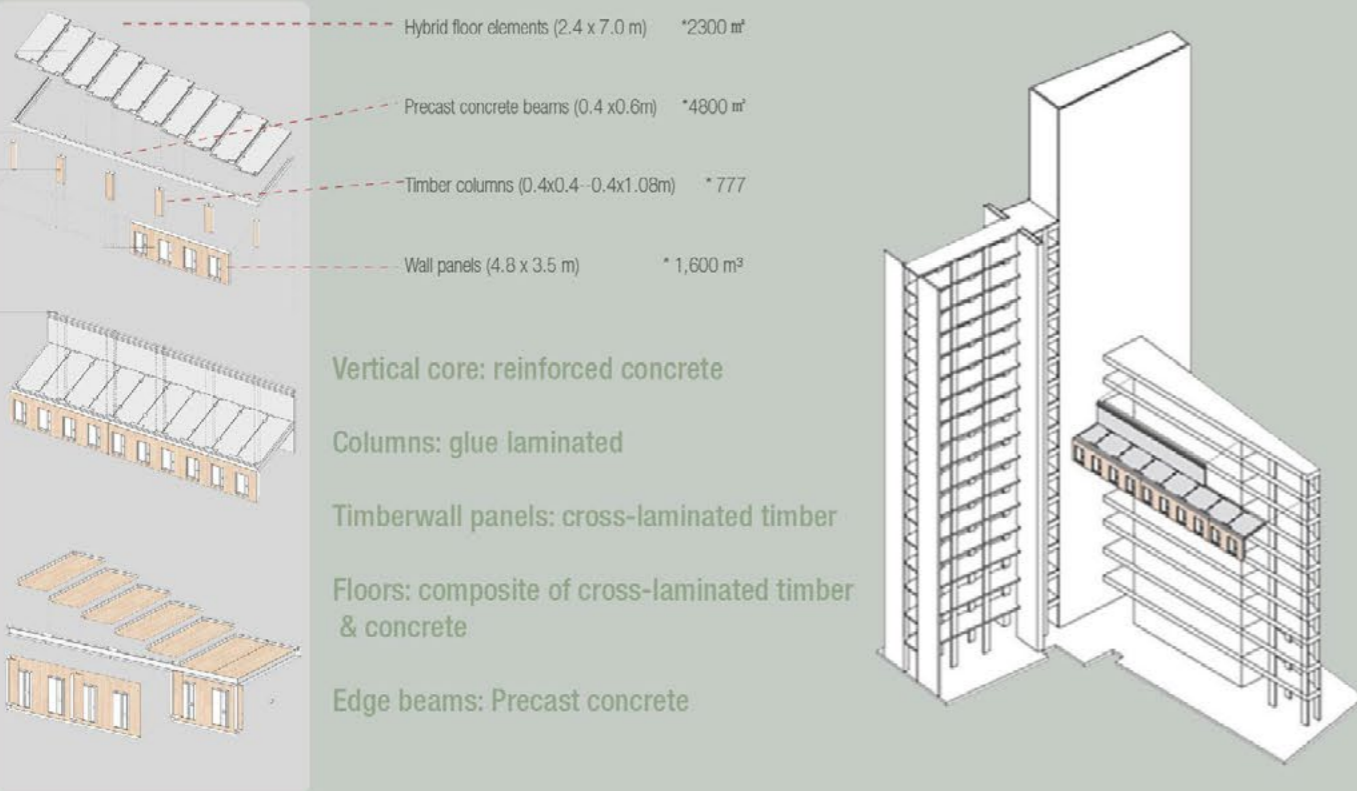
Structure Plan

1. A high degree of prefabrication saves time on the construction site
2. Timber from Austria's sustainably managed forests
3. Exemplary ecological performance indicators: Compared to reinforced concrete construction, the use of wood avoids some 2,800 tonnes of CO2 equivalents. construction method saves some 300,000 megawatt hours of primary energy. This is approximately the amount of energy needed to heat a tenement with 32 apartments over a period of 1,100 years.
4. The energy concept encompasses energy supply measures and measures for the prevention of energy loss.

