rebuilding today
building tomorrow

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GSAPP 2023 - 2024

REBUILDING TODAY BUILDING TOMORROW

This is a collection of speculations, starting from a place of understanding the world today through dissecting the ideas that exist within historical buildings and repiecing them together to be comprehensible to present. These speculations subsequently read what architecture is today and questions what it could be, looking into the forefront of today to decades into the future pondering, how could we inhabit the world then?

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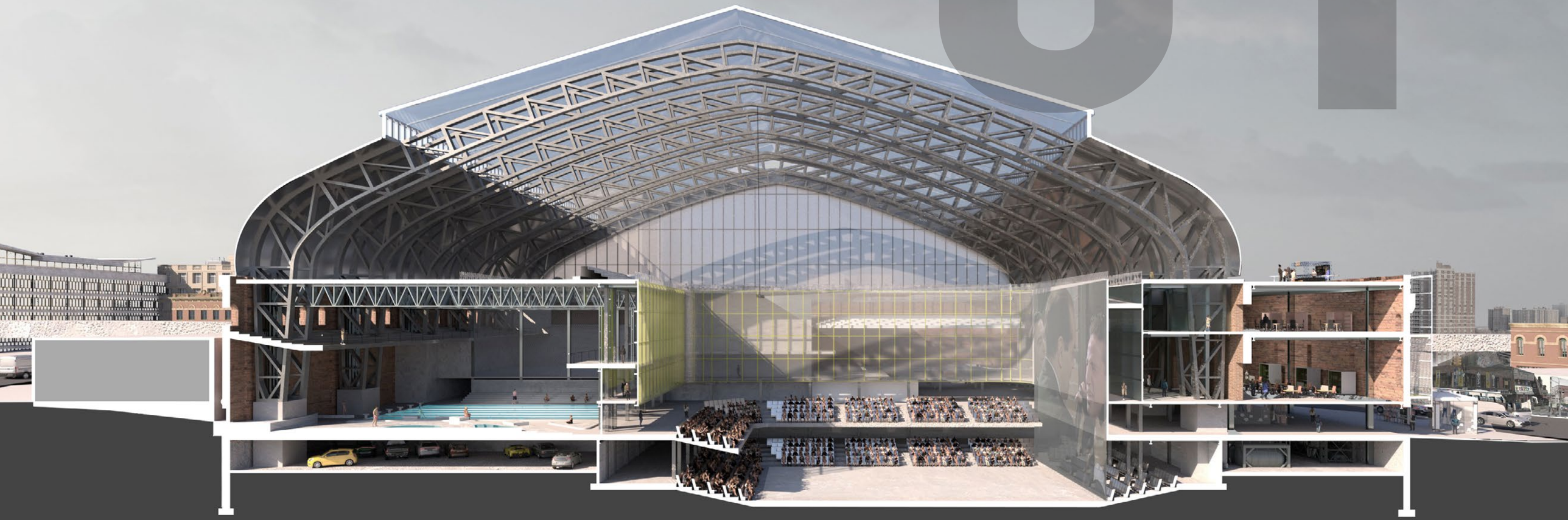
THE EXPANDED MARKETPLACE

ADVANCED ARCHITECTURAL STUDIO (FALL 2023)
Professor: Laurie Hawkinson
Teamwork with: Jingwei Wu

01



Section **B-B'** Through Outdoor Movie Screening

THE EXPANDED MARKETPLACE
a revitalization of Kingsbridge Armory

Located in a vibrant, cultural rich neighborhood of the Bronx, the Kingsbridge Armory is currently a 200,000 square feet, 130 foot high empty shell blockading surrounding residents from easily interacting with each other.

Despite the unwelcoming, fenced off nature of the armory, the local community has repurposed this restrictive boundary by setting up street vending on the fences, food stalls on the sidewalk, and marking the front of the headhouse, claiming the site as 'Our Armory'.

1 | COMMERCIAL BUFFER TO THE SOUTH

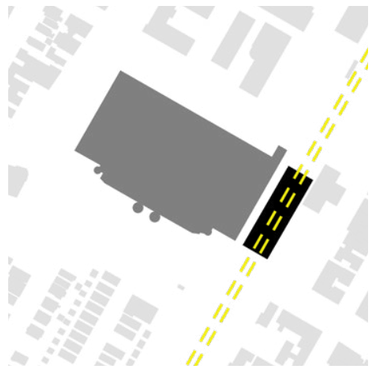
Commercial programs are concentrated on the south of the site, being a much busier street compared to the other sides of the building.

2 | PRIMARILY RESIDENTIAL SURROUNDINGS

The surrounding neighborhood is primarily multifamily residential, with a predominantly hispanic population. The demographic is highly entrepreneurial and the western border of the site is relatively quiet.

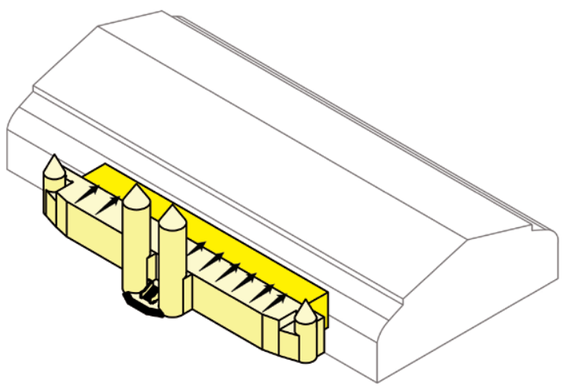
3 | EDUCATION STRIP TO THE NORTH

North of the site, there are 2 elementary schools, 5 high schools, and the Lehman College campus. This younger, student population often come south toward the southside commercial street.



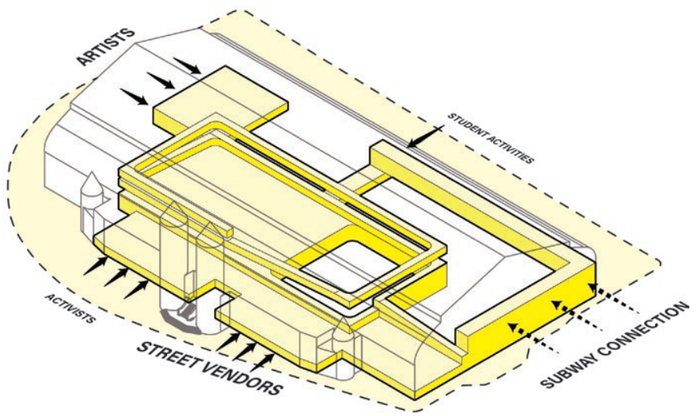
4 | ADJACENCY TO SUBWAY STATION

The armory sits a few feet away from the Kingsbridge Road subway station, which acts as a funnel for residents outside the Kingsbridge community to visit and contribute to the local economy. The distance offers opportunity to connect the station directly to the armory.



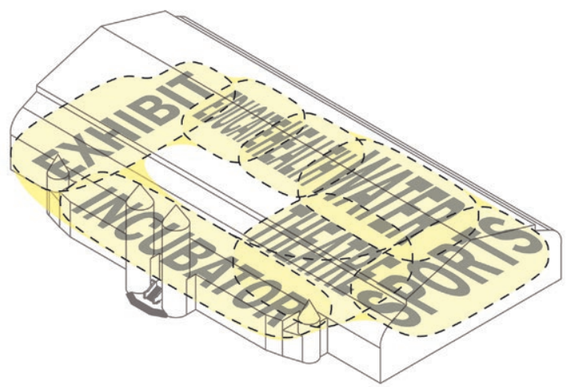
HEADHOUSE EXTENSION

The headhouse becomes support system for the community, acting as a career and business incubator. The space extends into the main drill hall of the armory, assimilating more with the interior marketplace.



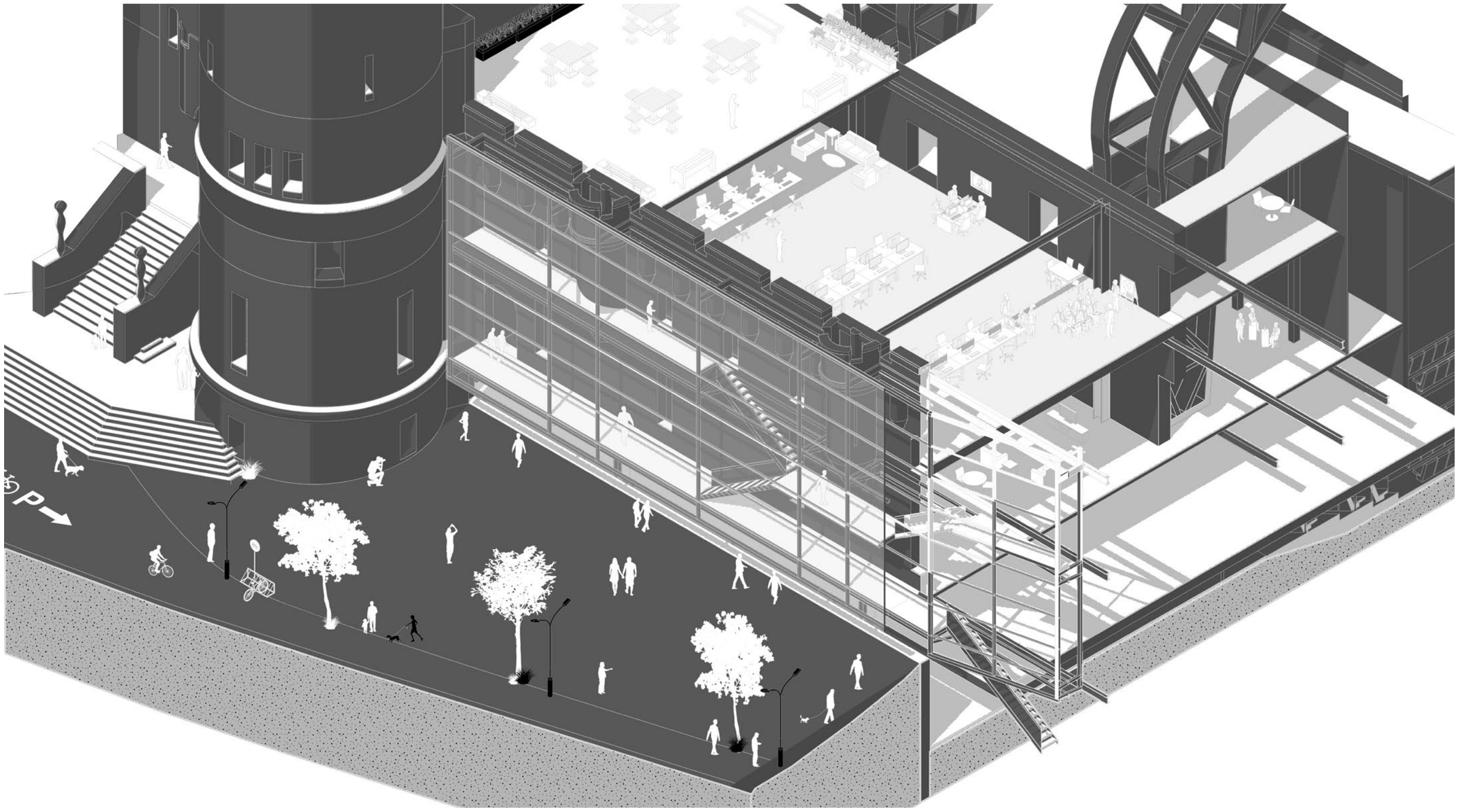
BRINGING IN THE STREETSIDE

The Expanded Marketplace is a celebration of the border conditions of the armory, where streetside activity such as street vendors, activists, and community businesses are drawn into the interior of the armory and the interior paths provide shortcuts between the surrounding communities.



