

This is a catalogue of work developed over six semesters
at Columbia, GSAPP.

This is a catalogue of explorations in Revitalization.
Resiliency.
Reinvention.
Remediation.
Regeneration.
Readaptation.

This is a catalogue of my interests in architecture.

01	REVITA-LOT URBAN INTERVENTION <i>takara beautilion</i>	09
02	PS64 GREEN INFRASTRUCTURAL SCHOOL <i>tactile traction</i>	25
03	HOME//WORK NEW HOUSING TYPOLOGY <i>irregular</i>	47
04	RESTORE & REWILD COMMUNITY HUB <i>rai: the fungal bot</i>	71
05	EXTRACTIONS OF TOMORROW MATERIAL ECOSYSTEM OF DUNE SAND BIO-BRICKS <i>ma'dan tribes of iraq</i>	95
06	GROUND MATTER ART & DESIGN INCUBATOR	123



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REVITA-LOT

SCAFFOLDING THE URBAN VOID

MANHATTANVILLE, NY
 FALL 2019
 INSTRUCTOR: ALESSANDRO ORSINI

Located primarily along Broadway in Manhattanville, the project proposes a revitalization of privately owned, narrow empty lots to serve the typically under-served community of the previously incarcerated.

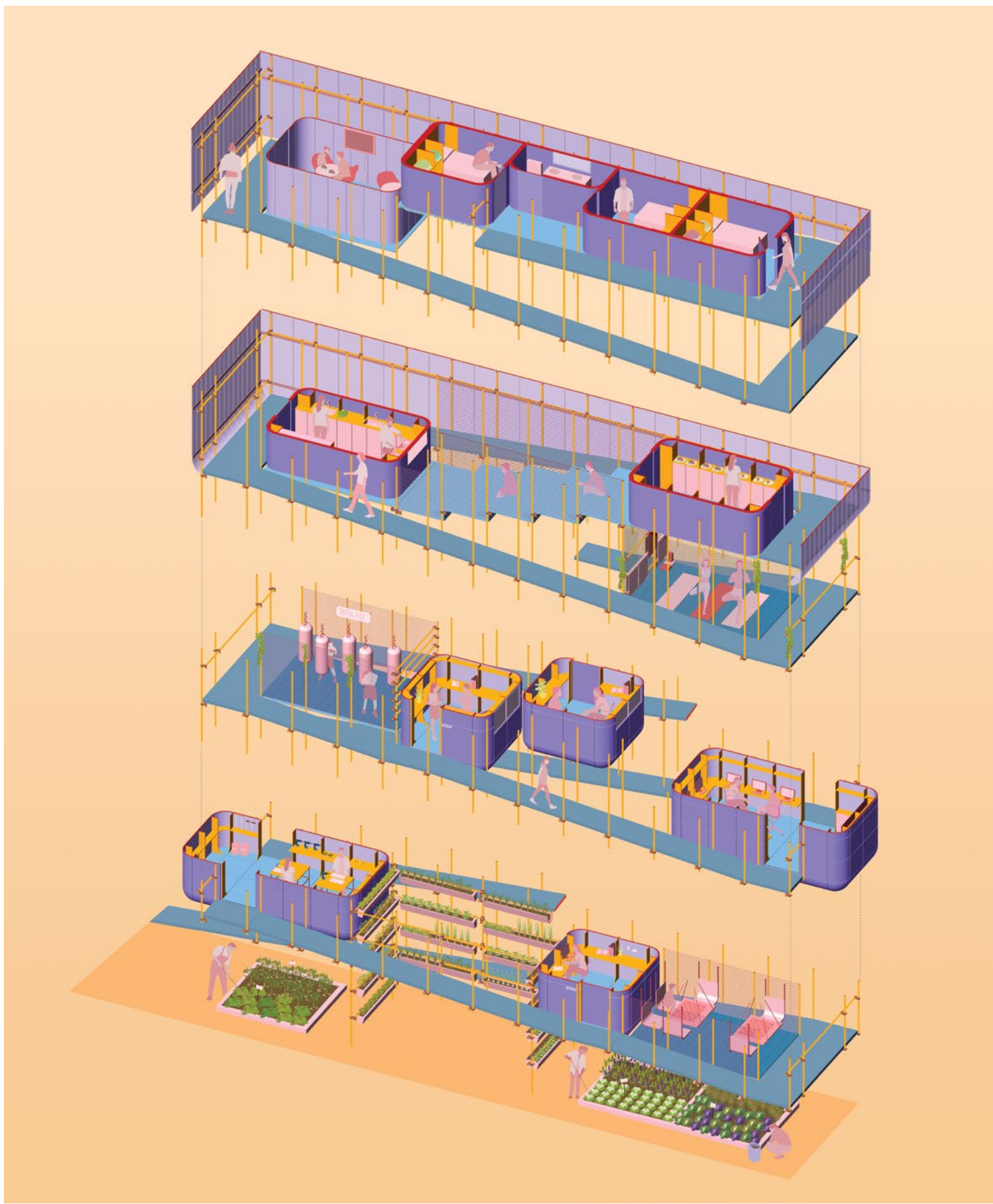
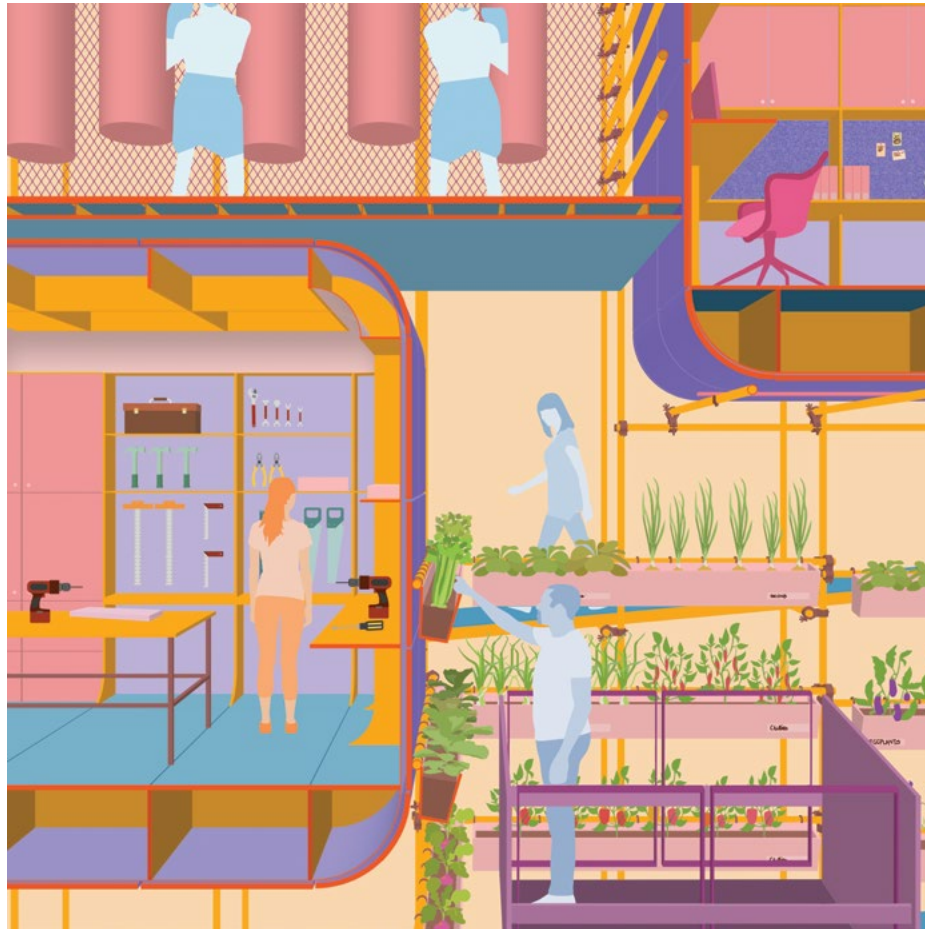
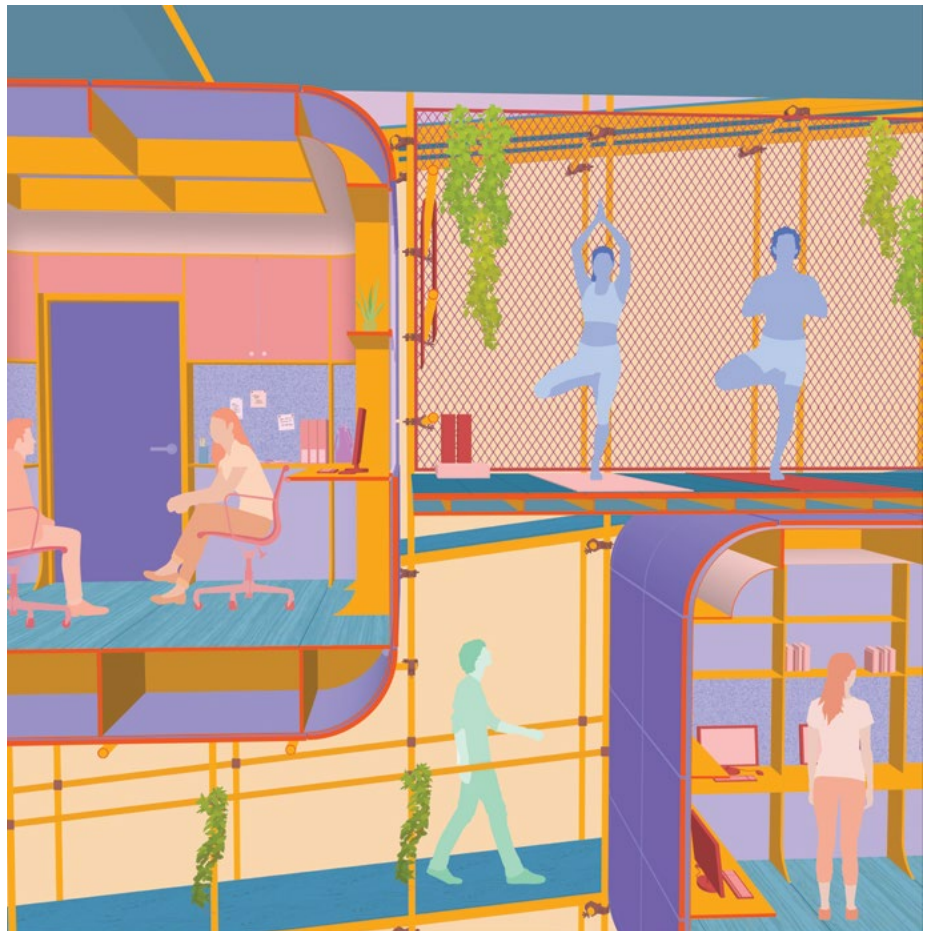
These 'urban voids' are a typology that exists throughout the city of New York and are often forgotten and left undeveloped.

