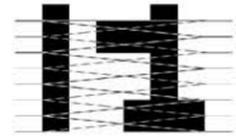


# ESTEFANÍA SERRANO



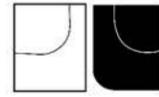
GRADUATION PORTFOLIO  
Master of Architecture - GSAPP, Columbia University.  
2019 - 2022

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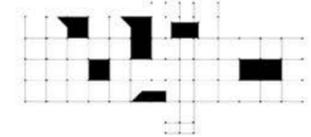
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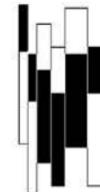
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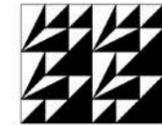
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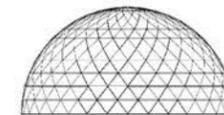
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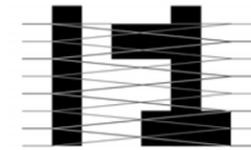


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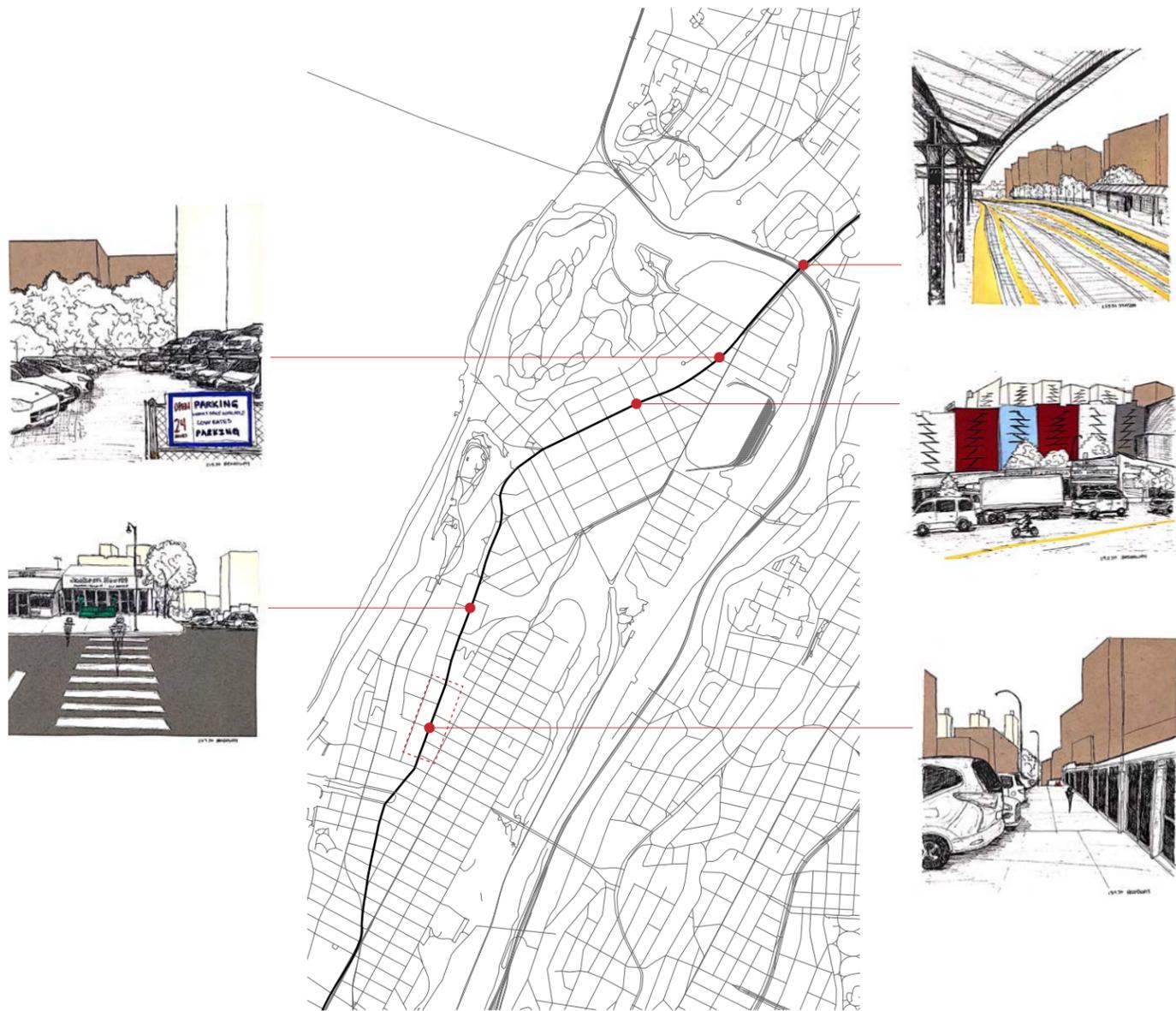
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## THE PARK-IN CINEMA

Type: Studio - Individual  
Semester: First Year, Fall 2019  
Location: Inwood, New York  
Professor: Joshua Uhl

This project focuses on serving as a mediator to alleviate the invasion of cars on pedestrian space while not denying their importance or existence as part of Inwood's transportation infrastructure. The intervention addresses a third space in which both cars and people are present through the creation of a multiuse structure in the form of a parking garage/community garden/movie theater. The location of the site is off-Broadway but sited in a block adjacent to the artery at 184th Street. The immediate surrounding context is made up of residential buildings that provide the density to support and aid the usage of the proposed multiuse public space.



Derive of Inwood

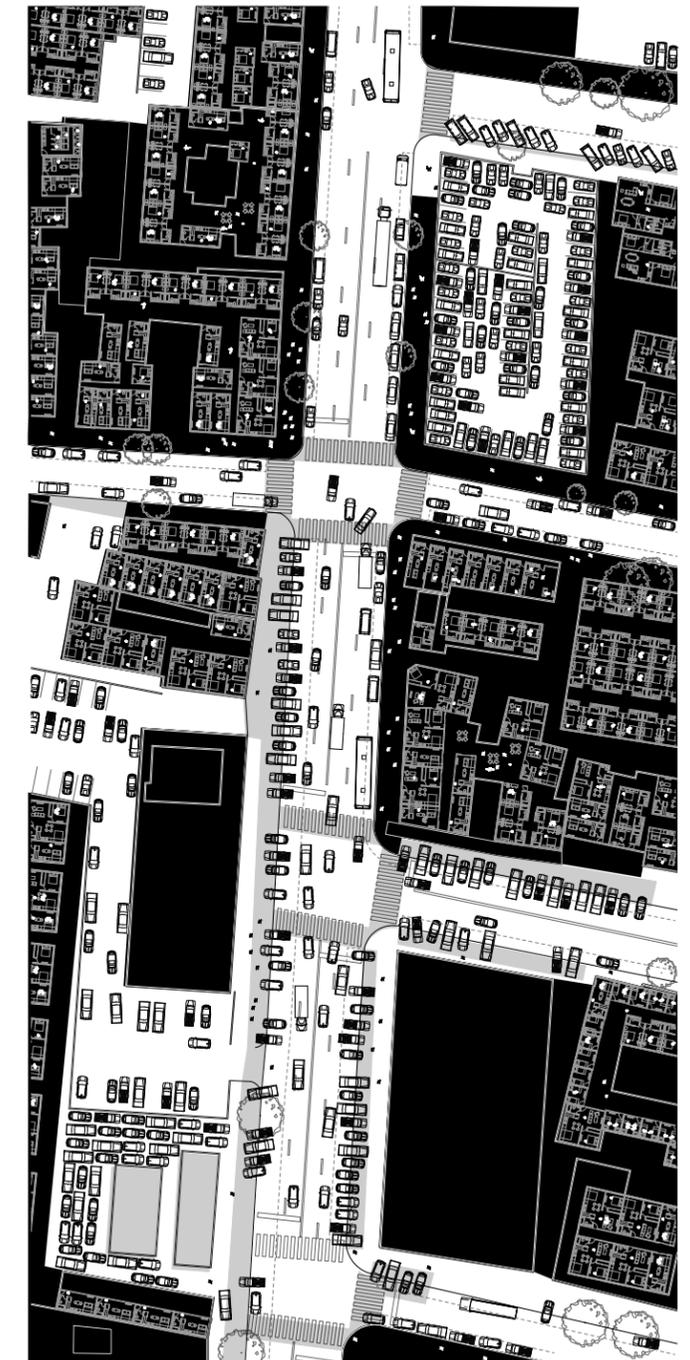
Sketches of different moments along in Broadway from 182nd Street to 225th Street.

The project started with a study of vehicular density in Inwood. Upon visiting the site, I noticed how different the spatial qualities and infrastructure were in comparison to the lower parts of Manhattan. My initial observations of this section of Broadway specialized in understanding the relationship between public and private spaces afforded to vehicular transportation vs. pedestrians/people; and how this dominance of cars dictates and shapes the urban spatial composition.



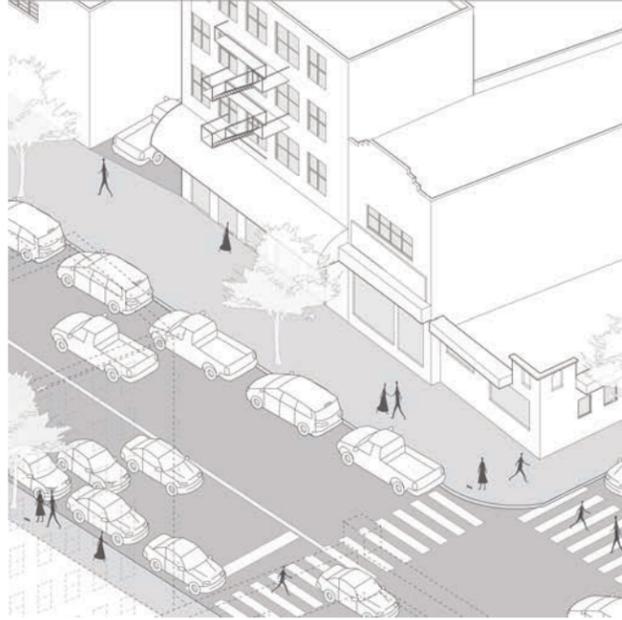
Representation of street life in plan view

After observing car density in the area, I selected a section of Broadway from 182nd Street to 185th Street for study. This area contains commercial spaces and well as fully residential buildings.



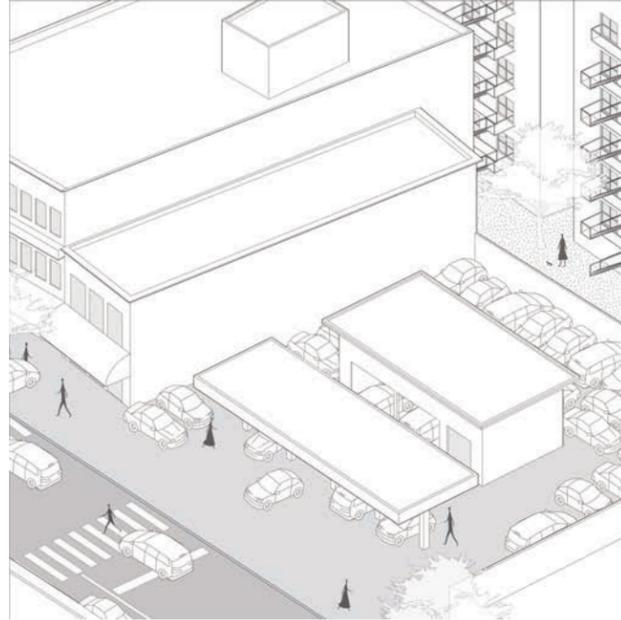
Noli inspired diagram

Spaces afforded to cars (white), pedestrians/people (black), and the space where both coexist (gray).



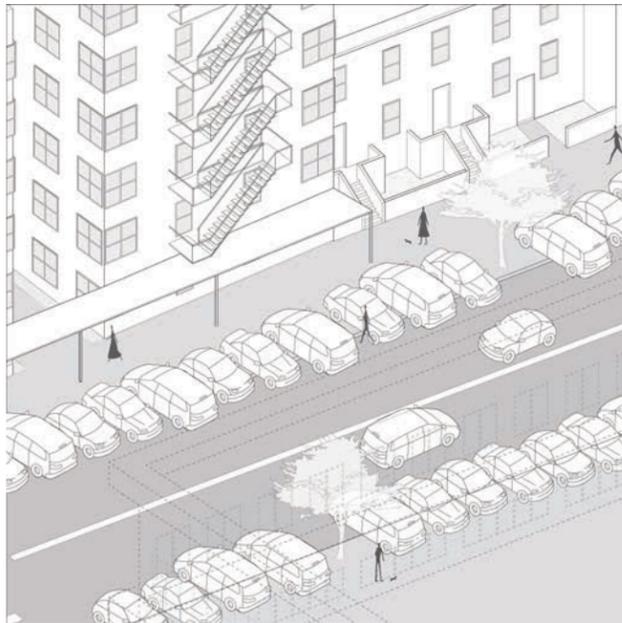
**Parallel parking**

Cars parked alongside the street sometimes invading sidewalks.



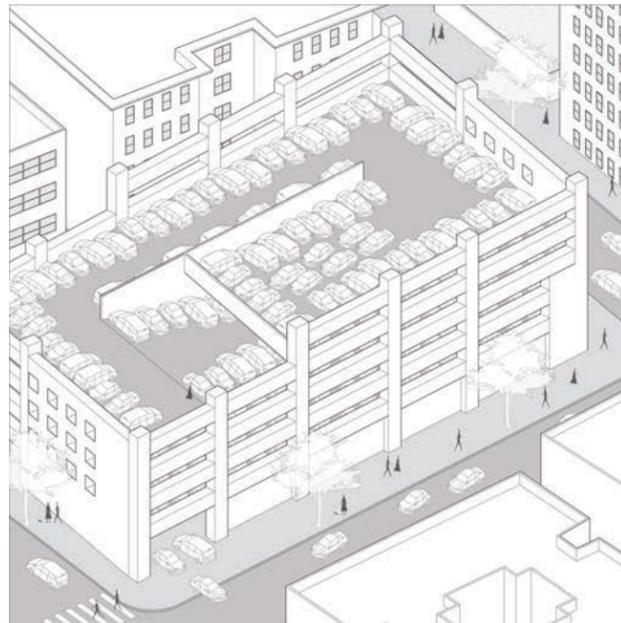
**Aggregated parking**

Arbitrary parking behind a gas station and car repair shop.



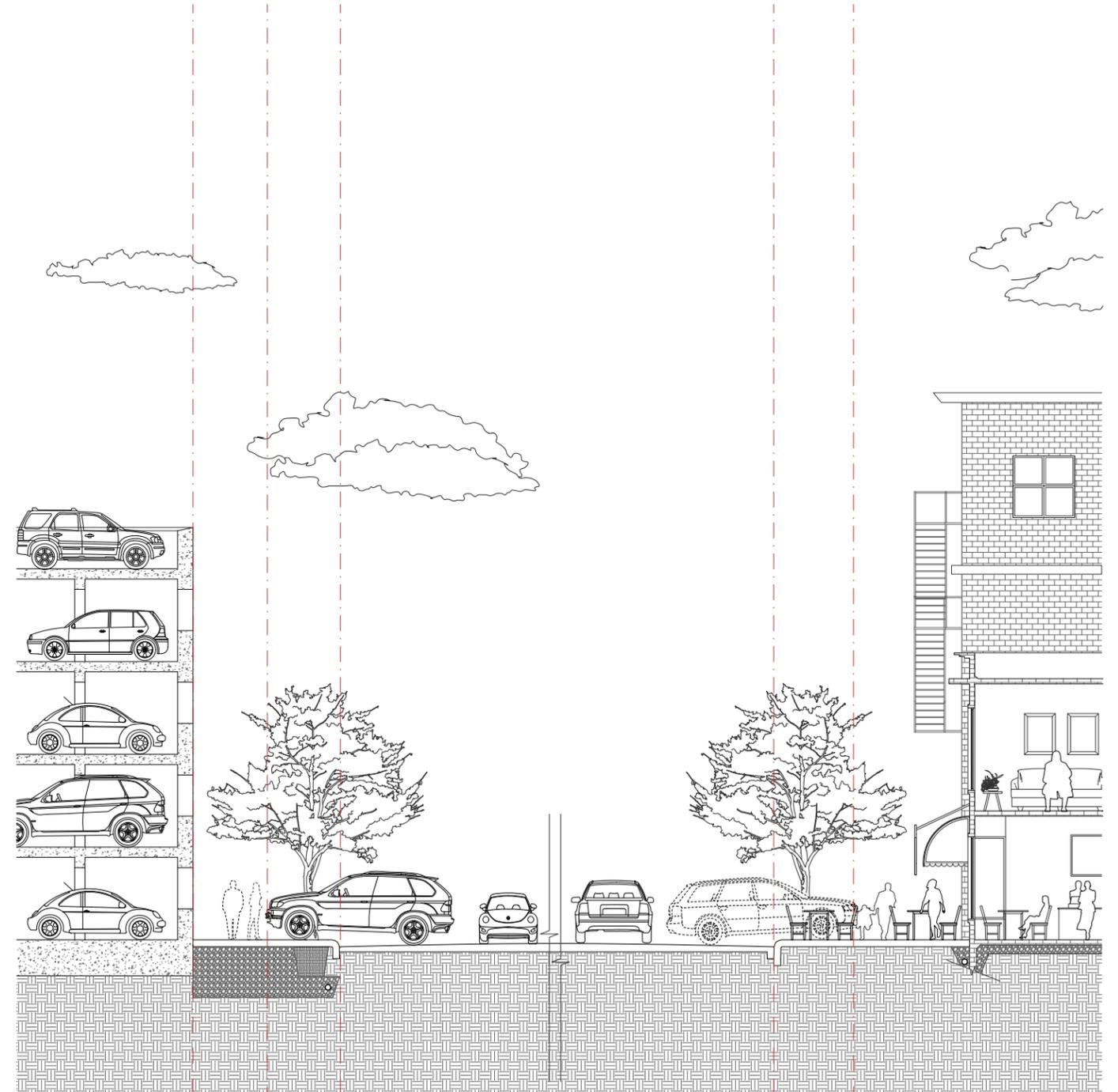
**Perpendicular parking**

Cars invade the sidewalk.



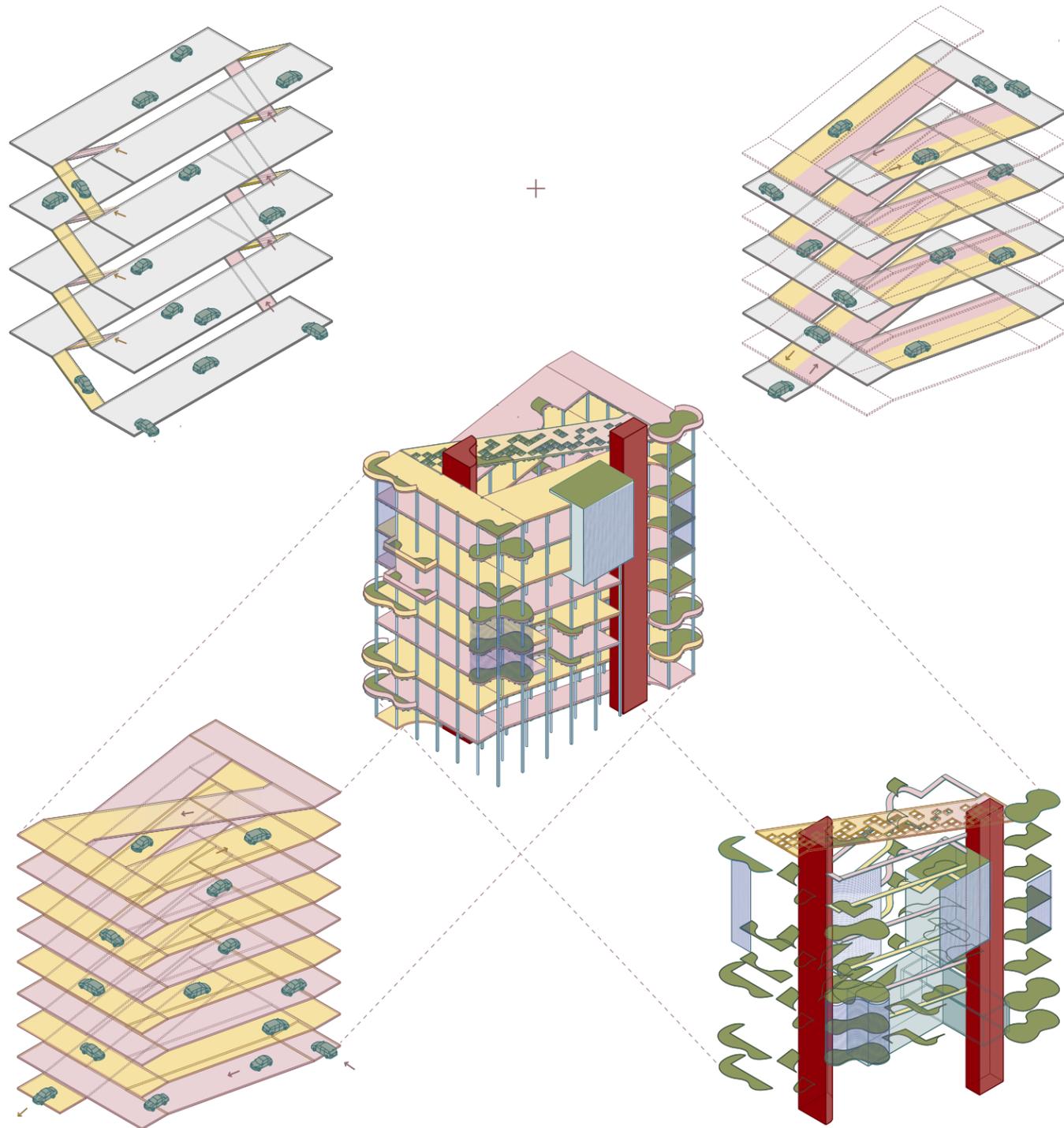
**Parking garage**

Building for cars. Saturation of vehicles.



**Section of Broadway in 184th Street**

Section of the street in which you can see a comparison between the structure of a building for cars and one for people. How the urban spaces can be viewed through different zones; cars only, people only, and third space where both coexist.

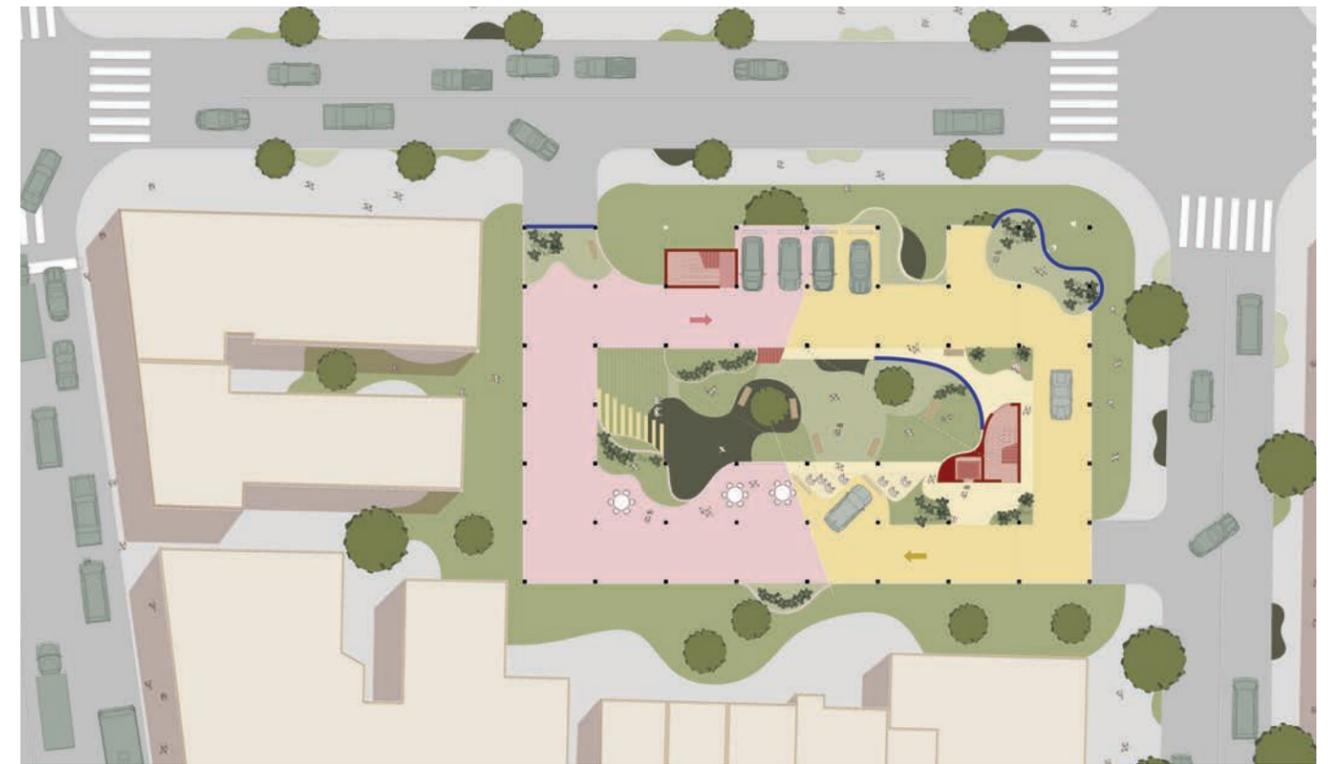


Concept Diagrams

The form of the building was defined through an exploration that mixed two parking structure typologies (split level and single helix) in order to create a new typology. The goal was to have a parking structure that could be entered from one side and exited from an other (split level) while guiding the car and pedestrian to travel through all the spaces within the structure (single helix). To achieve this two single helix structures were connected by a diagonal slab in the top level.



First level plan. View of interior public space, entrance and exit, water recollection room, interior concession area.



Fifth level plan. View of parking areas, LED screens, balconies to interior, diagonal parking, and common areas.

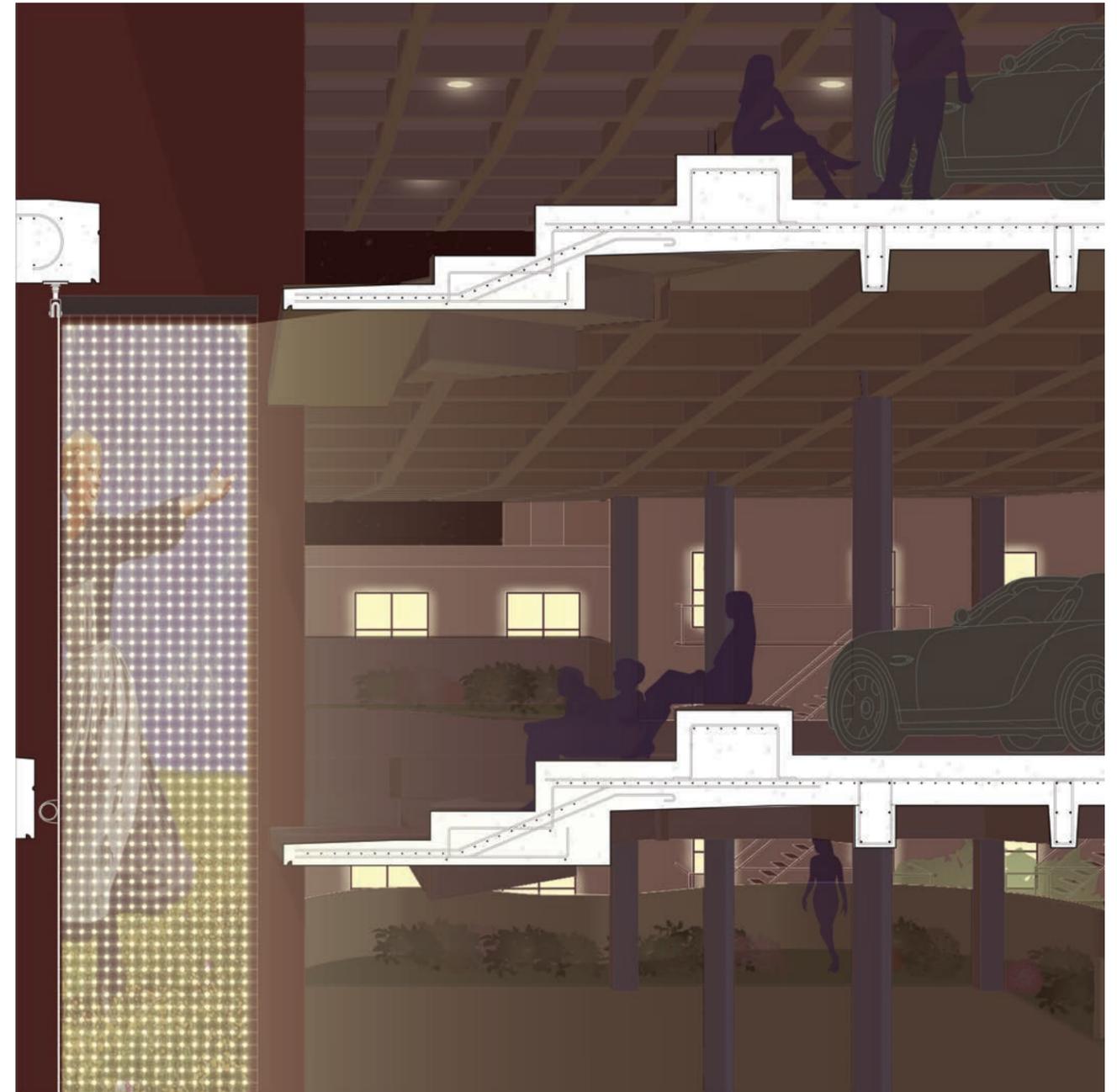


Section perspective

This section shows the parking structure and its various spaces within. The two helixes serve as circulation space for both cars and people. A pedestrian path follows the helixes all around the interior courtyard as a way to easily access the balconies and bleachers to watch the projected movies in the blue mesh screens.