BLENDING OF PROGRAM

Educational programs lean towards the north to serve the adjacent student population, and more active programs tend towards the east where the neighborhood edge is busier and noisier. Programs however, begin to share blended spaces through the interwoven 'marketplace'.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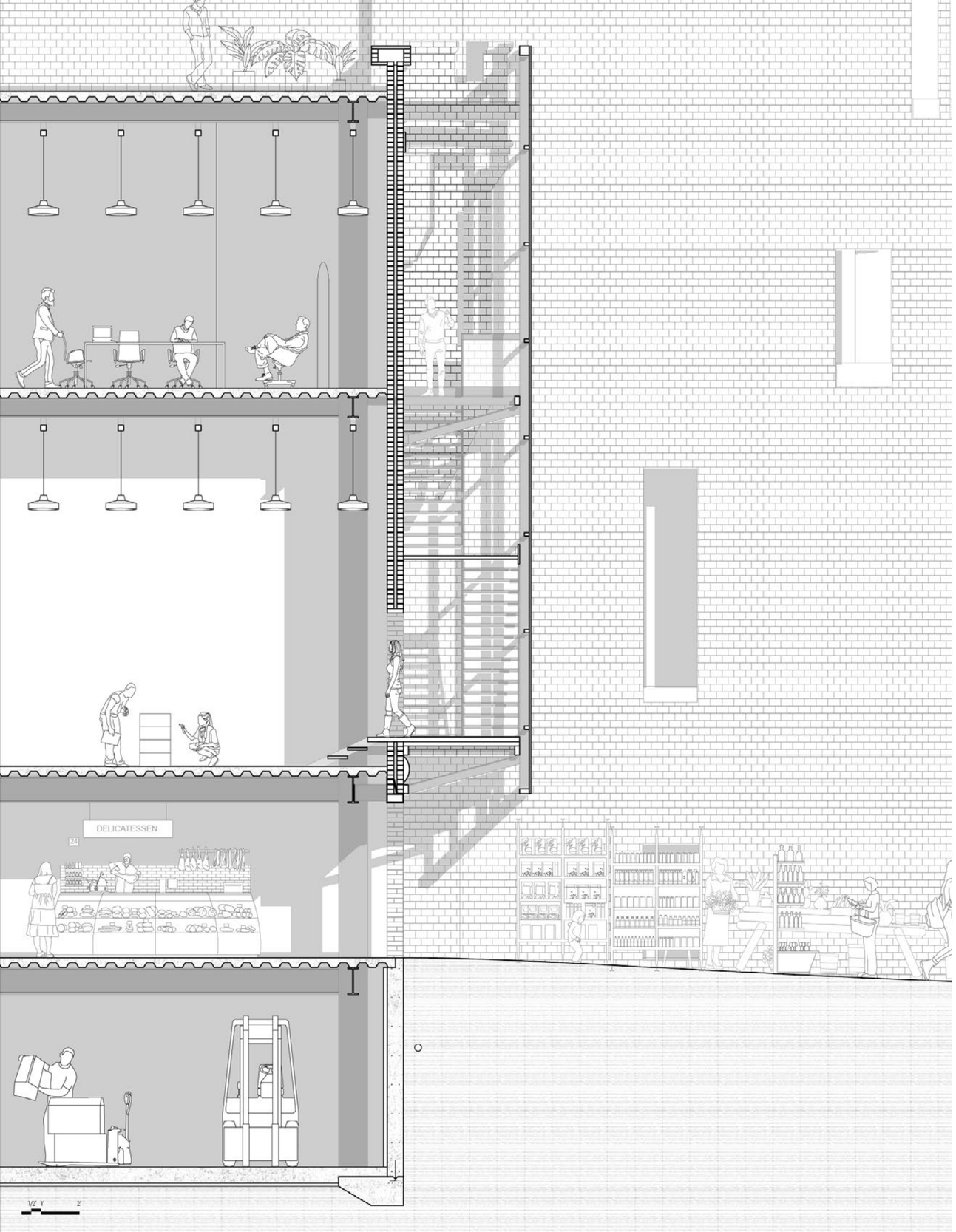
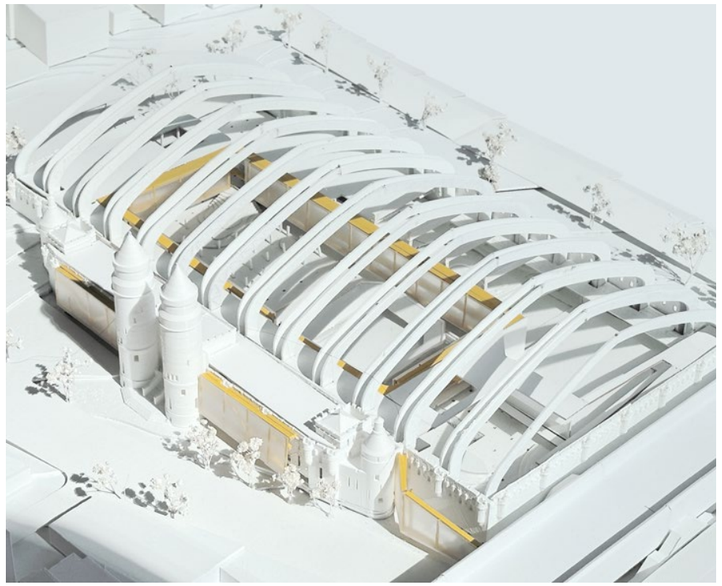
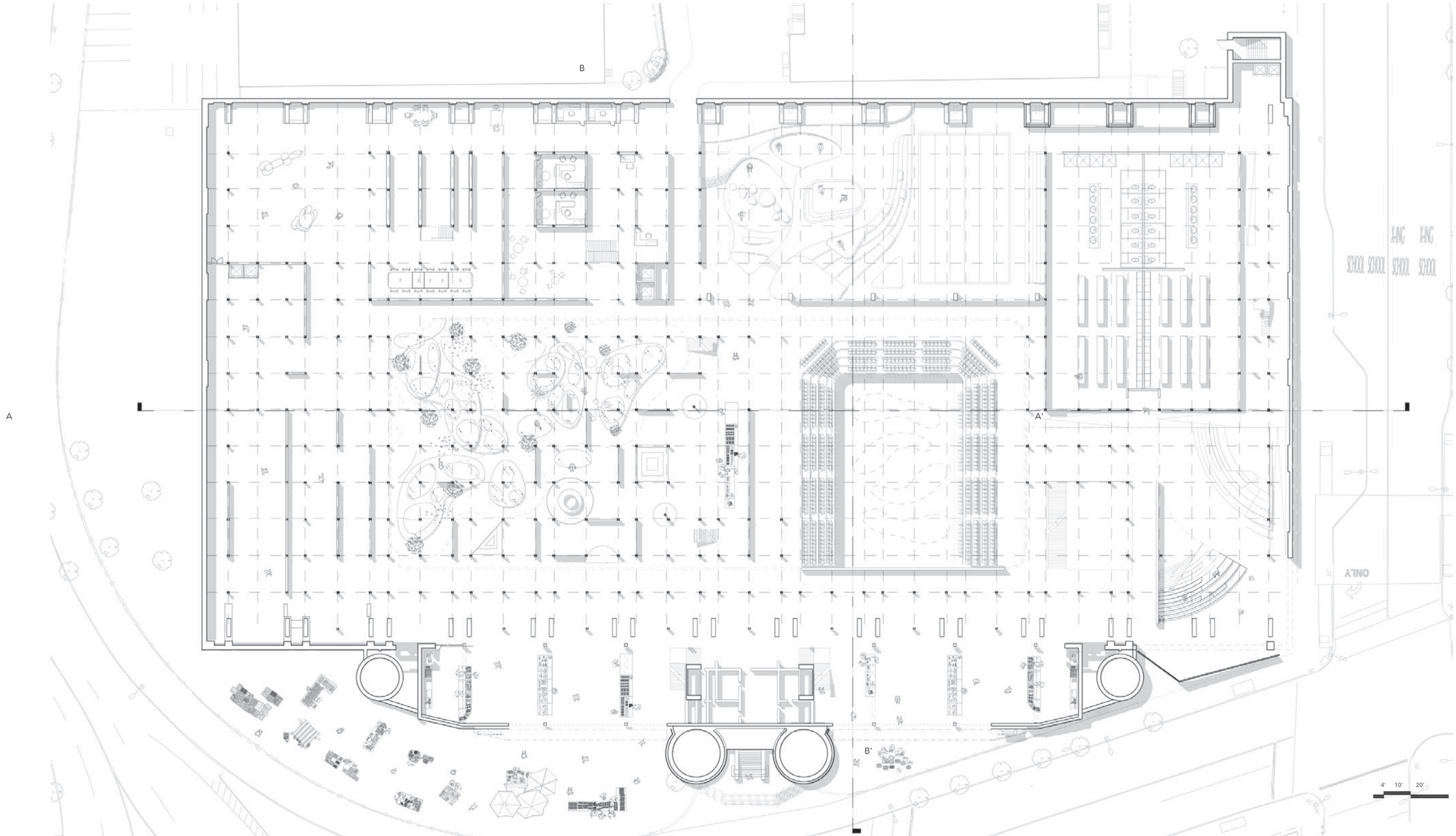




