

# PORTFOLIO



## JIANYU ZHENG

Selected works  
2023-2024

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-01-

**Architectonics:** Consonance | Dissonance | Rhythm

A tangle of spatial impermanence

**Locus Solus (1978) by Tomás Marco & Locus Solus (2024) by Us**

Team Work

Columbia University GSAPP

ADVANCED STUDIO VI Spring 2024\_ **Architectonics of Music**

Teammate: Chi Chung Yang

Advisors: **Steven Holl and Dimitra Tsachrelia**

In the musical world, consonant and dissonant harmonies refer to moments in the music where more than one pitch is played at the same time, creating either a sense of stability and repose as a consonant harmony or a sense of impermanence and discord as a dissonant harmony. When the interaction between consonance and dissonance turns too intense, Marco inserts breaks, rhythmic monotoned piano notes, to disrupt and reset the balance. We've taken inspiration from this dialogue and translated it into a line language of curves and rectilinear structure, then from the diagrammatic into three-dimensional spatial language.

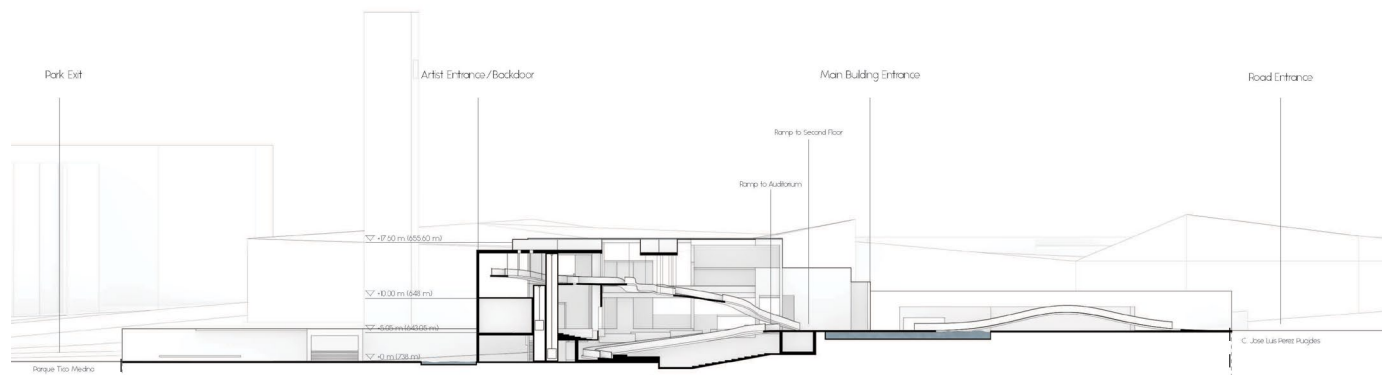
Co-existing, consonance and dissonance perform together and continuously exchange the notion of temporality. In spatial language, Locus Solus (2024) envisions the buildup and release of spatial impermanence through bodily movement on and off the two central curved ramps. Surrounding the curved ramp are boxed-shaped walls retaining the outer turns of the wave, connecting them in elevation, and creating circulation throughout the structure. As one walks on the curved ramps, one experiences permanence and smoothness, while the connection to the rectilinear spaces infers impermanence and detouring.

Like the rhythmic monotoned piano notes that interrupt intense musical interactions, the architectural circulation strategically navigates between smooth, permanent curves and detouring rectilinear spaces. Ultimately, Locus Solus (2024) intends to capture the essence of musical expression, translating it into a spatial experience that resonates with the intricate design of Tomas Marco's composition.