Rifts



Structure

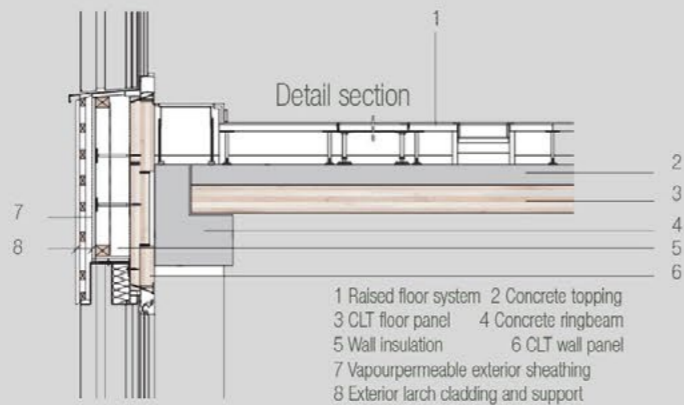


Prefabrication

CLT production and pre-fabrication



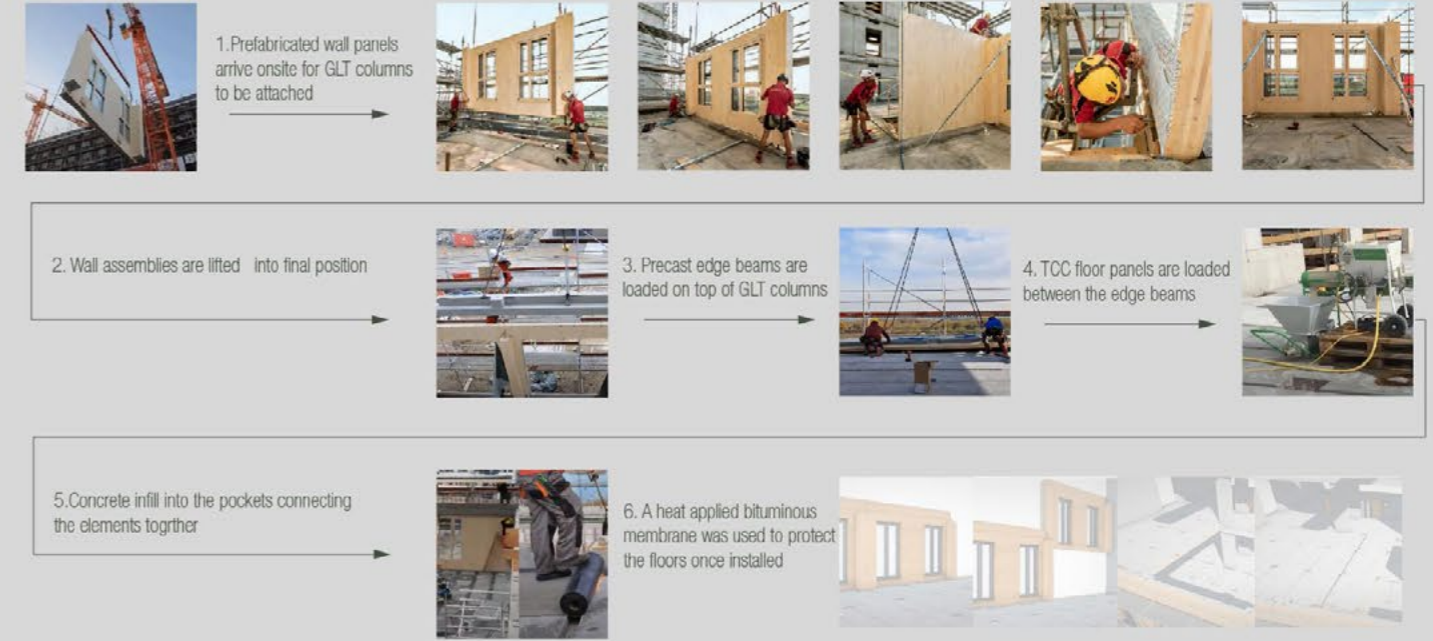
Glulam Production



Xlam Concrete XC panels



Assembly



Figures

Mass



Speed

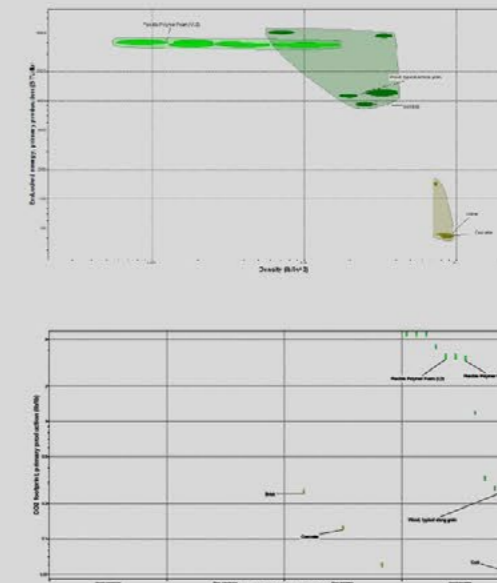
Total Construction Time:
24 Months

Reinforced Concrete Core
1 level per week

Timber Structure/ Walls:
1 level per week

Timber Deliveries:
50 Trucks

Chart



Analysis

1. RLP Rüdiger Lainer + Partners estimate that the CO₂ emissions from HoHo Wien will save **2,800 tonnes of carbon dioxide** compared to a more conventional building of the same size.; which is about the equivalent amount of emissions as 500 car trips around the world.