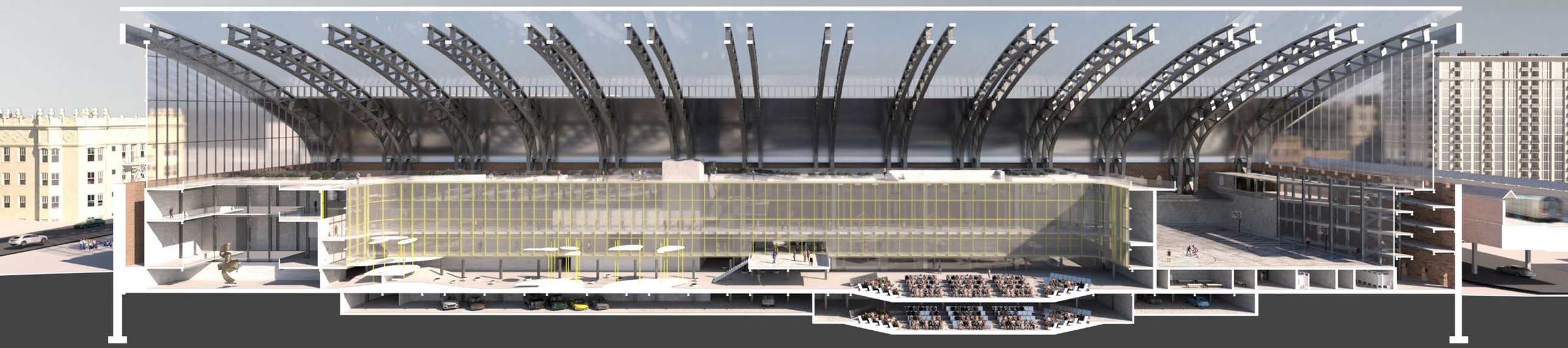
1' = 1/32" MUSEUM BOARD + BASSWOOD + PLA MODEL



FLEXIBLE GROUND FLOOR

Extending the street vendors space into the core of the armory, the marketplace traverses through the interior and the armory's existing steel columns are repurposed to become a canvas for placemaking, supporting flexible vending strategies, installations, and pop-up activites organized by community members.


KET
BREAKFAST



4' 10' 20'

Section **A-A'**

BUILD AND SEE

ADVANCED ARCHITECTURAL STUDIO (SPRING 2024)

Professor: Juan Herreros

Teamwork with: Lula Chou, Caining Gu

02

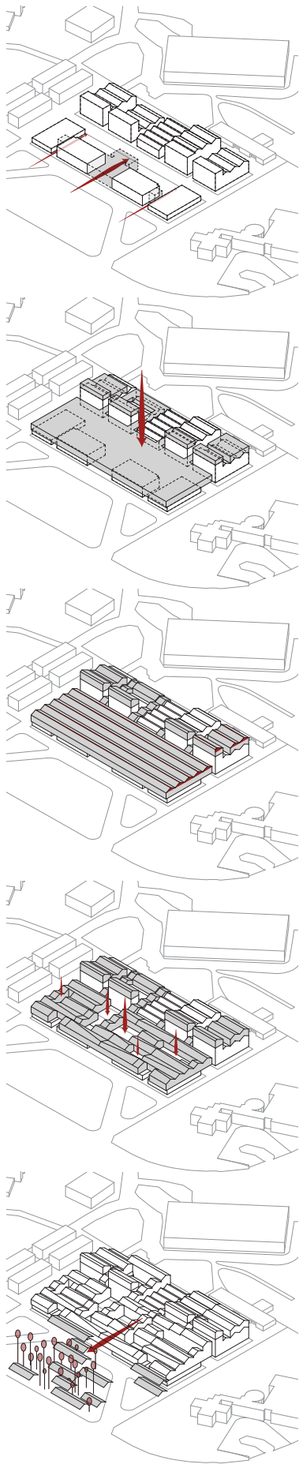
Section **B-B'** Through Outdoor Movie Screening

BUILD AND SEE

a gallery and makerspace representing contemporary Spanish culture

Built during the height of Francoist Spain, the center for metallurgical research in the University of Madrid was a symbol of the country's cultural hegemony and a dictatorial vision for Spain's progress to be intertwined with one of industry and power. The urban infrastructure surrounding the building was designed to faciliate efficient policing as the university was a congregation of many who opposed facist rule, and the government aimed to repress any cultural diversity that would arise from the institutions.

The new museum will have a focus on combining exhibition with making, becoming a space for students and faculty to create and exhibit their ideas of contemporary Spanish culture to the world.



1 | CUTTING EXISTING BUILDING

The front administrative building is cut to remove the central and connecting nodes as there is a material difference between those points and the rest of the site.

2 | INTRODUCE NEW MASSING

A new space above the existing buildings is able to accomodate for the gallery needs while preserving the existing buildings' heritage.

3 | SAWTOOTH ROOF MOTIF EXTENDED

The form of the warehouses' roofs is expanded across the new massing, paying homage to the industrial dreams that the buildings characterized in the 1960s.

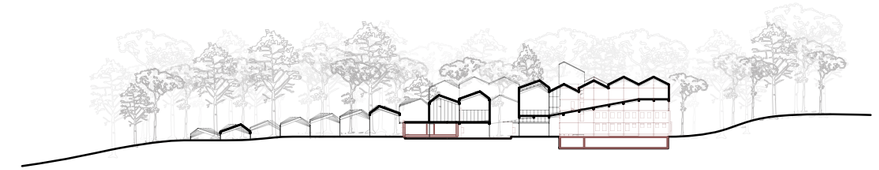
4 | PUNCH MASSING FOR COURTYARDS

Void spaces are produced to reintroduce natural light to the central courtyards, producing visual connection between the new gallery space and the old office towers.

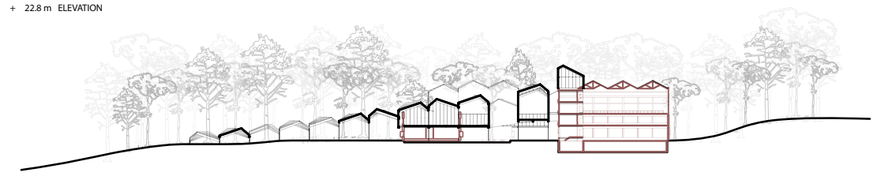
5| EXTEND ROOF SYSTEM TO GARDEN

The dancing roof that sits above the old architecture extends and dissipates towards the front garden, merging with the landscape to become space neither interior nor exterior.

