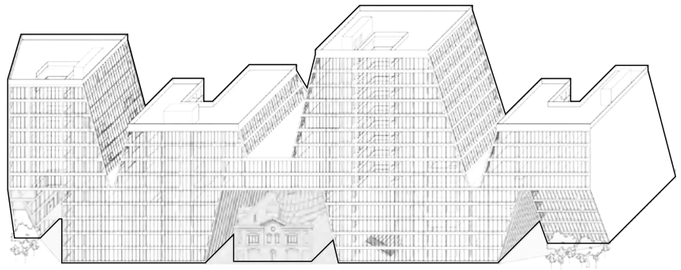
Ji Hyun Nam

Selected Works 2023-2025

Master of Architecture 25'
Columbia University GSAPP

1. Interlocking Dwelling

Student Housing: Residential + University Program

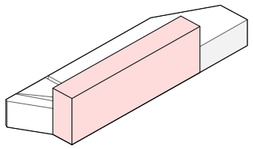


LOCATION: 454 W 128th St, New York, NY, 10027
YEAR: 2023 Fall, Core III (GSAPP)
INSTRUCTOR: Christopher Leong
TEAM MEMBER: Jiwon Kim, Ji Hyun Nam
KEY WORDS: Housing, In-Between, Young Adult

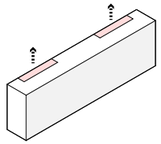
Inspired by the marbled texture of a New York strip steak, our project introduces an innovative concept: an interstitial layer symbolizing an education program within a housing project. Positioned in Manhattanville at the crossroads of commercial and residential zones, our design seamlessly blends educational and residential spaces, challenging traditional living norms. The building accommodates public and private functions, creating serendipitous interactions at its central axis. Classrooms, libraries, workstations, and dining areas are dispersed across various floors, embracing the concept of erosion. The spaces between building masses, inspired by erosion, foster unexpected meetings. Indirect circulation paths encourage encounters, nurturing a vibrant sense of community and togetherness. Our commitment to inefficiency in circulation aims to redefine living and learning, providing a unique and transformative experience in a space that transcends conventional school and housing structures.

Mass Concept

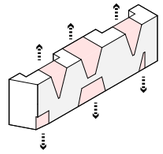
Our primary goal when during the mass study was to complease the block, but still bring public towards the courtyard. Therefore, the building looks continuous with surrounding buildings but create interesting in-between spaces within the eroded spaces.



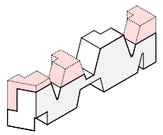
Completing the Block



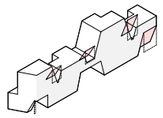
Carving Out Internal Courtyards



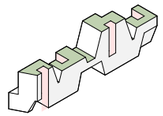
Erode openings for Inbetween Spaces



Change in Height



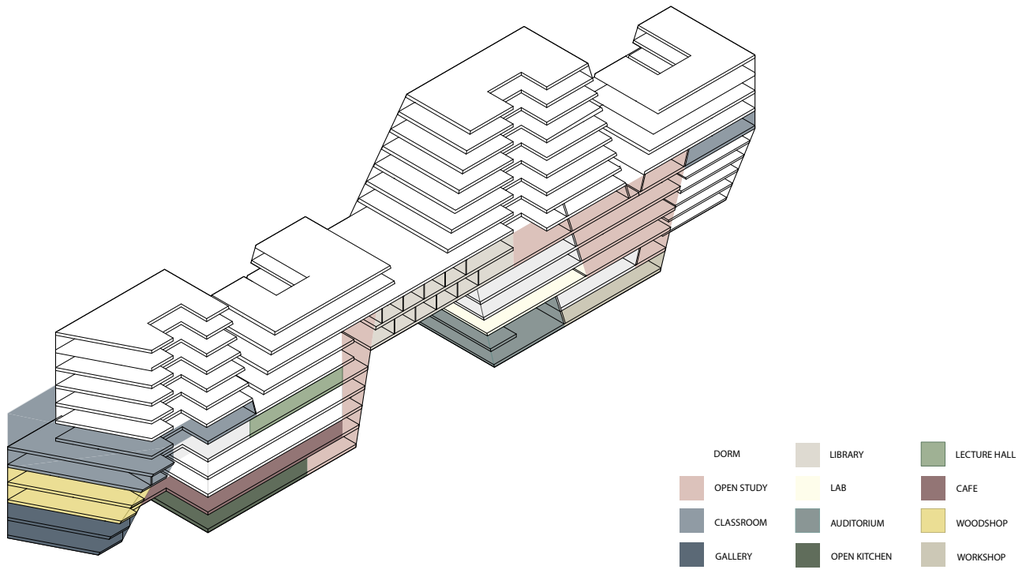
Angle Towards Courtyard

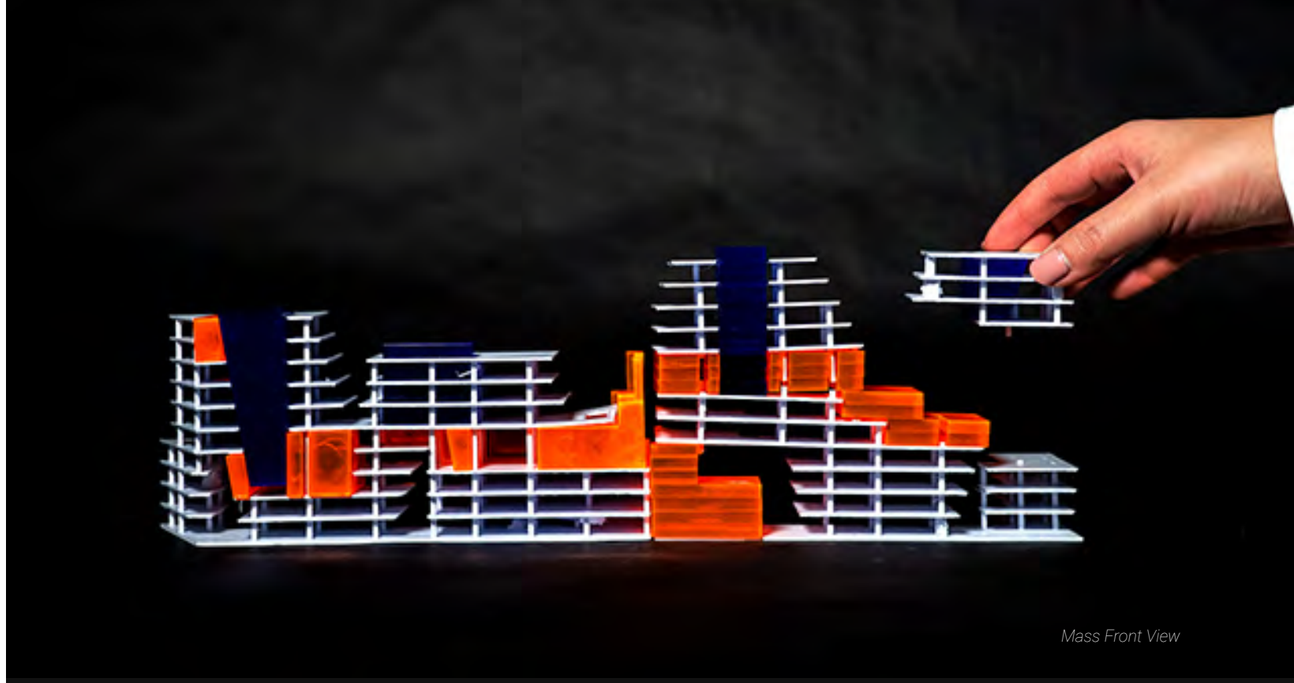


Cutout Atriums and Create Gardens

Programming Diagram

Although we were designing the residential building for the students we did not want to seperate school programs from residential spaces. Therefore, the public spaces are put in between residential floors for unexpected interaction.



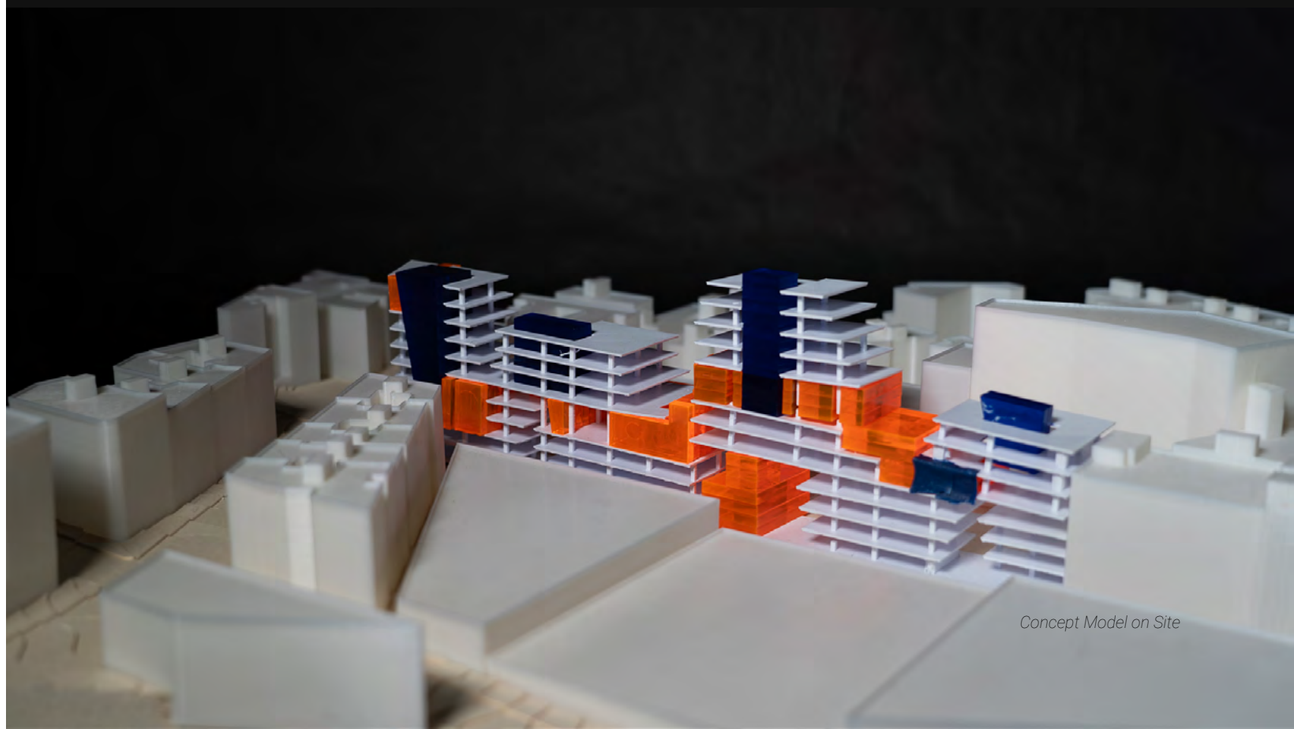


Mass Front View

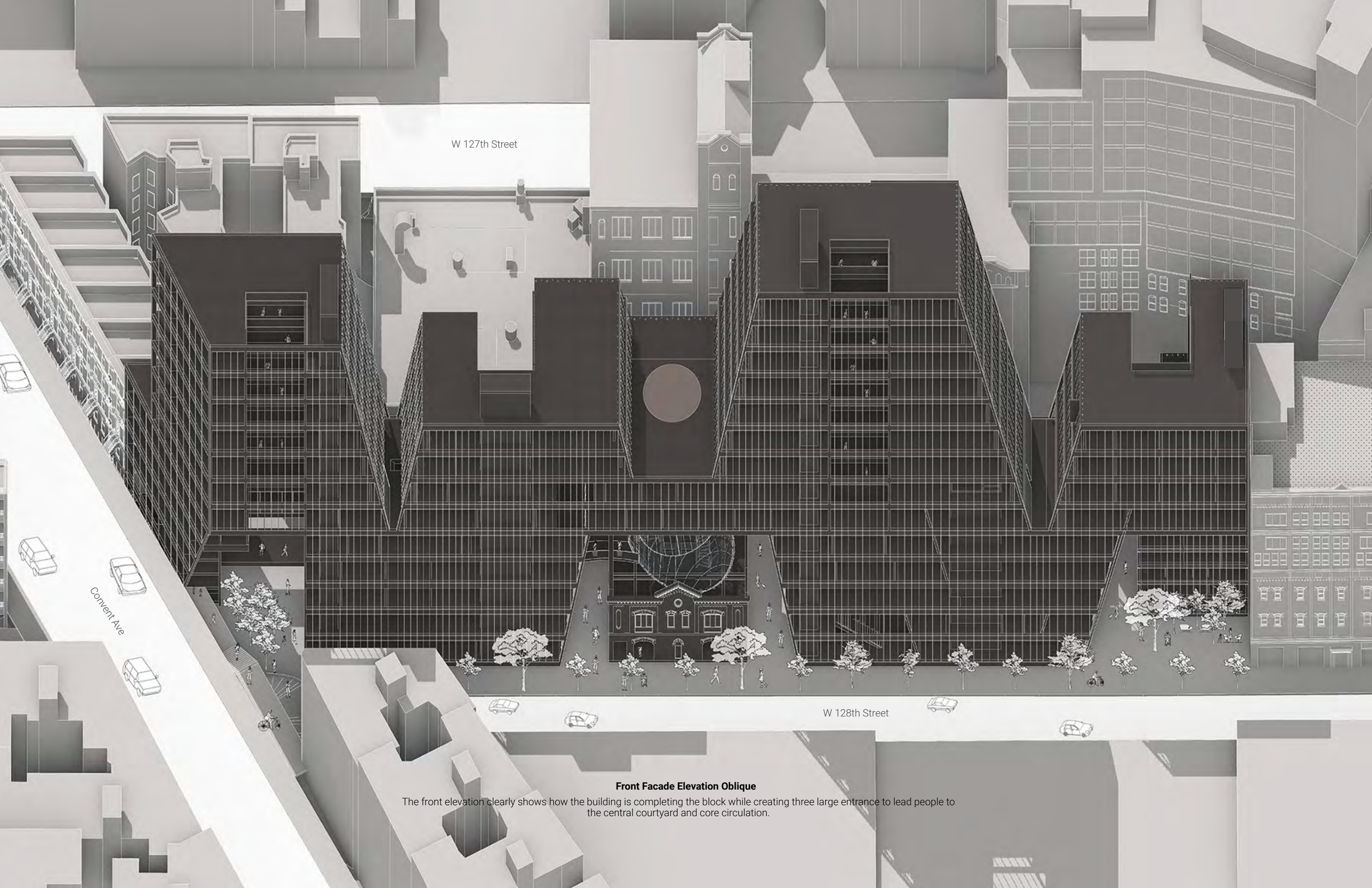
Program Concept Model

The model helps to understand how school program, atrium, and residential spaces are interlocking together. The color contrast is interesting to see how intersecting spaces are going to create socializing spaces.

Public Program Atriums Residential Area



Concept Model on Site

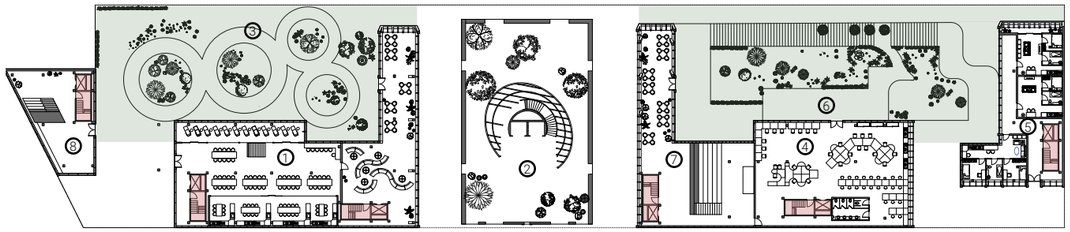


Front Facade Elevation Oblique

The front elevation clearly shows how the building is completing the block while creating three large entrance to lead people to the central courtyard and core circulation.

Ground Floor Plan

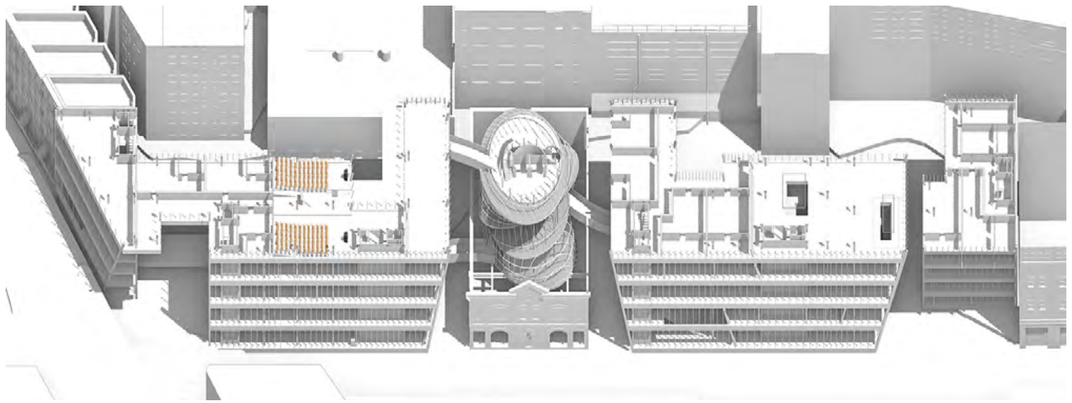
Three main grand entrances bring people into the two courtyards. The ground floor is used mostly for the school programs such as lecture space, dining room, study, and common area. The right side building is residential from ground to the highest floor.



1- Library **2**- Central Circulation **3**- Courtyard A **4**- Cafeteria **5**- Student Housing **6**- Courtyard B **7**- Cafe **8**- Lounge

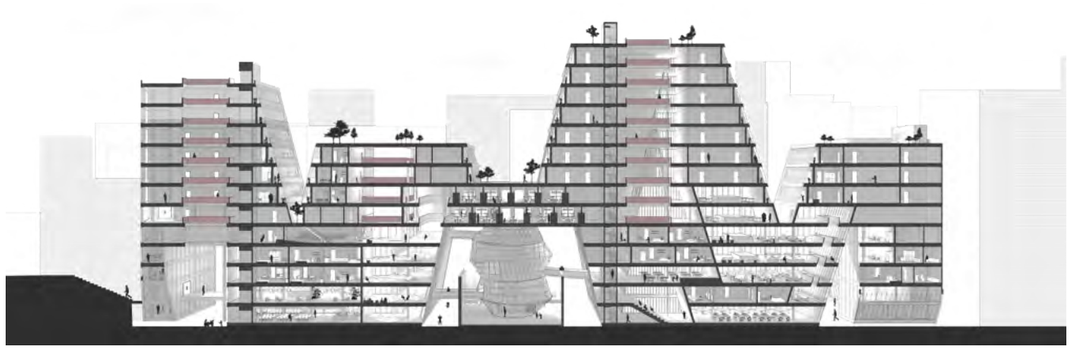
5th Floor Plan Oblique

Similar to the ground floor 5th floor clearly shows how the residential spaces are mixed in between public spaces. Importantly, the central circulation portal is used to send people to different floors.



