

ARCHITECTURE PORTFOLIO

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I AM MAURO RODRIGUEZ, A DESIGNER AT HEART.
MY MIND IS A PLAYGROUND OF QUESTIONS, ALWAYS
CHASING THE REASONS BEHIND THE FUNCTIONALITY
OF OBJECTS AND SPACES; WHILE TRYING TO DECIPHER
HOW THEY WORK.

MY CURIOSITY CAN BE REFLECTED IN THE FOLLOWING
DESIGNS. THROUGHOUT MY CAREER, I HAVE
CULTIVATED A FASCINATION WITH **CURIOSITY**, AND
FUNCTIONALITY, CONCEPTS THAT HAVE SHAPED MY
PORTFOLIO.

CREATING SPACES, FOR ME, GOES BEYOND THE
PHYSICAL. IT TELLS A LASTING STORY THAT I AM EAGER
TO VISUALIZE AND CAPTURE. I ACKNOWLEDGE THE
HIGH STAKES MY FIELD FUNCTIONS IN AND I DON'T
TAKE THAT LIGHTLY.

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● COVER TO COVER HOUSING +

In Mexico, the roof is a gesture of protection without confinement—an open, permeable system that bridges public and private, formal and informal, individual and collective. Reimagining the block around Mercado de San Cosme means weaving together street vendors, market vendors, fonda owners, and working-class residents into a shared spatial network. This design addresses tensions caused by spatial hierarchies and resource inequities by proposing a visible, communal infrastructure that fosters equity, housing, and belonging.

By turning the roof into a water-harvesting and distribution system, it becomes a shared resource that unites all vendors and residents under one canopy. Water flow reorganizes access and visibility, redistributing value across FOH and BOH spaces. The result is a fluid market structure that supports both formal and informal economies—while integrating affordable housing for young families—fostering connection, fairness, and a strong sense of cultural identity.

Location: San Rafael, Mexico City
Course: ADV Studio VI
Partner: Seong Hyun Leem
Professor: Gabriela Carrillo & Thomas De Monchaux
Term: Spring 2025





Conceptual Model

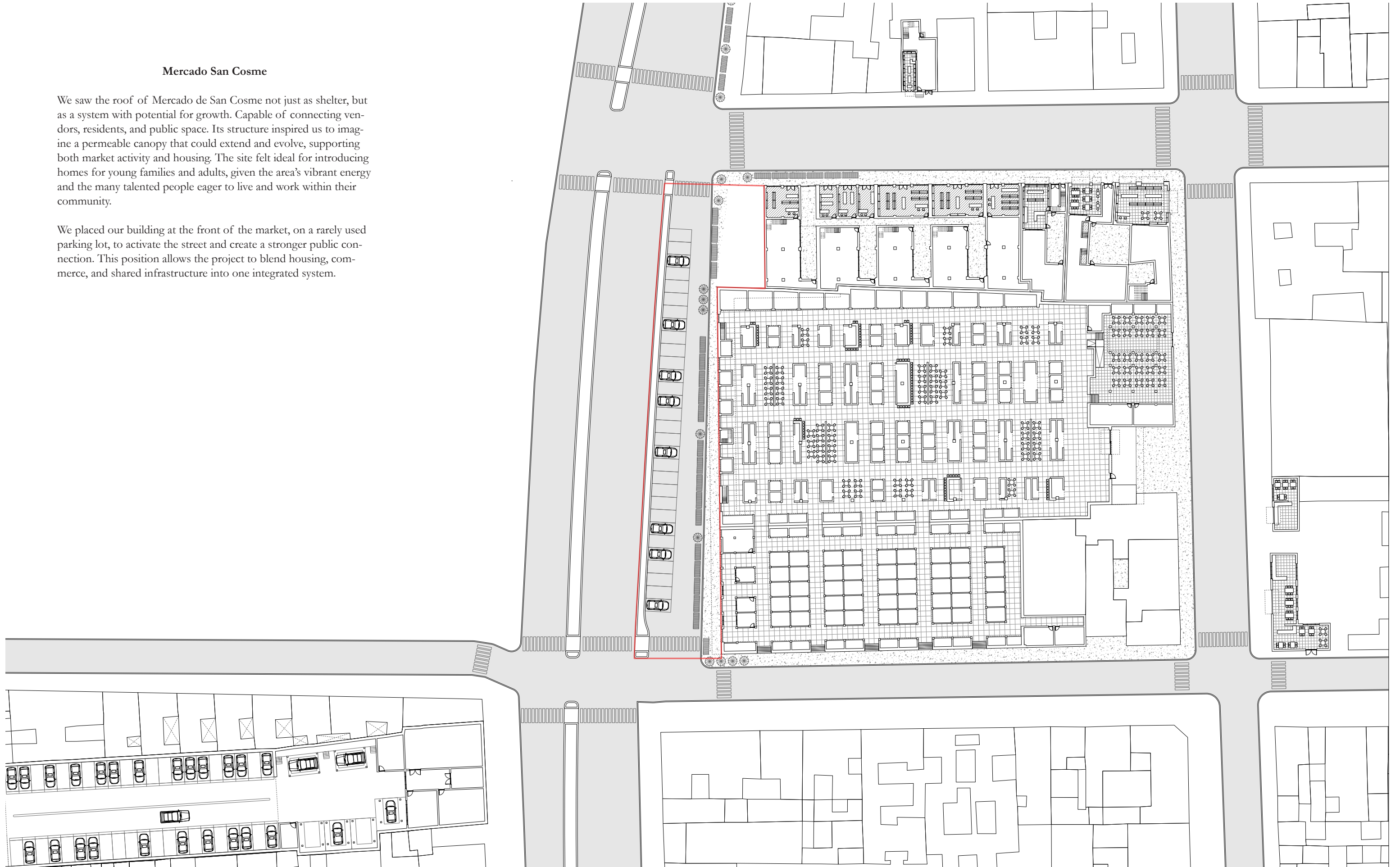
We created a conceptual model inspired by the roof plan (RCP) of Mercado de San Cosme to inform both the façade and interior programming of the building. Using found objects, the model explores how the roof's open, connective logic can extend vertically. It includes a kinetic element, allowing it to shift and generate multiple spatial outcomes—reflecting the adaptable, ever-changing nature of the market.

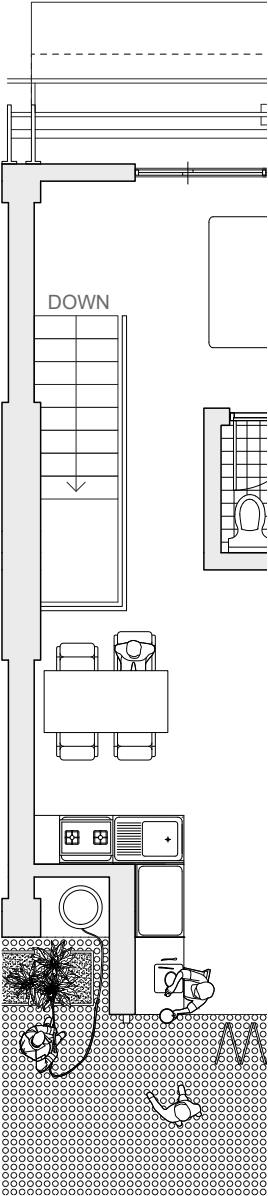
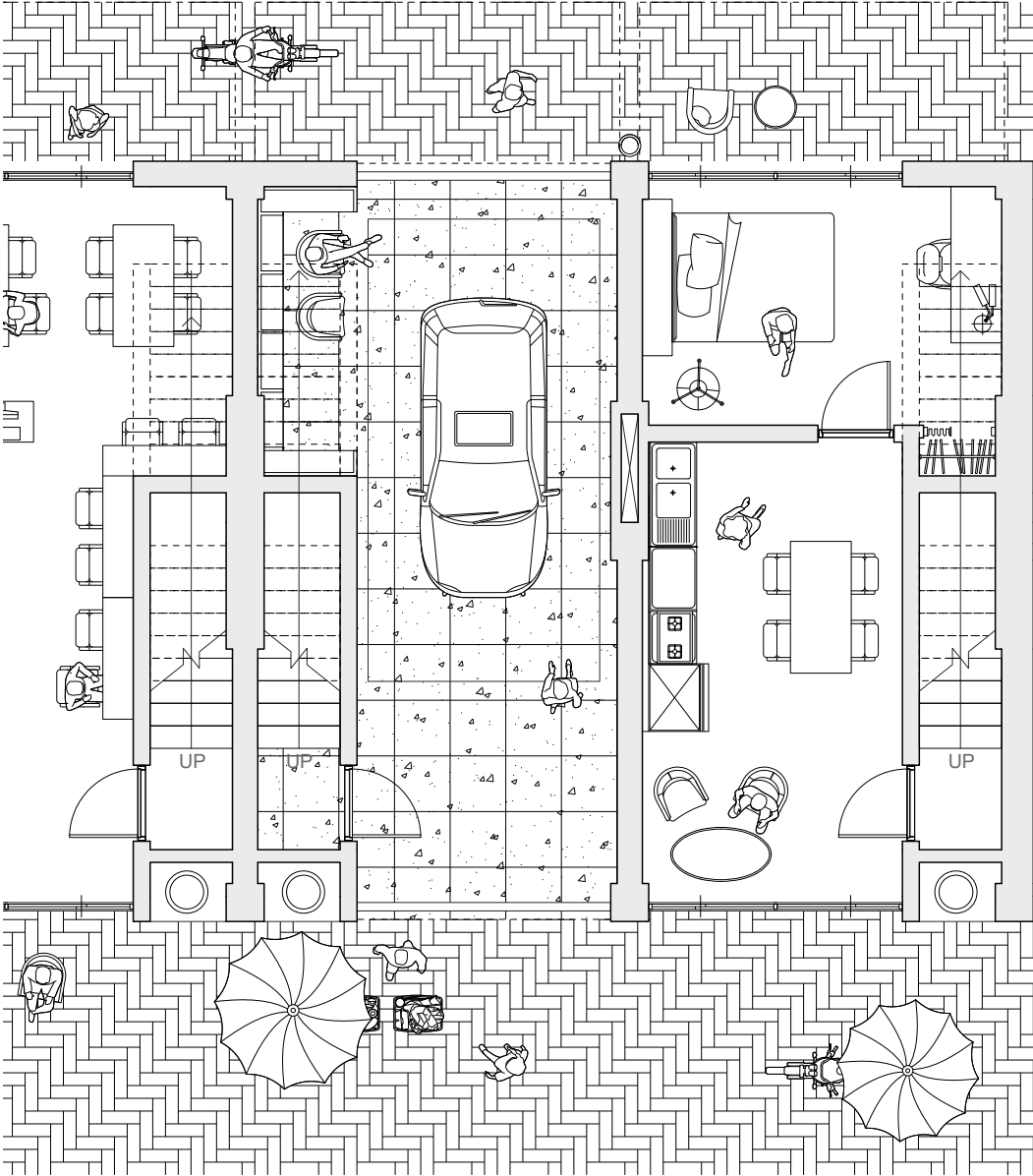


Mercado San Cosme

We saw the roof of Mercado de San Cosme not just as shelter, but as a system with potential for growth. Capable of connecting vendors, residents, and public space. Its structure inspired us to imagine a permeable canopy that could extend and evolve, supporting both market activity and housing. The site felt ideal for introducing homes for young families and adults, given the area's vibrant energy and the many talented people eager to live and work within their community.

We placed our building at the front of the market, on a rarely used parking lot, to activate the street and create a stronger public connection. This position allows the project to blend housing, commerce, and shared infrastructure into one integrated system.

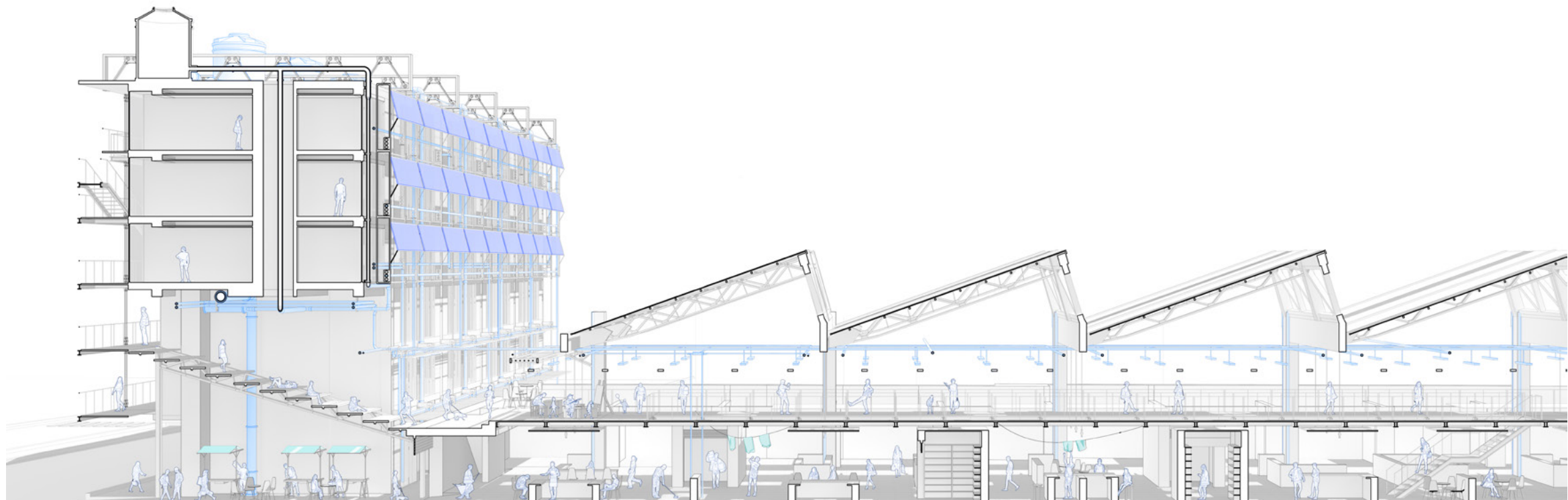
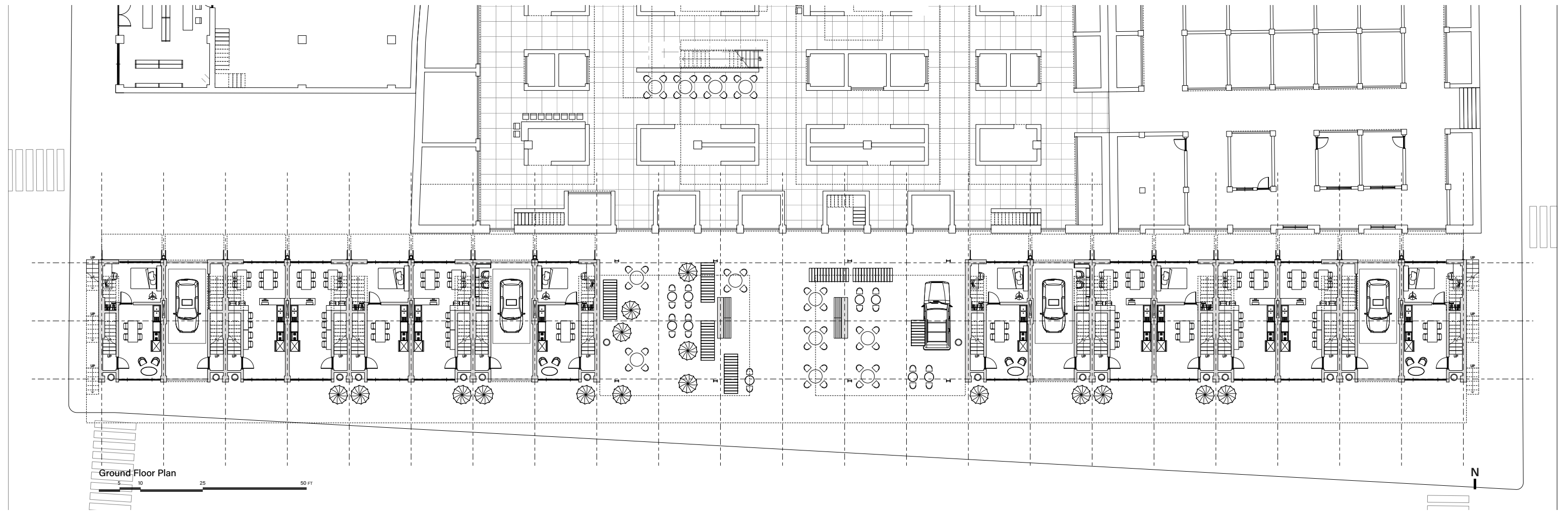