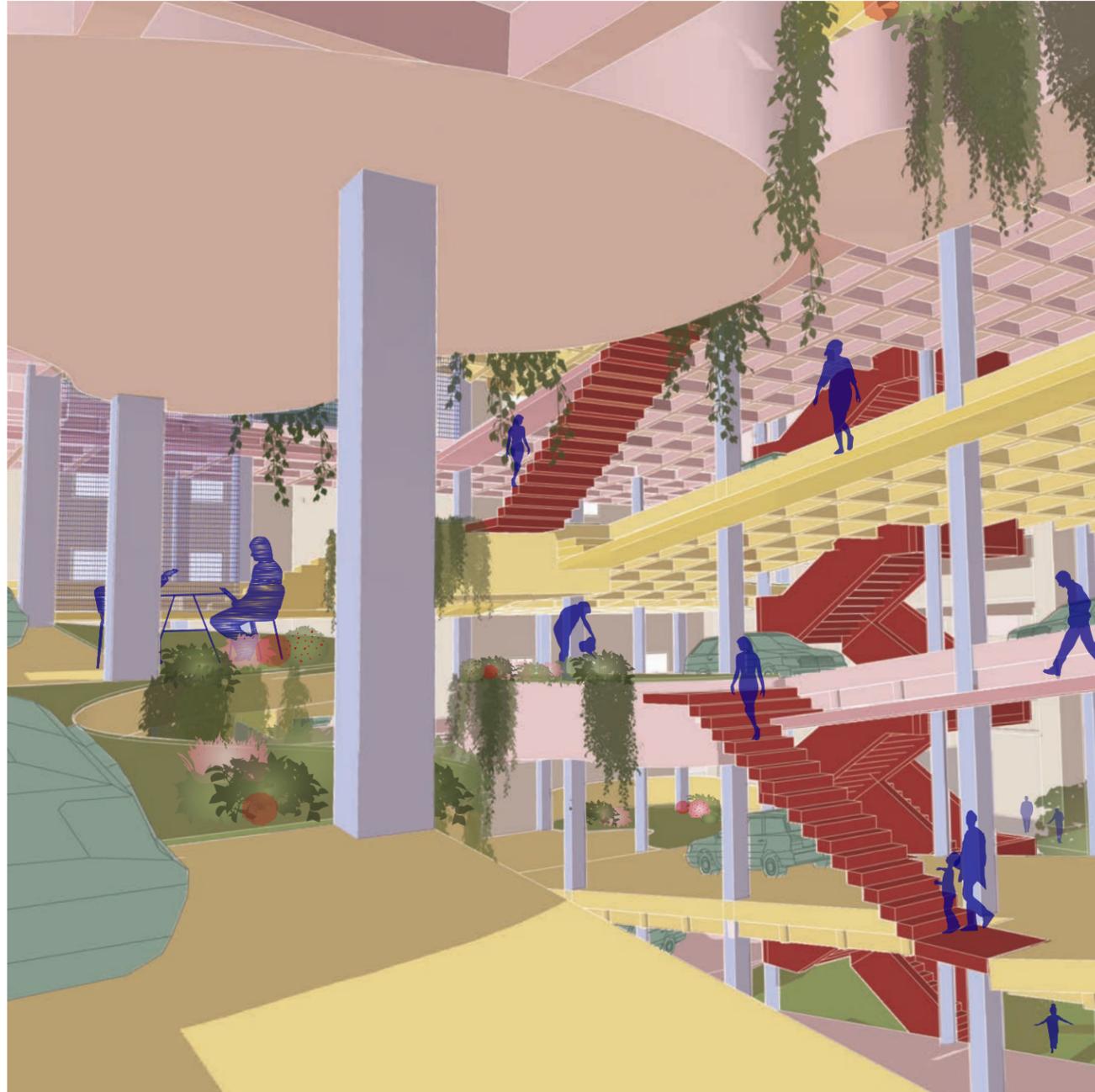
The structure provides with flexible space that when is not being used as a parking garage can be an open sharing space for the surrounding community. In the first level there is an indoor concession area for visitors to buy food or sit down and talk.

The open air indoor garden and bleachers along the helixes point towards a main screen for movie projections. The structure serves as a center to that removes cars from the streets while also giving the community a familiar space for neighborhood activities.



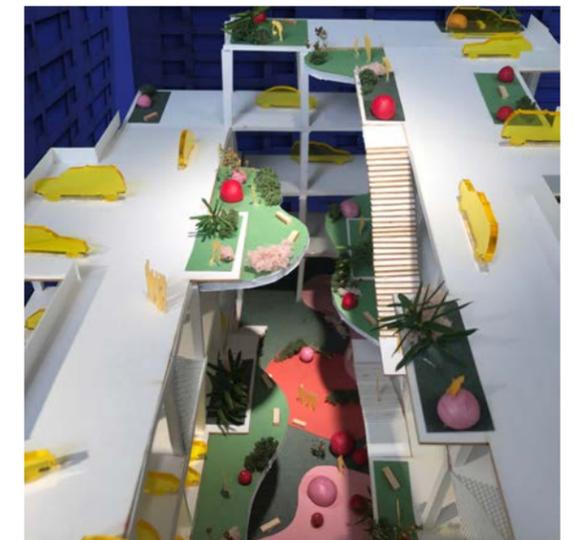
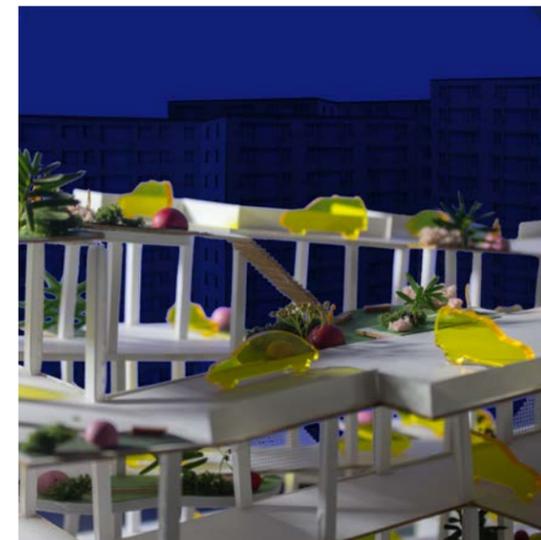
Detail section

View of bleachers along helixes and projection screens.



Perspective View

A community within the structure with the city as the background.



Concept Model

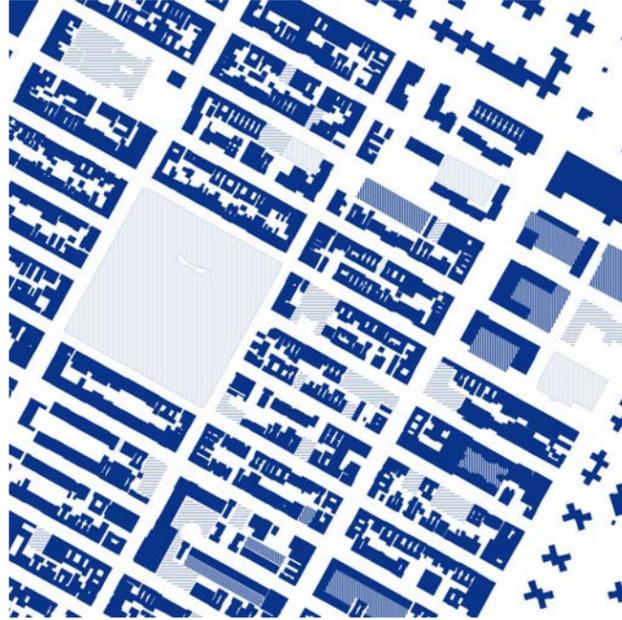
View from interior courtyard of parking structure, view of top of building from the exterior, Aerial view of the interior courtyard.



## POCKET GARDEN ELEMENTARY SCHOOL

Type:	Studio - Individual
Semester:	First Year, Spring 2020
Location:	East Village, New York
Professor:	Benjamin Cadena

This proposal focuses in restoring the former PS 64 school by transforming the existing structure into a space that integrates nature and community in education. The intervention consists of carving the existing H plan structure in order to create different spatial experiences through the insertion of open air, green spaces as part of each classroom and play spaces along circulation paths. The idea behind this is to integrate nature as an essential part of the child's education in order to promote sensibility to the natural environment; something very hard to find in the city of New York City. The project tries to approach education through a playful manner by looking at it as a landscape. The school will be a space where the community can gather and use for different activities.



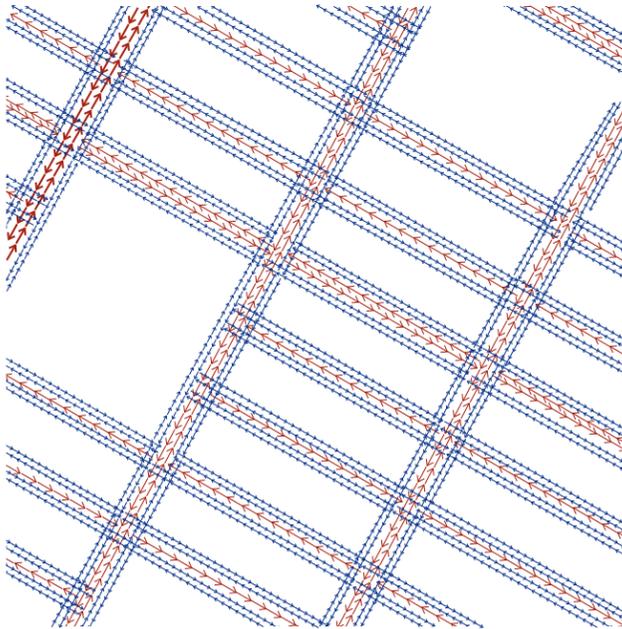
Public and private gradient

Mapping of public and private community spaces near the site. Solid blue is private and thinnest hatch public.



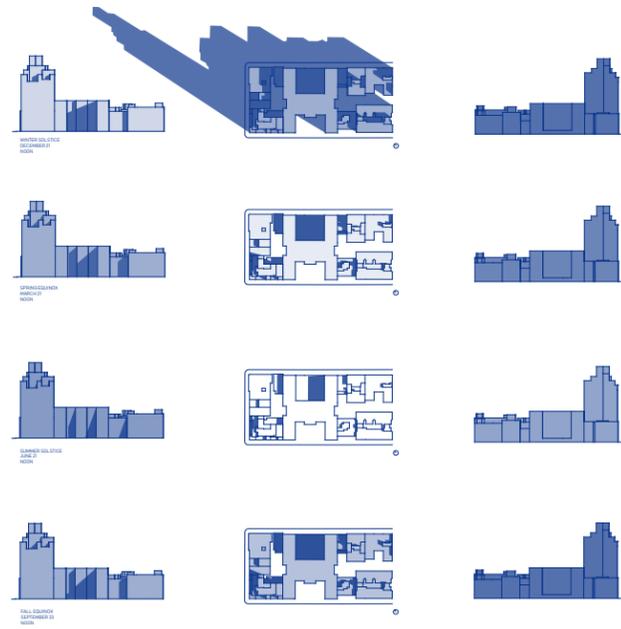
Used and unused open air spaces

Mapping of used and unused open air spaces; parks, vacant lots, and interior of blocks.



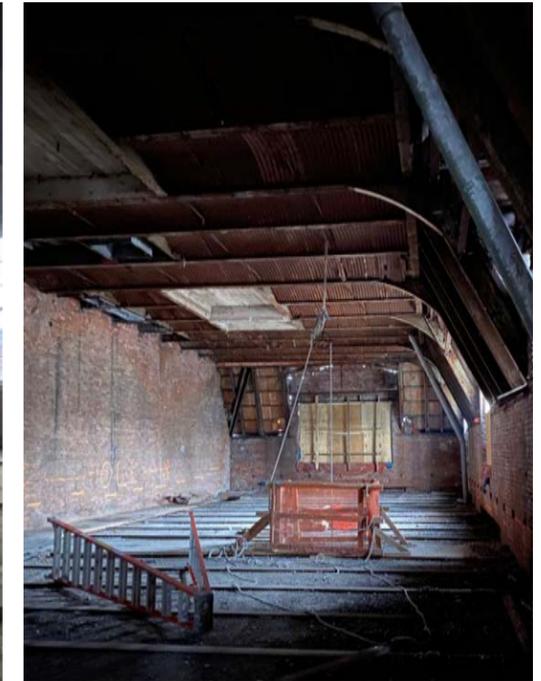
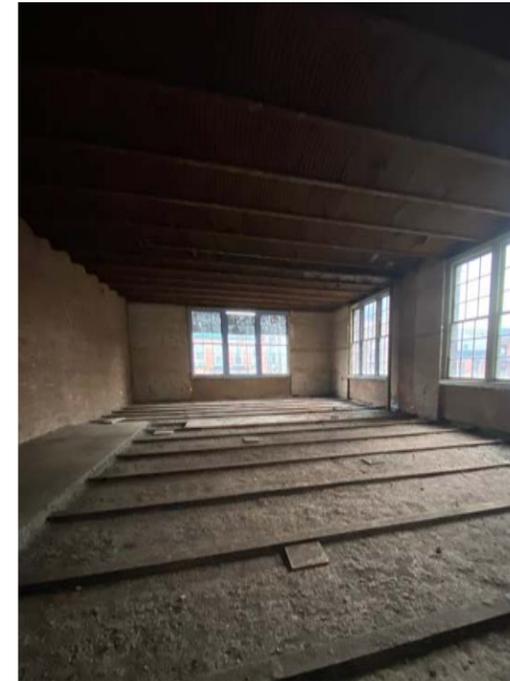
Direction and density of movement

Cars invade the sidewalk.



Shadow path

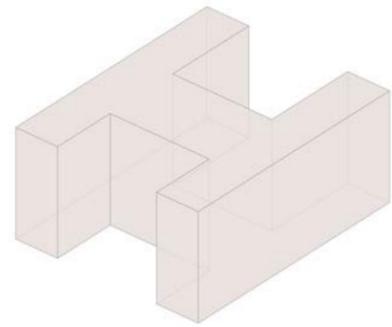
Shadow paths in the site at noon in different seasons of the year.



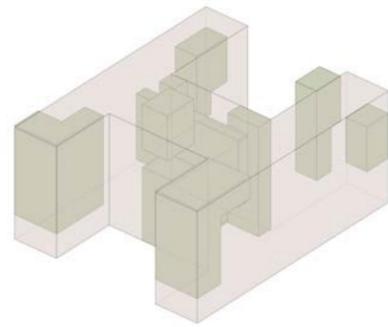
Existing conditions of site

The project started with identifying the accessibility and type of common spaces near the PS 64 school. The majority of these spaces are open air, community gardens that can be accessed by specific groups of this part of East Village.

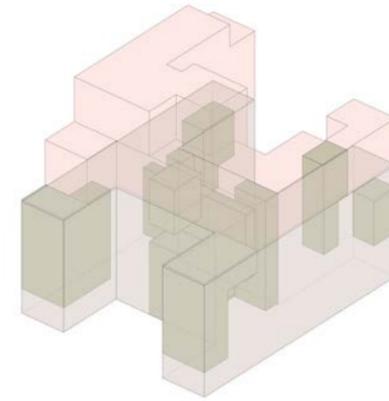
Upon visiting the site and spaces within the existing building I observed how spacious and bright its interior was. These observations and the previous analysis led me to keep most of the existing structure. To work within it and insert open air gardens. This is how I came up with my proposal, the Pocket Garden Elementary School. It is a school where nature and community are part of education.



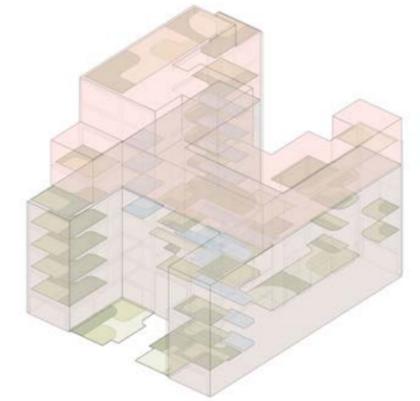
Existing structure



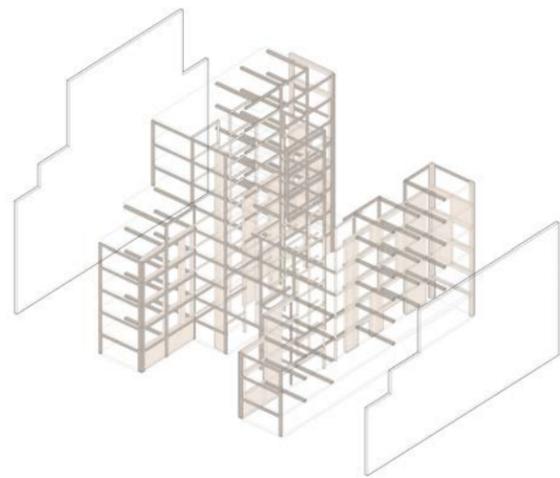
Carvings for gardens



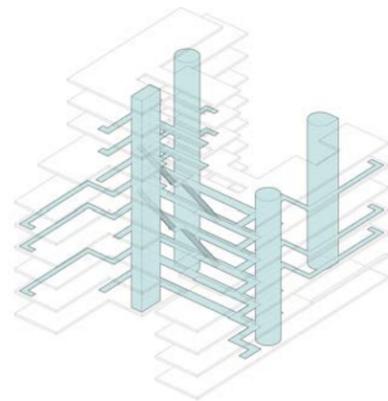
Additions for program



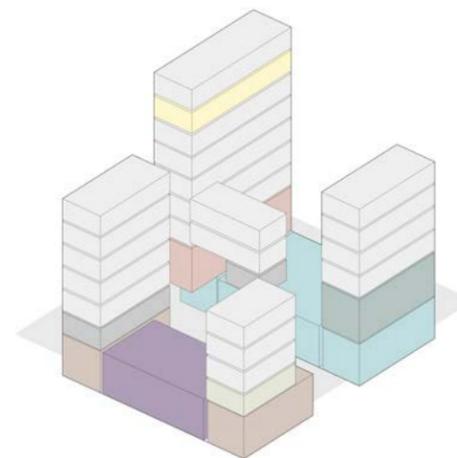
Volume with gardens and play spaces



Structure



Circulation



- |                                                                                                                                          |                                                                                                                                                                  |                                                                                                                                        |                                                                                                                                            |                                                                                                                                                 |
|------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| <span style="display: inline-block; width: 10px; height: 10px; background-color: #8B4513; border: 1px solid black;"></span> Science Labs | <span style="display: inline-block; width: 10px; height: 10px; background-color: #669999; border: 1px solid black;"></span> Library                              | <span style="display: inline-block; width: 10px; height: 10px; background-color: #99CC99; border: 1px solid black;"></span> Music Room | <span style="display: inline-block; width: 10px; height: 10px; background-color: #C08080; border: 1px solid black;"></span> Dining Hall    | <span style="display: inline-block; width: 10px; height: 10px; background-color: #FFD700; border: 1px solid black;"></span> Art Studio Workshop |
| <span style="display: inline-block; width: 10px; height: 10px; background-color: #663399; border: 1px solid black;"></span> Auditorium   | <span style="display: inline-block; width: 10px; height: 10px; background-color: #66CCCC; border: 1px solid black;"></span> Gymnasium, Dance Studio, Lockerrooms | <span style="display: inline-block; width: 10px; height: 10px; background-color: #CCCCCC; border: 1px solid black;"></span> Classrooms | <span style="display: inline-block; width: 10px; height: 10px; background-color: #666666; border: 1px solid black;"></span> Administration |                                                                                                                                                 |

Gardens and play spaces

The design strategy consisted of carving the existing H plan structure in order to create different spatial experiences through the insertion of open air, green spaces as part of each classroom.

The structure of the building is made up of load bearing walls from the original building. A superstructure was added to support all the carvings.





Site plan

The school serves as another garden in East Village for the students, faculty and community.

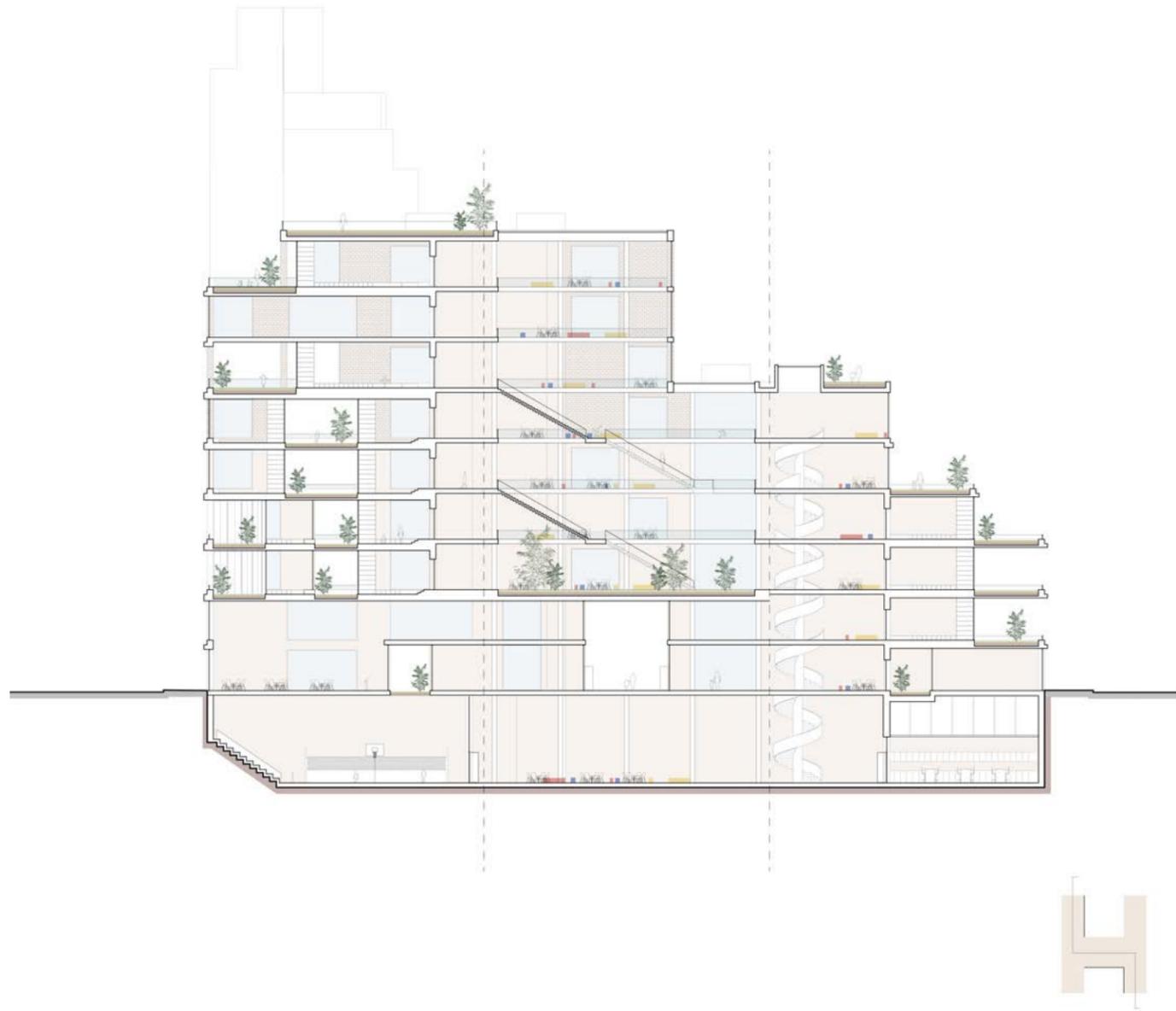
The approach to the site focused on removing the first two levels of the central part of the building in order to create a corridor that connects 9th street and 10th street. The school doesn't have a front or back entrance, it can be entered through its center. Green spaces serve as a playground and are located along the corridor. These can be used by the students during school hours and by the community off-hours.



Third level floor plan

This is a plan of the third level where the classrooms, gardens, play spaces and service areas can be observed as a system. I tried to approach the school through a playful manner by thinking of it as a landscape project. It was important for me that the spaces blended with each other while also maintaining their separate spatial qualities. To achieve this I treated the spaces as patches that differed in color, materiality and sectional differences.





Unfolded section cutaway

In this unfolded section I wanted to show the green spaces through the building. From the classrooms, to the shared central space and classrooms again.



Elevation

View of gardens in classrooms through the façade.



**Kindergarten - 1st grade**

Two classrooms that share a garden.



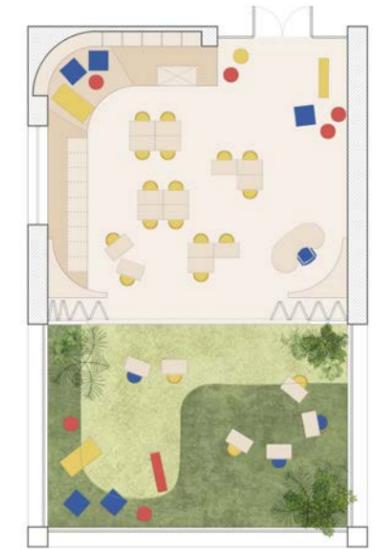
**2nd grade- 3rd grade**

Two classrooms with individual green spaces.



**4th grade- 6th grade**

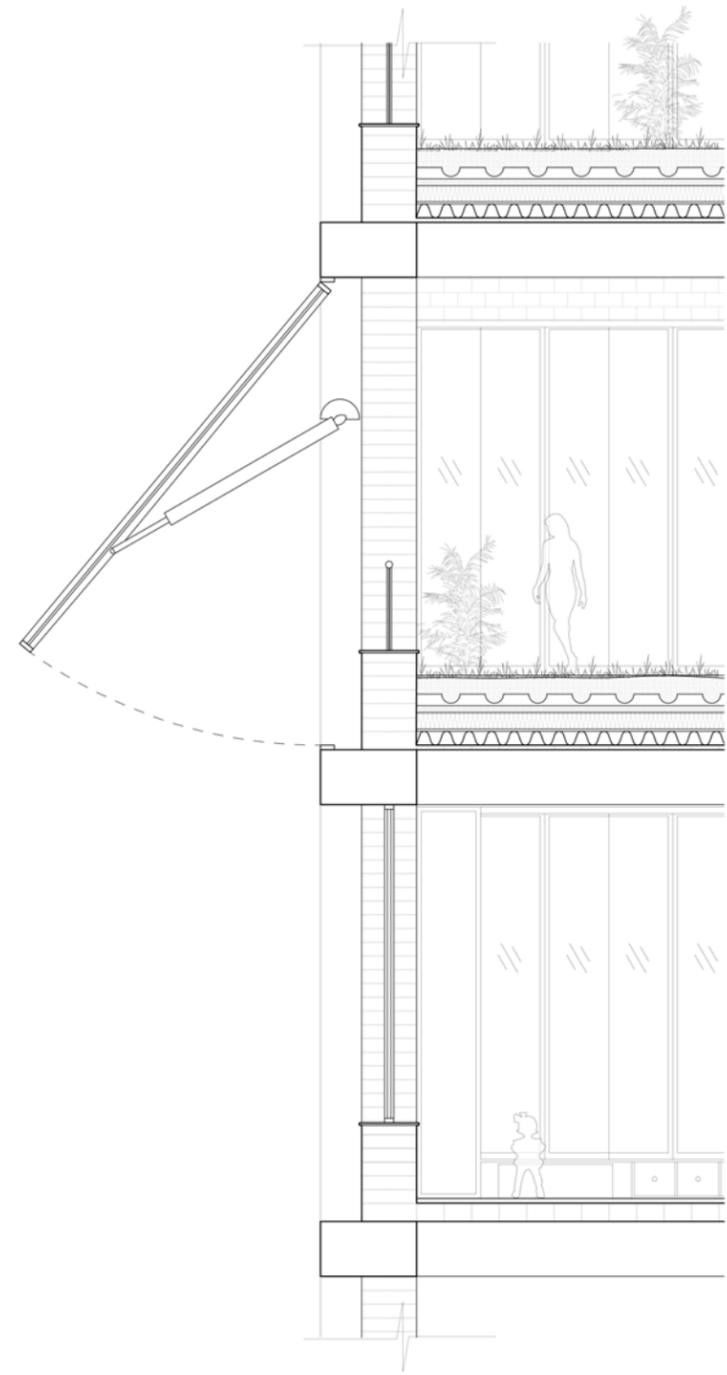
Single classroom with extra space and larger garden to accommodate bigger groups and use for other school activities.



**4th grade- 6th grade**

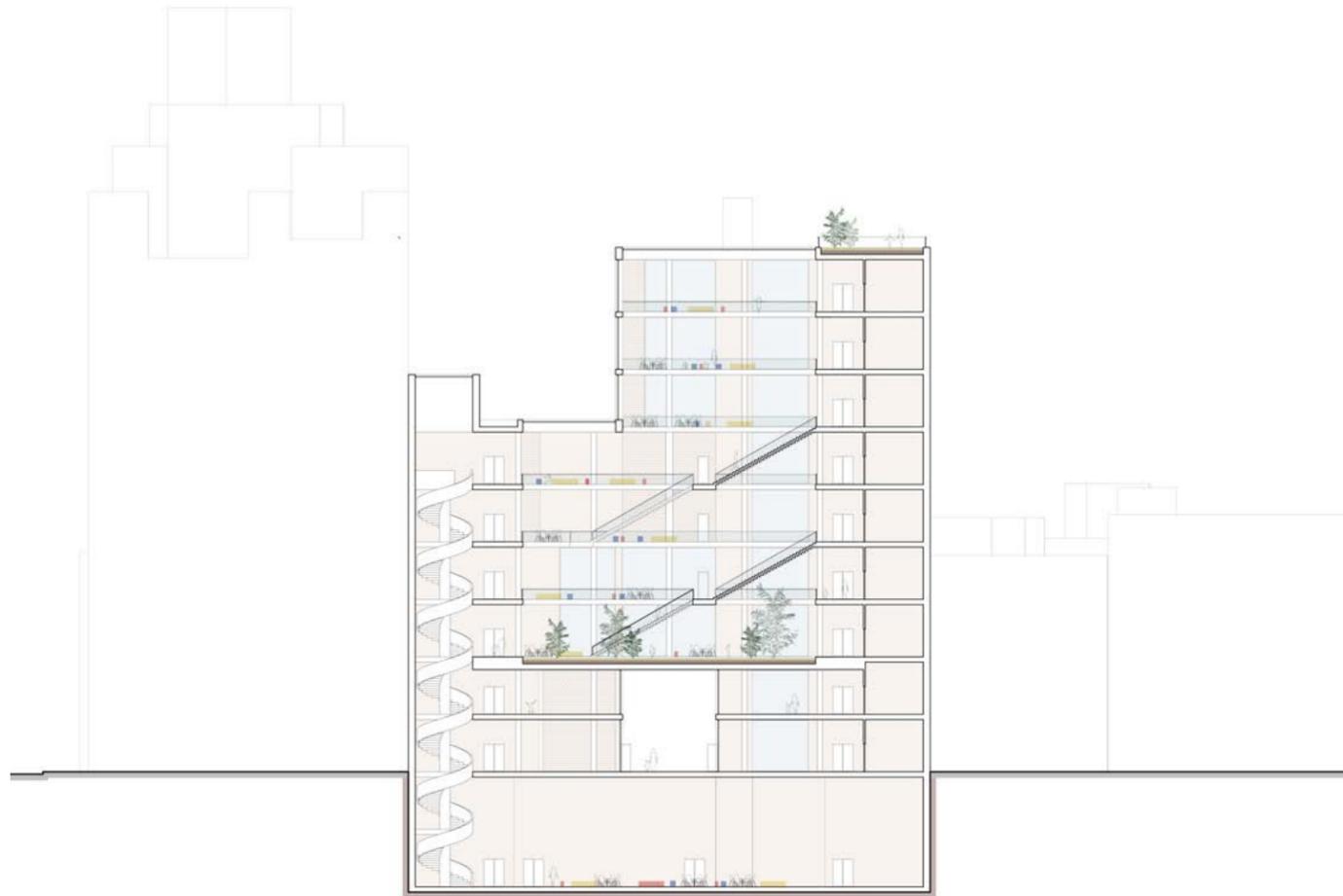
Single classroom with individual green space.





