



ARCHITECTURE

LINGFAN JIANG

Selected Works 2022 - 2023

***SELECTED
WORKS***

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Studio Project | Spring 2023

1 6 | **AIRCO**
Studio Project | Fall 2022

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Studio Project | Summer 2022

3 8 | **CURTAIN WALL**
Building Science & Technology | Fall 2022

4 4 | **ULTRAREAL**
Visual Studies | Fall 2022

from SOIL to AIR

East Village | New York, USA

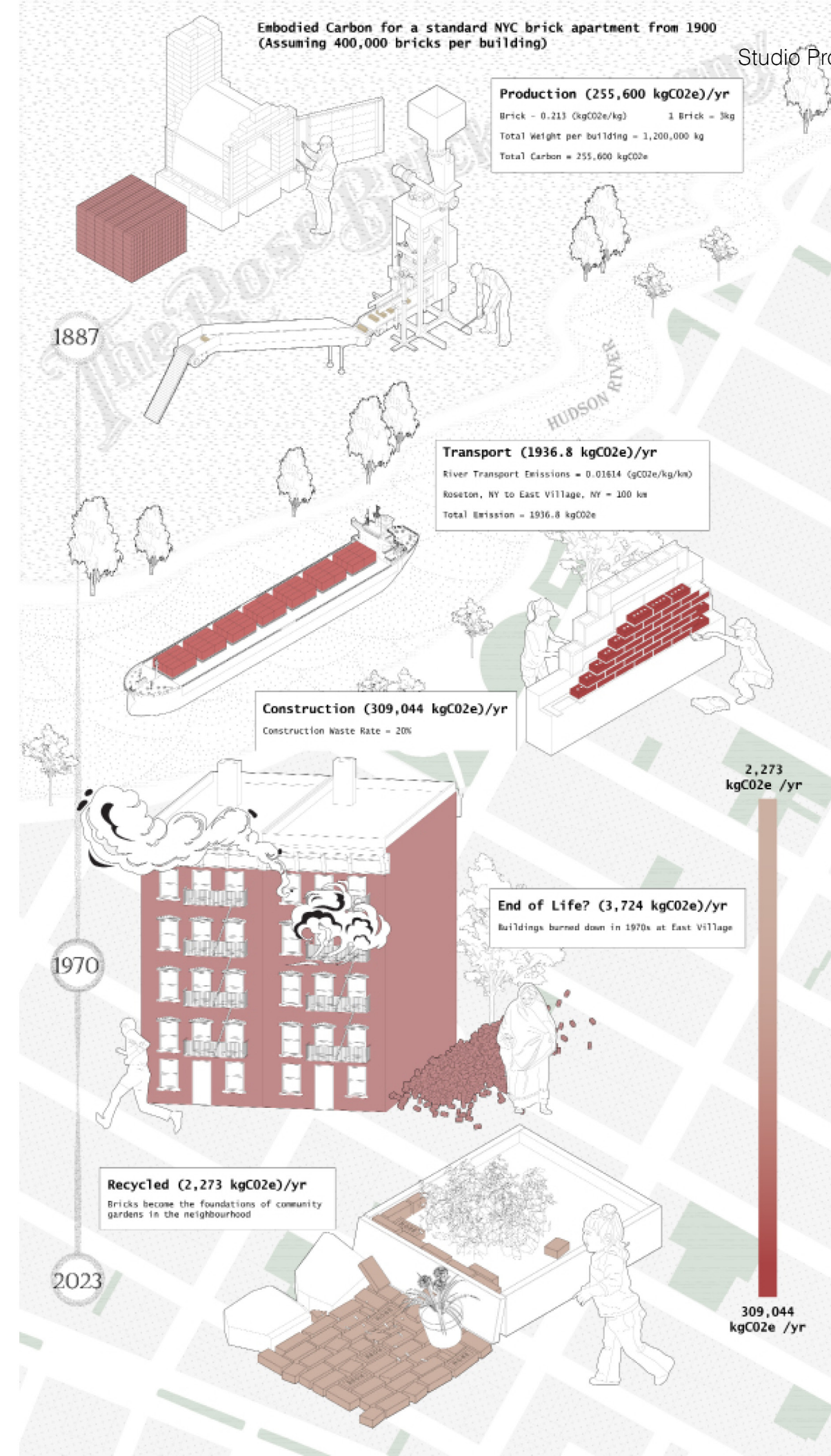
In Collaboration with: Augie Schott

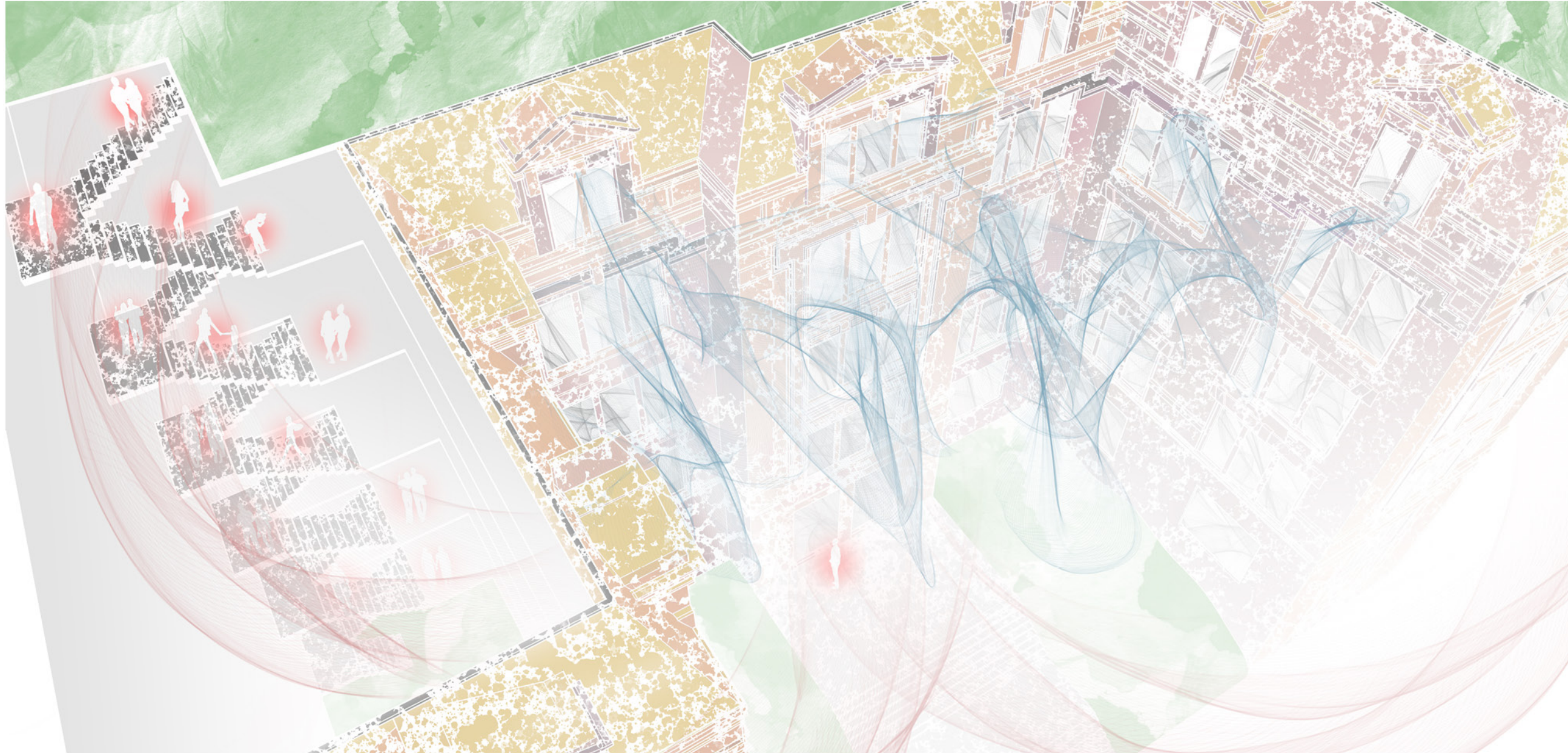
Contribution: Conceptual Design (50%),
Technical Drawings and Renderings (100%)

From the start of the semester we approached Building 64 with a reverence for the land on which sits, and the community that it's a part of. This reverence was inspired by our examination of a Brick created by the Rose Brick Company, found in La Plaza Cultural just down the block from Building 64. As we dove into the history of the Rose Brick and the support it now provides to the community gardens and their composting functions, we focused on the interconnected themes of the passage of time, decomposition, and recomposition.

When we brought these ideas to the building, we found ourselves struggling to define a future typology, use, user, or program. The building seemed to be resisting us. Instead of forcing ourselves past this resistance, we decided to embrace it, and explore it through six vignettes that seemed to represent various ecologies: Material, Sociohistorical, Human, Terrestrial, Aerial, and Memory (& Perception)

It is through our exploration of these vignettes that we'd like to challenge you, as stewards of the built environment, to imagine how this study can be a model for development that actually transcends concepts of typology, program, use, and user, and honors these densely rich arcs of Building 64's own experiences.





Material

From a rose brick as the literal foundation, to the concrete masonry units employed to secure a vacant building, the physical materials found in Building 64 are a living history of construction materials. The practical, the useful, and the cost-effective. The arc of their lifespans - following the passage of time - has outlasted, and will continue to outlast, the generations of humans that have sought shelter, exploration, education, and community within the spaces these materials create. The building itself is the sole organism that is aware of the multitude of stories that have passed through the spatial presence that it occupies within the urban fabric of New York City; the materials are the surviving imprint of those human and nonhuman stories past, and the canvas for the stories of the future. The materials of Building 64 are multidirectional, sensing and recording from within, while expanding and sharing without. The materials do not demarcate a boundary, rather they represent a porous invitation to share space.



Sociohistorical

Use and User are inextricably tied to our modern understanding of Program. The rigidity that this places on Real Estate inherently limits a building's ability to respond to human and nonhuman needs. In the 1970s, we saw Building 64 reject the prescribed Use and User amid the fiscal and spiritual crisis of New York City. When the binary systems of zoning and building codes - implemented with positive, yet flawed intent - were ignored because the city was in crisis, we saw the building free itself to human and nonhuman whims. The presence of CHARAS/El-Bohio throughout these years, as quasi-legal squatter tenants, challenged the socially restrictive nature of form-based zoning. Without the shackles of what it's allowed to be, we can look at Building 64 as an exploration of what could be. The socialization of the building has evolved arguably independent of external definitions and interventions.



Human

Humans in Building 64 represent a complex interdependence, one not subordinate to the other. A typological approach asks, “What is this building for? What can this building do for me? What does this building do for me?” Instead, this manifesto asks, “Who is this for?” The subject and object become interchangeable. Building 64 is, and is not, for the human user. The human is, and is not, for the support of Building 64. In examining the array of ways that humans intervene in nature, we can look at the handful of times that the intervention is mutually beneficial. An apple farmer pruning and grafting an apple tree allows the tree to maintain its healthy growth, while maximizing the food production for the farmer. A gardener deadheading flowering blooms allows for the maximization of water use, secondary blooming, and enhanced supply for pollinators, enabling the growth of pollinator-dependent foods. Using these natural examples, a nuanced understanding of why humans should intervene at Building 64 should prioritize the subject object interchangeability when approaching the work. In its current state, building 64 has been physically prevented from a natural exploration of “Who is this for?”, and so it is appropriate for a human-based intervention to remove these preventative barriers.



Terrestrial

An excavation of the ground floor brings Building 64 to grade with the sidewalk. The physical leveling of access to the public realm posits a blurring of private property and community access. In Real Estate Development, the Residual Land Value is a key metric in assessing the feasibility of a development. Derived through assumptions of what a building can economically produce on a given site, the Residual Land Value is dependent on market assumptions of the site's future use; it does not assign an inherent value to land itself. However, the value of land communally, socially, and emotionally is immeasurable. The introduction of a composting function on this literal ground floor intensifies the questions of land, ownership, and development. The act of visiting the site at the naturalized ground floor with a composting facility, then leaving with the terrestrial product of that cycle i.e. compost, represents a type of un-development that aligns with the Theory of Nonlocality. Acting as a vehicle of value, the compost travels away from the land on which Building 64 sits and generates related yet new value at sites throughout the city. Through this provision of soil and compost as an extension of the land, Building 64 presents a model of reparative un-development, challenging the restrictive assumptions of private property and the reductive nature of Residual Land Value that limits potential value to use.



Aerial

Of all the ecologies, air is the easiest to understand through the multidirectional, expansionist lens. An invisible mass that fills and moves freely, carrying with it the qualities of its most recent presence: scents, feelings, temperatures. Where the buildings meet the sky should philosophically mirror the ground level challenge that the provision of soil and compost makes on notions of private property and land. At this aerial expanse, Building 64 could be an expansive and contractive model. Through an expanding ecological reach to the neighboring structures, a sharing mechanism is created that emits a physical and philosophical power, while simultaneously drawing in other human and environmental users. Envisioning undevelopment becomes realistic through this lens as neighboring buildings determine that the social, ecological, and communal value gained through an interconnectedness outweighs the restrictive ideas boundaries, privacy, and space.