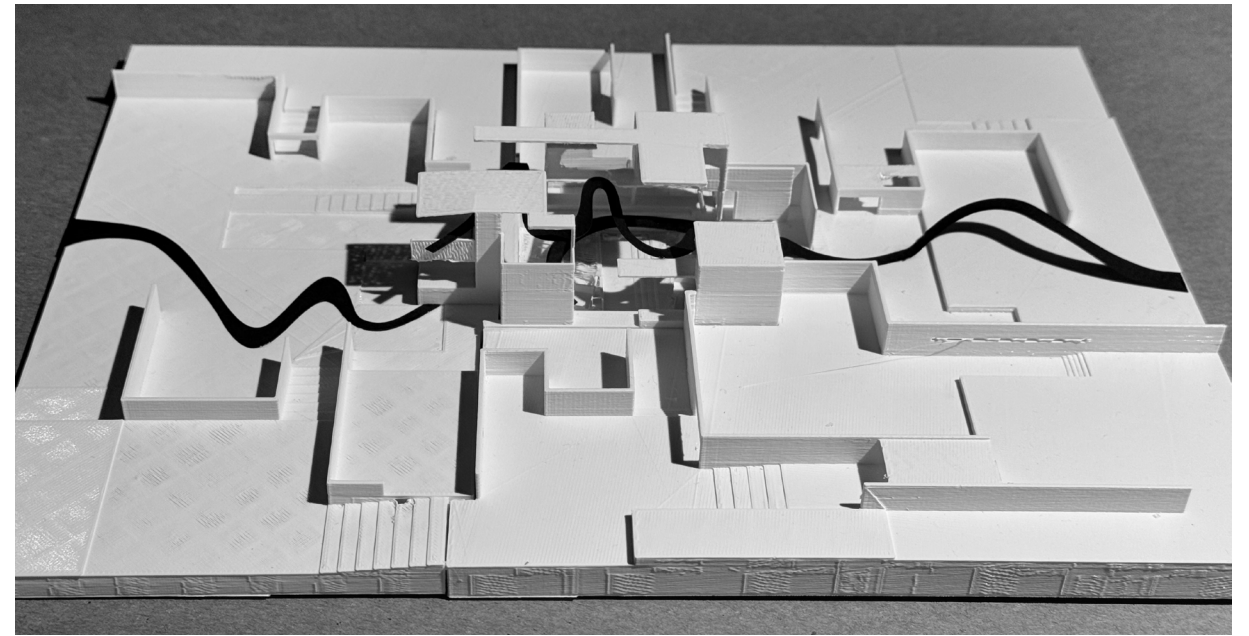


Pure Space Conceptual Model

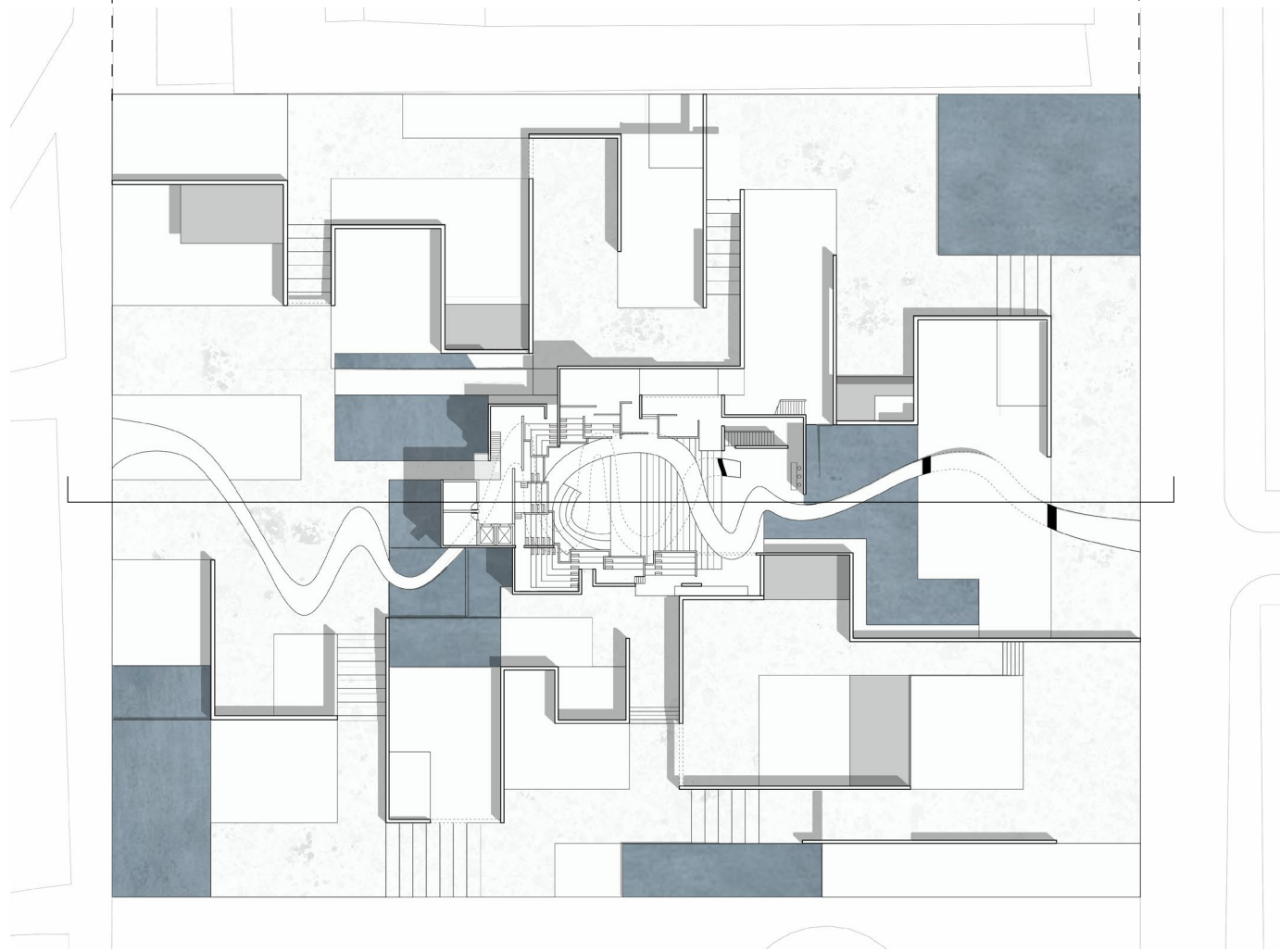




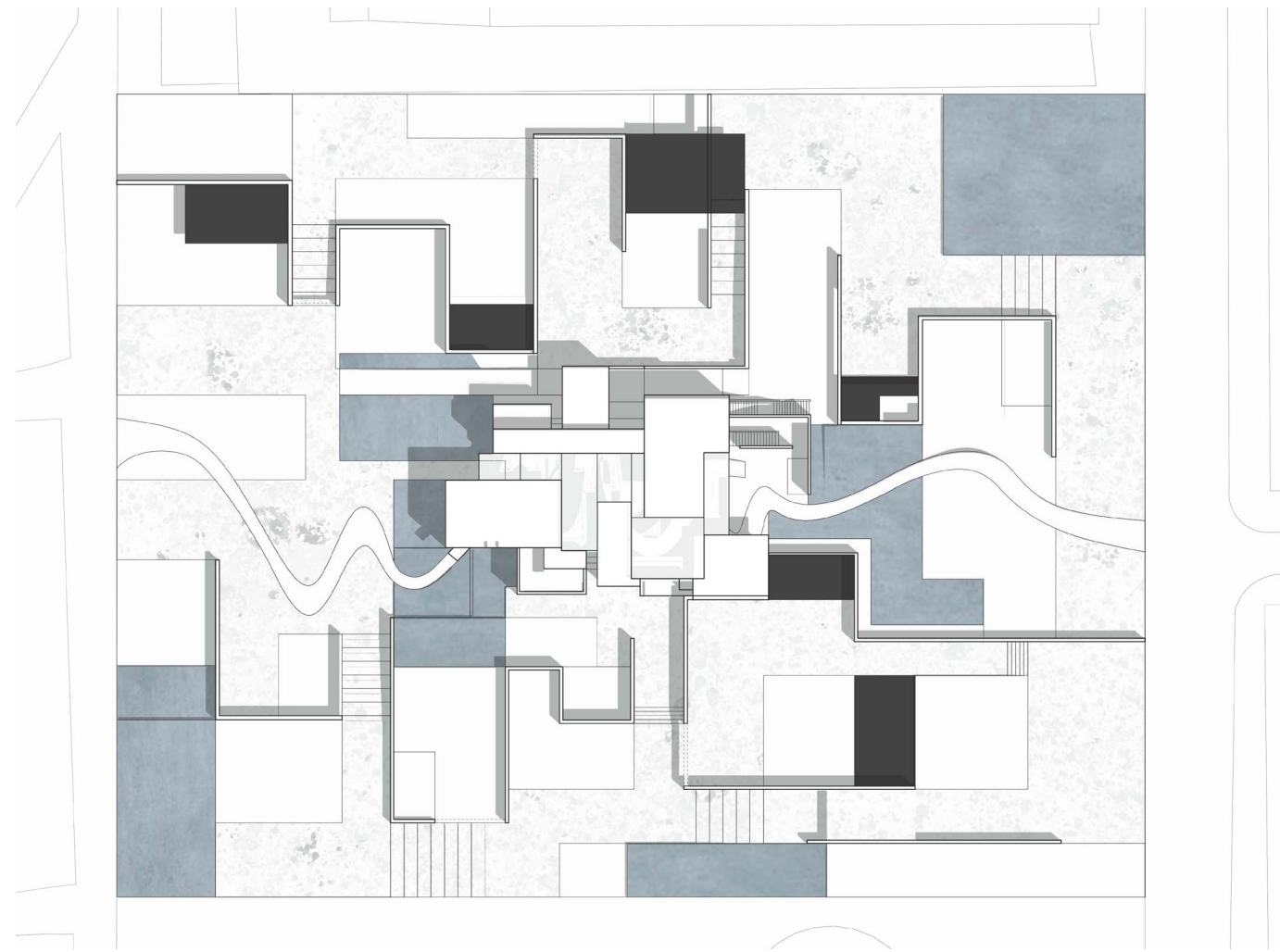
Landscape Section



Conceptual Model

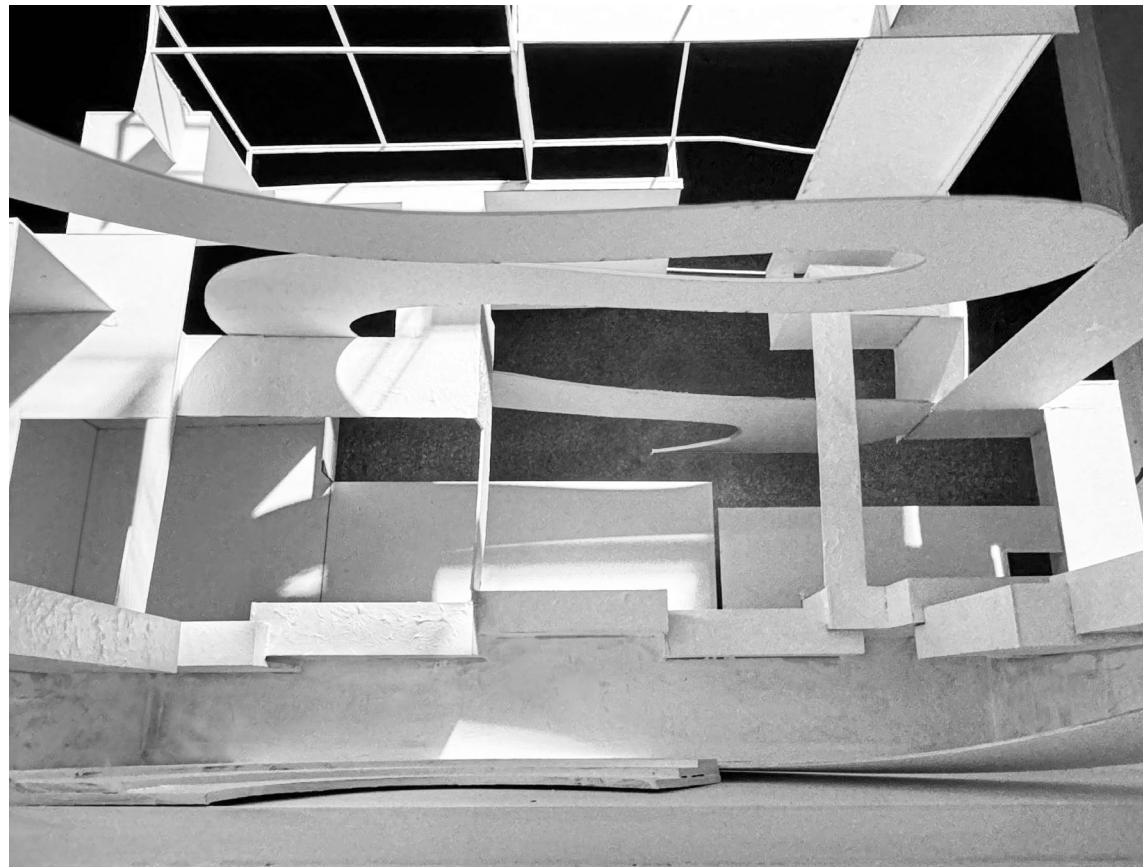


Groundfloor Plan with Landscape



Site Plan

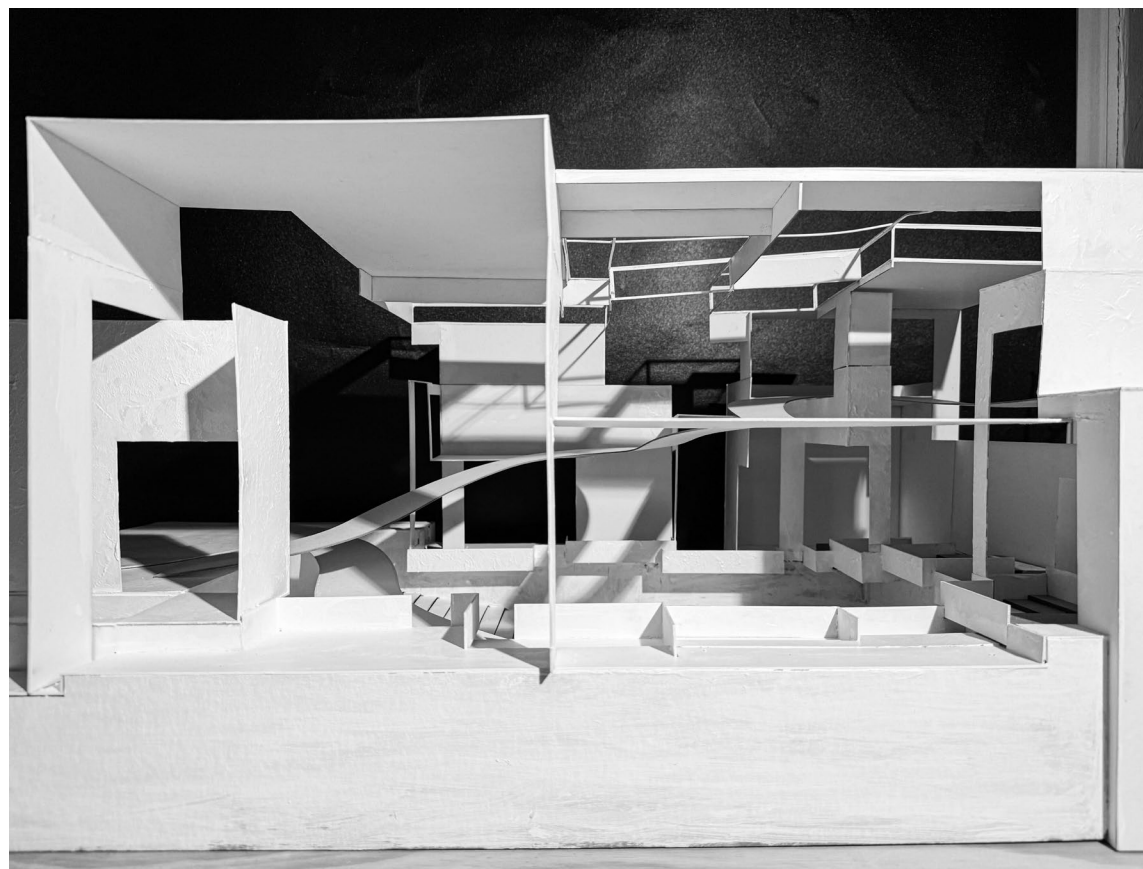




Project Chunk Model: Auditorium



Landscape View



Project Chunk Model: View From Landscape



End of the Ramp: Sightseeing Balcony





View of the Ramp Above





Audience View of Auditorim

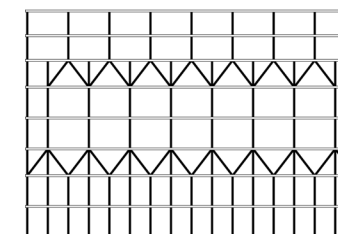