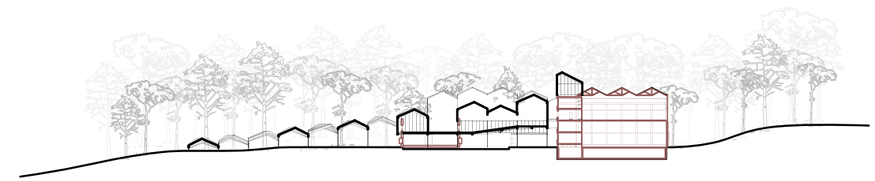
+ 19 m ELEVATION



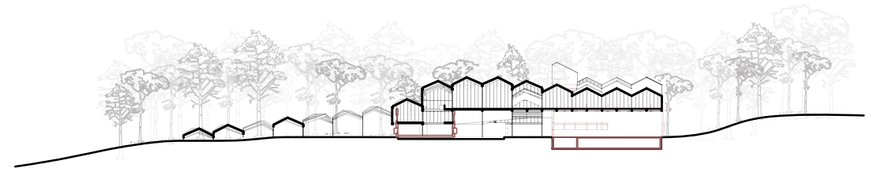
+ 22.8 m ELEVATION



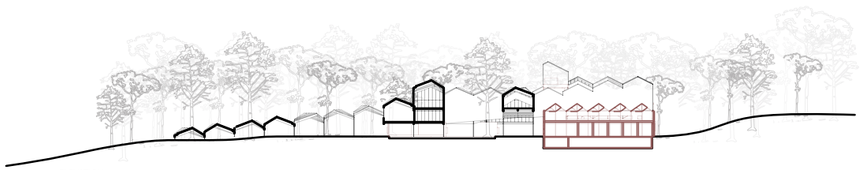
+ 28.5 m ELEVATION



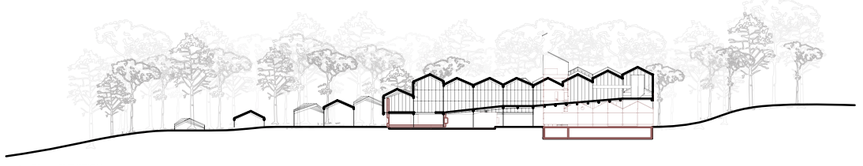
+ 41.5 m ELEVATION



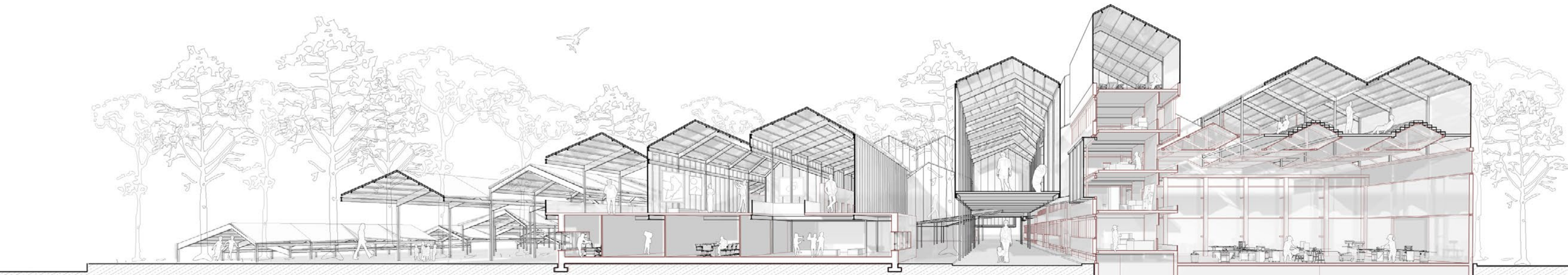
+ 46.5 m ELEVATION



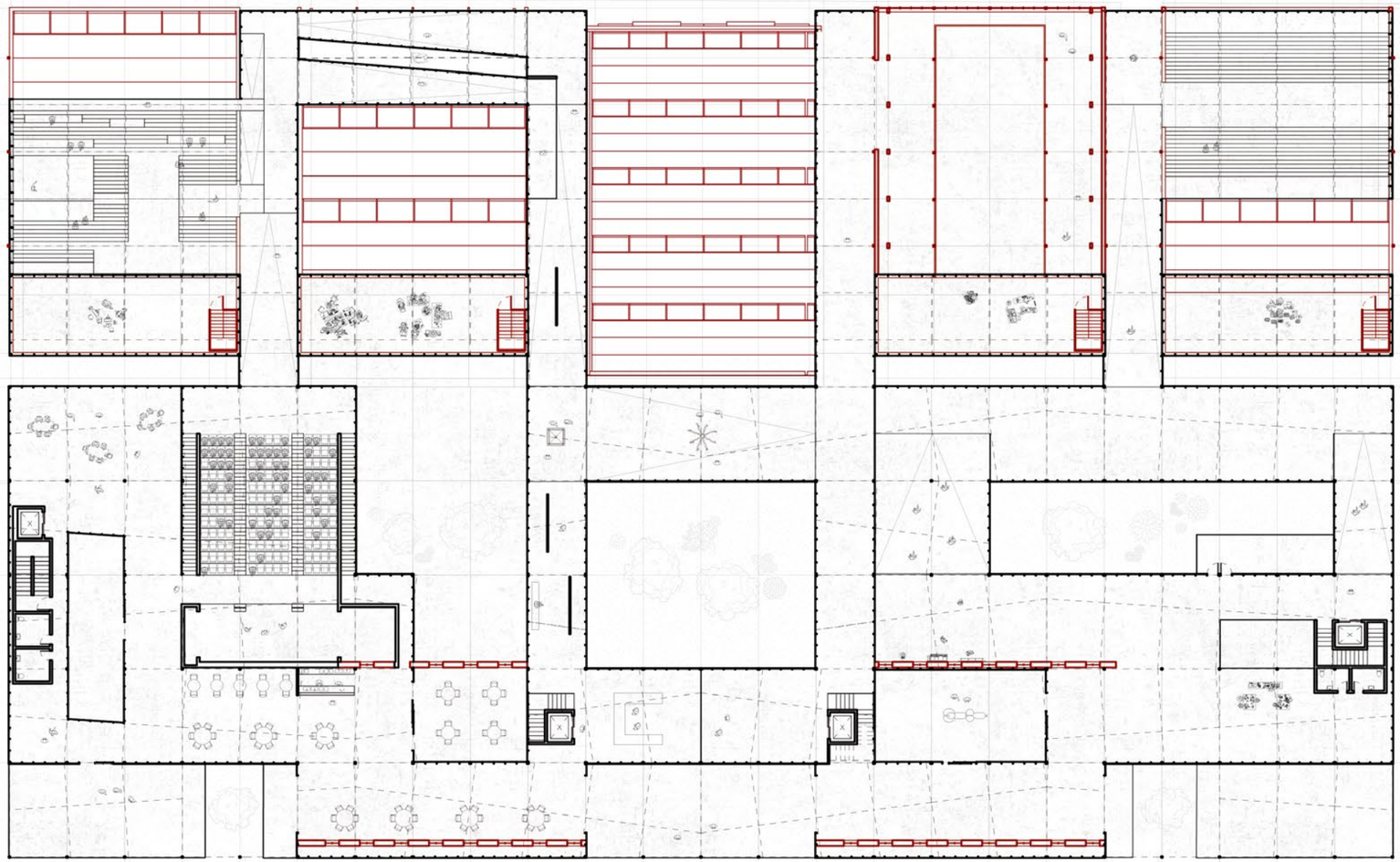
+ 50.6 m ELEVATION



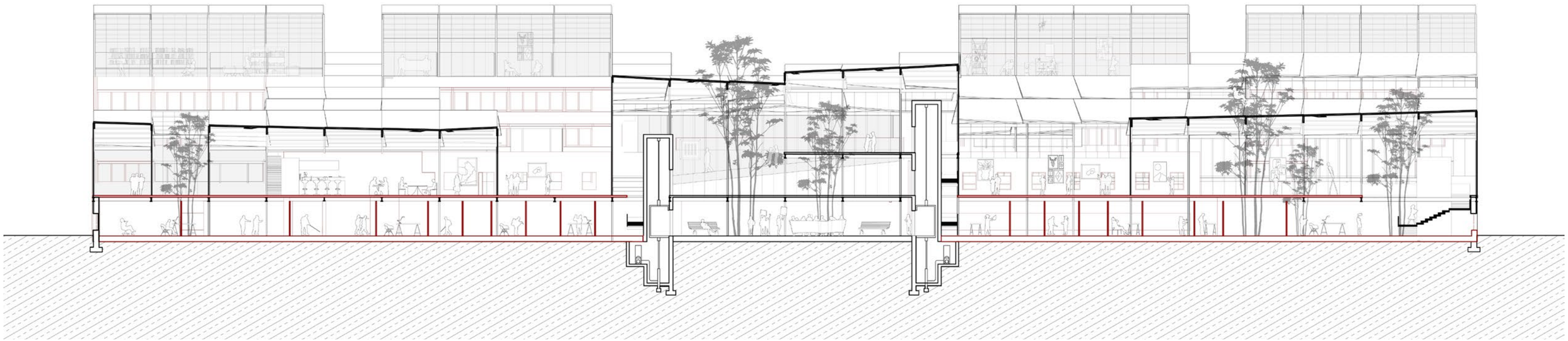
+ 72 m ELEVATION




N
1m
2m
5m
10m



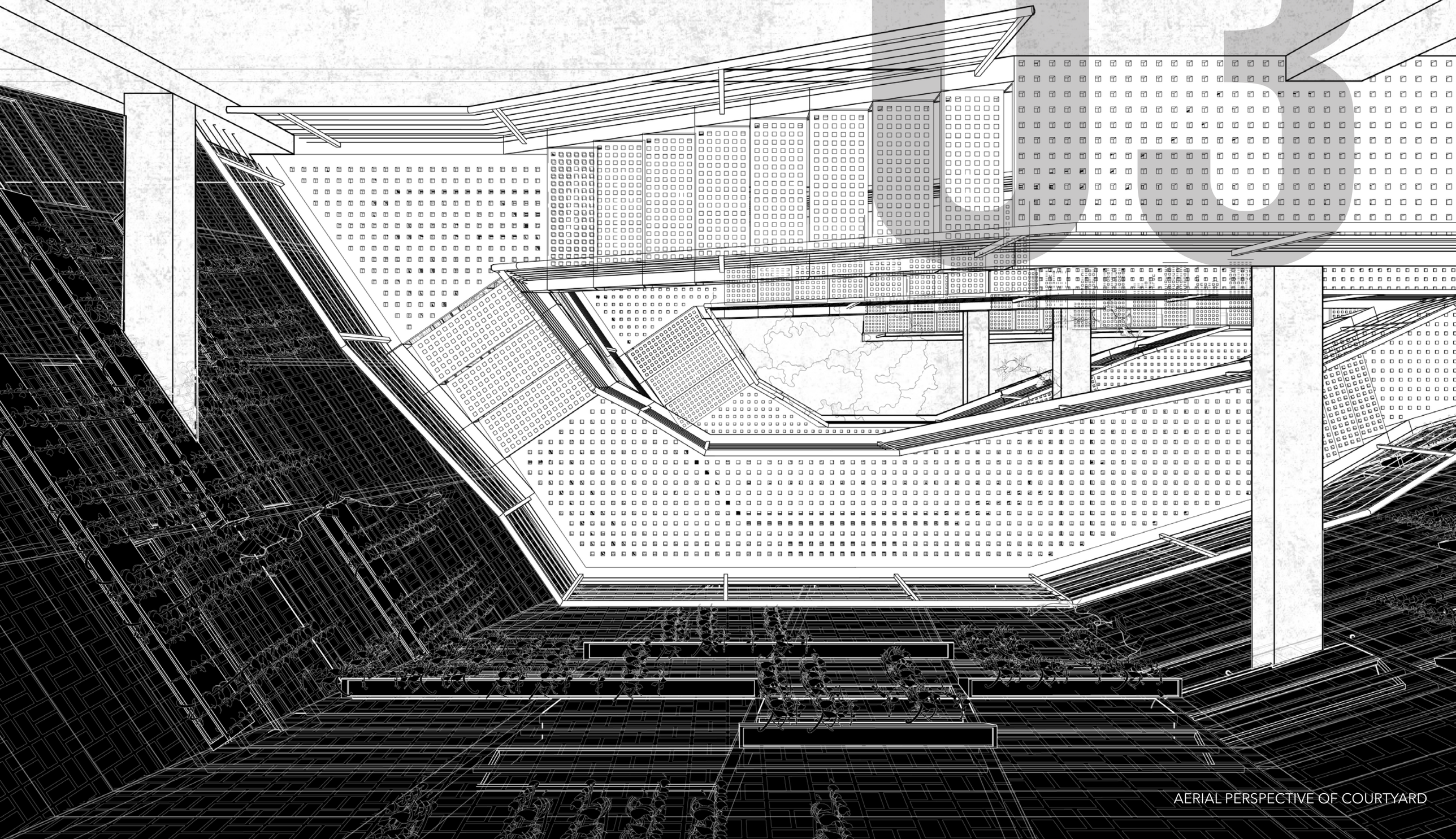
N
1m 5m
2m 10m



THE COST OF REUSE

FOOTPRINT (SPRING 2024)
Professor: David Benjamin

02

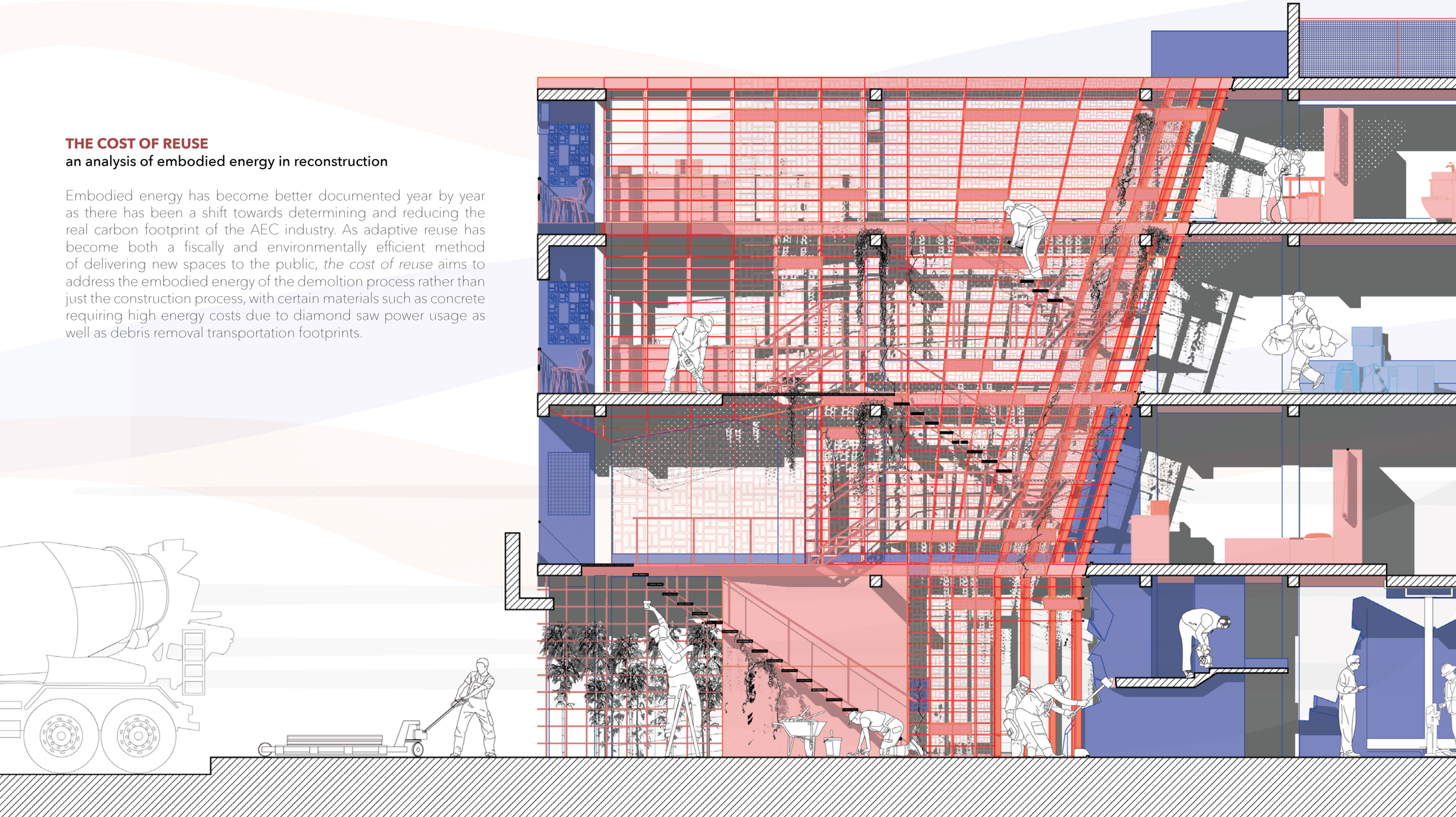


AERIAL PERSPECTIVE OF COURTYARD

THE COST OF REUSE

an analysis of embodied energy in reconstruction

Embodied energy has become better documented year by year as there has been a shift towards determining and reducing the real carbon footprint of the AEC industry. As adaptive reuse has become both a fiscally and environmentally efficient method of delivering new spaces to the public, *the cost of reuse* aims to address the embodied energy of the demoltion process rather than just the construction process, with certain materials such as concrete requiring high energy costs due to diamond saw power usage as well as debris removal transportation footprints.



CURTAIN

RE-THINKING BIM (FALL 2023)
Professor: Joseph Brennan
Teamwork with: Thomas Wang, Andy Lu, Tai Ning

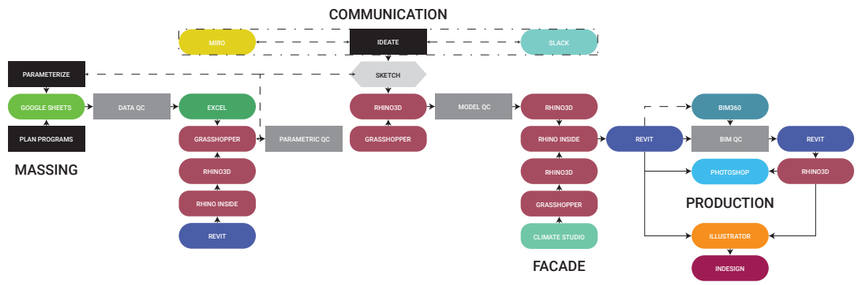
04