UNIT DETAIL FLOOR PLAN
Extended Economic Opportunities

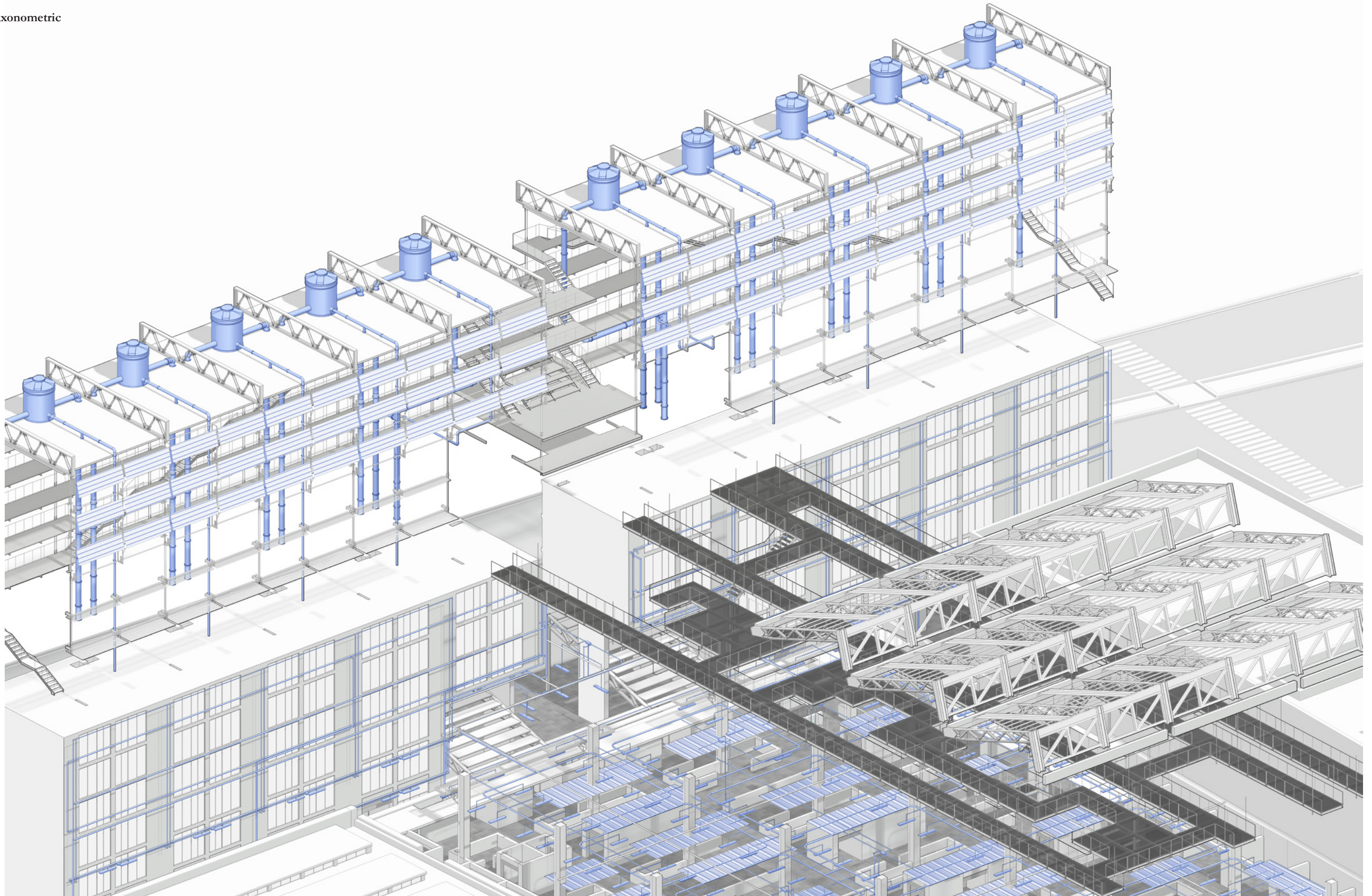
4 8 16 FT







Axonometric



● CARBON REMOVAL RATING TECHNOLOGIES

This project proposes a global facility managed by the United Nations Framework Convention on Climate Change (UNFCCC) to transform carbon removal technologies into scalable, proven solutions. By testing different technologies in diverse, controlled environments, the facility will rate their **efficiency, price, embodied carbon, resilience, and carbon capture capacity.**

This initiative addresses urgent climate needs by ensuring solutions are ready for global deployment, tailored to diverse conditions around the world. Bridging technology and policy, the facility creates a foundation for a thriving, equitable carbon removal market and offers hope to avoid irreversible global



Location: Santa Fe, New Mexico
Course: ADV Studio V
Individual
Professor: David Benjamin
Term: Fall 2024



Photography

I took the following images when visiting Bandelier, once home to the Tewa and Keres Pueblo people, two groups with distinct languages but shared cultural practices provides a glimpse into how architecture and design can respond to both environmental and social challenges. An ideal site for this project, due to its extreme weather and historic resilience.



Biome 01

The Structure is drawn from Buckminster Fuller. His geodesic dome is known for lightweight structure, energy efficiency, even structural stress, no need for internal supports, modular design.

What will be tested? - Engineer Solutions Comparison



Direct Air Capture

Scalability in the Next 10 Years:
DAC: 60% – High scalability, but costly.



Dependencies on this technique?



Locations	Energy	Co2 Storage	Time to Deploy	Maintenance
Any where with energy and storage sites	5 - 6 MWh per ton of CO2	Permanent - Stored underground in geological formations	5–10 years Fast scaling but costly.	Regular maintenance of chemical filters and machinery

What is the current market?



Competition	Investors	Birth	Leading
10 - 15 Companies	High Interest: Bill Gates, Chevron, and venture capital firms	Early - 200s Developed as high solution to capture CO2	Climeworks Carbon Engineering Global Thermostat

Cost per Ton of CO₂ Removed

\$100 - \$600 / Ton



Carbon Mineralization

Scalability in the Next 10 Years:
Carbon Mineralization: 30% – Limited by geography.



Dependencies on this technique?



Locations	Energy	Co2 Storage	Time to Deploy	Maintenance
Basalt-rich regions or areas with reactive minerals	2 - 3 MWh per ton of CO2	Permanent - Converts CO2 into stable carbonate minerals	10 - 20 years Specific location requirements and infrastructure	Low - Minimal upkeep after setup, mainly monitoring for leakage

What is the current market?



Competition	Investors	Birth	Leading
5 - 10 Companies	Moderate Interest: Funding from industries needing long-term storage	2006 - Pioneered by Carbfix for converting CO2 into rock.	Carbfix, Mineral Carbonation, Solid Carbon

Cost per Ton of CO₂ Removed

\$50 - \$150 / Ton



Enhanced Weathering

Scalability in the Next 10 Years:
12% Slower due to material handling.



Dependencies on this technique?



Locations	Energy	Co2 Storage	Time to Deploy	Maintenance
Regions with silicate-rich rocks	3 - 4 MWh per ton of CO2	Permanent - CO2 reacts with mineral and forms stable carbonates	20 + years Due to mining, crushing, and spreading rocks	Low Once the rocks are spread, minimal maintenance

What is the current market?



Competition	Investors	Birth	Leading
Few Pilot Universities	Low interest - Limited due to high logistics costs and infrastructure	Late - 1990s Conceptualized to enhance natural capture processes	University of Sheffield, Enhanced Weathering Research Group

Cost per Ton of CO₂ Removed

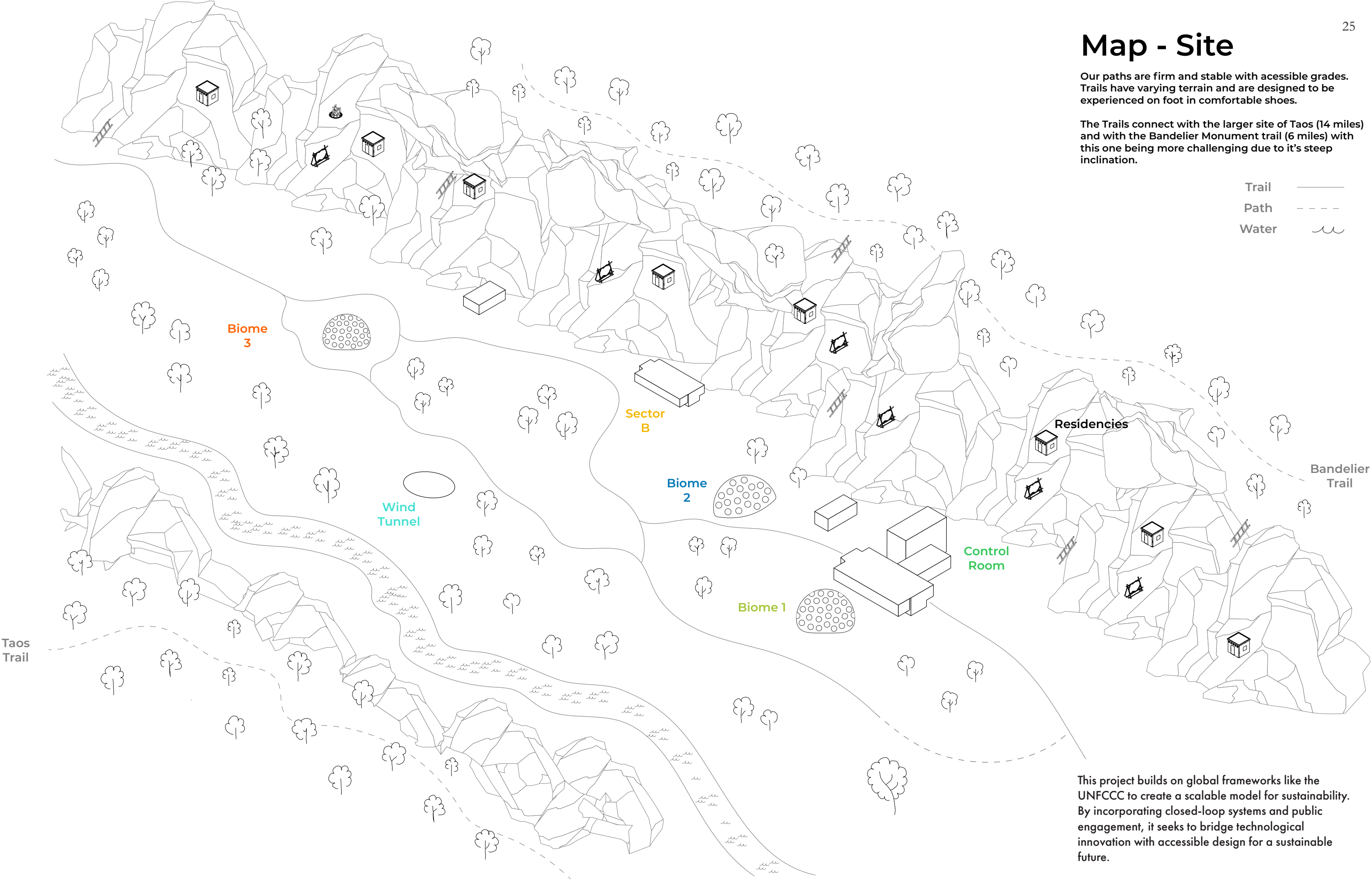
\$30 - \$100 / Ton

Map - Site

Our paths are firm and stable with acessible grades. Trails have varying terrain and are designed to be experienced on foot in comfortable shoes.

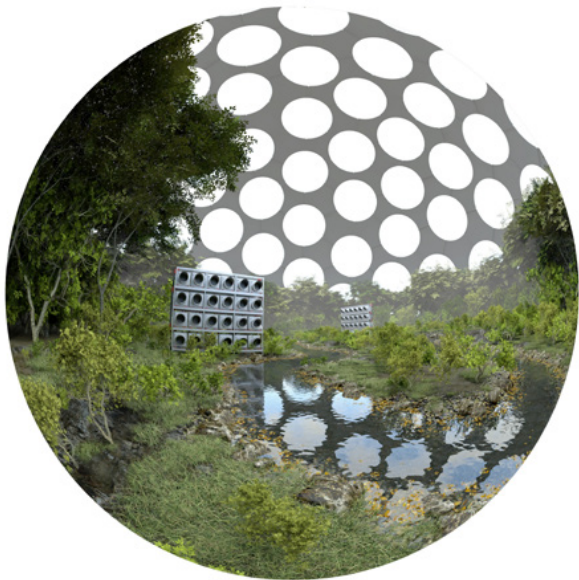
The Trails connect with the larger site of Taos (14 miles) and with the Bandelier Monument trail (6 miles) with this one being more challenging due to it's steep inclination.

- Trail
- Path
- Water



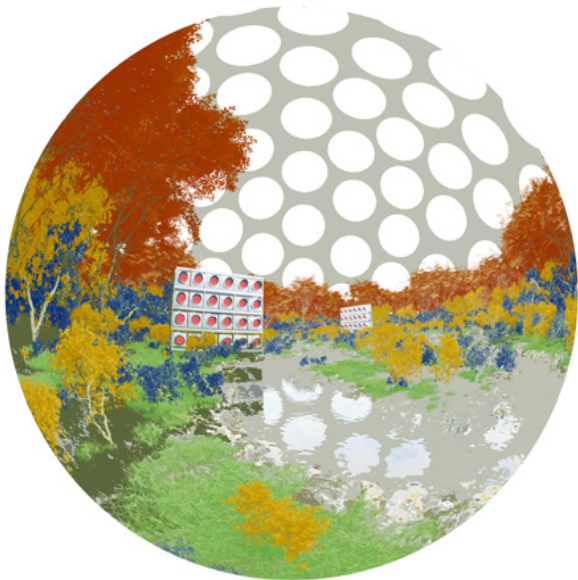
This project builds on global frameworks like the UNFCCC to create a scalable model for sustainability. By incorporating closed-loop systems and public engagement, it seeks to bridge technological innovation with accessible design for a sustainable future.