**-02-**  
**B.O.S.S Future**

Headquarter of “B.O.S.S” (Bamboo, Oyster, Seaweed System), A Container of Office, Manufacturing and Housing

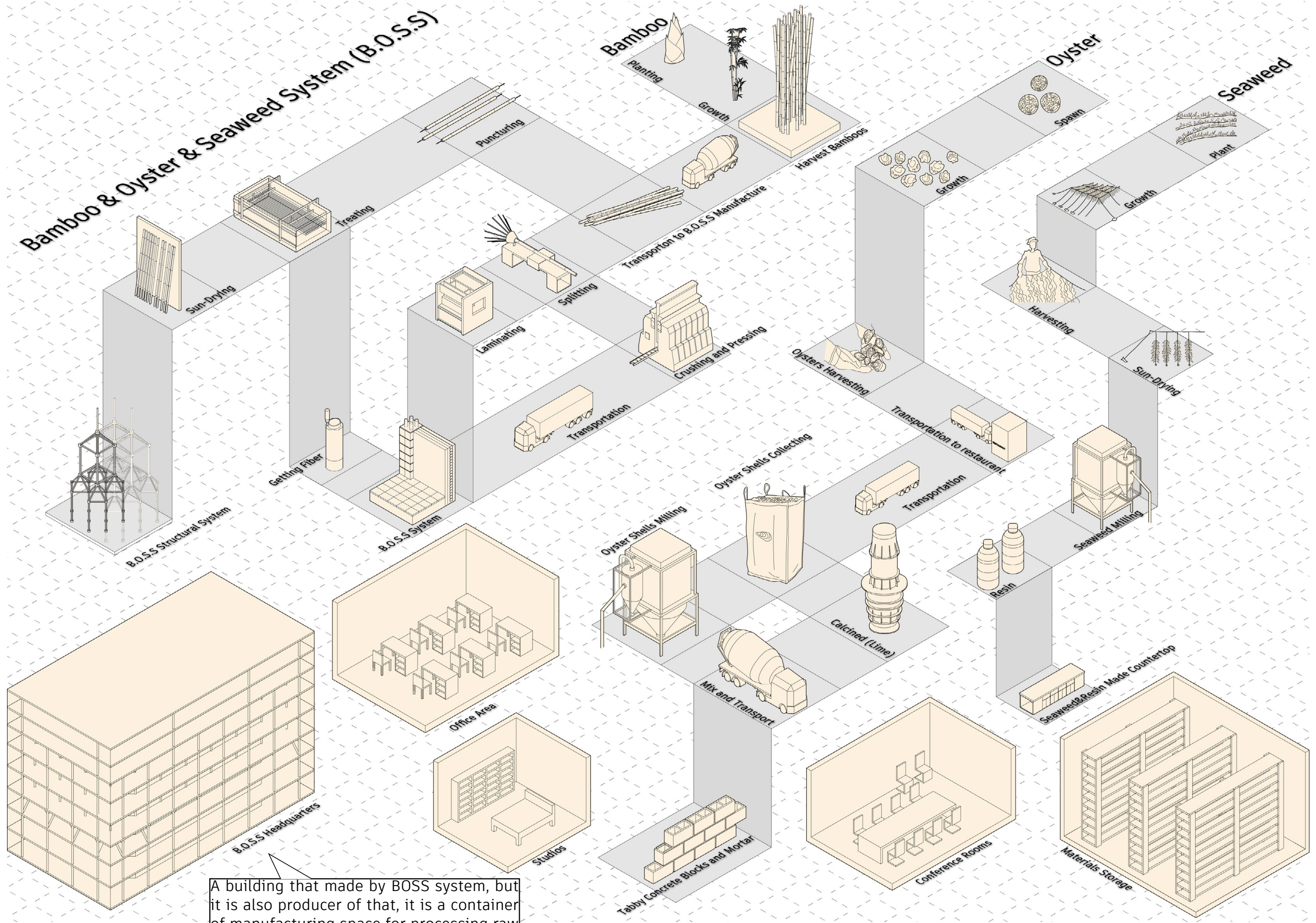
Individual Work  
Columbia University GSAPP  
2023 Fall Advanced Studio\_Reset Studio  
Site: Gowanus, Brooklyn, NY  
Instructor: **Prof. David Benjamin** | davidbenjamin@gmail.com



**Approach to AI** : AI was most useful as a narrative tool to generate images to convey early conceptual ideas that would otherwise have taken the whole semester to produce with great effort. This allows my efforts to start at the next chapter in the story, rather than ending with our thesis or question.