The project proposes a design strategy that could revitalize such under developed urban voids to be used by NGOs to provide their services to the public. By choosing the typical typology of the empty lot in NYC - an infill lot- the project proposes a structure that inserts itself into the void, using the neighboring buildings as a structural support. As a result, it is able to lightly occupy the private lot, almost hovering over it.

Symbolizing impeding displacement, the scaffolding carries a negative connotation of gentrification in neighborhoods. This project uses it as a tool that brings positive change to the neighborhood and its inhabitants and not negative.

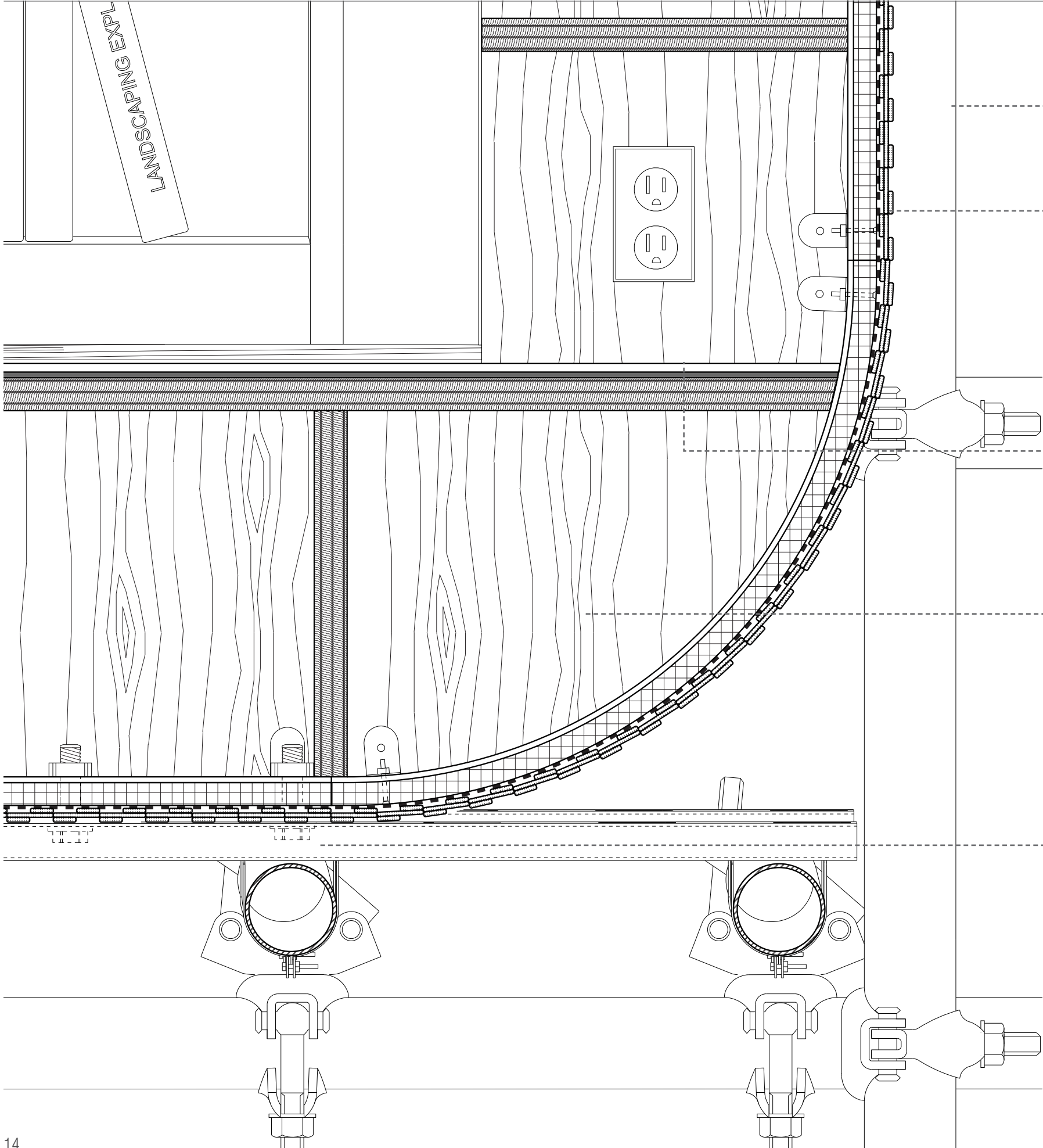
The design capitalizes from its easy constructibility as an asset for easy deployment onto the various urban voids present in the neighborhood. The scaffolding provides a structural framework that enables various program to be inserted within it and allows for a gradient of porosity through the program as one ascends through the project.

01.01 ELEVATION



01.02/03 MODULE VIGNETTES
 01.04 PROGRAMMATIC OBLIQUE





---SCAFFOLDING SYSTEM

---FACADE PANELS:

- RECYCLED WOVEN PLASTIC BAGS
- WATER BARRIER
- 1" RIGID INSULATION
- 1/4" PLYWOOD INTERIOR

---FLOORING SYSTEM:

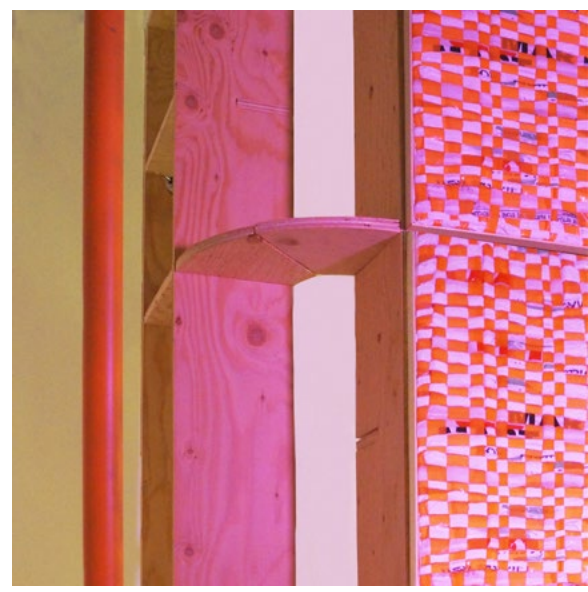
- 1/4" FLOOR FINISH
- RUBBER SOUND ATTENUATION
- 2" PLYWOOD FLOORING