Section detail

The weather will not always be warm and pleasant for a day outside which is why large operable glass windows protect the gardens during cold or rainy weather.



Transversal section cutaway

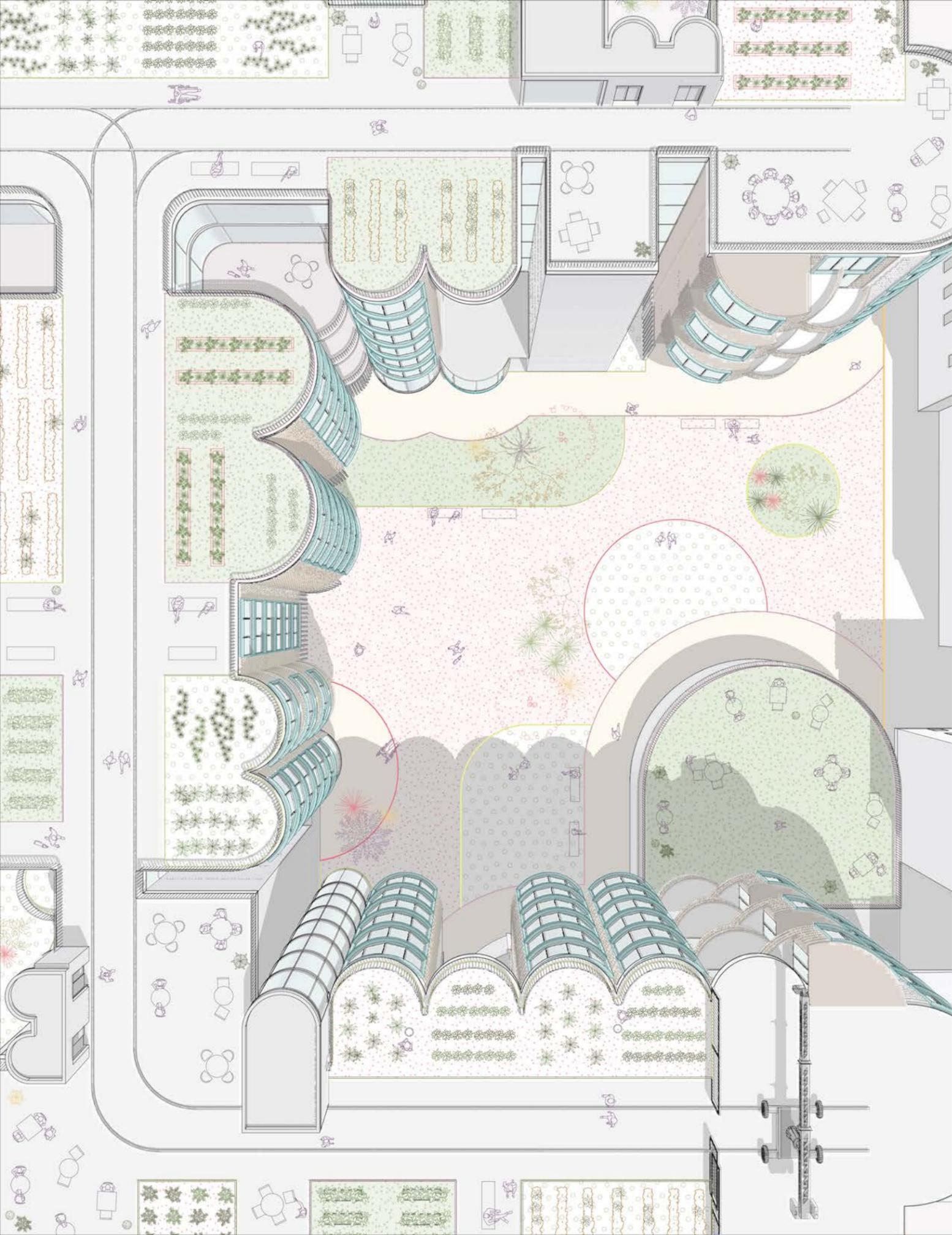
View of void in the central space of the school that provides a main indoor courtyard open to and visible from all the levels of the building. This central space is surrounded by all the play areas and green space. It fosters a sense of community within the school by reuniting different parts of the school there through program placement and circulation.



View of indoor courtyard. Students and teachers using play spaces to study and play.



Transformed view of indoor courtyard. Reimagination of the space as a market for the harvest from the gardens once the building stops functioning as a school and is converted to a community garden/marketplace.



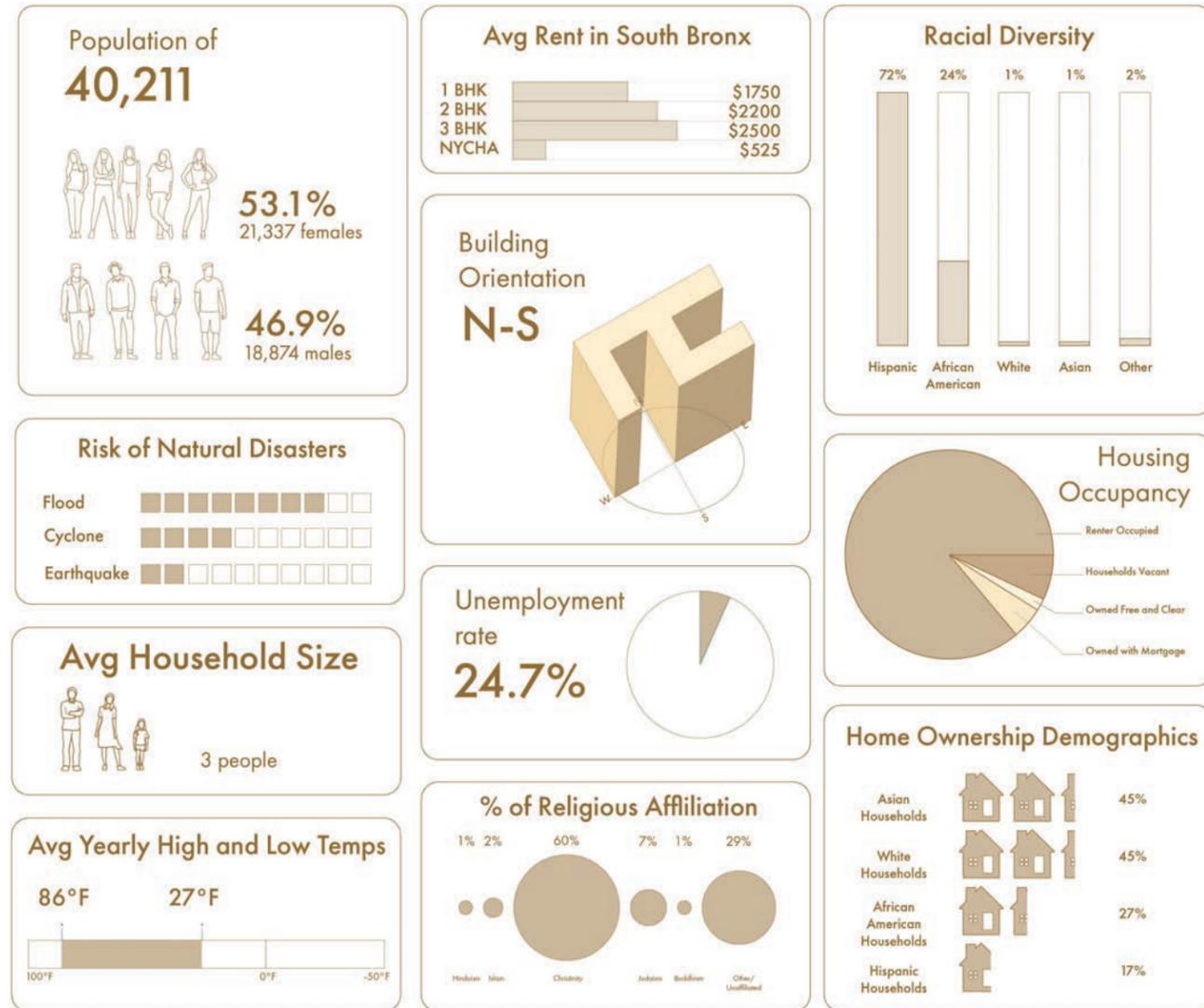
## EXPANDABLE LIVING

Type: Studio - Group  
Partner: Alyna Karachiwala  
Semester: Second Year, Fall 2020  
Location: The Bronx, New York  
Professor: Eric Bunge

This project is a multifamily affordable housing building that addresses the economic and demographic diversity of the site and permits adaptability to changing households. It proposes a modular construction co-op housing model that encourages homeownership through the growth and expansion of apartment units overtime according to the needs of the residents. The proposed building promotes a self-sustainable community through different programs such as urban agriculture. A rooftop garden provides spaces for food to be harvested and then sold in a market on site. The modular construction is facilitated through a permanent armature that contains structure, service spaces and communal programs for the residents. The armature supports a variety of fixed and expandable units that wraps around two main courtyards that are accessible to both the residents and the public.

# THE BRONX - 10455

(ZIP CODE)

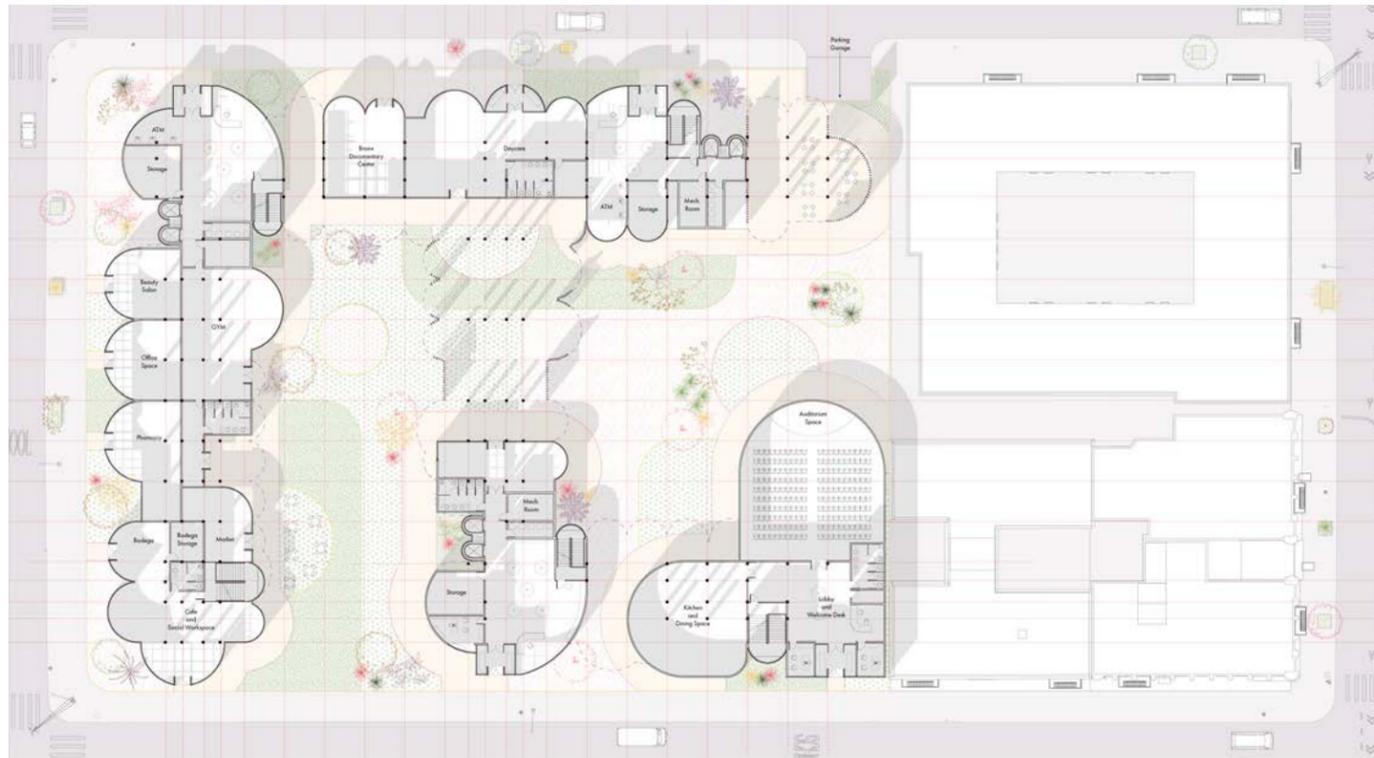


Proposed site plan

The median age in the area near the site averages between 30 and 25 years. A closer look at the breakdown of age population reveals that there are actually many young kids in the area and a small elderly population. The neighborhood is mostly made up of young families. Additionally, about 86% of the population rent homes. In 2018, NYC homeownership rate was 44% for Asian and white households. Only 27% and 17% for black and hispanic households. Given that the neighborhood is made up of 80% Hispanic or Latino and 23% of the black community the project seeks to encourage homeownership in the site. Studios and one bedroom apartments are mostly rented whereas two bedrooms and up are more likely to be owned.

The building is located at 151st Street, between Cortland Avenue and Melrose Avenue in the Bronx, New York. The site strategy consisted of creating a shape that wrapped around 2 central courtyards. The form helps prevent dark spaces and facilitates ventilation. It also maximizes daylight for indoor spaces and takes advantage of the eastern winds. Both courtyards are accessible to the public and residents. Programmatically, the west courtyard provides a more commercial setting and public environment because of its location next to Cortland Avenue. The east courtyard does not have commercial spaces making it a semi private park/playground area for residents. The courtyards make a gesture to connect to the community gardens on streets 151st and 152nd.



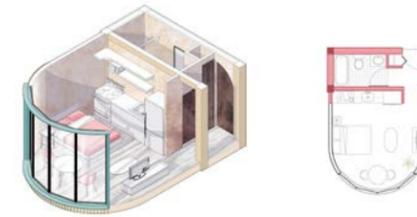


**Ground level plan.** The building has three main private entrances next to elevators and stairs that provide access to the apartments and rooftop. Facing Courland Ave, there are spaces for offices, a cafe, a bodega and beauty parlor. Facing 152nd, because it is a quieter street, there is the Bronx documentary center and a daycare. And located at 151st, there is a community center with a black box theater space and dining hall that can be rented out for various events.

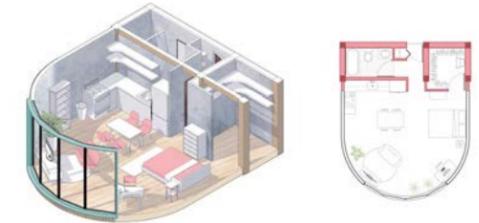


**Typical plan.** The building follows a double loaded corridor strategy. All apartments have views to either the central courtyards or the street. The corridor highlighted in red works as an armature that includes structure, circulation, wet walls and service spaces that support modular construction on site. The apartments are stacked in towers in order to facilitate construction and expandability. In addition to the private homes, the building offers several communal spaces such as workspaces, laundry rooms, play spaces, yoga rooms and arts and crafts in the building central spine.

### Fixed Units



300 sqft Micro unit



500 sqft Studio



300 sqft Micro unit



500 sqft Studio

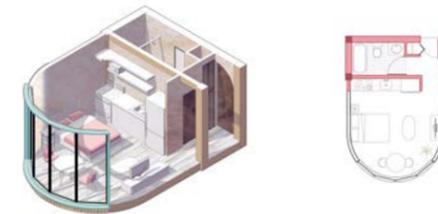


300 sqft Micro unit



500 sqft Studio

### Expandable Units



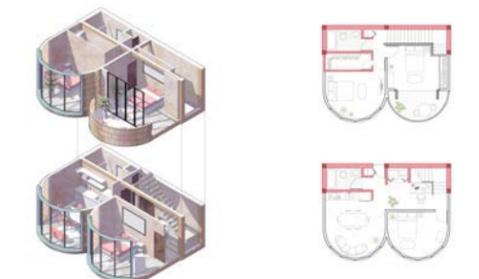
300 sqft Micro unit



500 sqft Studio



300 sqft Micro unit



500 sqft Studio



1



2



3



4



5



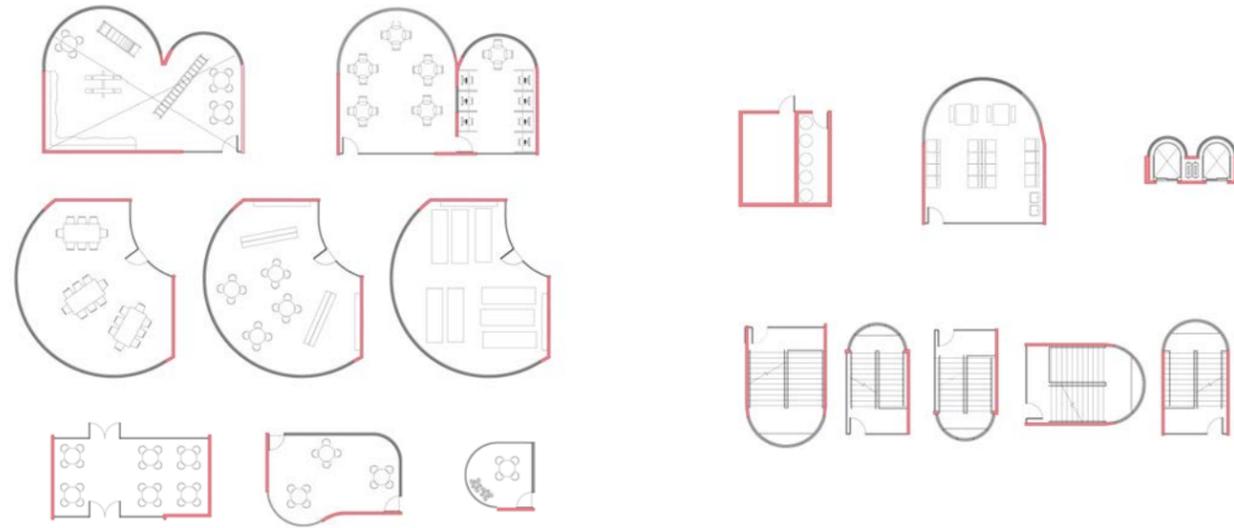
6

**Expandable unit installation process**

Sequence of how the prefabricated expandable units are installed in the building.  
 (1) Moving crane. (2) Crane lifts unit from truck. (3) Crane placing the unit in its place.  
 (4,5) Facade changing as more units are expanded. (6) Maximum capacity of unit expansion.

Communal Spaces

Service Spaces



Armature catalogue

This catalogue shows spaces that are part of the armature. They serve as infrastructure and communal spaces for the apartment units.

The armature is made of a steel frame structure. The part of the armature highlighted in red houses wet walls, closets, garbage disposal, and mechanical rooms. The structure that supports the units are a 5'x15' grid of columns. The columns work as anchor for the units that cantilever from them.



View of exterior facade. View of terracotta cladded facade, balconies and circulation towers.

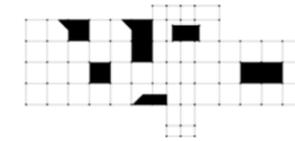


View of armature. Corridor and common area balconies for residents.



Interior view of one bedroom unit. Double height living room space with view to one of the courtyards.





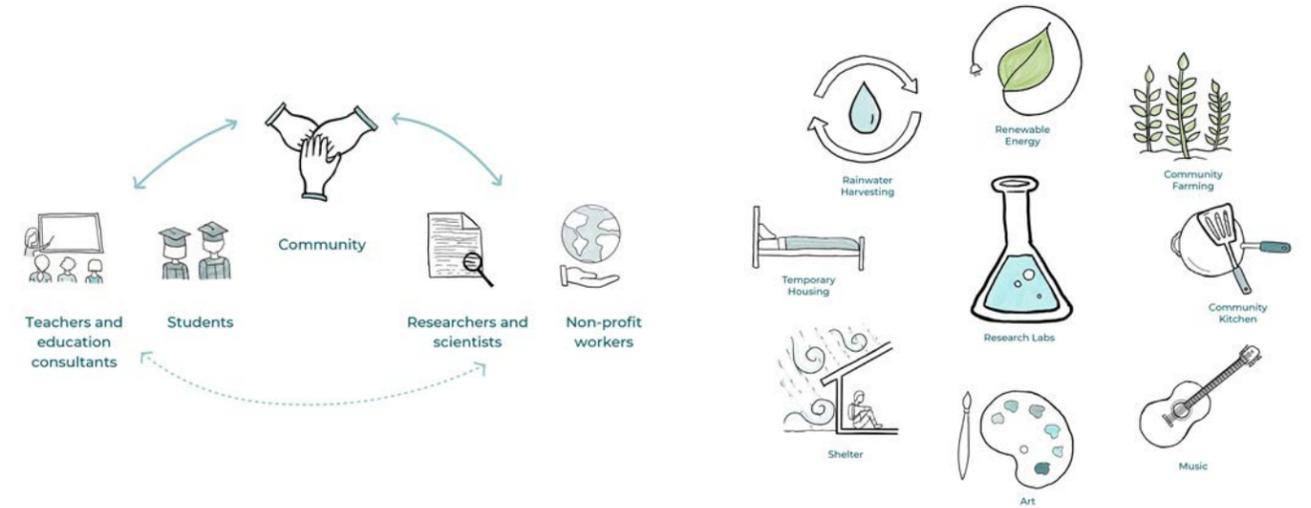
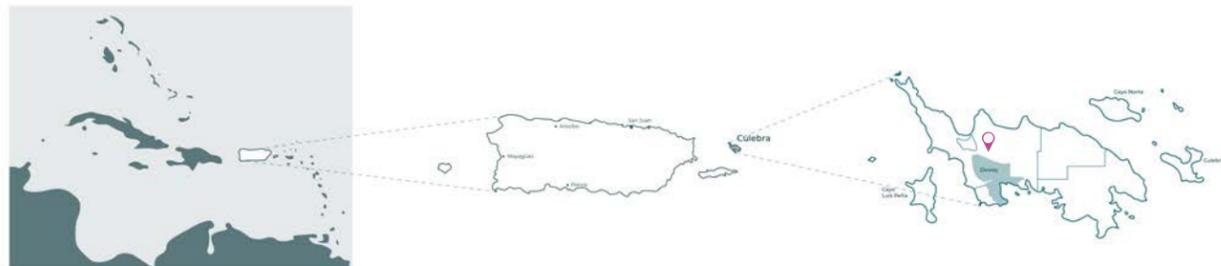
## ECOLOGICAL RESEARCH CENTER

Type:	Studio- Group
Partner:	Zhaoxiang Yun (Urban Planning)
Semester:	Second Year, Spring 2021
Location:	Culebra, Puerto Rico
Professors:	Douglas Woodward, Richard Plunz

This project proposes a systematic intervention on an abandoned factory building and its surrounding landscape in Culebra, Puerto Rico. Aimed to build robust capacity in the island for ecological research and education, the project will serve as a development engine through ecological tourism, the improvement of its education system, and also function as a pivot for a more diversified and sustainable local economy. The intervention synthesizes ecological research, education, temporary housing and other demands from local residents. The spaces provided will not only support research, but also prepare local residents to hazardous weather in advance and accommodate diversity of their daily activities. Progressing from its fundamental objective of providing housing and laboratories for participants of research projects on the island, the center also explores the possibility of improving the local education system by relating researchers and school age population.



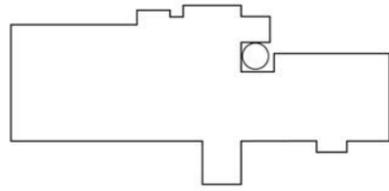
**Immediate Context.** The site is close to the town center of Dewey and near the programs that would work directly with the Ecological Research Center. The number 1, would be the Ecological School, which would be one of the schools that the Center would supply teachers and consultants. In number 4, would be the ferry, one of the main means of access to the island.



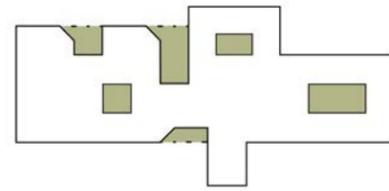
Rather than a frozen project, taking the opportunities and demands identified, the Ecological Research Center will serve as a complex that is structurally and constructionally flexible that can accommodate the needs of the stakeholders and different situations of budget. As a response to the high cost and long time span needed for this project to be completed, the phasing of this project ensures the lowest financial burden on local government and the maximum viability of the building at each phase.



Existing

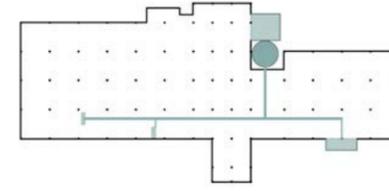


Proposed

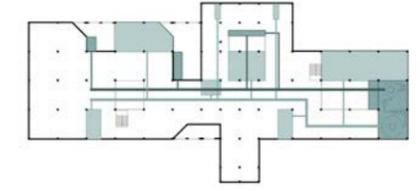


Interior Massing

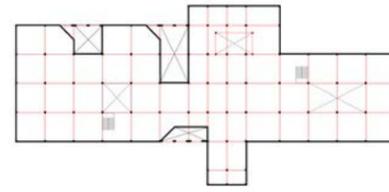
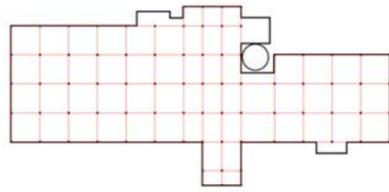
Existing



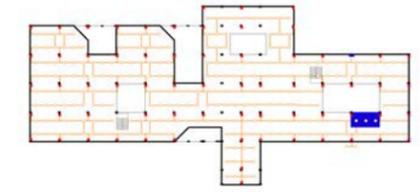
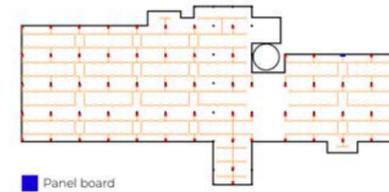
Proposed



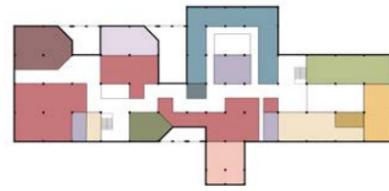
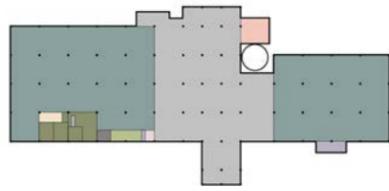
Water



Structure

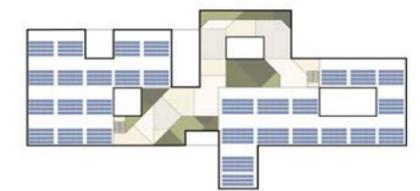
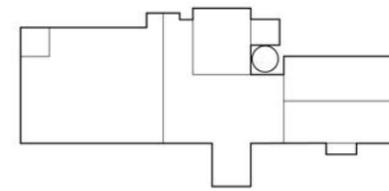


Electricity

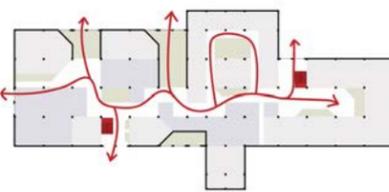
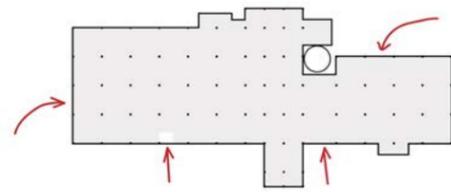


- |               |           |                     |                    |                   |
|---------------|-----------|---------------------|--------------------|-------------------|
| Manufacturing | Reception | Library             | Storage            | Laundry           |
| Storage       | Kitchen   | Movable Walls Space | Solar Control Room | Temporary Housing |
| Management    | Unknown   | Workspace           | Water Management   | Research Labs     |
| Bathrooms     | Infirmary | Bathrooms           | Community Kitchen  | Management        |

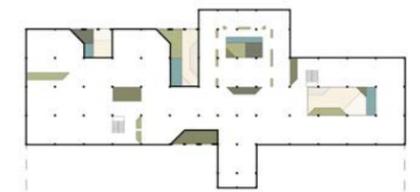
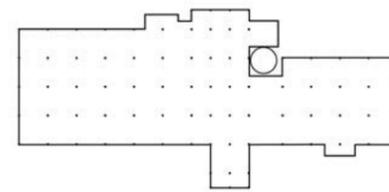
Program



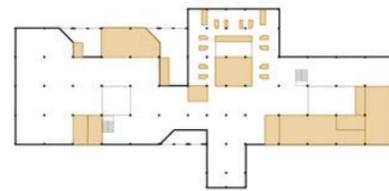
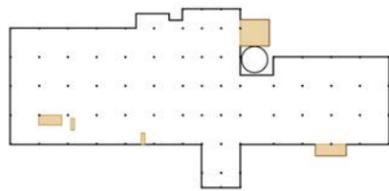
Roof



Circulation



Green and Common Spaces



Service Spaces



Phase 1 - Year 1

Housing, research labs, trees, courtyards, circulation, solar panels and water collection, movable walls