Memory & Perception

Each time you return to a space, you're refreshing your memory, but with slight variances caused by the passage of time. This is most acutely seen in nature. Nature's dramatic changes are seen because their time scale is much more compressed than the materials of the built environment. However, we still notice a perceptive shift in the places created by the built environment as our current and future experiences integrate with our historical memories of buildings and places. When we revisit buildings from our childhood, we're struck by how normal their scale seems in comparison to our earlier memories of the same buildings. These memories and perceptions are multidimensional, directionless associations. Like the cellular structure of a plant, the memories are discrete yet interconnected, a web of recollections informing the present and amending or reinforcing the past. The cellular, honeycomb structure is transcalar and transmaterial; it represents a human's physical presence within a building, a memory, or an imagination. An awareness of this subjective layering introduces opportunities for practitioners of the built environment to integrate memory as a reparative tool in the development process.

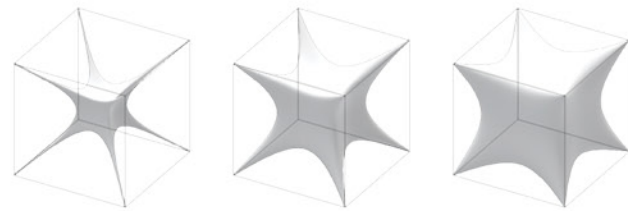
AirCO

a cyborg company

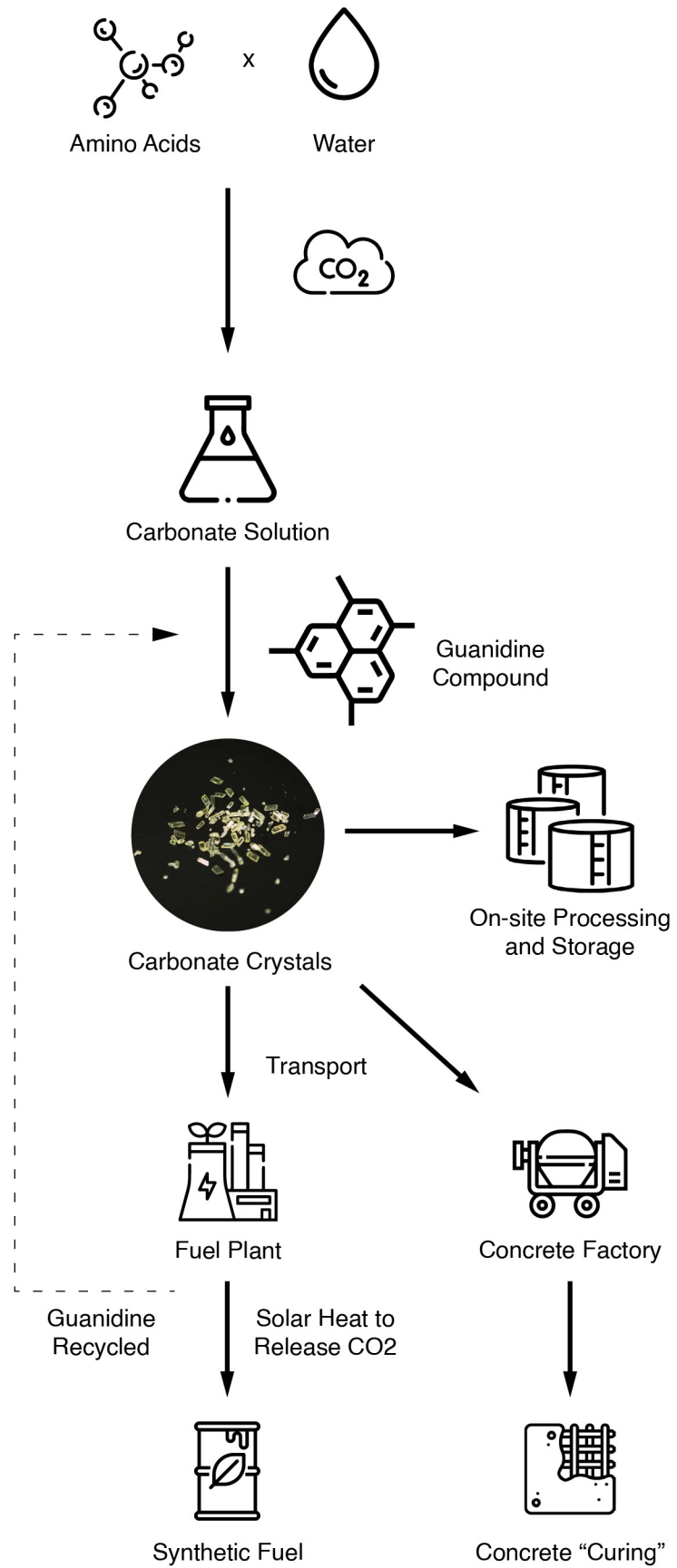
In Collaboration with: Yuntian Zhang

Contribution: Conceptual Design (40%),
Technical Drawings and Renderings (50%),
Website Development (90%)

<https://fjiang1996.wixsite.com/airco>



In AirCO, we are taking advantage of the automation to build good machines, machines that are not aiming for optimization solely, turning the heavily emissive factory line into a self-cleaning, self-digesting cyborg. The idea of optimization is embedded in modern and contemporary every-day machines like air conditioner, computers, microwaves, and so on, aiming for production rate and quality as high as possible. A **good machine** like AirCO cyborg, on the other hand, is constantly negotiating with itself, contesting its own birth and creation, eating up its footprint along the process of its completion.



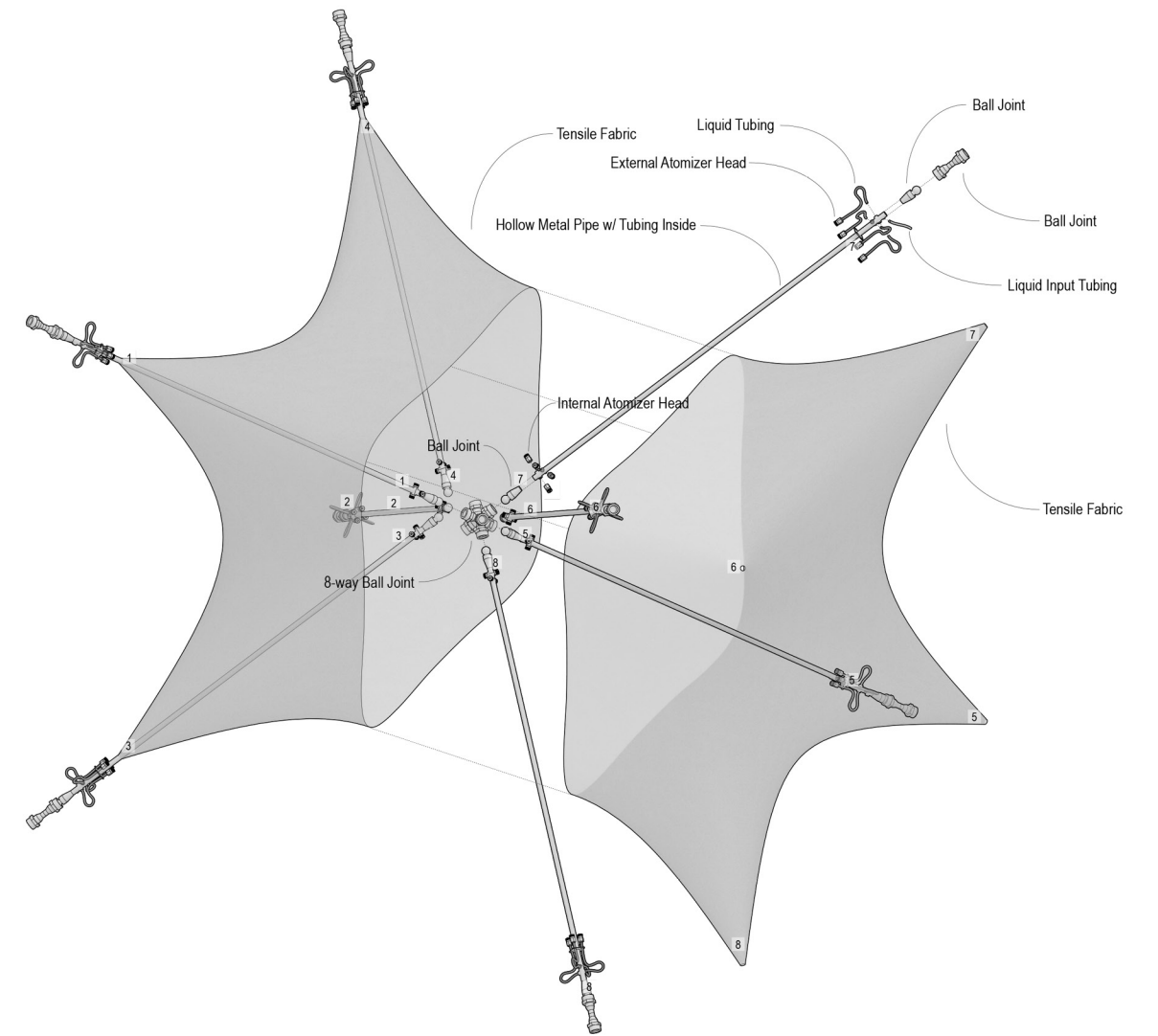
Crystallization

Existing carbon capture and storage technology can only slow down the carbon emissions of large point sources but cannot treat the already accumulated CO₂ in the environment. Crystallization provides a simple strategy to capture CO₂ **directly from ambient air**. The reactive process forms insoluble crystals that trap CO₂ in a carbonate form in a dense hydrogen bonding network. The process is reversible by heating the crystals to recycle the solution and CO₂ for other uses.

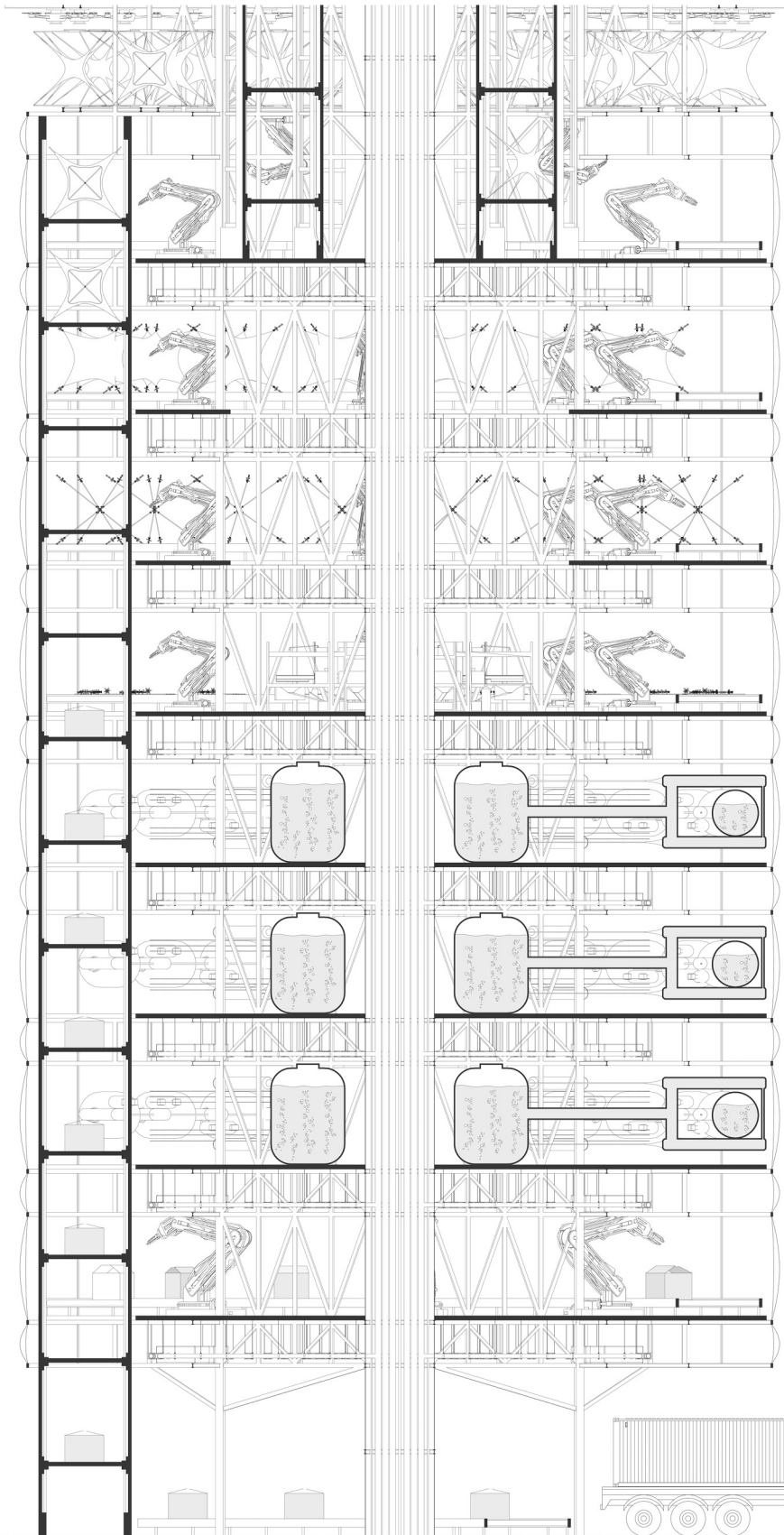
The recycled CO₂ from the crystallization process can be reutilized in power production, concrete production, and urban farm greenhouses that use CO₂ to facilitate photosynthesis reactions in plants. The recycled guanidine compound can be turned into solutions for future crystallization processes.