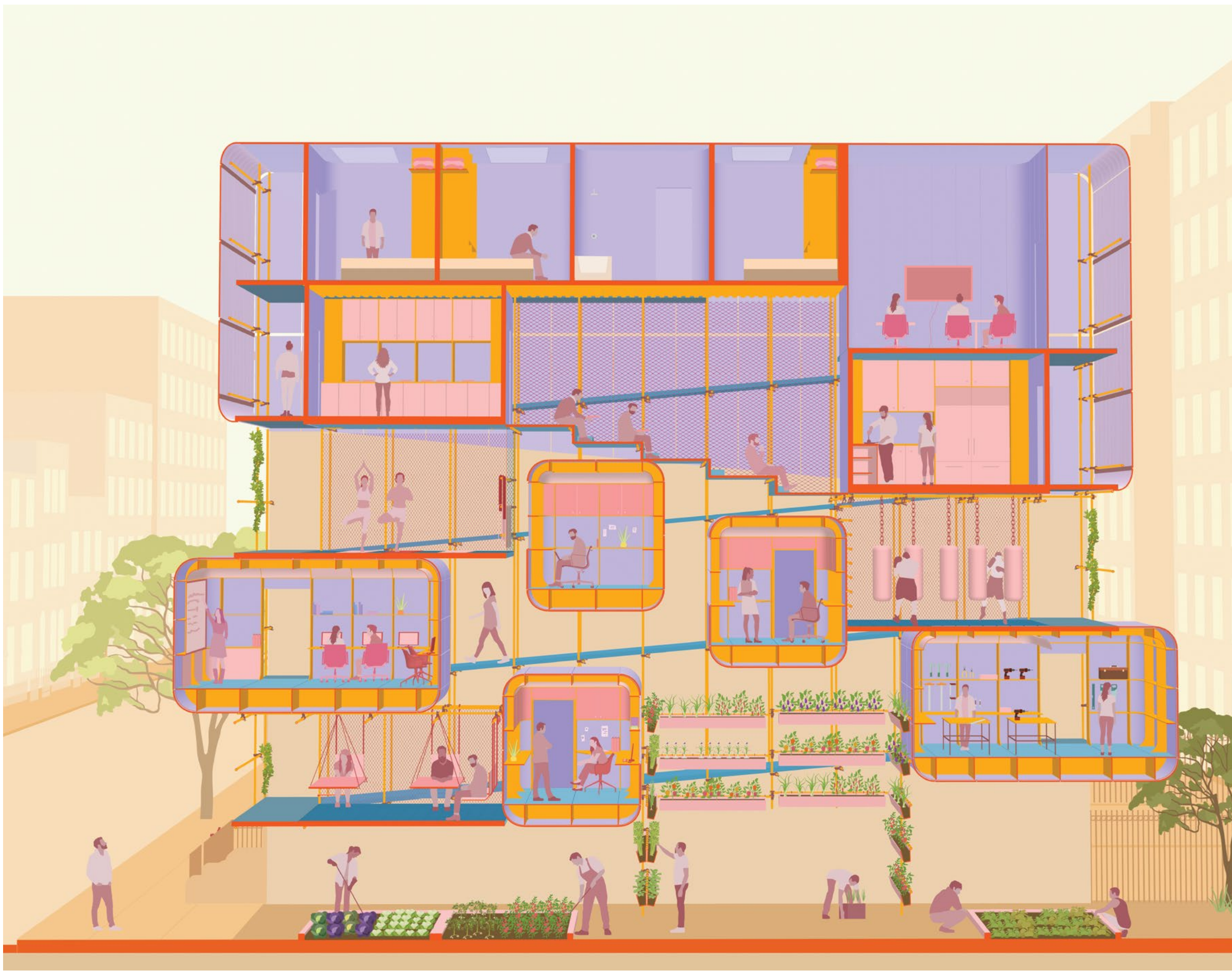
---MODULE PLYWOOD WAFFLE STRUCTURE [BEYOND]

---MODULE CONNECTION DETAIL:

- STEEL TRACK
- HEX BOLT CONNECTIONS
- CONDUIT PIPE WALL SLEEVES

01.06 MODULE DETAIL

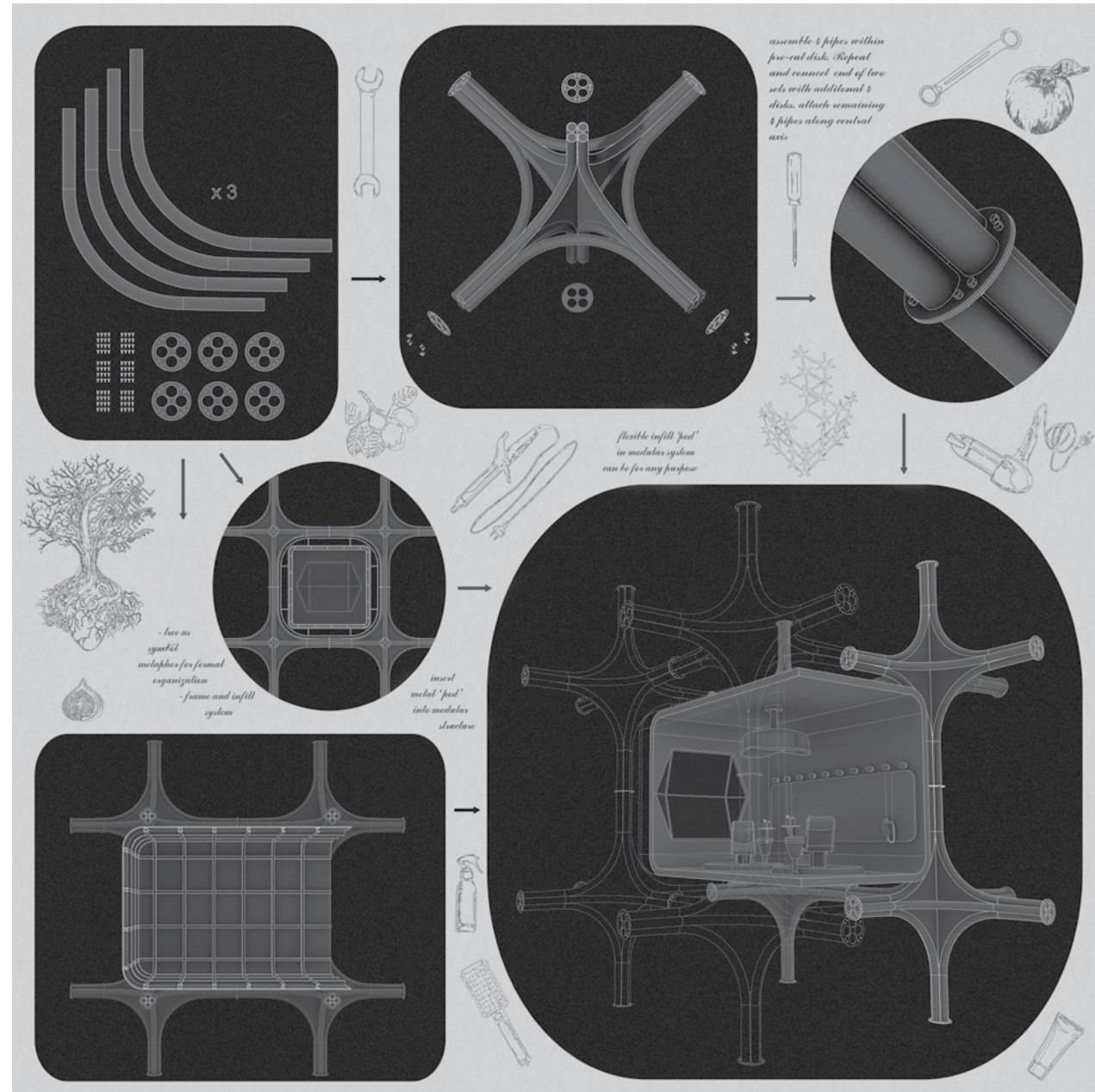




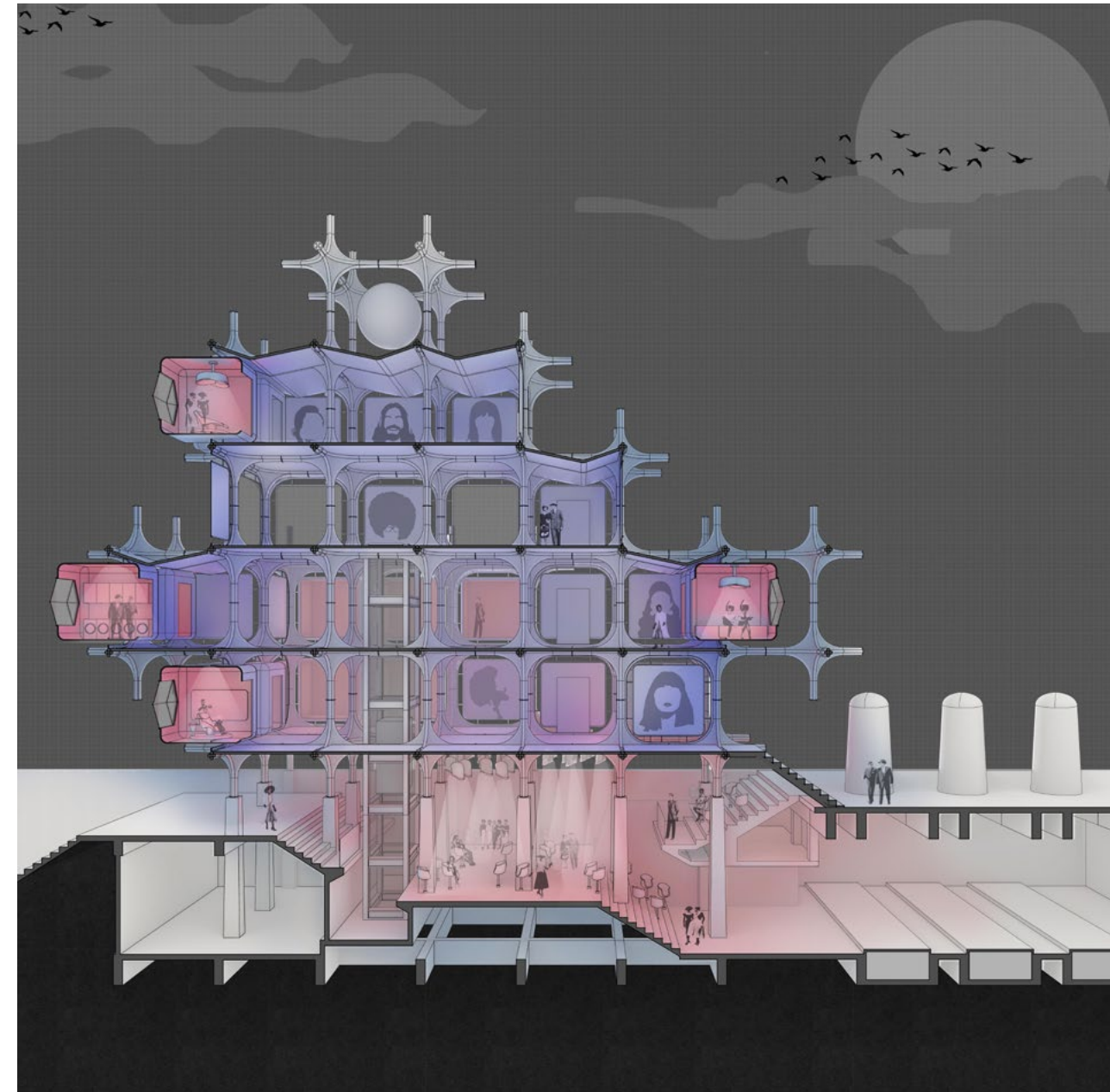
01.07 SECTION PERSPECTIVE

takara beutilion | case study

ARCHITECTURAL DRAWING REPRESENTATION I
INSTRUCTOR: BIKA REBEK

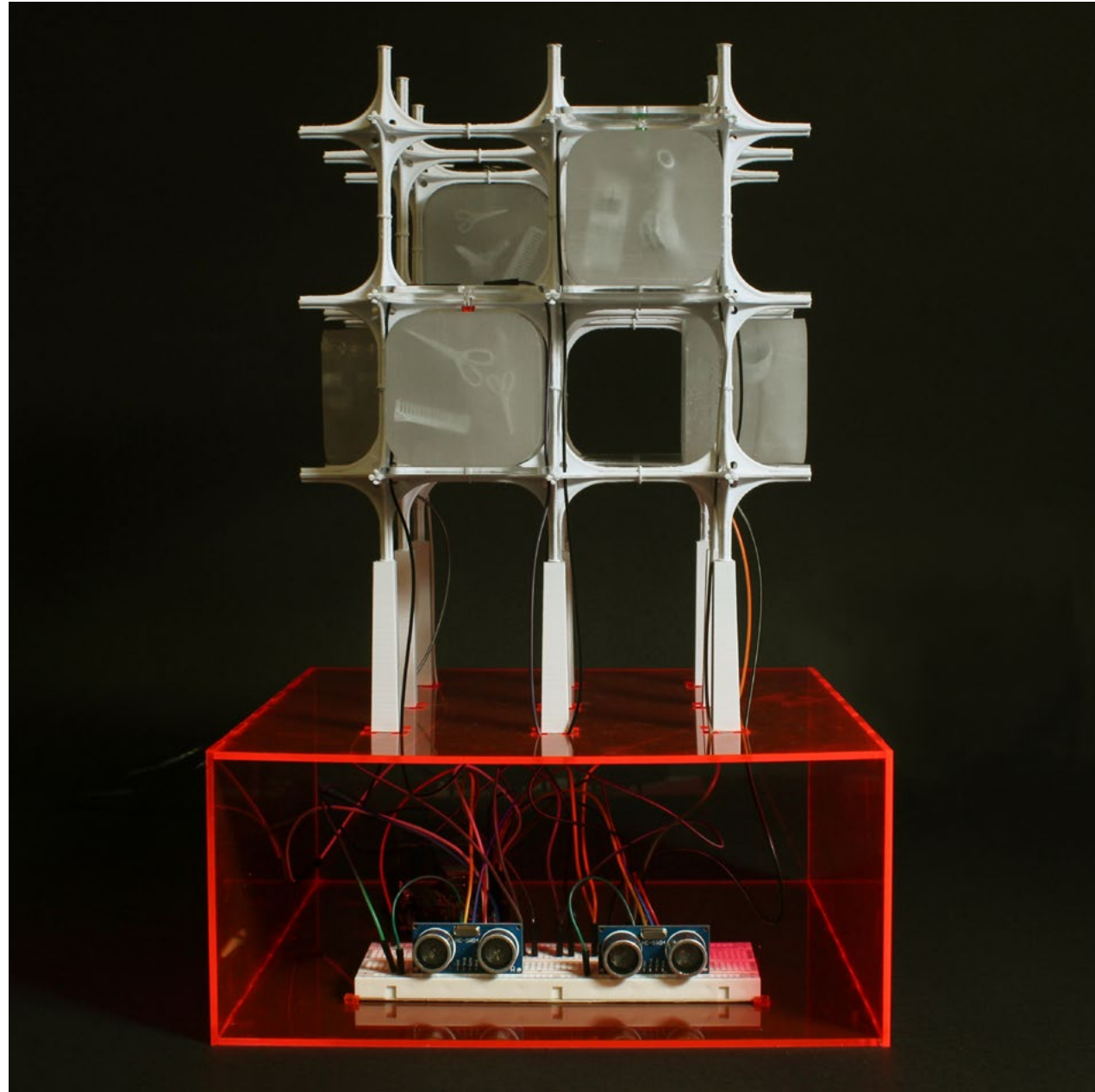


module components

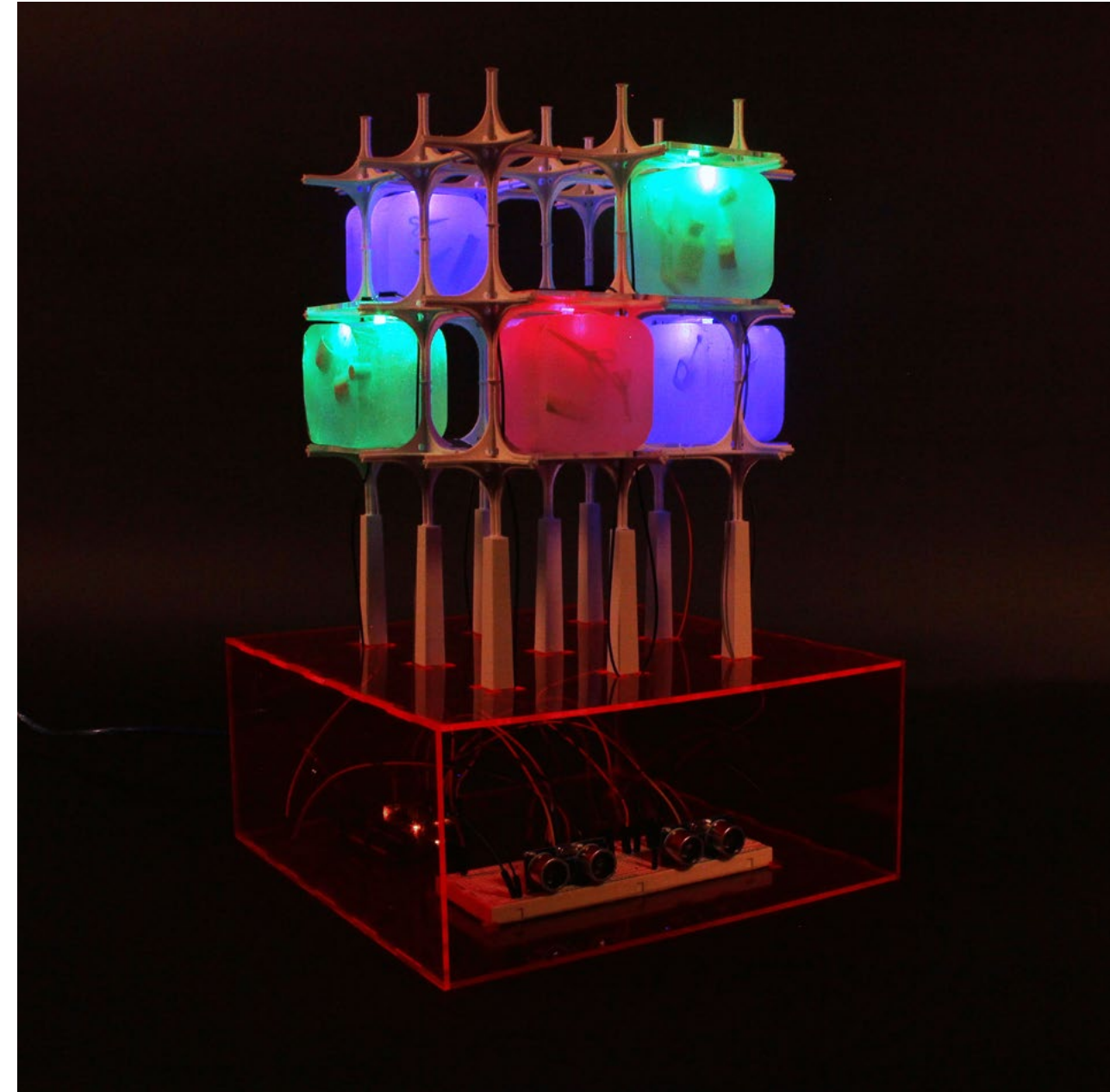


section

Case study of the Takara Beutilion Pavillion of the Metabolist movement at the 1970's world expo. The modular construction allowed for a quick framework into which prefabricated modules were inserted. The generic framework can host multiple program variations, proving that the identity of the structure comes forth by the human interaction and occupation.



conceptual model



animated modules



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PS-64 GREEN INFRASTRUCTURAL SCHOOL

LOWER EAST SIDE, NY
 SPRING 2020
 INSTRUCTOR: EMMETT ZEIFMAN

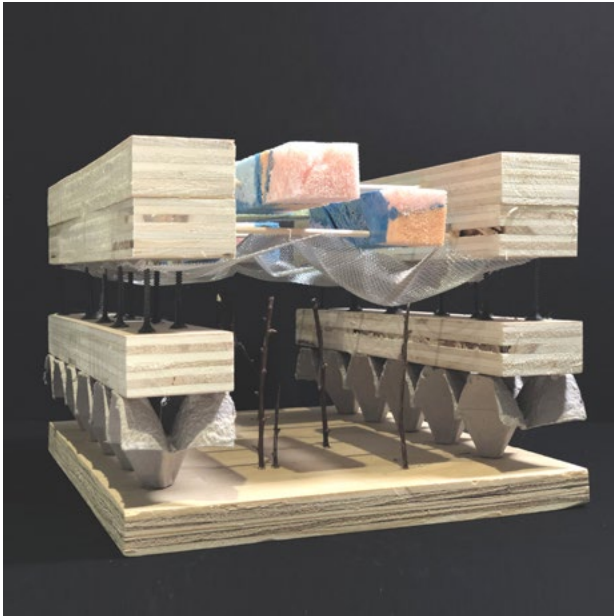
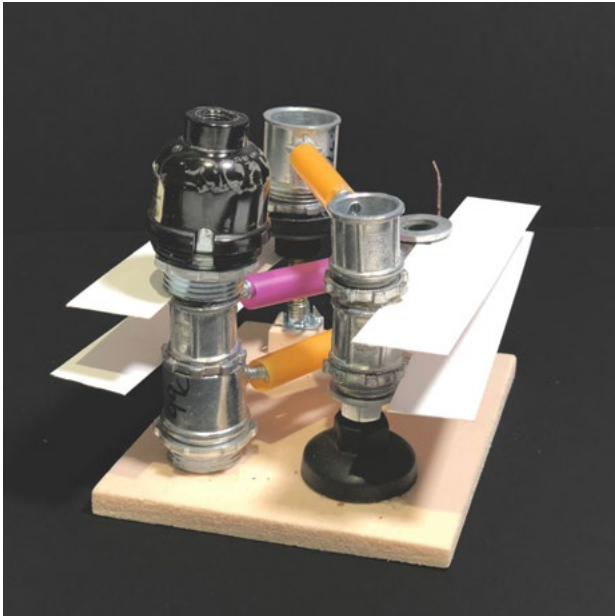
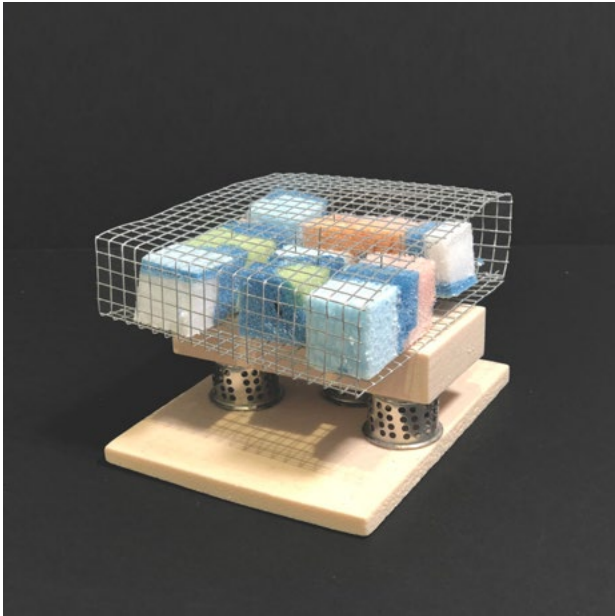
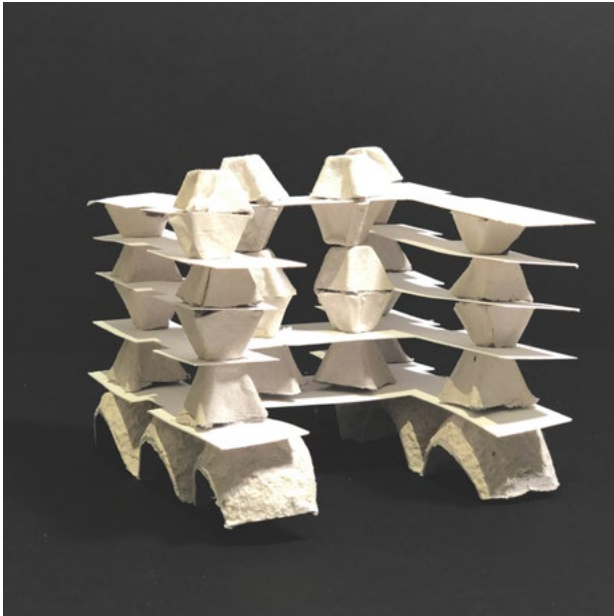