**Statement** : In 2040, the world grappled with severe natural disasters, prompting governments to declare states of emergency. Conventional materials like steel and concrete proved vulnerable, leading to strict regulations. Governments incentivize innovation by offering tax breaks for builders adopting sustainable alternatives. Bamboo emerged as a key material due to its short life span and low carbon emissions. Teaming up with oyster cement and seaweed-based insulation, a resilient system called “B.O.S.S”, replacing traditional materials. The “Resilience Revolution” transformed construction practices, making sustainable materials and disaster-resilient designs the new norm. This shift not only reduced carbon footprints but also fortified communities against the impacts of climate change, marking a pivotal moment in architecture and construction.





# Bamboo & Oyster & Seaweed System (B.O.S.S)

A building that made by BOSS system, but it is also producer of that, it is a container of manufacturing space for processing raw materials coming from outside, private and public office area provided for employees who produce and invent boss, and also studios for them to live, some public gathering space and lab area.

## B.O.S.S Embedded in a Building

Teaming up with oyster shells and seaweed, a resilient system called "B.O.S.S", replacing traditional materials, oyster shells could be mortar and tabby concrete and seaweed could be insulation after processing.



- △ Seafood Restuarant
- ▣ Wharf For Shipping
- Truck Garage
- Site
- Open Area



### Site Analysis

The Site in Gowanus, Brooklyn, and is currently in its early stages of development. It may be beneficial to consider conducting practical exercises and tests within the open spaces available in New York City. Additionally, the vicinity boasts numerous truck garages for potential transportation needs and seafood restaurants that can supply oyster shells.



Cases of Existing Bamboo-Made Buildings



"Energy Efficient Bamboo House"  
Studio Cardenas Conscious Design , 2016



"Bamboo Hostels China"  
Studio Anna Heringer , 2016



"From the Territory to the Inhabitant"  
Rozana Montiel | Estudio de Arquitectura



1



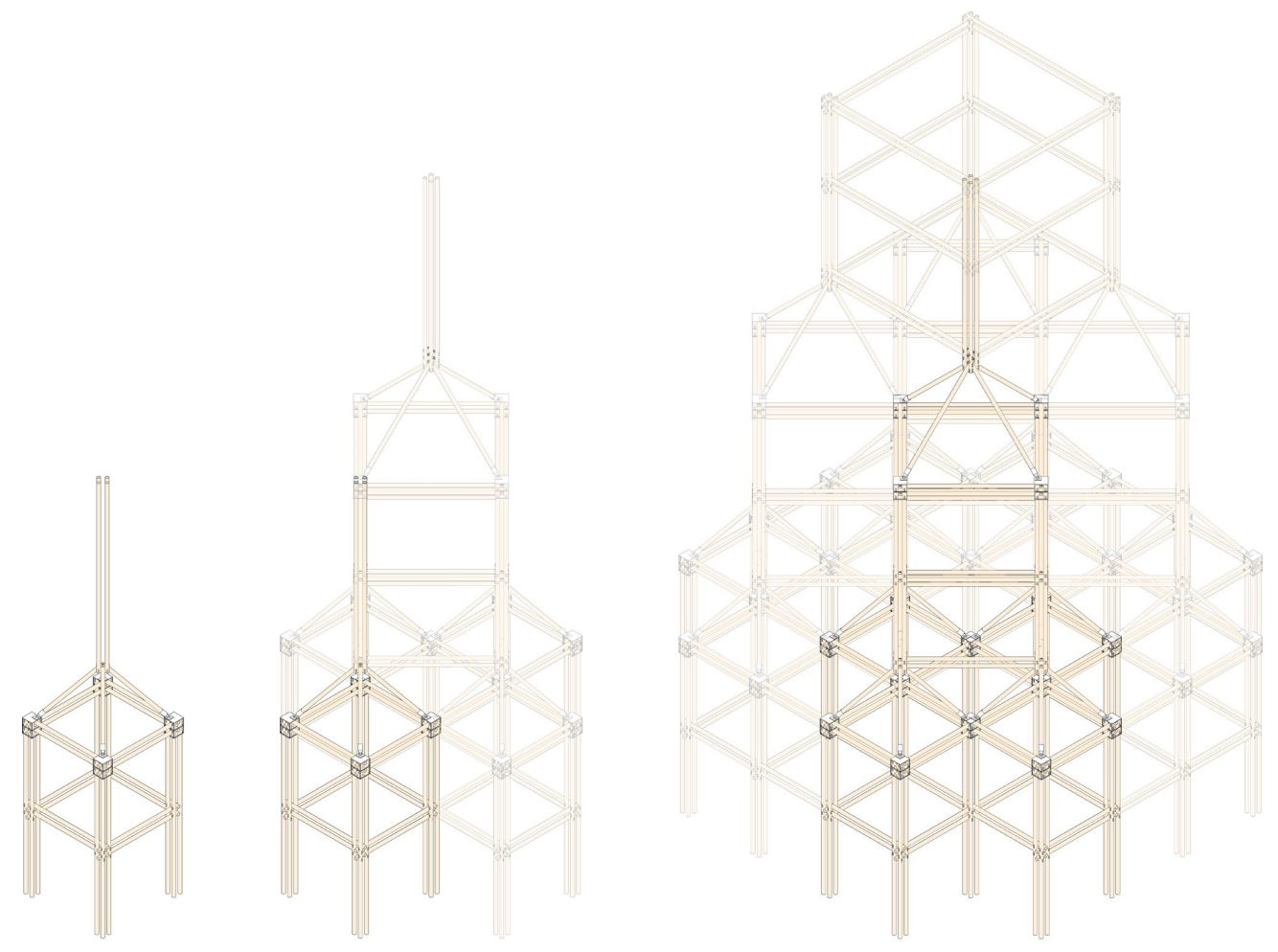
2



3

The existing buildings that made by bamboos are normally in a relatively small scale, such as hostel, house and so on. So it would be a totally different structure organizing strategy if we build a 6 floors hybrid modernism headquarter.

B.O.S.S Structure Prototype Development

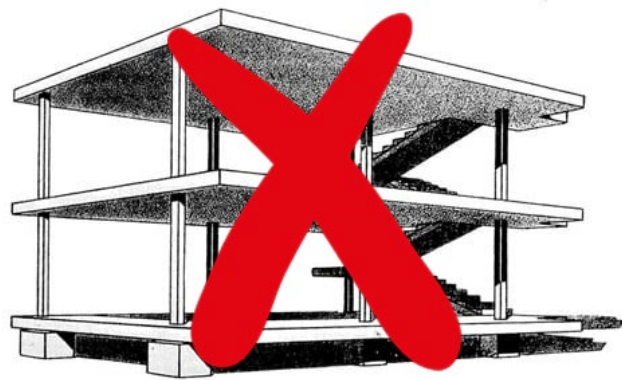


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2

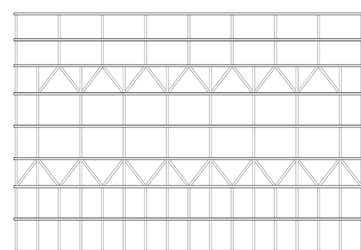
3

Multiple single bamboo structural units to form a bamboo structure on a bigger scale which is more dynamic than the conventional frame structure in terms of each floor plan.

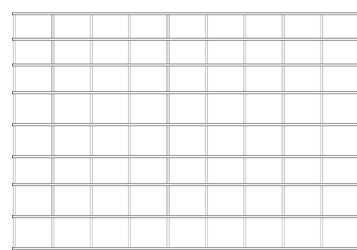


Conventional Frame Structure

Almost all the columns in conventional frame structure are all the way up until the top.