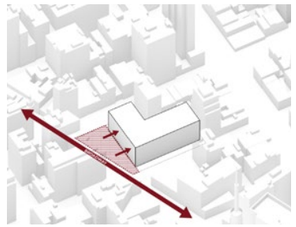
THE CURTAINS
optimizing facade design through data and parametrics

The Curtains is a tower designed with the intention of activating Broadway as a pedestrian channel, all whilst using data driven design practices to generate a facade that responds to a multivariate environment.

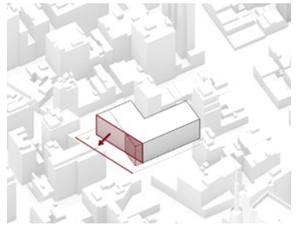
THE PROCESS

The project was as much of an exercise in BIM workflow as it was a design challenge. Climate studio and grasshopper tools such as ladybug and honeybee were used to analyze environmental conditions such as wind speed and direction, view analyses, solar illuminance and glare, and others.

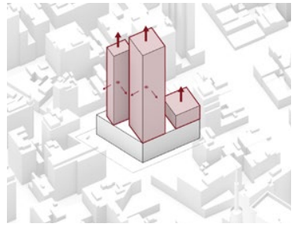




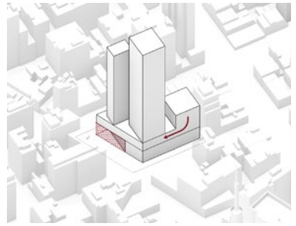
1 | Broadway side site is set back for improved pedestrian flow and public engagement.



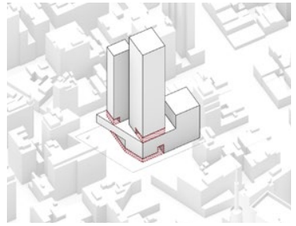
2 | Podium massing is tilted outwards to be parallel to street.



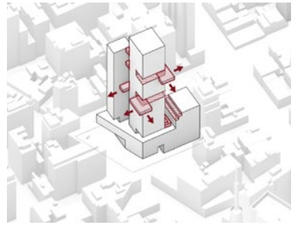
3 | Three extrusions come out of the podium with the two residential towers having greatest access to views.



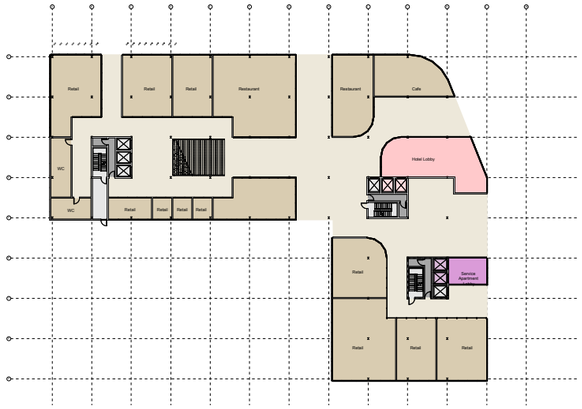
4 | Podium cantilevers over entrance plaza for shade and increasing public space.



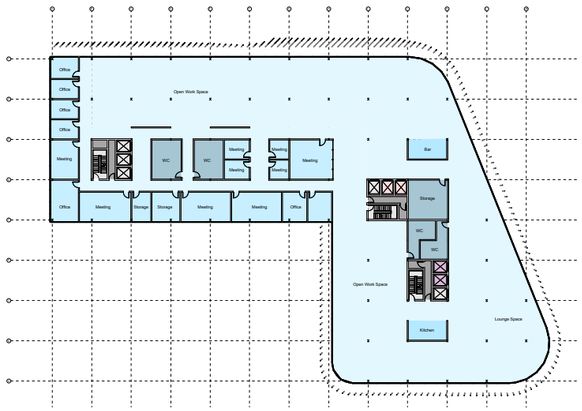
5 | Voids are introduced for additional outdoor space and amenities.



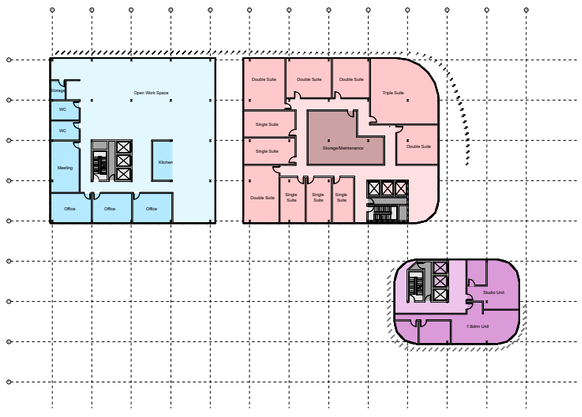
6 | Terraces and cantilevered decks are scattered for green space access to residents and office workers.