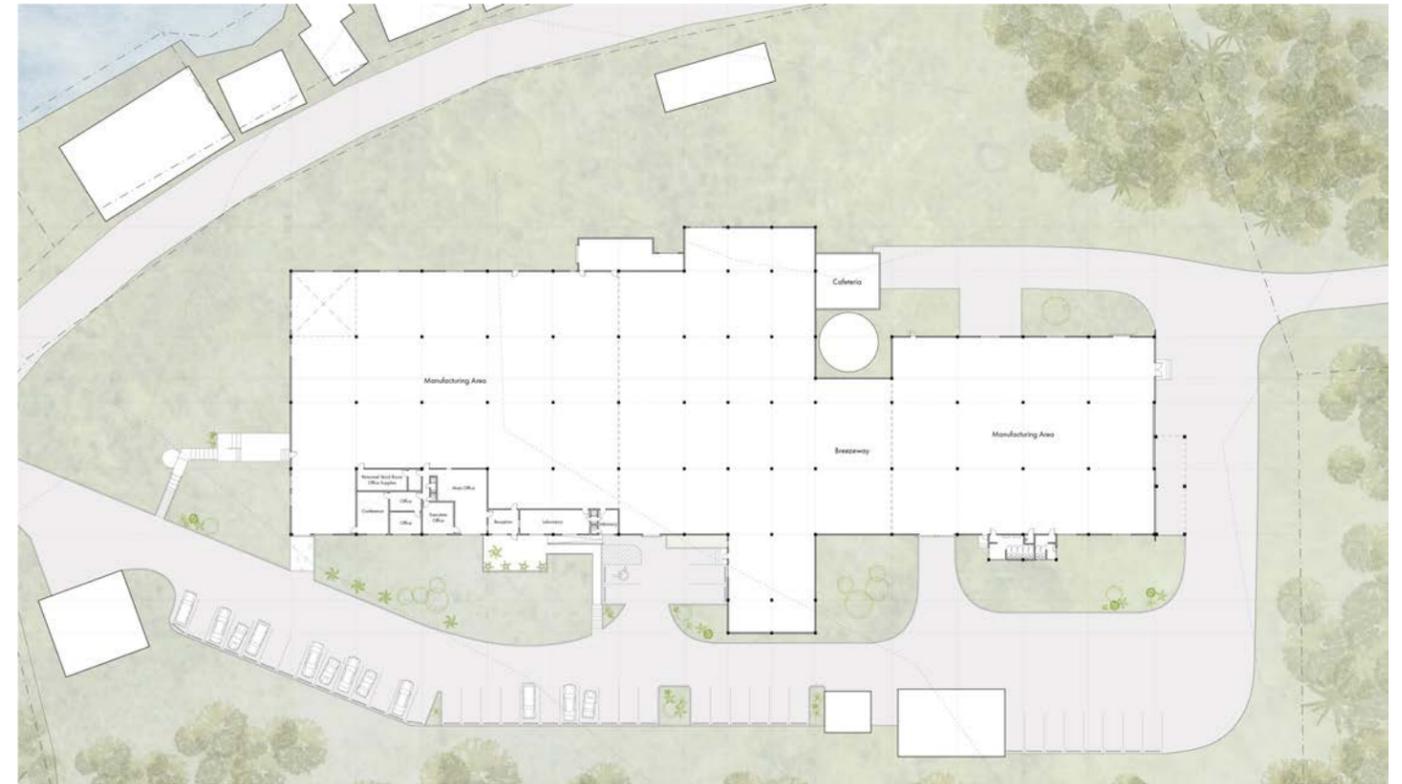
Phase 2 - Year 5

Rest of the program. Complete outdoor spaces, expand parking with green spaces

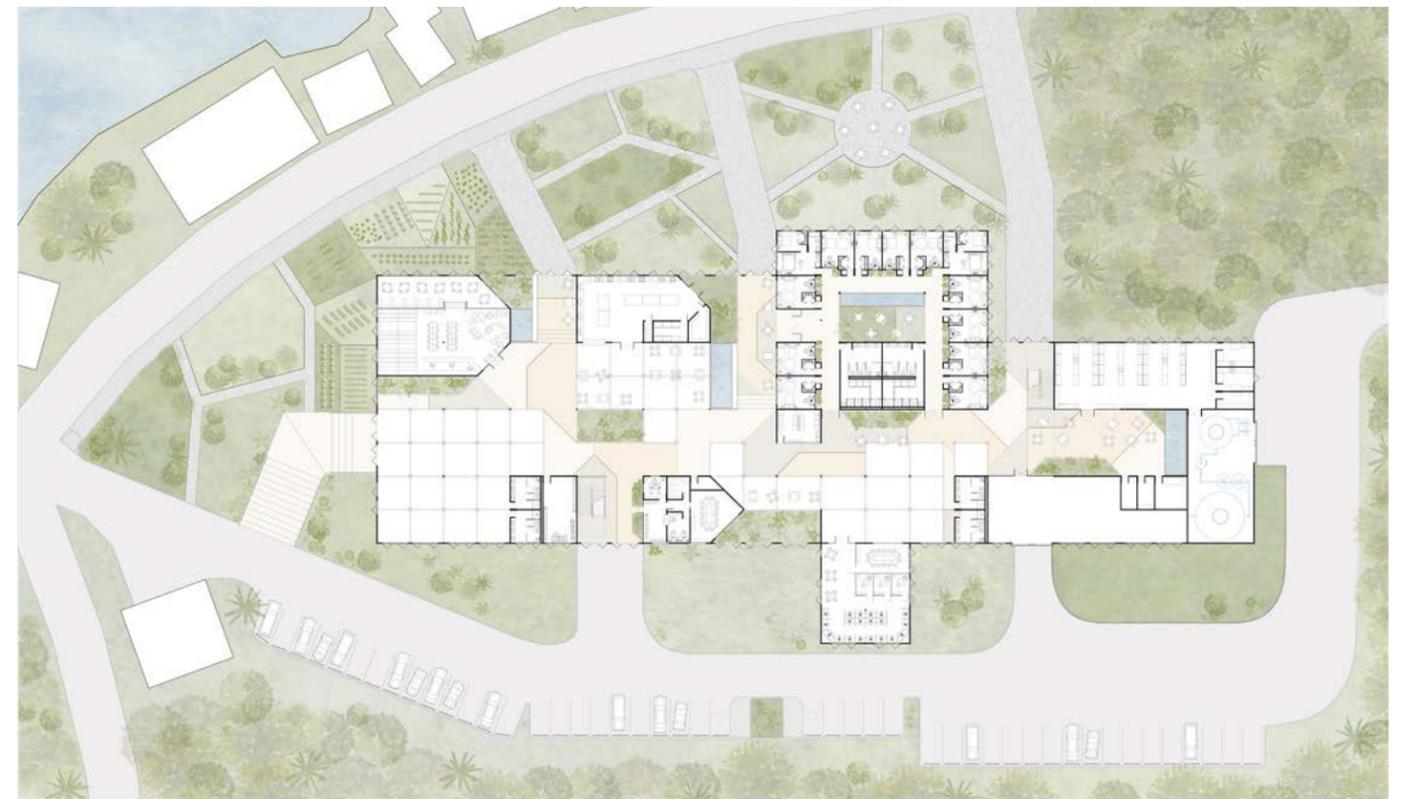


Phase 3 - Year 10

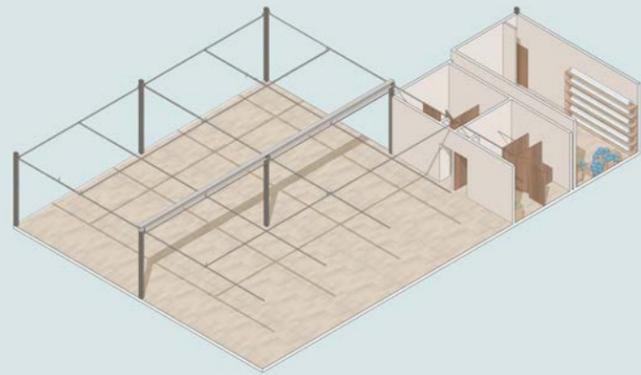
Housing extension, alternative roof.



**Existing Plan.** The building structure is mainly composed of a column and truss steel frame with spans of 30' by 30'. It used to be the first Baxter International Company brought to Culebra in 1972. The company manufactured iv serums. It later became RD Medical after it was sold in 1996. The building is currently in disuse and owned by the government.



**Proposed Plan.** The intervention strategy consisted in placing courtyards throughout the building to maximize ventilation, lighting and open up the building to the outdoor spaces. All the changes occurred within the existing structural grid and some slight additions to support and maximize space for the proposed programs.

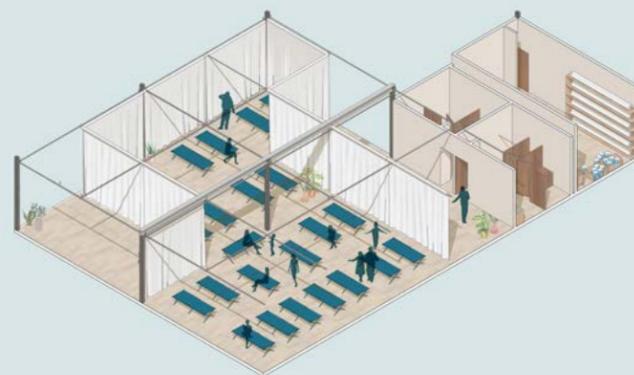


**Movable Wall Spaces**

The multi use open spaces can be compartmentalized into a grid of 15' by 15'. This will allow the building to adapt pop-up programs that the community might have. To support the different uses, a system of movable walls that can be rolled down and back up according to the needs runs attached to the primary structure. Each movable wall space is accompanied by bathrooms and a storage space that contains equipment to support the changes.



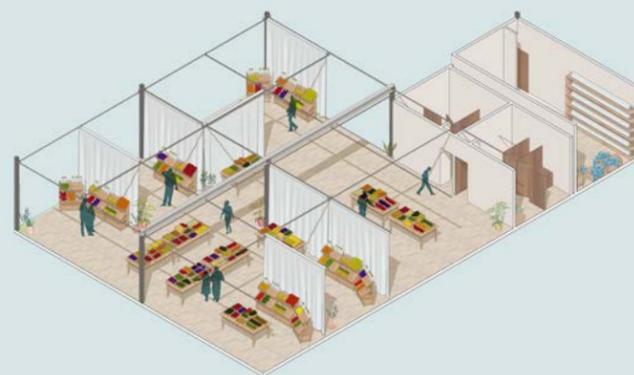
Emergency Vaccination Center



Hurricane Shelter



Art Exhibition



Farmer's Market



**Zoomed in view of temporary housing area**

The temporary housing is strategically located in a way that creates privacy for the guests while also being included on the rest of the building's programs. It is located near the community kitchen, a communal bathroom and its own courtyard.



One bedroom



Studio with two beds



Studio with one bed

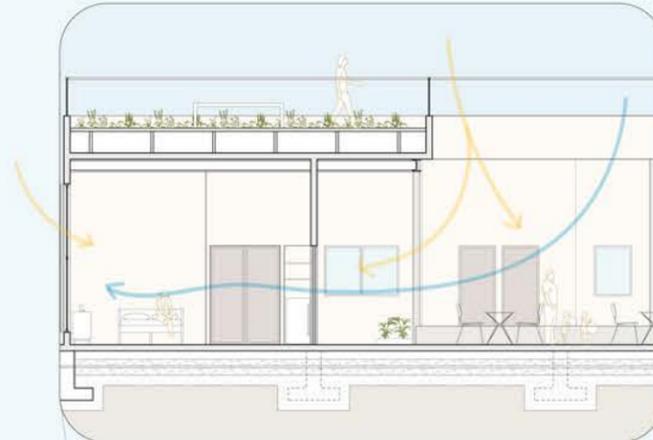
**Housing Units**

Units will be available for both commercial rental and leasing for contributing travelers like, teachers, researchers and organization workers for a discounted price.

The building also offers three types of accommodations for the incoming researchers and teachers. A studio with a single bed and another with two twin beds. These rooms would make use of the community kitchen and communal bathrooms located near it. The third room is a one bedroom unit meant for families or larger groups. The units are located towards the outdoor spaces to take advantage of views and access the outdoor spaces.



Education

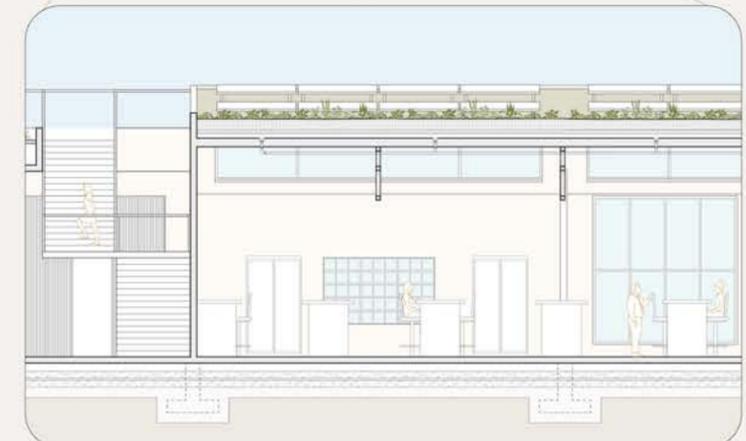
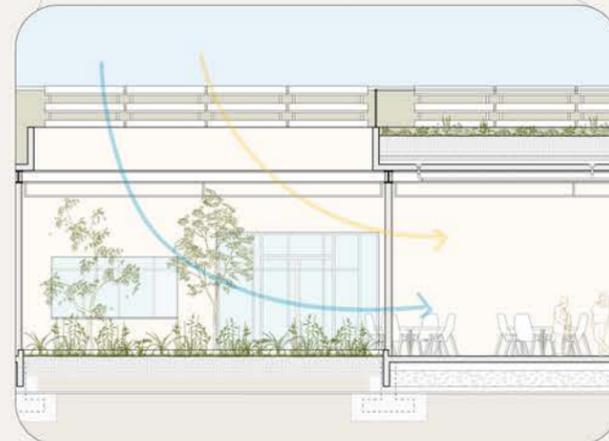


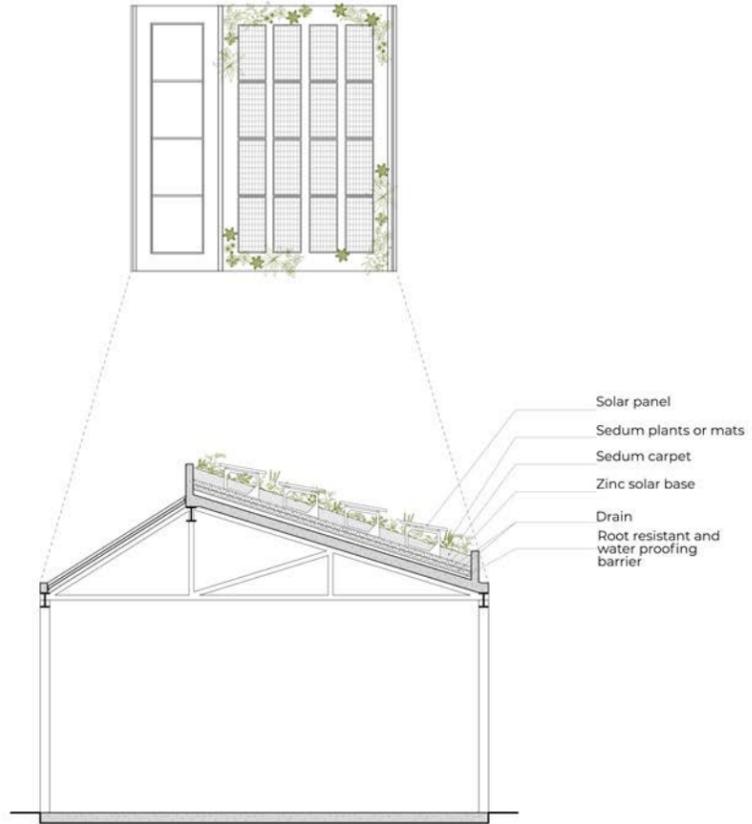
Temporary Housing



Community

Research





**Alternate Roof System - Phase 3**

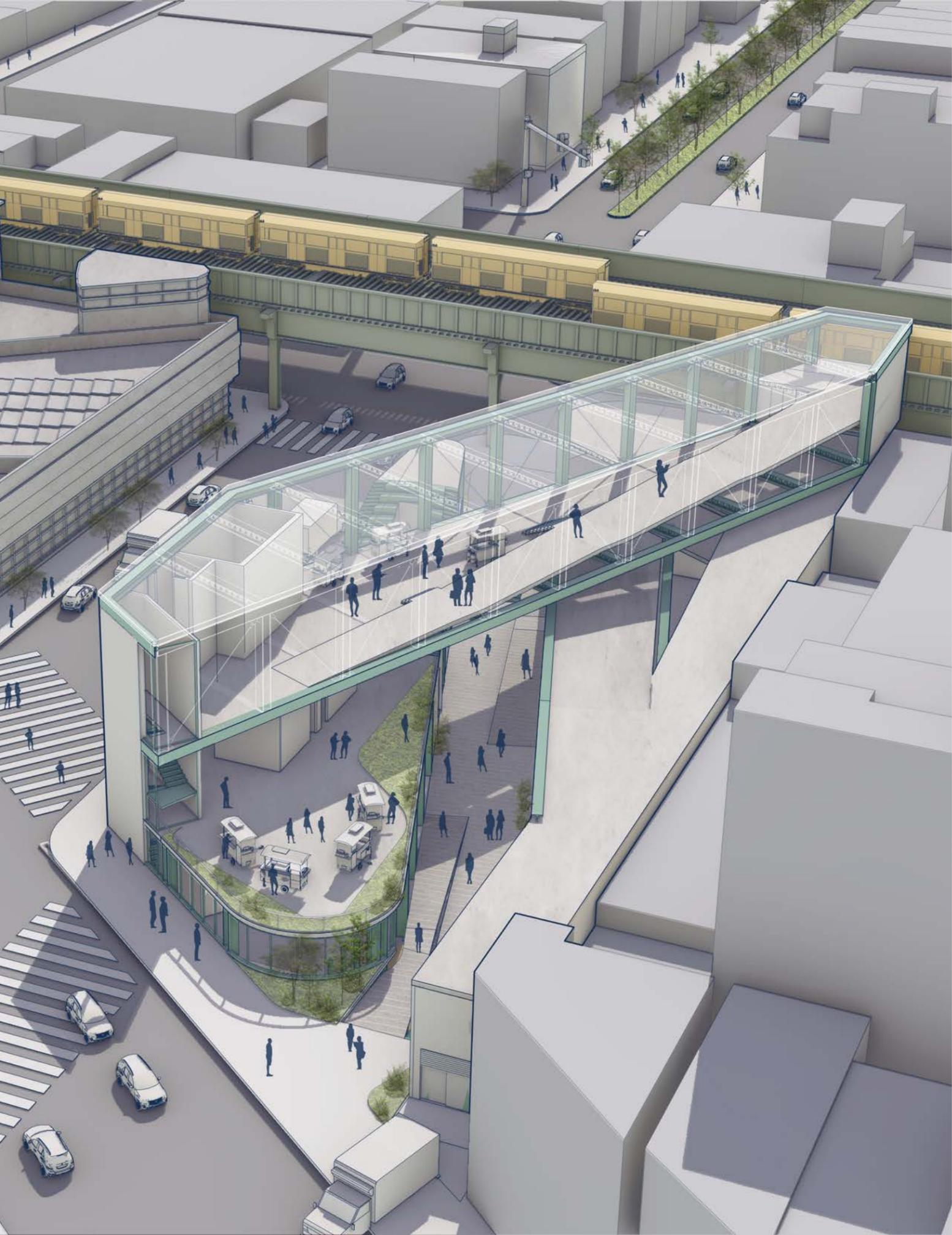
In the later stages of the project, the roof could potentially be replaced by a sawtooth biosolar roof. On one side solar panels and a green roof are combined. This would allow for energy generation while simultaneously dissipating heat gain through the green roof and facilitate for rainwater harvesting. On the other side of the roof, there would be windows to allow more light to come into the spaces inside the building.



Exterior view of proposal. View of public outdoor green area right by the northeastern facade of the building.



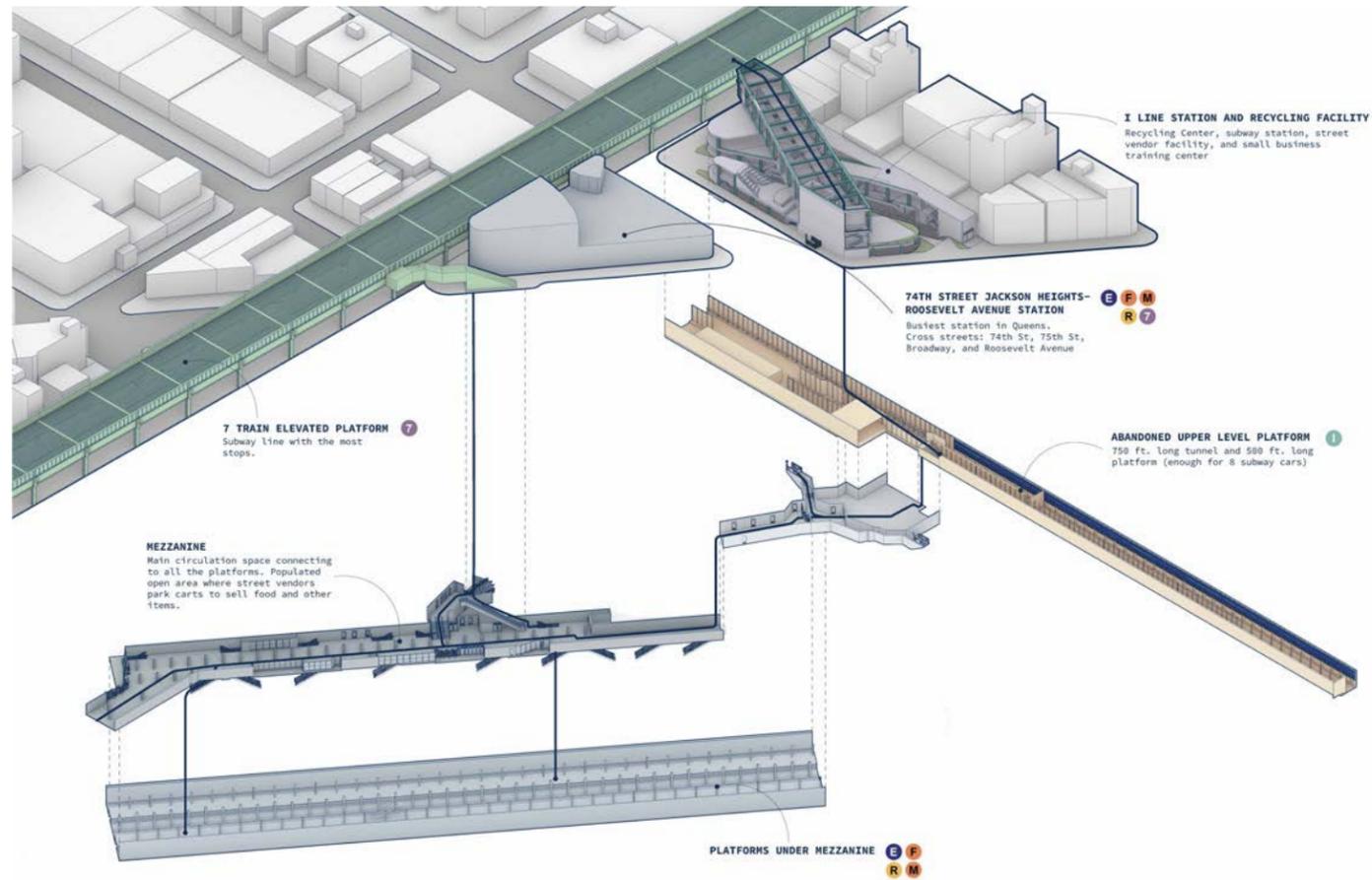
Interior view of proposal. View of courtyard in front of the research laboratories in the rear part of the building.



## THE I LINE

Type:	Studio - Group
Partner:	Alyna Karachiwala
Semester:	Third Year, Fall 2021
Location:	Jackson Heights, Queens, NY
Professor:	Phu Hoang

The I Line focuses on transportation equity for Queens. Many immigrants work in the city and commute long distances back to Queens at odd hours of the day when most transportation systems are not operational. Our building seeks to support and add to the city's recycling network, provide infrastructure to local informal businesses and also provide a more reliable transportation alternative for the general public. The strategy consists of exposing the unseen inner workings of the city and making them part of the everyday lives of the people in the area. A sunken urban corridor that connects Broadway to Roosevelt Ave is the main entrance to the building and serves as a link between the existing subway station, the recycling center, public spaces and the small business training center. Long spanning ramps and bridges supported by trusses connect the programs and the resulting sectional changes provide windows into other programs. This creates a visual and programmatic kaleidoscope of formal and informal infrastructures coming together. Our recycling network first offers solutions at a city-wide scale by lowering the amount of waste in the state, but aims to impact the global outflows of recyclables to junkyards, oceans and other impoverished countries.

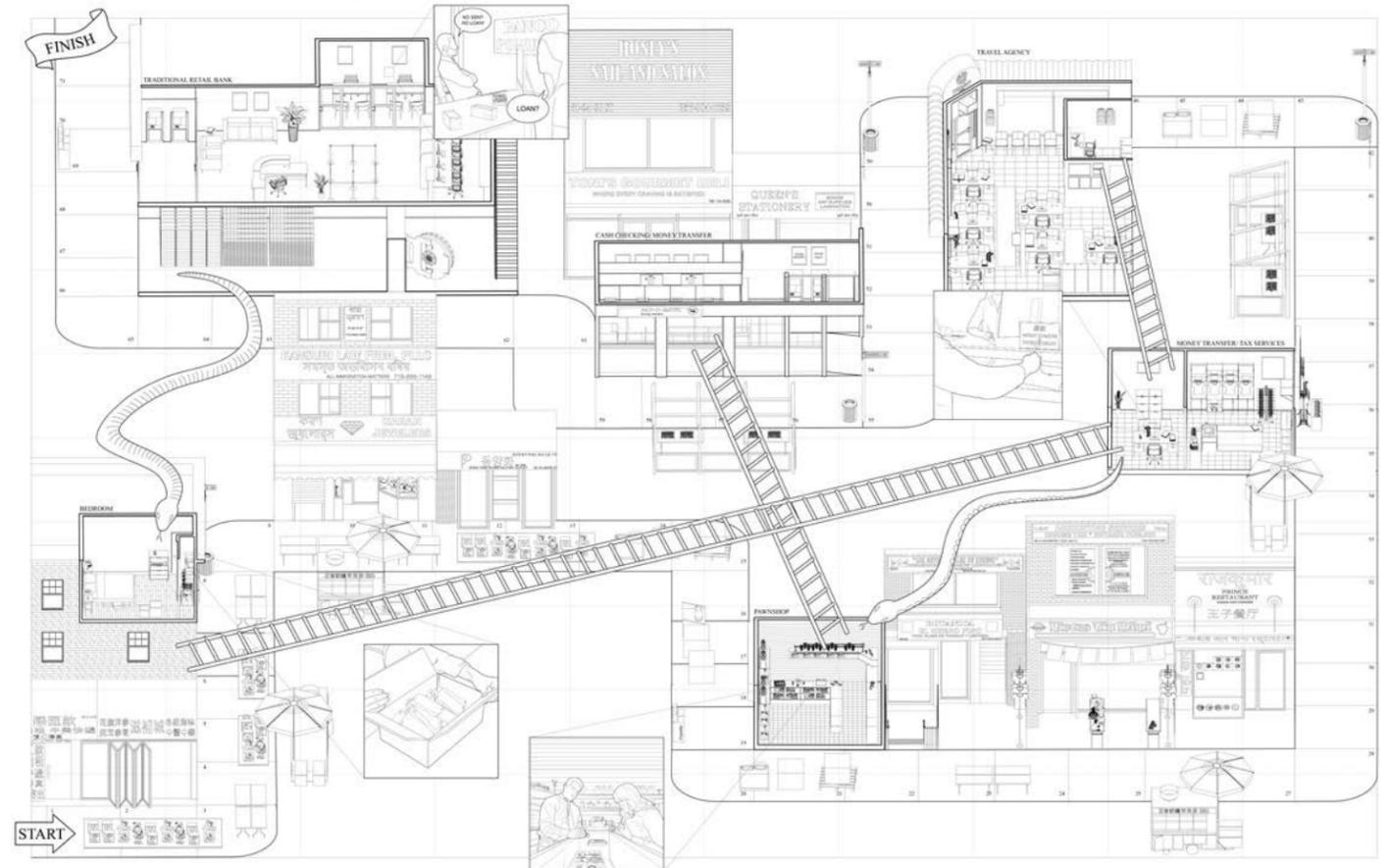


Site Selection

The project started with the site selection. During the initial research stage, we discovered an abandoned subway platform in the 74th street Jackson heights Roosevelt Ave subway station. This abandoned station was built in the 1920's but construction was stopped because of World War II and the Great Depression. However, a subway platform exists to this day.

While visiting the site, many informal economies could be observed at play in the form of street vendors, both inside the station and on the sidewalks. Another informal economy observed was that of the NY canners riding the subway and hauling massive bags of plastic bottles and cans with them.