The new PS64 integrates itself into the LES as a mega green infrastructure that is able to participate within the community by being more than just an educational institution. The integration of green strategies like bioswales, rainwater collection, and on-site composting not only creates a sustainable pedagogical shift within the school, but also allows it to serve the community as a whole by integrating itself into an existing network of community gardens serving as flood mitigation zones.

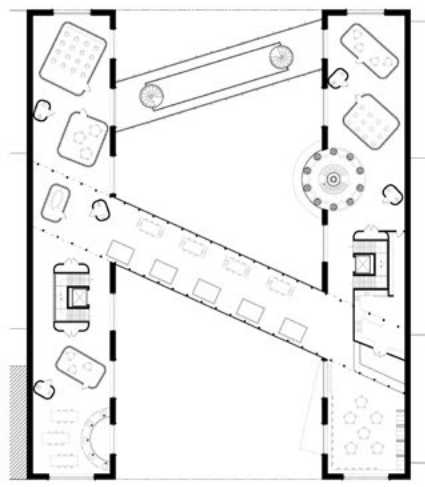
The conventional class room model is replaced by 'LEARNING ZONES' that are paired with specific green strategies based on the type of learning that these found infrastructural pieces provide formally.

Scaled-up and color-coded versions of 'found' green infrastructural elements like water filtration tanks or composting drums are not only embedded into the mass of the existing school building but also into the pedagogy of the proposed school.

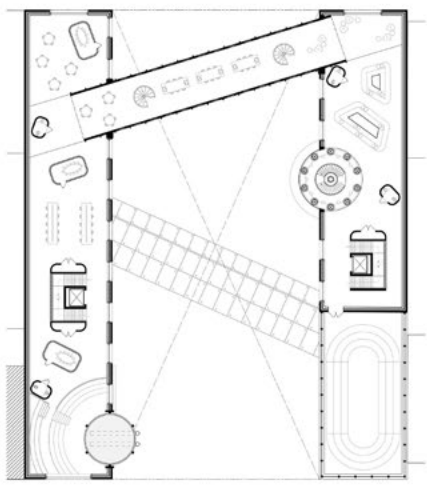
These zones are meant to allow for learning to take place as an interactive practice, where students are immersed within their study of sustainable practices. The color coded spaces become a visual aid to show these strategies interact with each other in a larger system.