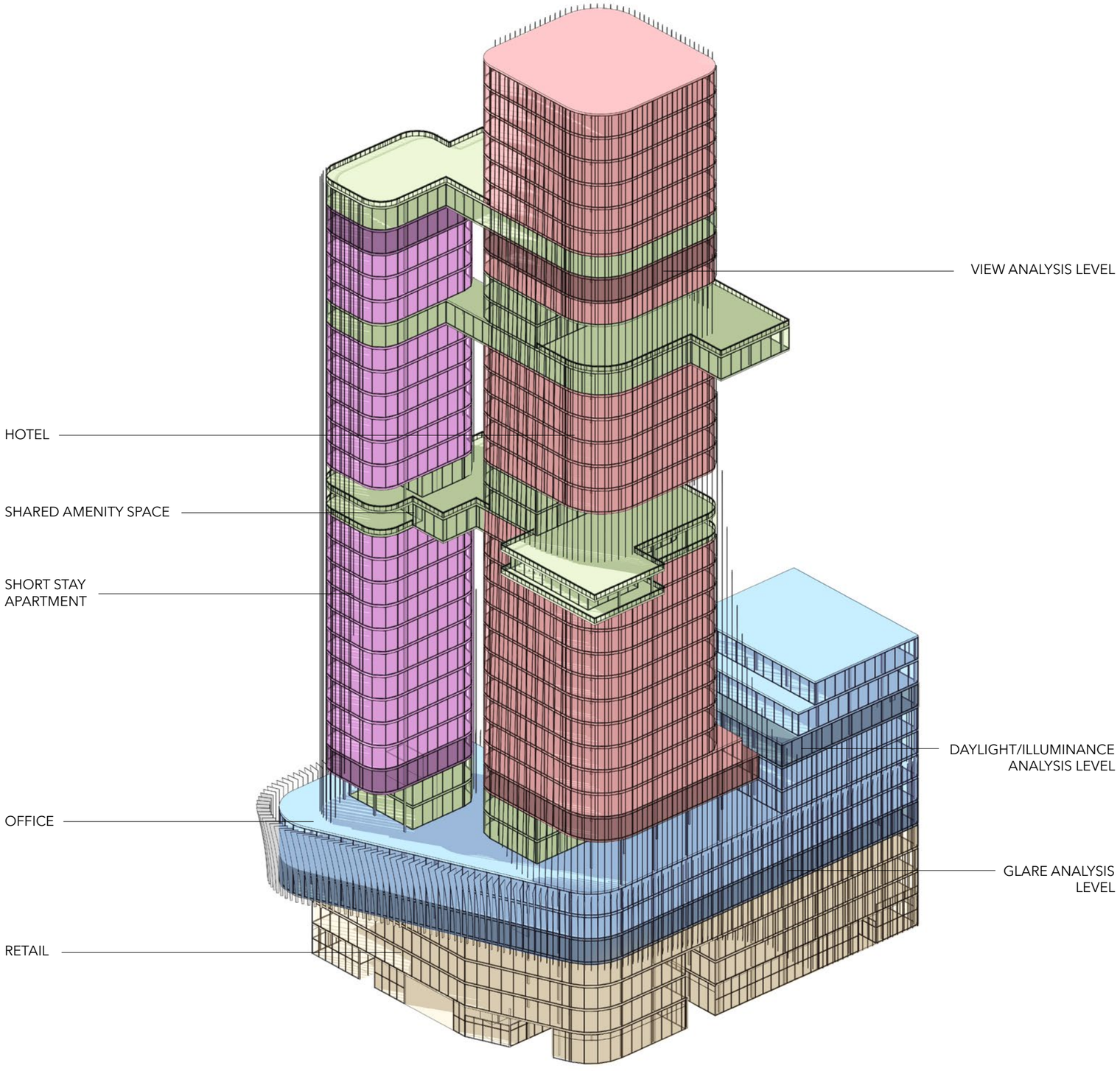
L1 FLOOR PLAN



L5 FLOOR PLAN



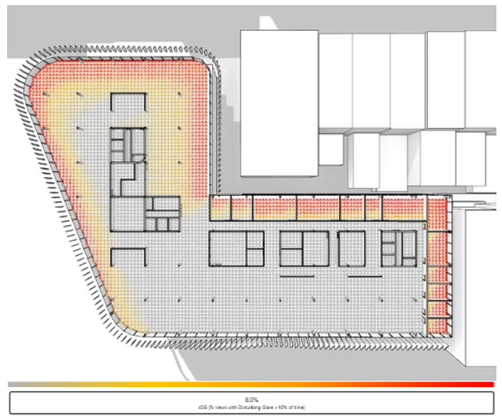
L10 FLOOR PLAN



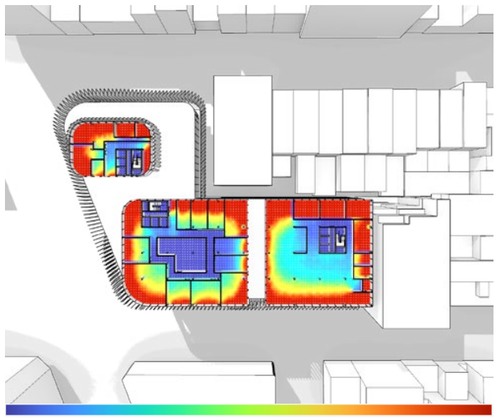
NORTH EAST ISOMETRIC

DAYLIGHT | All three towers have plenty of daylighton the perimeter, and the only residential spaces that don't have enough are the cores and corridors.

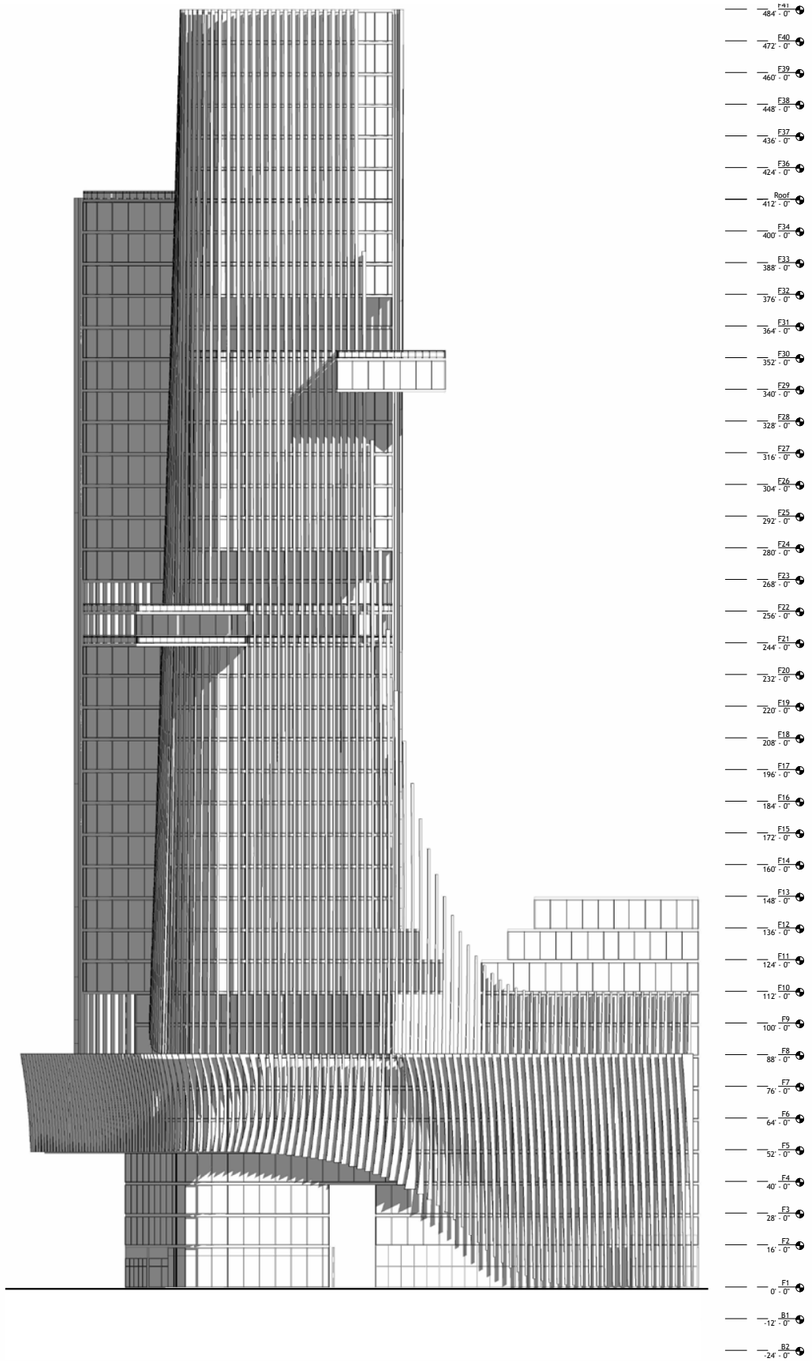
VIEWS | The building's massing and orientation is optimized, with 73% of the building's floor area having quality views.



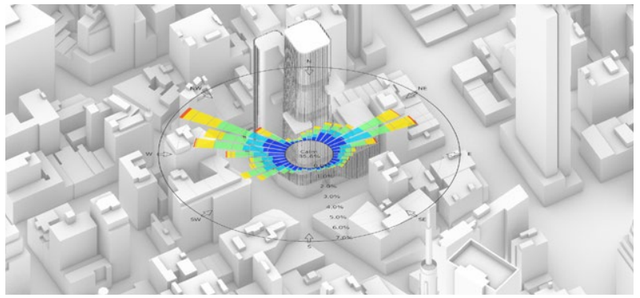
GLARE | There is overall quite a bit of glare on the south facing facade, and interior measures such will likely need to be taken in addition to the louvres.



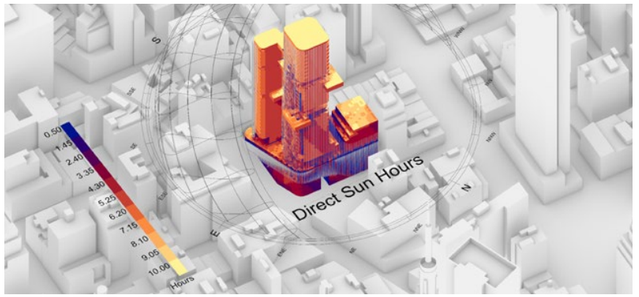
ILLUMINANCE | There is significant illuminance throughout the living spaces as well as offices and meeting rooms, reducing interior lighting energy usage.