Long Section

The section shows how the residential and public spaces are mixed together. The V-shaped terraces are residential terraces that are facing each other. It could also create spontaneous interactions in private sector.

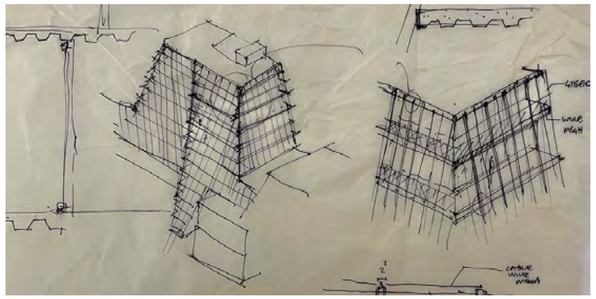


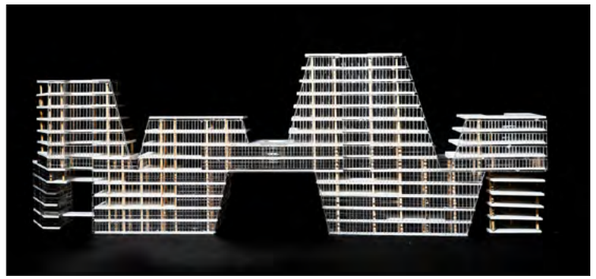
Short Section with Courtyard

The grand entrances welcome people to the courtyard inside the block. It is open to the public it could be used as surrounding neighbor's event space. Additionally, the atrium space for the students is designed to create more interaction in between floors.

Facade Idea Sketch

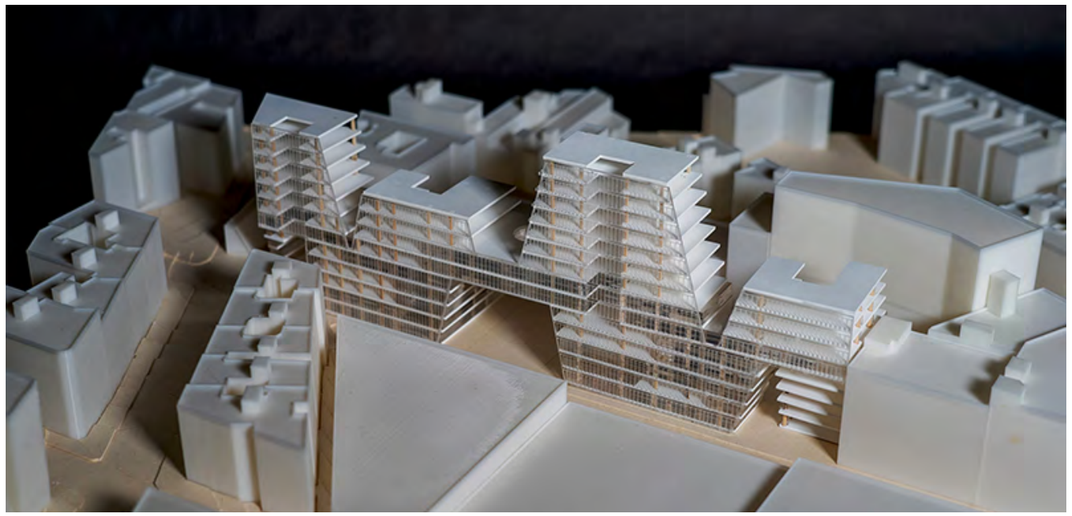
As the whole mass was very elegant in cuts and angles, we tried to make the enclosure continuous as possible. We used the angled surface to create continuous facade system, and made terraces when there is a v-shaped.





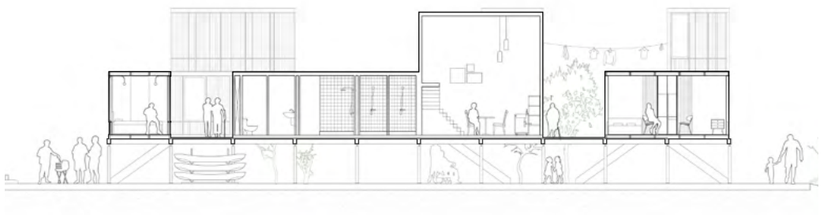
Site Model

The site model shows how our buiding complete the block and create vast openings to welcome people to the space.



Resident Terrace Render

2. City 1.5+
Emergency Housing for Refugees



Housing Module Section

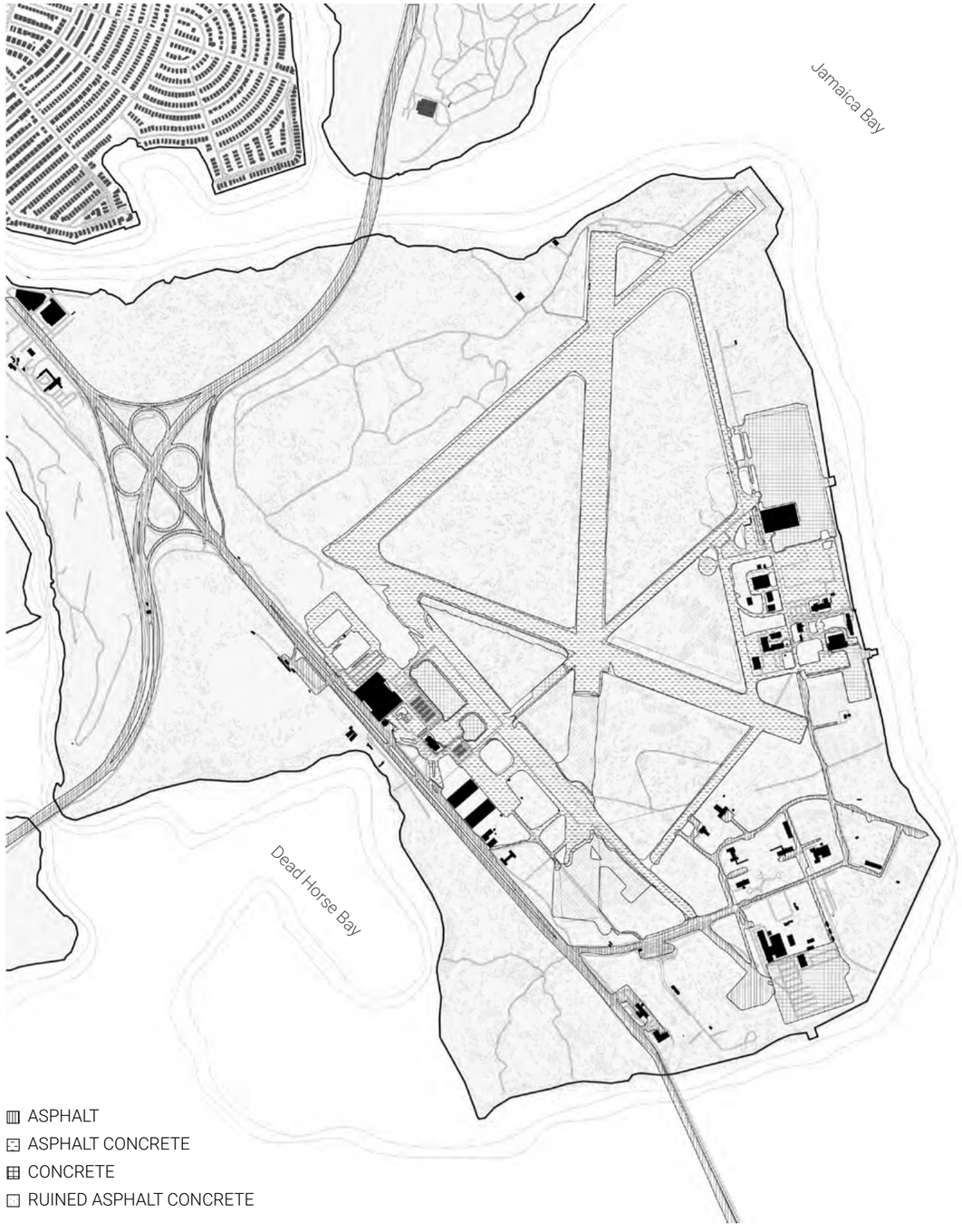
LOCATION: Floyd Bennett Field, Brooklyn, NY
YEAR: 2024 Spring
INSTRUCTOR: Havard Brevik
PARTNER: Joanna Cheung, Albert Mo
KEY WORDS: Refugee Camp, Flood Mitigation, Temporary Housing

City 1.5 merges emergency reception solutions for displaced populations with the recreational revitalization of Floyd Bennett Field national park. Informed by our initial flood risk analysis, our design accommodates living requirements for incoming refugees while ensuring safety and sustainability.
Comprising three communal Hubs, the project seamlessly integrates permanent public programs within a recreational park environment, fostering community interaction and repurposing underutilized spaces. Hub One serves as the main reception area, accommodating both incoming tourists and arriving refugees, complete with education and clinic facilities. Hub Two offers recreational amenities for residents and refugees alike, promoting community engagement and well-being. Positioned by the shore, Hub Three provides water-related activities and ferry access.

Housing Module Bird's Eye View Render

Site Mapping

There was a extensive study about the site condition. Not only hard&softscape was studied but also flood, light, flora&fauna, evacuation zone, etc were studied. Studying the site was crucial because it is so different from conventional Manhattan site.



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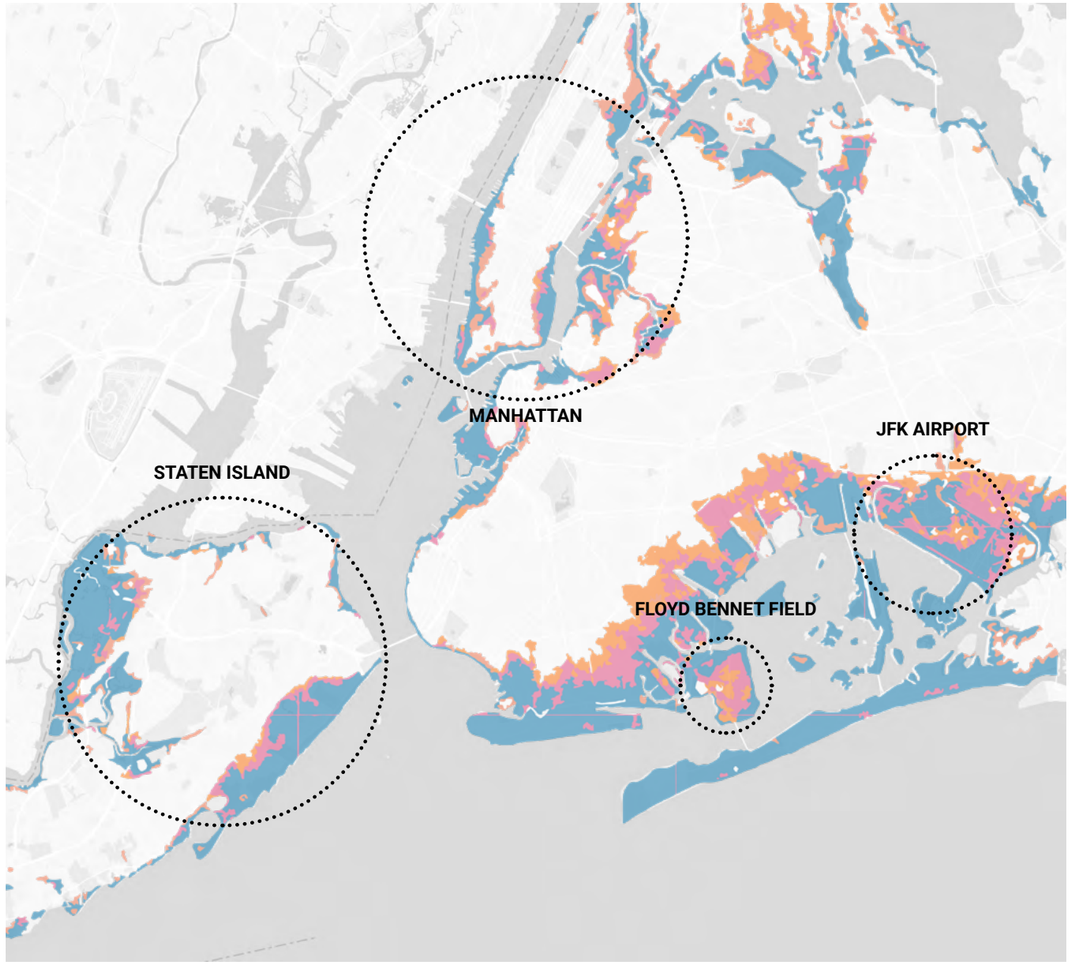
Flood Plain Map

Analyzing flood plain map was crucial to our project since the site is in the extreme flood zone. Also, we need to come up with the flood mitigation plan. Considering multiple exteme conditions on site was helpful base information for our design.



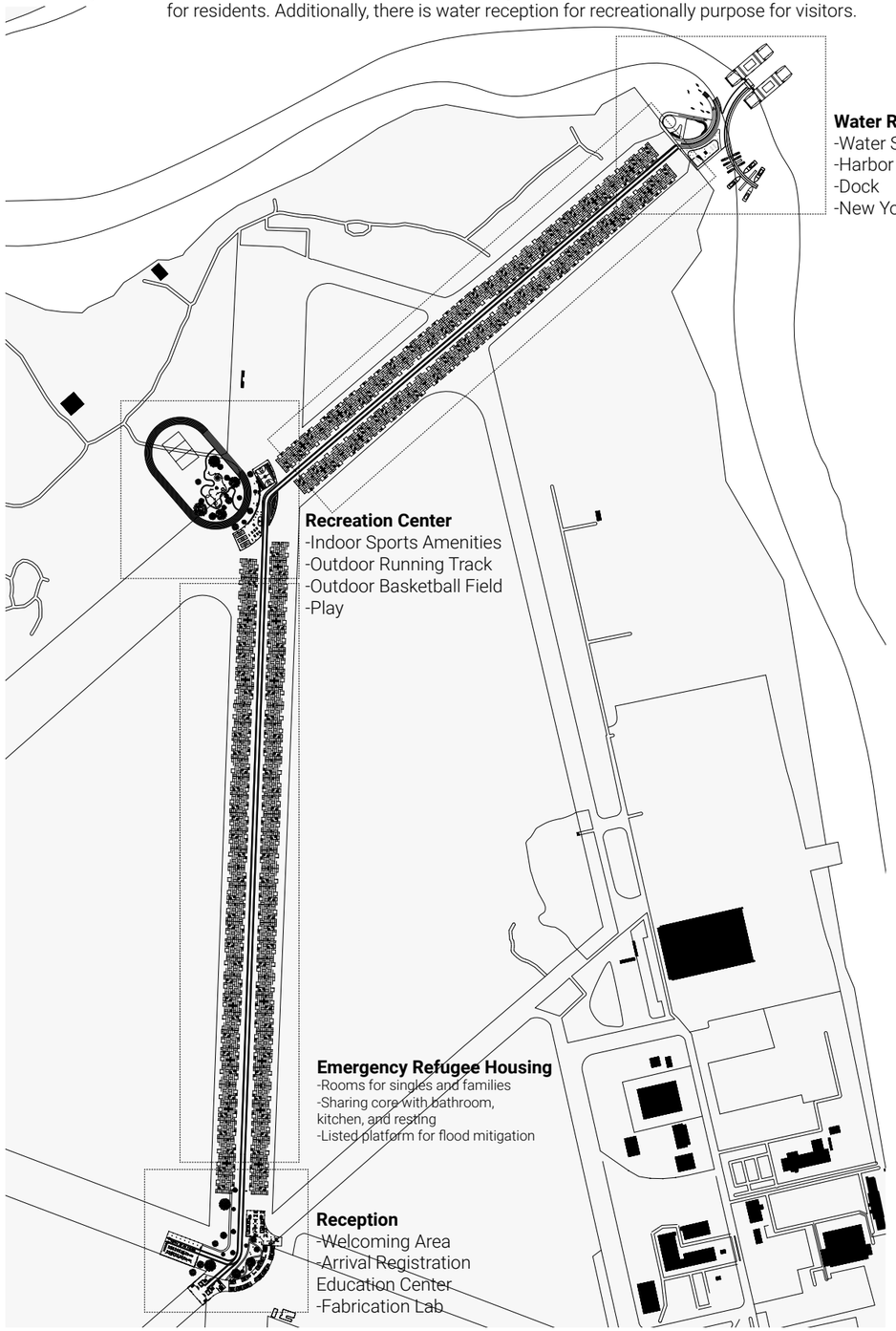
Flood Plain (2020)
Flood Plain (2050)
Flood Plain (2080)

Visualizing the data we collected from the nyc flood hazard mapper, we are able to observe the progressive flooding condition from the year of 2020 to 2080 in the future. The flood plain of 2020 covers most of the coastal area along the shoreline of southern new york city, including our site floyd bennett field and the jfk airport. Throughout the year from 2050 to 2080 the flood plain would dive deeper to inner land. Interestingly, the western portion of brooklyn and the uptown of manhattan would seemingly survive the flooding for a very long period.

As for floyd bennett field, most of the peninsula won't be fully covered by the flood plain until 2080. Which is a great indicator for our sitting to avoid future flooding condition.