AirCO cyborg-01

AirCO cyborg-01 is a mechanization of a natural process - crystallization. It functions as a cybernetic organ for architecture and the environment by grafting it onto the subject and **feeding on the CO₂** released from mechanical systems, factories, and vehicles. The unit responds to the CO₂ concentration values in the surrounding atmosphere and captures CO₂ through the crystallization process. The unit is designed to be **replicable, flexible,** and **deployable**.



AirCO Tower
(Bottom Half)



Sorting Deck

Pneumatic Assembly

Frame Assembly

Parts Printing

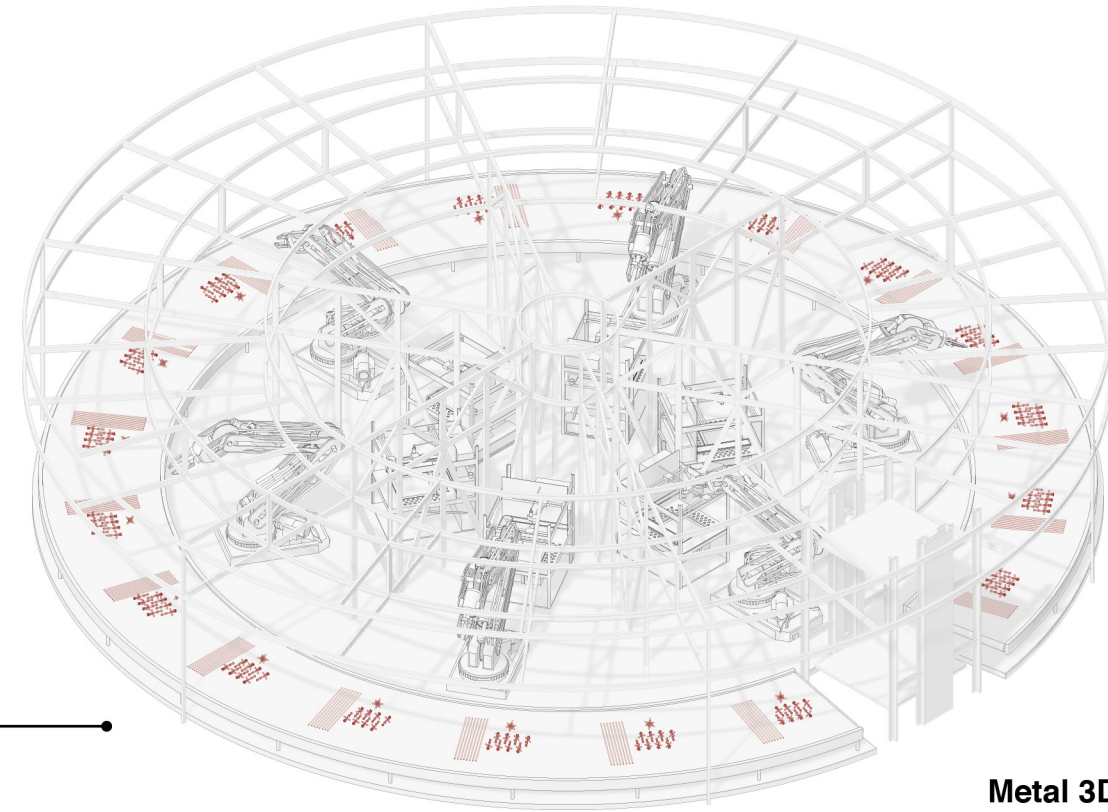
Amino Acid Storage

Greenhouse Gas Storage

Synthetic Fuel Storage

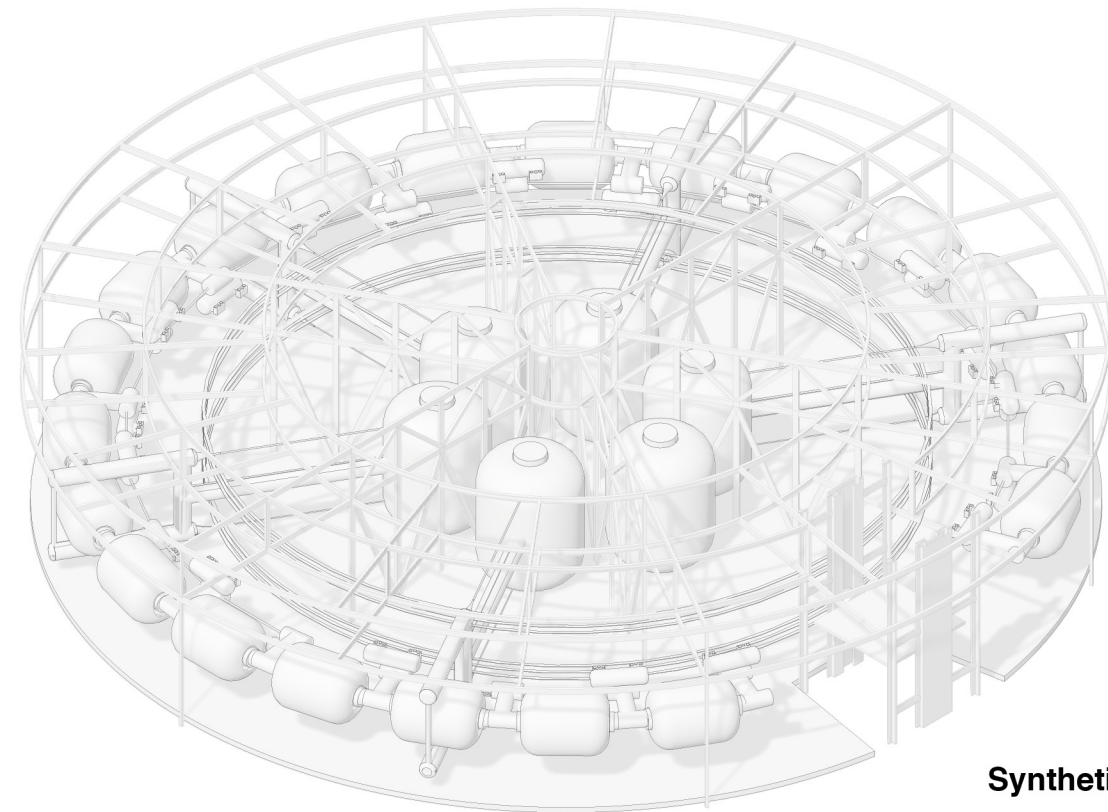
Sorting Deck

Loading/ Unloading Port



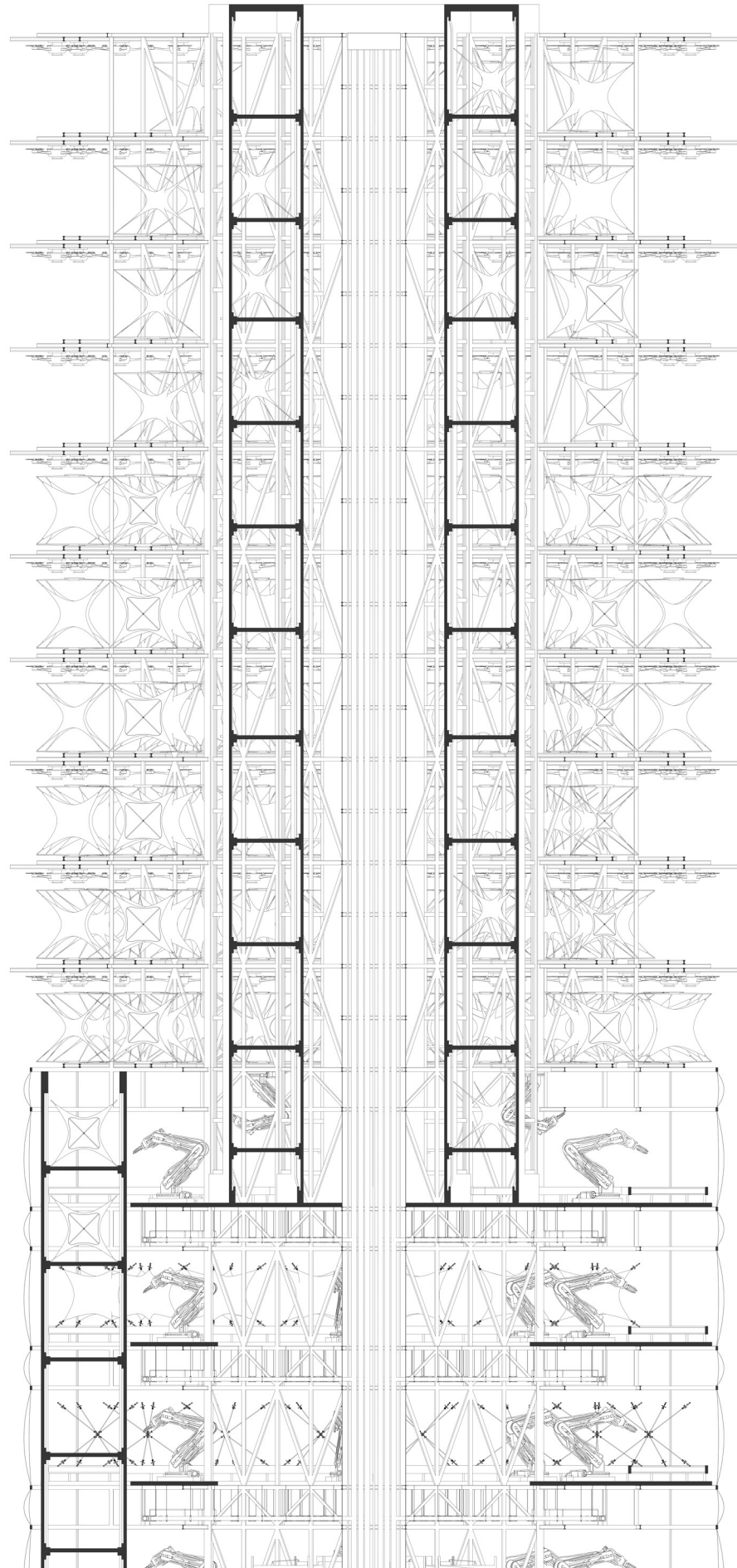
Metal 3D Printing

We use metal 3D printing method to manufacture the component parts of the units.



Synthetic Fuel Storage

We provide on-site crystal process and synthetic fuel storage service.