BIOME 01
Rain Forest

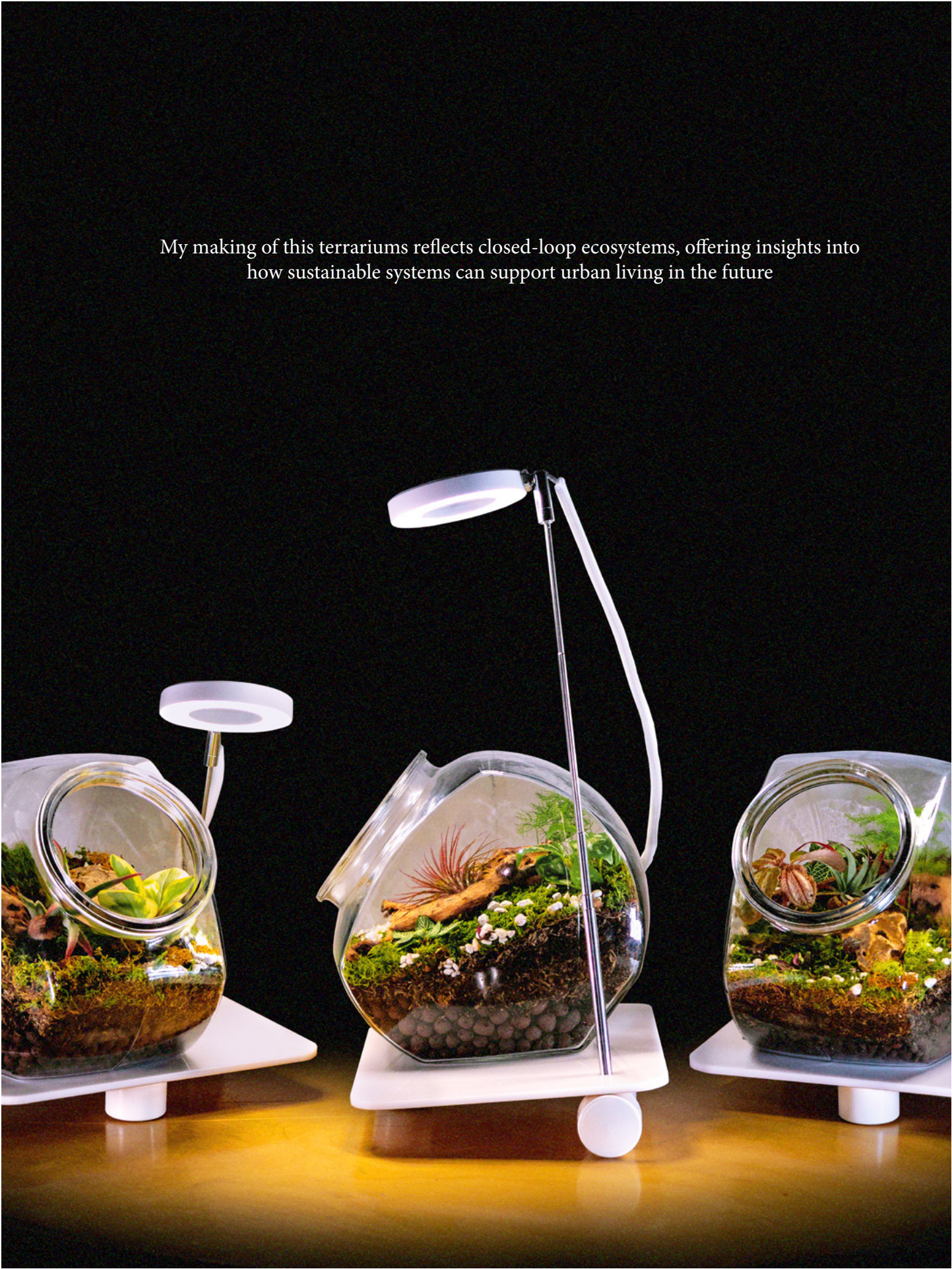


Standard View

BIOME 01
Rain Forest

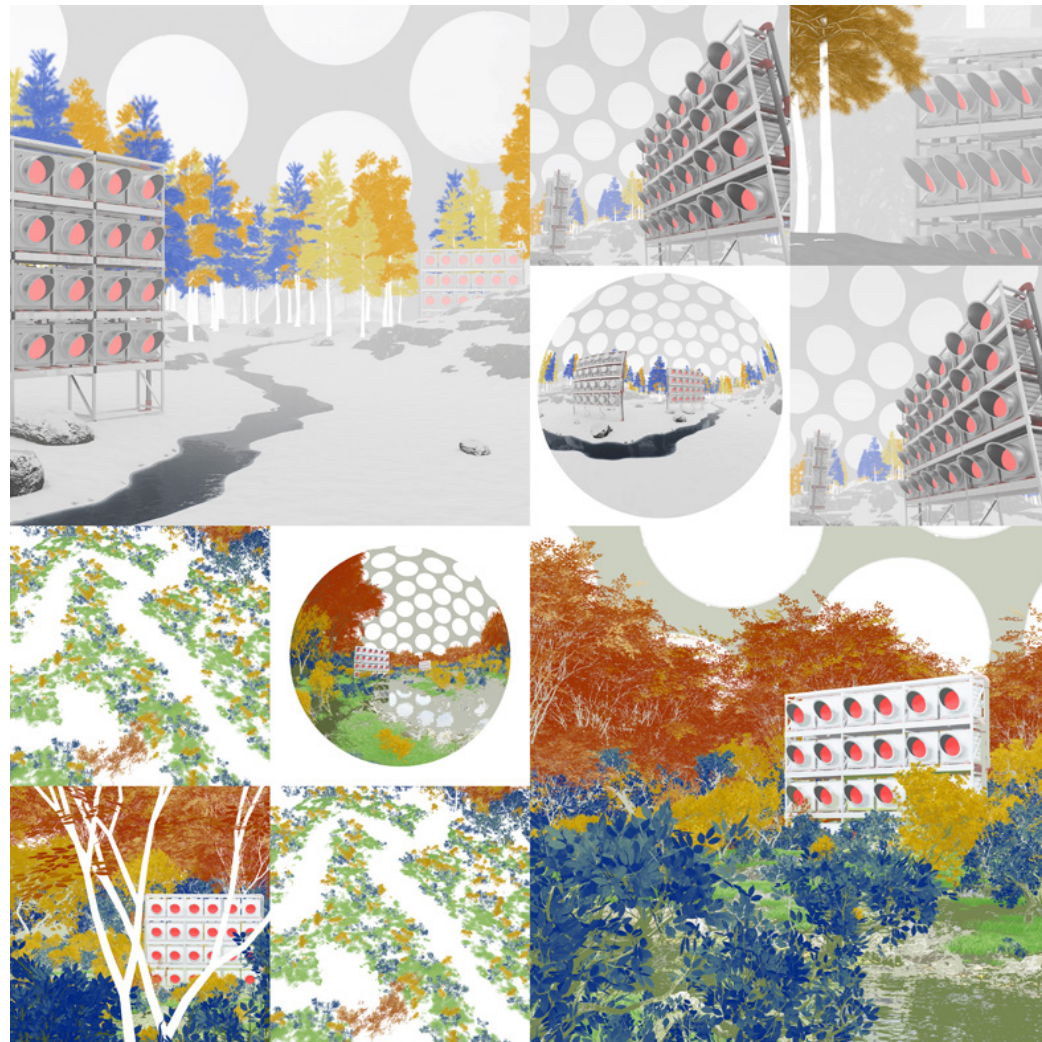


Carbon Capture Absorption Rate +

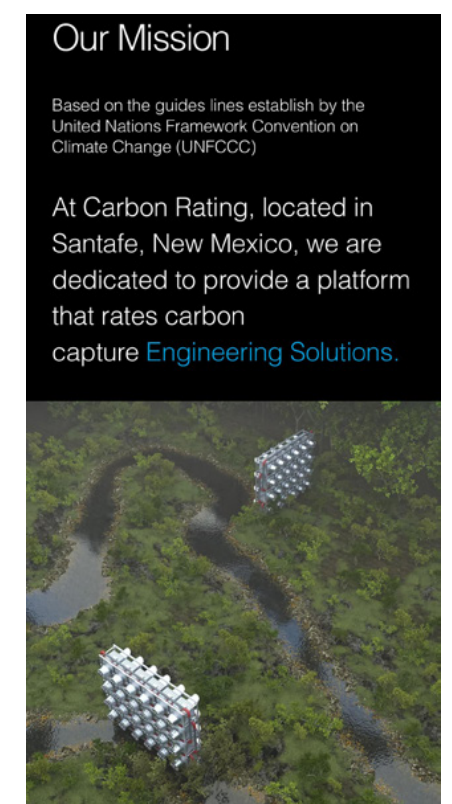
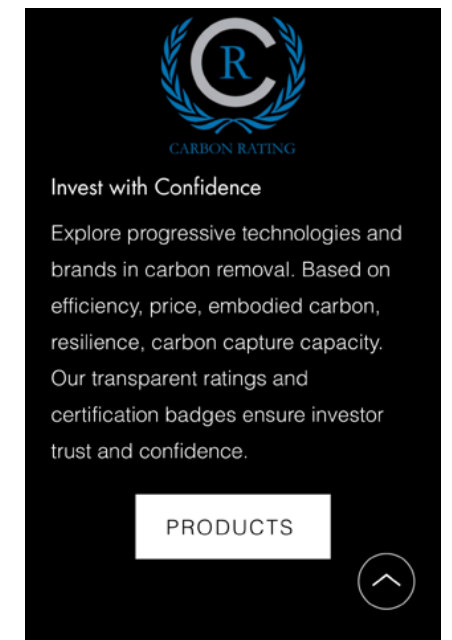


My making of this terrariums reflects closed-loop ecosystems, offering insights into how sustainable systems can support urban living in the future

The Website for this Possible Future



Imagine a rainforest glowing with reds and oranges. Each tree and plant revealing how much carbon it absorbs. In contrast, a cold tundra glows faintly blue, showing slower but steady sequestration. This color-coded world makes carbon capture visible, turning climate data into something people can see, feel, and act on.



<https://www.uncarbonrating.com/>

WHAT IF? CARBON CAPTURE

The Re-Fresh-Kills project re-imagines Staten Island's Fresh Kills Park as a green infrastructure integrating carbon capture into the urban landscape. It aligns with the studio's focus on territorial dependency, turning ecological systems into architecture. Spanning 500 feet, the structure combines air capture machines with hydroponic gardens to purify air and sequester carbon.

These public stations educate visitors and foster community participation, blending technology with environmental stewardship. The project acts as a performative urban engine. Improving air quality, raising awareness, and promoting ecological restoration through design.

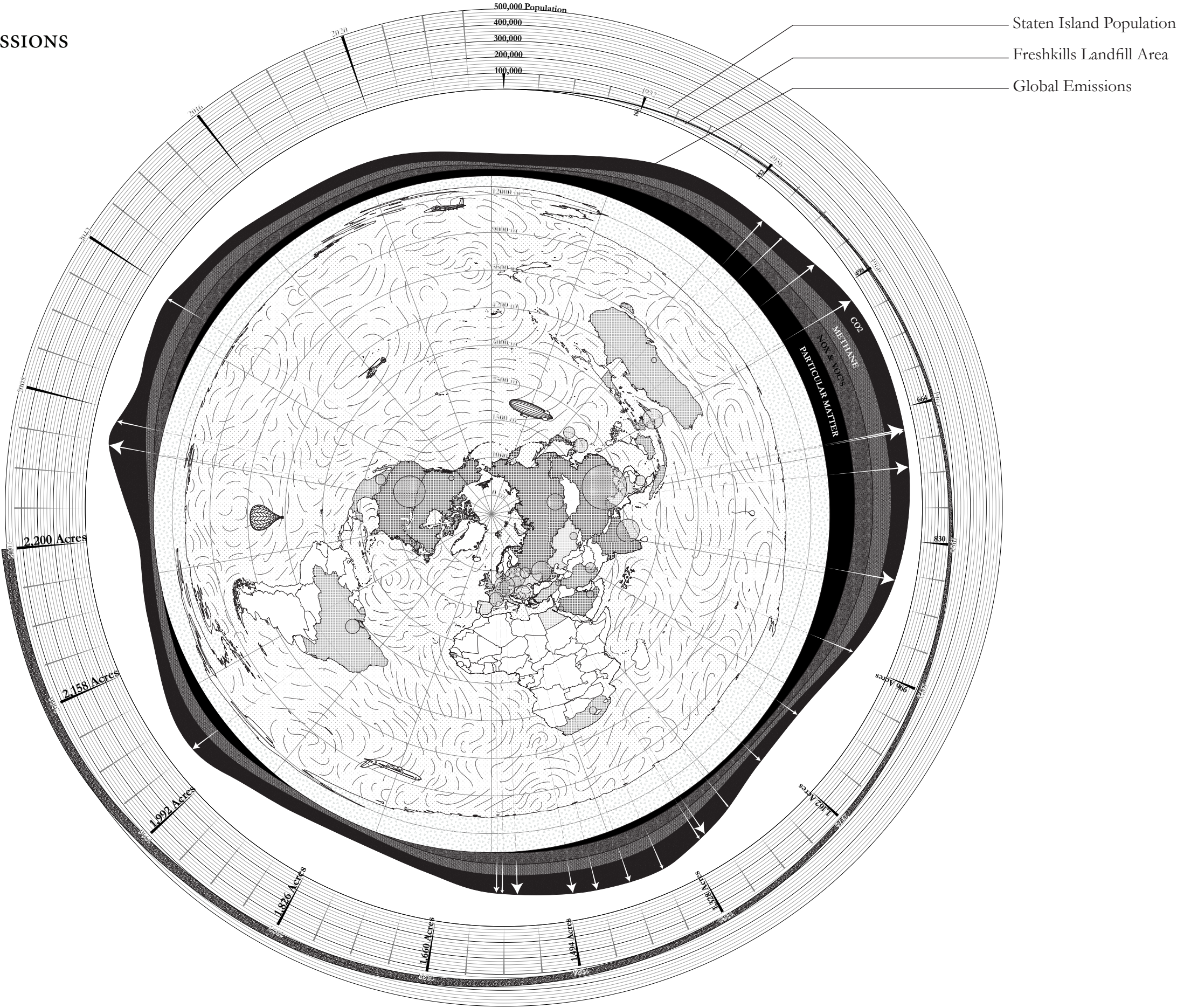
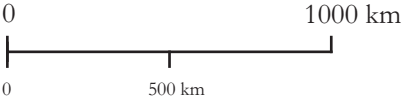
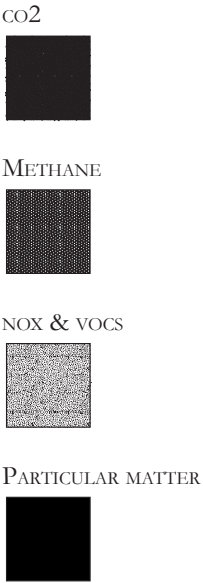
Location: Staten Island, NY
Course: Core Studio III
Individual
Professor: Esteban de Backer
Term: Spring 2024



AIR QUALITY & GREENHOUSE GASES EMISSIONS

Globalization and urbanization have accelerated consumption and waste, worsening pollution, climate change, and air quality. This project at Fresh Kills explores hidden air flows, aiming to reconnect us with the Earth while addressing preventable deaths linked to environmental neglect.

As we advance technologically, we risk forgetting our dependence on natural systems like air and water. This growing detachment endangers both human life and the planet's delicate ecological balance.





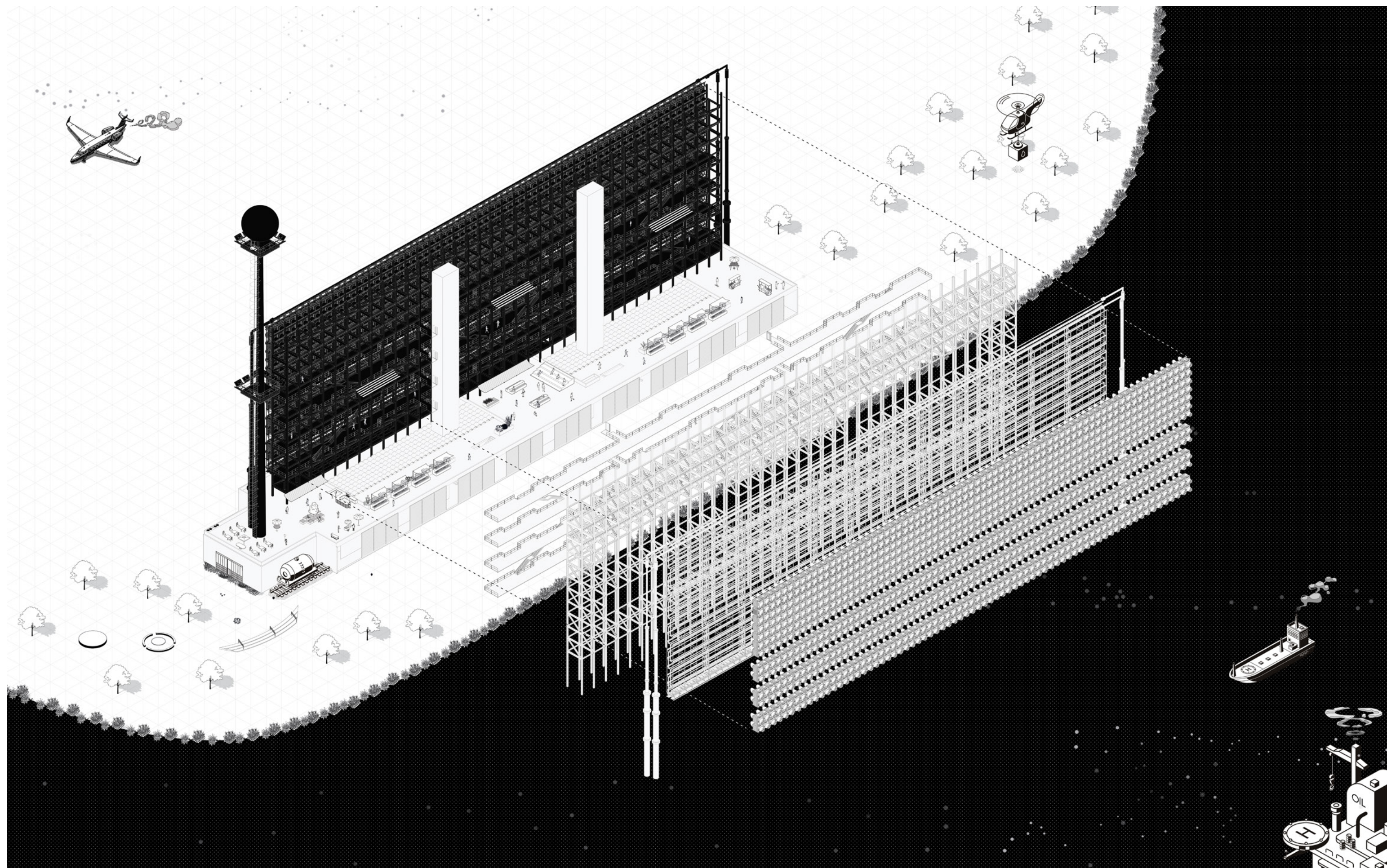
The History

Fresh Kills, once the world's largest landfill, is a key site for studying air quality issues. Its history, from the 1909 Bay-way Refinery to its 2001 closure, reveals the lasting environmental impact of human activity and waste management.