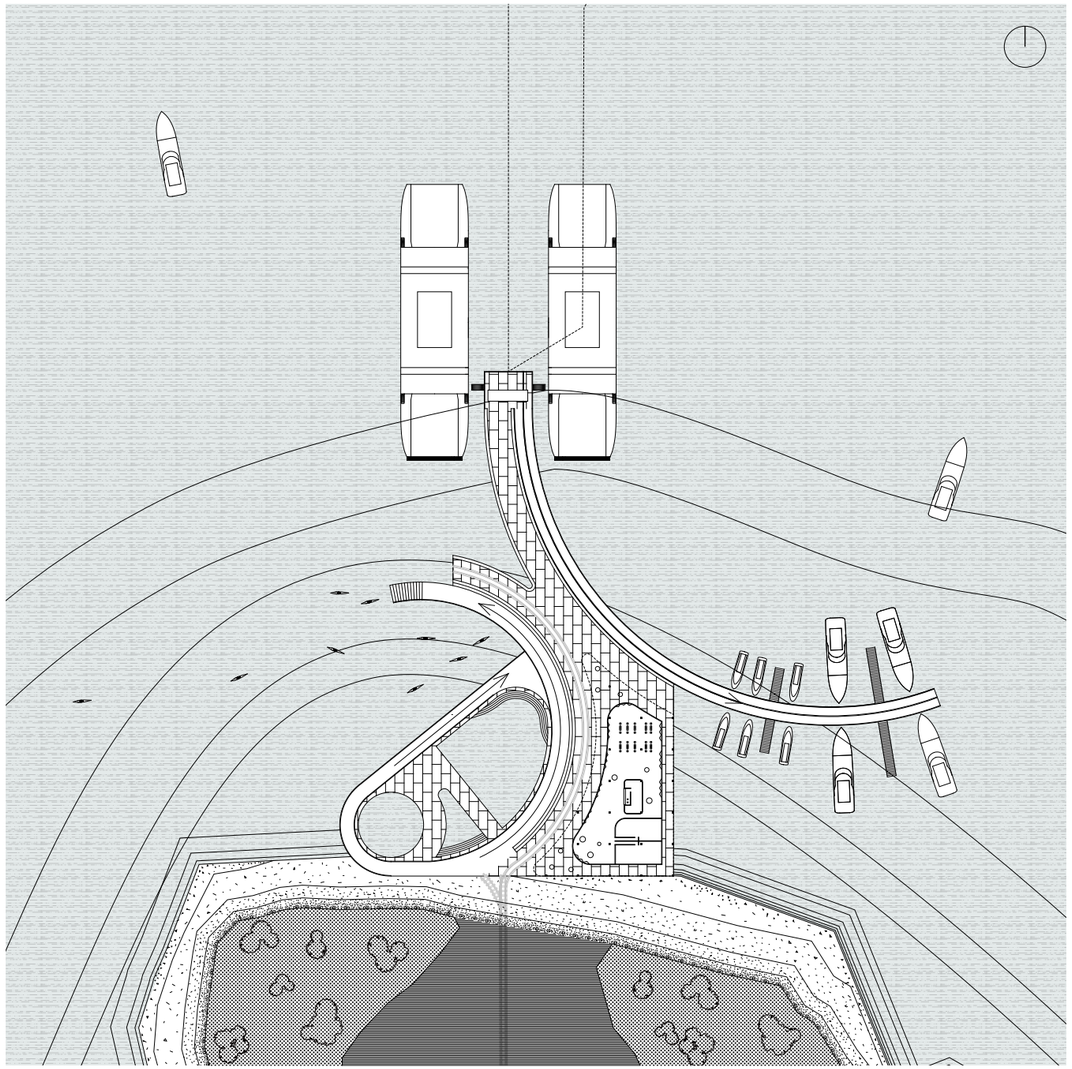
Major Center Design

Three Major centers are located along the past airplane landing area. Starting with welcome center there is a recreation center for residents. Additionally, there is water reception for recreationally purpose for visitors.



Water Reception Design

Water Reception was designed to not only serve residents at the site but also the visitors to Floyd Bennett Field. It would vitalize the site by bringing more people. The Site is currently using as fishing spot but this design could bring more people



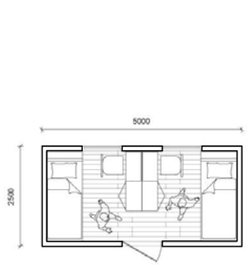
Site Plan: Water Reception

Water Reception Section

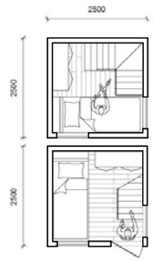
Housing Assembly Center

Moduler Emergency Housing

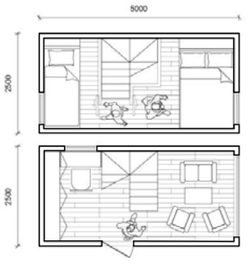
Moduler housing system was developed to make it quick, easier, and steady housing for refugees. It has four variations which are single single stoy / double stories and couple single story, and family housing.



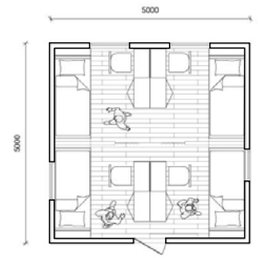
Single Standard Room
(single story - 135sqft)



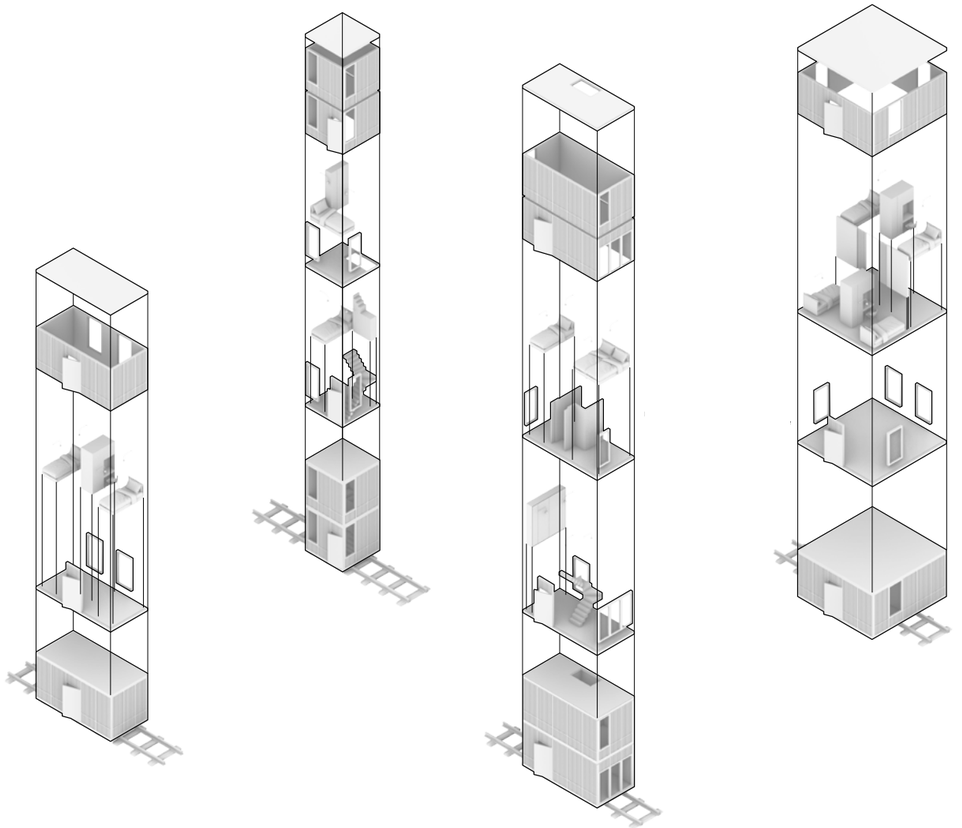
Single Standard Room
(double story - 67.5sqft)



Family Standard Room
(double story - 135sqft)

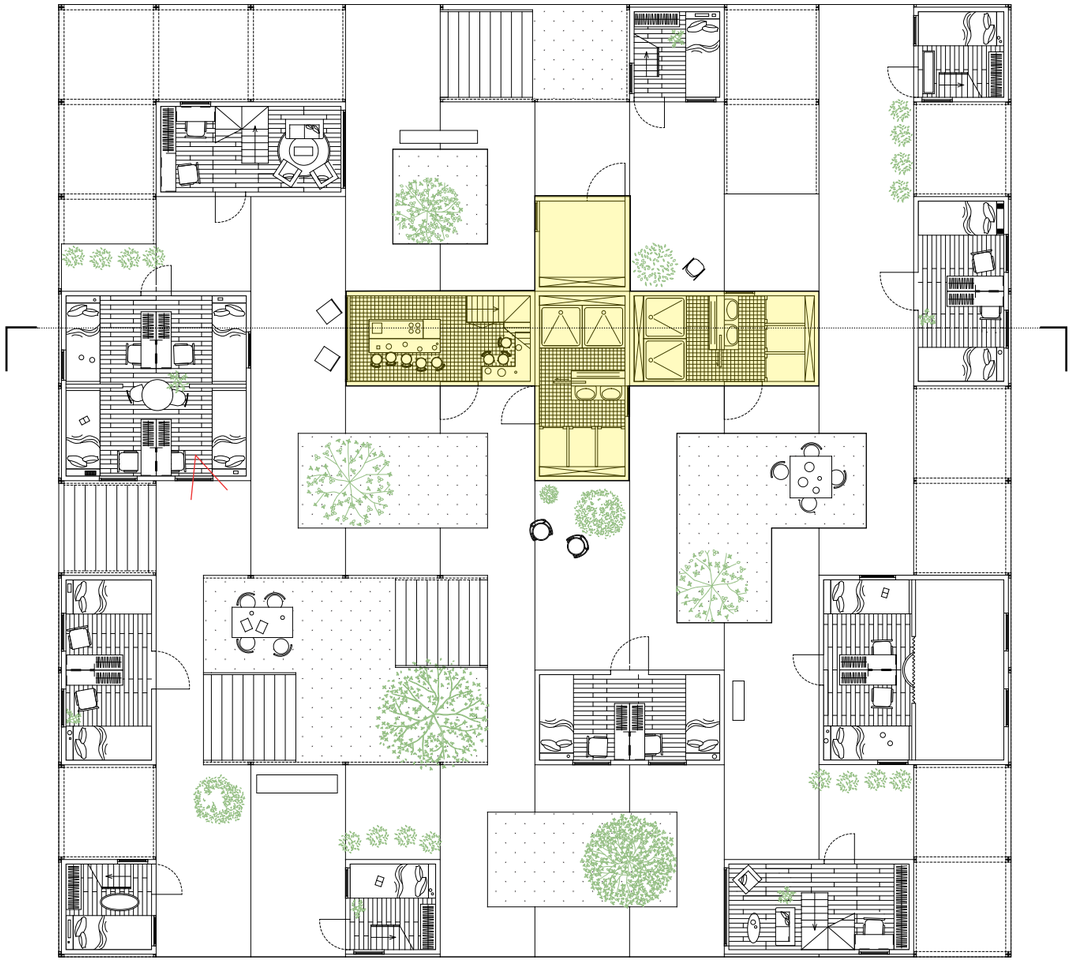


Family Standard Room
(single story - 270sqft)

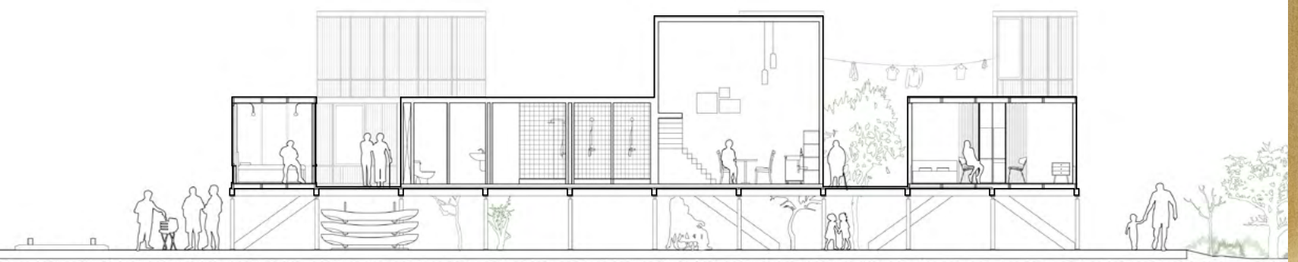


Moduler Emergency Camp Design

Moduler houses of singles and families were designed to accomodate various types of refugees. When the new refugee comes new module could be assembled in the fabrication lab and move on the railing track.



Moduler plan for 30 people with shared core and elevated platform.

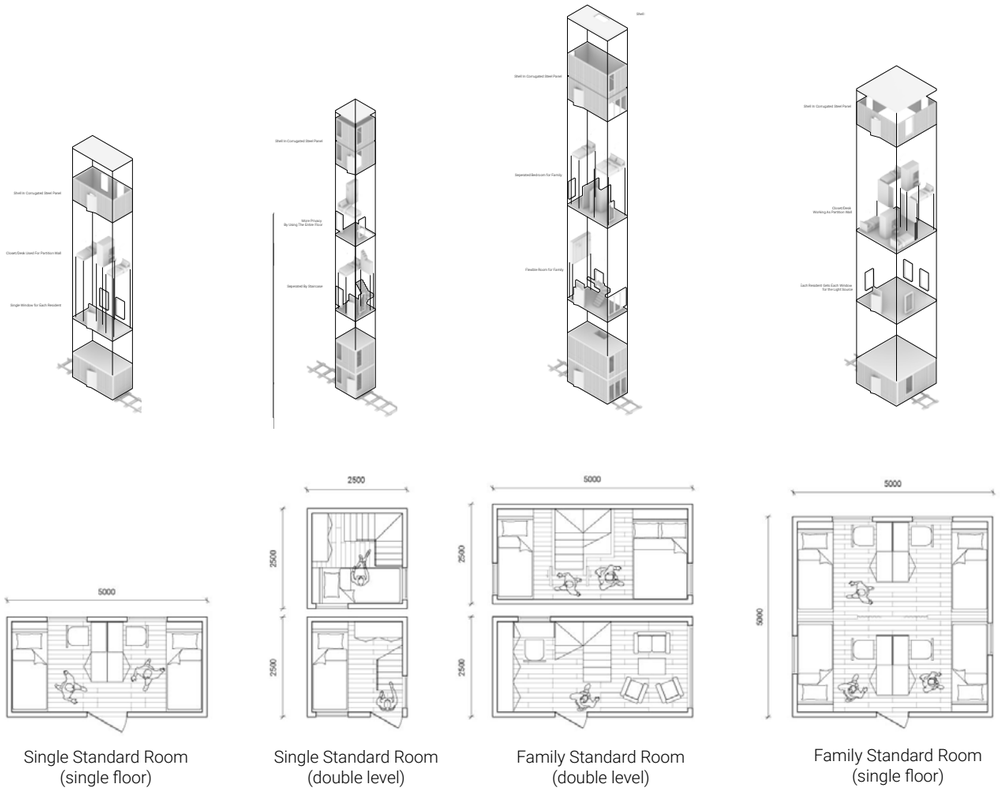


Moduler Emergency Housing Section

Moduler House Indoor Rendering

Major Center Design

Three Major centers are located along the past airplane landing area. Starting with welcome center there is a recreation center for residents. Additionally, there is water reception for recreationally purpose for visitors.



Single Standard Room (single floor)

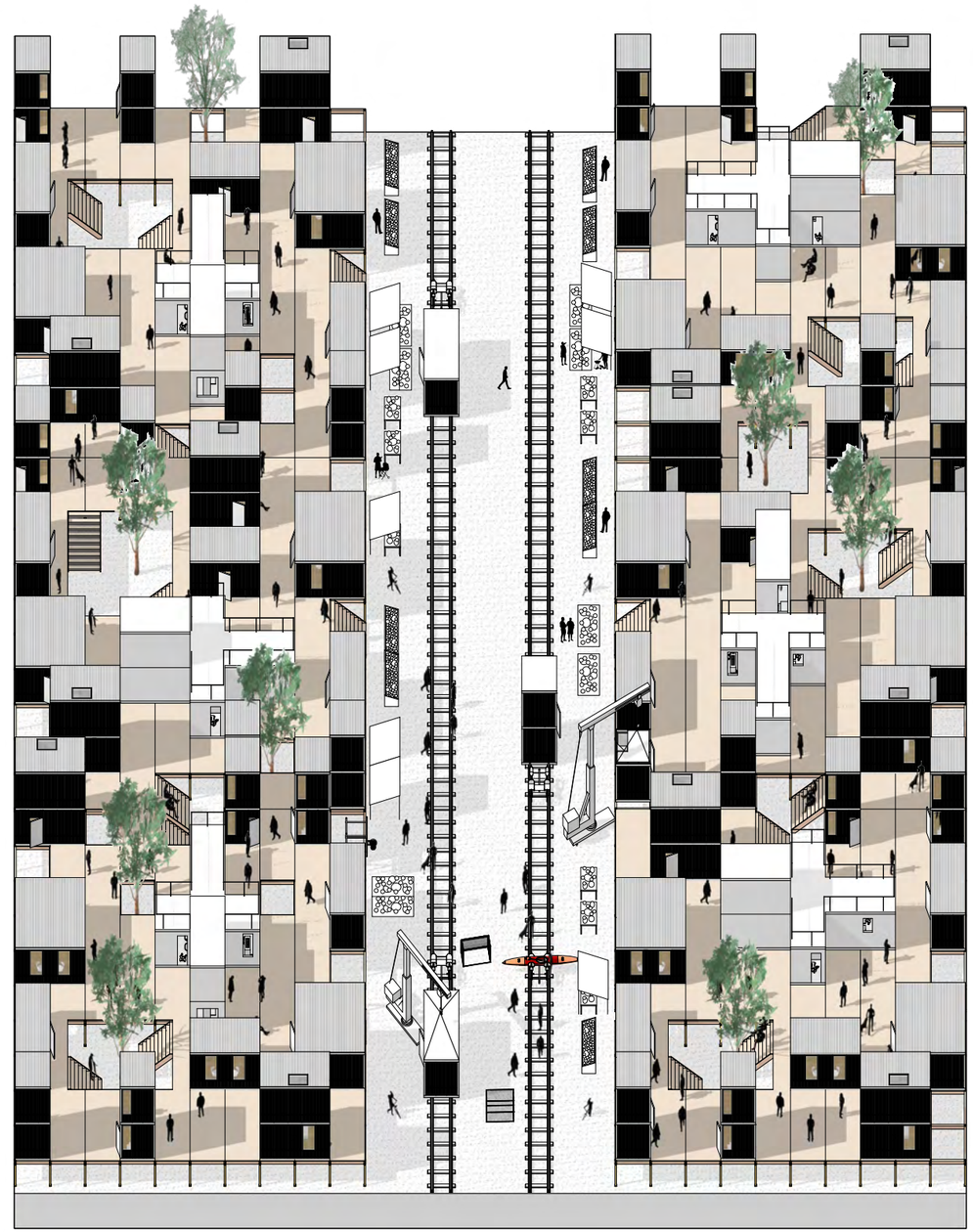
Single Standard Room (double level)

Family Standard Room (double level)

Family Standard Room (single floor)

Life at the Emergency Camp

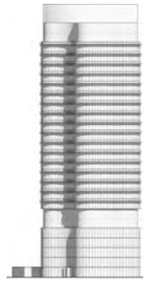
Rails in the middle is going to be utilized as main transportation line for moving moduler units. Along that railroad there will be community gatherings. All the units are going to be placed on the elevated platform for flood mitigation.