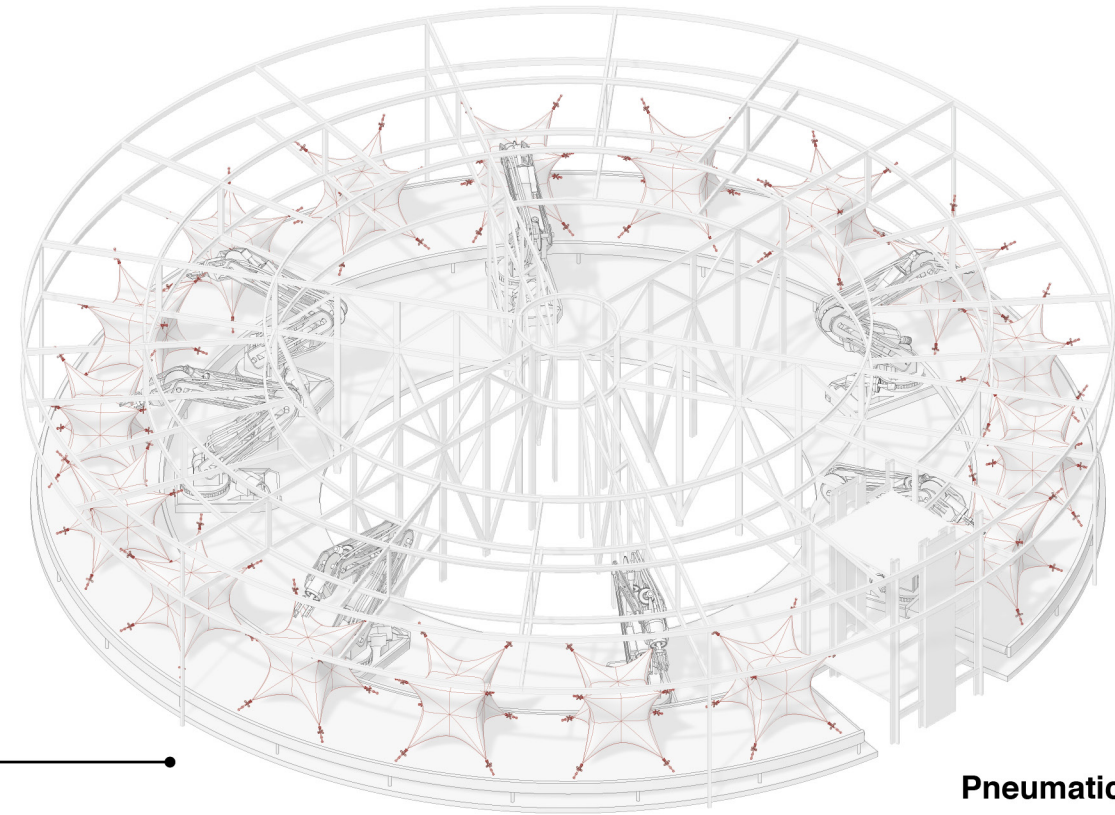
AirCO Tower
(Top Half)

Storage & Deployment Deck

Sorting Deck

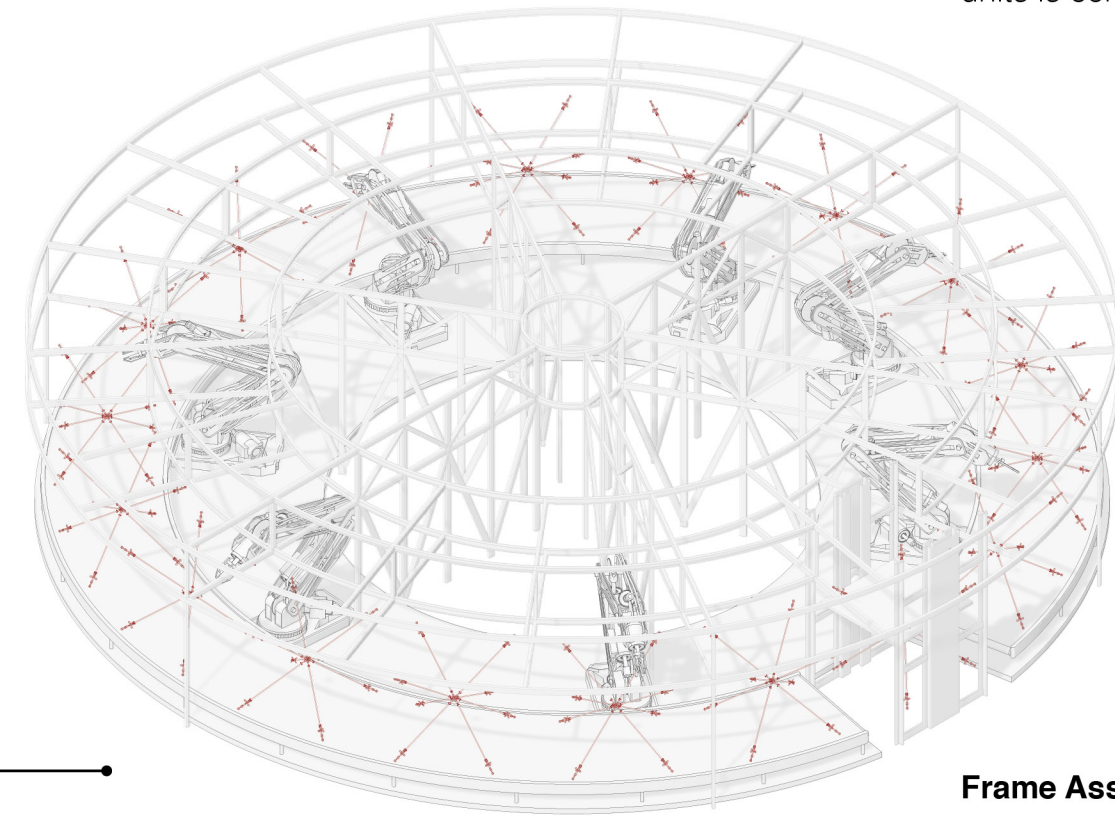
Frame Assembly

Frame Assembly



Pneumatic Fabric Install

After the pneumatic fabric is installed, the fabrication of the units is complete.



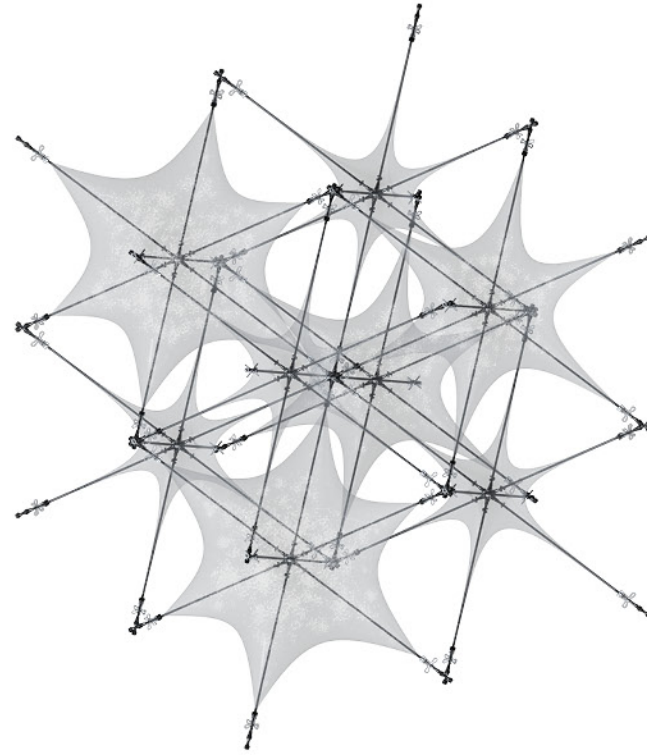
Frame Assemblage

As the parts are conveyed upwards, the frames are assembled.

Alpha Test

Earlier this fall, we carried out the first field test on the **Cross Bronx Expressway**, NY. Piercing through the city of Bronx, this intervention of Robert Moses has caused heavy impairment to the city development, community welfare and environmental conditions.

As one of the busiest and most congested traffic venues in New York City, the daily truck traffic on the CBE is twice the amount on the neighbor highways, major Deegan, and Bruckner expressway. By applying the average number of emissions per mile by each passenger car and truck, the estimated **annual emission** on CBE would take **560 Central Parks**, absorbing emissions non-stop, for an entire year. This makes the CBE the perfect and "fertile" ground for AirCO interventions.



Annual Emission of Greenhouse Gases on CBE

Trucks: 441714 kg CO2 per day
 Passenger Cars: 254722 kg CO2 per day
 Total: 696436 kg CO2 per day

= x 560



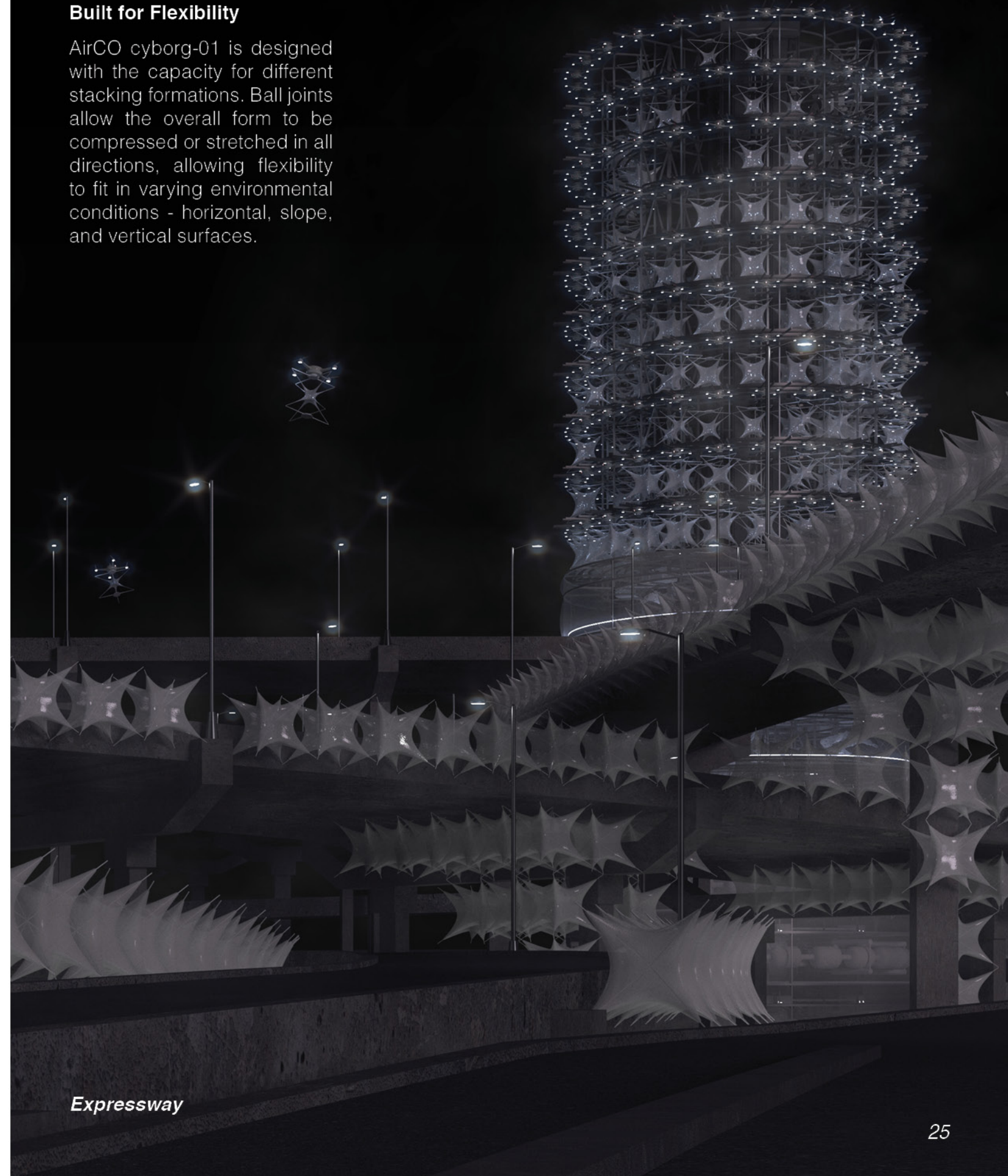
Annual Absorption of Greenhouse Gases by Central Park
 = 453592 kg CO2 per year



Sound Simulation
 (Before & After Deployment)

Built for Flexibility

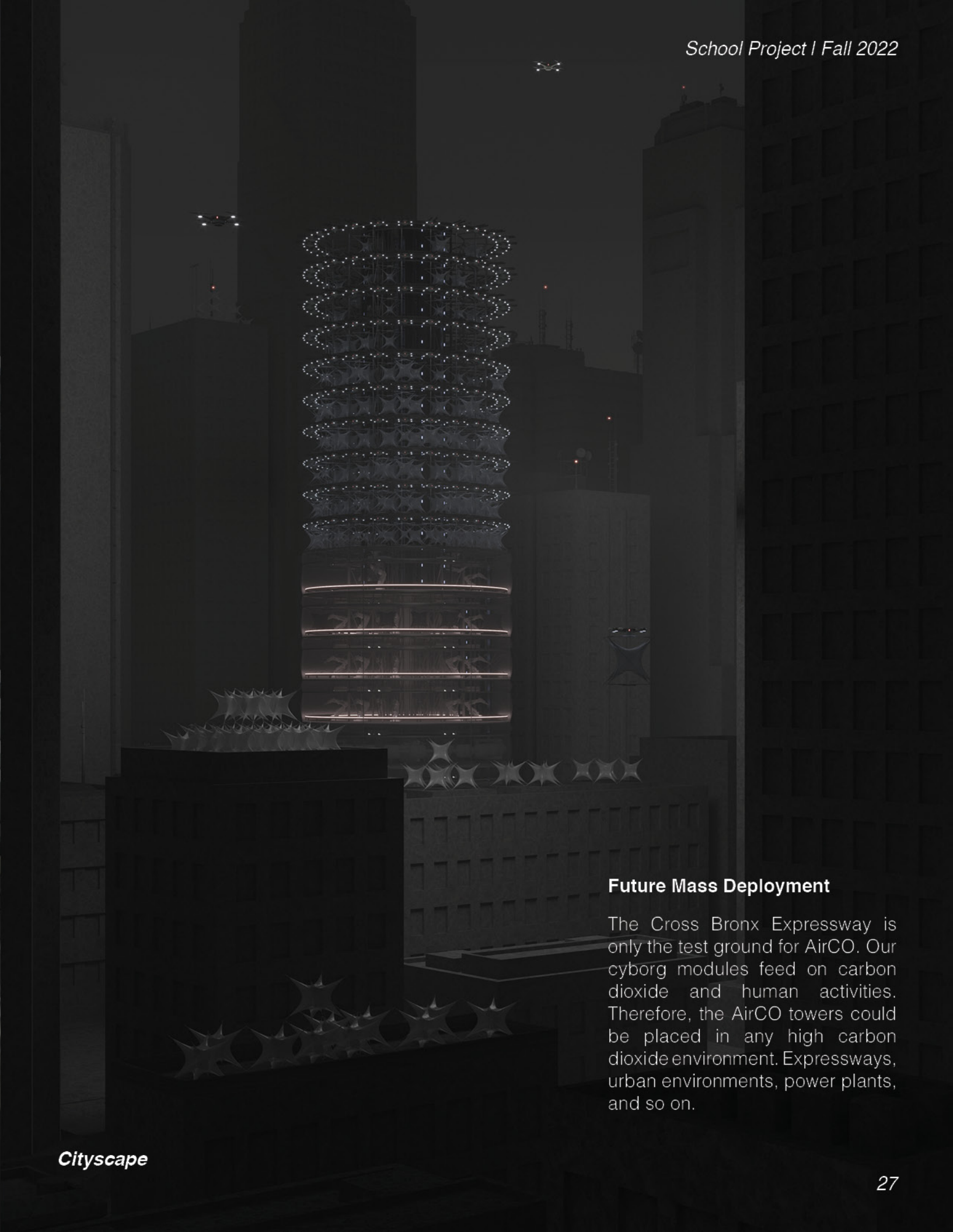
AirCO cyborg-01 is designed with the capacity for different stacking formations. Ball joints allow the overall form to be compressed or stretched in all directions, allowing flexibility to fit in varying environmental conditions - horizontal, slope, and vertical surfaces.