Alternate Reality

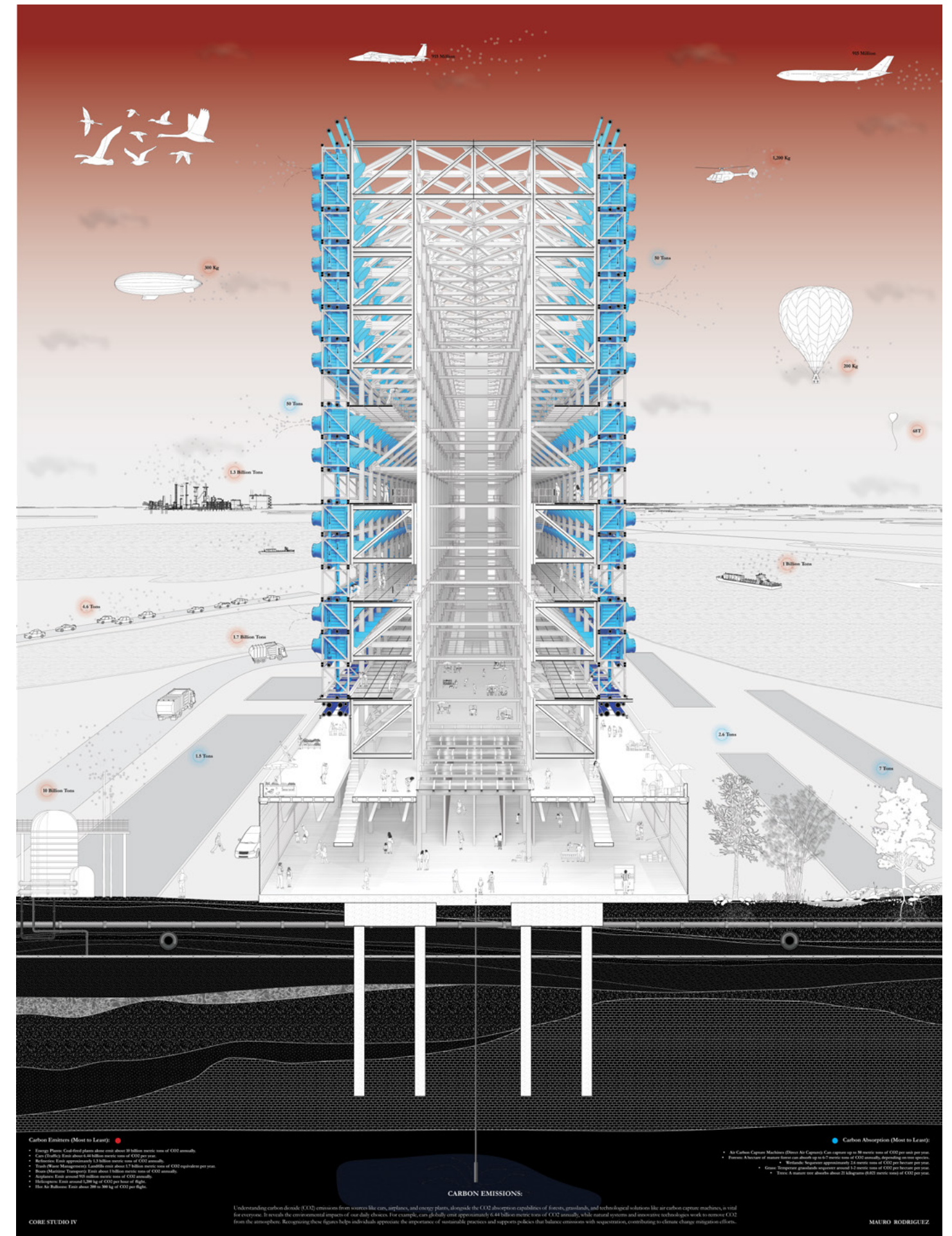
The Re-Fresh-Kills project transforms Fresh Kills Park into a living system of carbon capture. Its 500-foot structure blends machines and gardens, turning a former landfill into a site of restoration, education, and ecological innovation.





- 1,000s DAC Machines -

This is how many machines would be necessary. A microcosm for the broader environmental issues we face globally. By examining the historical and current problems associated with Freshkills, insights can be gained into the strategies needed to improve air quality and ensure the long-term viability of our planet. This research underscores the urgency of investing in sustainable practices, policies and global collaboration to address the urgent issue of air quality and its impact on human health and ecological systems.



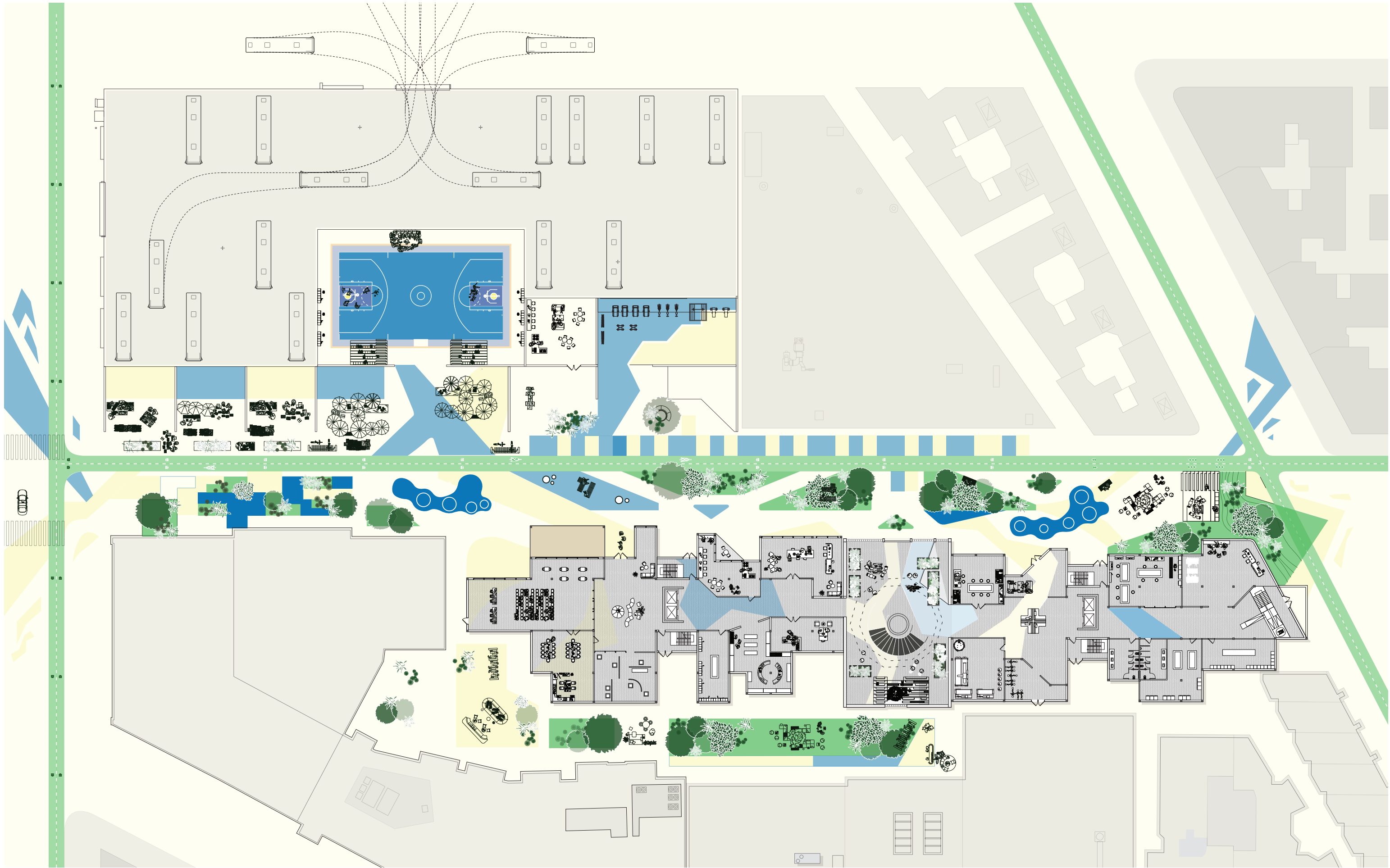
● SHARING VOLUME HOUSING

A new take on affordable housing re-imagines what “home” can feel like in Harlem’s dense urban setting. Instead of focusing solely on square footage, the design explores height, volume, and smart spatial strategies to create compact yet inspiring spaces.

In a city where every inch matters, these homes use three-dimensional design to make small interiors feel open and airy. Elevated ceilings, flexible furniture, and efficient layouts turn limited space into something luxurious, proving that affordability and comfort can coexist.

Location: Harlem, NY
Course: Core Studio III
Partner: Nicholas Richards
Professor: Garry Bates
Term: Fall 2023



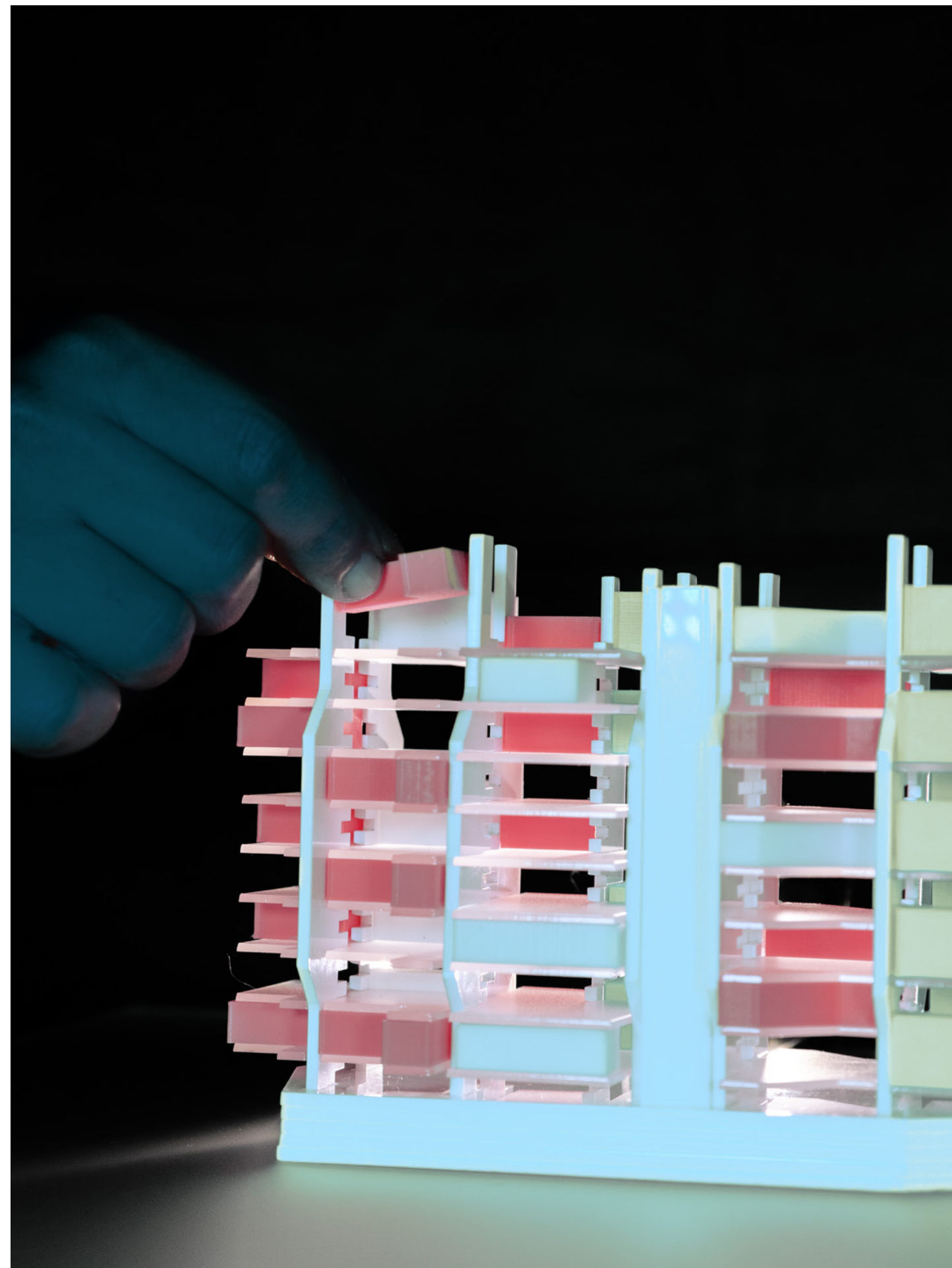


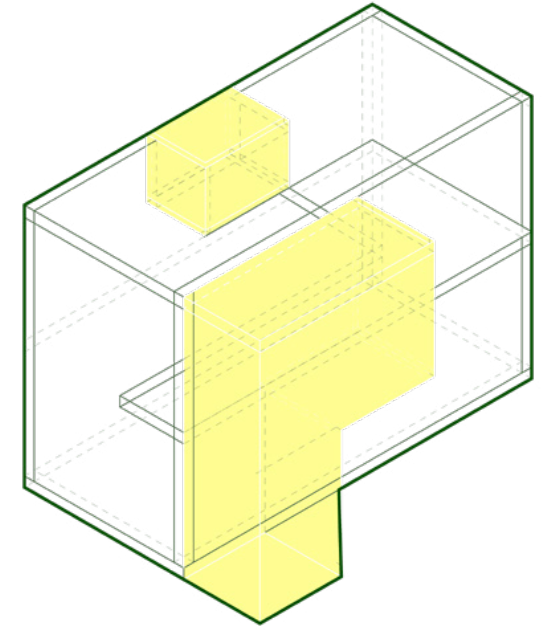
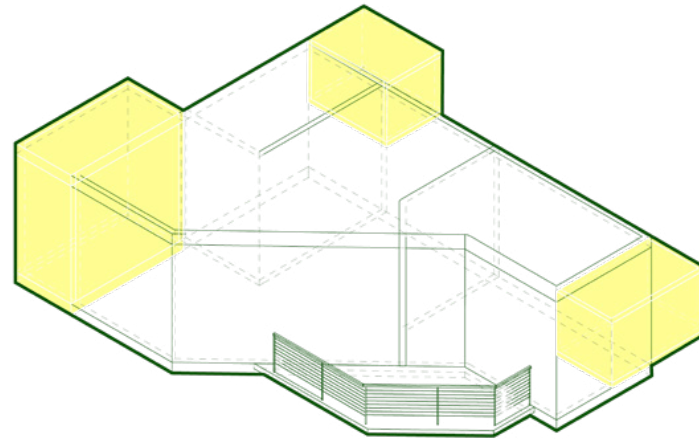
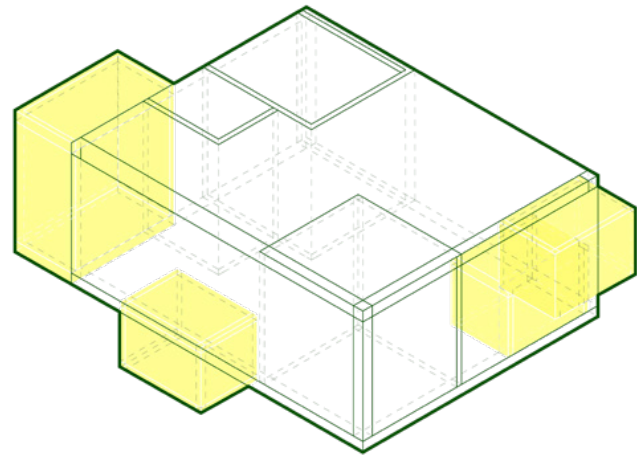
What If?

What if we measured housing by volume instead of just square footage? This question inspired us to design a building that is flexible, adaptable, and truly responsive to its residents' needs. Imagine trading ceiling height with your neighbor to gain an extra room in your apartment. This approach doesn't just make housing more enjoyable; it ensures that every bit of space is valuable and meaningful to someone.

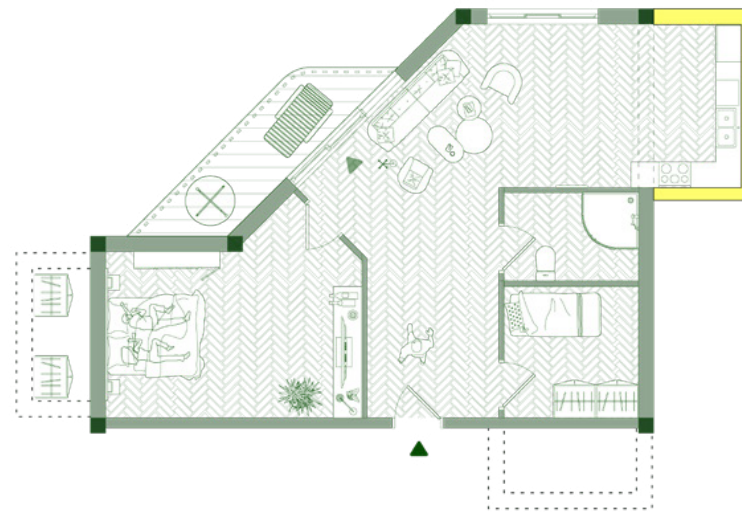
Our Model

Was an early exploration of how various unit sizes and configurations can shape the architecture itself. From a slim, three-story volume to a spacious one-bedroom apartment, these diverse layouts initially posed structural challenges. However, by embracing a modular design, we transformed these challenges into strengths, allowing each unique space to coexist seamlessly within the building's framework.