Emergency Housing Plan Oblique

3. NASA Research Center

Developing Project in Detail



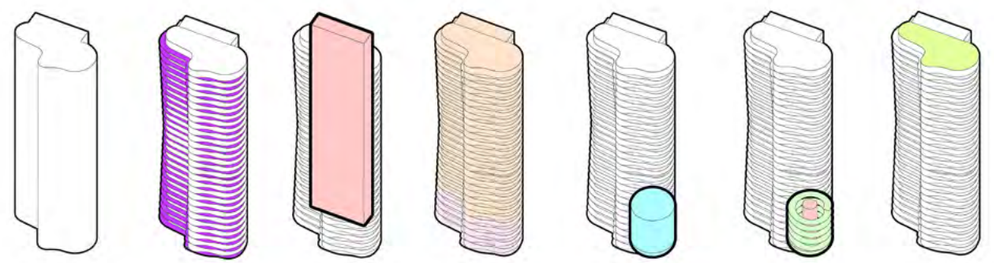
LOCATION: 245 Greenwich St, New York, NY, 10007
YEAR: 2023 Fall, Tech 4, (GSAPP)
TEAM: Yiu Lun Lee, Andrew Lin, Jiwon Kim, Wesley Lee, Ji Hyun Nam
INSTRUCTOR: Architect-Joe Hand, Structural Consultant- Paul Laroque, Mechanical Consultant- Sigal Shermesh, Encoosure Consultant- Alex Barmas
KEY WORDS: Highrise, Facade, NASA

The project's objective was to create a distinctive NASA exhibition and office center at the bustling Manhattan financial district. As a collaborative effort, each team member played a specific role, and my focus centered on conducting environmental analysis and crafting a facade design aligned with the findings. This undertaking went beyond a mere abstract design, evolving into a meticulous detailing project. The architectural plan allocated the first five floors for the NASA vacuum exhibition and auditorium, while offices occupied the 7th to 26th floors. Considering the surrounding rectangular box-shaped buildings, our challenge was to devise a structure with a unique and organic shape. This endeavor required the development of comprehensive plans, including detailed layouts, sections, HVAC duct plans, fire safety plans, egress plans, and more. My primary responsibility involved spearheading the facade development, necessitating the design and refinement of intricate joint details. The project, a successful fusion of creative design and practical planning, was conceived with the aim of drawing people to the site.

Building from Street (Greenwich St)

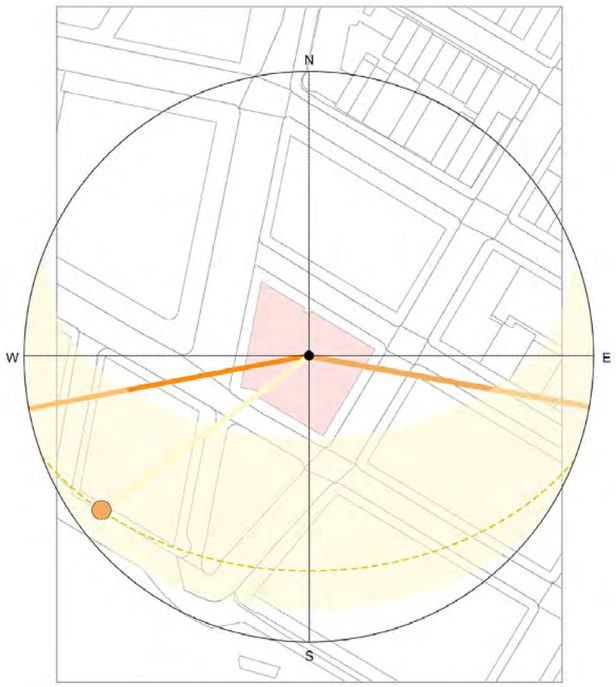
Reusing NASA Vaccum Chamber for Building

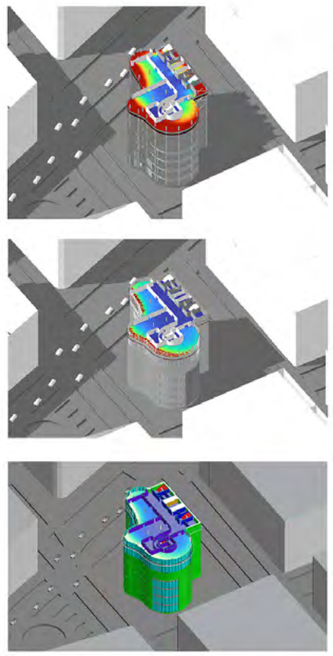
The vacuum chamber was designed and constructed to test both nuclear and nonnuclear space hardware in a simulated space environment. It features all-aluminum construction, and we plan to integrate this important facilitty as an exhibition space that can educate the public about space shuttle consturction.



Solar Analysis

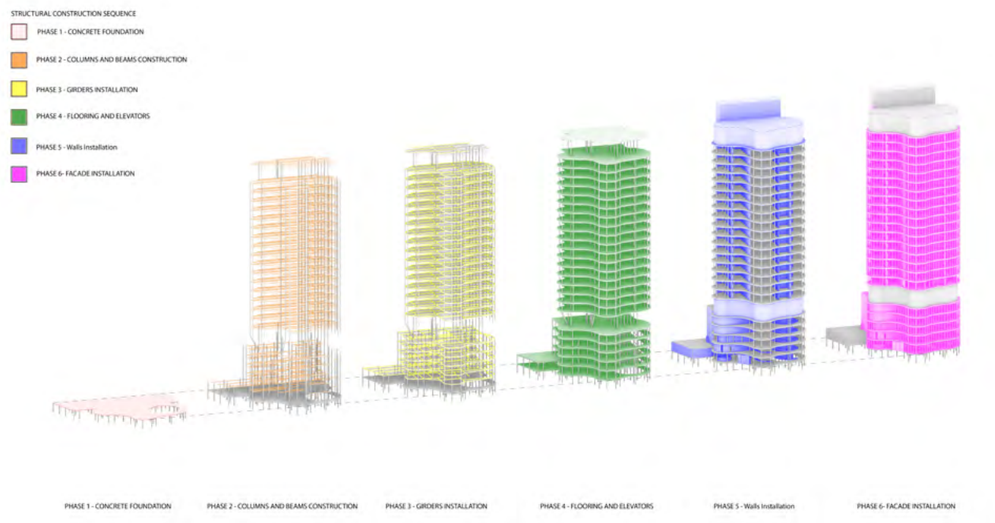
Solar analysis shows there is an excessive solar heat gain on the Southern side. Then, we decided to add doulbe horizontal louver around the building to optimize sunlight and solar is located on the Northern side solid wall is used.





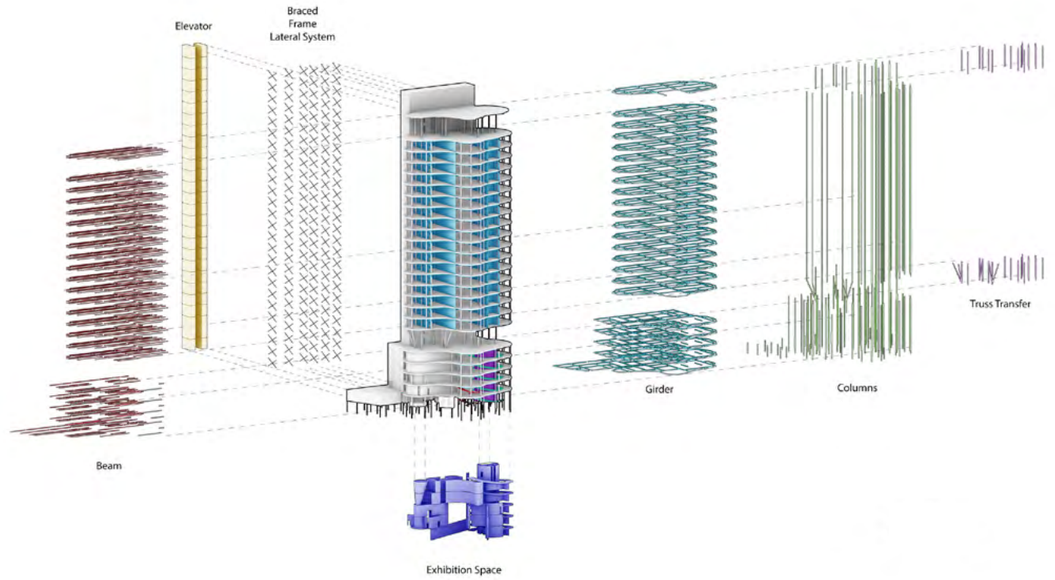
Structural Schedule

Structure for the bulding was analyzed and put them in schedule for step by step process.



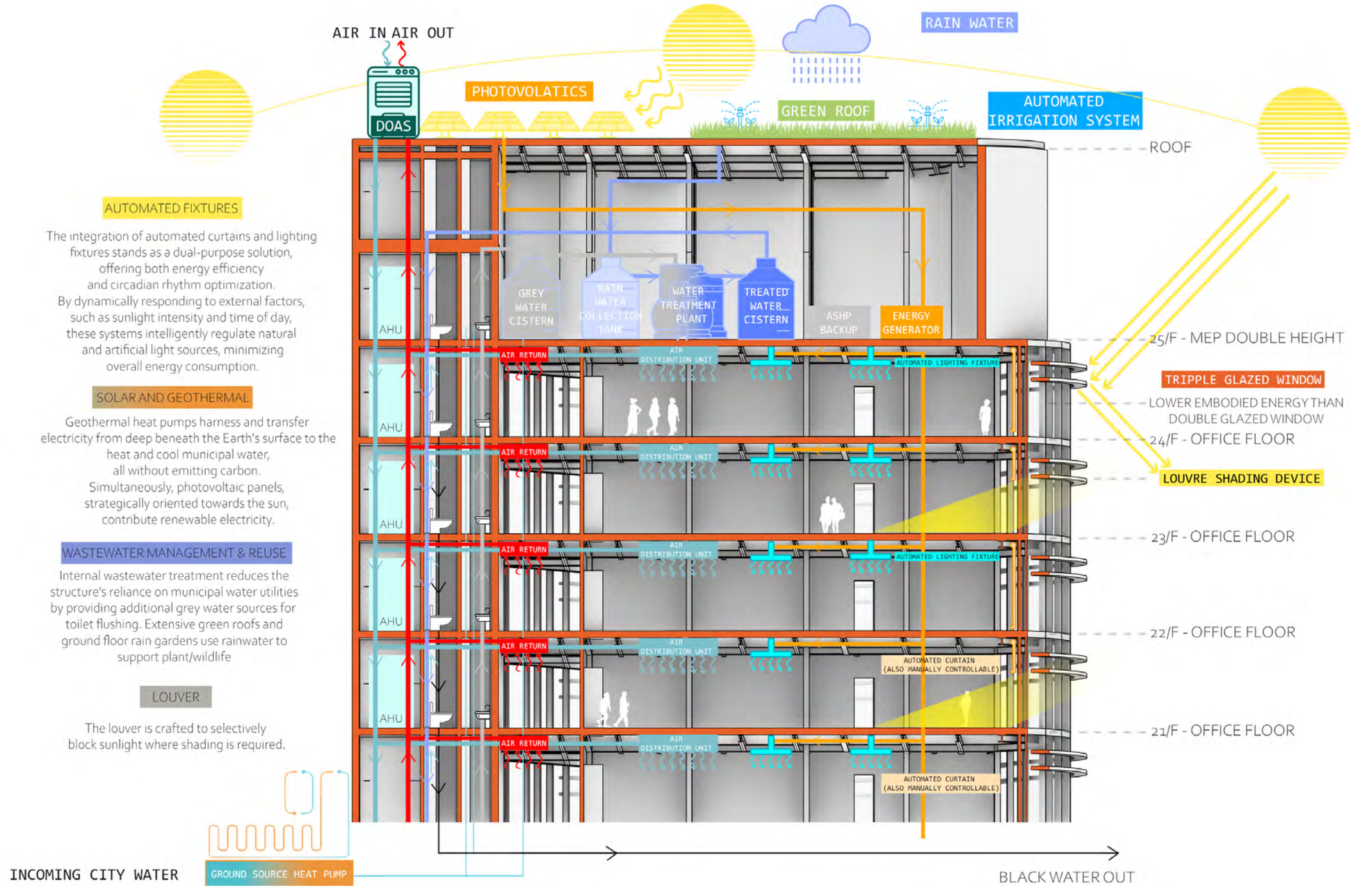
Exploded Structure

This exploded strucutre shows different structural elements supporting different parts of the building.



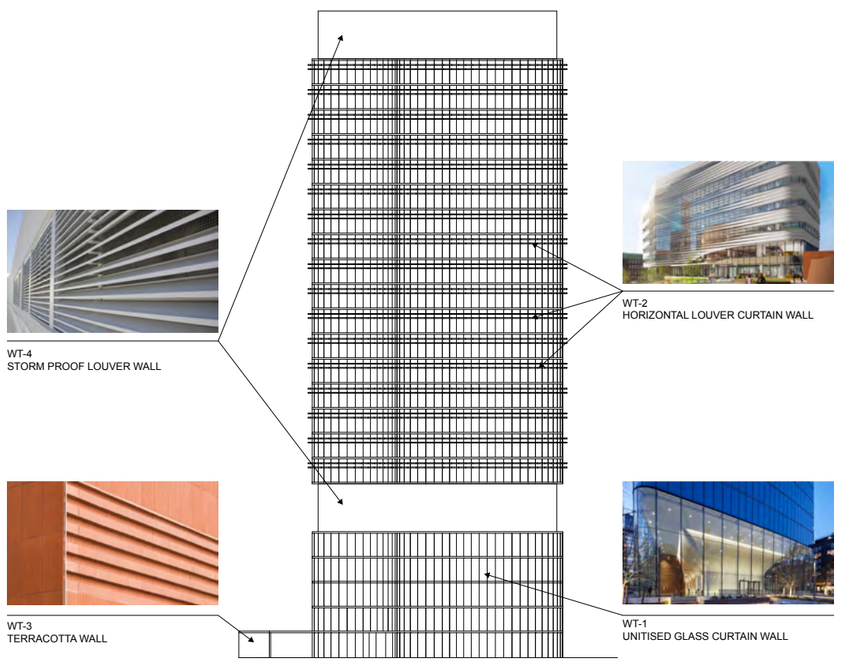
Sustainability Diagram

Most importantly as we were looking for LEED certificate it was significant for us to analyze sustainability features. We tried to optimize every aspects of building design. Mainly, our facade design was a big part of the sustainable design, green roof, and HVAC system following the next.



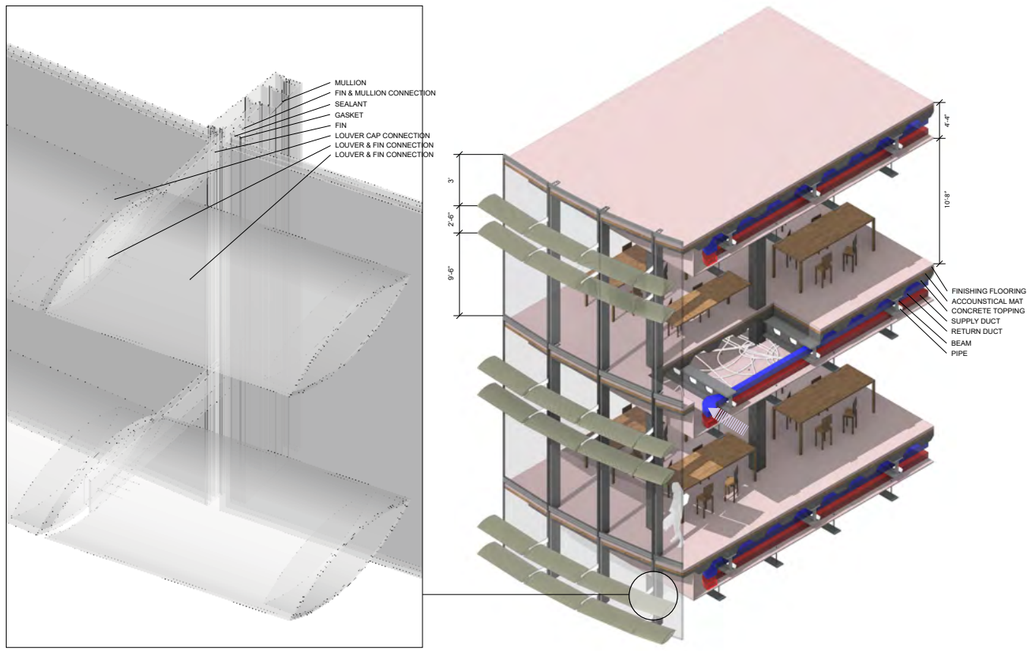
Glazing Schedule & Material Layout

Various materials were studied to put in various parts of the building. Mostly, the materials were selected for the sustainability and the visual reasons.

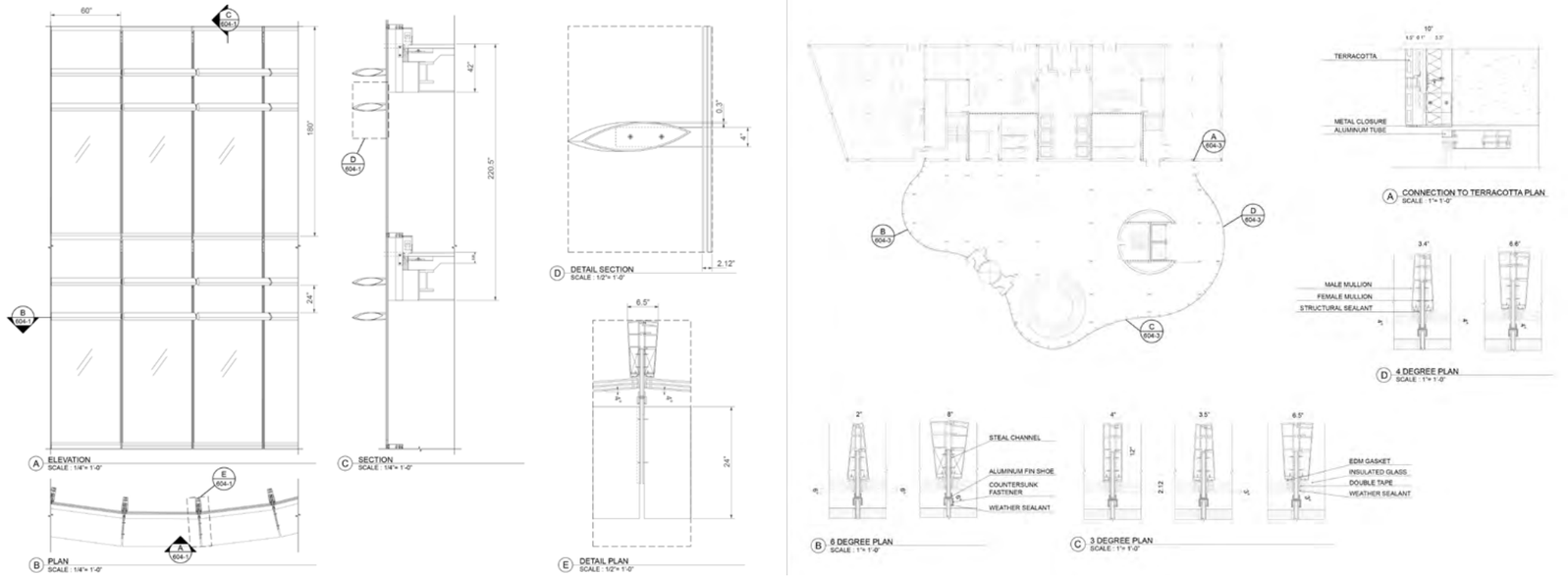


Facade System Axon Section

The facade system was meticulously designed to mitigate excess sunlight and reduce afternoon glare. The assembly intricately developed, is tailored to accommodate various angles across the entire building. The louver system, crafted with a dual purpose in mind, not only serves an environmental function but also contributes to the distinctive and unique formm of the building.