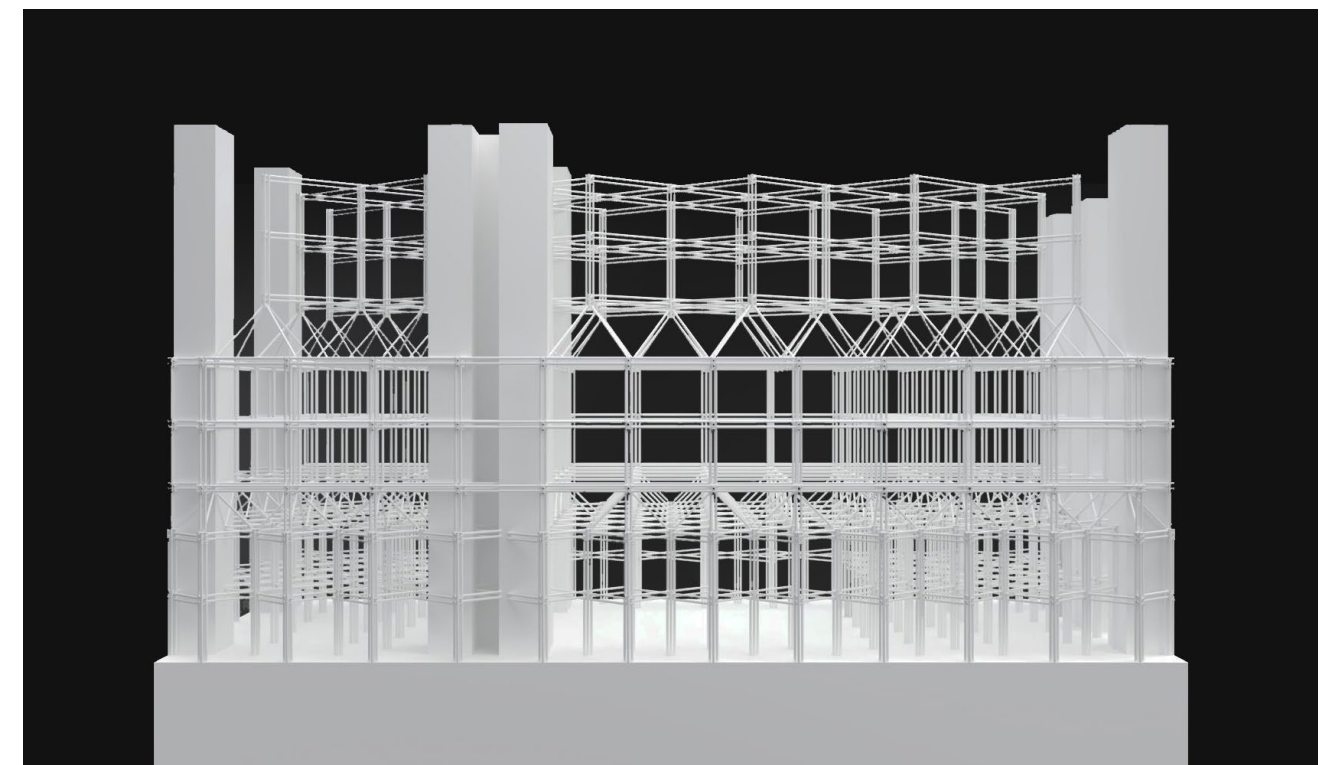
New Structure



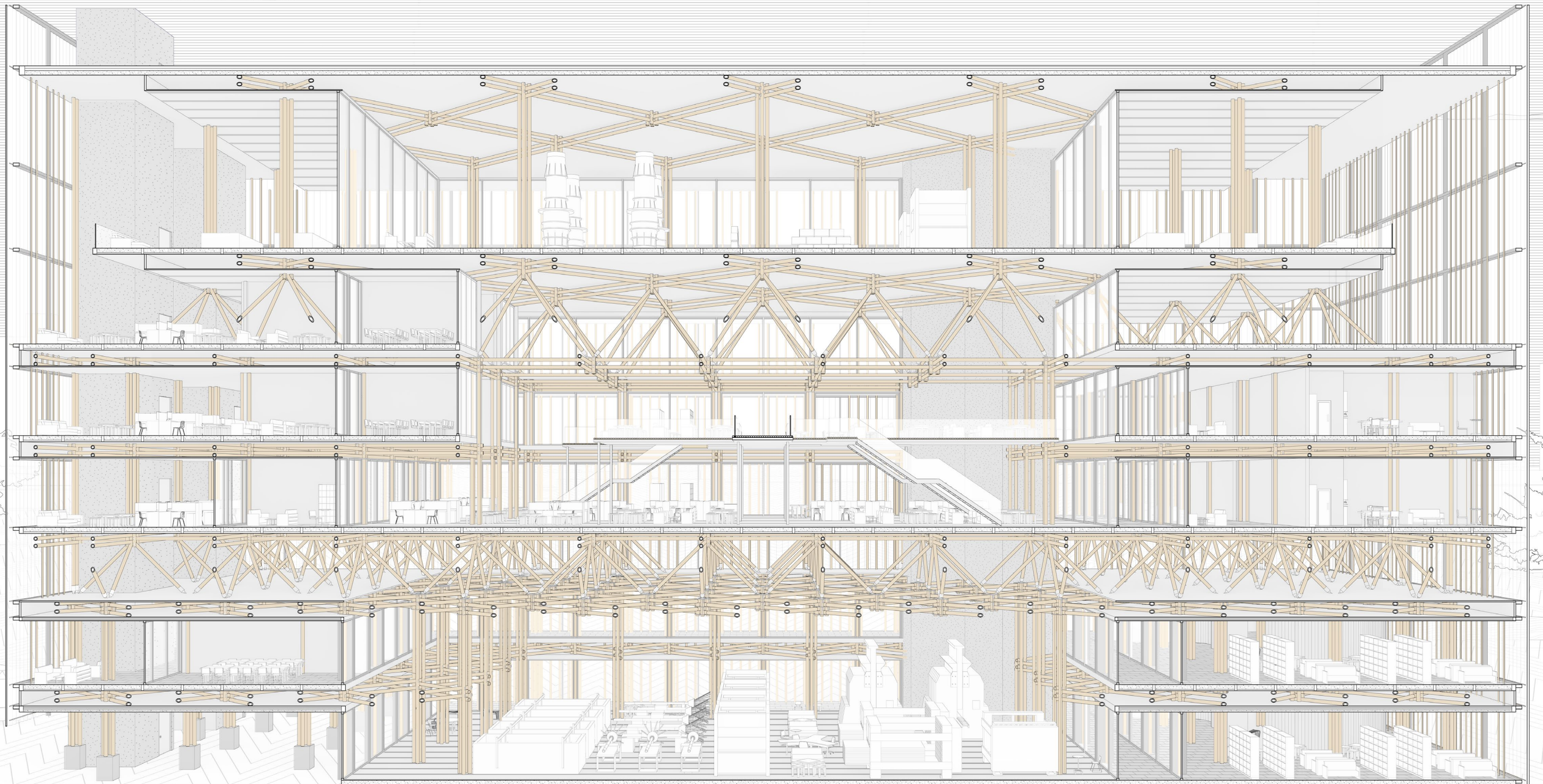
Frame Structure

B.O.S.S Conceptual Model

The strength of the bamboos is not as good as the traditional material, but instead of put more bamboos together to make thicker columns, I put more columns in lower floors and along with the floor being upper the span of the bamboo made columns became wider, and through truss to transfer load, which could make the space inside more dynamic so that we could apply functions with different dimensions inside.