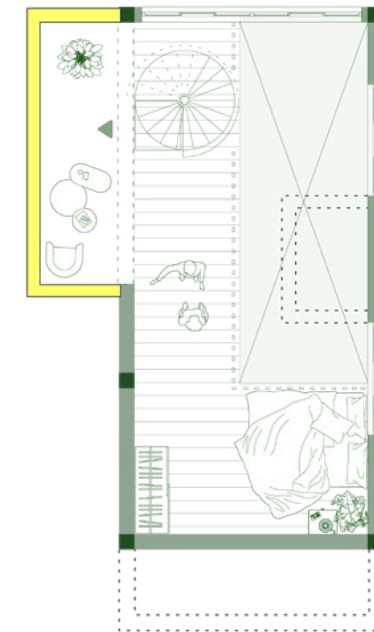




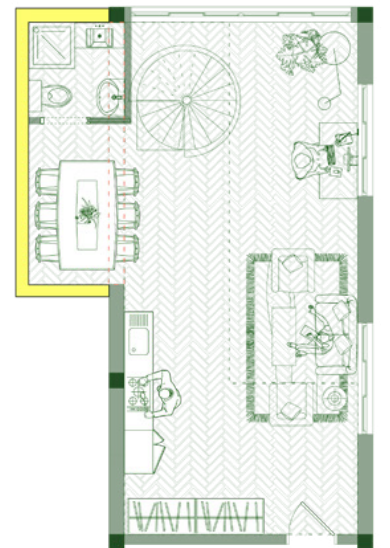
0 2' 4' 8' 16' ⌚



0 2' 4' 8' 16' ⌚



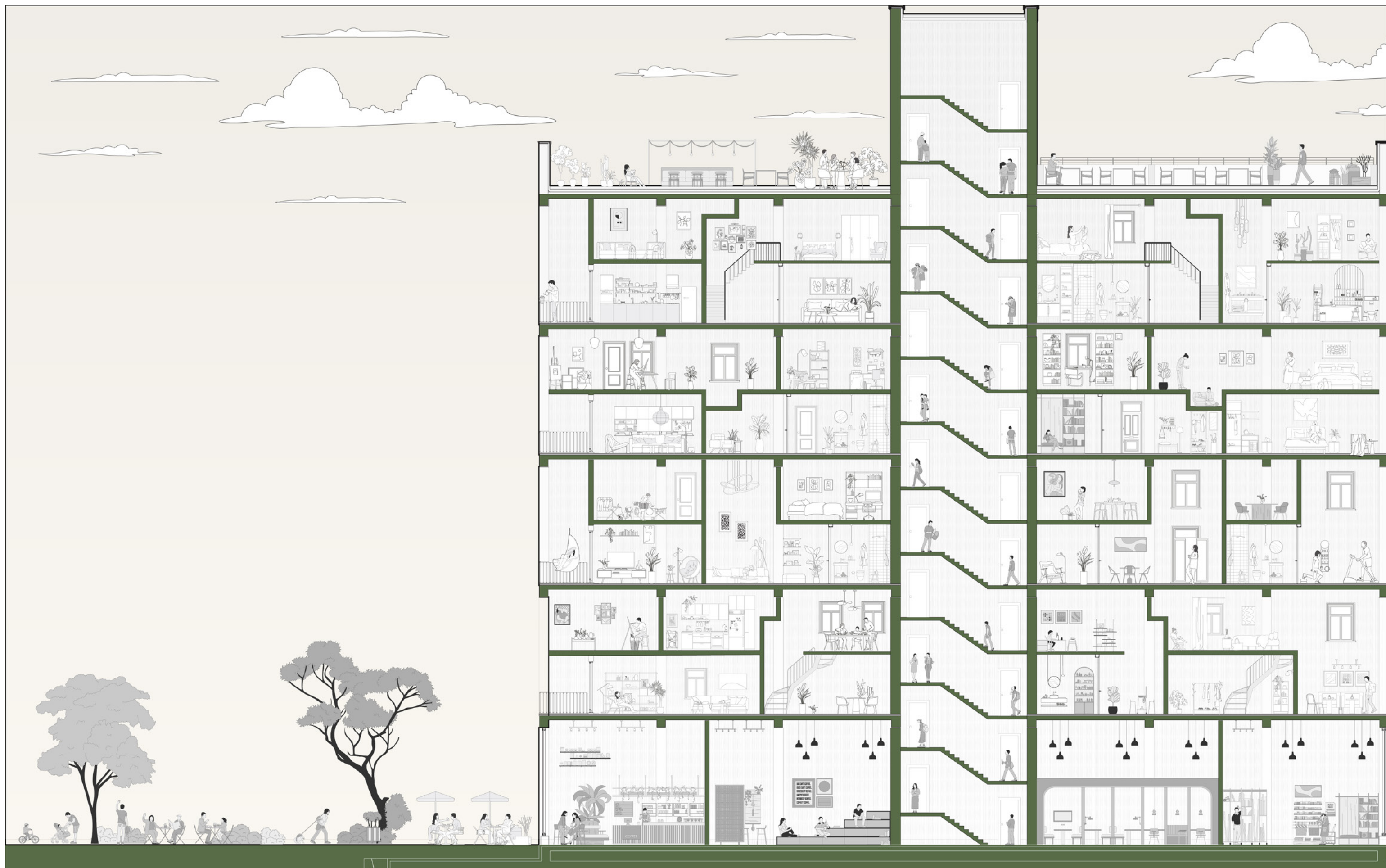
Floor 02



Floor 01

0 2' 4' 8' 16' ⌚

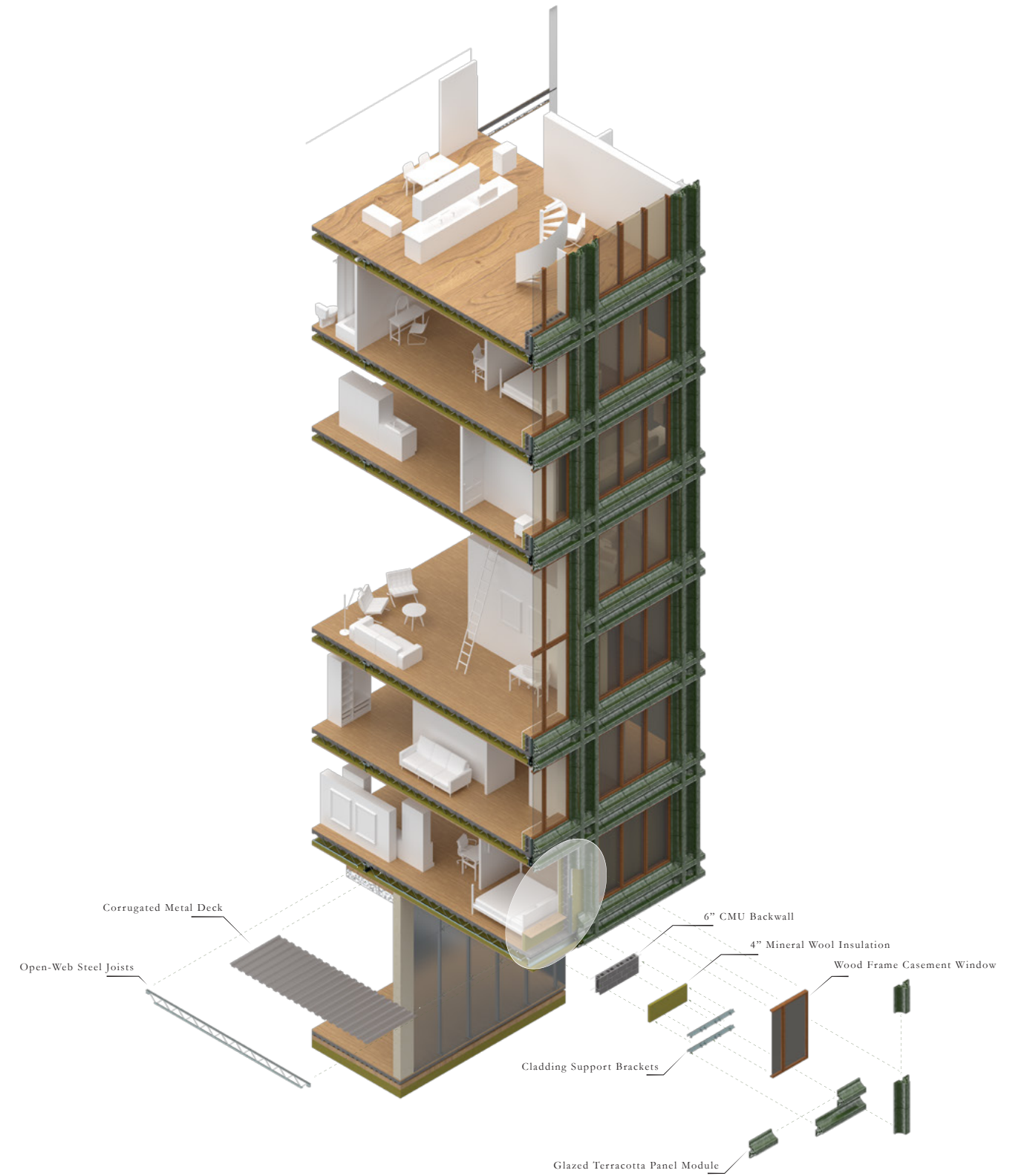
Different Ways to Visualize a 3,000 Cubic Feet Unit





VOLUMETRIC LIVING

FACADE AXONOMETRIC DETAIL MODEL

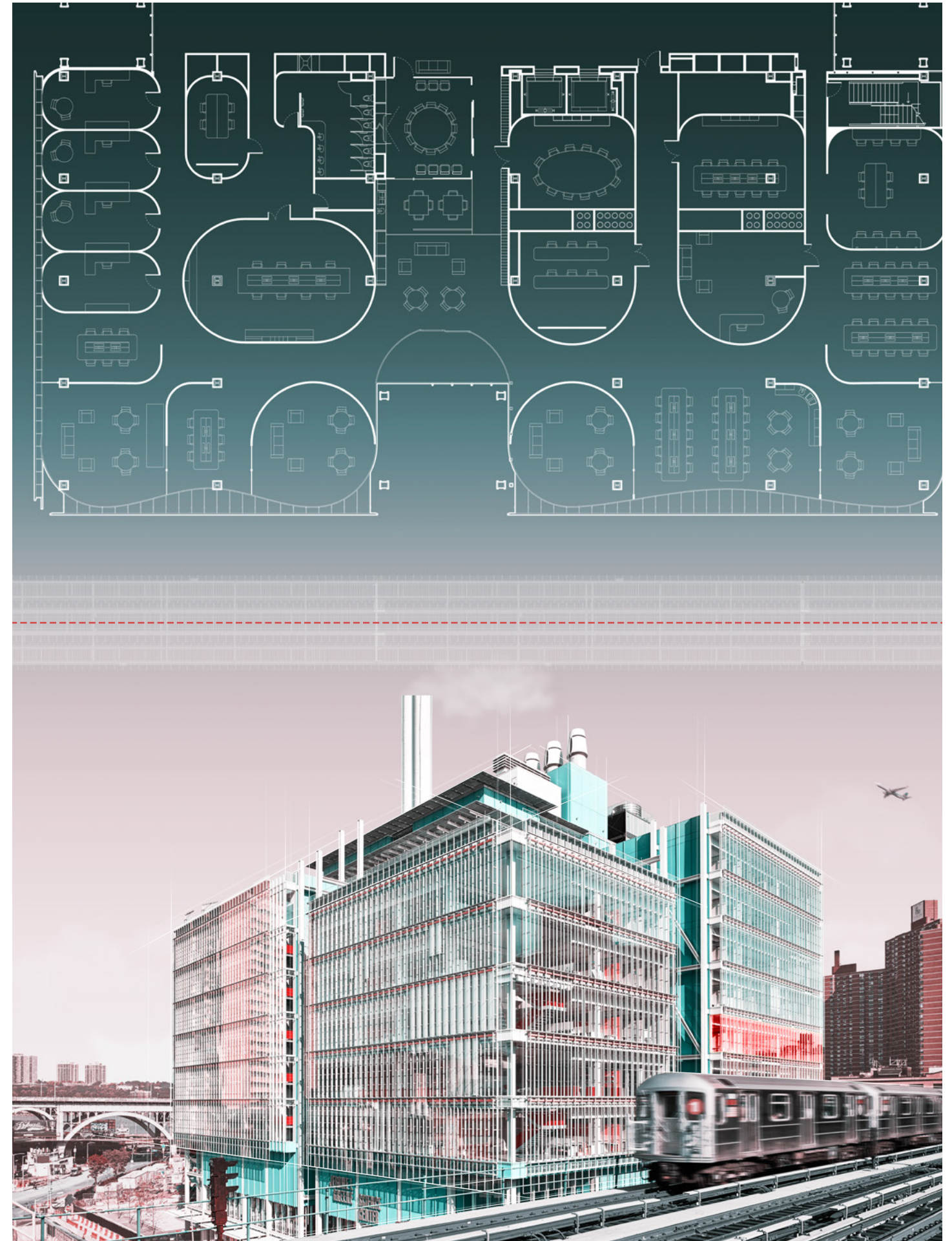


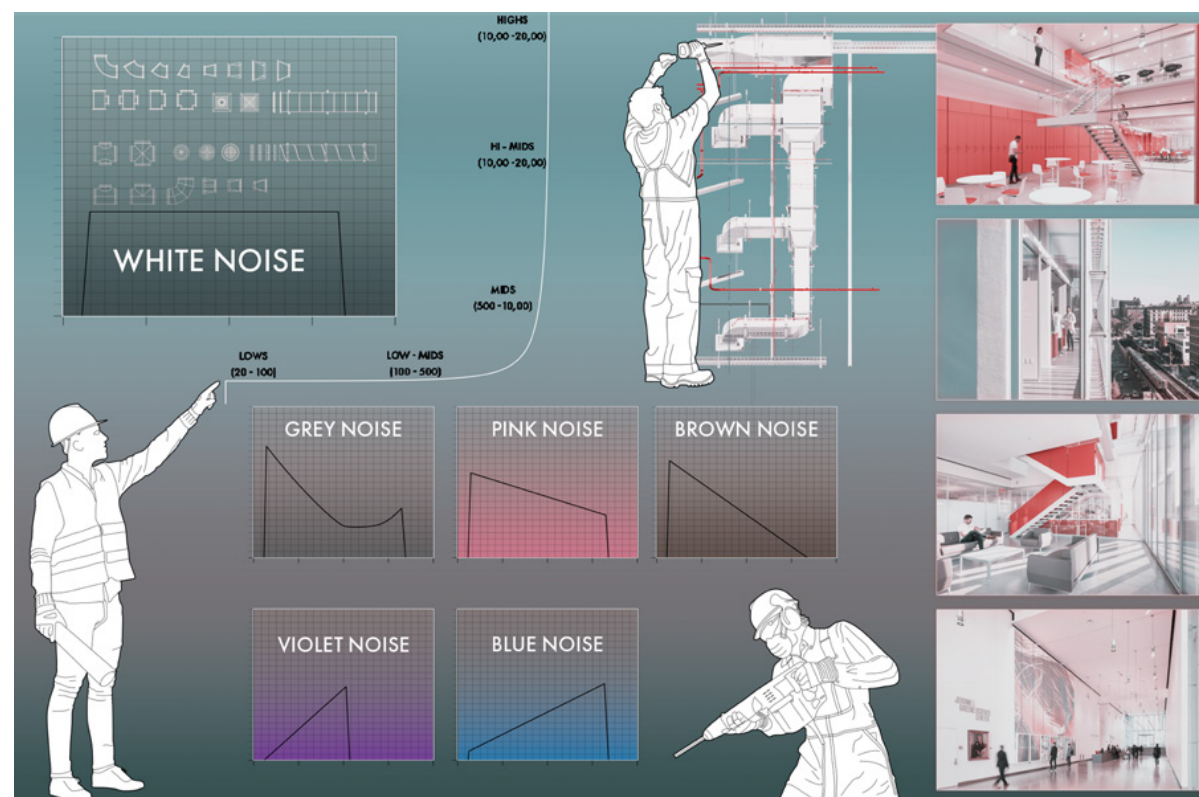
● WHISPERING WALLS ADAPTIVE REUSE

At the corner of 125th Street, Renzo Piano's Jerome L. Greene Science Center has been reimagined to harmonize with the city's soundscape. Embracing the noise of trains and traffic, the building uses aluminum to enhance acoustics and regulate temperature, turning urban clamor into calming white noise.

Inside, curved forms guide and soften sound, while aluminum cables on the facade catch subway vibrations, translating them into a quiet, rhythmic hum. This transformation creates a tranquil refuge in the city. An architectural experience defined as much by sound as by form, offering calm and clarity amid Harlem's energy.

Location: Manhattan, NY
Course: Core Studio III
Individual
Professor: Regina Teng
Term: Spring 2023





Color Noises

Different color noises. White, pink, brown; Each have unique frequencies that define their sound. White noise, in particular, combines all frequencies to create a consistent, soothing backdrop that masks other sounds, creating a calm and focused environment.





Physical Model

The new facade system's model uses wood and guitar strings to mimic how the actual building would respond to the nearby train. The wood frames the structure, while the strings, vibrating with the train's rumble, preview how the facade could convert movement into a harmonious sound element, integrating the urban pulse into the building's acoustic identity.