Expressway



Factory



Cityscape

Future Mass Deployment

The Cross Bronx Expressway is only the test ground for AirCO. Our cyborg modules feed on carbon dioxide and human activities. Therefore, the AirCO towers could be placed in any high carbon dioxide environment. Expressways, urban environments, power plants, and so on.

SFWD

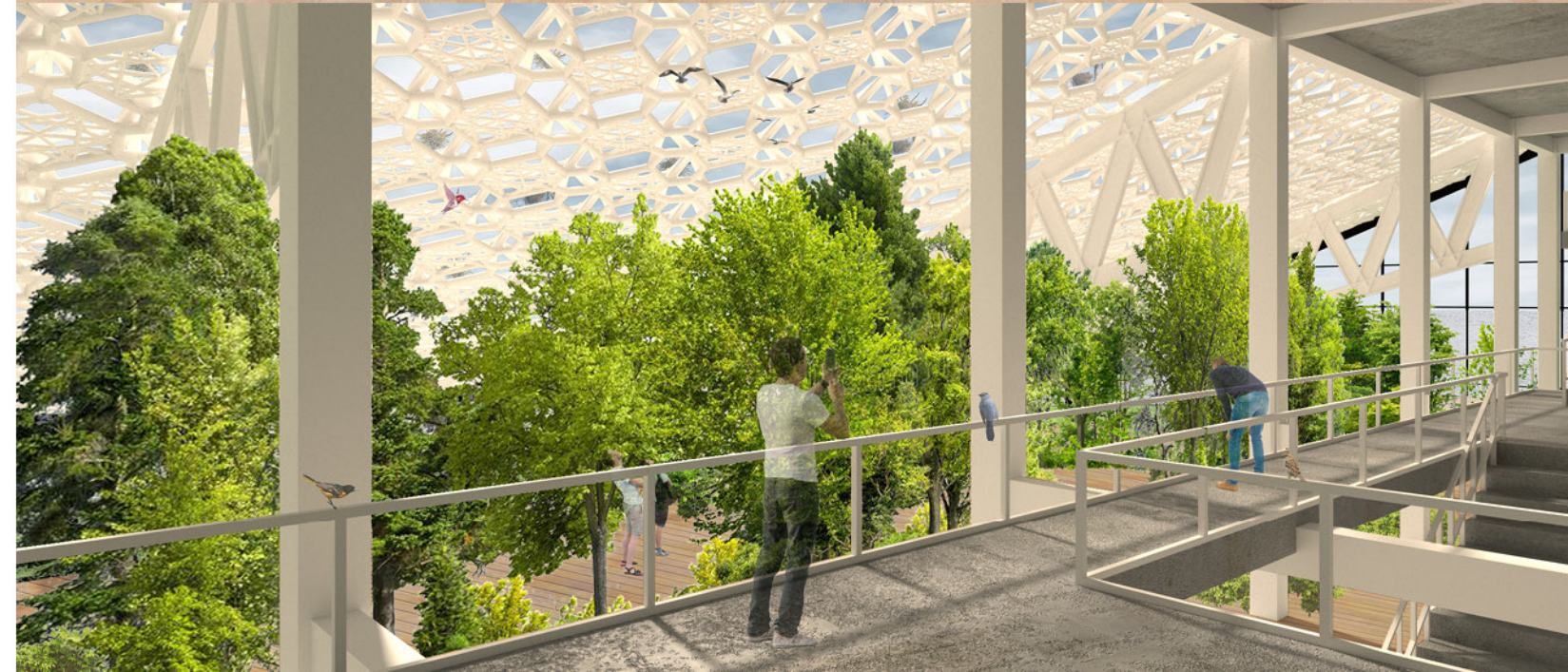
Speculative Flushing District | New York, USA

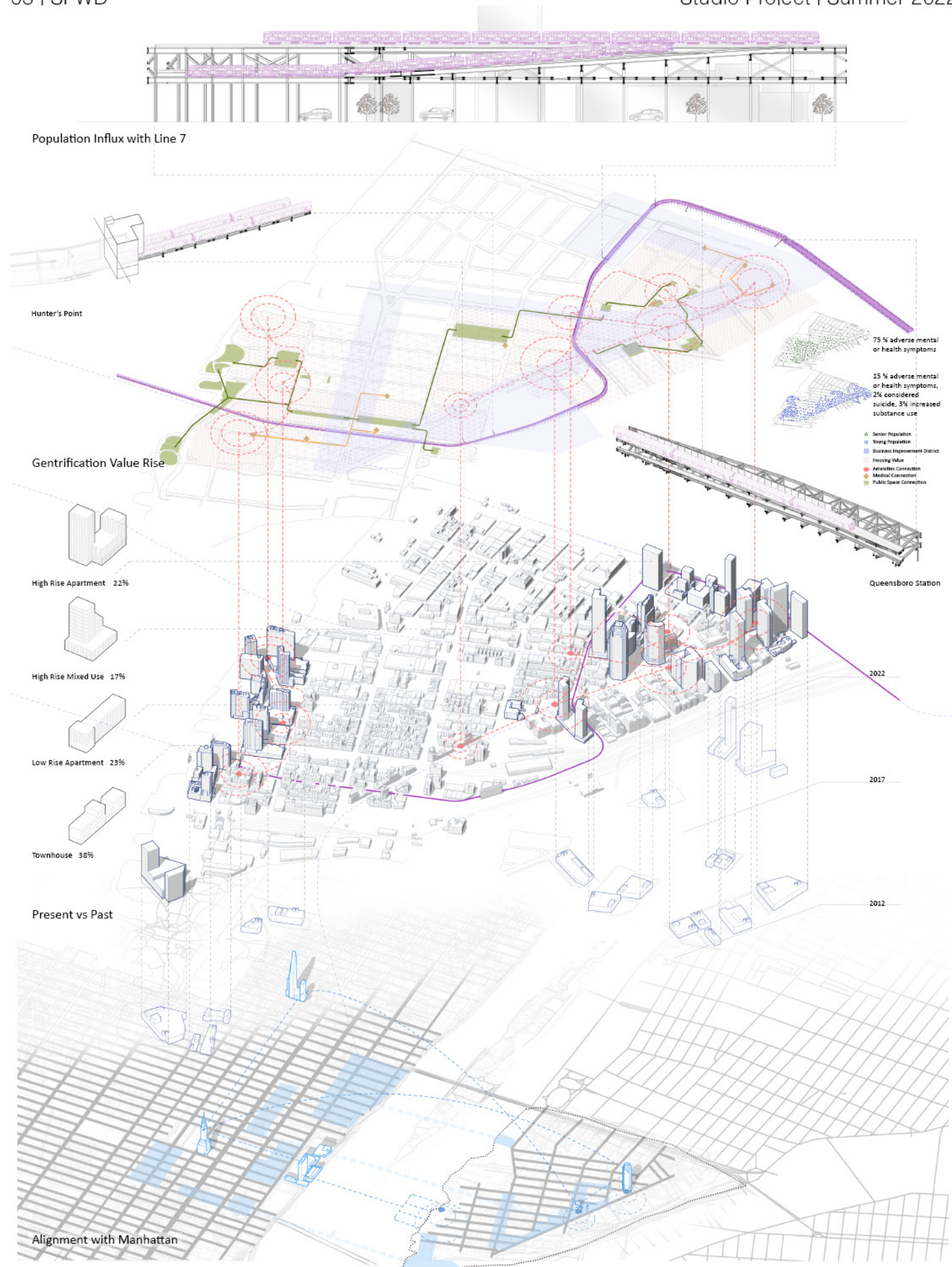
In Collaboration with: Zeyin Fei

Contribution: Conceptual Design (60%),
Technical Drawings and Renderings (60%)

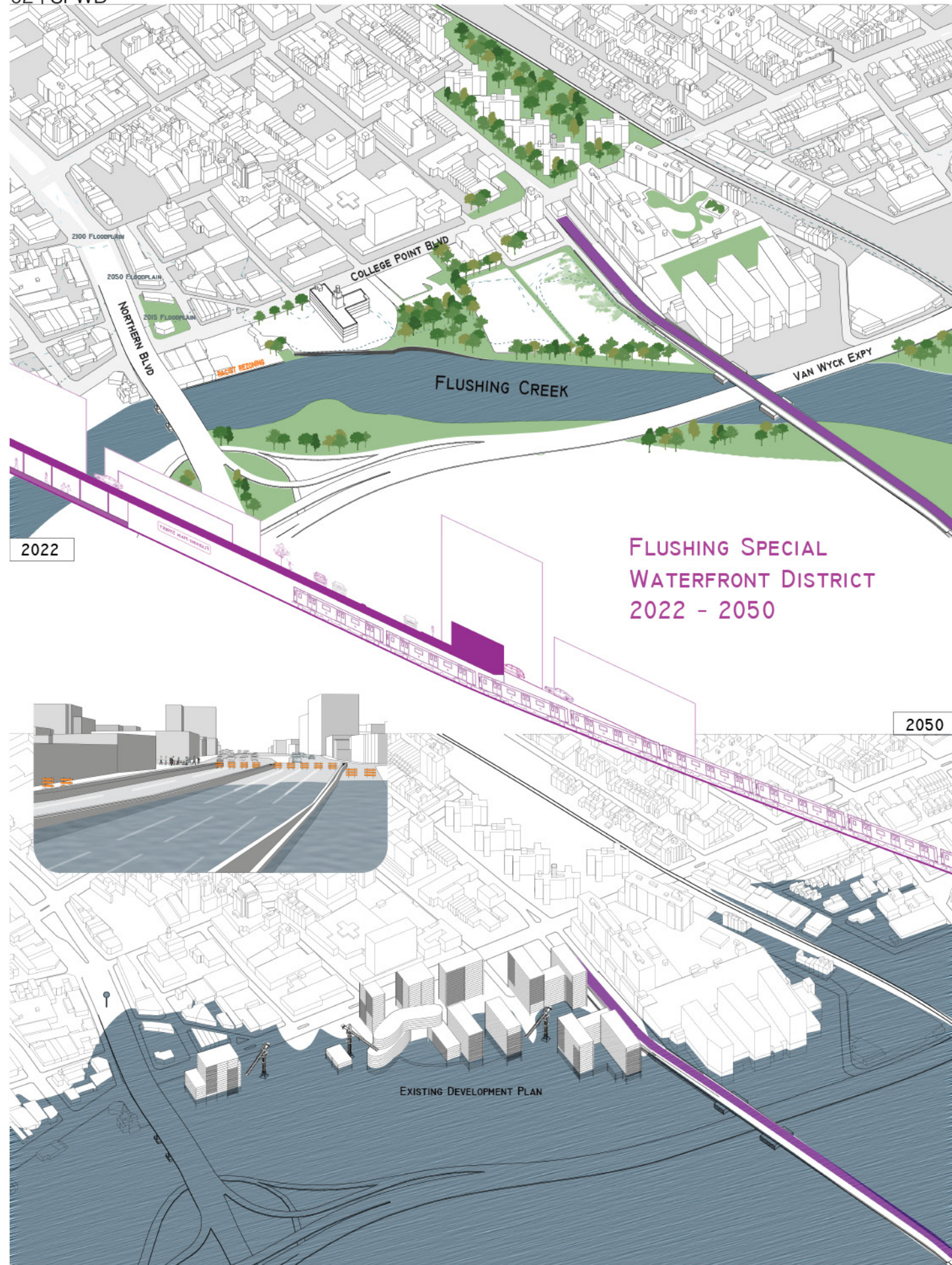
We're proposing a post-pandemic healing park that helps improve the mental health of local residents. The park mainly includes healthcare facilities, a theater, a boathouse, and farming lands to encourage more activities at our site for the post-pandemic situation. Also, we intend to challenge the passive parks and give space for social activists in Flushing to fight for land use equity, water quality repair, and any other human rights violations.