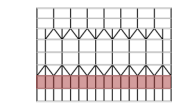
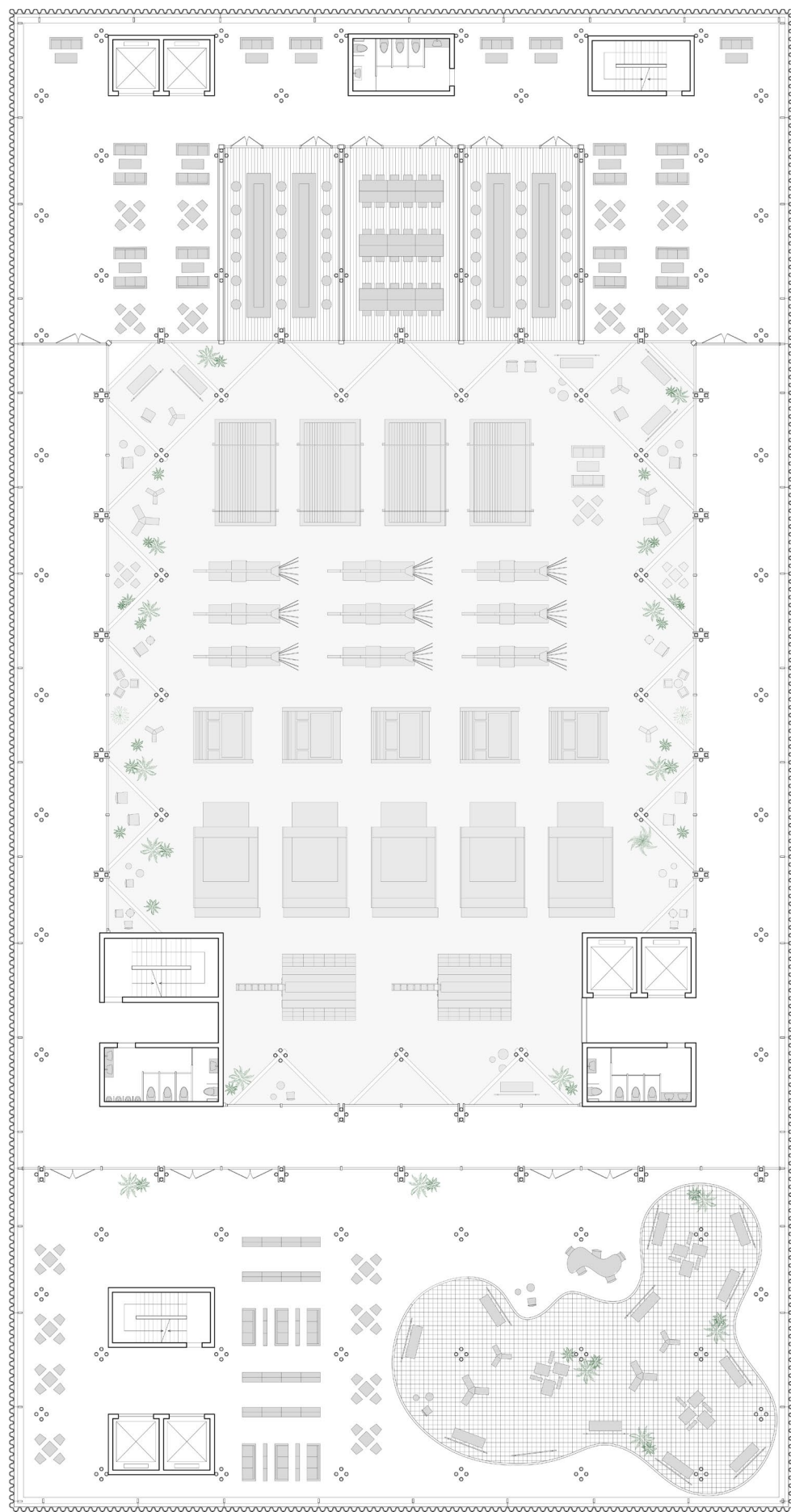




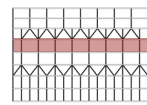
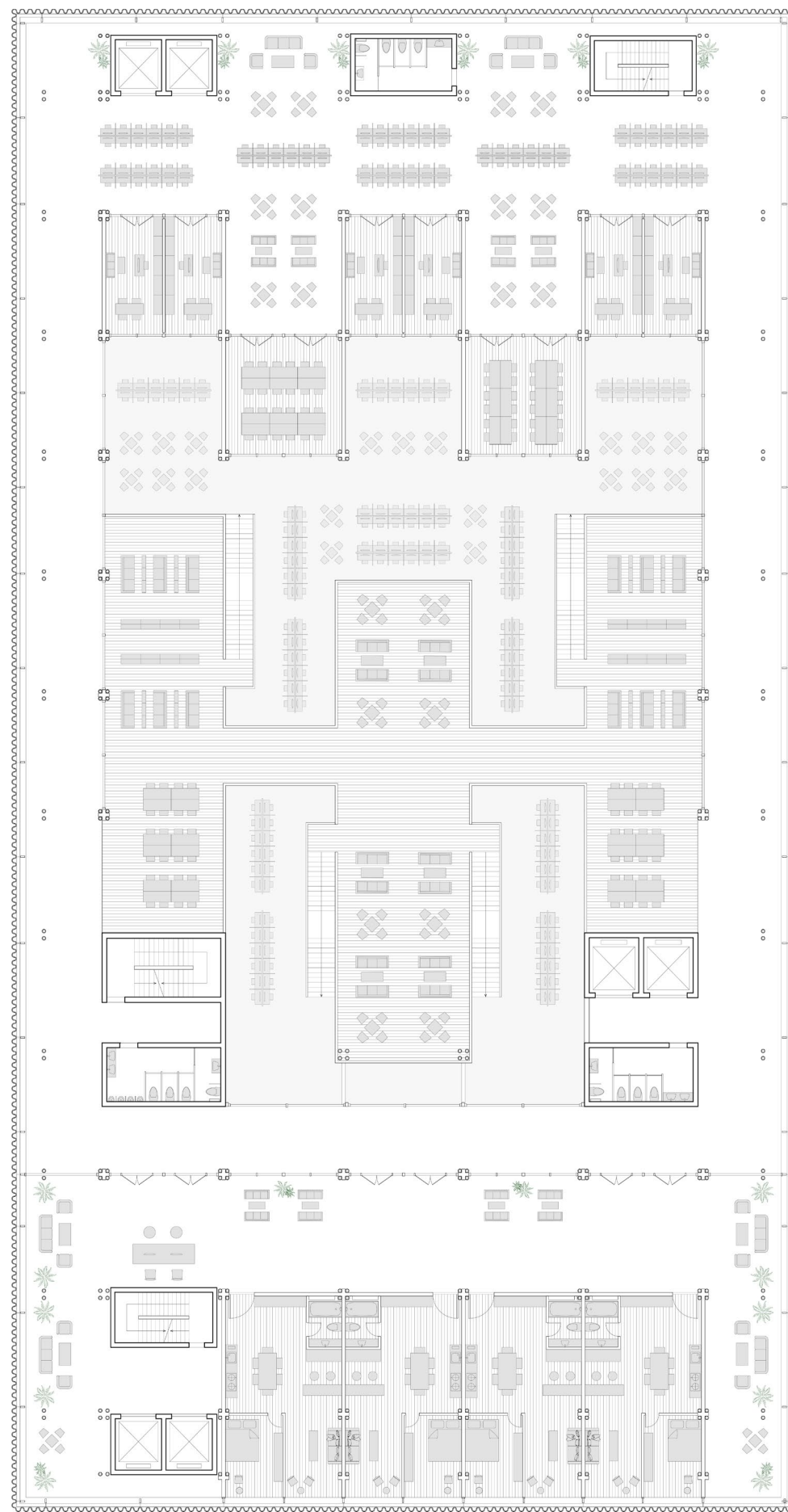
**Perspective Section**

Three sections of bamboo column structure system to also divide up the building into three sections vertically.