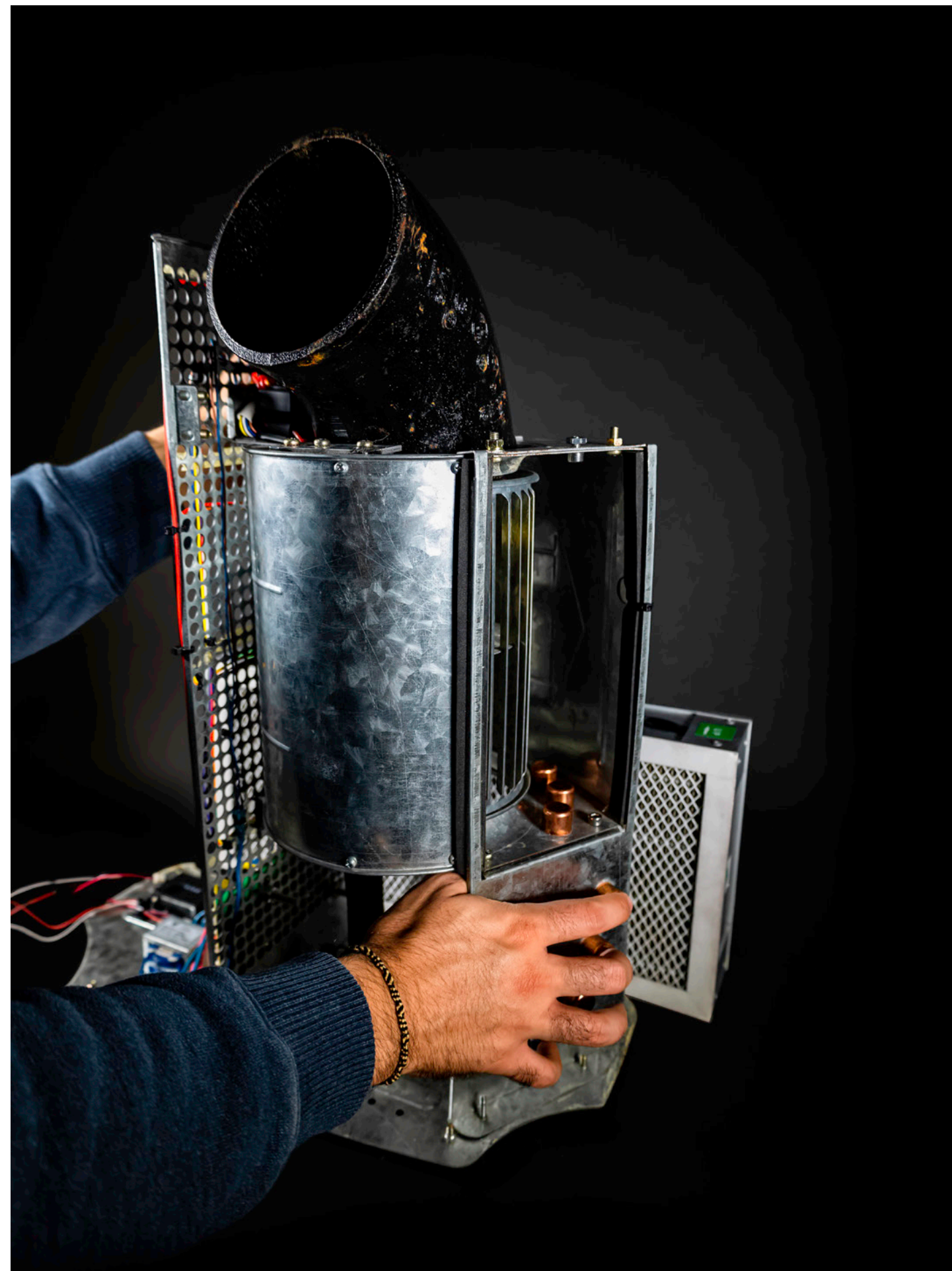
● BROADWAY'S HARMONY ADAPTIVE REUSE

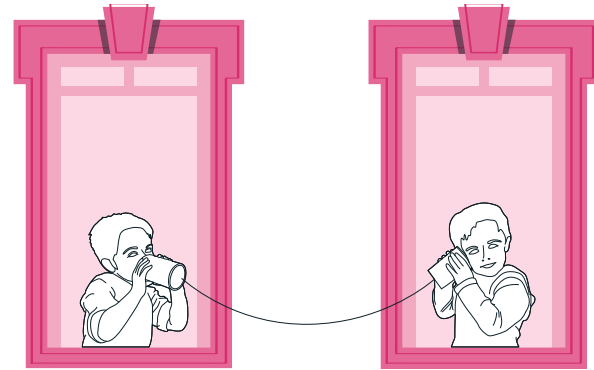
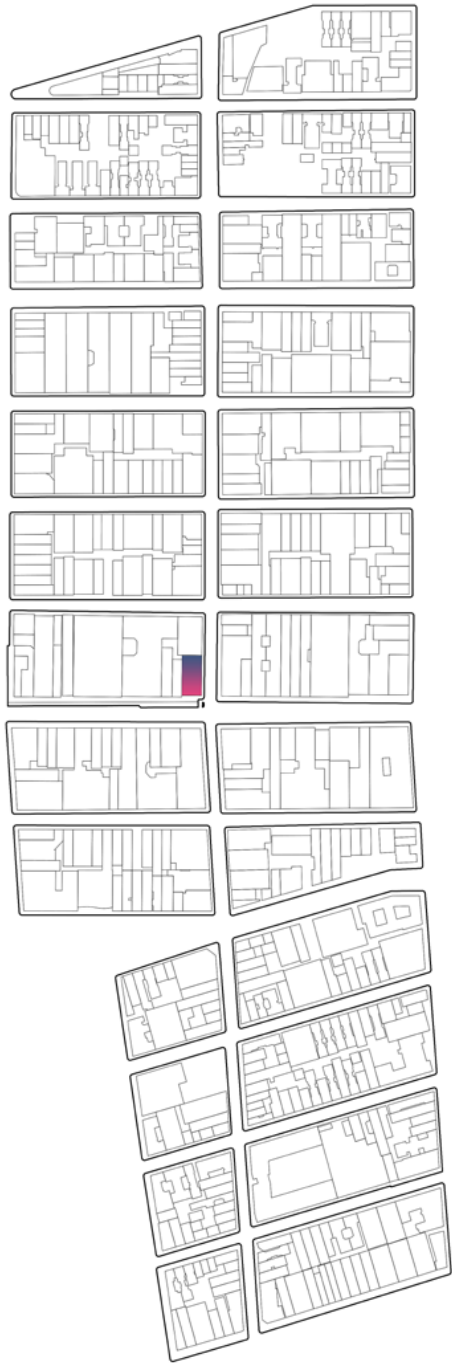
This project tackles overbuilding by reusing materials and energy, transforming a bank at Broadway and Spring Street into a musical instrument. Instead of demolishing, the structure becomes a material inventory repurposed for sound and interaction.

Using the existing air conditioning and the subway below, vibrations activate unique tones based on each material's properties. Visitors can interact with the building, creating melodies and engaging directly with sound.

Music enhances cognitive health, especially for children and older adults. This space encourages active music-making, offering both a sensory experience and a therapeutic environment through creative engagement with architecture.

Location: Manhattan, NY
Course: Core Studio I
Individual
Professor: Lindsey Wilkstrom
Term: Fall 2022

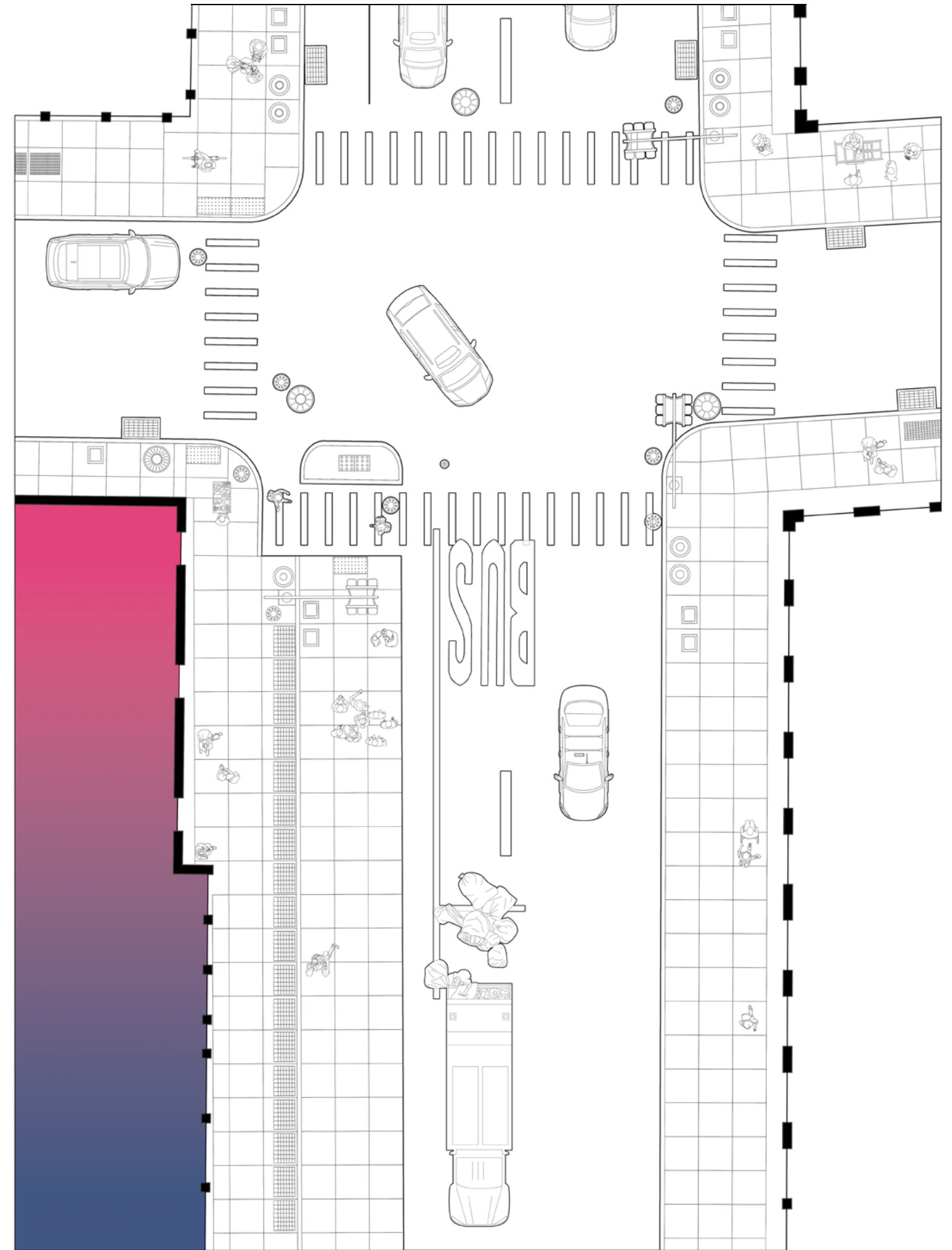


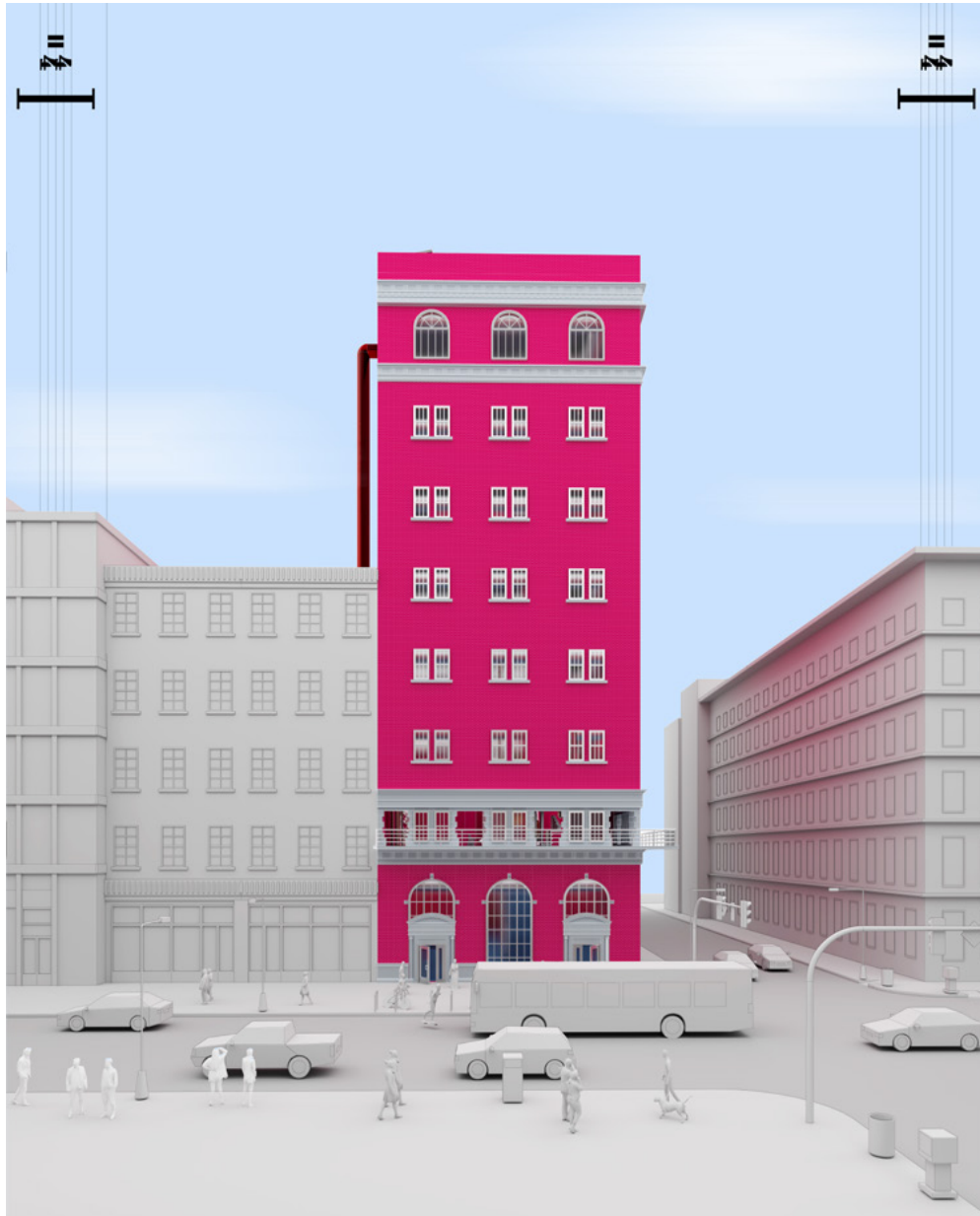


Broadway Stories

At the intersection of Spring Street and Broadway, the area is always buzzing with activity. From crowds passing by to noise from nearby shops and the subway below. It's a loud, energetic part of the city where peaceful moments are rare. That's why our building was designed to offer something different: a quiet, calming space where people can take a break from the constant noise and movement around them.

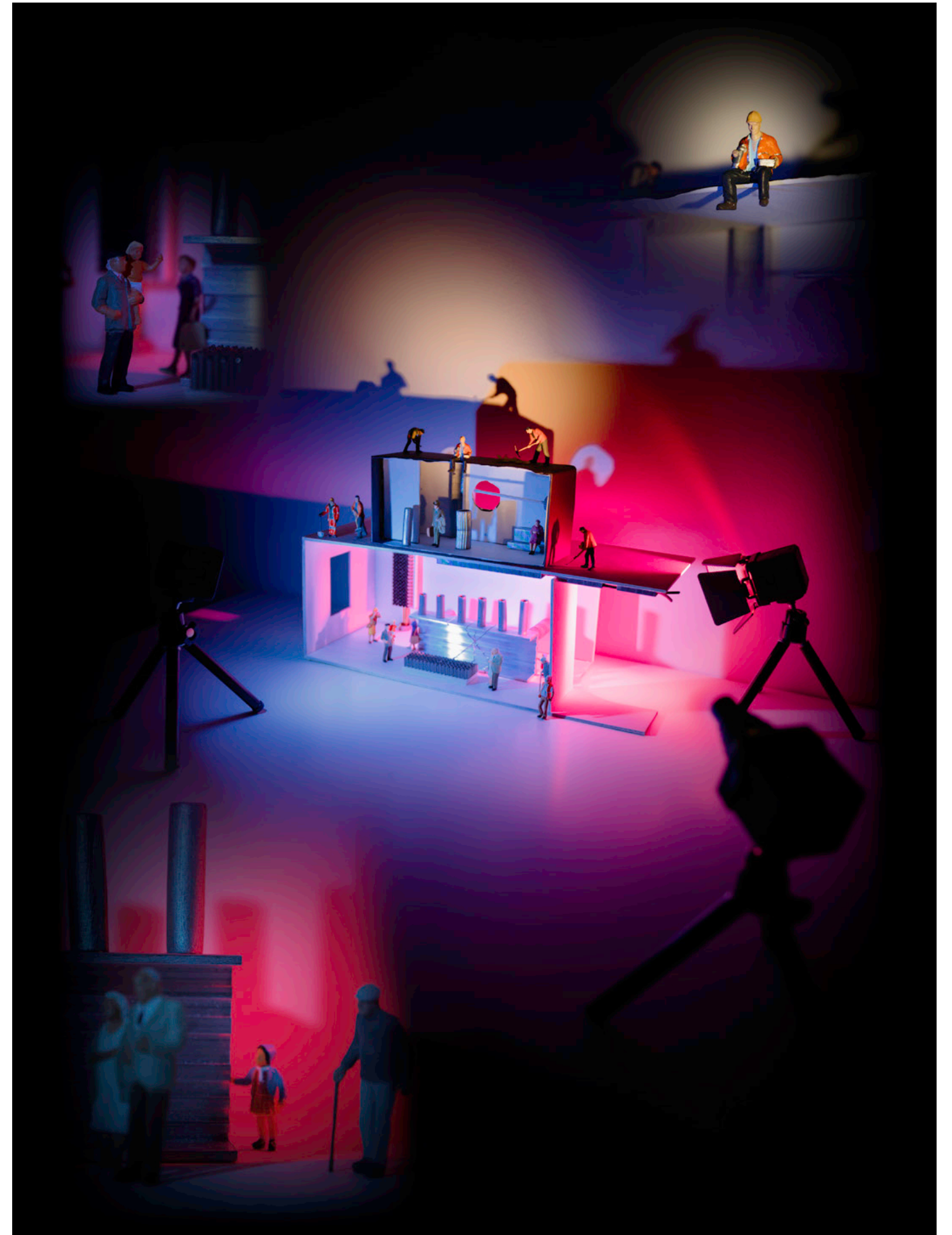
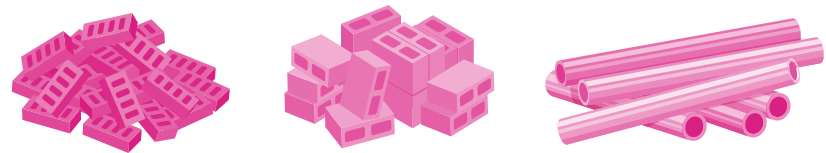
SPRING STREET