02.01 CONNECTIVE THROUGH-WAY

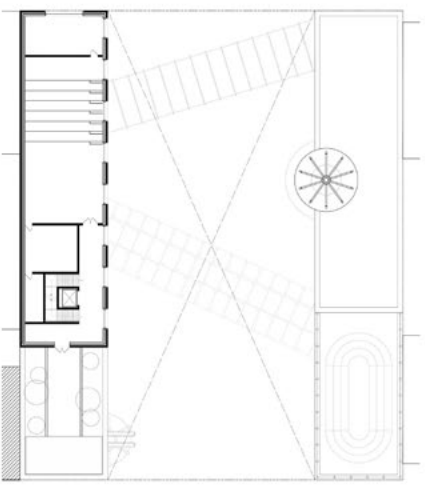




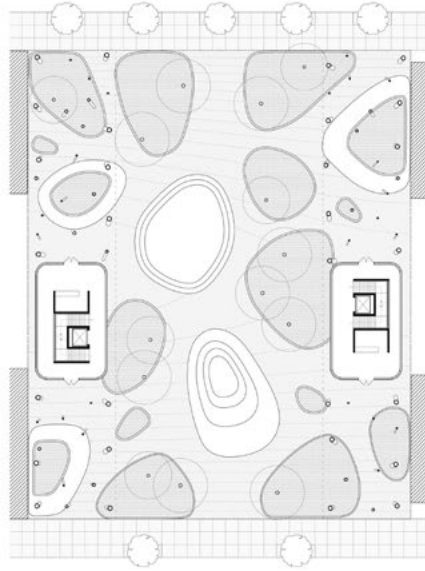
LEVEL 04



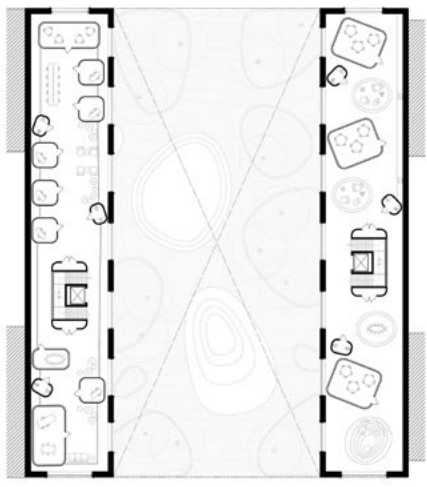
LEVEL 05



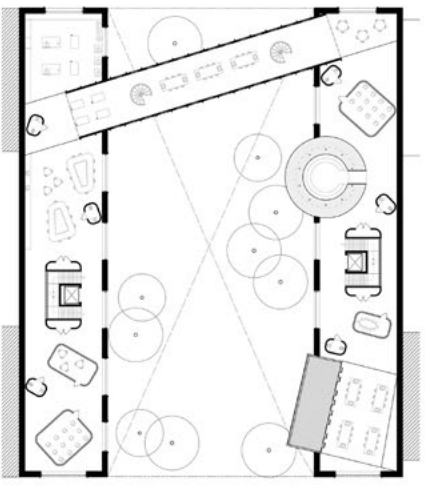
LEVEL 06



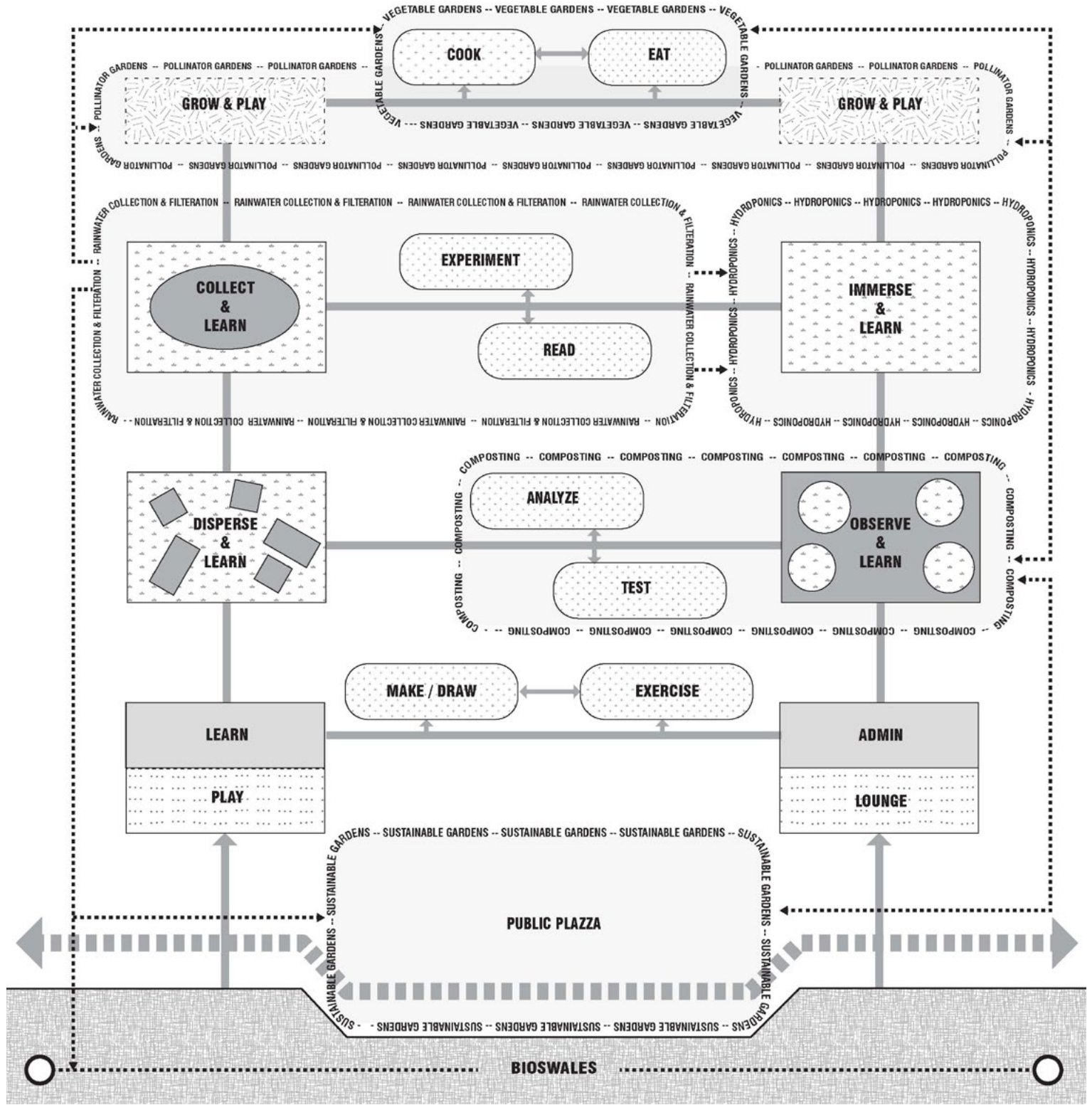
LEVEL 01