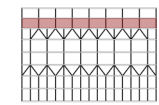
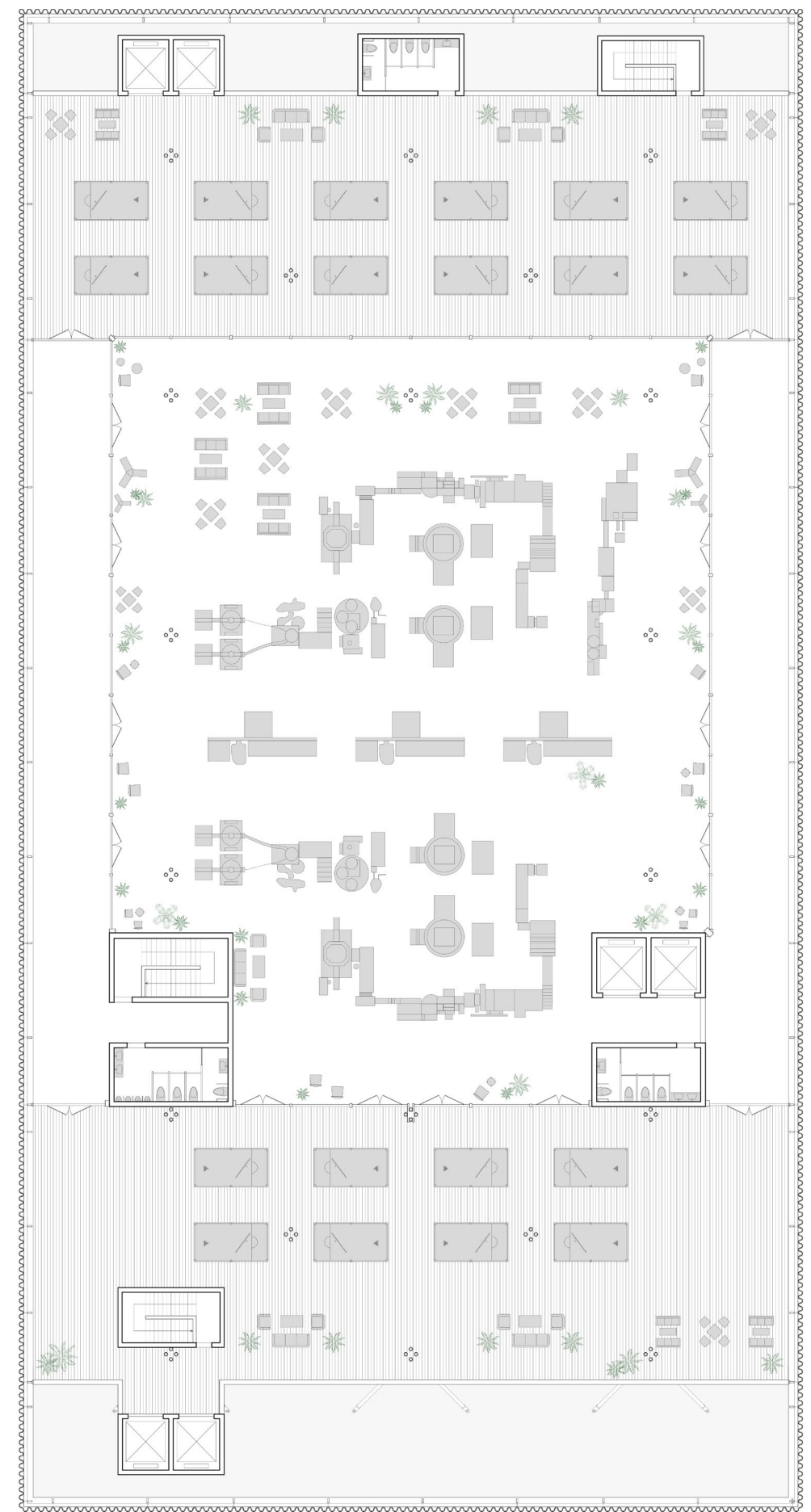




**2nd Floor Plan**



**4th Floor Plan**



**6th Floor Plan**

Exhibition / Public Lab / Private Lab Rooms / Bamboo Manufacturing Space (Ground Floor)

Studios / Public Office Area / Private Office Area / Conference Rooms

Public Recreational Space / Seaweed & Oyster Manufacturing Space





#### 4th Floor: Public and Private Office Area

You can see public office space where people could have some conversation and the relatively private office and conference rooms which visually interact with the public office space.





### 5th Floor: Sight-seeing Corridor

A corridor connecting both sides of the building, and could also be for investors to visit how to manufacture these different materials, but not go into it.





### -03- Shore, City

An **Community in the Extension** Built between a T-shaped Abandoned Building for Immigrants to New York City

Teammate: Ziyi Zhu  
Columbia University GSAPP  
2023 Spring Advanced Studio\_City Island  
Site: Coney Island, Brooklyn, NY  
Instructor: **Prof. David Eugin Moon** | d@nhdm.org

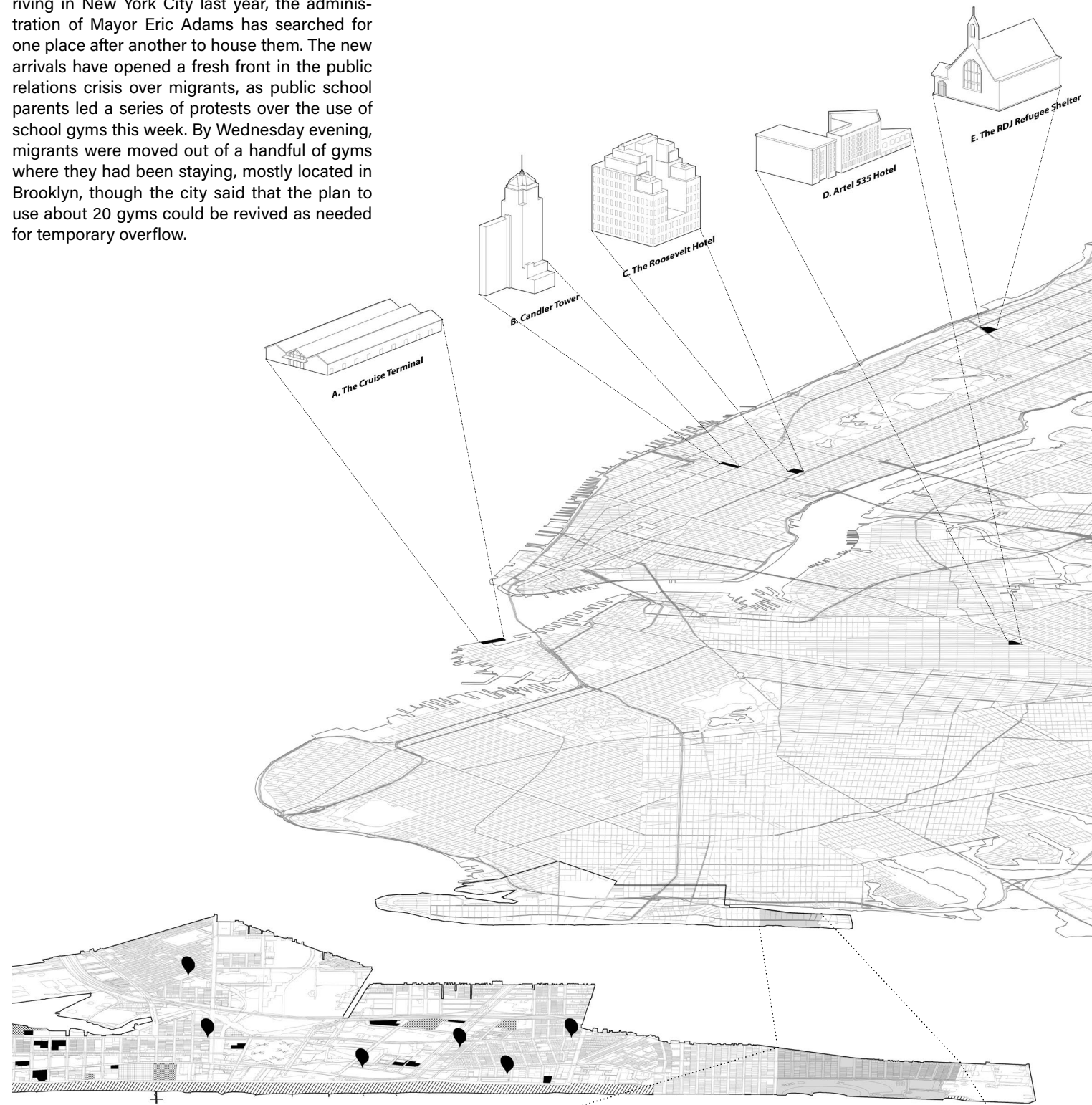
**Context:** New York City has accommodated a substantial influx of immigrant shelters designed to cater to individuals and families newly arrived in the United States. Regrettably, owing to the insufficiency of designated facilities for refugees and immigrants, these newcomers often find themselves compelled to utilize public spaces as makeshift dwellings, including school gyms and parks. This situation has engendered tensions between the immigrant population and the local residents, prompting protests within the community that advocate against further immigration to New York City.