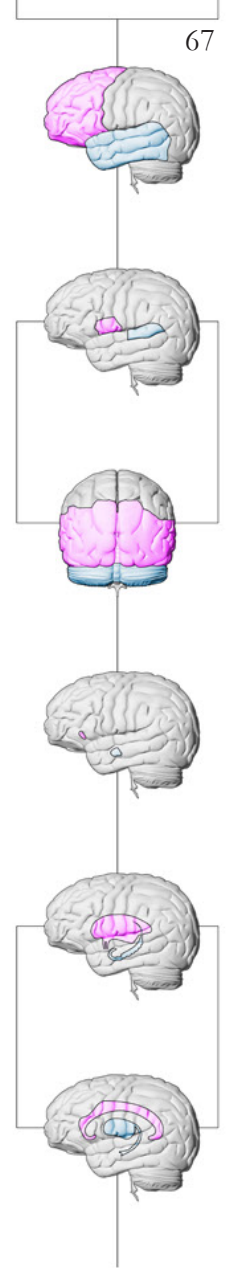
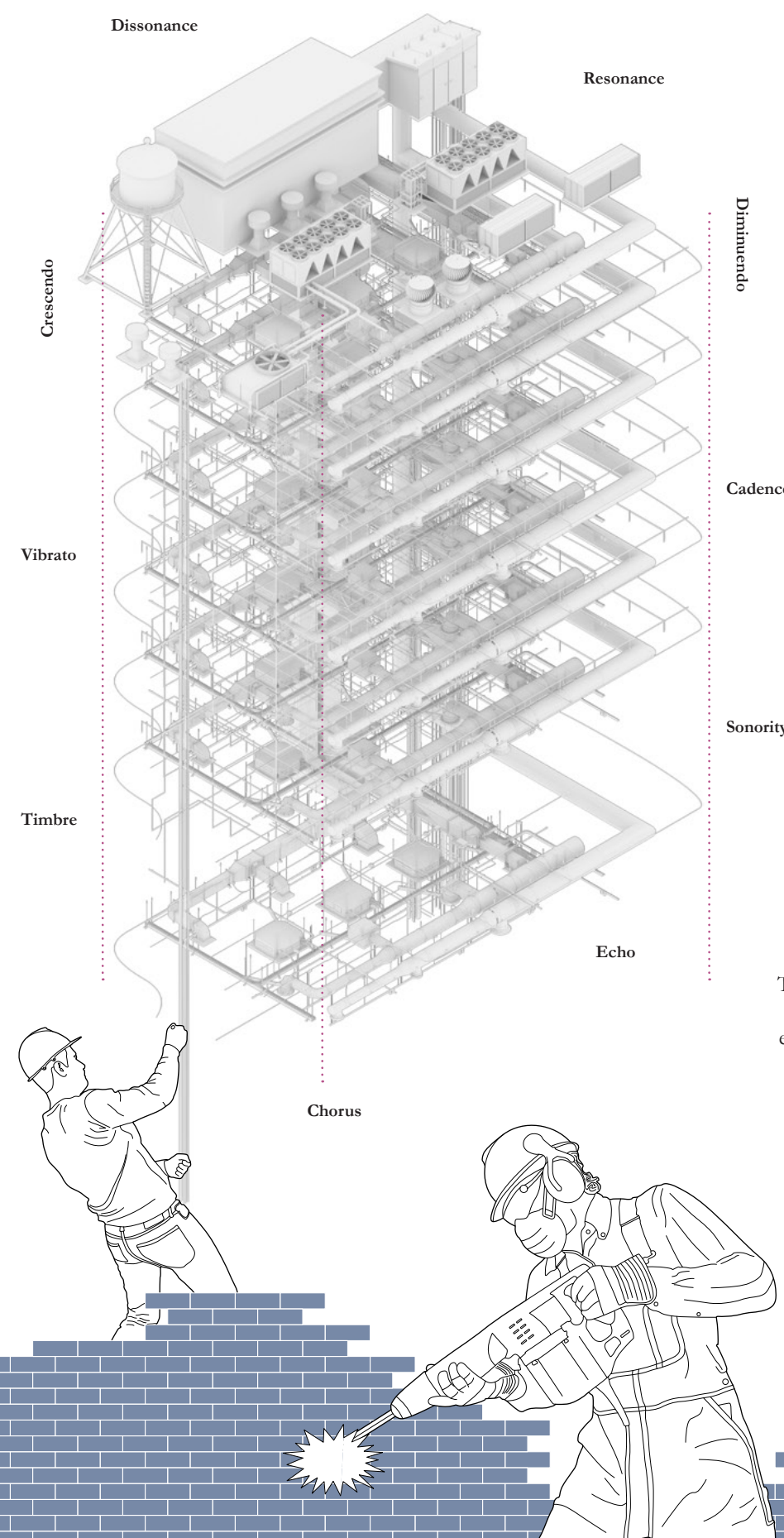
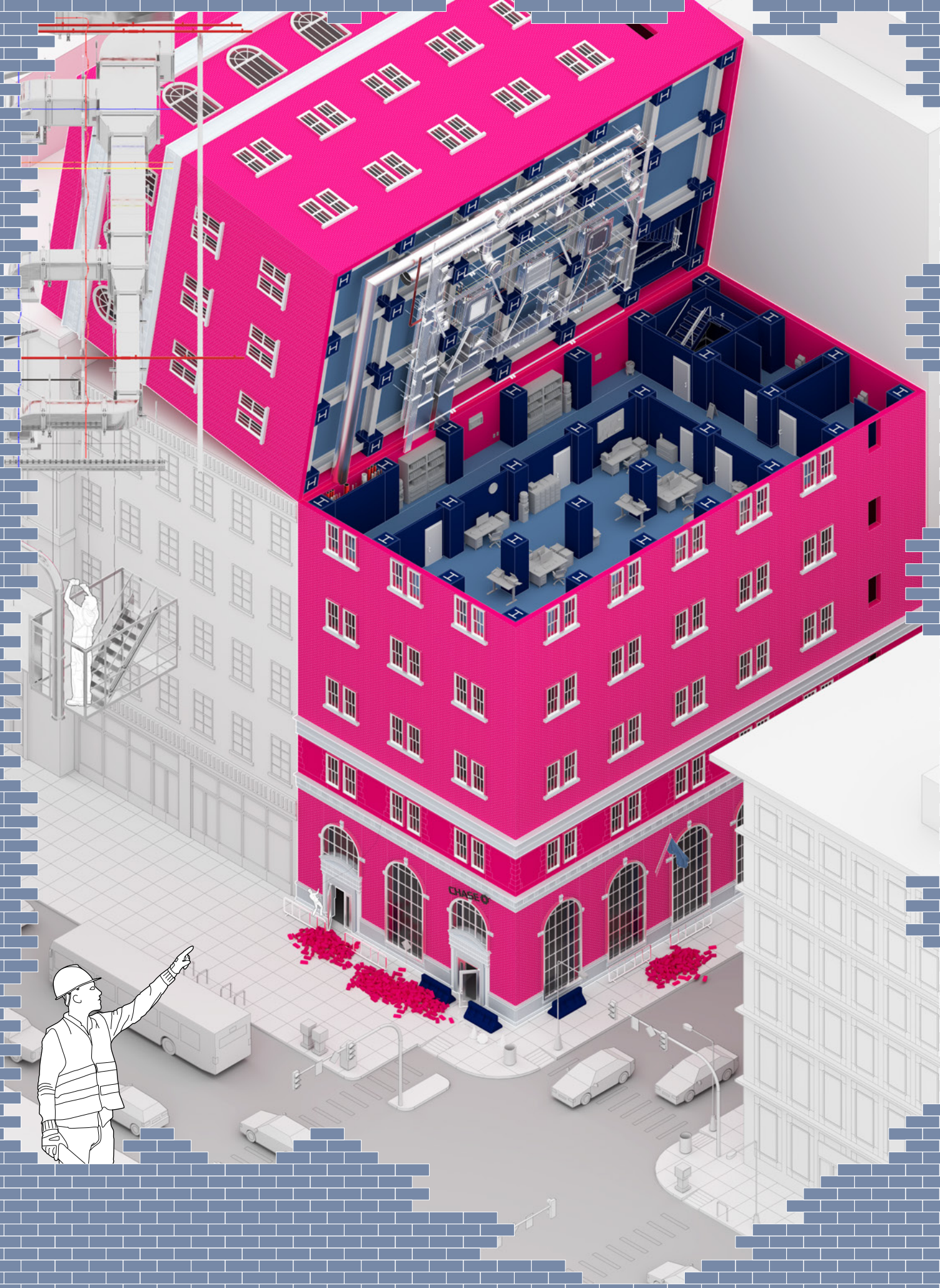




The Material Inventory

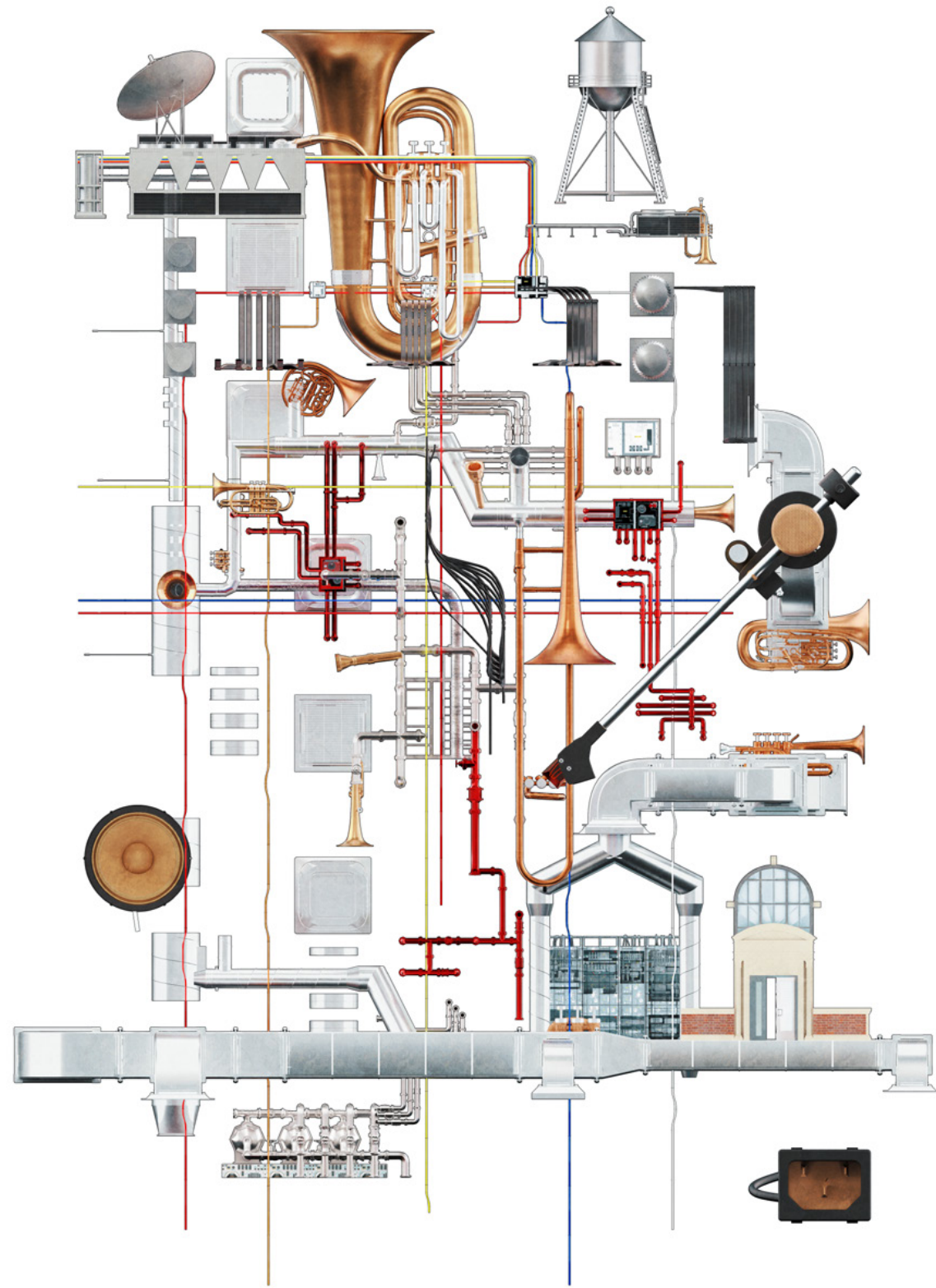
The Chase Bank building, standing at the vibrant intersection of Broadway and Spring Street in NYC, presents itself as a veritable material inventory, its varied materiality and grand scale offering untapped potential for radical transformation. Envisioning the bank not merely as a structure but as a repository of resources, the architectural vision seeks to re-purpose its abundant materials, such as metals from the air conditioning system and structural steel, to serve an entirely novel purpose: converting the building into a living musical instrument.





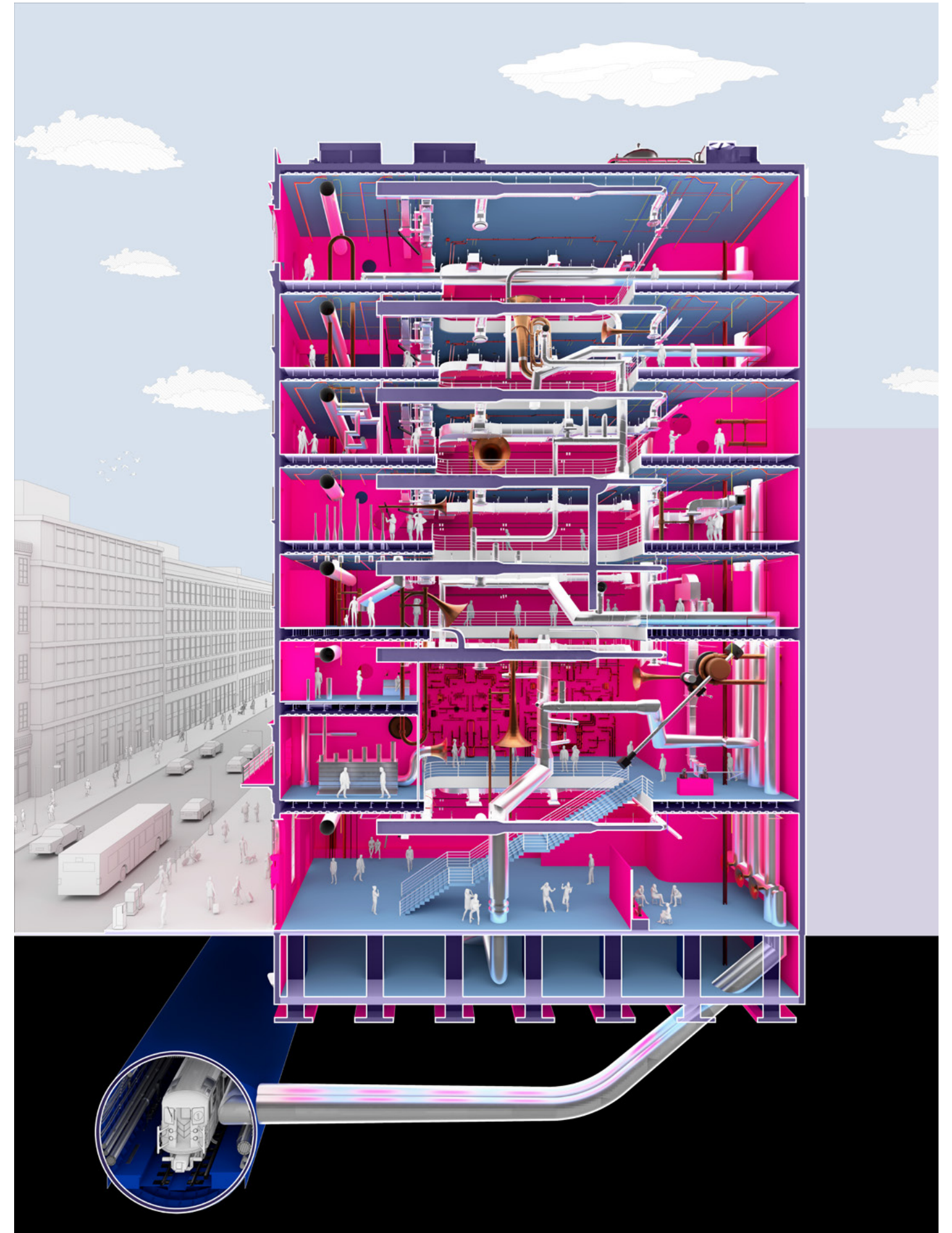
The Brain on Music

The brain's response to music works like a well-designed building, with each area playing a distinct role. The prefrontal cortex shapes emotion and the auditory cortex processes sound. Together, they form a unified system, showing how music powerfully engages our minds, bodies, and emotions all at once.