## SNAKES AND LADDERS: QUEENS' IMMIGRANT EDITION

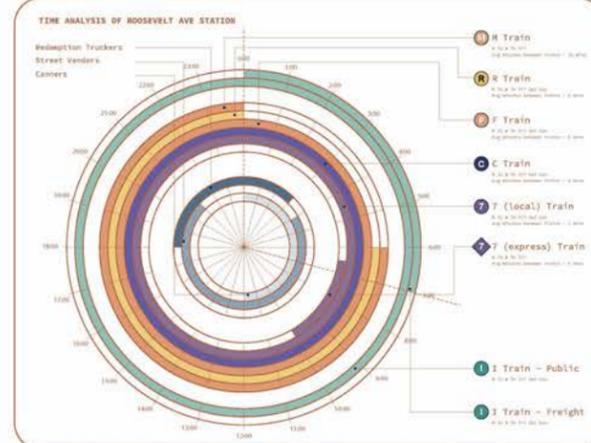
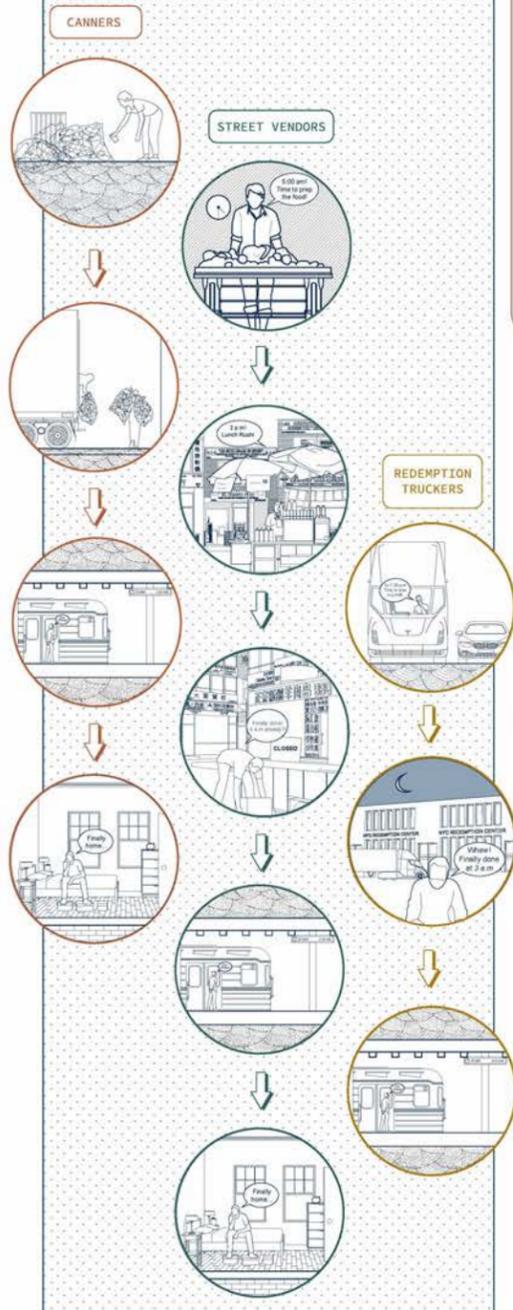


Snakes and Ladders Interpretation Drawing

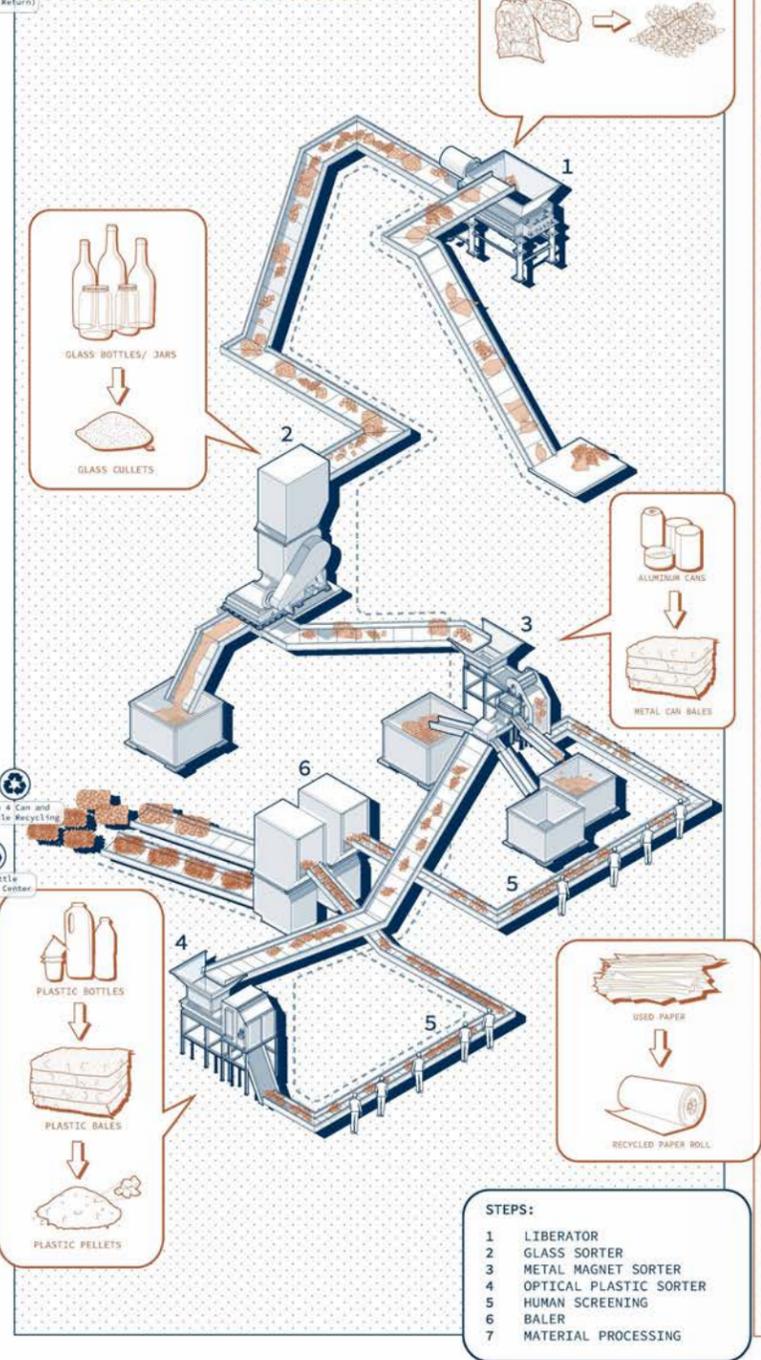
This drawing is a playful way to represent a gradient that shows the accessibility in terms of language and formality of services to immigrants in Queens. The ladders represent the services that are immediately available to the immigrants and the snakes represent the setbacks.

A closer look at these informal economies reveals that many of them are small independent businesses that are seeking to grow but face obstacles such as language barriers and lack of access to resources. As a response, the project seeks to formalize the informal by combining these informal programs with larger scale infrastructural networks such as recycling and transportation. And at the same time, informalize the formal by creating spaces where humans and infrastructure seamlessly coexist.

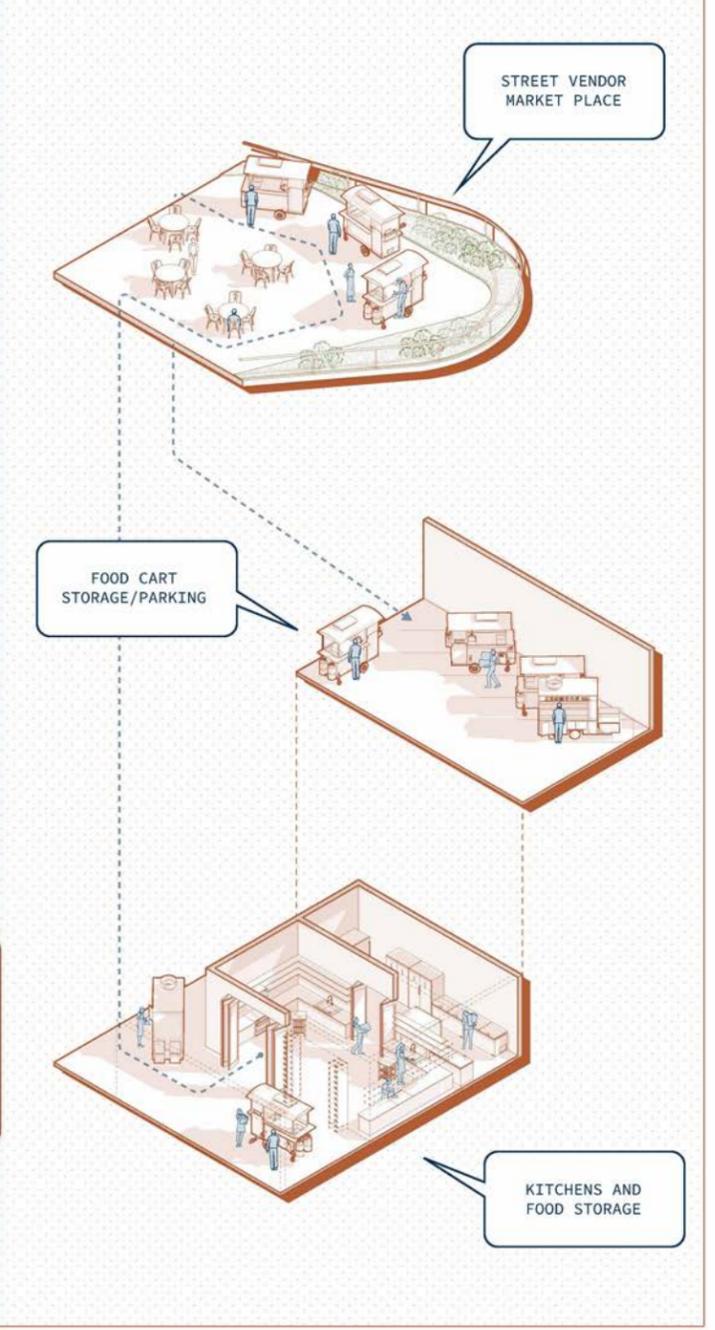
# A DAY IN THE LIFE OF INFORMAL ECONOMIES...



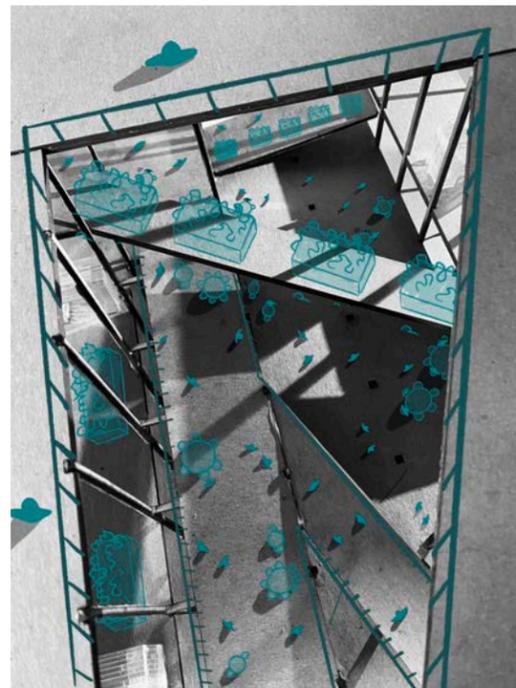
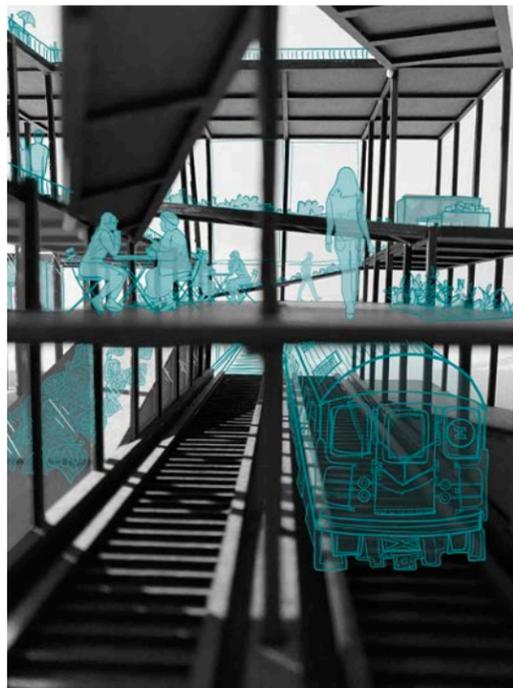
# RECYCLING SORTING PROCESS



# STREET FOOD VENDOR INFRASTRUCTURE



Initial Concept and Massing Exploration Models



The design strategy consists of long spanning ramps, supported by trusses, that connect different programs to each other, the different levels of the building and the surrounding context. All these ramps sectionally overlap providing a sense of transparency and visibility into all the different spaces of the building. This reinforces the idea of exposing what is usually hidden.

Final Concept and Massing Models



Bridge-truss/ Connection to 7 train elevated platform



Underground Recycling Center space



Sunken urban corridor/ Connection from Roosevelt Ave to Broadway



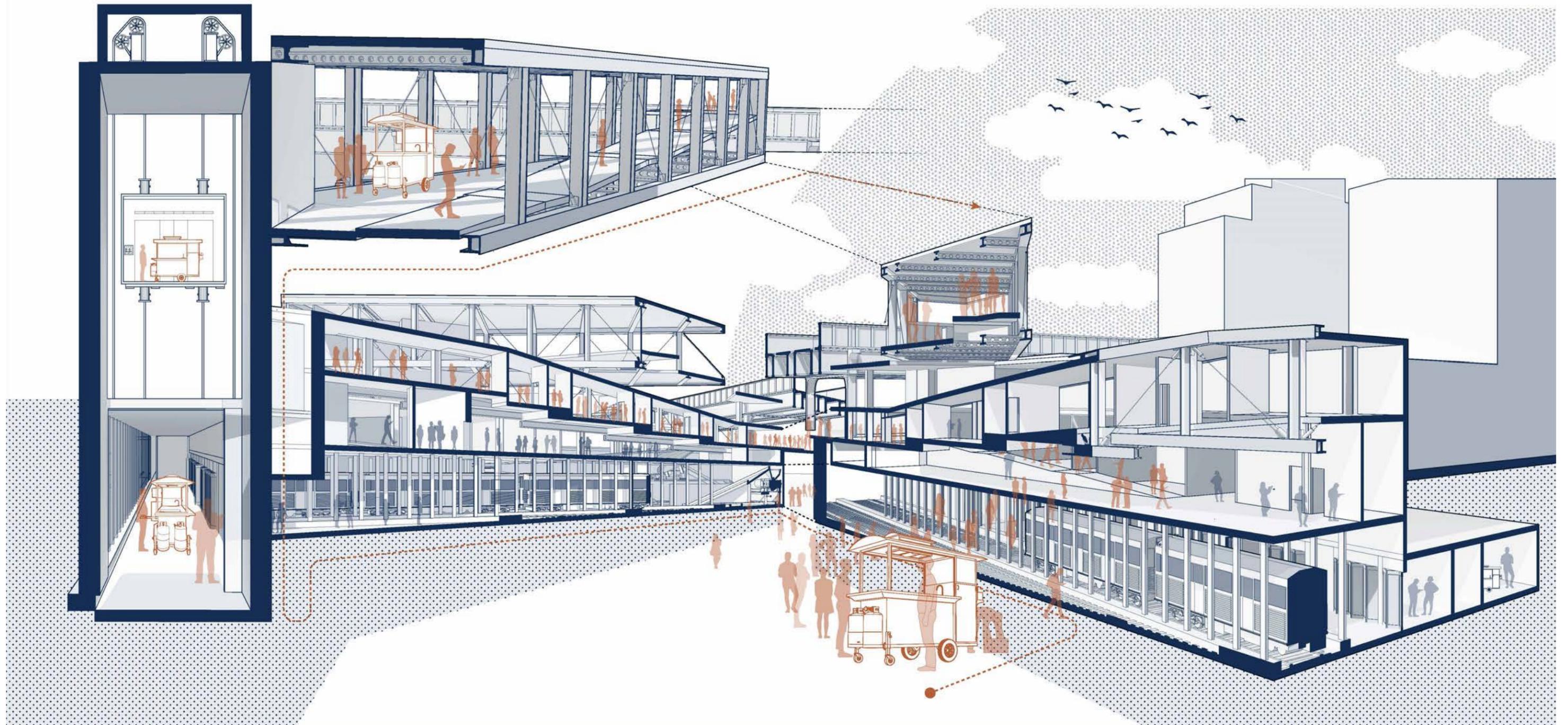
Ramps for Small Business Training Classrooms



View from sunken corridor to Small Business Training Center Space

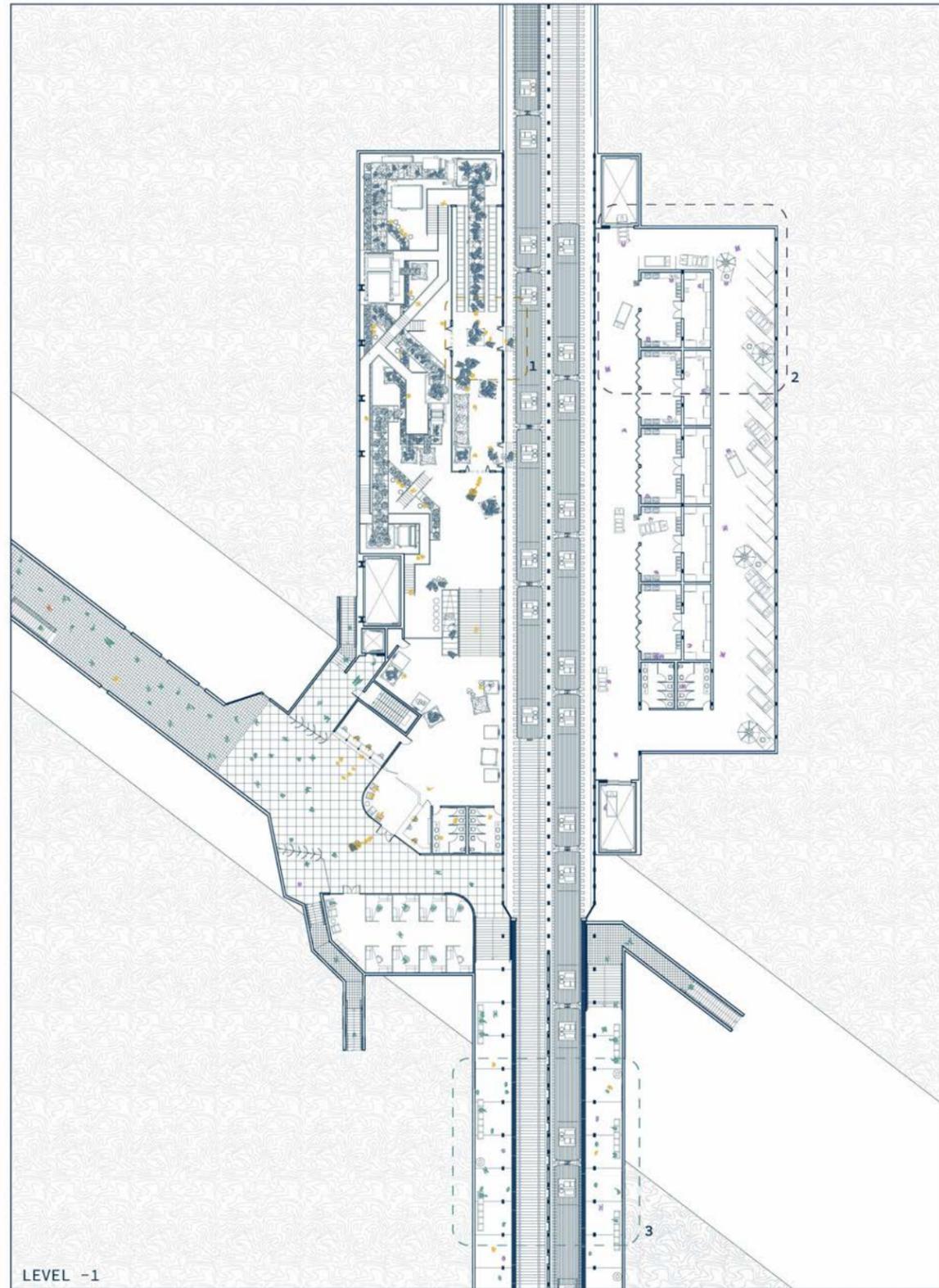


Open air Amphitheater and Street Vendor Market Space



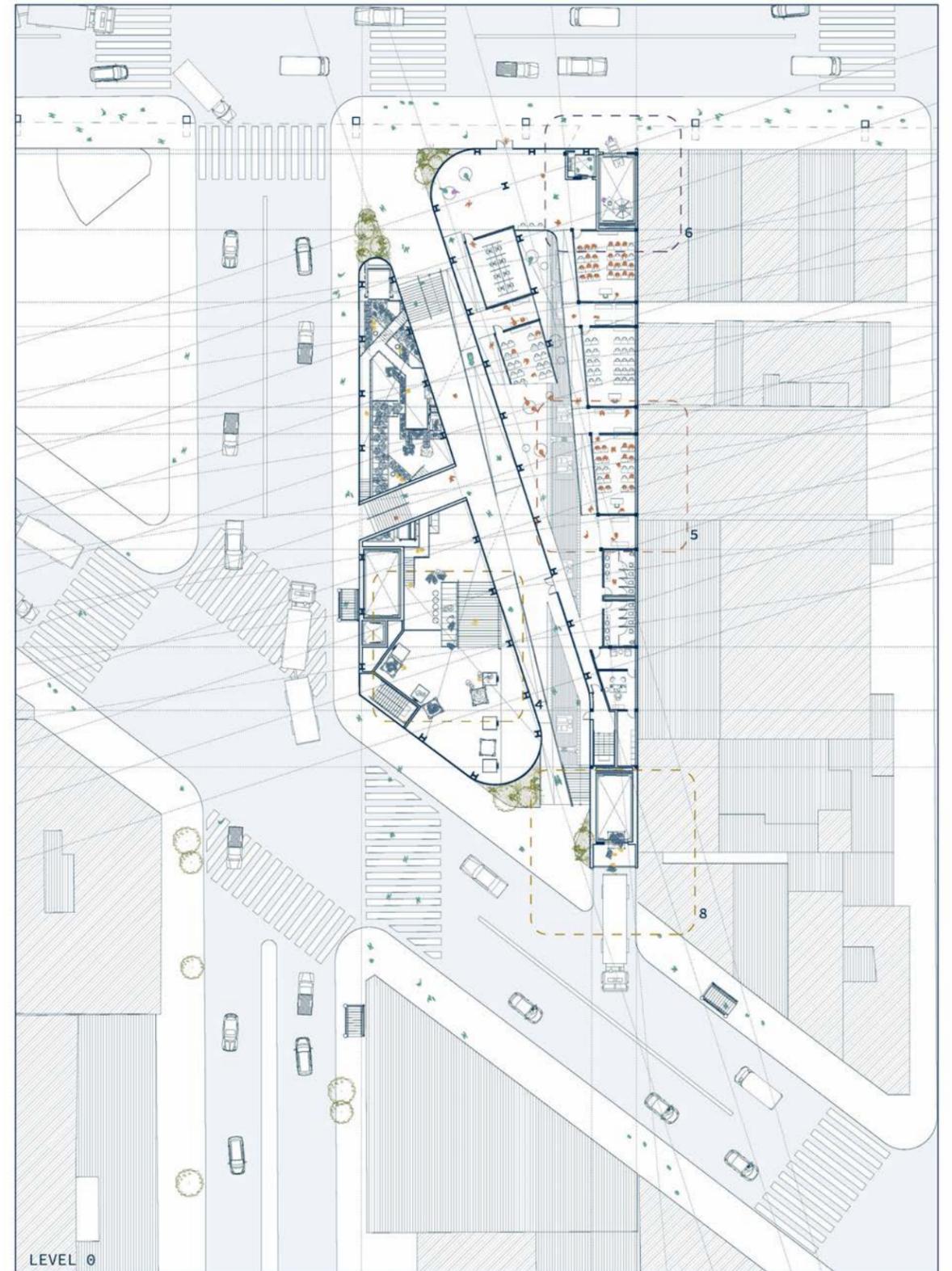
Unfolded Section Perspective

This section shows the how the project is about movement, transparency and connection. It is shown through the loop that is created through the circulation in the building, both for people and machines.



**Recycling Center, I Line Subway Platform, and Street Vendor Infrastructure**

In this plan, the connection from the I Line to the existing 74th St Roosevelt Ave/Jackson Heights can be observed. In addition, MTA offices have been relocated and access to the facilities for street vendors can be seen.



**Urban Corridor and Small Business Training Center**

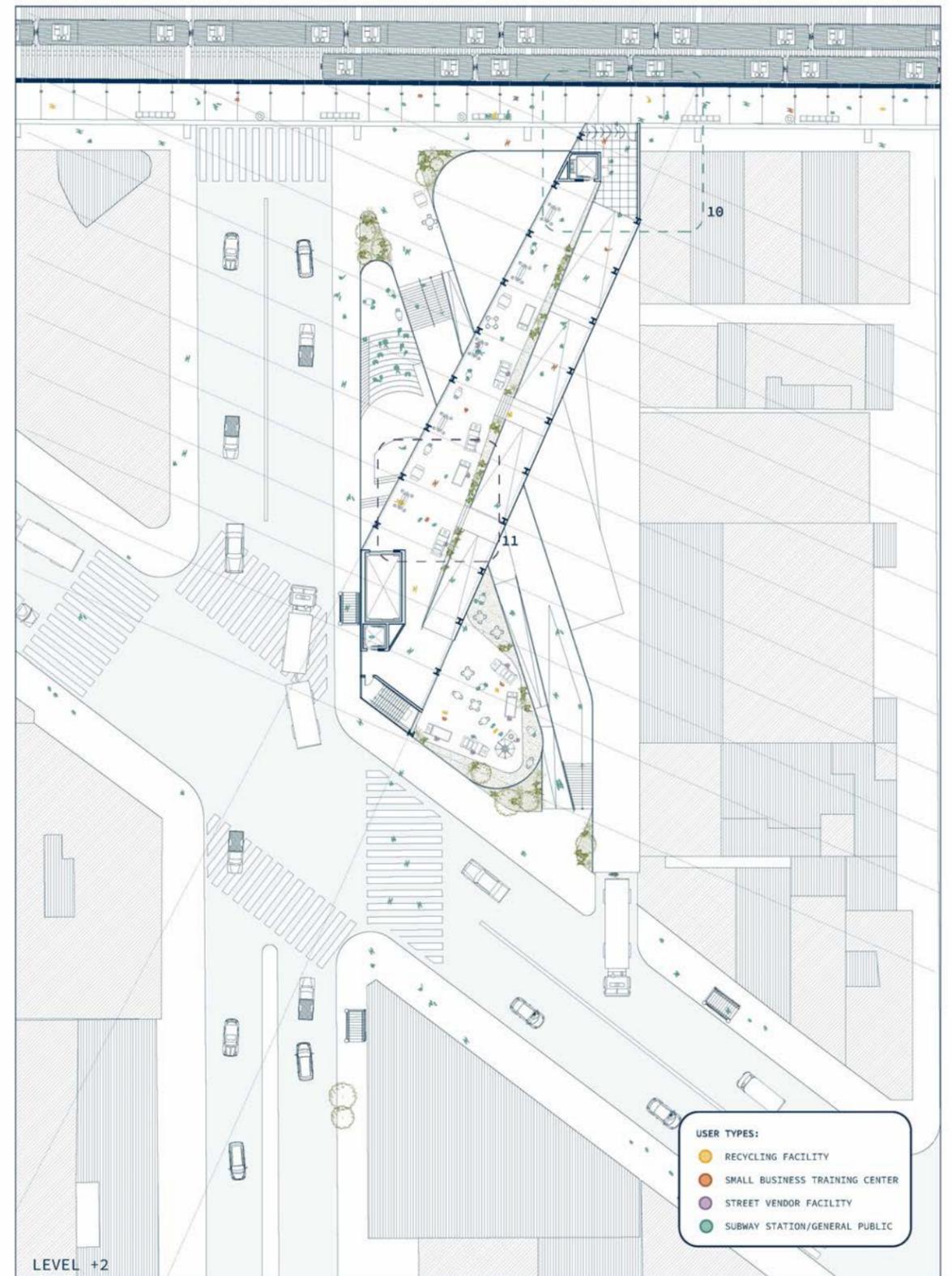
This plan shows the connection to the sidewalk through a sunken corridor which serves as a connection to the building's main entrance to the training center. It also shows a view to the underground recycling center and subway.



**Recycling Center, I Line Subway Platform, and Street Vendor Infrastructure**

The left side of the building, shows the outdoor amphitheater and street vendor market space. The right side shows the classrooms and coworking spaces from the Small Business Training Center.

The ramp designs consider different users that would occupy them. These were divided into 4 categories.



**Bridge-Truss / Open Air Street Vendor Market Space and Connection to 7 Train Platform**

First, the commuter that is walking on the sidewalk or going through our building to take the train. Second, the recycling workers that are working directly in the facility and the canners who come to deposit their recyclable in exchange for money or a train ticket. Third, the small business training students who are making use of coworking spaces and taking classes to improve their business expertise. Lastly, the food truck vendors, who work prep and store food underground and sell it in the open air market spaces in our building.



**Exterior Sunken Corridor Perspective.** View of outdoor sunken corridor that connects from Roosevelt Avenue to Broadway in 75th Street. This corridor also serves as an entrance to the Small Business Training Center and provides views to the Recycling Center.



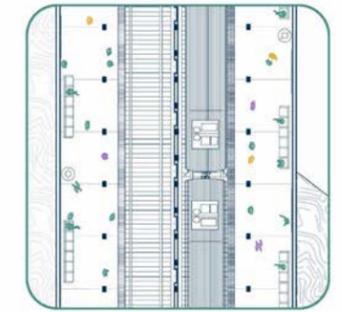
**Interior Recycling Facility Perspective.** View of recycling facility space with the machines and unloading/loading area.



**1 TRAIN UNLOADING AREA**



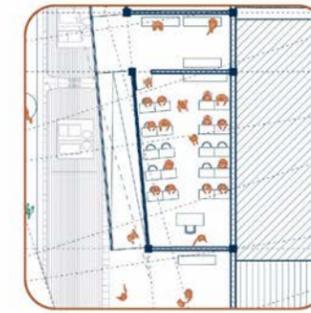
**2 KITCHENS, FOOD STORAGE AND STREET CART PARKING**



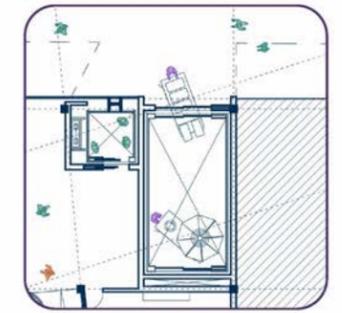
**3 I LINE PLATFORM**



**4 CANNER WEIGH AND DEPOSIT STATION**



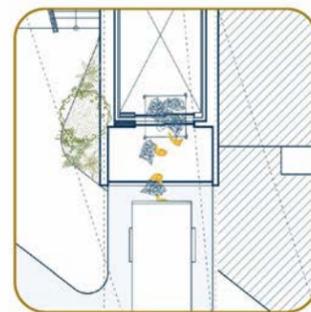
**5 CLASSROOMS**



**6 STREET VENDOR CART ACCESS**



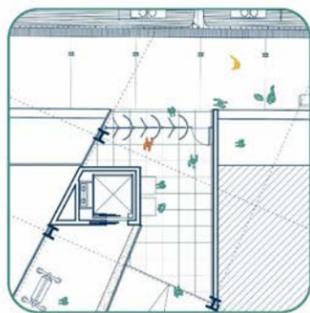
**7 COWORKING SPACES**



**8 TRUCK UNLOADING AREA**



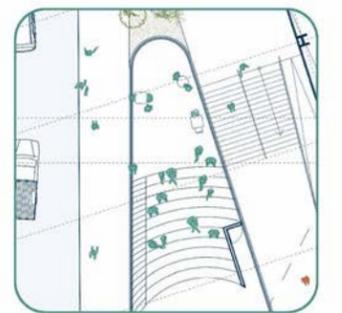
**9 STREET VENDOR MARKET PLACE**



**10 CONNECTION TO 7 TRAIN**



**11 STREET VENDOR MARKET PLACE**



**12 OPEN AIR COMMUNITY AMPHITHEATER**



History and Global Impact

In regard to the the global impacts of the project, it considers the global issues in dealing with recyclables and waste. According to the research, most countries export their recyclables to impoverished countries through barges that consume large quantities of fuel. The proposal deals with this issue by introducing infrastructure that would reduce the amount of waste exported. Calculations were performed and indicated that by operating for one day, the I Line would prevent 5,000 tons of carbon dioxide from being released into the air that would normally be released by barge.



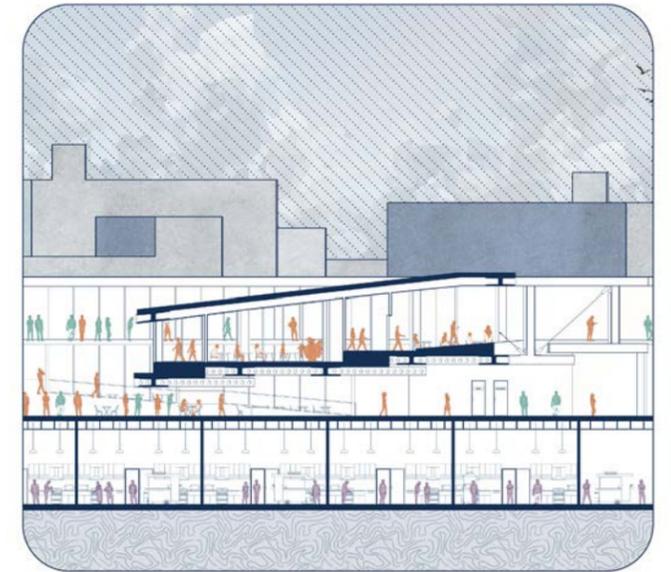
Long section with view of underground recycling center, sunken level corridor, outdoor amphitheater and truss bridge.