2. In Austria, forests produce **30 million cubic metres of timber a year**, of which **26 million cubic metres are logged**. The remaining 4 million cubic metres remain in the forest, continually increasing timber stocks.

In other words, 1 cubic metre of wood grows back every second and thus the timber used for the entire **HoHo Vienna project will have grown back in our country's forests in only one hour and 17 minutes.**

Reference

1. **TALL WOOD BUILDINGS DESIGN, CONSTRUCTION AND PERFORMANCE** MICHAEL GREEN JIM TAGGART
2. **Holzochhaus HoHo Wien HoHo Vienna – the technical solution** Internationales Holzbau-Forum IHF 2015, R. Woschitz
3. **Detail** 01/2017 Review of Sustainable Architecture and Energy-Efficient Refurbishment
4. **Case Study: HoHo Vienna, An 84m Tall Timber Giant (Webinar)** Youtube

06

1200 B'WAY

Mixed Use Highrise Design

Columbia 2024 Spring

RETHINKING BIM

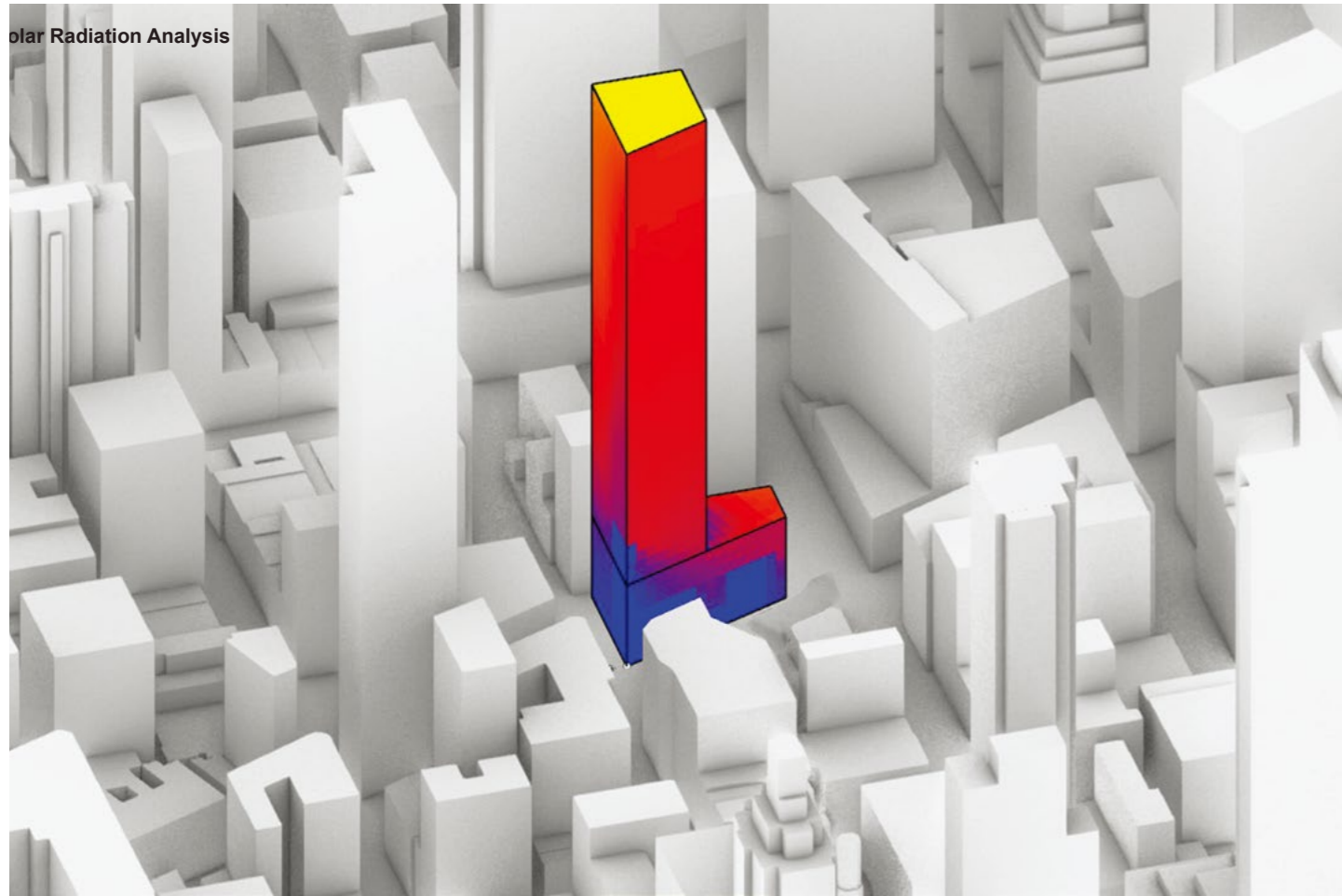
Feb. - May. 2023

Instructor: Joe Brennan

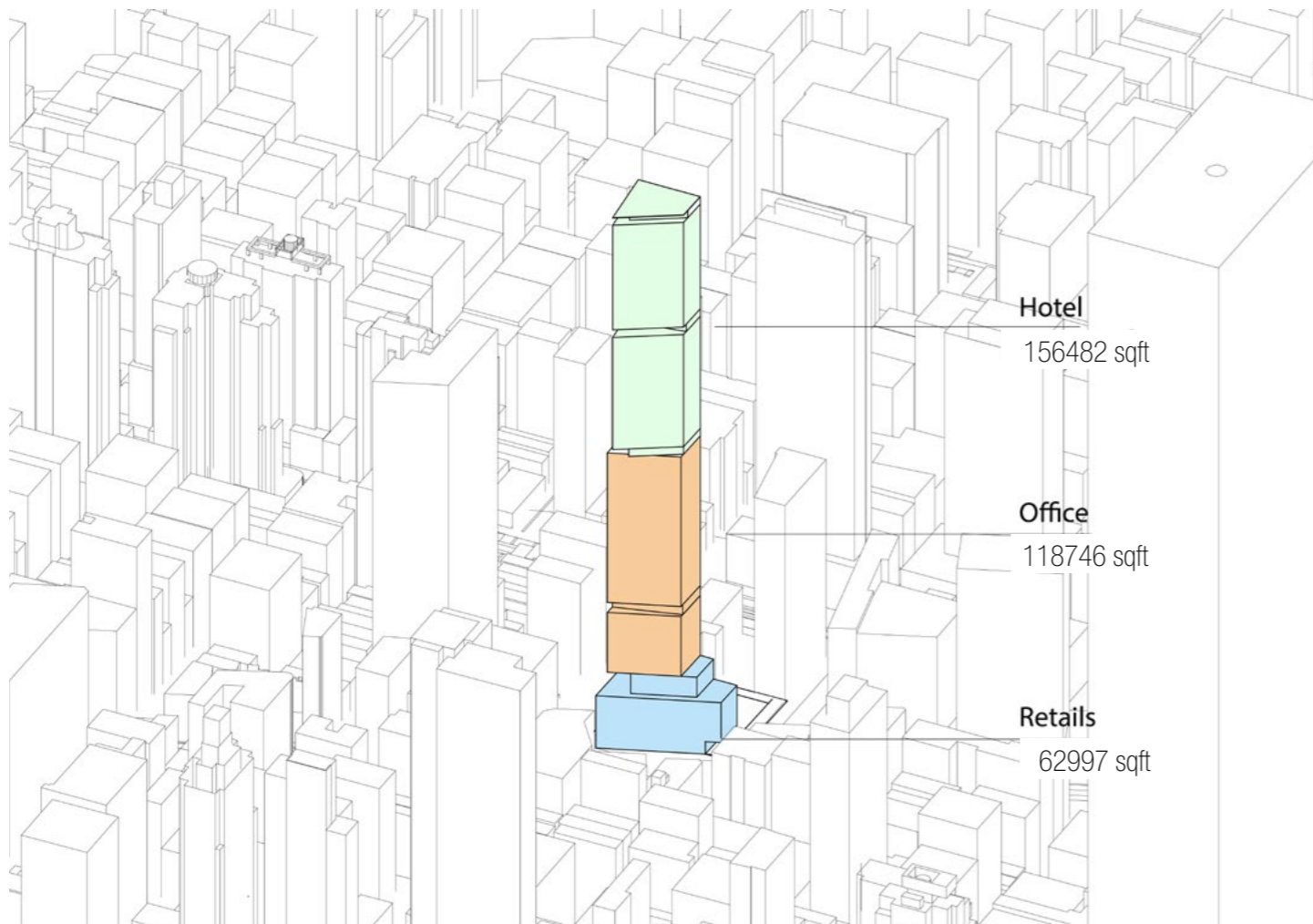
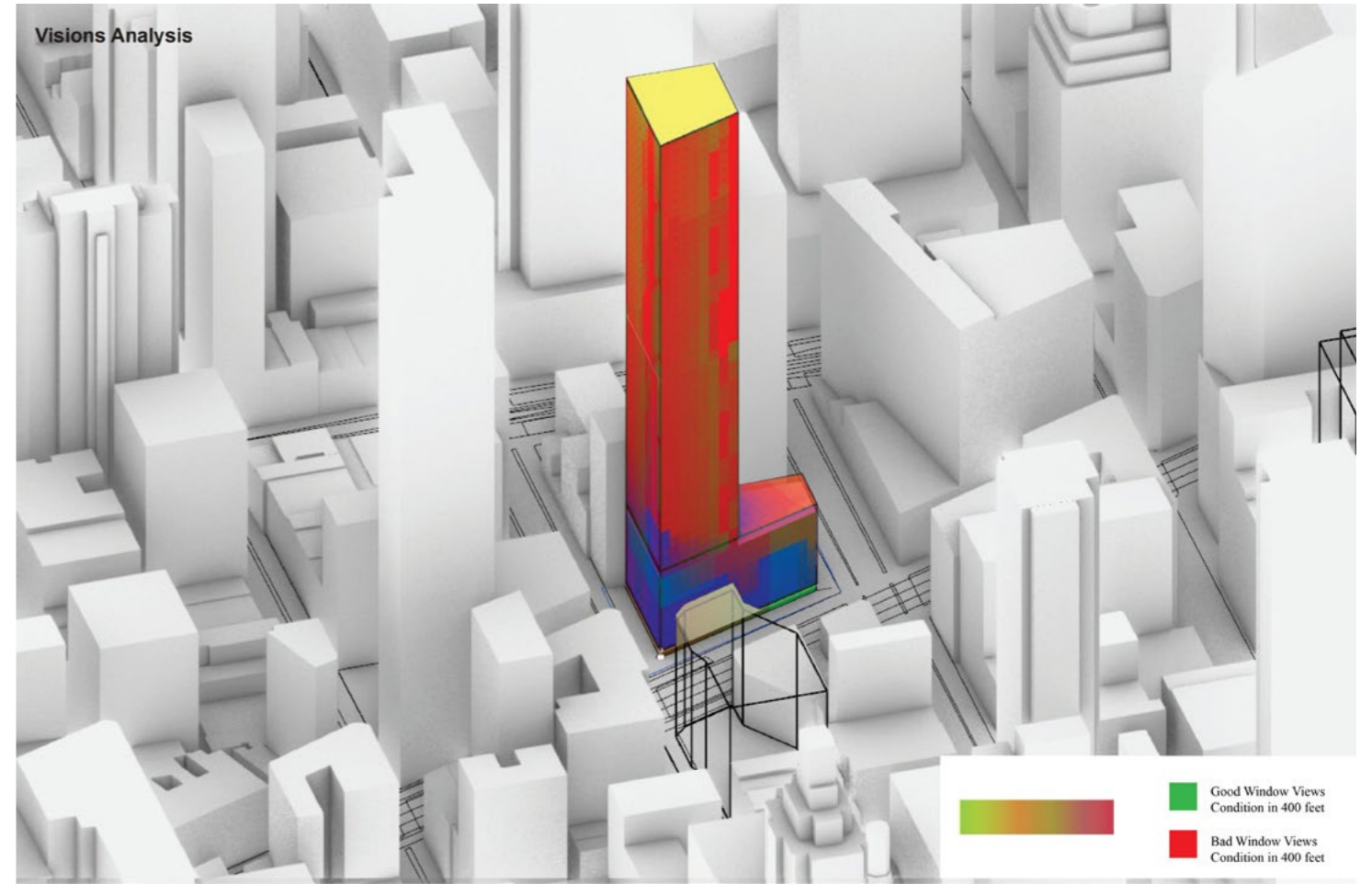
Group Mates: Yishu Yu, Xiaoqi Shen, Sizhe Wang, Jianyu Zheng



Solar Radiation Analysis



Visions Analysis



Hotel Program Daylight Analysis

Floor 30-62

*No dynamic shading has been modeled, and ASE > 10% in one or more spaces. The design addresses glare as follows:

- 0 credits
- 30.2% sDA
- 11.0% ASE
- 697 avg lux
- blinds open

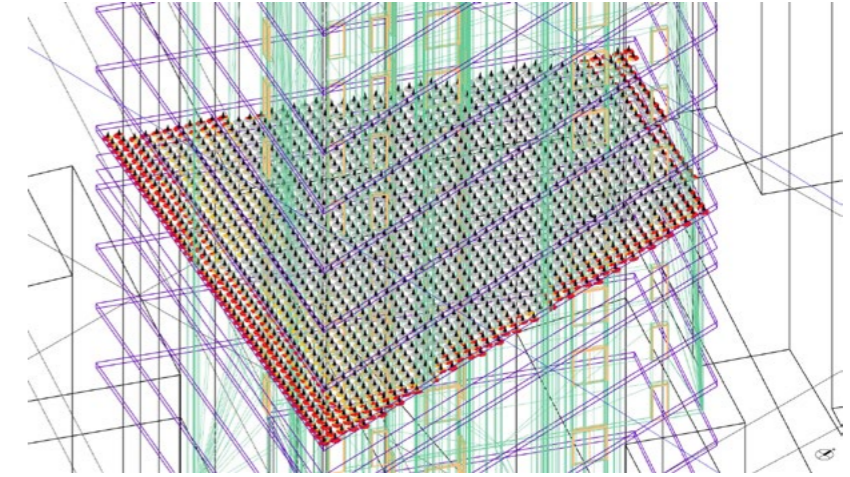
Daylight Autonomy (200 lux) 0 50%

Daylight 6 - LEED v4.0 Daylight Option 1 - 1

Space ID & Description	Area	Spacing	Shading	Auto	Exempt	sDA	ASE
hotel MESH	6618 ft ²	2.0 ft	N	N	N	30.17%	11.02%

Totals: 6618 ft² | 30.17% sDA | 11.02% ASE

Daylight 6 - LEED v4.0 Daylight Option 1 - 2



Office Program Daylight Analysis

Floor 8-29

*Spaces with ASE > 20% not counted toward total. (sDA before deductions = 66.8%)

No dynamic shading has been modeled because:

- 0 credits
- 0.0% sDA
- 43.2% ASE
- 2295 avg lux
- blinds open

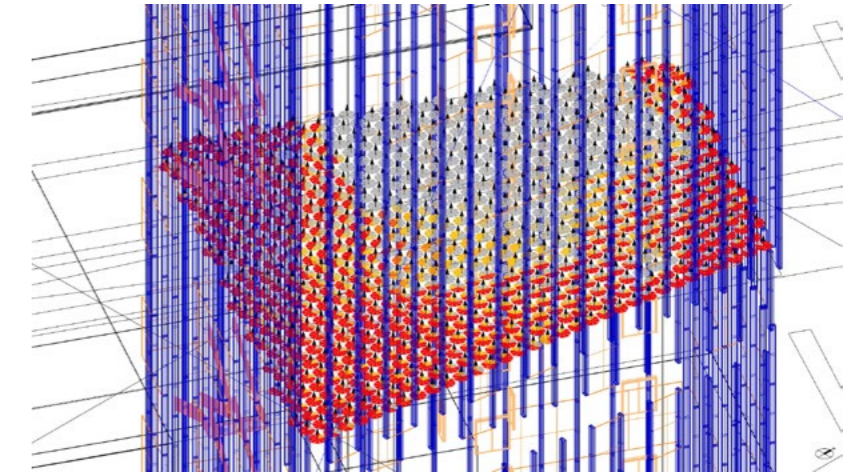
Daylight Autonomy (300 lux) 0 50%

Daylight 4 - LEED v4.0 Daylight Option 1 - 1

Space ID & Description	Area	Spacing	Shading	Auto	Exempt	sDA	ASE
office MESH	6979 ft ²	3.0 ft	N	N	N	66.76%	43.22%

Totals: 6979 ft² | 66.76% sDA | 43.22% ASE

Daylight 4 - LEED v4.0 Daylight Option 1 - 2



Retail Program Daylight Analysis

Daylight 5

*Spaces with ASE > 20% not counted toward total. (sDA before deductions = 74.4%)

No dynamic shading has been modeled because:

- 0 credits
- 0.0% sDA
- 39.1% ASE
- 2094 avg lux
- blinds open

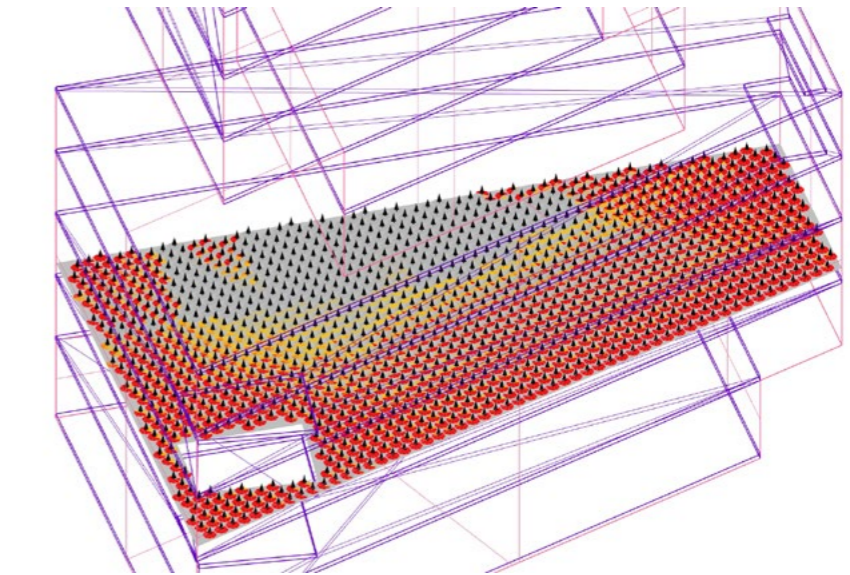
Daylight Autonomy (300 lux) 0 50%

Daylight 5 - LEED v4.0 Daylight Option 1 - 1

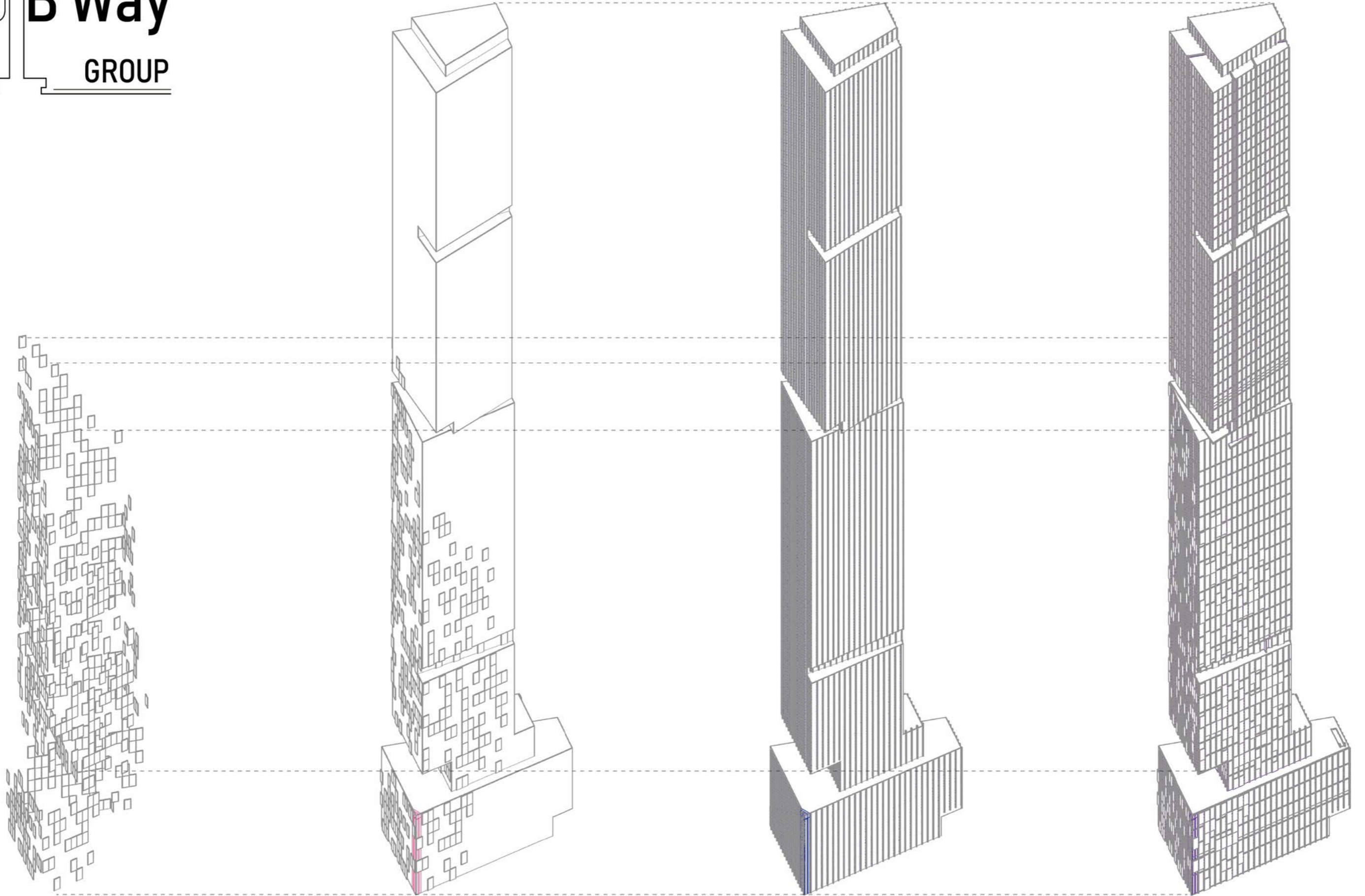
Space ID & Description	Area	Spacing	Shading	Auto	Exempt	sDA	ASE
9	11688 ft ²	3.0 ft	N	N	N	74.36%	39.06%