Covid-19 has severely influenced people's lives both physically and mentally. Anxiety, depression, loneliness, and financial pressure are mental issues amplified by the pandemic. As the pandemic gradually ends, people are slowly recovering from it. Yet, gentrification and displacement crept up on the Flushing communities again before their finances were restored.

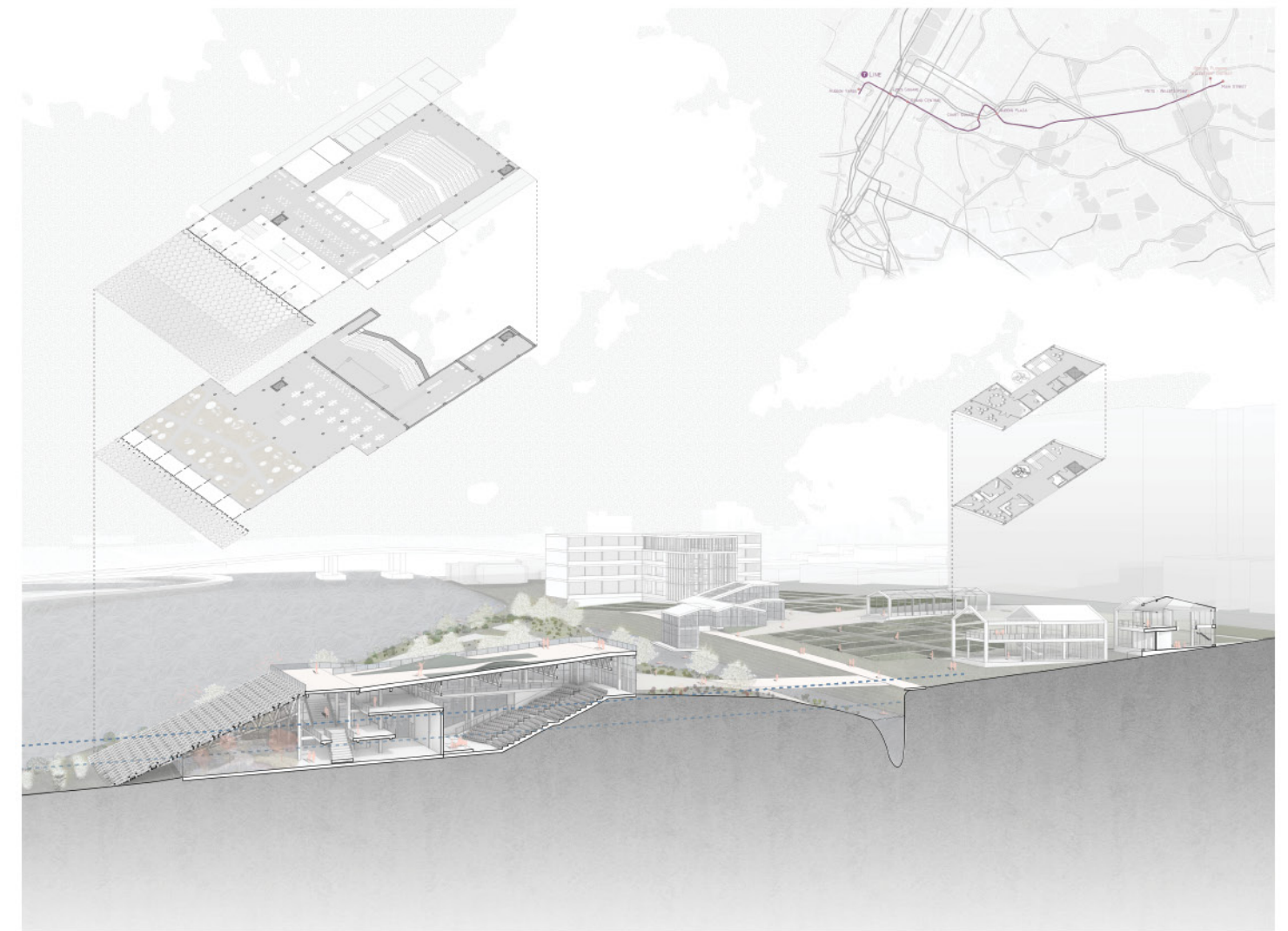




The study of long island city along the 7th line shows an uneven distribution of population and wealth caused by gentrification. Similar to our site, the 7th line also comes from underground to above ground, and the rails transition from parallel to overlapping at different levels. Most of the high rises are constructed along the 7th line, and the addition of amenities, healthcare, and open space are forming a network to reinforce the gentrification by excluding people who cannot afford the rising housing values. Because of its proximity to manhattan, the layout of long island city is getting more aligned with the manhattan grid. The similarities of both the MOMA, the Citigroup building, the Chrysler Building, and the zoning of the mid-to-high rise residential buildings create a symmetrical pattern along the axis of the river. The analysis of LIC gives us a negative example of urbanization and thus we hope to suggest an alternative for the public and create a space with the Flushing characteristics.



In December 2020, the Flushing waterfront development was approved. It is a massive 13-tower mixed-use project that included 1700 housing units, retail and office space, and more than 800 hotel rooms. However, only 61 affordable housing units are provided among them. Such luxurious development is not for the local Flushing residents, or what they can afford. Additionally, more than half of the site is located within the 2050 floodplain. If no effective actions against flooding are taken into consideration, the project is likely to fail within thirty years. Therefore, building for short-term profits is neither rational nor visionary.



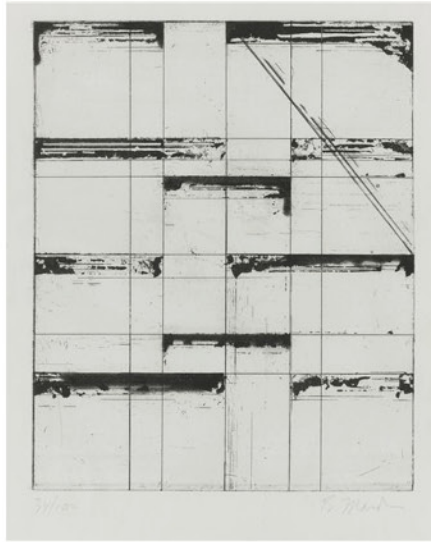


- A. Healthcare
- B. Theater
- C. Botanic Garden
- D. Boathouse
- E. Vertical Farming Center
- F. Farming
- G. Pollinator Garden
- H. Habitat
- I. Reforestation
- J. Reforestation
- K. Wetland Buffer



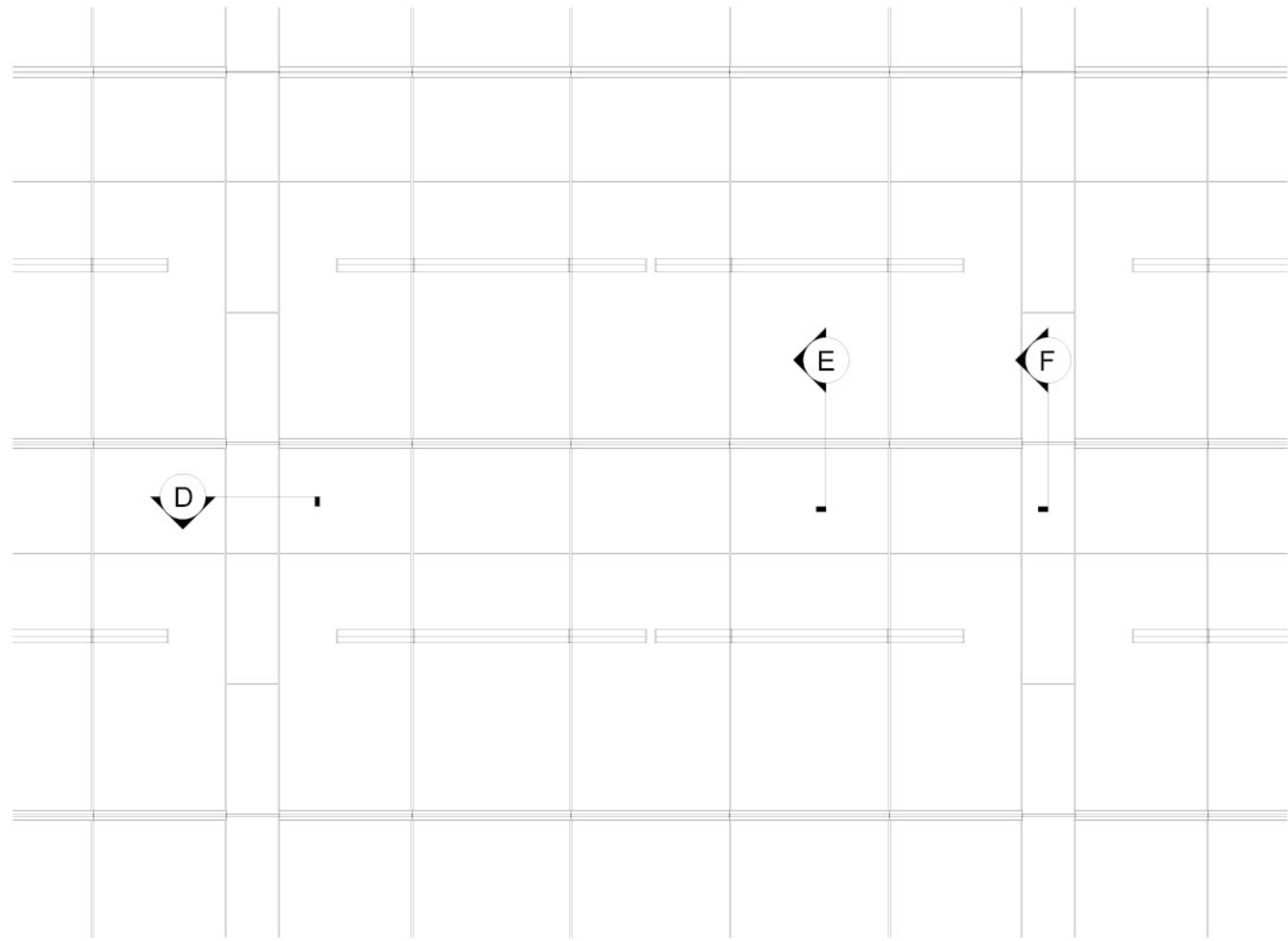
CURTAIN WALL

Retail on Fifth Avenue | New York City, USA

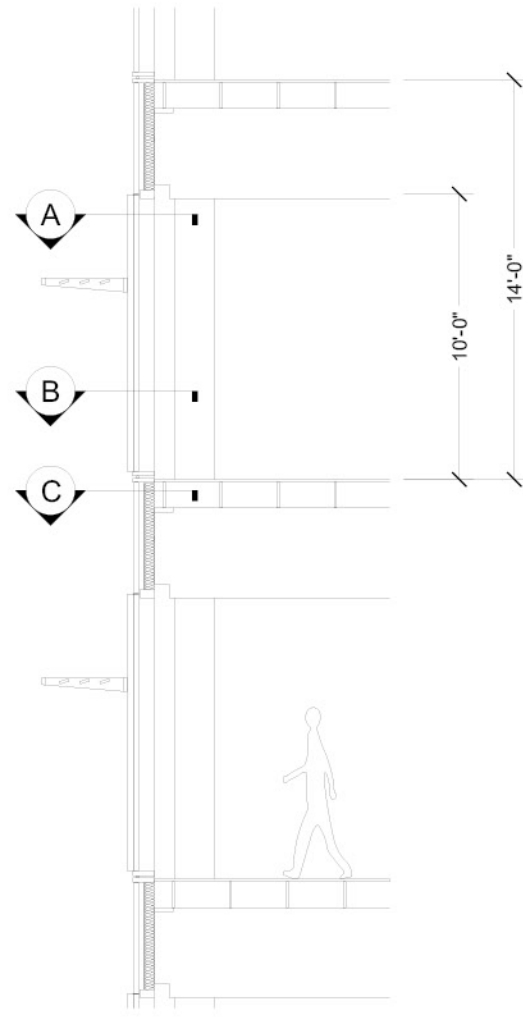


The design of the facade is inspired by the painting “Etching for Parkett” by Brice Marden. I love the simplicity of the drawing as well as the variation it presents with limited colors and elements. The thin lines in the painting become the unitized grid on the facade. The varying spacing between the thin lines changes the use and material of the panels. The vertically continuous granite units define the edge of each bay and break the horizontal pattern of the grid. An additional layer of shading device is interpreted from the thick horizontal lines in the painting. It also works as a light shelf that provides additional lighting during the day.