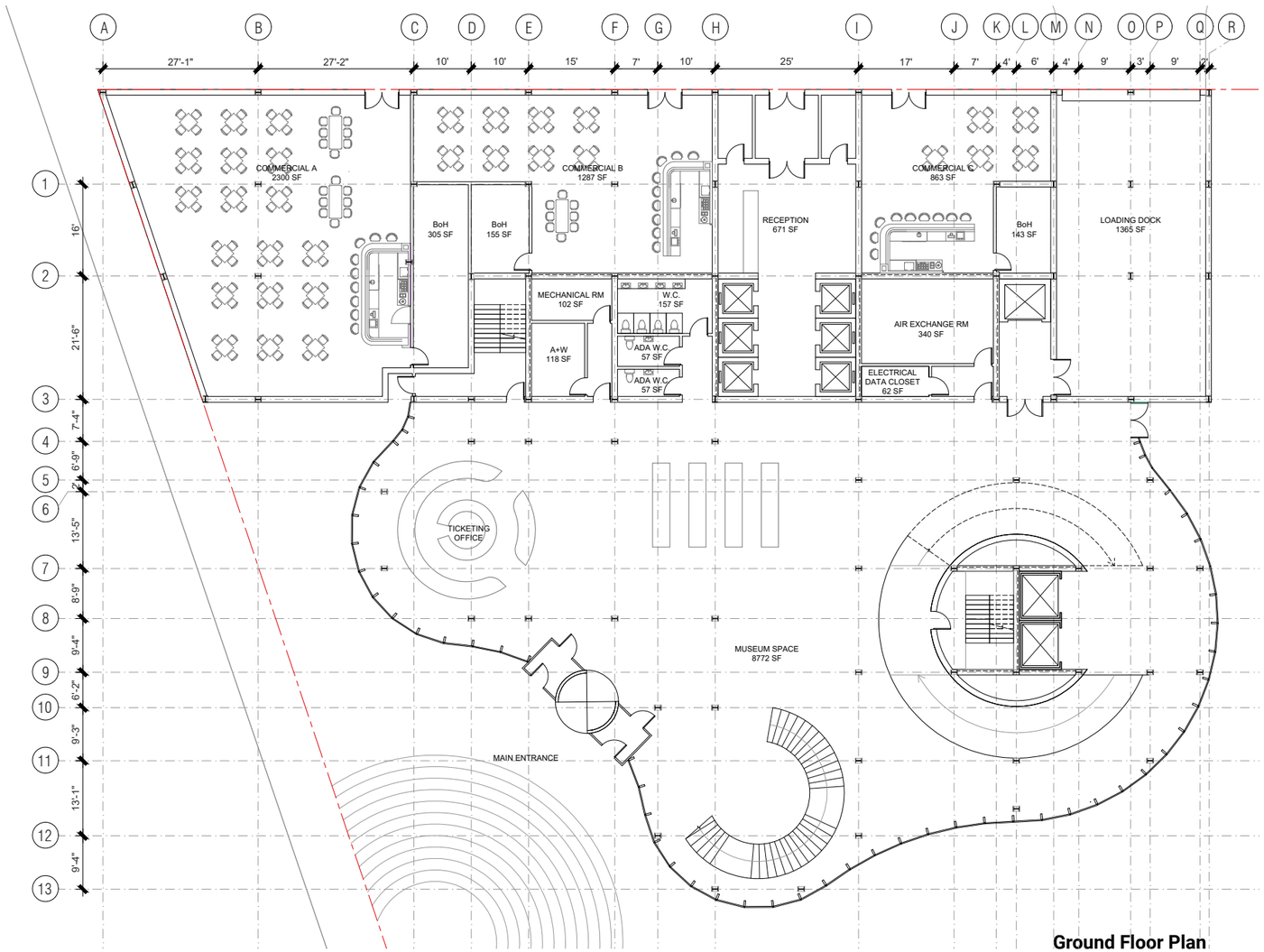


Facade System Details



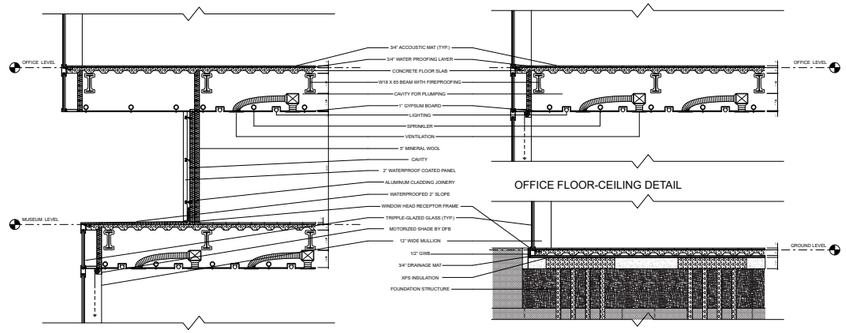
Construction Document Drafting

Full package of drafting documents were created by using Revit. Detailed plans, RCP, HVAC plan, electricity, and many other plans were drawn. Not only plans but also every section details were drawn. The drawings were drawn by five team members and my role was to draw mostly detailed sections.



Ground Floor Plan

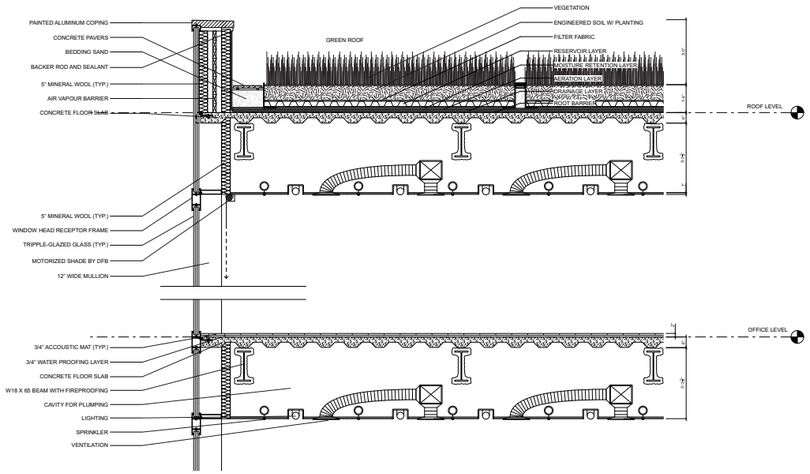
Multiple Wall & Ceiling Type

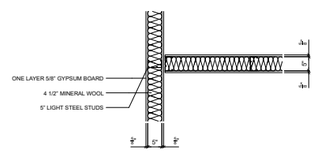


OFFICE FLOOR-CEILING DETAIL

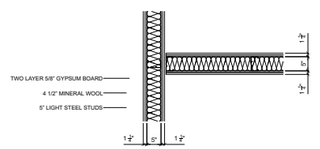
MUSEUM FLOOR-CEILING DETAIL

GROUND FLOOR DETAIL

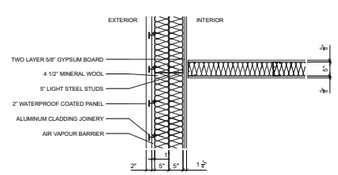




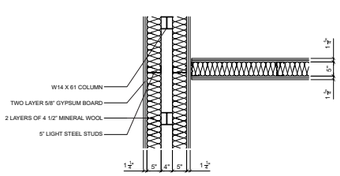
DETAIL - RATED WALL - 1 HOUR



DETAIL - RATED WALL - 2 HOUR



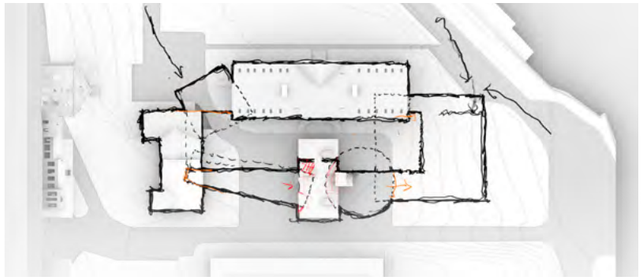
DETAIL - EXT. WALL - 4 HOUR



DETAIL - RATED WALL - 4 HOUR

4. Ad-Hoc Architecture Center

Designing Architecture Centerr on Governors Island



Concept Hand Sketch

LOCATION: Governors Island
YEAR: 2024 Fall, Advanced Studio V, (GSAPP)
TEAM MEMBER: Ji Hyun Nam, Seonghak Lee
INSTRUCTOR: Wonne Ickx
KEY WORDS: Ad-Hoc, Multi-Phase, Architecture Center

The project is located on Governors Island and our team used existing Georgian style buildings to create architecture center. The projec had three phases. For the first phases we design the architecture archive and restoration office. Second, we designed the library, cafe, and study center. Lastly, we design permanent and temporary exihibition space. Also, the theme ad-hoc was important for our project. As most of the building on the island were design with the idea of ad-hoc we tried to follow the idea. We designed the new masses to be utilize in needs of different phases. Therefore, we had hundres of hand sketches to find the best approach for the design. The final product has the central courtyard that connects all three phaes.

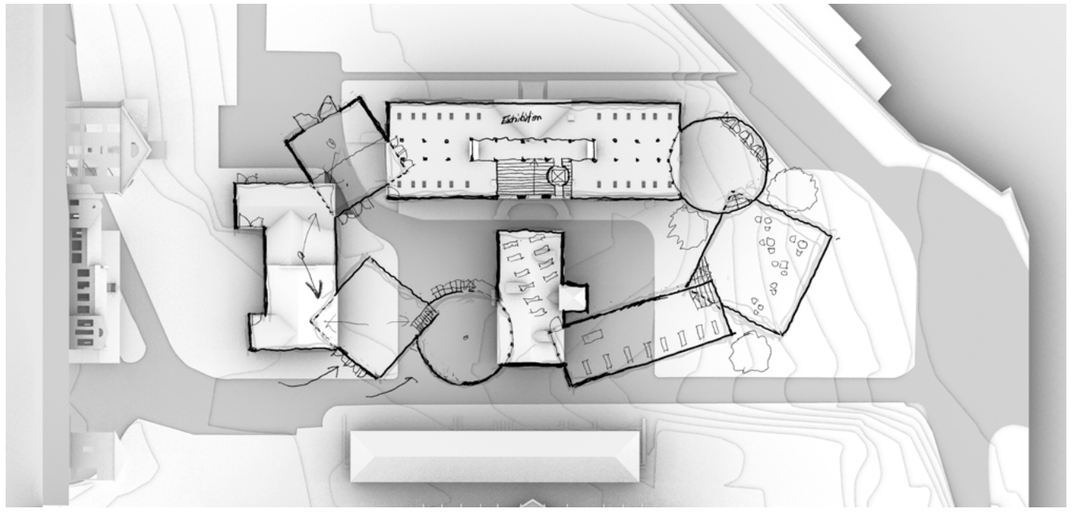
Physical Model Top View

Site Research

Most of the buildings on Governors Island are brick buildings. Most of them were designed with Ad-Hoc idea which meaning new parts were added due to their necessity. Therefore, buildings do not have uniformed aesthetics but they have more unique shape.

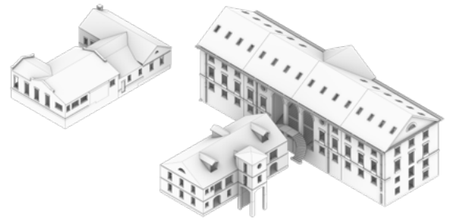
Mass Concept

Our primary goal when during the mass study was to complease the block, but still bring public towards the courtyard. Therefore, the building looks continuous with surrounding buildings but create interesting in-between spaces within the eroded spaces.



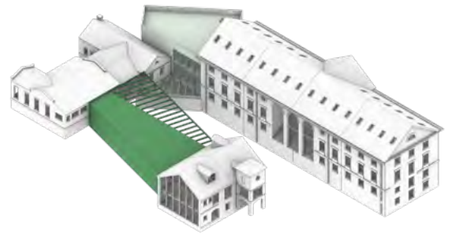
Three Phaes

We used three existing buildings and added new building mass when it's necessary. For the final product we tried to have a closed central courtyard that connects all.

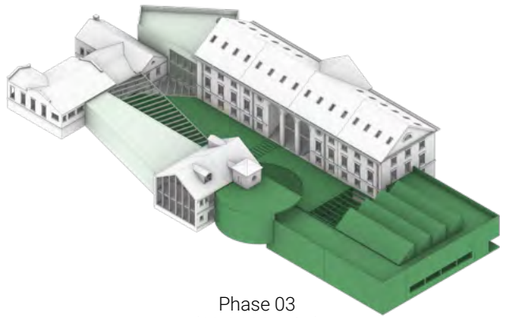


Existing Condition

Phase 01
(0-6 Months)



Phase 02
(6-12 Months)



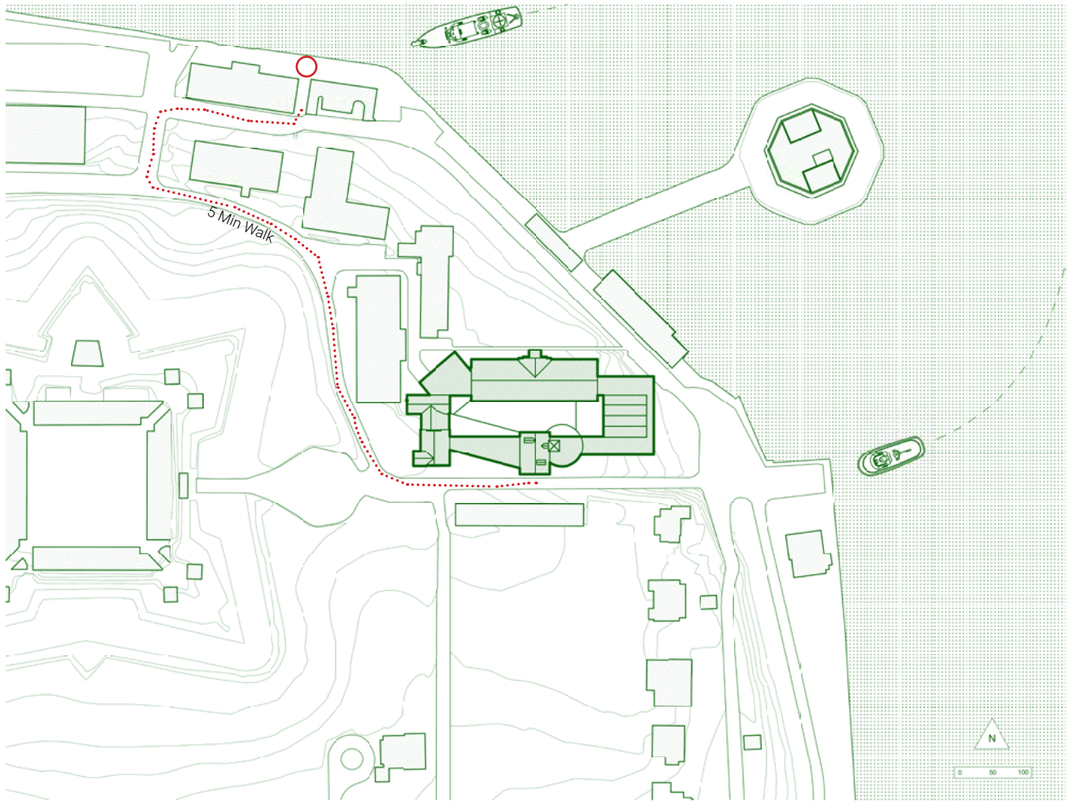
Phase 03
(12-24 Months)

Model Photo Front Facade

Existing buildings have pitched roof and new buildings have flat roof to have distinction between old and new.

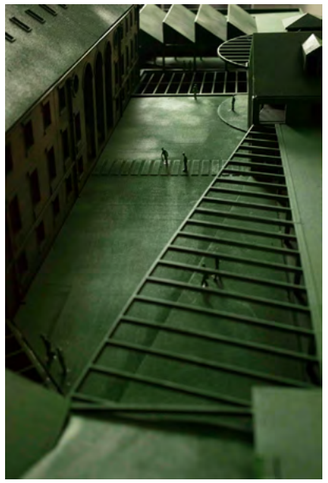
Site Plan

It shows where the site is located near the coastline and how the attached building are creating the central courtyard. As it is near the ferry dock, it will become the starting point of the journey at the Governors Island.