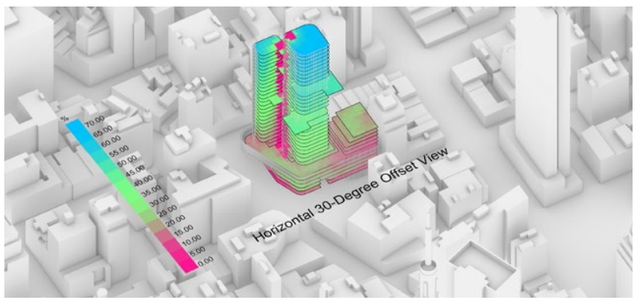
NORTH ELEVATION



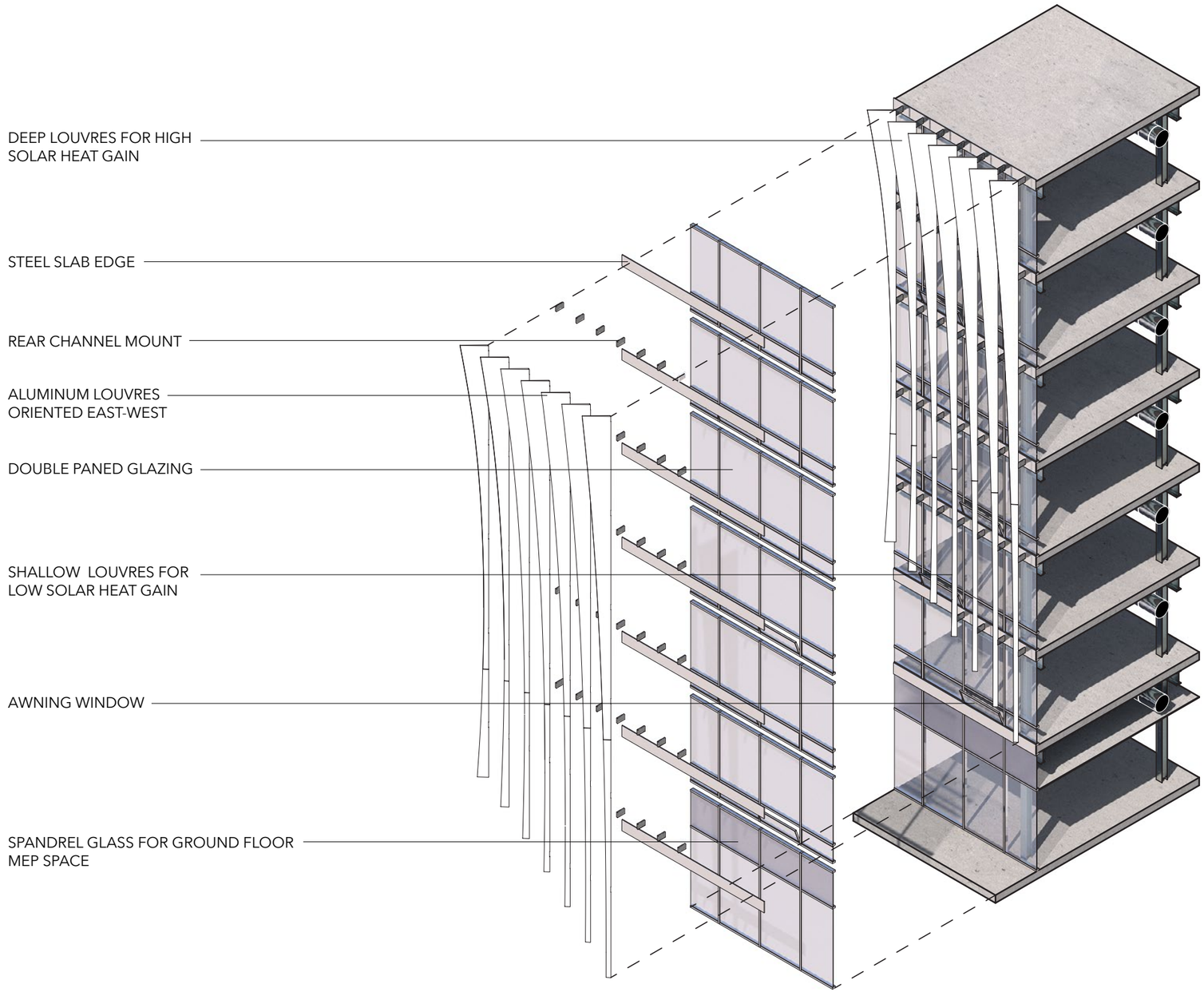
1 | To take advantage of east-west winds, the vertical louvres are oriented to maximize airflow into the awning windows.



2| Using attractors and values from sample points Ladybug analyses, the louvres' curve points are proportionately moved to accomodate greater solar heat gain.



3 | Greatest view access are on the towers for residential programs, and the two cores face inwards so that the living spaces' views won't be obstructed.

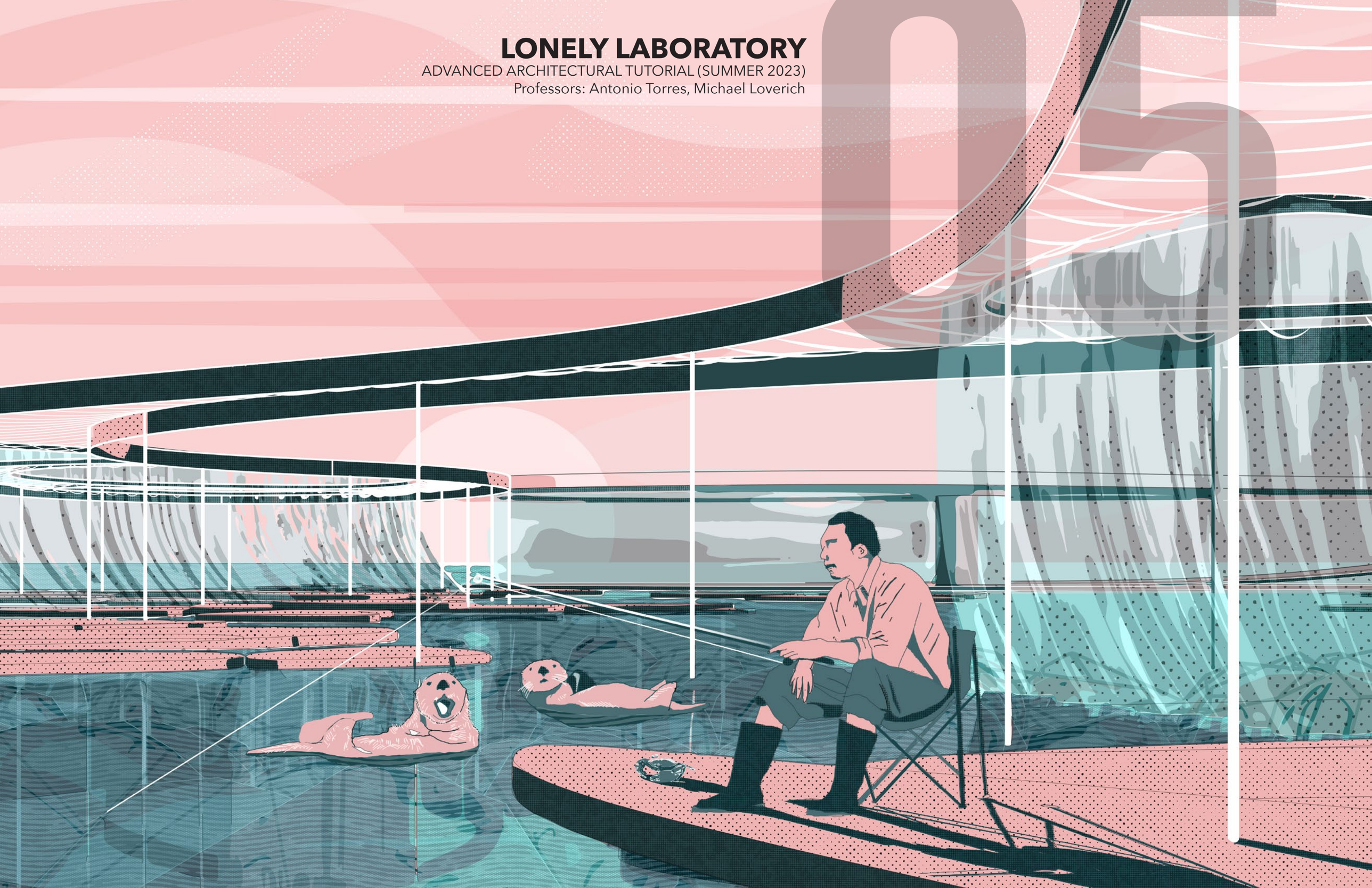


FACADE EXPLODED ISOMETRIC

LONELY LABORATORY

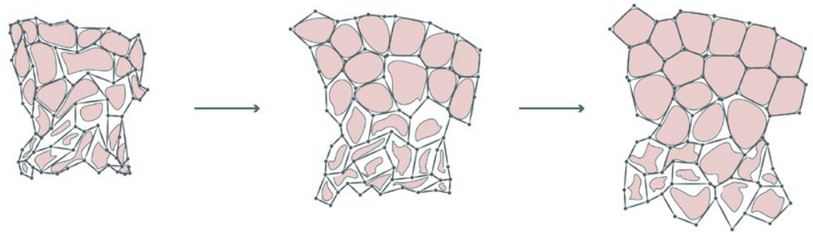
ADVANCED ARCHITECTURAL TUTORIAL (SUMMER 2023)

Professors: Antonio Torres, Michael Loverich

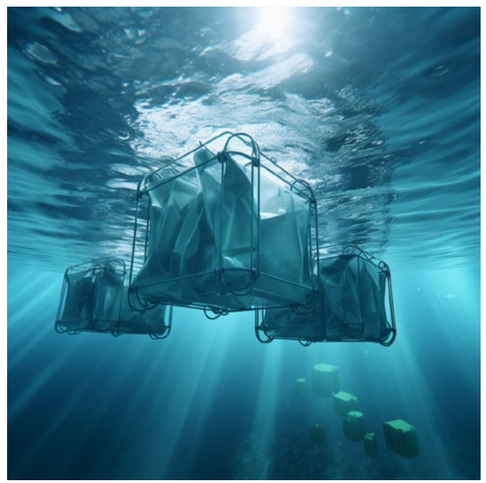


LONELY LABORATORY
a method of redefining sites of ecological study in marine habitats

The lonely laboratory speculates a future of harmonious environmental study, redefining human-ecology relationships through a symbiotic laboratory that transforms itself to become the ecosystem. The island, despite being a product of the Anthropocene, is a site of observation for the lone human.