Totals: 11688 ft² | 74.36% sDA | 39.06% ASE

Daylight 5 - LEED v4.0 Daylight Option 1 - 2



1200 B'Way
TIVER GROUP





0' 2' 5' 10' 20' 30'

Typical Hotel

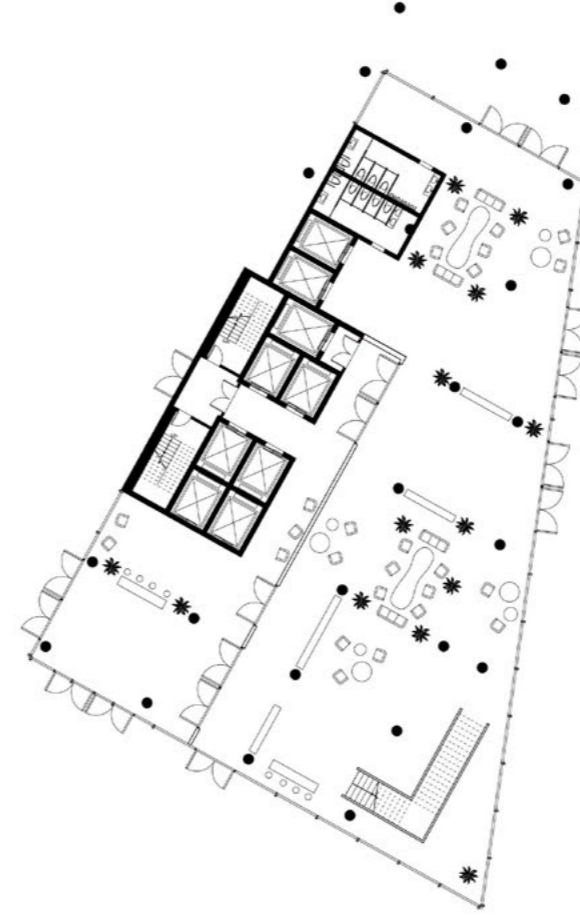
0' 2' 5' 10' 20' 30'



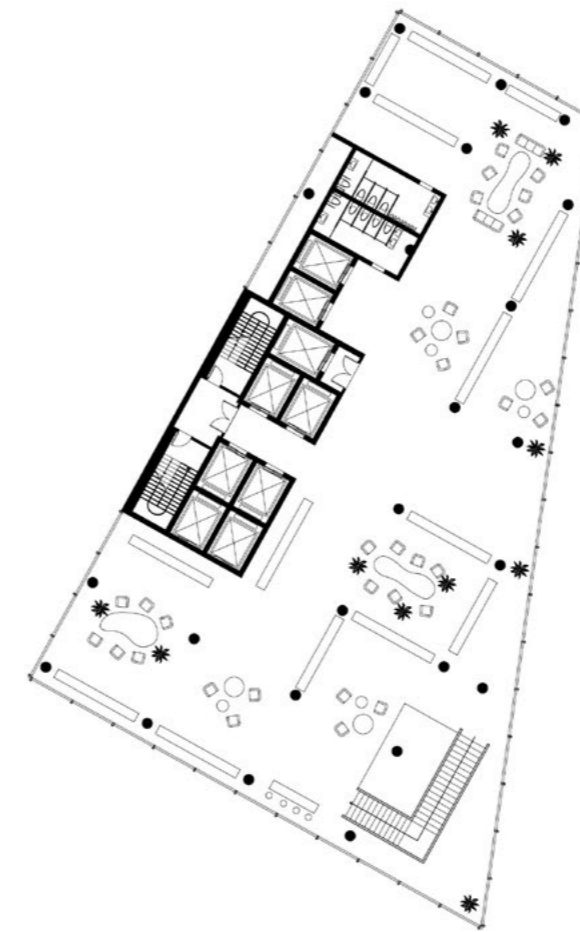
0' 2' 5' 10' 20' 30'

Typical Office

0' 2' 5' 10' 20' 30'



Ground Floor Plan



4th Retail - Plan