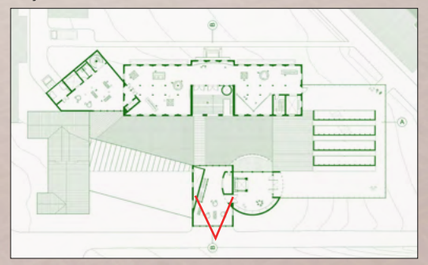


Temporary Exhibition

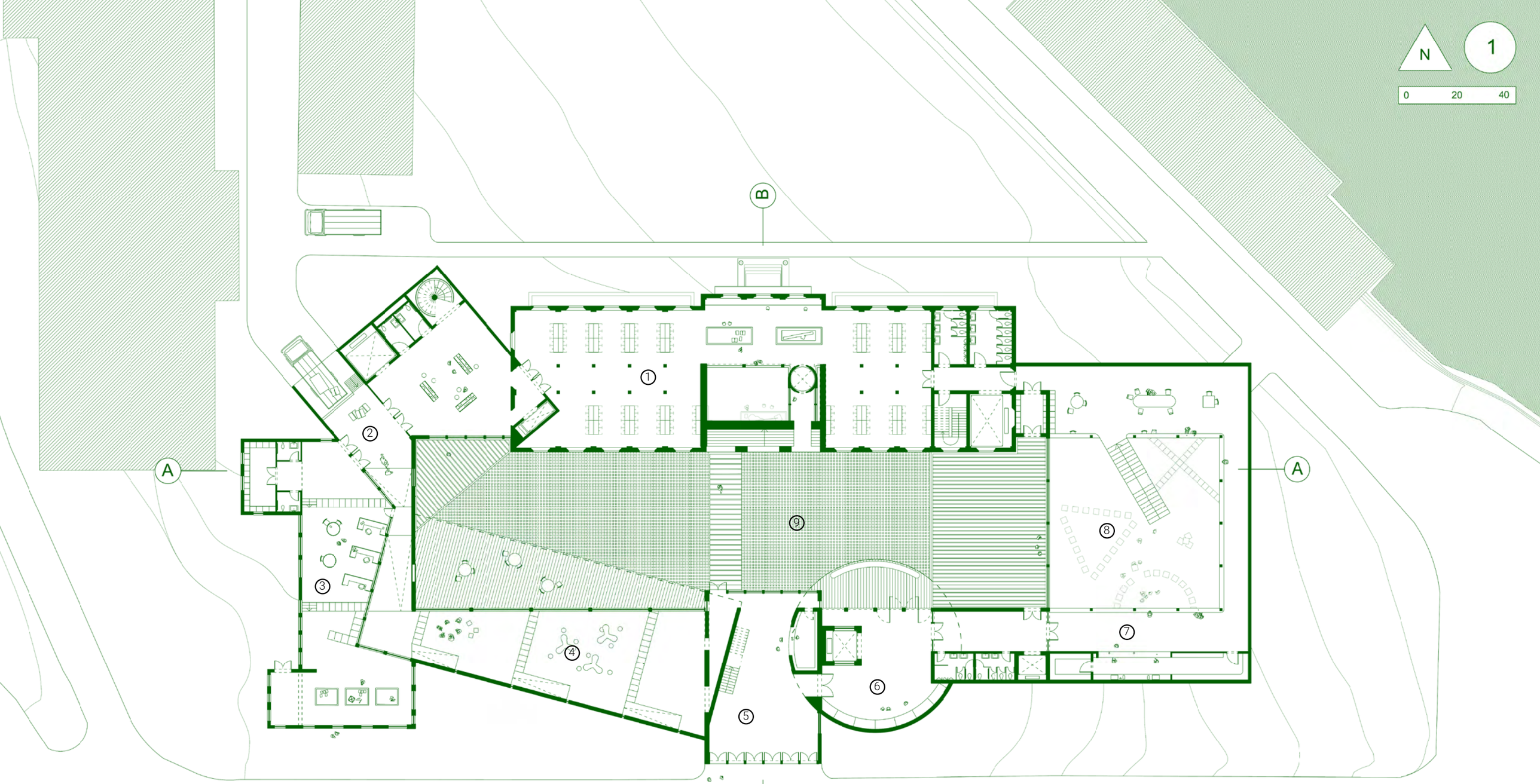
Central Courtyard



Key Plan



Welcome Center Second Floor View



Legend

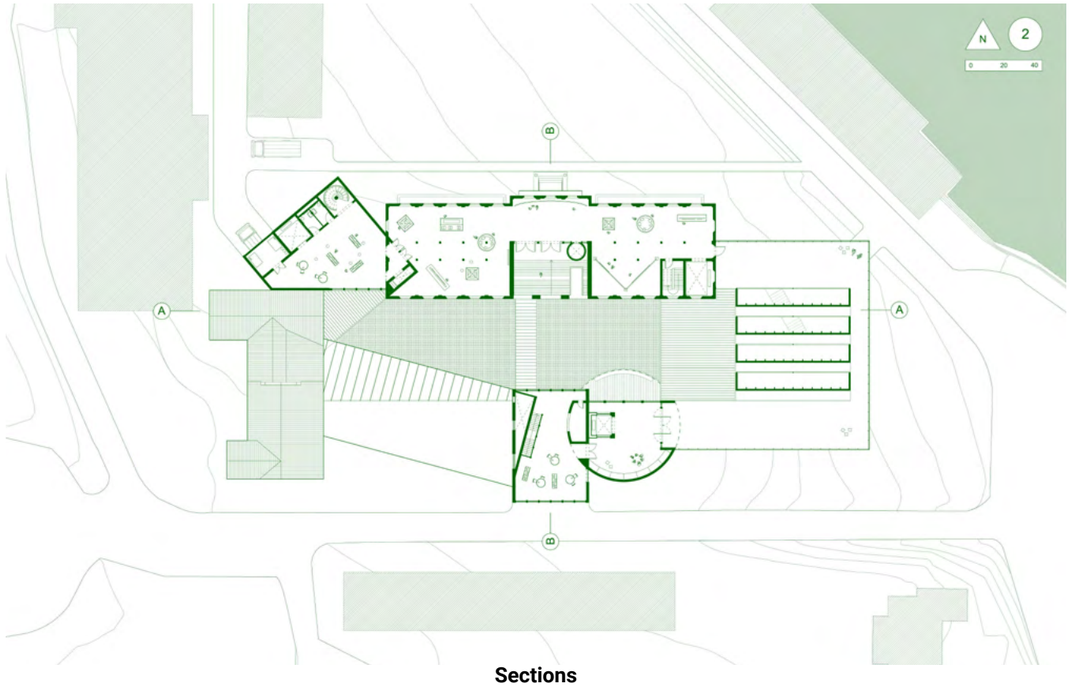
1- Archive
2- Loading
3- Restoration Office
4- Library
5- Welcome Center
6- Study Area
7- Cafe
8- Temporary Exhibition
9- Central Courtyard

Ground Floor Plan

All the existing buildings are in grid but the addtional buildings are in off grid. Then, it is easier to regocnize which buildings were added to connect and continue this architecture center with the central courtyard.

Second Floor Plan

As all the building has the different height and floor, building cutline gets smaller as the floor gets higher. The roof of the lower voulmes become the roof terrace for the higher buildings.



Sections

Two sections clearly shows how building masses are connected together not only physically but also visually. It is clear how the central courtyard is connecting everything together.

Temporary Exhibition Ground Render

Permanent Exhibition Roof Floor

5. Anti-Noise Facade

Damage Control: Noise Pollution Intervention

Panels Made with CNC Machine

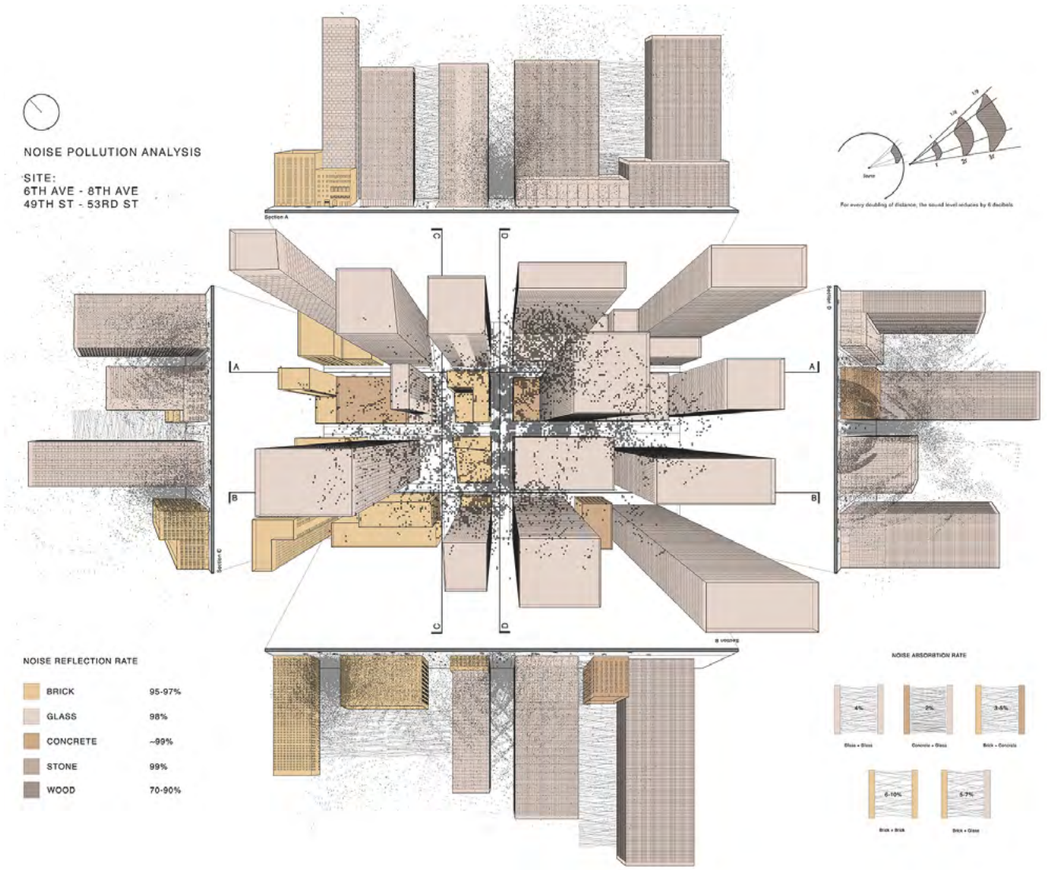
LOCATION: Midtown, New York, NY, 10019
YEAR: 2023 Spring, Core II (GSAPP)
INSTRUCTOR: Regina V. Tang
KEY WORDS: Noise Pollution, Mass Timber, Facade

Noise pollution is more significant than people imagine and it is the problem that city dwellers face everyday. The project specifically investigates the noise pollution in New York City. The NYC noise report shows that “more than 30 million people in the US have hearing loss due to exposure to loud noise. And nearly one in six adults report ringing in their ears or hearing loss.” Then, the project focuses on the facade system that could be applied to buildings in NYC to mitigate noise pollution. The project’s goal is not to cancel the entire noise in the city but propose to lower the noise level by 10-15db. The facade system not only remediates the noise level on the street but also creates a better indoor acoustic comfort. When it’s applied to high office buildings the facade will even create the outdoor terrace spaces. Also, it might be the turning point for the megacities to change building envelopes to mass timbers.

Facade Attached Street View

City Noise Simulation

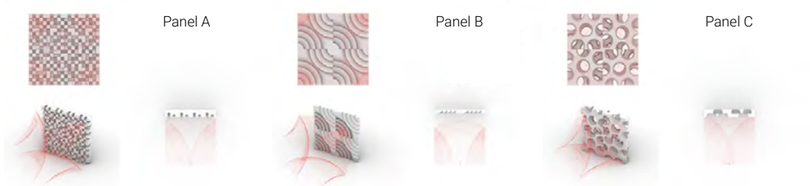
Different materials were studied in terms of sound reflectance and absorbance rate. Grasshopper simulation was conducted with the builindgs around midtown area. After the several noise source simulation, I was able to find that noise particles stay in the area and never escapes. It was due to the high number of skyscrappers around the area and their materials' reflectancy rate.



Room Noise Particle Simulation

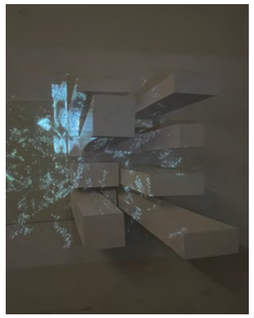
The study was conducted in 500sq ft rectangular room. Different shape of panels were attached to the walls to test the amount of reverberation time. Each of the panels was able to reduce the reverberation time around 50%. However, type C (perforated shape was the most effective one.

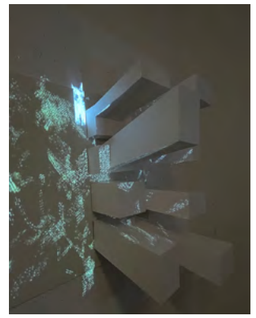
Normal Room	
Frequency Range	Reverberation Time
0	0.431232
1	0.49235
2	0.611442
3	0.771454
4	1.339516
5	1.221601
6	1.115693
7	0.904569



Plan Perspective Physical Model Simulation

Real time simulation was created with the grasshopper script to visualize the noise pollution on the physical model. It allowed people to actually see it takes long



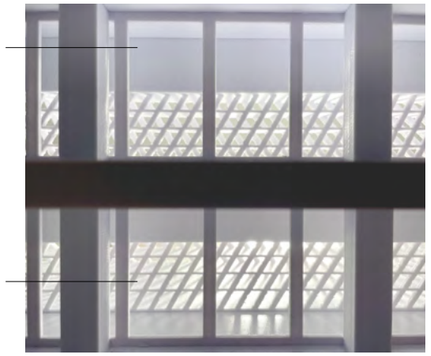


Panel Shape Study

After several iteration of the facade panel studied I found this shape is very efficient for noise absorbtion. It has few layes of vertical and horizontal louvers and solid panels for the noise absorbtion optimization.

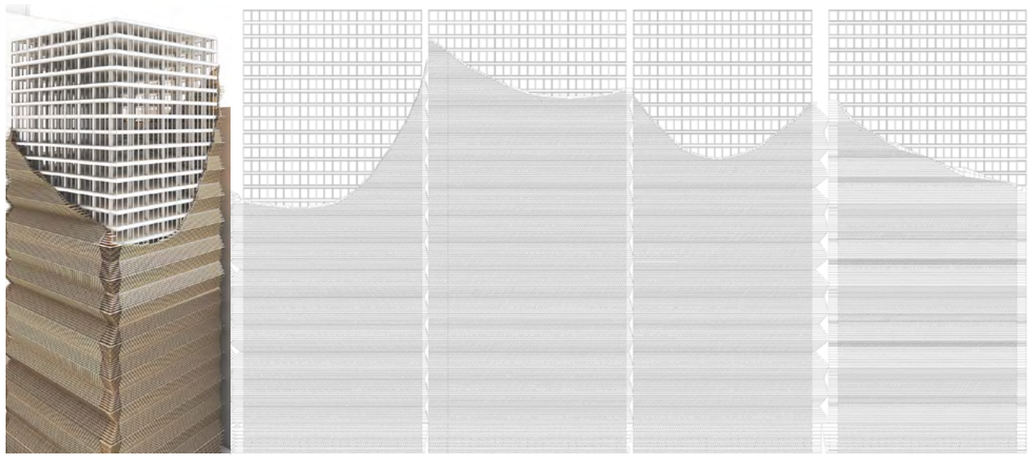
Upper half of the panel is solid to absorb more noise.

For the lower buildings the solid panels are removed for more sunlight.



Sun Shading Analysis & Aapplying

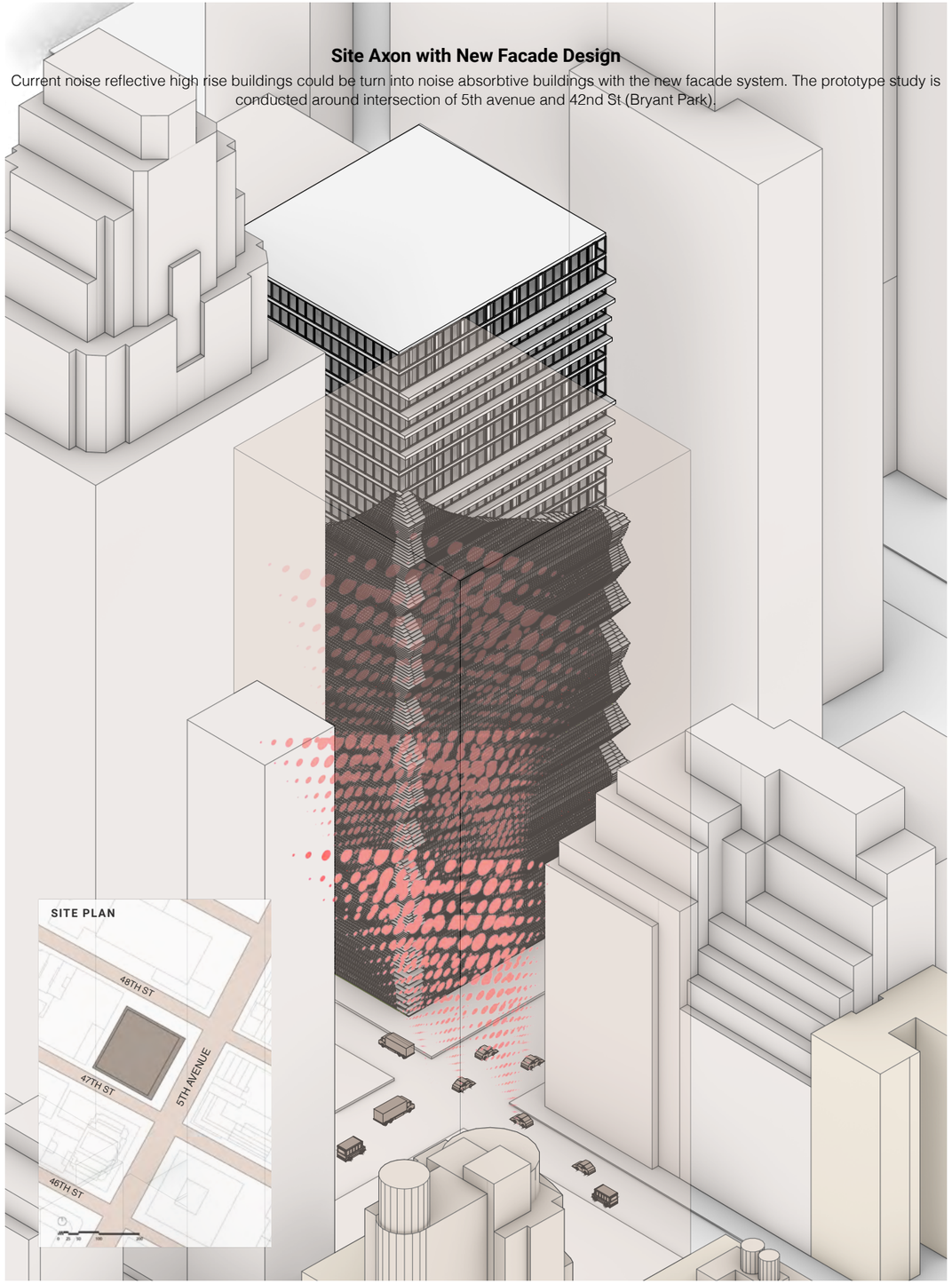
Sun Analysis was applied for the facade system. Northeast side was more opened for more sunlight. Northwest side was mostly covered due to the tall building next. Southern sides were more covered.