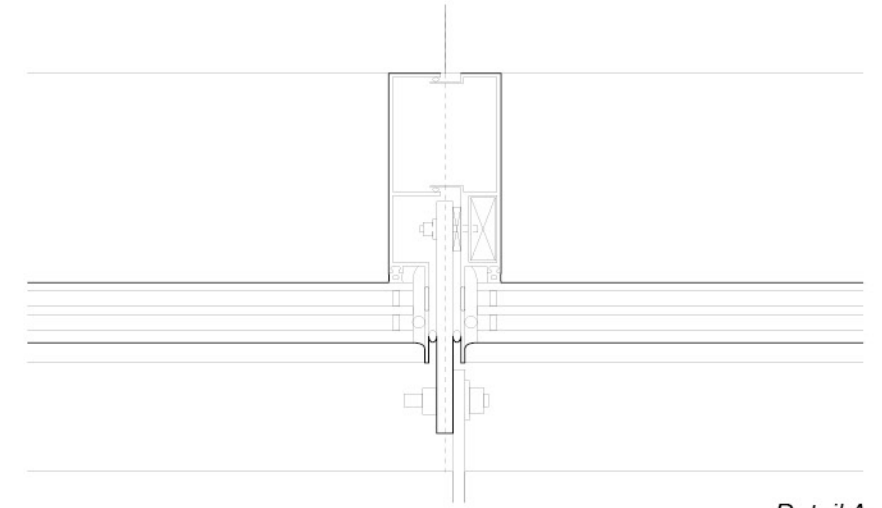




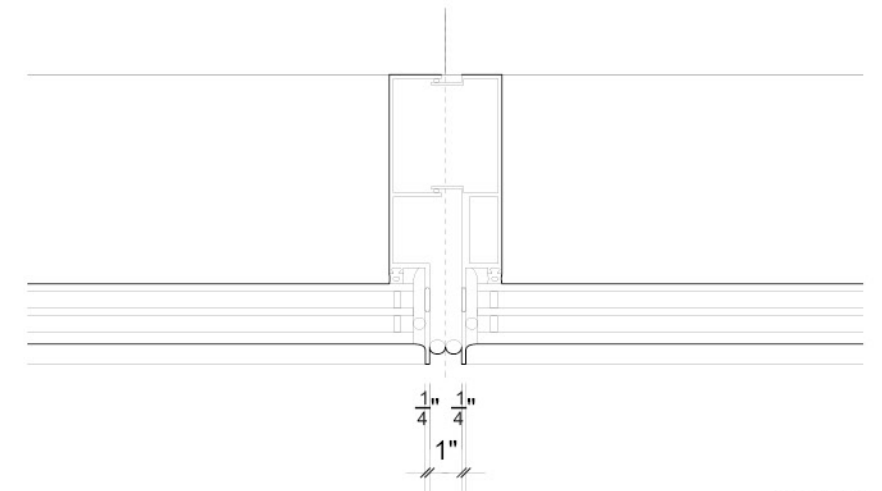
Roadmap Elevation



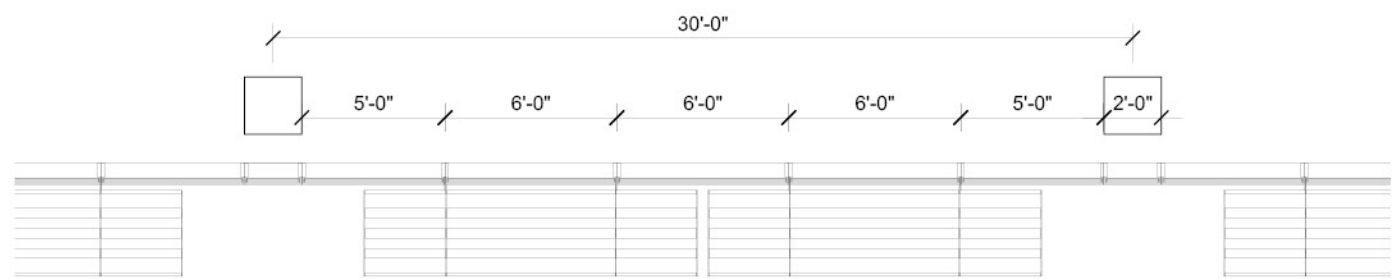
Roadmap Section



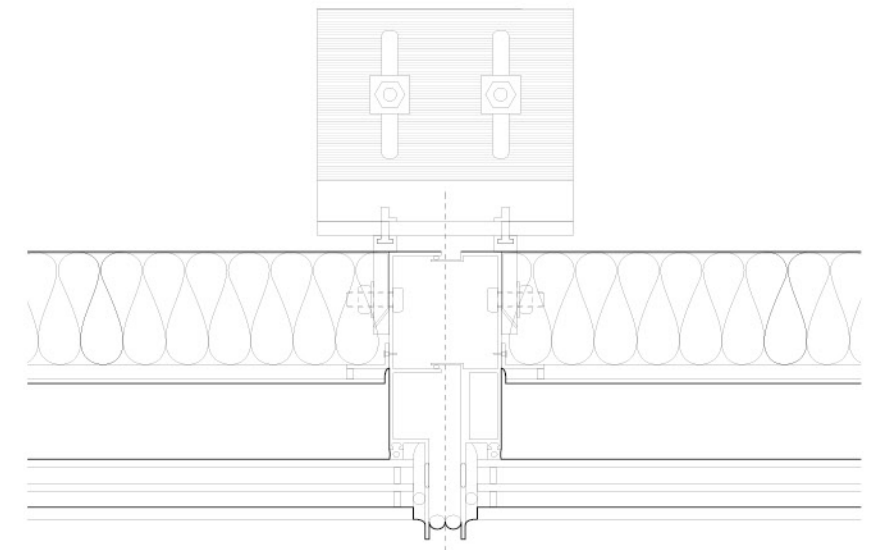
Detail A



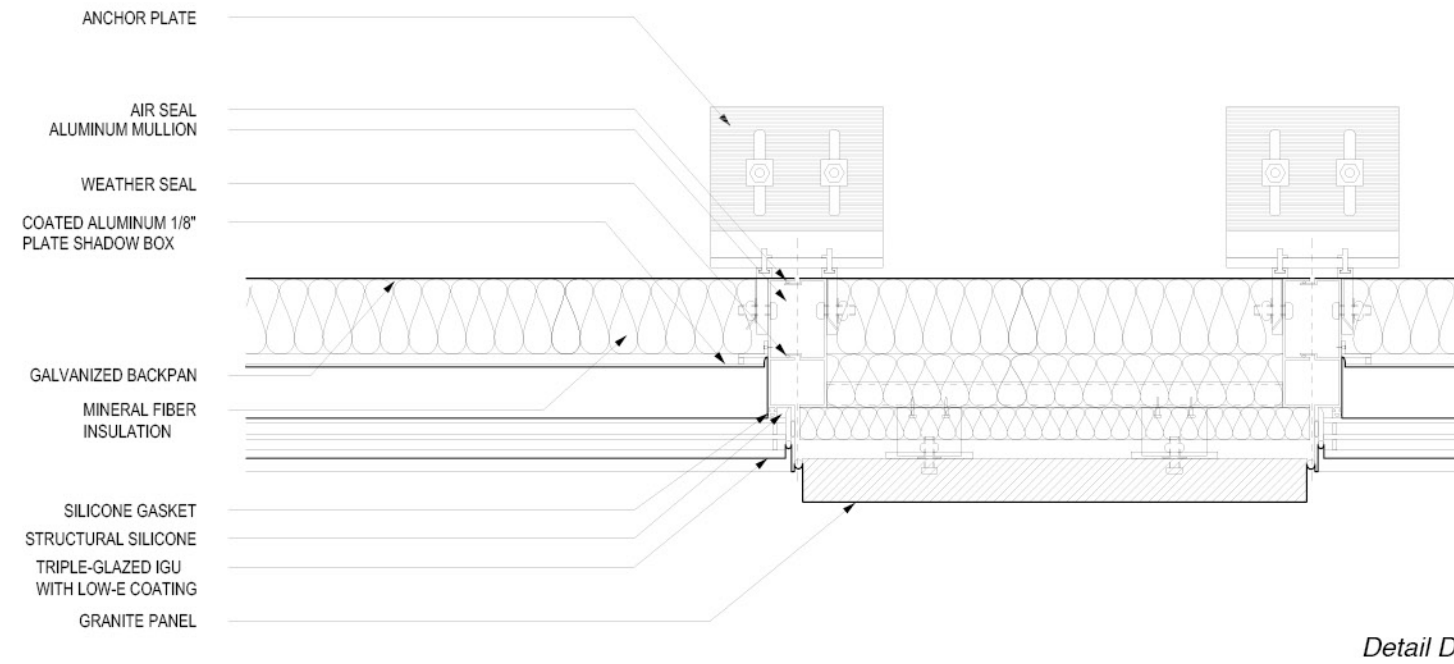
Detail B



Roadmap Plan

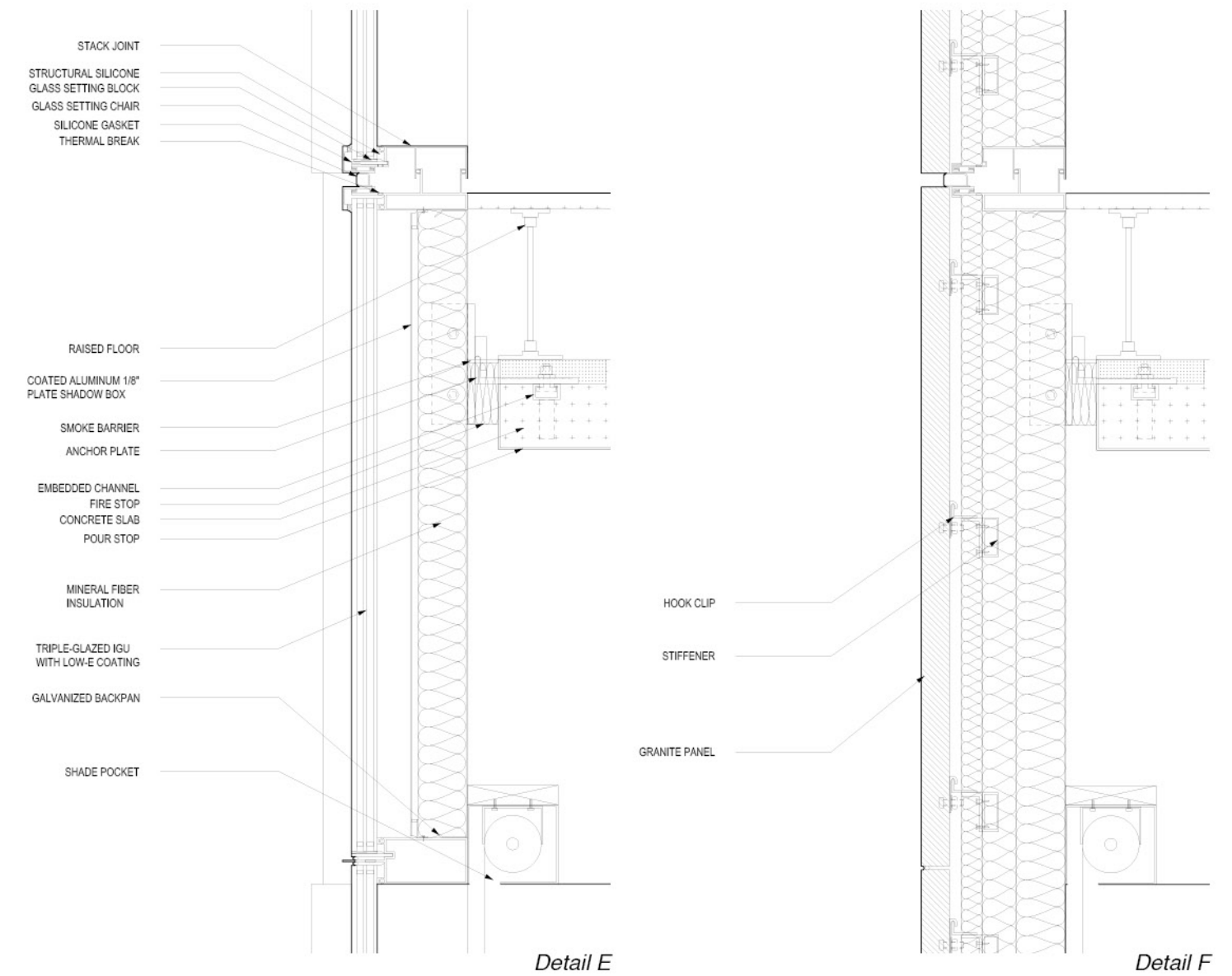


Detail C



WT-1: Aluminum, Glass, Granite, Unitized Curtain Wall System:

The system consists of three insulating glass units four-side structural silicone glazed onto unitized frames of thermally broken, custom profile extruded aluminum. The glazed spandrel areas incorporate insulating glass, coated aluminum backpan, minimum 3-1/2 inches mineral fiber insulation, galvanized steel channel aligned with the perimeter fire safing, and galvanized smoke barrier sheet. The granite panels are anchored to aluminum sub-framing, backed with integral insulation and galvanized steel channel. Additional support is provided within the aluminum extrusion as needed to install shading devices in the field. System is anchored to the building structure at top of concrete slab.