Cross section of building with view of recycling center, small training business school, underground street vendor infrastructure and truss bridge connecting to 7 train.



Section of truss bridge connecting to the 7 train elevated platform, elevator for street vendor carts, and small business training school classrooms.



Long section with view of small business training school and underground street vendor kitchens.



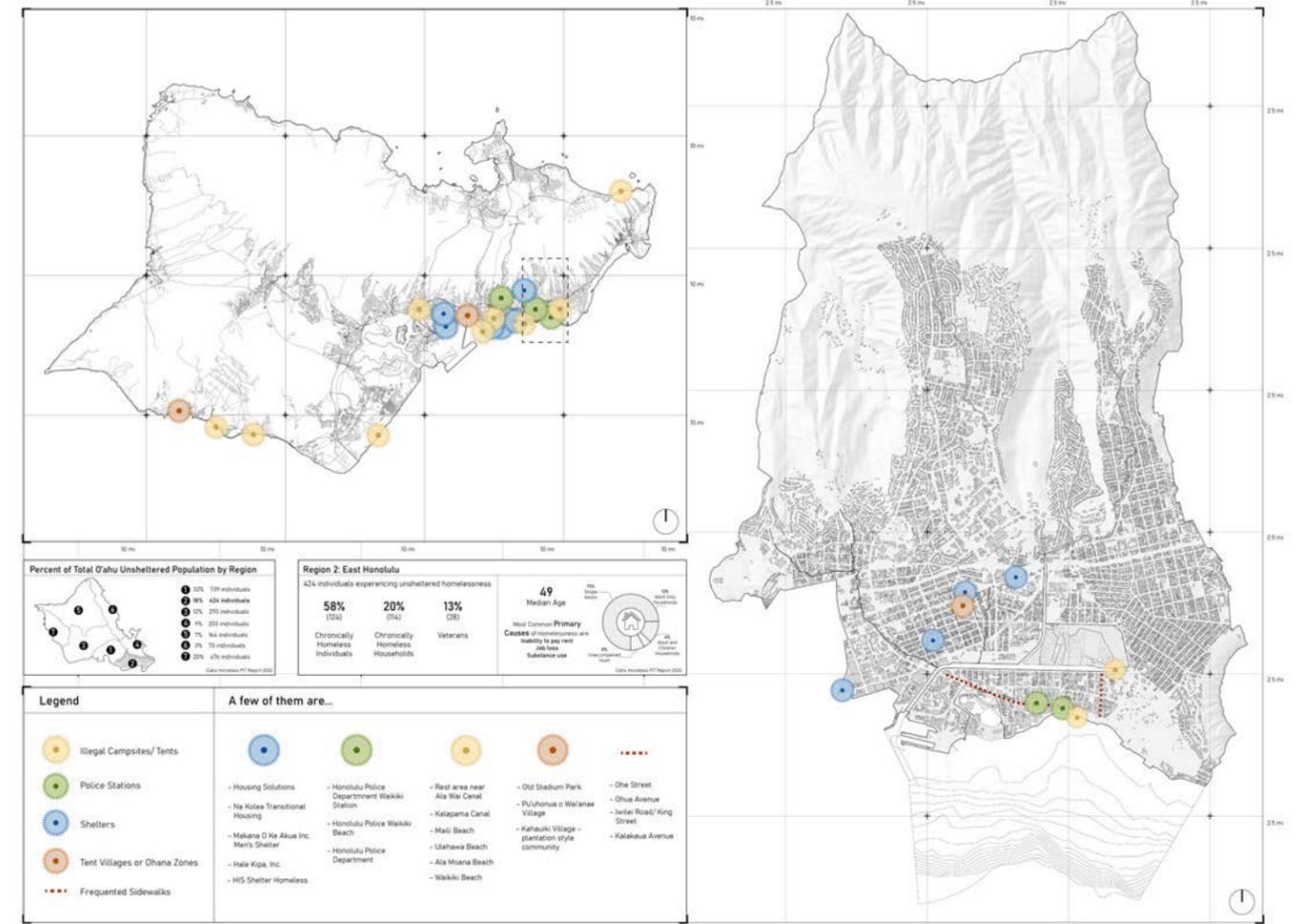
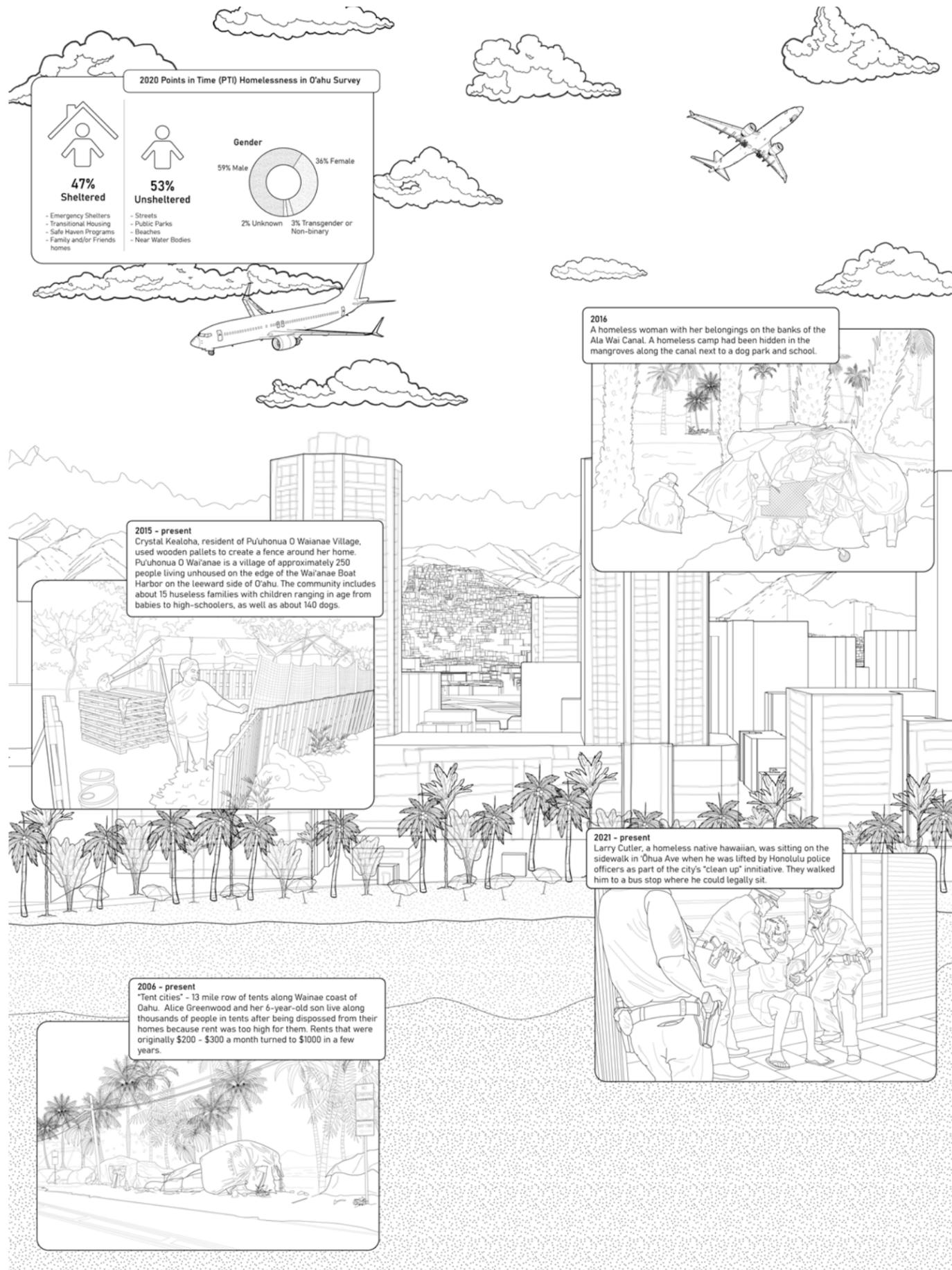




## PU'UHONUA HALE COMMUNITY

Type:	Studio - Individual
Semester:	Third Year, Spring 2022
Location:	Fort Derussy, Honolulu, HI
Professor:	Mario Gooden

The Pu'uhonua Hale Community is a place of refuge that aims to re-establish connections to ea by creating an ecosystem where its inhabitants take care of aina, each other and the land takes care of them in return. The project aims to provide hales and education to everyone in need and involve communities in a cooperative environment that fosters acknowledgment of the original ahupua'a and Hawai'ian culture. The project works as an ecosystem in which its inhabitants live and work on site to take care of fishponds, taro and rice fields, and educate the community with practical skills and heal each other.



**Mapping of Houseless Encampments, Shelters and Related Services**

The map shows the incidence of the houseless community at the island level of Oahu and then zooms into the Waikiki area.



**Ahupua'a**

In Ancient Hawaii, temporary hales were usually located near beaches to accommodate a leader and his group when going on diplomatic journeys across the moku. Or in the mountains to house farmers during agricultural seasons.



**Military Fort Derussy**

During the military occupation, Fort Derussy served as a base for temporary encampments while the permanent structures were built. These encampments were also located along beaches, under palm trees and near the water.



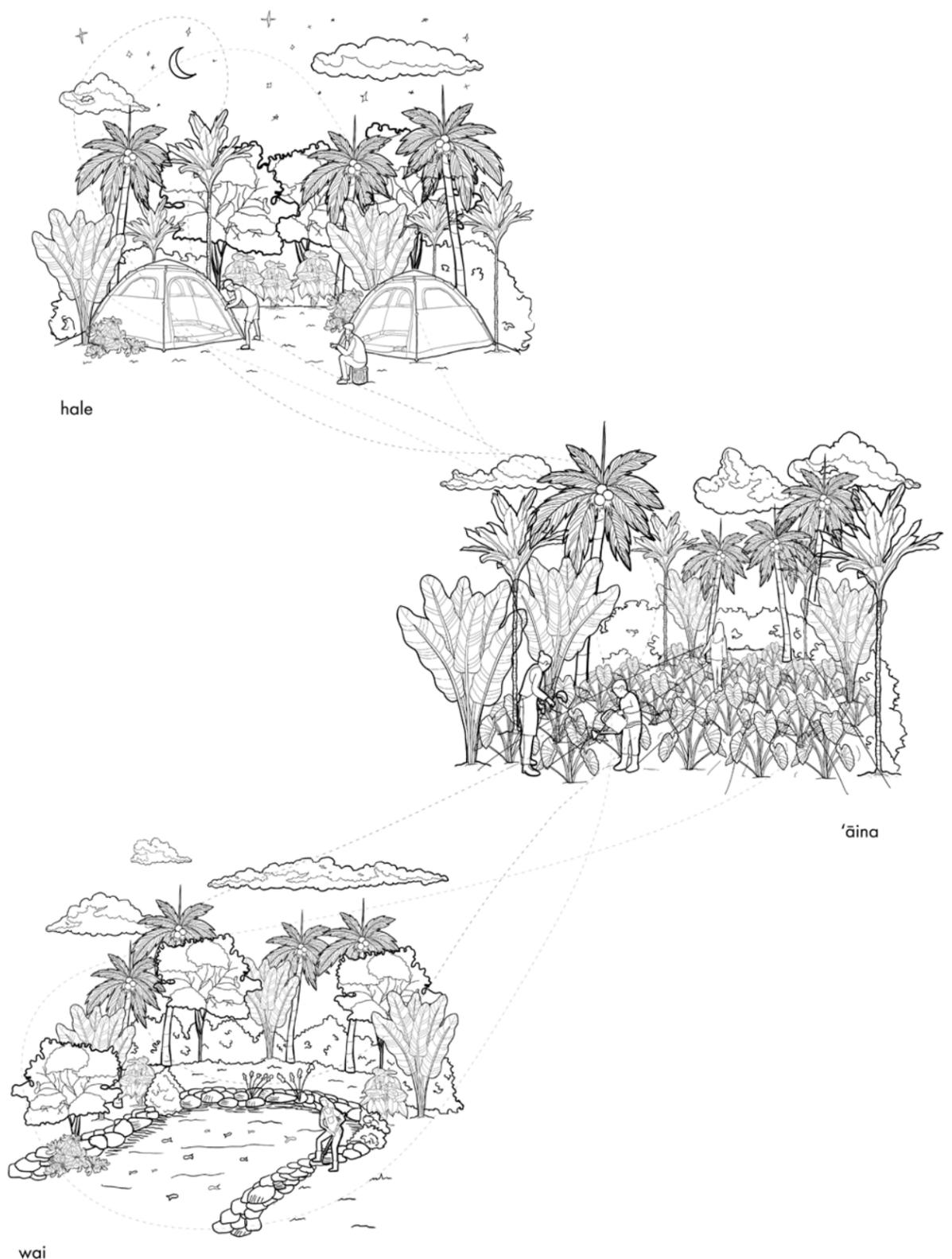
**Present Day**

Today, a similar typology of informal settlements can be observed through the houseless community in Oahu.



**Mapping of Houseless Encampments, Shelters and Related Services**

This drawing is an overlapping of the three previous maps. It shows how much the landscape has change in the area of Fort Derussy in Waikiki.



Concept Diagram

The project is based on the notions of ea, ʻāina, wai and hale to create an interdependent ecosystem



Proposed Site Intervention

The intervention design was conceptualized with the intent to use directionality as a form of acknowledgment by directing the visitors view towards natural landmarks such as Lēʻahi (Diamond Head), Pūowaina (Punchbowl Crater) and the ahupuaʻa (mountains).

At the urban scale, the intervention proposes the restoration of ecologies by excavating original fishponds and creating new water ways that connect to the watershed, in order to mitigate flooding and purify polluted waters, caused by an impervious urban fabric. The proposal considers the return of taro and rice fields to promote food sovereignty; and brings back dune systems on the beach as habitat to different species. Additionally, the site supports different types of hale where people can freely decide whether to live indoors in a formal structure or outside under the stars.



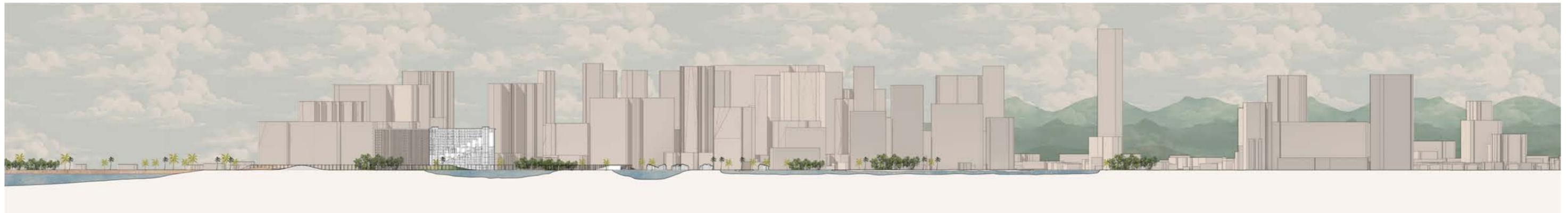
Section Cut through Wetland Canal



Section Cut through Fishpond



Cross Section through Urban Intervention



Long Section Cut through Wetland Canal



Proposed Site Intervention

View of the proposed design to repurpose the Hale Koa Military Hotel into hales for anyone in need.

At the architecture scale, the project proposes a post-military future where the military Hale Koa Hotel is occupied and repurposed into a hub for homes, education, and health services. As a metaphor or symbol or subversion, the Maile Tower is sliced to create a public stairway that functions as circulation and access to residences and community programs; but also an experience through nature.



Proposed Site Intervention

View of the Ahupua'a from the green terrace in building.

The building intervention envisions an entirely open-air structure where rich vegetation helps purify the air. Sectionally, the earth comes into the building through a two-story-high slope that connects to the green stairway that leads to a view of the ahupua'a.



**Ground Level**

This plan shows the community kitchen and food market.



**Fourth Level**

This plan shows the slope connecting to the first terrace, laundry space, and hale units.



**Seventh Level**

This plan shows trade school spaces, common lounge space and hale units.



**Tenth Level**

This plan shows trade school library, hale units and the highest point of the green terraces.

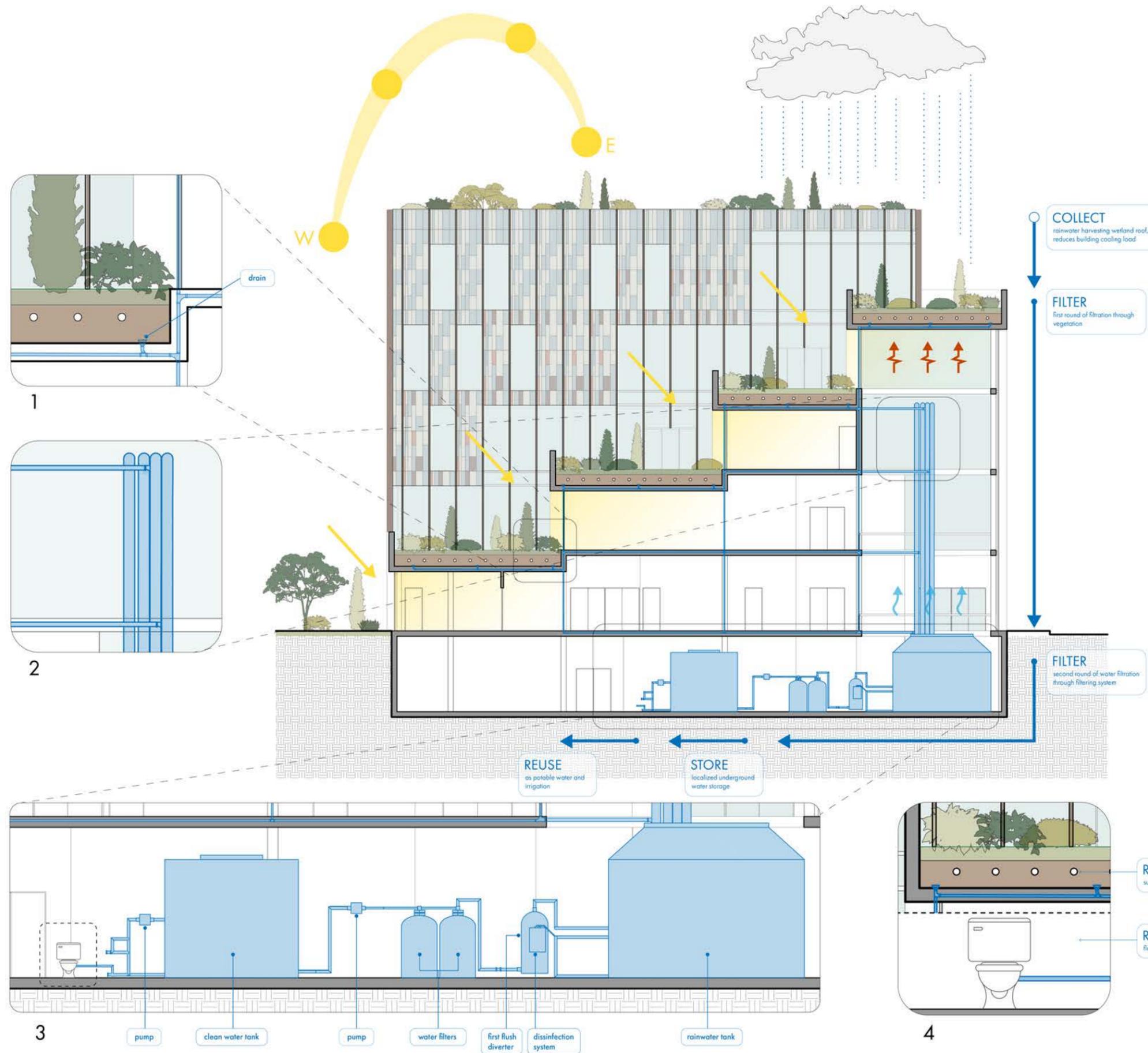




## MELROSE COMMUNITY CENTER

Type: Tech Sequence - Group  
Partners: Andrés Álvarez,  
Anays González,  
Gizem Karagoz  
Semester: Second Year, Fall 2020  
Location: The Bronx, New York

This project addresses my team's belief that the true potential of a building is connected to its multilateral use of resources. Our project focused on using water as a resource that shaped the formal structure of the building while operating as a social condenser. This gave us an opportunity to integrate the physical and social component of the project through its structure, program and materiality. The project is a community center with sports related programs, education and research programs, and a blackbox theater. The building's facade is a terracotta cladding unitized system and the colors are tied to the concept of water shaping the earth. Additionally, the water system in the building is purposefully exposed as an architectural feature.



**COLLECT**  
rainwater harvesting wetland roof,  
reduces building cooling load

**FILTER**  
first round of filtration through  
vegetation

**RAINWATER MANAGEMENT**  
Rainwater management to offset potable water  
demand and minimize storm water runoff.

**NATURAL DAYLIGHT**  
Daylight penetration is maximized through the terraces  
and facades have vertical louvers used to filter light.

**VEGETATION**  
Plants used are native and adaptive to the region to  
minimize maintenance and irrigation.

**NATURAL VENTILATION**  
Operable windows in smaller spaces such as class-  
rooms permit natural airflow.

**FILTER**  
second round of water filtration  
through filtering system

**REUSE**  
as potable water and  
irrigation

**STORE**  
localized underground  
water storage

**REUSE**  
supply to drip irrigation

**REUSE**  
flushing toilets

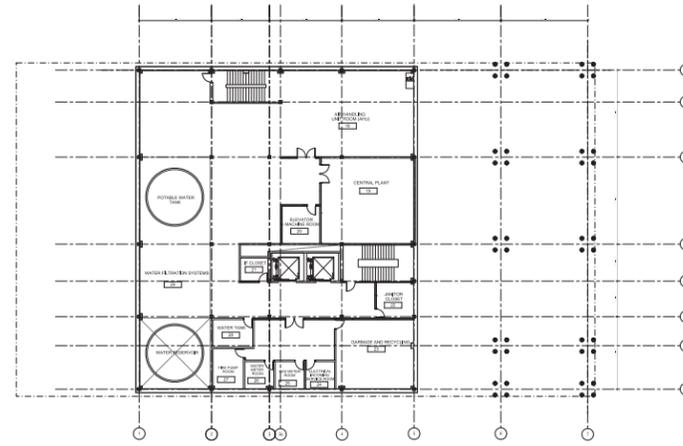
3  
pump clean water tank pump water filters first flush diverter disinfection system rainwater tank

4

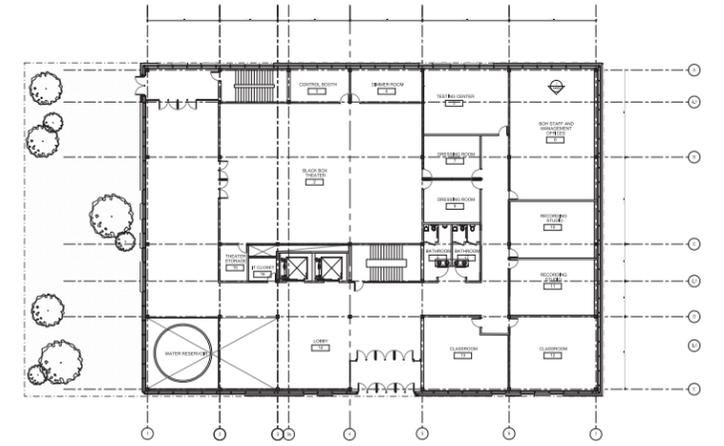


**View of lobby area.** This is one of the first spaces you step into when entering the building. Here you can see the water system exposed as both an architectural and mechanical element of the building.

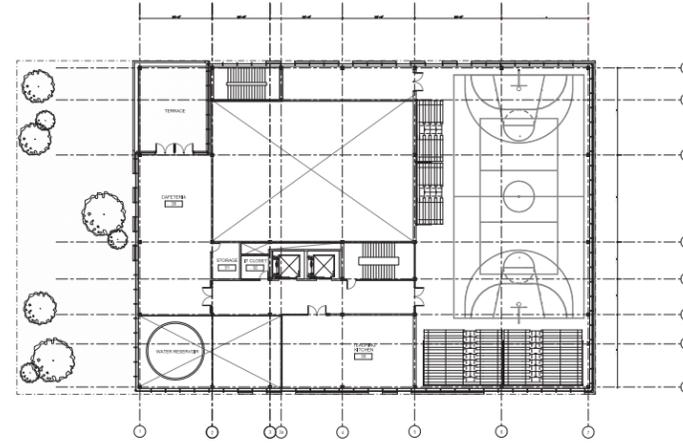
The building's main sustainability strategy is water reuse. The building has a water catchment system where rainwater gets collected through the terraces and then travels down through plumbing to the water treatment plant located in the basement of the building.