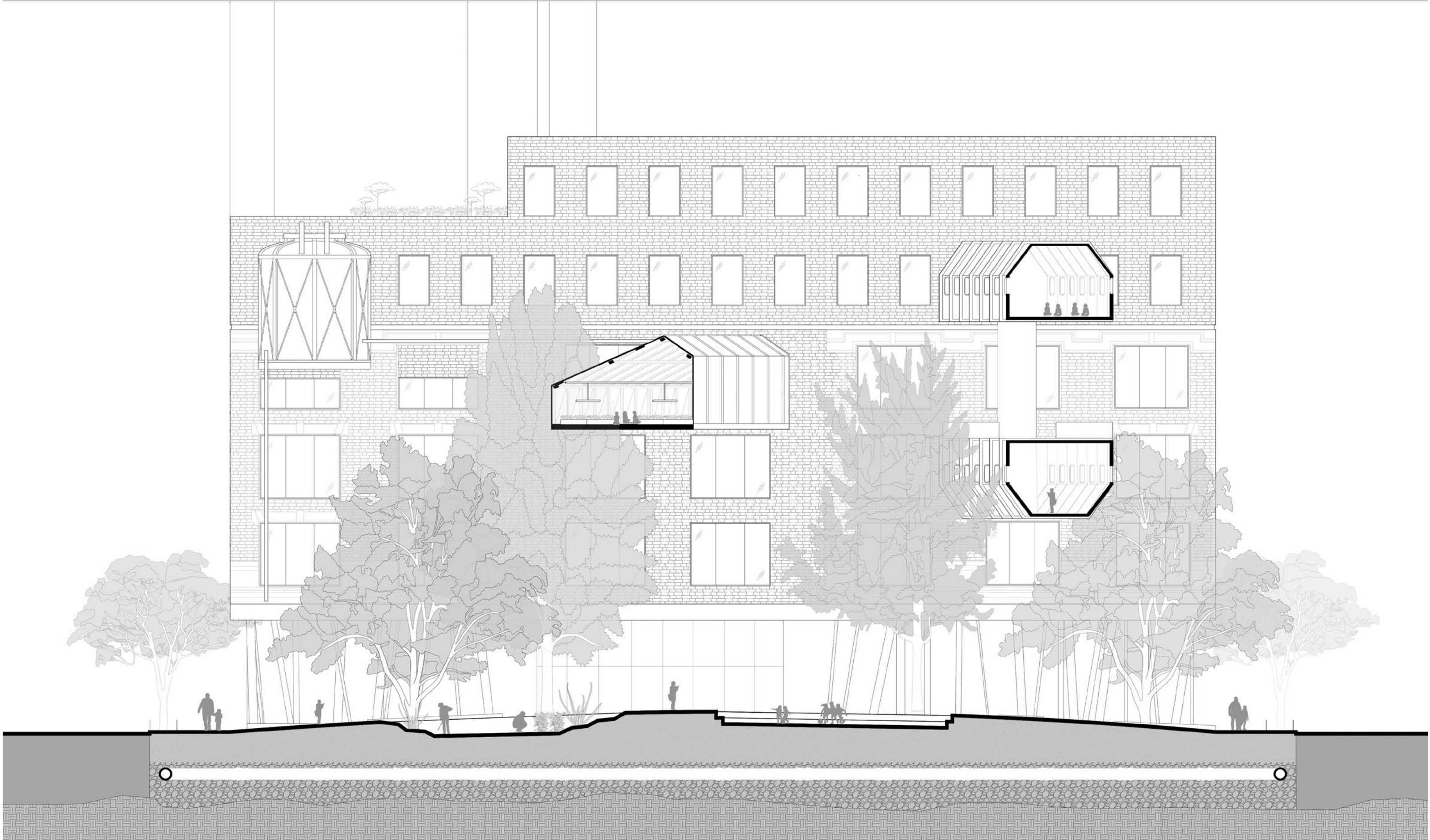


LEVEL 02

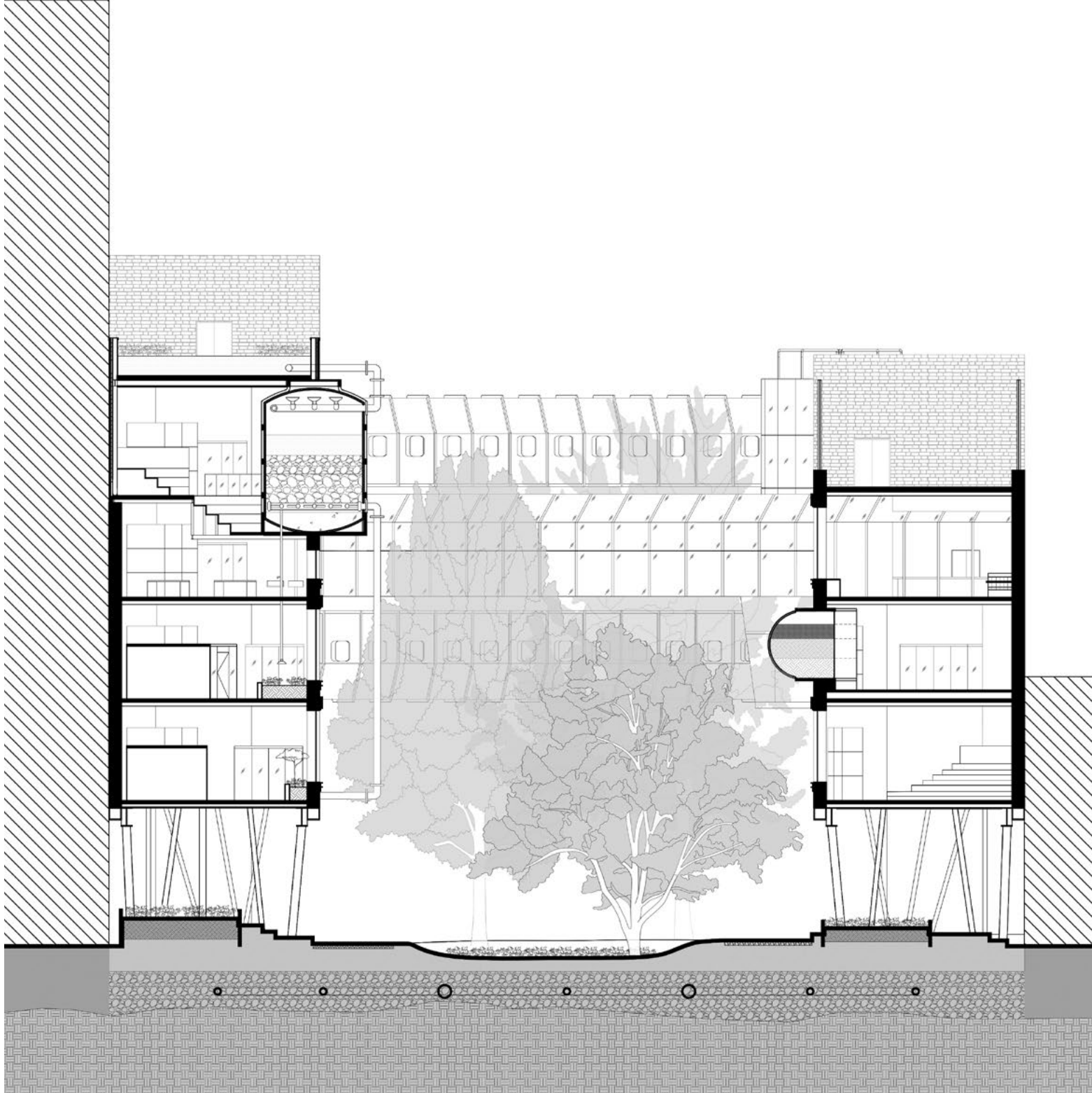


LEVEL 03

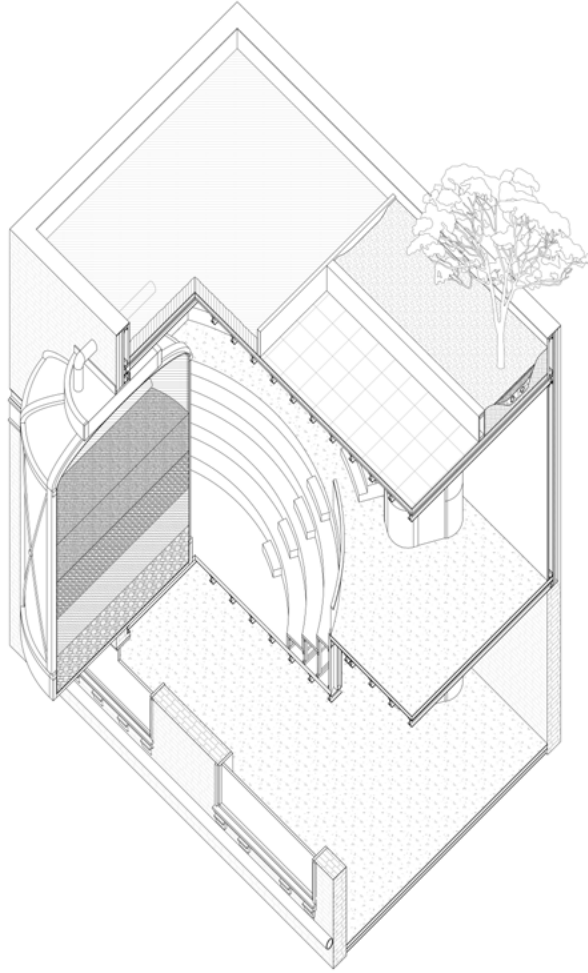




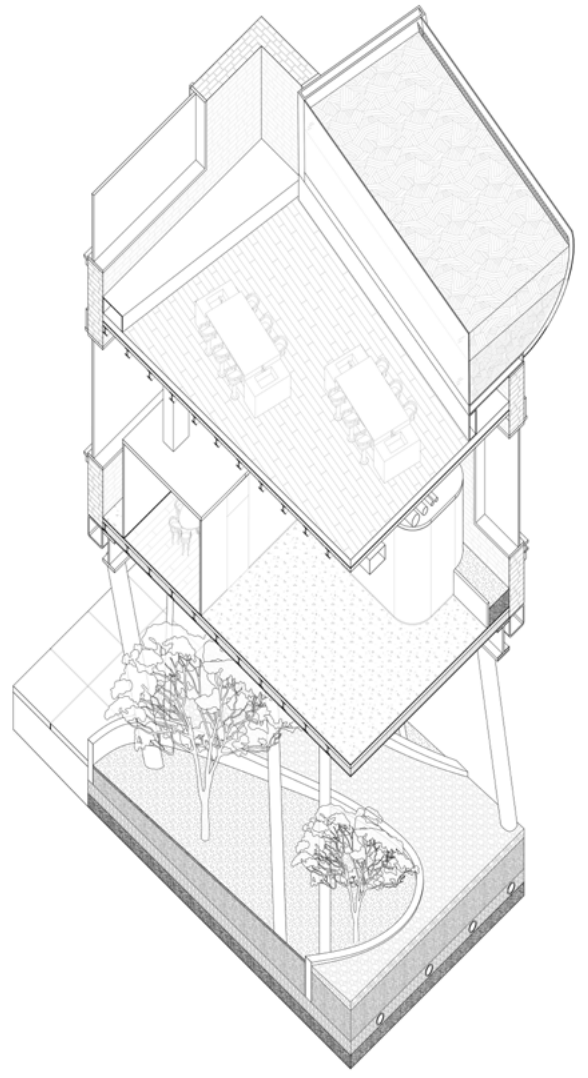
02.05 TRANSVERSE SECTION



02.06 CROSS SECTION



02.07 RAINWATER FILTRATION AUDITORIUM