**Program:** This project endeavors to manifest our conceptualization of an extension integrated between the wings of a T-shaped abandoned building on Coney Island. This architectural endeavor combines elements of immigrant housing with a public area intended for the joint use of both immigrants and the local community. Serving as an experimental prototype, this innovative concept holds the potential for application in diverse urban settings. The primary objective of this undertaking is to transform Coney Island into a more dynamic locale, fostering a sense of welcome and integration for newcomers, who will hopefully find themselves more embraced by the existing local communities.



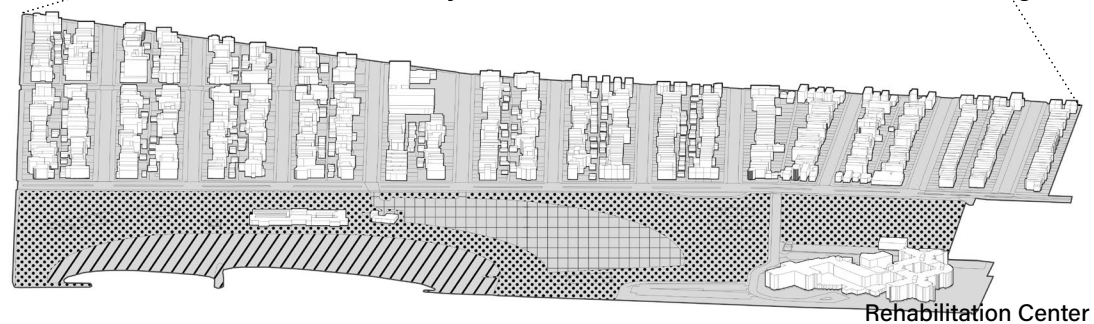
## The Distribution of Existing Refugee Shelters in NYC

Since tens of thousands of migrants began arriving in New York City last year, the administration of Mayor Eric Adams has searched for one place after another to house them. The new arrivals have opened a fresh front in the public relations crisis over migrants, as public school parents led a series of protests over the use of school gyms this week. By Wednesday evening, migrants were moved out of a handful of gyms where they had been staying, mostly located in Brooklyn, though the city said that the plan to use about 20 gyms could be revived as needed for temporary overflow.



Distribution of Different Areas in Coney Island and The Potential Area of Terminal for Immigrants

- Jewish Communities
- Plant Areas
- Beach Areas
- Site and Surroundings
- Public Housing Areas



Potential Sites/ Final Site/ Route of Immigrants

**S<sub>1</sub>**

**Potential Site: Floyd Bennett Field**  
Reuse the abandoned airport as an entrance to the living place for migrants on coney island, with temporary functions as a landing site.

**T**

**Terminal on Coney Island**  
Include a terminal on the east side for migrants to land on coney island and then transported to different living areas.

**S**

**Final Site on Coney Island**  
Renovate and add new designs to existing building on coney island for migrant housing and community, which also serves local people and responds to emergencies.

**P**

**Potential area**  
As an area of connection between coney island and Floyd Bennett Field, containing new water shuttles connected by piers.

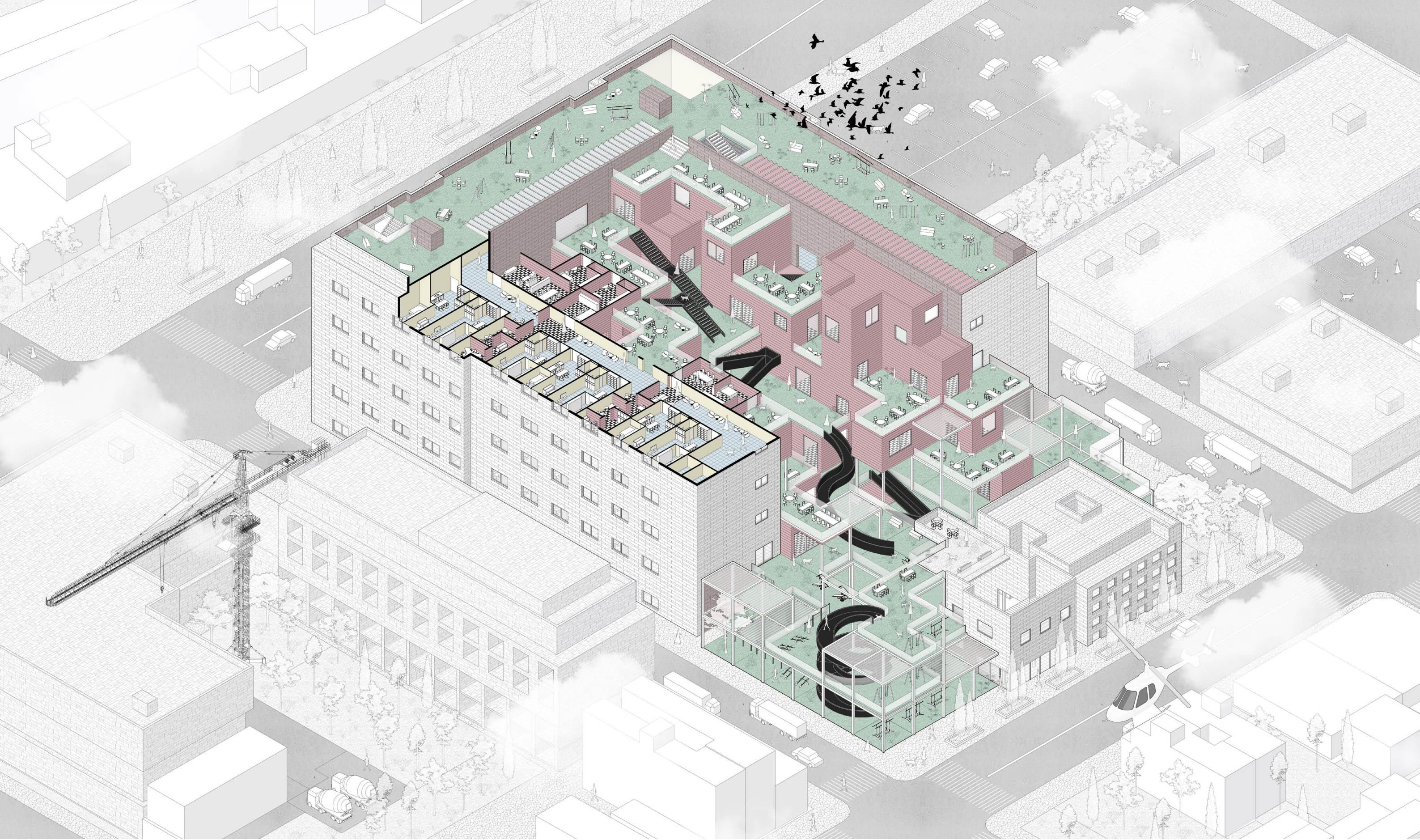




**A Test of an Innovative Gateway Integrated with a Pier for New Arrivals**

This collage depicts our initial vision of a grid structure that seamlessly integrates a building with a pier, serving as an entrance and temporary residence for immigrants, refugees, and asylum seekers arriving at Coney Island and could also be considered as a starting point of them to be engaged in New York City.





**Extension Building is Attached and Interact to the Existing One**

In the primary design illustration, the newly constructed extension seamlessly integrates with the existing “T”-shaped building. A discernible gradient delineates the transition from private to public, progressing from left to right. Black architectural elements serve as connecting gestures, linking various levels of the extension.

The extension’s walls extend into the interior of the existing building, giving rise to captivating public spaces. This architectural approach facilitates a dynamic interaction between the new and the old, creating a harmonious blend of contemporary and established elements.





### Chunk Model of the connection between Existing Building and Extension

This model illustrates the connecting section between the extension and the existing building. It delineates both public and private spaces, employing two acrylic plates to symbolize ground and sea levels during high tide at Coney Island. Consequently, the first floor predominantly comprises public areas.