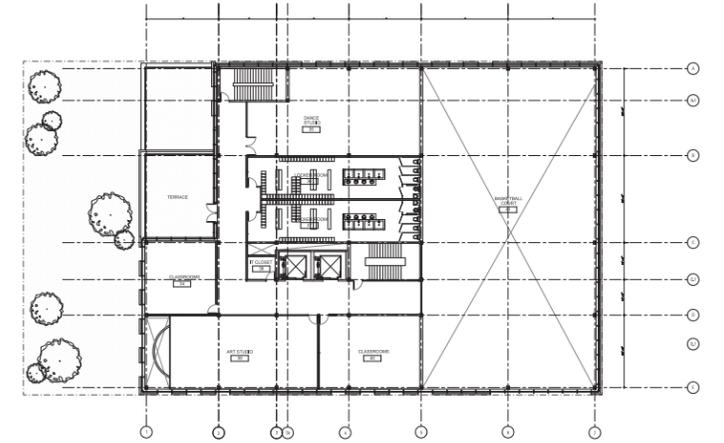
Basement Level



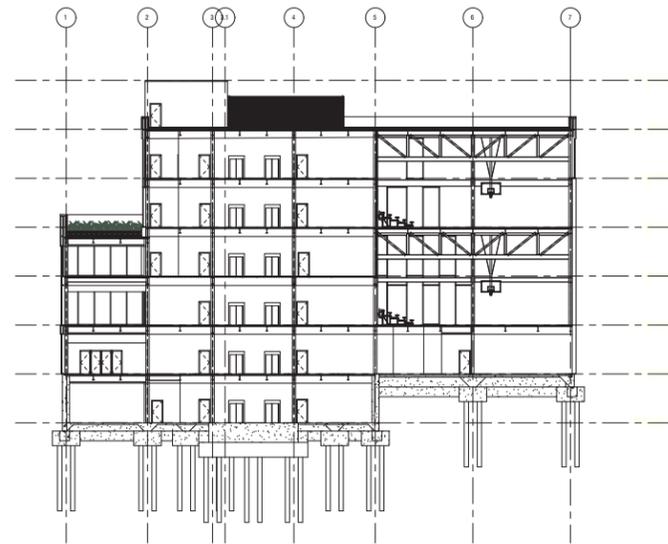
Ground Level



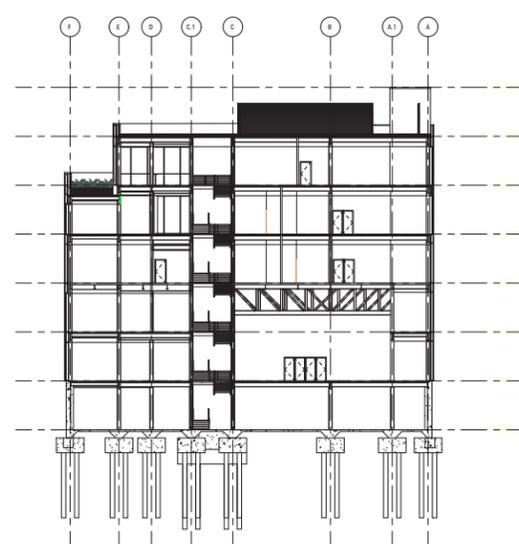
Second Level



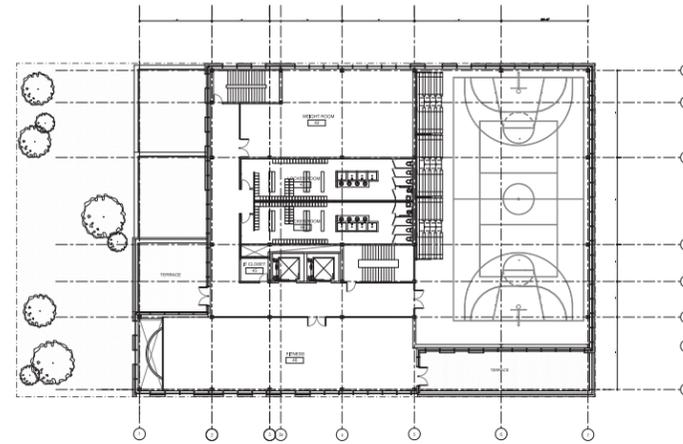
Third Level



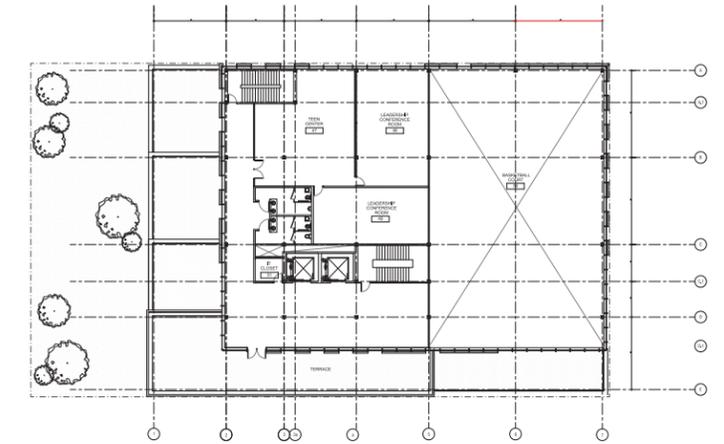
East-West Section



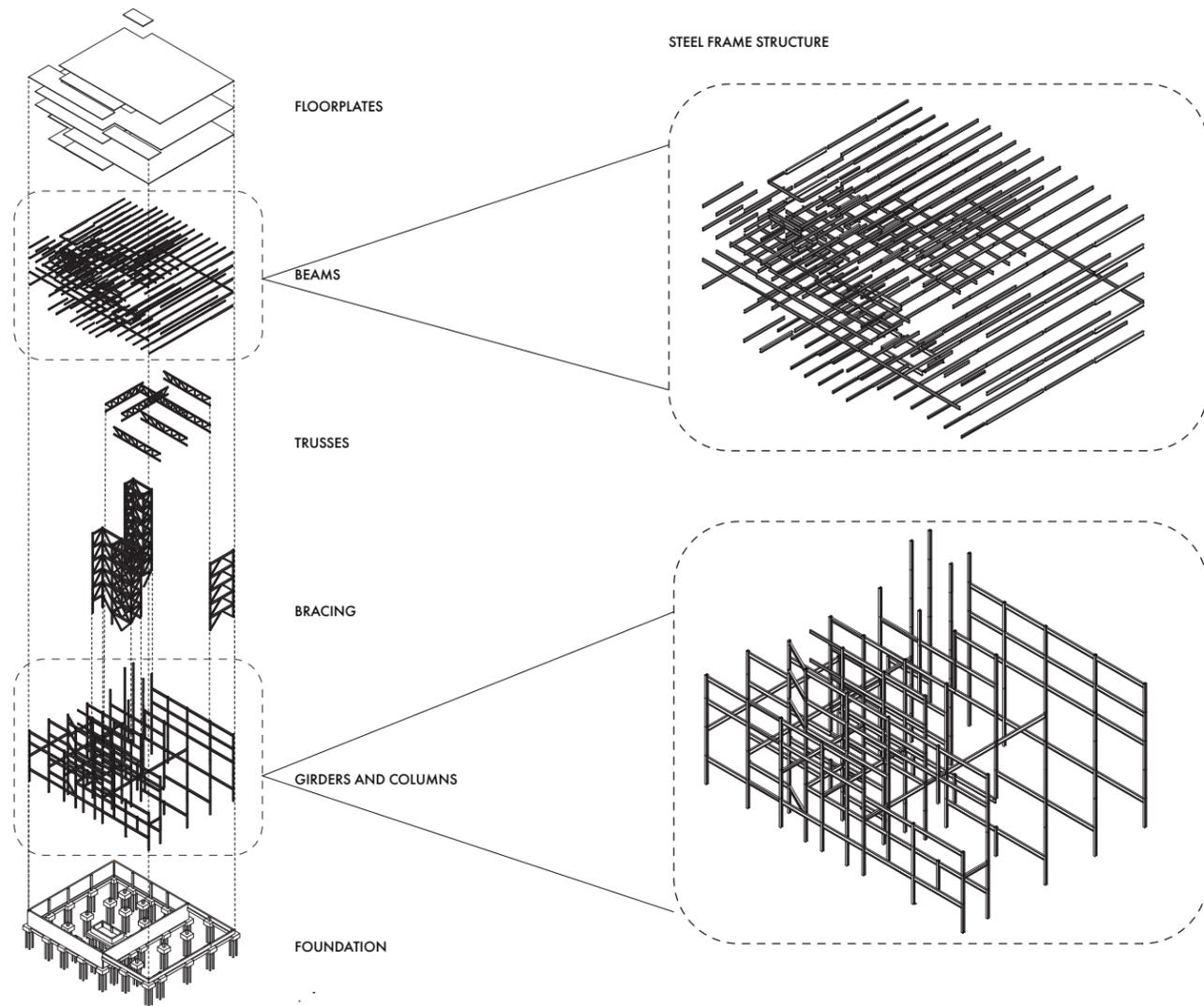
North-South Section



Fourth Level

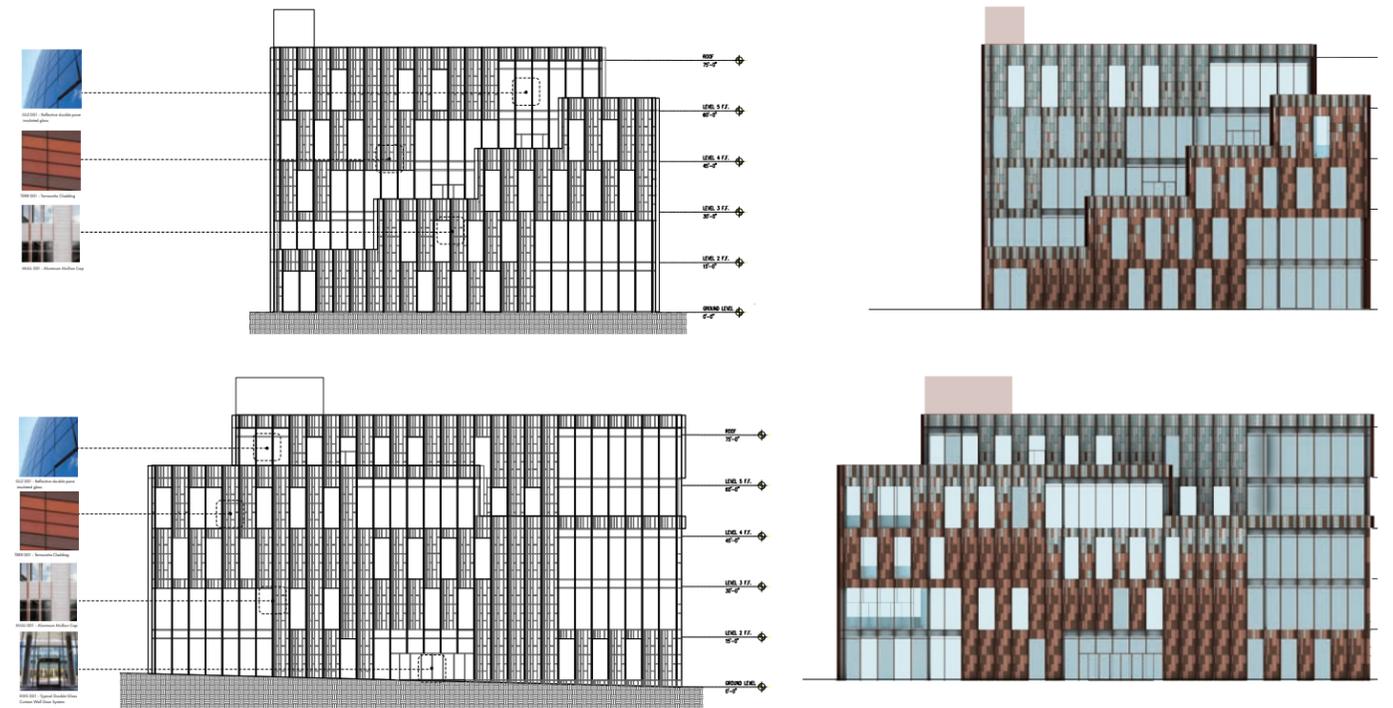
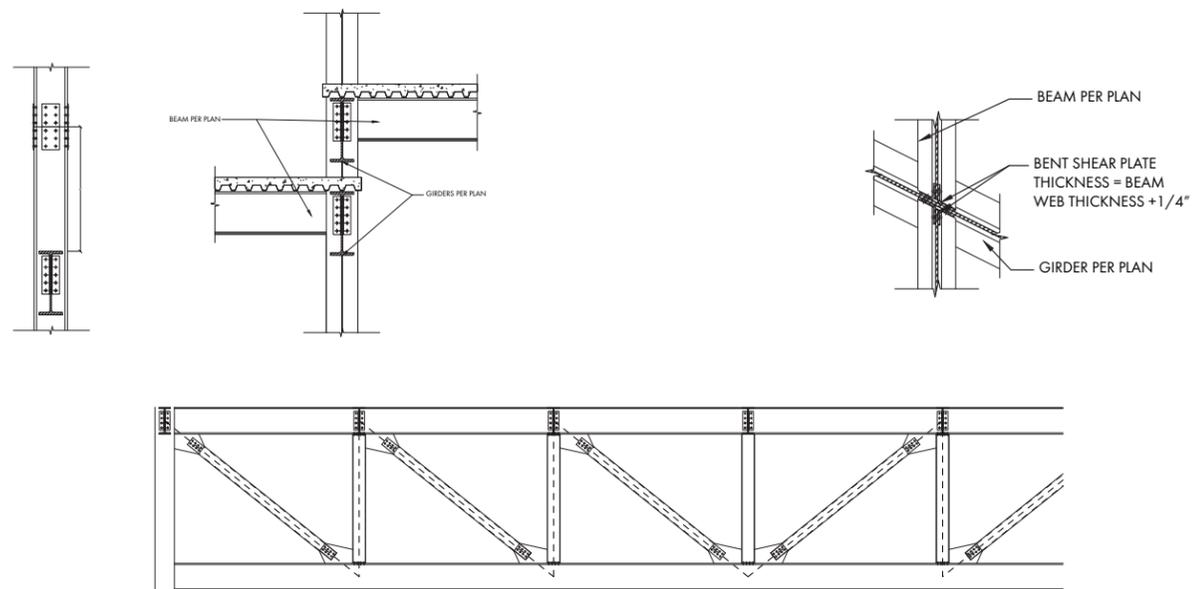


Fifth Level



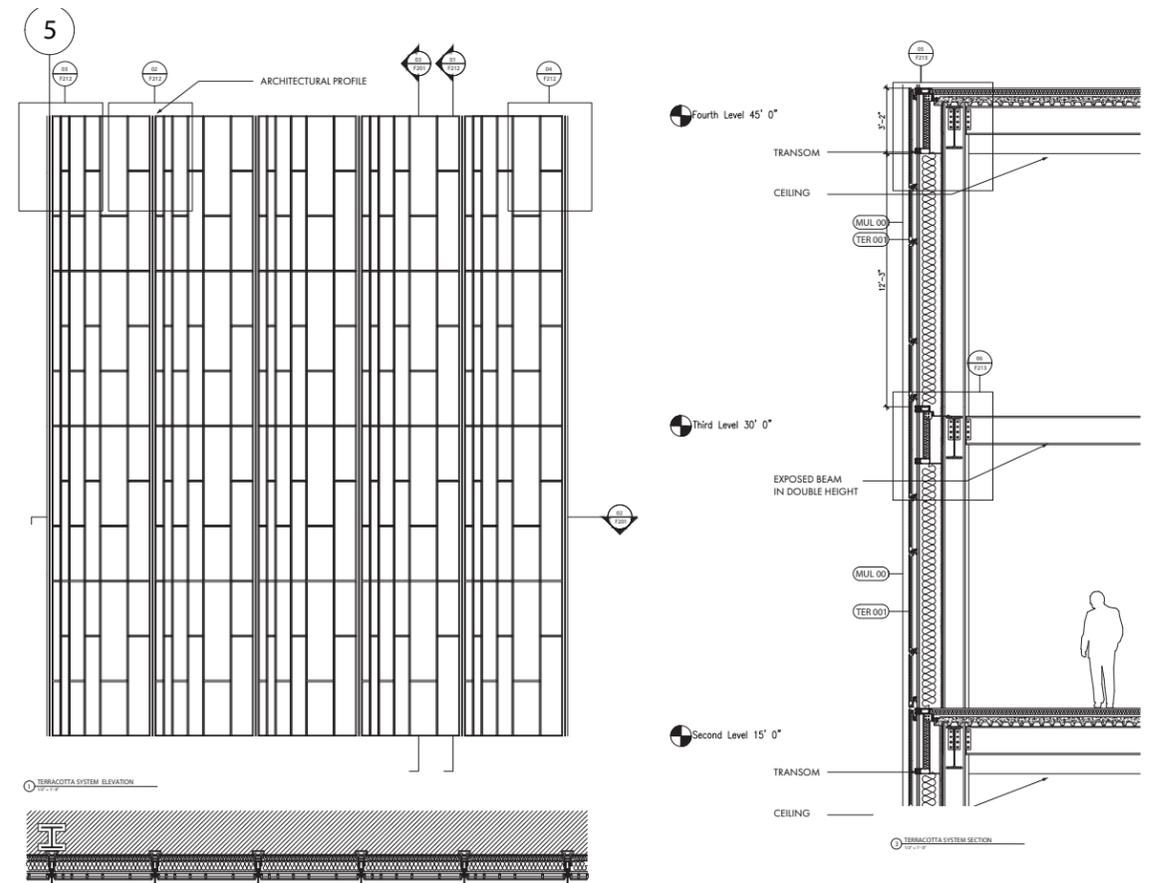
**Structural System**

The building is mainly composed of a steel frame structure.



**Mapped Elevations**

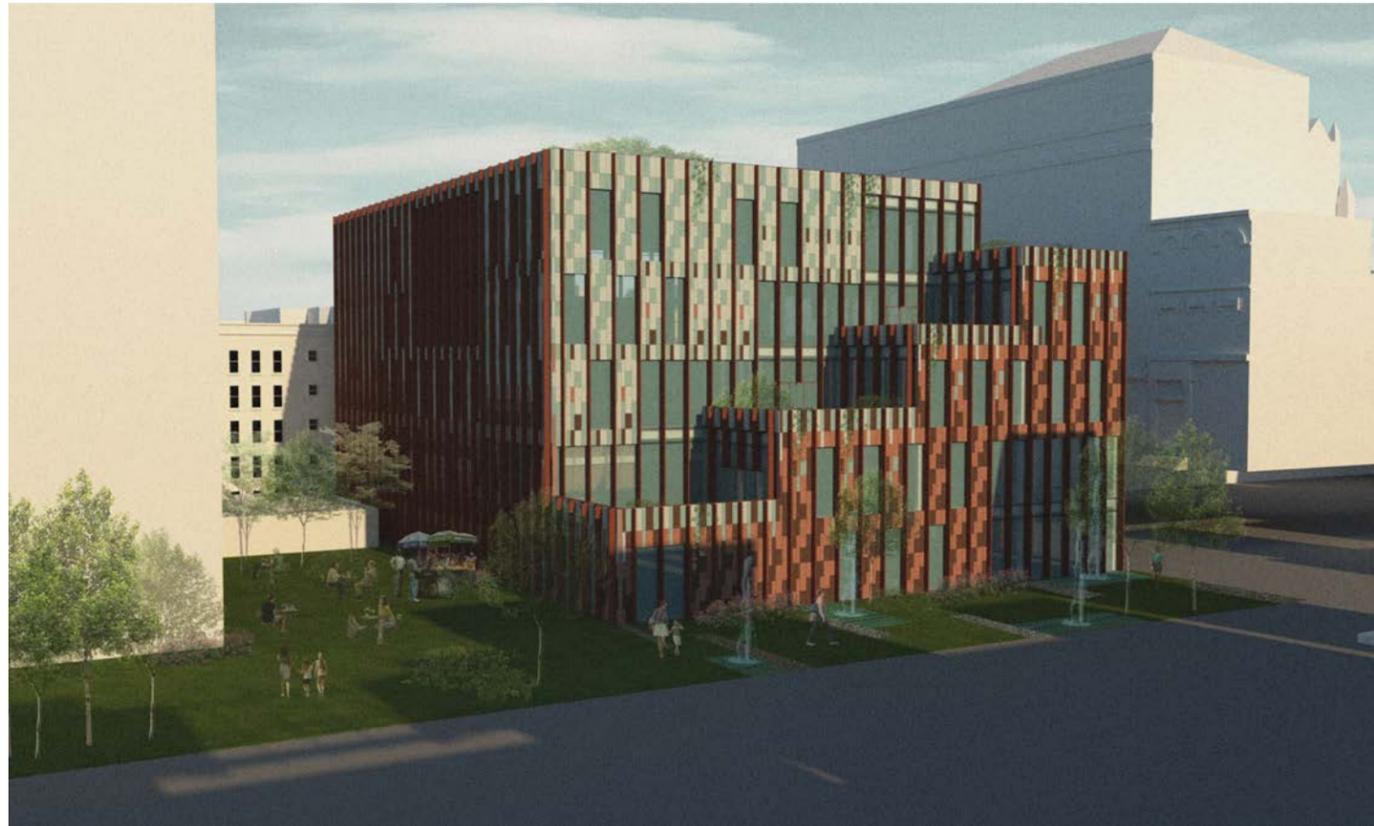
The facade system consists of a unitized curtain wall system with pre-fabricated panels made up of terracotta tiles of various colors.



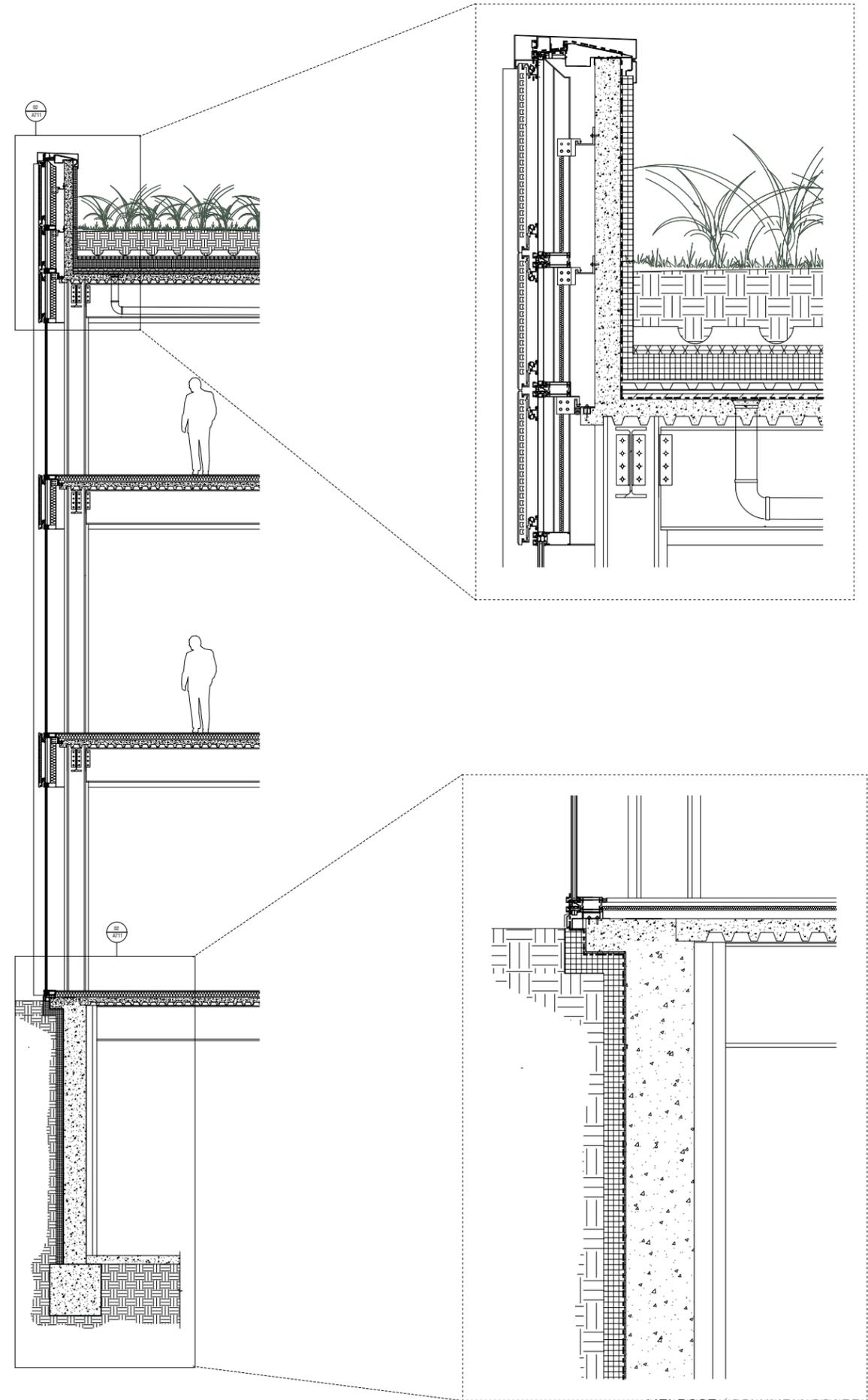
**Facade detail**

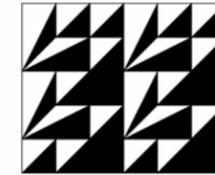


View of terrace. Terrace located near cafeteria on the second level of the building.



View of building. Building from Northwest angle. View of terraces and facade. Green spaces on the street level form an urban corridor to connect 151st Street to 152nd Street.

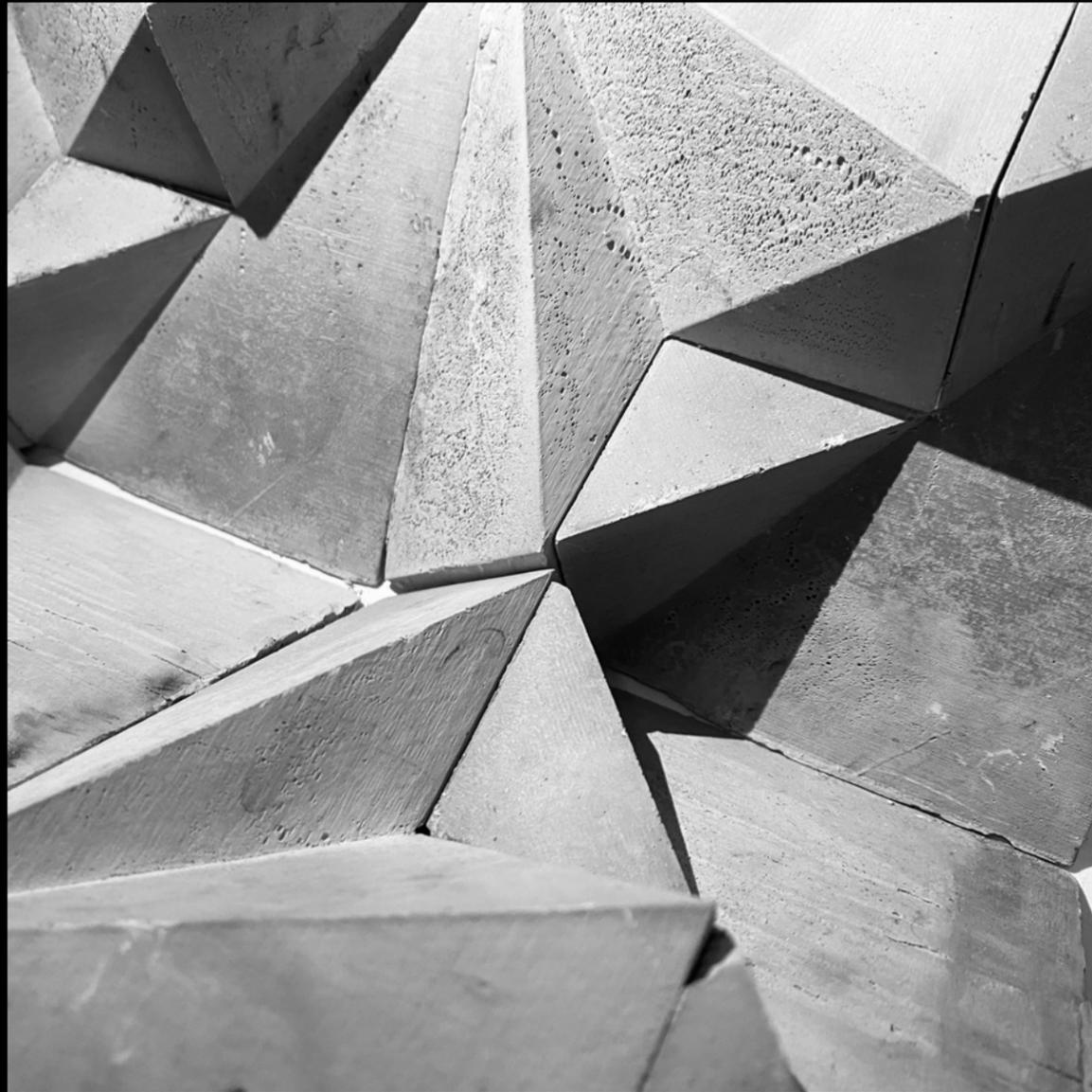
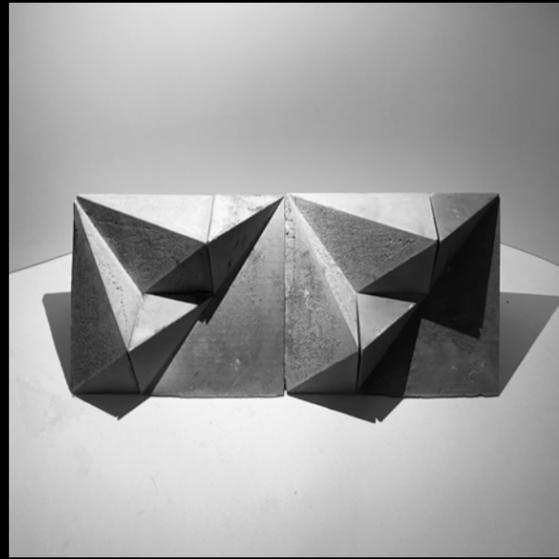
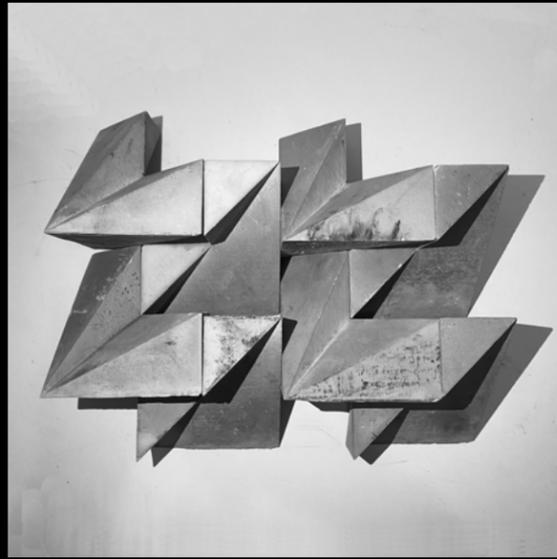




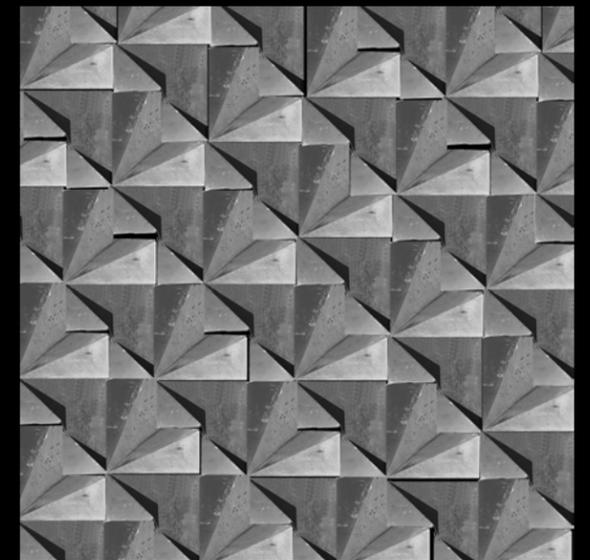
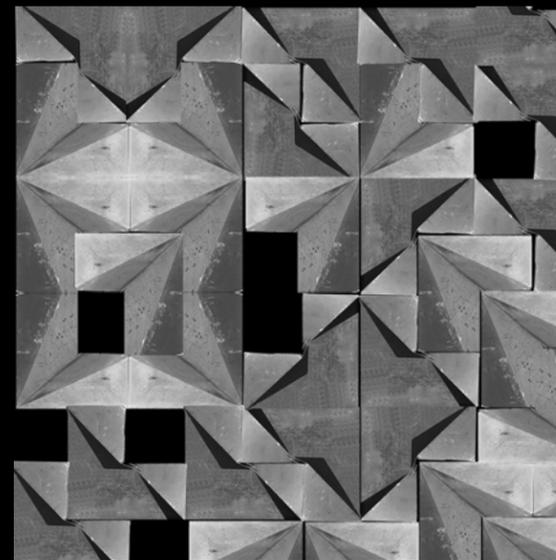
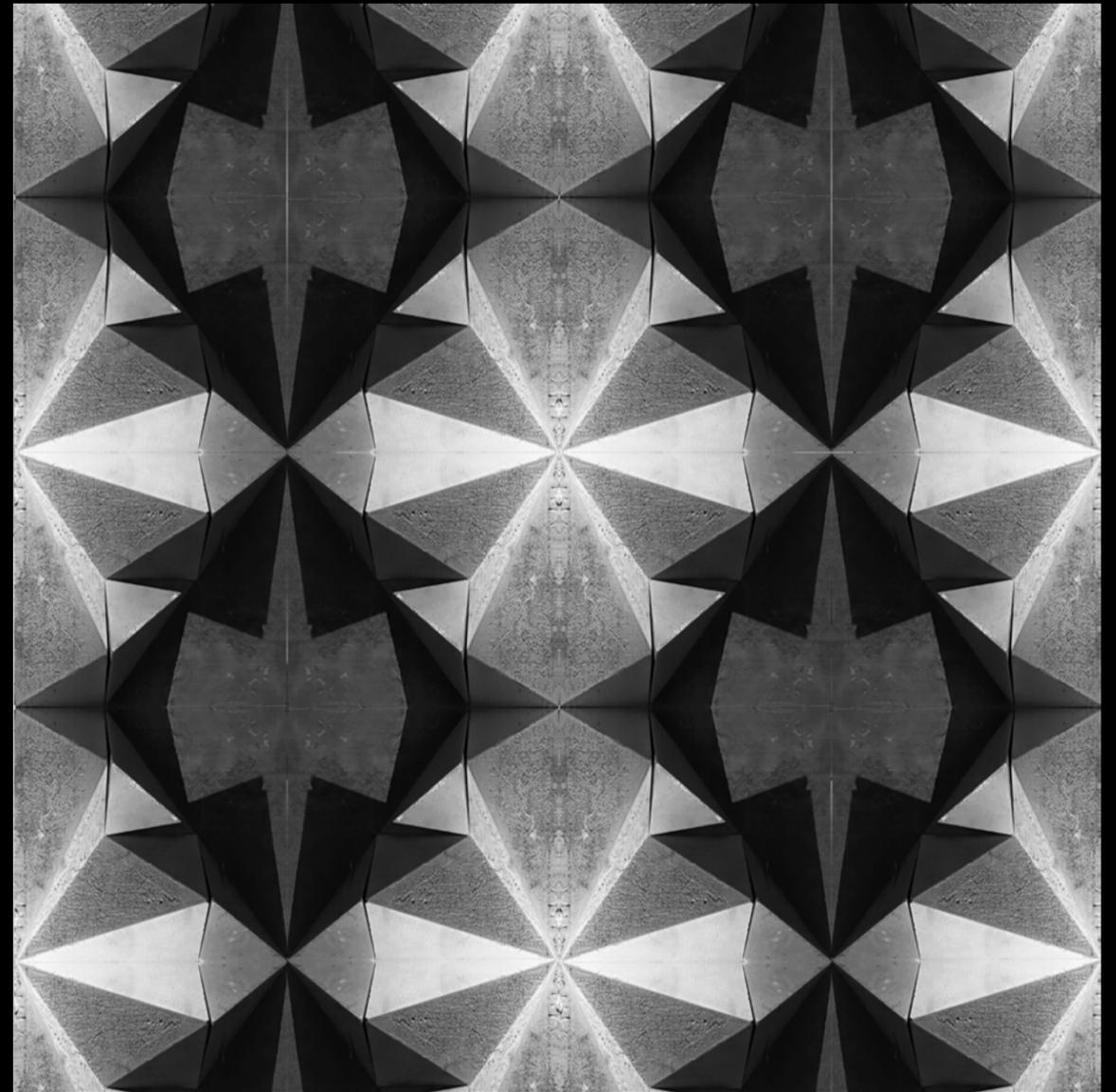
## KALEIDOSCOPE

Type: Tech Elective - Individual  
Semester: Second Year, Spring 2021  
Professor: Josh Jordan

The project is a three dimensional geometric exploration in which the goal was to create a tile that could be repeated and combined creating different patterns. The idea was to create patterns that resembled a colorful kaleidoscope. The first iteration consisted of a grey concrete tile that is a modified cube where triangles were extracted in order to create surfaces that can connect to another tile. The second iteration consisted on a smaller tile that could connect to the first tile. This smaller tile was made in different colors to add to the concept.