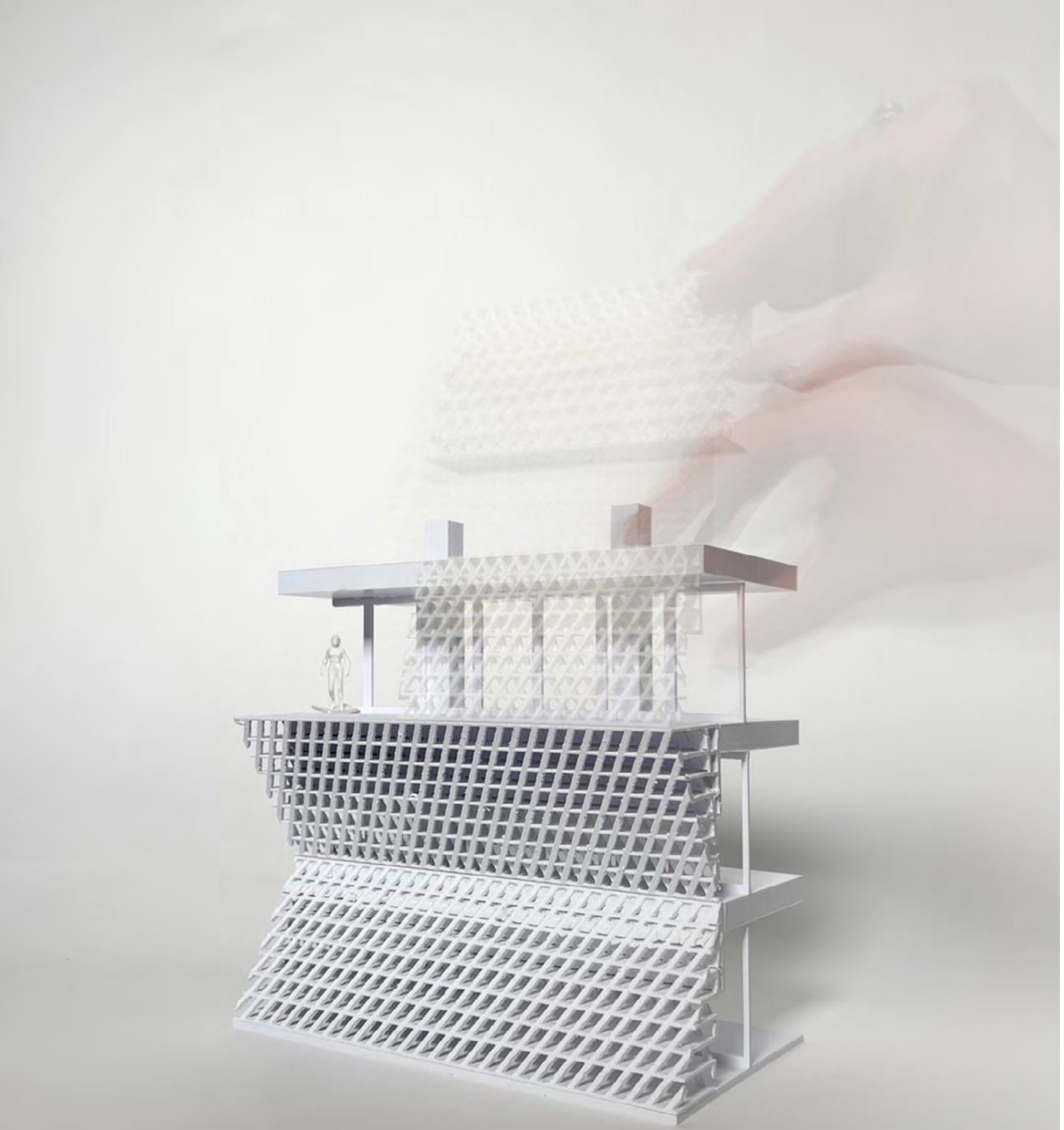


Inbetween Facade and Existing Building

Site Axon with New Facade Design

Current noise reflective high rise buildings could be turn into noise absorbtive buildings with the new facade system. The prototype study is conducted around intersection of 5th avenue and 42nd St (Bryant Park).



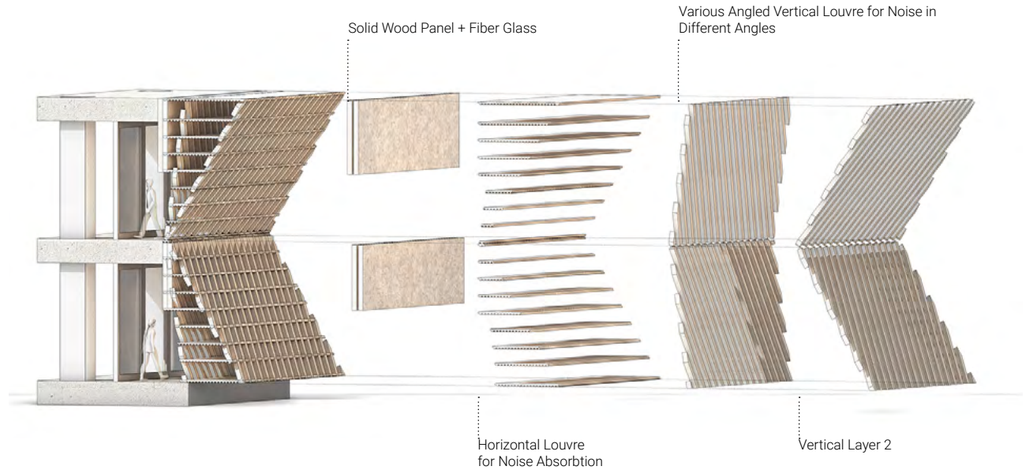


Physical Section Model

Designed panel system could be applied to existing glass buildings to evelope the buildings. The facade does not only protect the people indoor but also reduce noise in the street level.

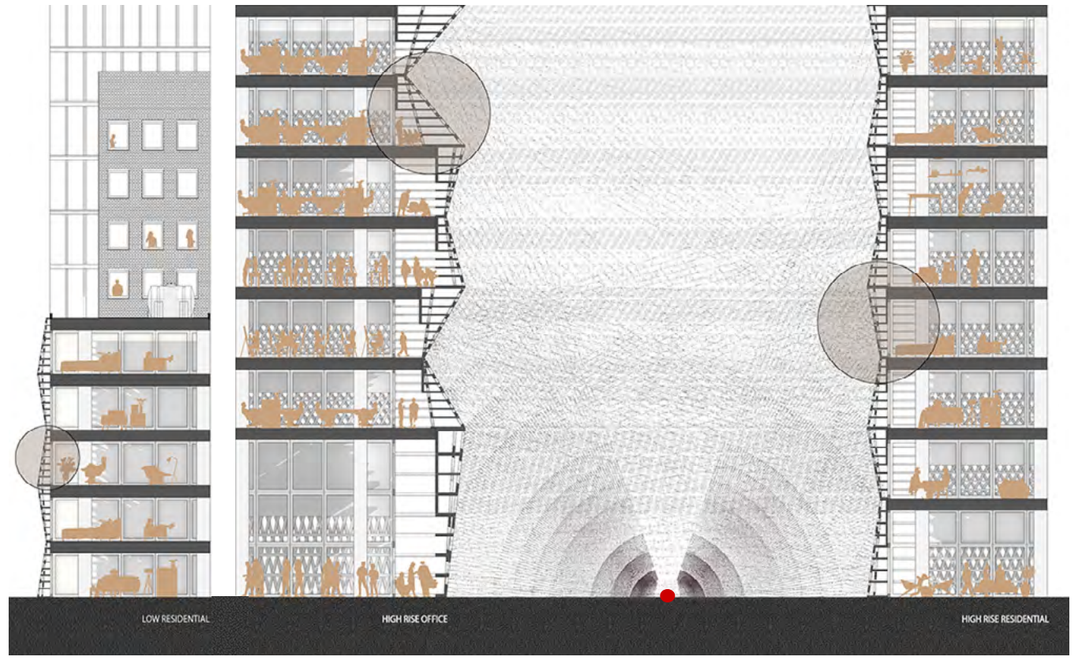
Sound Absorbtion Panel Design

Multipe layers were designed to filter the most noise particles that are bouncing in between high rise buildings. As particles are spread in different angles and speed I need different stages of layers to filter them all.



Section Different Types of Buildings with Noise Facade System

Different types of facade systems were applied for various types of buildings. As residential needs more lighting to the living area the depth of the facade is shallower. However, office buildings have thicker facade system to have terrace system and to absorb more noise and they do not need much natural lighting.



6. Re-Vitalizing The Vacant

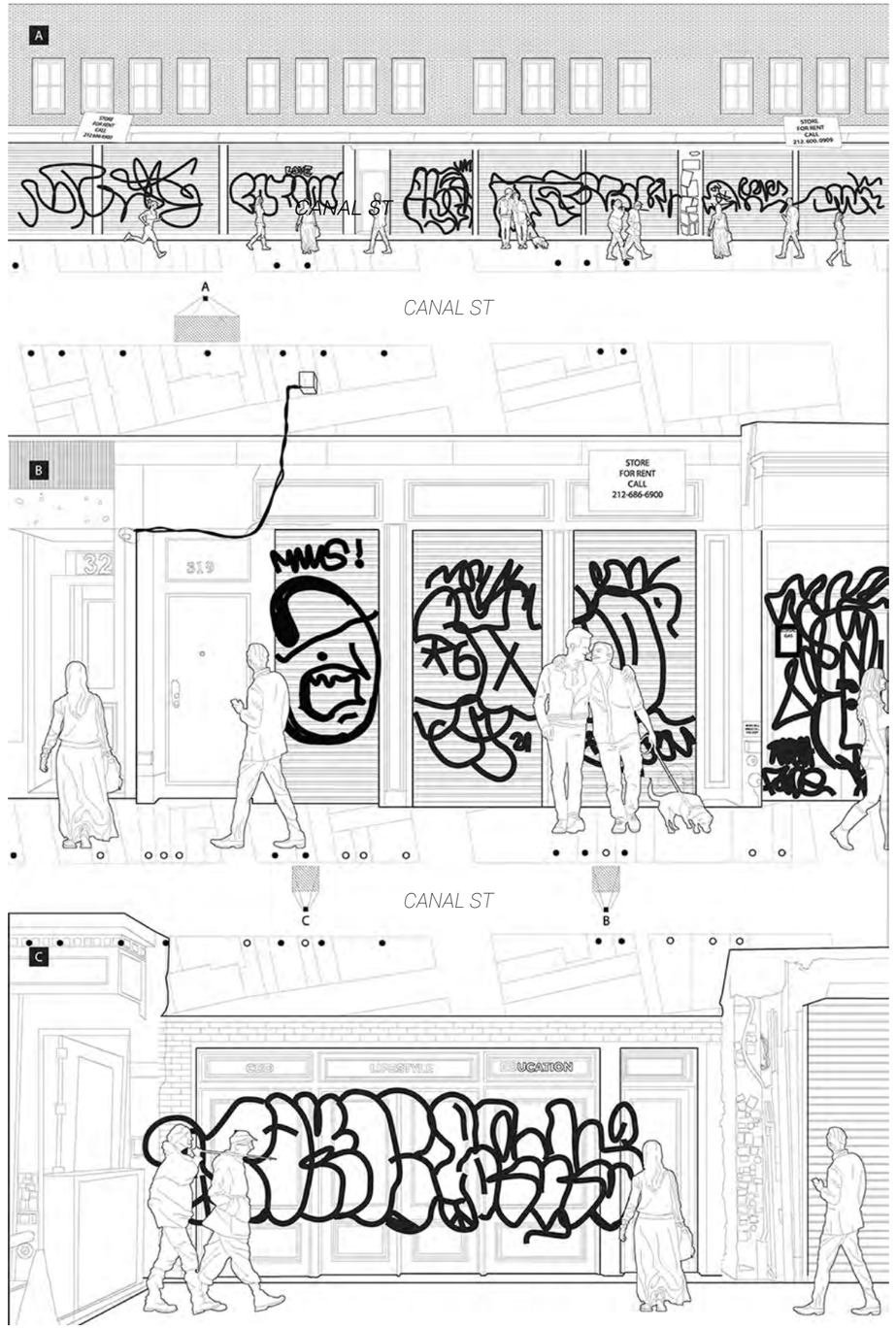
Material Study: Recycling Material within The Vacant Spaces

LOCATION: Canal St, New York, NY, 10013
YEAR: 2022 Fall, Core I (GSAPP)
INSTRUCTOR: Linddsey Wikstrom
KEY WORDS: Material, Vacant Spaces, Adaptive Reuse

The project intended to re-vitalize the underutilized spaces (vacant commercial spaces) to provide food gatherina space. and solution for lead contamination. Alona Cana Street. commercial vacancv is increasing, and the number is significant. The project proposes emptying each vacant ground-floor commercial space to create an urban farm. The extracted concrete. brick, and asphalt are then used as a subter-ranean material to be installed beneath the roadwavs or sidewalks at different sites Clean sol from the Clean Soil bank will be transported to the sites to support the urban farm. Crops raised at these urban farms. which emolov UV iantina. are consumed ov the communities in Manhattan. The proiect re-purposes the vacant units as urban farms and creates material circulation, theretore reducing carbon emissions

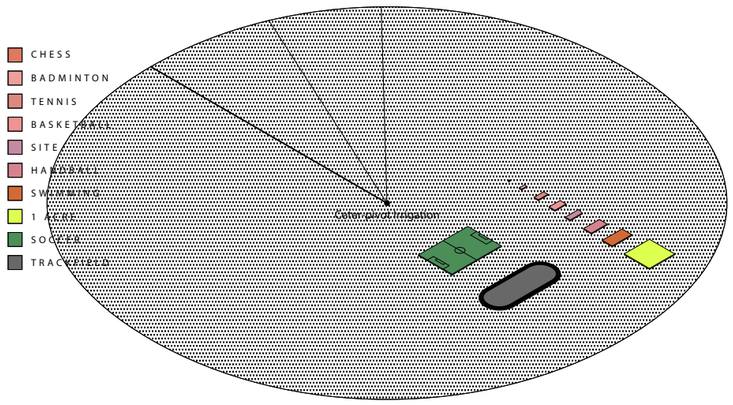
Visualizing the Vacant Spaces in Canal St.

Around 40% of the commercial spaces on the ground floor were vacant on the Canal St. Most of them were covered with the steel doors and grafittis High value of Manhattan land were wasted on the ground



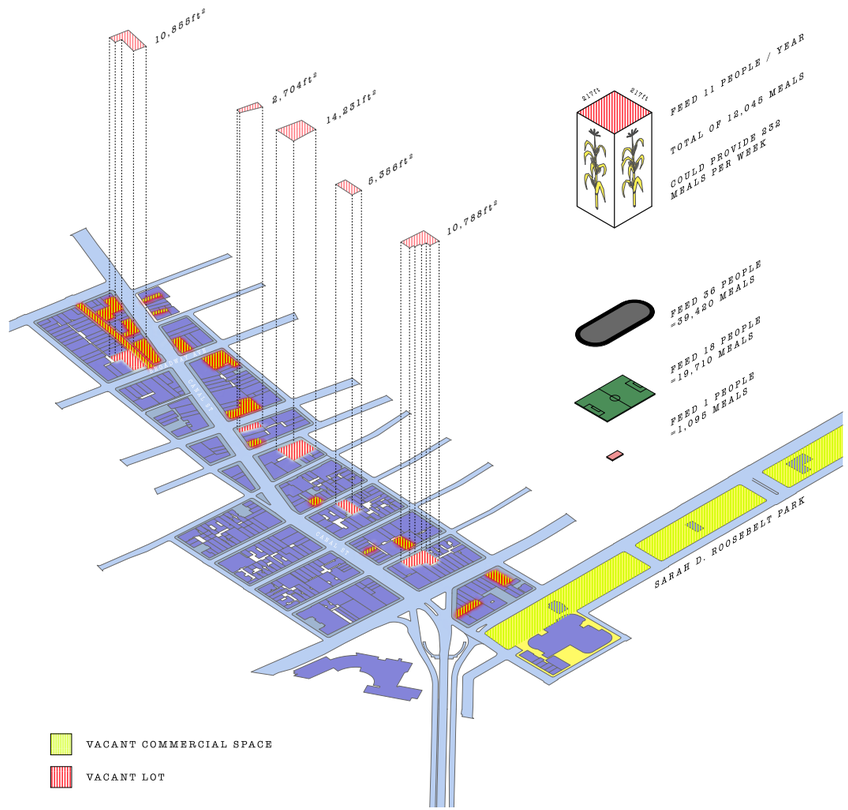
Sports Fields Compared with Center Pivot Irrigation System

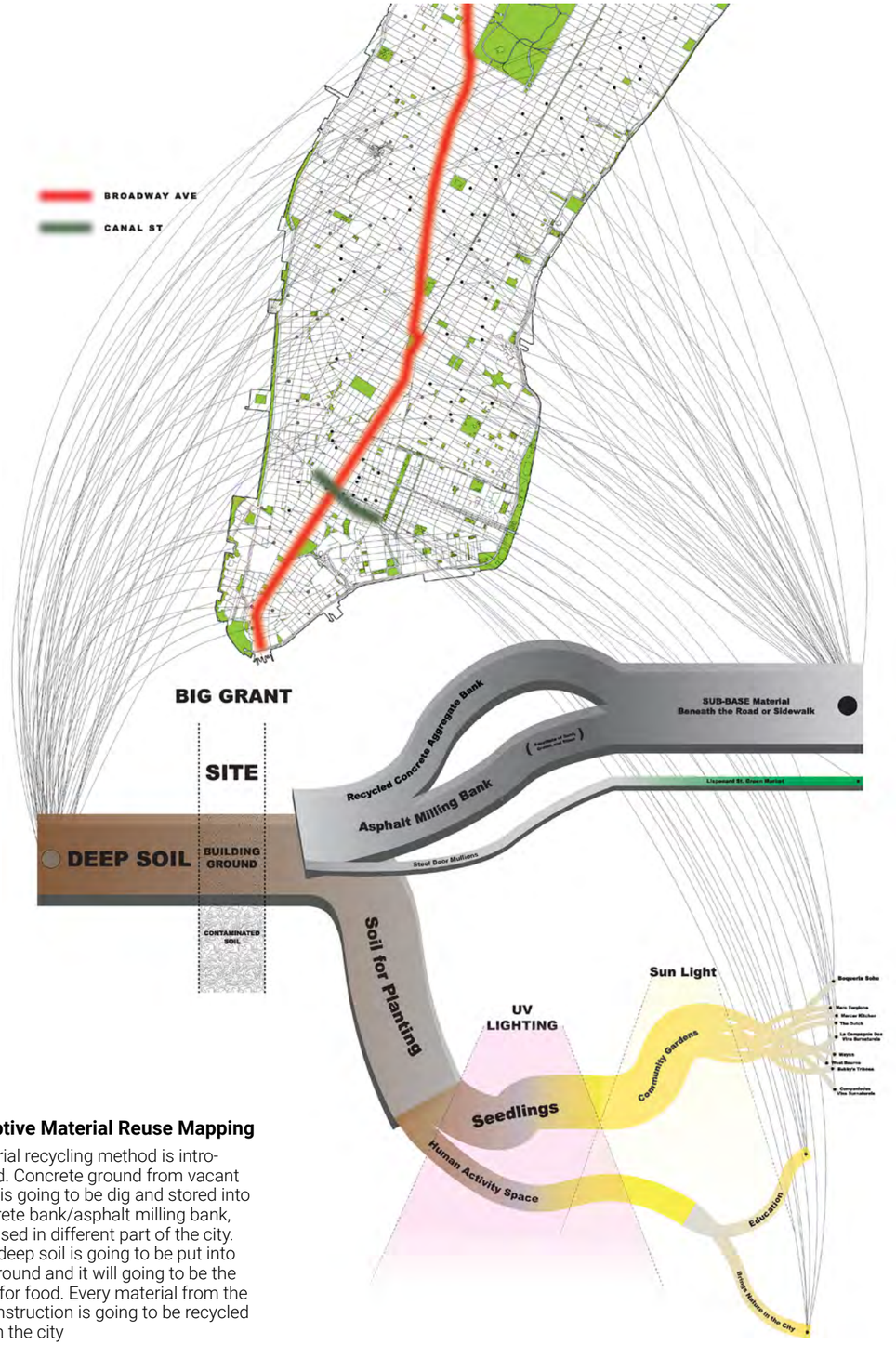
Those two were compared to see the size of land to grow crops and size of space to play sports. When the vacant spaces are turn into the gardens it could serve surrounding neighbors with basic food.