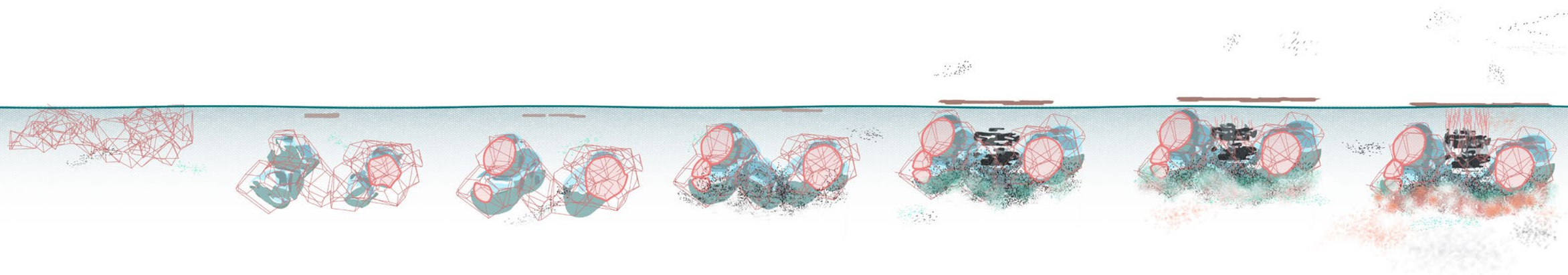
INFLATION PROCESS

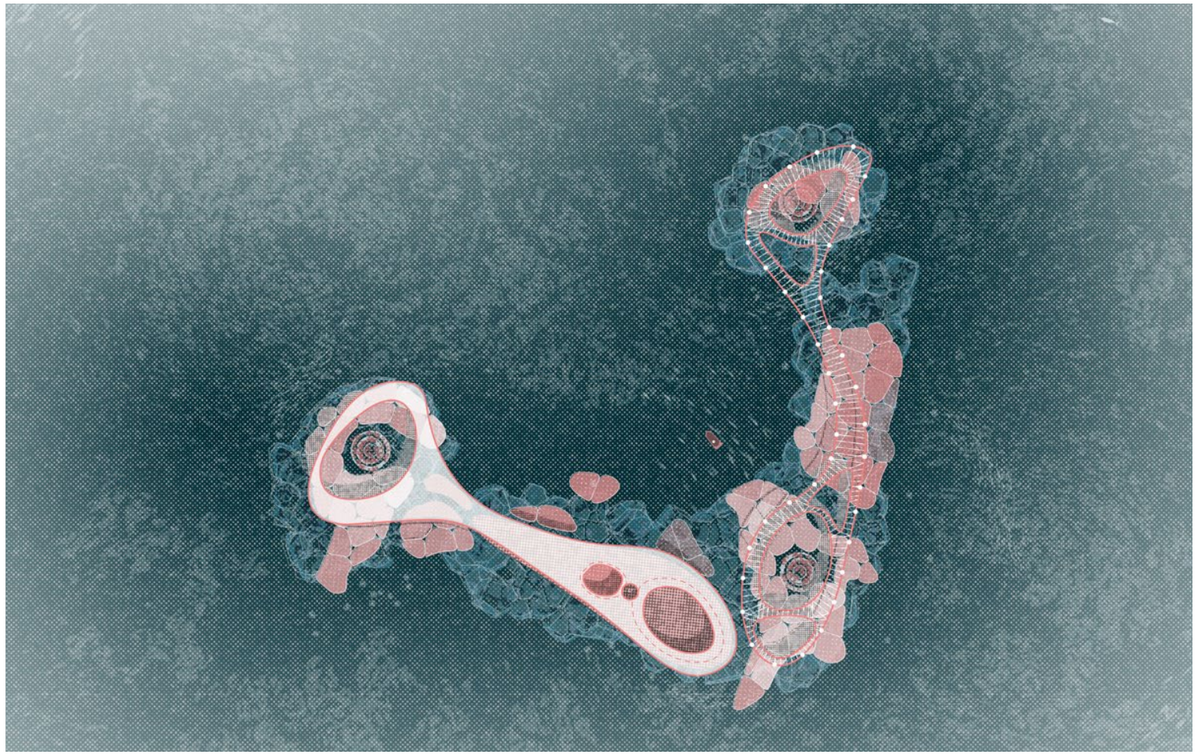



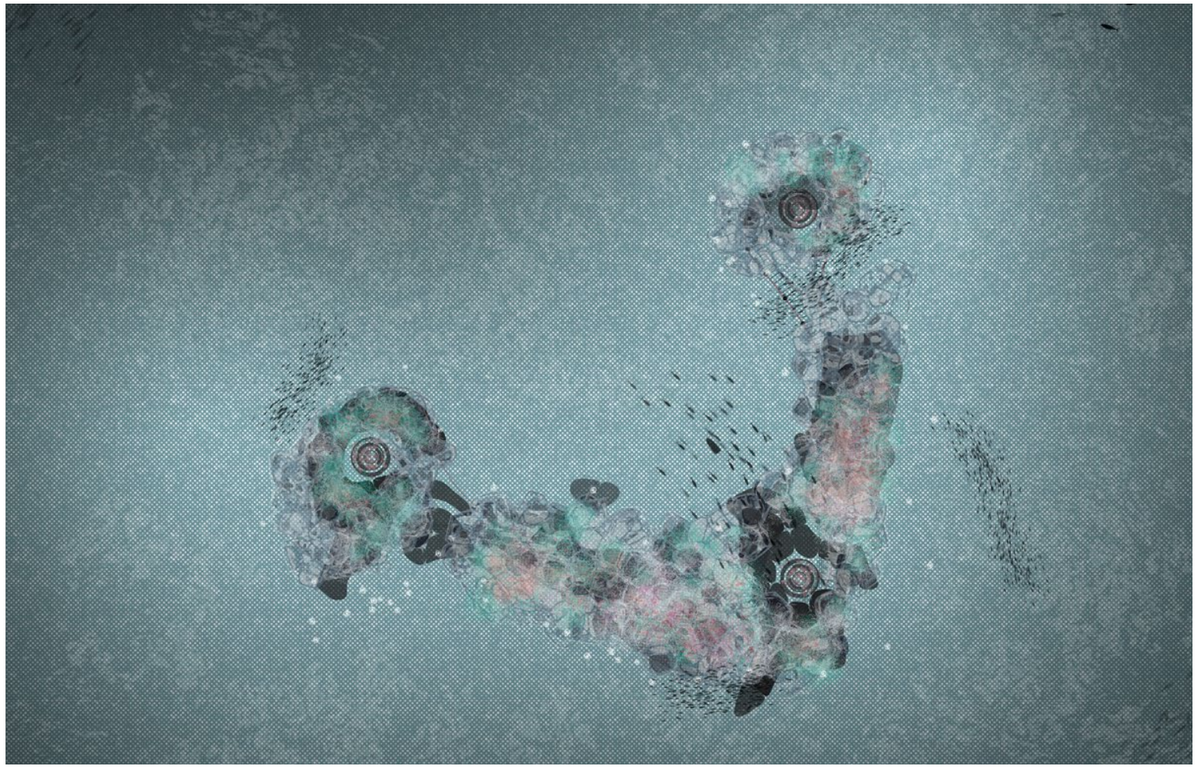
EARLY AI IDEATION

ISLAND TRANSFORMATION

Segments of rings act as the framework for new micro kelp forests. Coral polyps have attached to the aragonite crystals, forming a small reef on the underbelly of the island. Seagrass grows on the geofabric. Crabs, starfish, and other shallow water organisms crawl in the crevices of the undulating platforms. Fish, octopi, jellyfish, and other marine organisms wander throughout the shallow habitat.



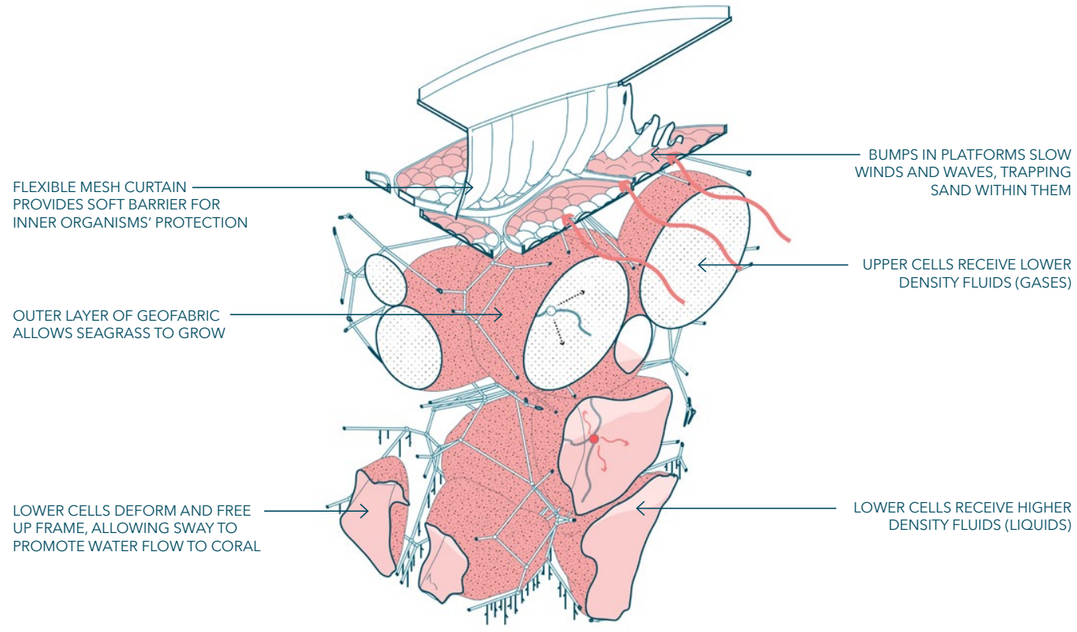




DRY ⟷ WET

CELLULAR MATERIAL

The vessels for the fluids are composed of a clear polymer that absorbs water, transforming its refractive index to be identitcal to water. This allows for a perfectly clear surface that maximizes sunlight exposure to plants at lower strata.



HABITAT STRATIFICATION

Different layers of the lonely laboratory support different species and ecologies, taking advantage of the island's biomechanical 'breathing' which allows for the top surface to rise and fall underneath sea level.

DAY 1 DAY 2 DAY 3 DAY 4 DAY 5

ARAGONITE GROWTH SIMULATION

The substrate is formed with acids reacting to dolomite, a limestone that reacts to form aragonite, a crystalline form of calcium carbonate that also happens to be the corpses of coral, the main substrate new coral attach and grow on.