First Iteration of Tile





First and Second Iterations of Tiles Combined



## MOUNTAIN DEW

Type: Visual Studies - Group  
Partners: Ayna Karachiwala, Meissane Kouassi, Kylie Walker  
Semester: Second Year, Spring 2021  
Professors: Joseph Brennan, Phillip Crupi

The story takes place in an enchanted, renaissance ruin hidden between mountains. Where, as you walk the bridge, a mystical choir of fairies welcomes you and illuminates the night. The design strategy for architecture of the project focused on a loop made of a water canal that enveloped bridges, stairs and cupolas. It also played with a distortion of gravity by turning some spaces upside down. In terms of the atmosphere of the images; colors, hues, materials and the environment were carefully chosen to provide a magical and bubbly experience.





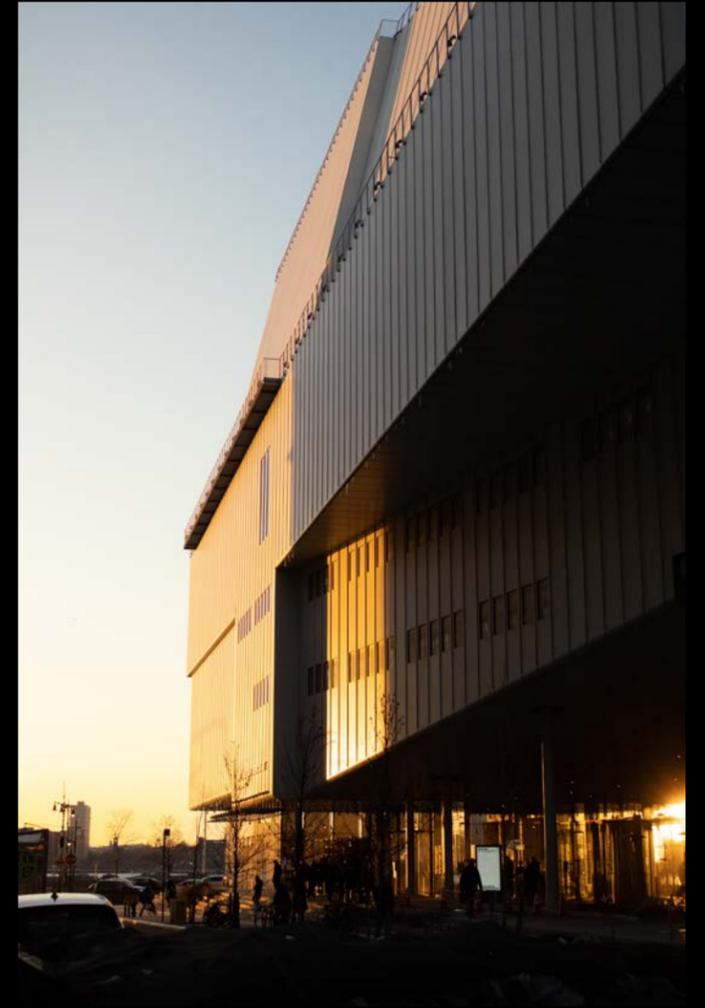
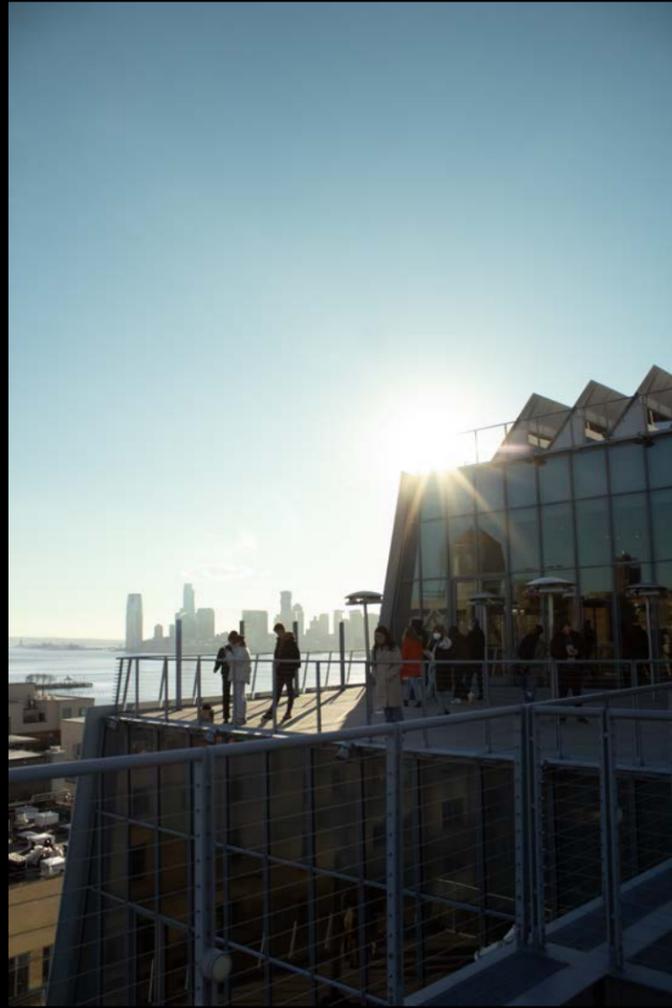
## PHOTOGRAPHY

Type: Visual Studies- Individual  
Semester: Third Year, Spring 2022  
Professor: Michael Vahrenwald

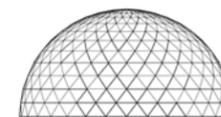
This is a selection of the photographs taken for assignments throughout the semester. The camera used was a DSLR Canon T7i Rebel with an 18mm-55mm lens. Photos were taken in different places in New York and Hawaii. Places include: an interior public space in Wall Street, the 42nd street subway station, the Whitney Museum and the Liljestrand House Foundation.







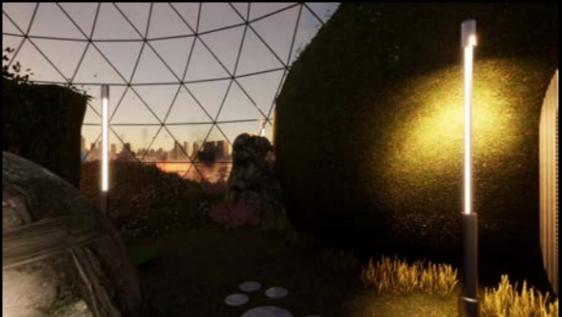




**6° C**

Type:	Extracurricular - Individual
Semester:	Summer Workshop 2021
Professor:	Vanessa Keith, Andrew Homick

The project is a video using virtual reality as a tool to promote empathy in the viewer through a more personal experience. The experience depicts a world that has progressively heated up by 6° C over the next fifty years. It starts by showing Earth as we know it, full of life. It later jumps into a future where the effects of global warming have become undeniably perilous to human health and solutions to preserving ecosystems and life have formed in the way of dome structures called Sanctuaries.



# Perspective Illusions in the Teatro Olimpico di Vicenza

Type: History Sequence - Individual  
Semester: Third Year, Fall 2021  
Professor: Mark Rakatansky

## Introduction

The Teatro Olimpico di Vicenza was designed by Andrea Palladio. Its construction started in 1580 and continued all through 1585. However, Palladio passed away a few months after construction had begun and another architect named Vincenzo Scamozzi took over the project and saw it to completion. The Teatro Olimpico is well known for the particularity of its stage's background and how it deals with perspective by creating an illusion of depth and three dimensionality. In contrast to what had been traditionally flat painted backdrops, the stage background of the Teatro Olimpico is a physical space that can be occupied. This essay will study and analyze the different techniques and elements Palladio used to achieve the forced perspective illusions displayed in the stage. The analysis was divided into the three main areas of the stage: the proscenium-arch, the perspective stage halls, and the spectator area.

## The Proscenium-Arch



Figure 1. Proscenium-Arch

The proscenium-arch is located at the stage facing the spectator area. It is Palladio's architectural interpretation of the traditional stage curtain or the screen that frames the actor's setting (Figure 1). Palladio was heavily influenced by the triumphal arch type which was popular at the time of his design's conception. Some of his influences included Sebastiano Serlio's "Tragic Scene" which includes a triumphal arch in the center of the composition; and Pietro Perugino's painting of the "The Delivery of the Keys to Saint Peter" which displays two different triumphal arches in its background.

Similar to other interpretations of the triumphal arch type, Palladio utilizes columns and entablatures as a representation of structure. Between these columns and entablatures, he strategically places niches and metopes that contain statues. As customary to the triumphal arch type, Palladio includes a frieze at the highest points of the arch depicting Hercules' triumph of Virtue over the Vices. Moreover, the structural elements tied to the architecture of the triumphal arch, and in this case the proscenium-arch, have led histori-

ans to refer to it as a façade. It is especially accurate in this case because behind the proscenium-arch, a built and occupiable space can be found.

In an effort to closely observe and better understand the façade, the proscenium-arch was recreated through drawing and five instances that employ ordering elements in terms of perspective were identified. These ordering elements are focused on achieving a sense of greater height, scale, and an emphasis on monumentality from the spectator's point of view.

The first ordering element identified was an elevational grid. This grid organizes the posts and beams in proportion to scale, decreasing as it rises in the façade (Figure 2). Palladio starts with taller quadrants at the base of the façade and ends with smaller ones at the highest points. This proportional decrease in scale is a characterizing design strategy that Palladio employs in different instances throughout the proscenium-arch.

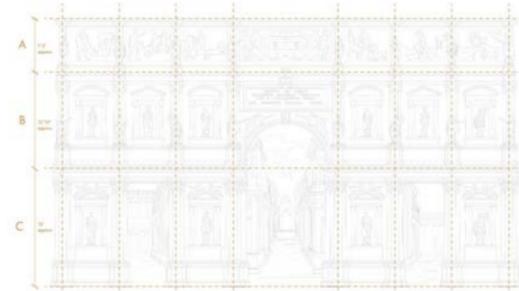


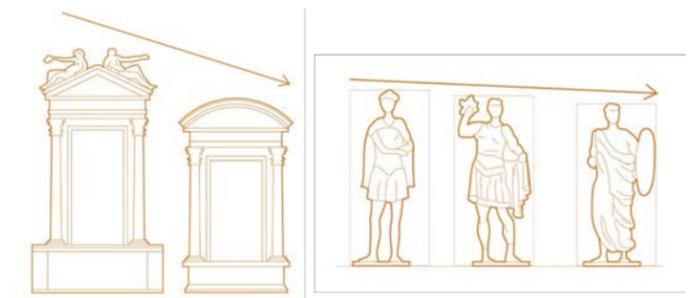
Figure 2. Façade Post and Beam Grid

A closer look into the structural elements that conform this grid reveals that the columns and entablatures also follow this logic. Palladio used three sizes of Corinthian columns in which he placed tallest and thickest at the bottom and smaller and thinner at the top. Similar to the column entasis used in ancient Greek monuments, he uses scale to warp the spectators view and make it seem like the proscenium-arch is much taller (Figure 3). Another move Palladio makes with the columns is the duplicating of columns and placing them right behind another in order to create depth in a somewhat two-dimensional wall (Figure 4). These columns not only follow Palladio's intent to distort perspective, but also become architectural elements by following structural logic in the thinning of its volumetry as its need for load bearing capacity decreases.

In the case of the entablatures, Palladio designed them in a way that as they ascend in placement along the proscenium arch, the stylobate bands become less spaced out and thinner (Figure 5). This treatment was also employed in the scale of the statues placed

along the columns, niches, and friezes. Although the changes in scale of the statues are slighter, being accompanied by other elements that change scale, such as the entablatures and columns, help distort the perspective (Figure 6).

Another moment where this can be seen is in the niches. Palladio uses two similar in size niches but plays with variation in three different elements that help make one niche look taller and more prominent than the other. The first variation is the base height for each niche. The niche located at the lowest level of the proscenium-arch has a larger base than the one above. This change in height makes it seem like one niche is taller than the other. The second variation can be observed in the pediments. One pediment is pitched, and another is arched. Visually, the pitched pediment looks like its taller than the arched one because the point draws the eyes upwards. On the other hand, the arched pediment directs the view downward following the curvature. Finally, the third variation is presented in Palladio's placement of statues sitting on each side of the pitched niche to add height and an illusion of weight to it.



Figures 6 and 7. Niches and Statues

The final instance that follows Palladio's ordering elements of perspective distortion, are the statues. These statues can be found in different parts of the proscenium-arch; along the columns, inside the niches and in the metopes. As seen in the niches, these statues are there to provide a sense of weight and scale to the overall composition. The statues do not have significant scale difference, but their placement in the proscenium-arch indicates variation in size (Figure 7). For example, the statues placed along the columns are slightly bigger than the statues placed inside the niches. The slight change in scale is a technique Palladio uses to accentuate the depth of the niches to give a sense of forced perspective in specific moments of the façade.

## Perspective Stage

According to Licisco Magagnato in his text *The Genesis of the Teatro Olimpico* (Magagnato 1951), behind the proscenium-arch the semblance of a space can be found. This means that it is a space that is not made to be used as a space, but as a three-dimensional background for the stage which has the potential to be occupied. The perspective stage is a pictorial illusion through architecture that had been reserved to painters and scenery-designers until then (Figure 8). When designing the stage, Palladio looked at Alberti's and Serlio's painted scenes. Similar to Serlio's *Tragic and Comedic Scenes*, Palladio chooses to build an environment that depicts the streets of a typical Italian city.

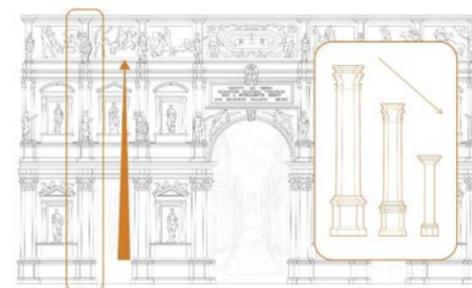


Figure 3. Column Scales

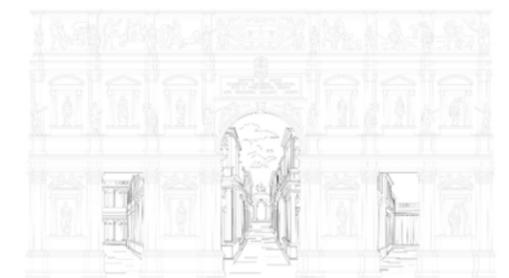


Figure 8. Perspective Stage View

Much like a painting or a two-dimensional backdrop environment, the perspective stage scene has a main vanishing point, a horizon line and orthogonals that indicate perspective lines (Figure 9 and 10). These lines can be drawn because of the distortion techniques Palladio used to create and force a perspective view. However, while designing the stage environment, Palladio concluded that because his planned design for the stage envisioned architectural solutions, he deemed it necessary to use architectural terms. Therefore, he called the perspective stage space the "stage halls".

In order to achieve depth and distance, he made the stage rise sectionally and caved in the urban walls of the streets in plan. The perspective stage then becomes a series of five halls in which the floors rise; the roofs slopes downward towards the back; and the walls

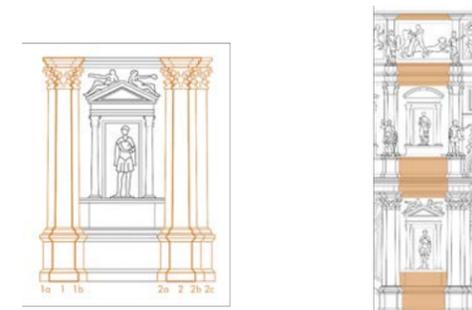
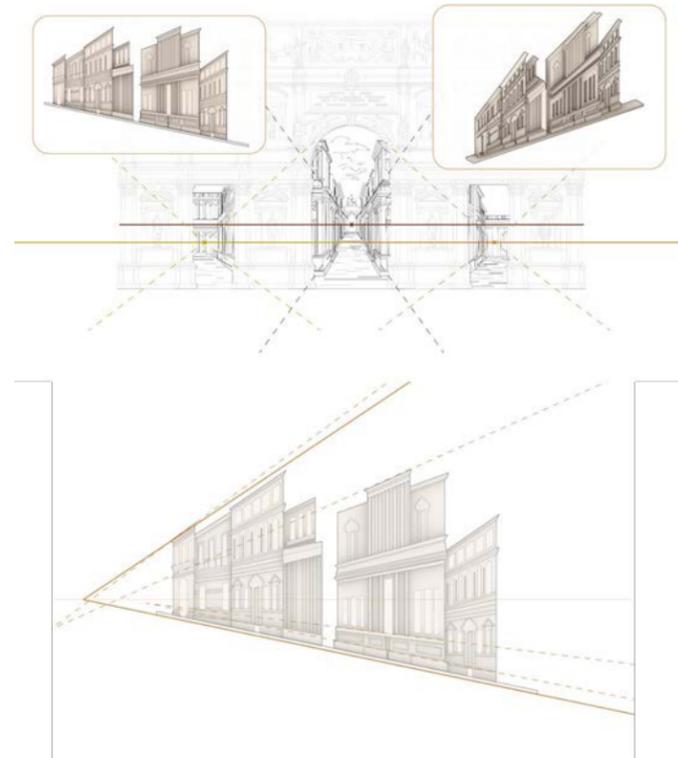


Figure 4 and 5. Column Overlapping and Entablature Scales

become narrower as you move further into it. It is evident if observed in the general plan of the stage and the section cut through the central hall (Figure 11). The manipulation of the roof, floor, and walls become tools to accentuate the perspective illusion. In addition, Palladio employed his decrease in scale ordering in elevation for each stage hall. The smaller scaled buildings can be found in the back of the hall while the bigger scaled buildings are in the front. The elevation of these buildings is also skewed to look like one side is shorter than the other, similar to how a building would be drawn or painted in perspective in a canvas.

After Palladio's death, 6 months after the project started construction, Vincenzo Scamozzi was selected to take over to oversee and finalize it. Under his management, Scamozzi added two lateral stage halls additional to the original three main openings to the perspective stage. Palladio's perspective illusions techniques were also used in the design of the new additions. The newer stage halls are located at both ends of the stage in the plan and section.



Figures 9 and 10. Perspective Lines and 3D Model of Stage Walls

When taking into consideration Palladio's techniques and how they are applied in the stage, it is an interesting exercise to remove all the angles and slopes that make up the forced perspective and compare to how it would look without them. As shown in Figure 12, an elevation of one of the stage halls was recreated in a 3D model. As a first step, the ramp was removed and turned into a flat surface. Secondly, the angled walls were straightened and made parallel to one another. These alterations result in the proscenium-arch framing an empty view, since no buildings can be seen anymore. The previous exercise reinforces the impact that Palladio's perspective illusions had in the creation of the

perspective stage space and how it is perceived by the spectator.

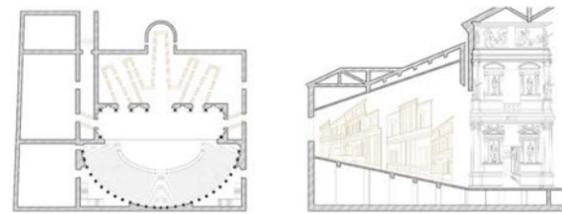


Figure 11. Plan and Section of Teatro Olimpico

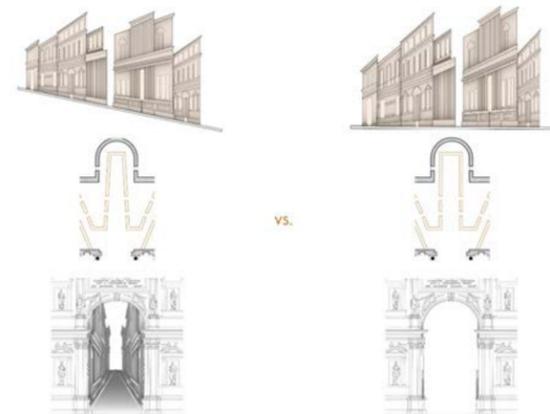


Figure 12. Comparison between Palladio's Applied Techniques vs. No Techniques Applied

### The Spectator Area

The last part of the study focuses on the perception of the stage from the spectator area. Inspired by Roman theater architecture, Palladio designed the spectator area in the shape of a semicircle. The rows of seats are placed along the semicircle directly facing the orchestra pit and stage. The semicircular arrangement compliments the perspective play happening in the background, in both the proscenium-arch and the stage halls, by allowing the spectator to view the stage environment as continuous streets in which buildings get smaller as they appear more distant.

Palladio's perspective illusions still prove effective at different locations in the spectator area because the angled walls and distorted elevations of the stage halls allow for a shift in perspective lines (vanishing point, orthogonals and horizon line) according to the spectator's point of view (Figure 13). The reason this works is because of an implicit radial organization. This organization is very evident in the spectator area as it is explicitly a semicircle that guides the spectator's view towards the front and center of the stage. Although it is not as obvious in the stage halls, these are also organized around a circle which positions the vanishing points for each individual stage hall following an invisible radial axis. Ultimately, these axes lead up to the front and center part of the stage as well. (Figure 14). The spectator area becomes a major piece in Palladio's pictorial illusion environment, given that it is from where the proscenium-arch and perspective stage are intended to be viewed.

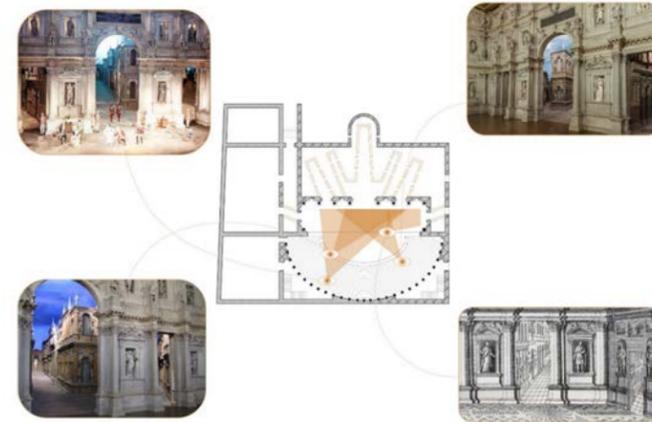


Figure 13. View of Stage Halls and Proscenium-Arch from Spectator Area

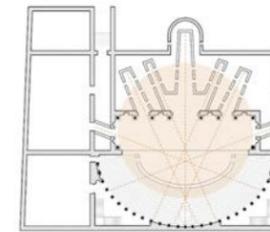


Figure 14. Vanishing Points from Spectator Area

### Conclusion

In conclusion, Palladio's perspective illusions in the Teatro Olimpico di Vicenza consisted of ordering elements that focused on shifts in scale and axial organization. As seen in the proscenium-arch, the façade was organized by a grid that emphasized a proportional decrease in scale in its quadrants, structural elements and ornamental features. In the perspective stage, through the manipulation of the floor, ceiling and walls of the stage halls, Palladio achieved a forced perspective that gave an illusion of depth and distance. This made the stage environment seem more realistic than the traditional painted backdrops that had been previously used in theaters. It can be said that Palladio created an innovative form of stage design by combining elements of painted stage scenery with three-dimensional occupiable spaces conceived by his architectural knowledge and influences of the Renaissance. The proscenium-arch becomes a frame for the perspective stage and the ever-changing composition of actors (Figure 15).



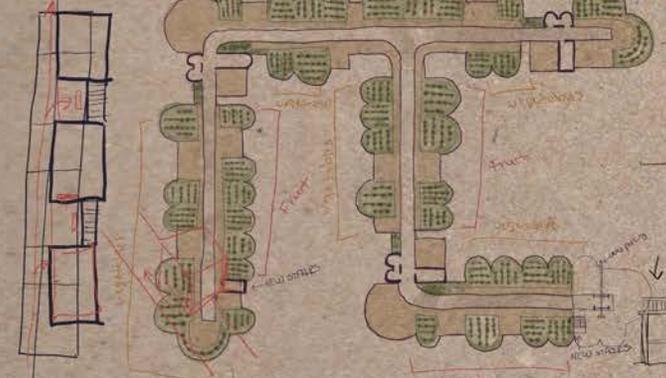
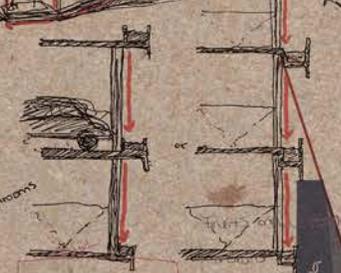
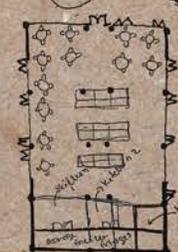
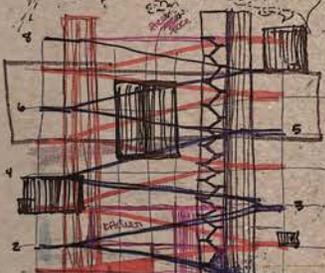
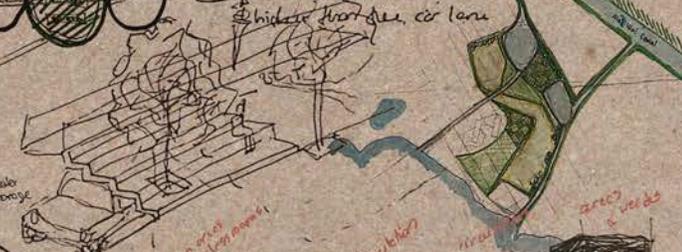
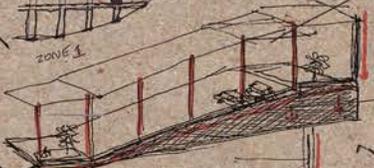
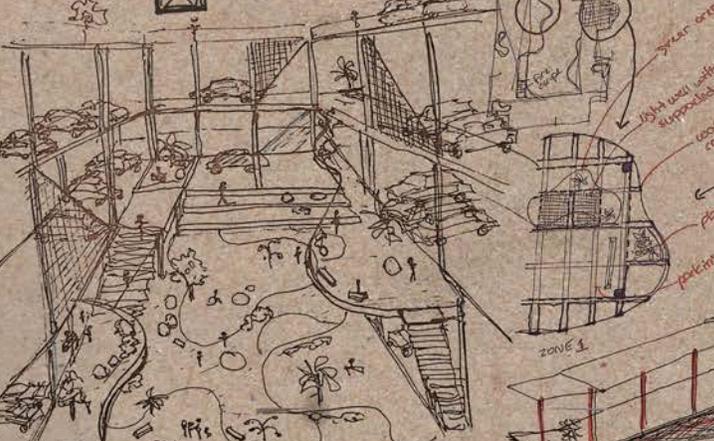
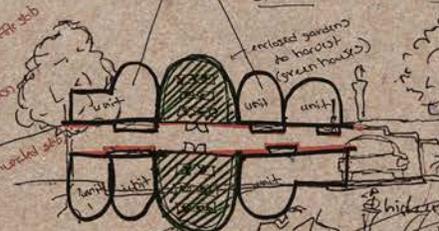
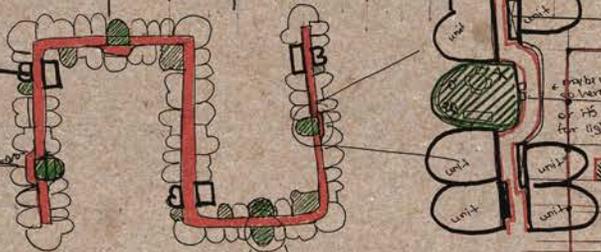
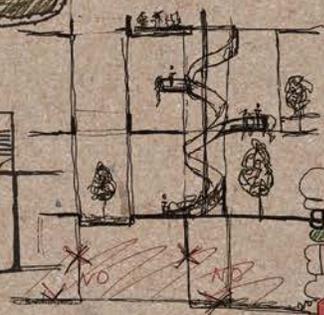
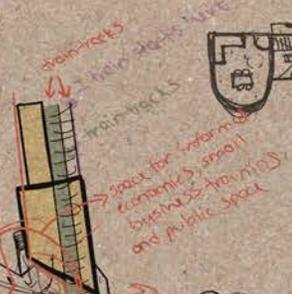
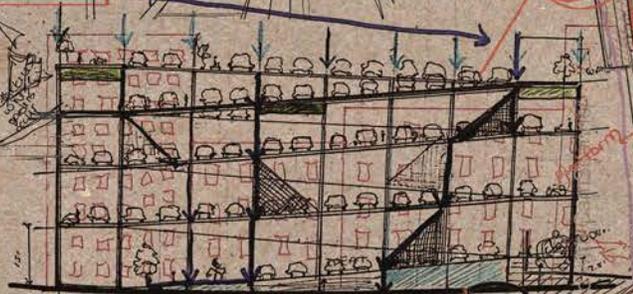
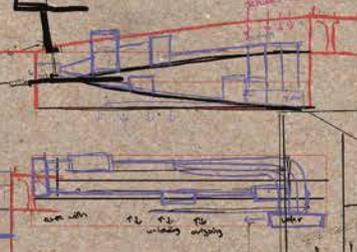
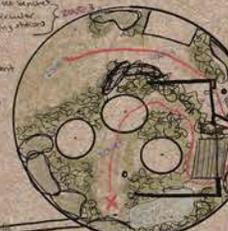
Figure 15. Collage of Renaissance Paintings and the Stage.

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- 1. 2nd floor
- 2. 1st floor
- 3. 0th floor
- 4. 3rd floor
- 5. 4th floor
- 6. 5th floor
- 7. 6th floor
- 8. 7th floor
- 9. 8th floor
- 10. 9th floor
- 11. 10th floor
- 12. 11th floor
- 13. 12th floor
- 14. 13th floor
- 15. 14th floor



2. Tomato
3. Lemon
4. Cucumber
5. Pepper
6. Carrot
7. Zucchini
8. Potato
9. Eggplant
10. Onion
11. Spinach
12. Mushroom
13. Garlic
14. Parsley
15. Basil