Canal Vacant Space Mapping

Vacant commercial spaces on the ground floor were researched to see how much land could be turn into the gardens. I converted the size of land with the number of corns could be planted and compared with the number of people could be served.



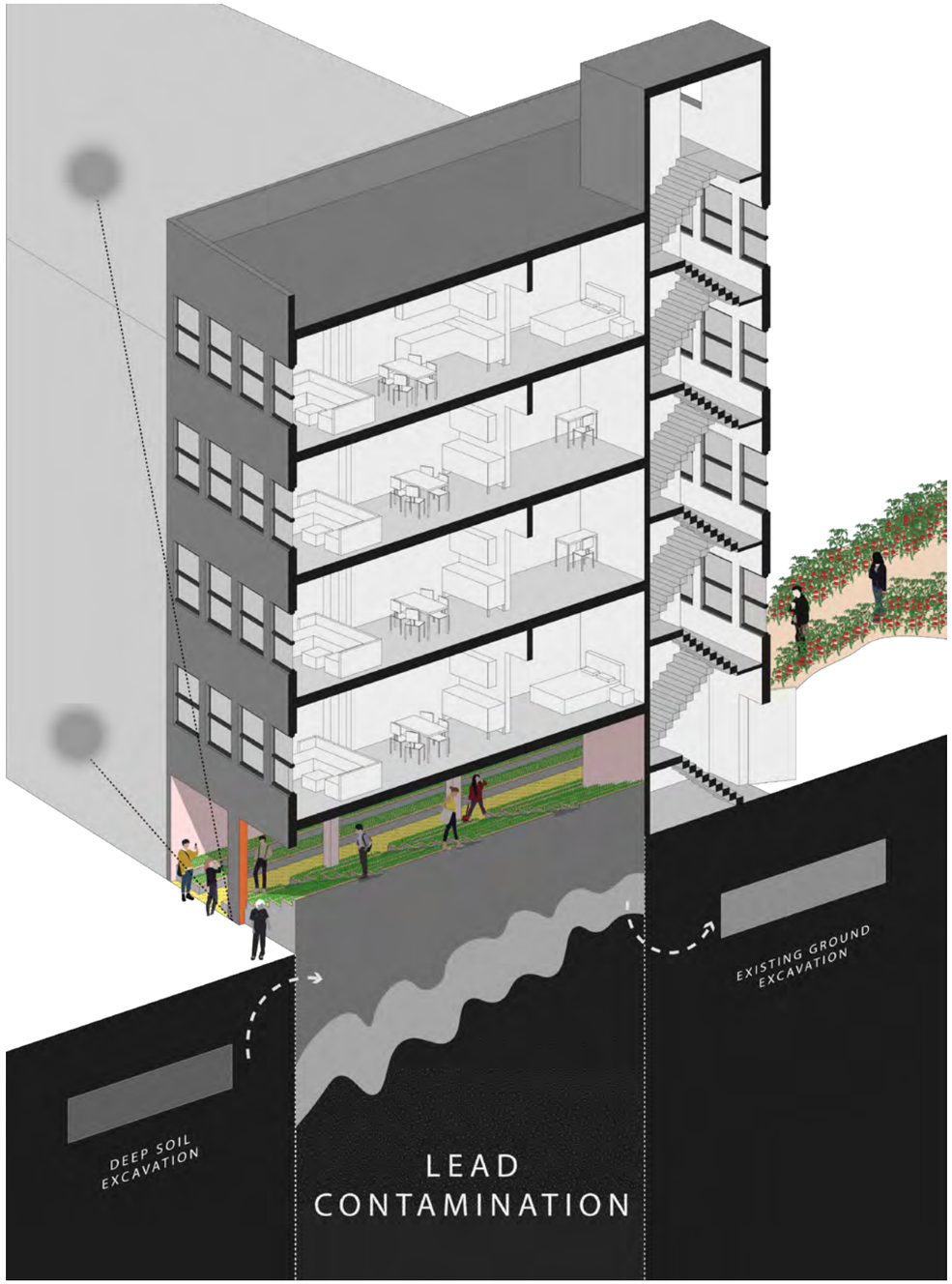


Adaptive Material Reuse Mapping

Material recycling method is introduced. Concrete ground from vacant units is going to be dig and stored into concrete bank/asphalt milling bank, and used in different part of the city. New deep soil is going to be put into the ground and it will going to be the seed for food. Every material from the deconstruction is going to be recycled within the city

Ground Soil Excavation and Vacant Space Use

Depp soil could be brought from NYC soil bank and excavated ground from the existing could be used in the other construction sites. Also, sidlings are suitable to grow under UV light condition vacant indoor spaces could be used as sidling bank and outdoor vacant spaces could be used as farms.



Remodeled Space Plan Oblique

The commercial spaces will be serving as seedling gardens. Since most of the ground spaces have no natrual light, the spaces need to have UV light for the plans. The space is not only served as a garden but also could become a gathering space for neighbors

How Steel Door Frames Could Be Utilized

Taken steel frames from vacant commercial spaces could be utilized in closed street to create continuous in and out space. They could be used to create long pavilion.

Closing Lispenard St. for Social Gathering Space

Excavated materials from the vacant commercial spaces are going to be upcycled to create gathering space. It could be a hub for the outdoor vendors come to create unique experience.

Remodeled Space Model Photos

Conditions of remodeled vacant spaces were made in physical model

Linspenard Situation

Indoor Remodeled

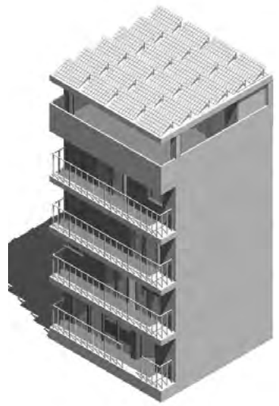
7. Liquidity of Concrete

Structure Study: Concrete

YEAR: 2024 Fall Tensile Structure
INSTRUCTOR: Robert Marino
KEY WORDS: Concrete, Tensile, Structure

8. Reusing Concrete Foundation

Repurposing Execive Concrete Foundation

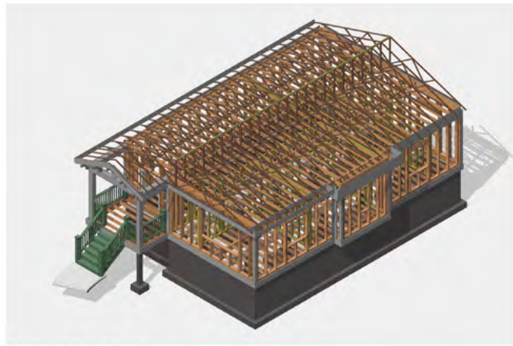


LOCATION: Atlanta, Georgia
YEAR: 2025 Spring, Advanced VI (GSAPP)
INSTRUCTOR: Michael Bell
KEY WORDS: Real Estate, SFR, Concrete Foundation

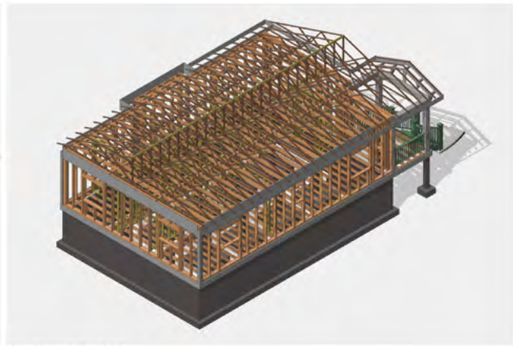
This project investigates the potential for densifying suburban single-family housing in Atlanta—specifically properties owned by institutional investors—through vertical expansion using mass timber construction. By analyzing a typical 1,300-square-foot, single-story house in Fulton County, the study evaluates the inefficiencies of traditional wood-frame construction and quantifies the embodied energy, material weight, and cost distribution of the building. The intervention proposes reusing the existing concrete foundation to support a 5- to 6-story mass timber structure, significantly increasing housing density while minimizing additional embodied energy and labor costs. Through BIM modeling and structural analysis, the project explores a sustainable and scalable strategy for transforming low-density, investor-owned housing stock into more efficient and community-oriented developments.

Analyzing Existing Wood Frame Housing

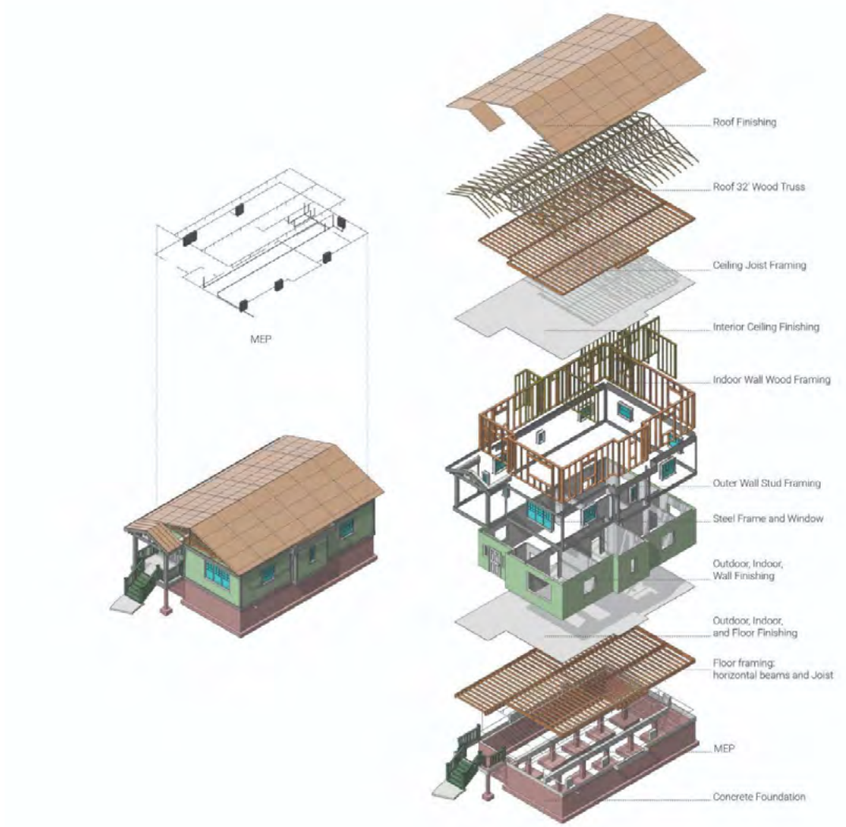
Existing wood frame houses use excesive wood for structure. Also, concrete foundation is more than necessary.



Southeast Front Facade



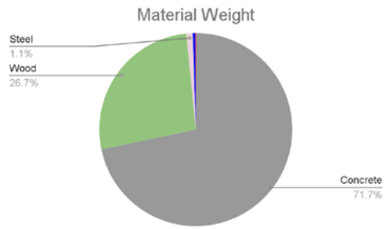
Northwest Backside



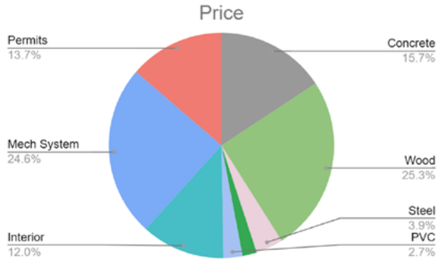
Analyzing Building Material

Analyzed building material, cost, weight, embodied energy.

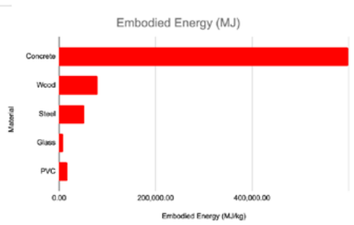
Material	Chosen Single Family House		
	Volume (cf)	Weight (lbs)	Weight (%)
Concrete	1,572.00	235,800.00	71.70
Wood	2,938.42	87,688.00	26.70
Steel	173.25	3,626.00	1.10
Glass	8.45	1,318.20	0.40
PVC	5.70	484.50	0.10
Total	4,697.82	328,916.70	100.00



Material	Price ($)			
	Material	Labor	Others	Total
Concrete	$13,000.00	$10,000.00	-	$23,000.00
Wood	$22,000.00	$15,000.00	-	$37,000.00
Steel	$1,700.00	$4,000.00	-	$5,700.00
Glass	-	-	-	-
PVC	$2,800.00	$4,200.00	-	$7,000.00
Interior Finishes	-	-	$17,500.00	$17,500.00
Mechanical Systems	-	-	$36,000.00	$36,000.00
Permits and Site Work	-	-	$20,000.00	$20,000.00
Total	$39,500.00	$33,200.00	$73,500.00	$146,200.00



Material	Chosen Single Family House			
	Volume (cf)	Weight (lbs)	Embodied Energy (MJ)	
Concrete	1,572.00	235,800.00	598,959.16	5.6MJ/kg
Wood	2,938.42	87,688.00	79,549.00	2MJ/kg
Steel	173.25	3,626.00	52,631.00	32MJ/kg
Glass	8.45	1,318.20	8,967.50	15MJ/kg
PVC	5.70	484.50	17,581.20	80MJ/kg
Total	4,697.82	328,916.70	757,687.86	

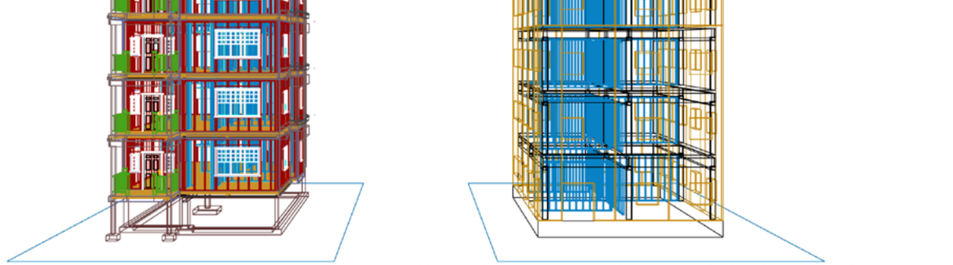


Analyzing Existing Concrete Foundation

Calculated how many more floors could be build on existing foundation.

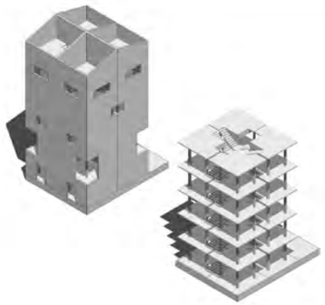
Location	Atlanta, Georgia		
Foundation	3ft Depth		
Footprint	1,320sqft		
Soil Bearing Capacity	2,000psf (Atanta's Clay Soil)		
Building Material	Wood Framing		
Soil Load Capacity	1,320sqft X 2,000psf = 2,640,000 lbs		
Wood Frame Weight / Floor	~60,000lbs		
Number of Floors	2,640,000 lbs / 60,000lbs = 44 floors	(theoretical)	
Now apply a safety factor (at least 2, per standard engineering practice):		22	
Estimate number of floors with typical single family housing concrete foundation		22 Floors	
		5 Floors with Building Code	
		with design strategies	5-6 Floors

Electricity and Plumbing are done for previous housing unit



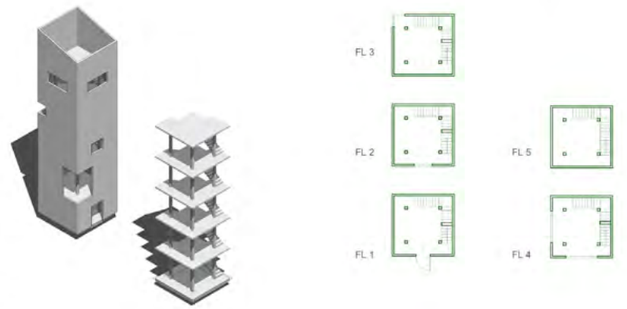
Mass timber structure uses less energy for heating and cooling

CLT = **fewer, bigger elements** that do more (structure + shear + fire resistance)
Light wood = **more, smaller elements** that each do less (and need added layers)



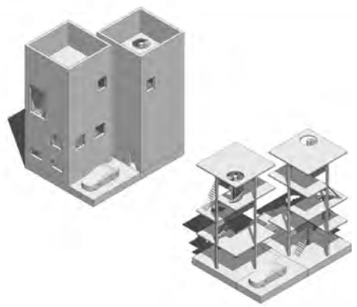
5FL (4 units)
3Bed
2Bath

12,040 ft3



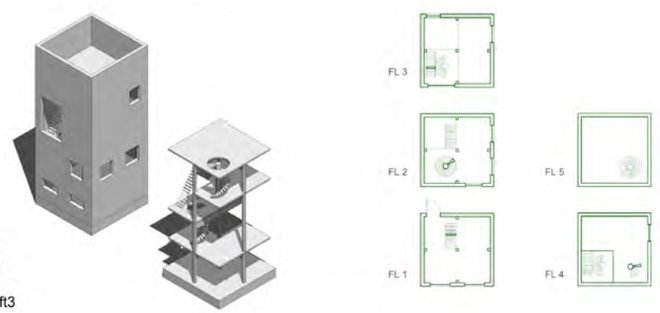
5FL
3Bed
2Bath

3,010 ft3



5FL (2 units)
3Bed
2Bath

9,728ft3



5FL
3Bed
2Bath

4,864ft3

Final Iteration

Minimized the wood structure, walls work as structure, core is supporting most of the weight.