Sound Distribution

This innovative metamorphosis into an interactive soundscape is designed to have a profound impact on the city's denizens. By allowing people to engage with the building's materials to compose and experience music, it intertwines the urban fabric with the therapeutic and cognitive benefits of music, fostering a unique sensory and emotional connection with the space, enriching the lives of New Yorkers, and redefining the intersection as a hub of cultural and creative rejuvenation.



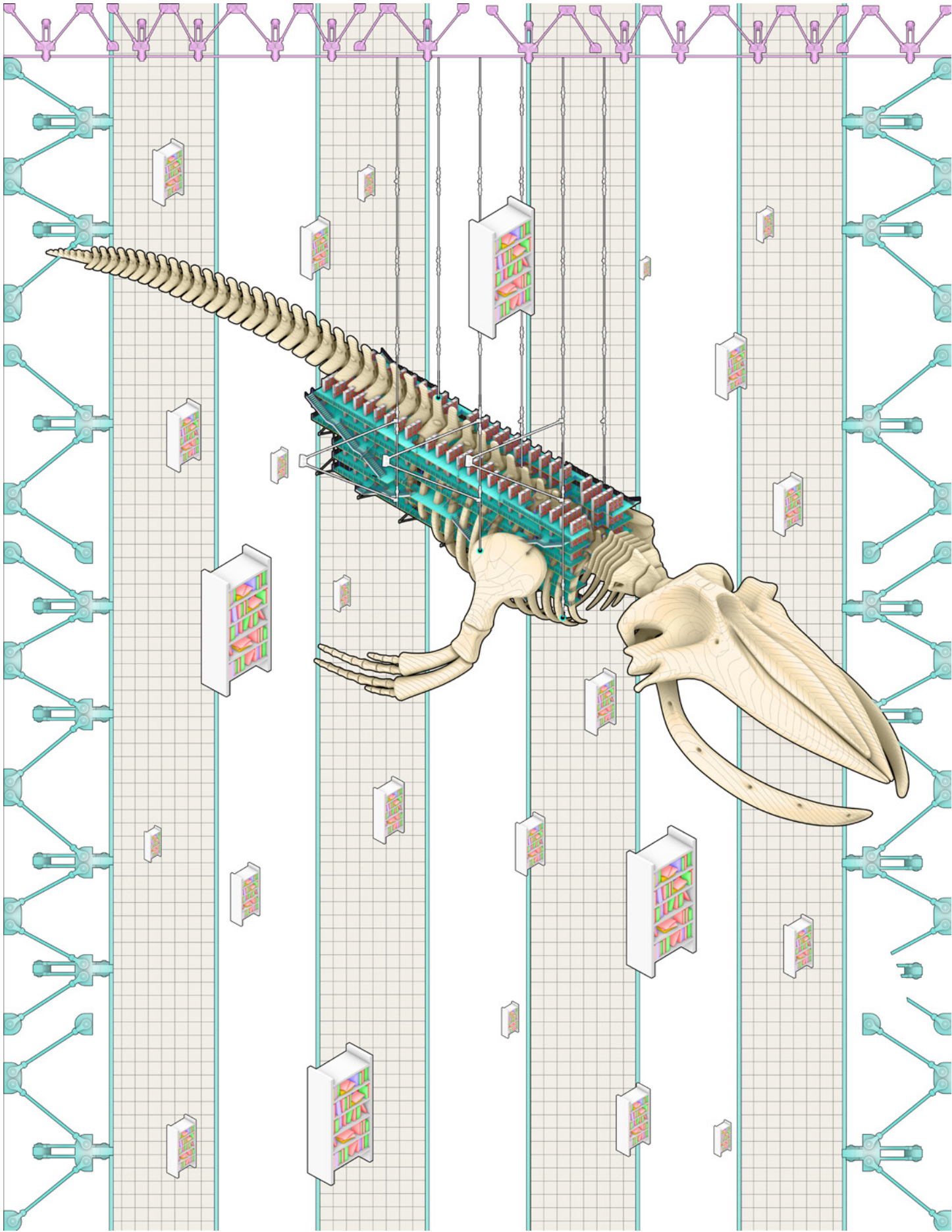
● DIGITAL ODYSSEY RETHINKING PROGRAM

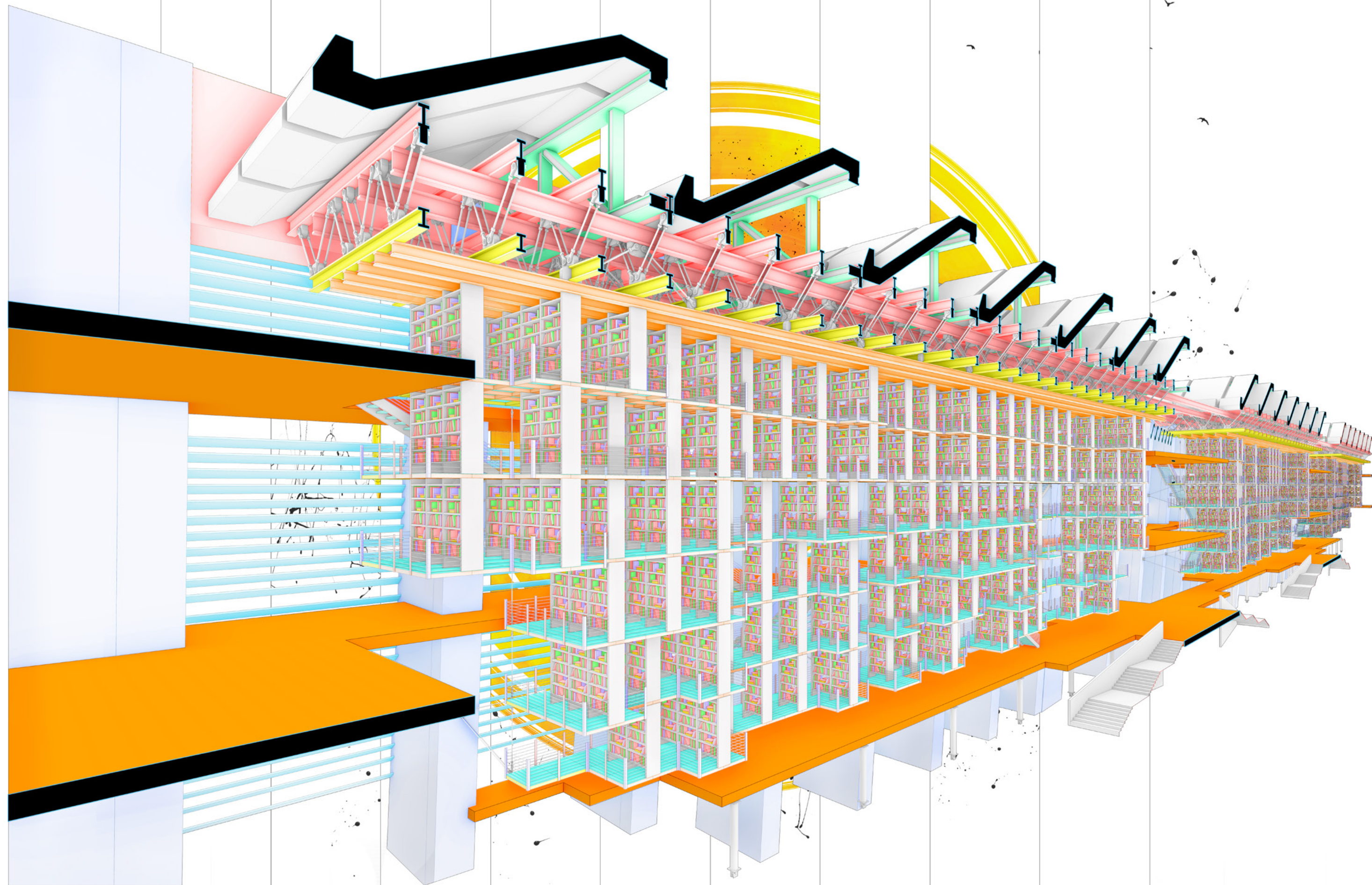
In a series of architectural drawings and renderings, I reimagined the Vasconcelos Library in Mexico City, a structure renowned for its monumental scale and futuristic ambiance.

Through 3D modeling, the library was depicted with a technological edge that speaks to the evolving concept of the library itself.

Beyond a mere repository for books. This vision addresses the decline of traditional print while opening a dialogue about the new roles a library might play in the digital age, whether as a hub for digital archives, a community space for interactive learning, or a sanctuary for diverse forms of knowledge preservation and exploration. The renderings challenge the it's program and invite us to wonder about the future of libraries in a world where information transcends the page and becomes an immersive experience.

Location: Mexico City, Mexico
Course: ADR I
Individual
Professor: Joshua Uhl
Term: Fall 2022





● UNITED ATMOSPHERES AIR PURIFIER

In our GSAPP class project, we developed 3D-printable hydroponic pods to enhance indoor air quality. These pods, equipped with fans and filled with expanded clay balls, improve airflow through plants, targeting fine particles and harmful gases like VOCs. Installed at GSAPP, this system not only utilizes photosynthesis but also leverages the purifying properties of plant roots, offering benefits like edible produce. This innovative, low-maintenance solution underscores the importance of clean air for occupant well-being. With most of the world living in areas exceeding WHO air pollution guidelines, addressing indoor air quality through such sustainable practices is increasingly essential.

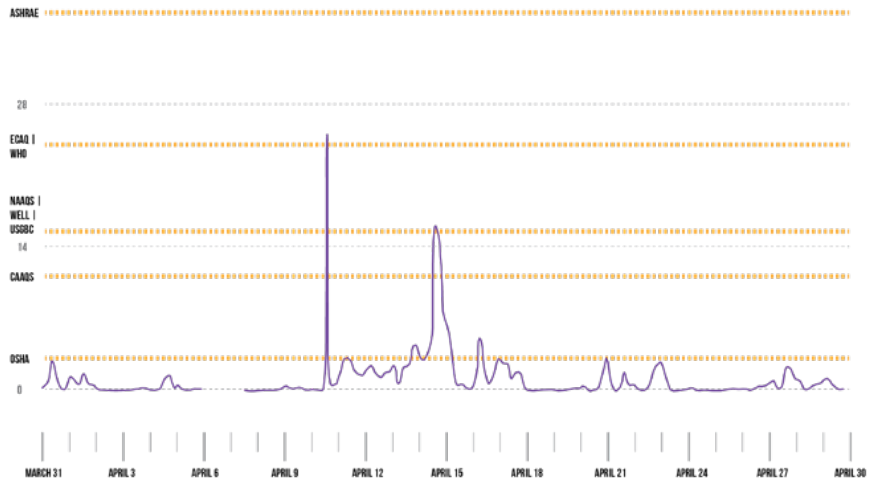
Location: Manhattan, NY
Course: United Atmospheres
Class
Professor: Andreas Theodoridis
Term: Spring 2023



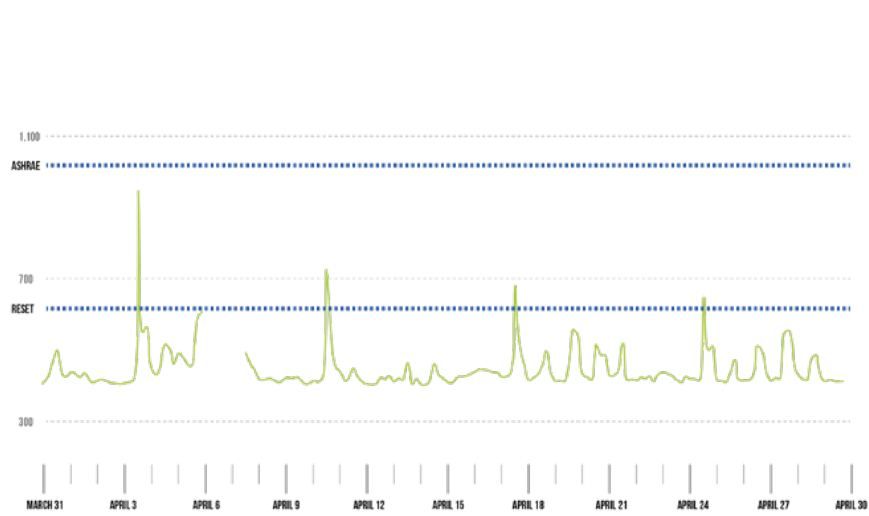
CASE STUDY: GSAPP, COLUMBIA UNIVERSITY

Common Contributors Within The School

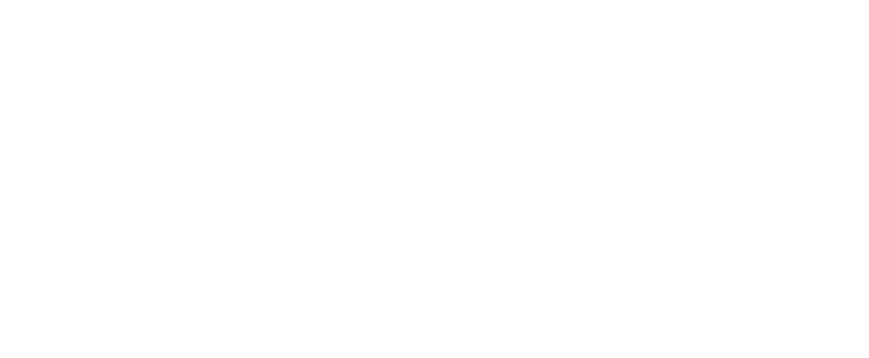
Recorded Data



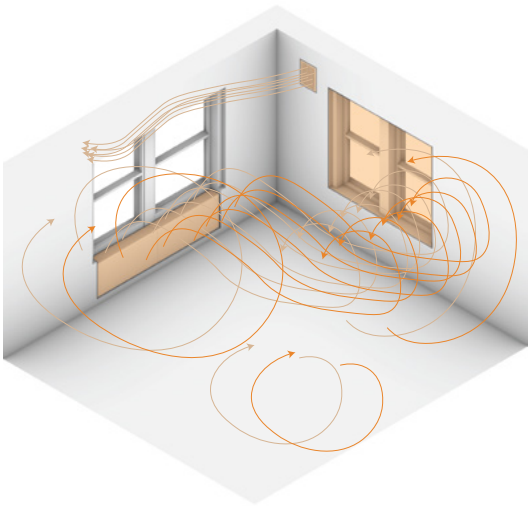
Particulate Matter Data



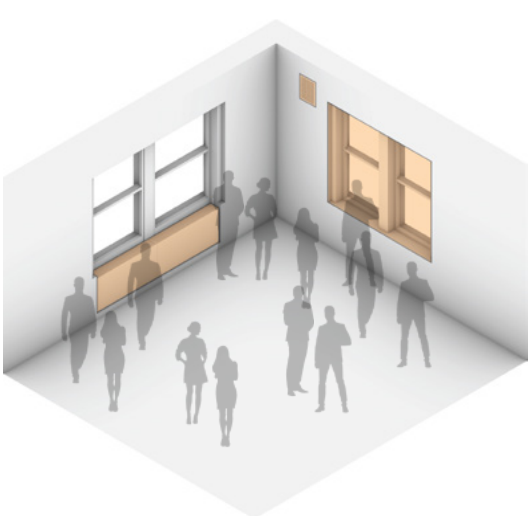
Carbon Dioxide Data



Classroom of Recorded Data



Lack of Ventilation



Increase in Capacity

Edible Plants

While also purifying the air of Carbon Dioxide via photosynthesis, the plant will provide an extra layer of available nutrients by producing edible fruit.

Water Dispenser

The water dispenser allows for the purification system to be self sustainable and low maintenance

Fan

A fan is used to push the polluted air through the root system which is more successful in purifying the air rather than pulling air through the root system

Soil Barrier

A barrier system is put in place to separate the excess water and expanded clay soil

Funnel

The funnel is used to capture excess water and is recirculated back into the system to avoid any water waste

Expanded Clay Balls

Expanded clay balls are used in lieu of soil to accommodate for better airflow through the root system of the plant. By using expanded clay, the water remains cleaner for a longer duration of time and prevents mold and mildew from growing requiring minimal maintenance.

ARCHITECTURE PORTFOLIO

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