ULTRAREAL

Somewhere in the Universe

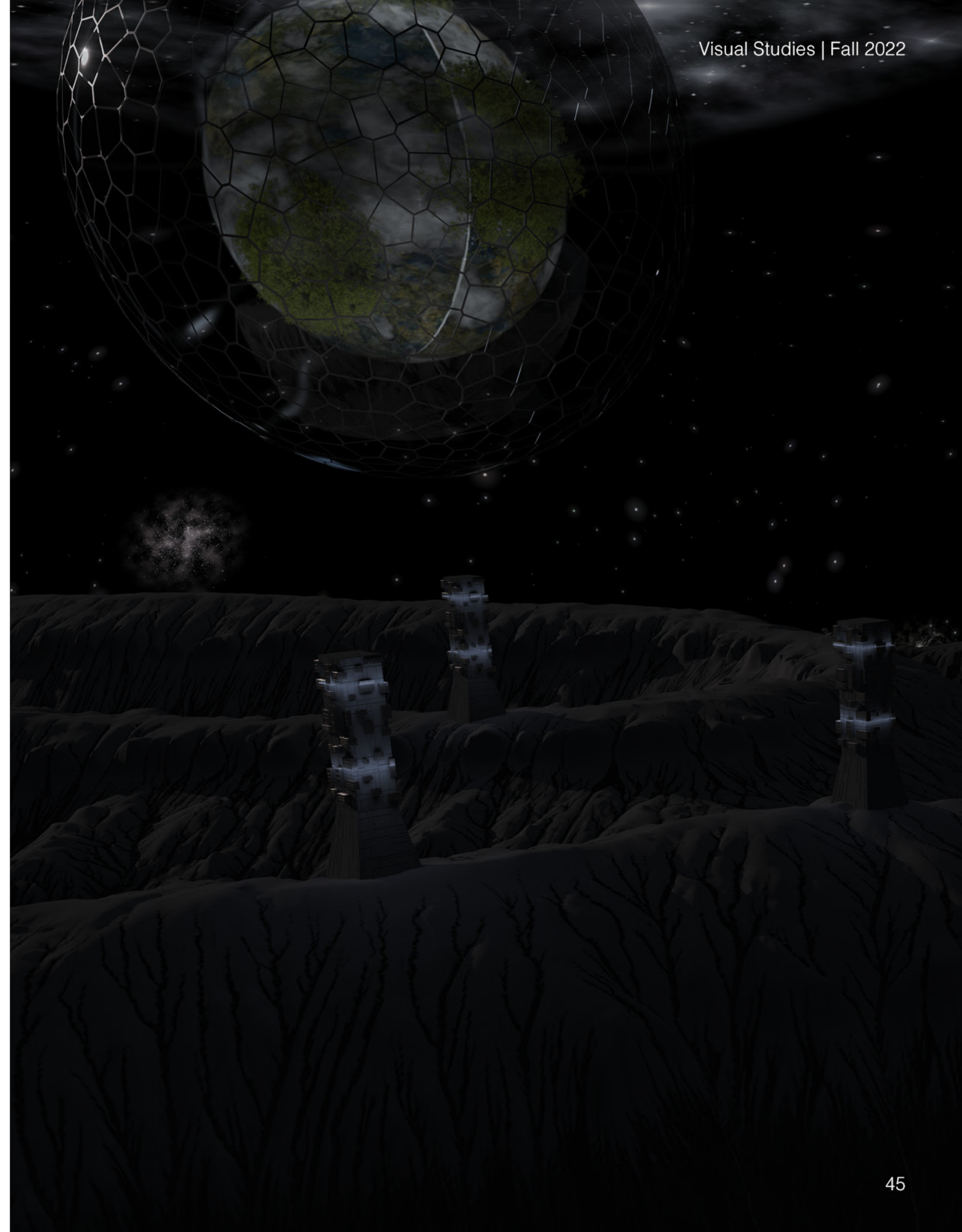
In Collaboration with: Yangxi Liu,
Mengyu Wang, Sixue Long

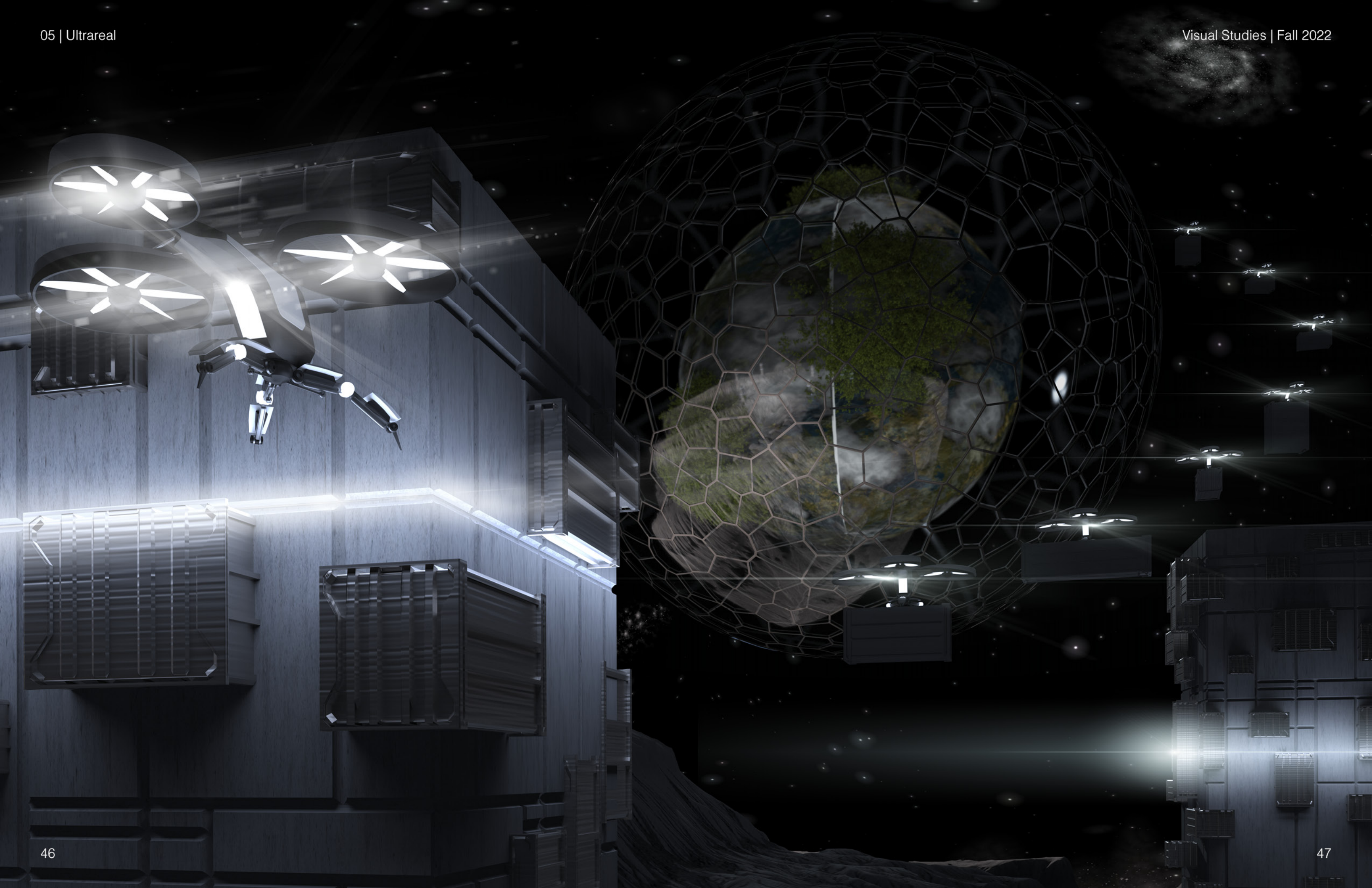
In the distant future, the Earth had become uninhabitable due to environmental destruction caused by human activities. The last hope for the survival of the human race was to preserve the planet's biological diversity and cultural heritage in archive towers that were designed to store and protect various species and artifacts. These towers were constructed in strategic locations around the globe and equipped with state-of-the-art technologies to ensure the longevity of their contents.

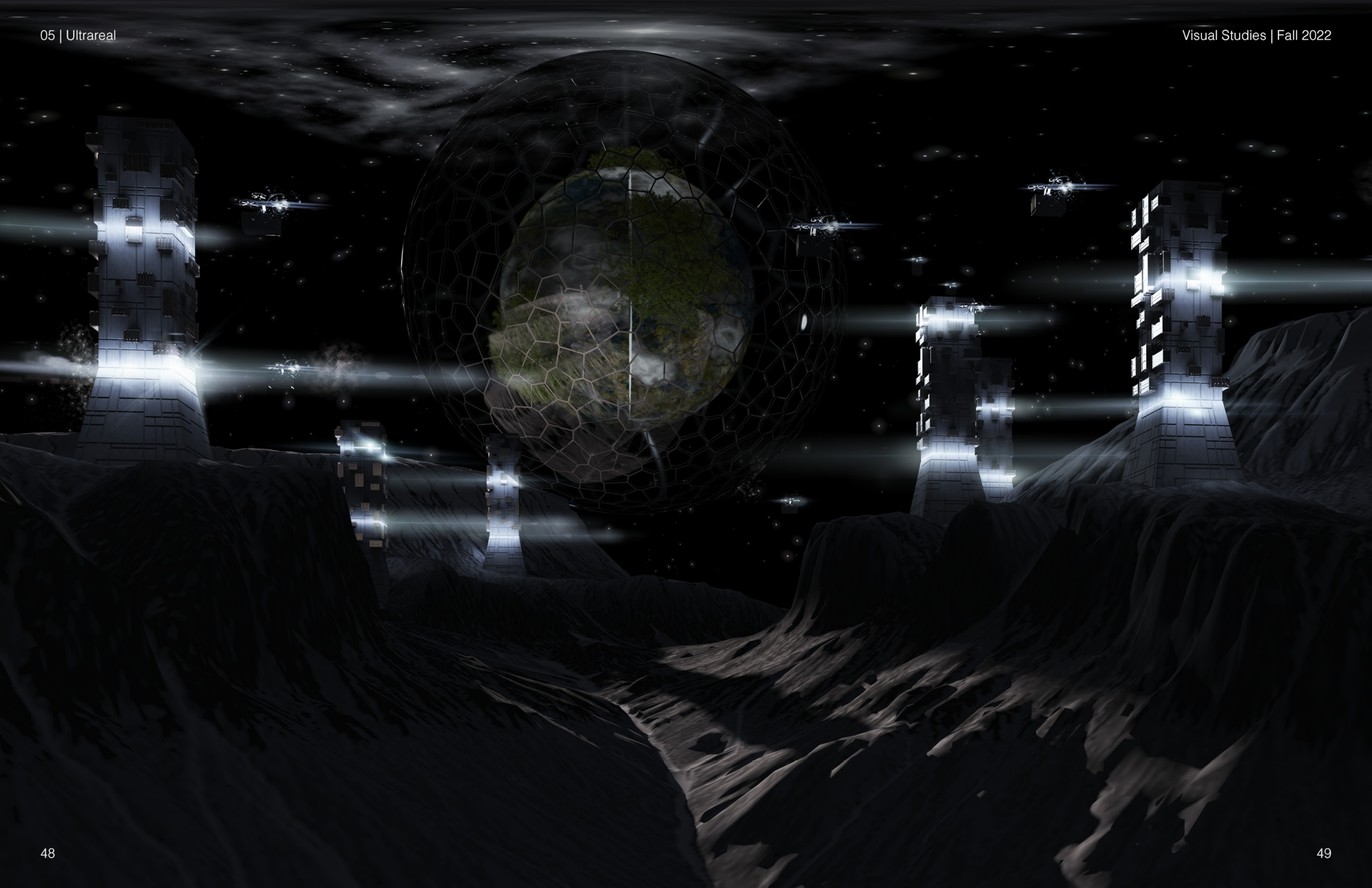
For years, people had been waiting for a suitable planet to continue their civilization. Finally, after a long search, a team of astronomers discovered a planet that seemed to be a perfect match for human life. This planet had an unusual feature - an outer shell that was transparent and contained a breathable atmosphere, while the interior was a lush garden full of greenery and water. The team of scientists and engineers from Earth quickly developed a plan to transport the archive towers and their contents to this new world.

The process of transferring the archive towers was complex and required the use of advanced technology. Each archive tower was carefully sealed and loaded into a container box that was designed to withstand the rigors of interstellar travel. The boxes were then transported through space using a sophisticated system of propulsion and navigation.

After a long and arduous journey, the containers finally reached the new planet. The archive towers were carefully unloaded and activated, and the frozen species and artifacts were carefully thawed and reanimated. The planet was now home to a rich and diverse ecosystem that would sustain the human race and provide a new beginning for civilization.







Thank You.