02.08 COMPOSTING SEPARATION LAB

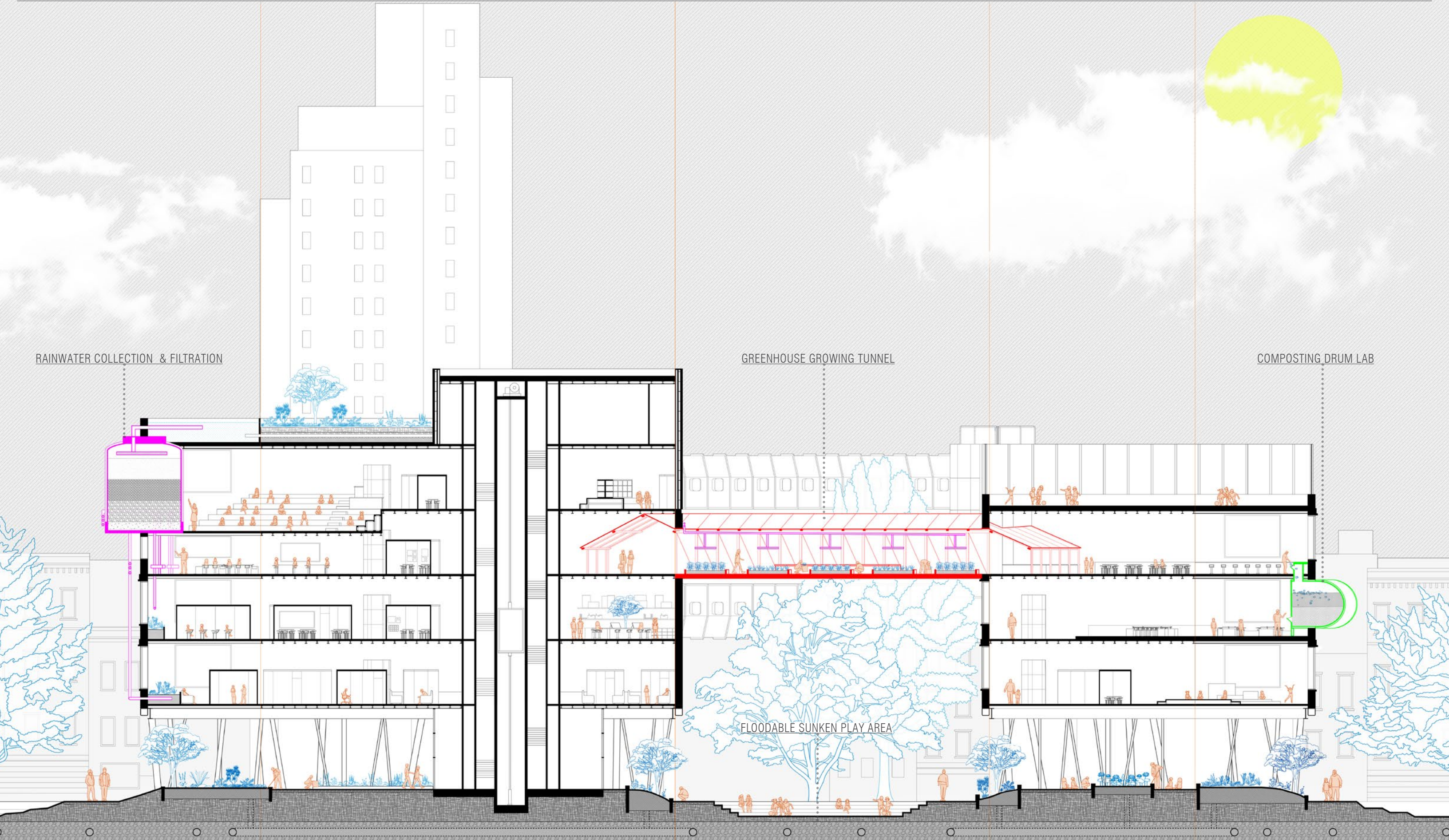




02.09 AQUAPONIC CLASSROOM



02.10 GREENHOUSE CLASS TUNNEL



RAINWATER COLLECTION & FILTRATION

GREENHOUSE GROWING TUNNEL

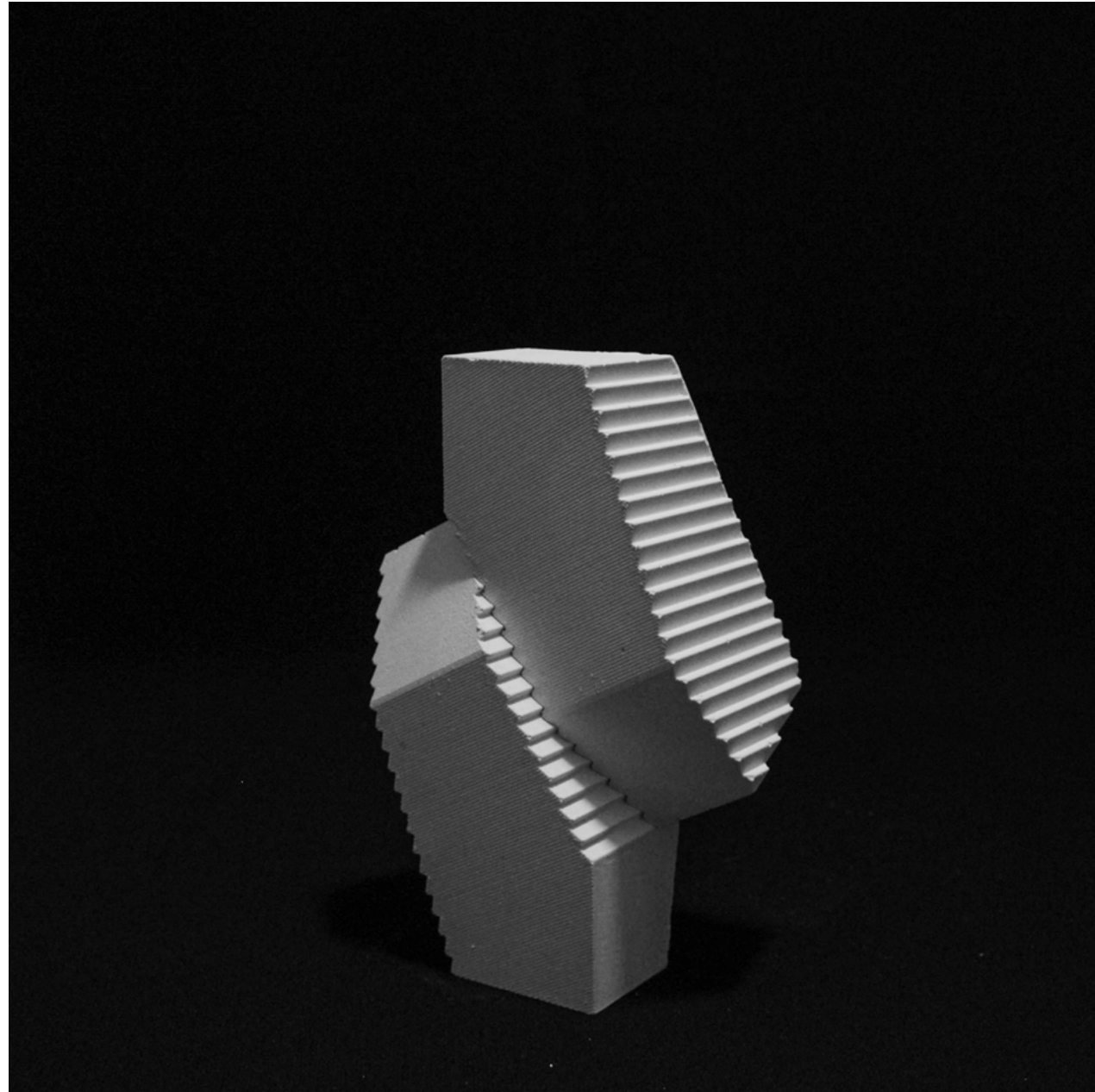
COMPOSTING DRUM LAB

FLOODABLE SUNKEN PLAY AREA

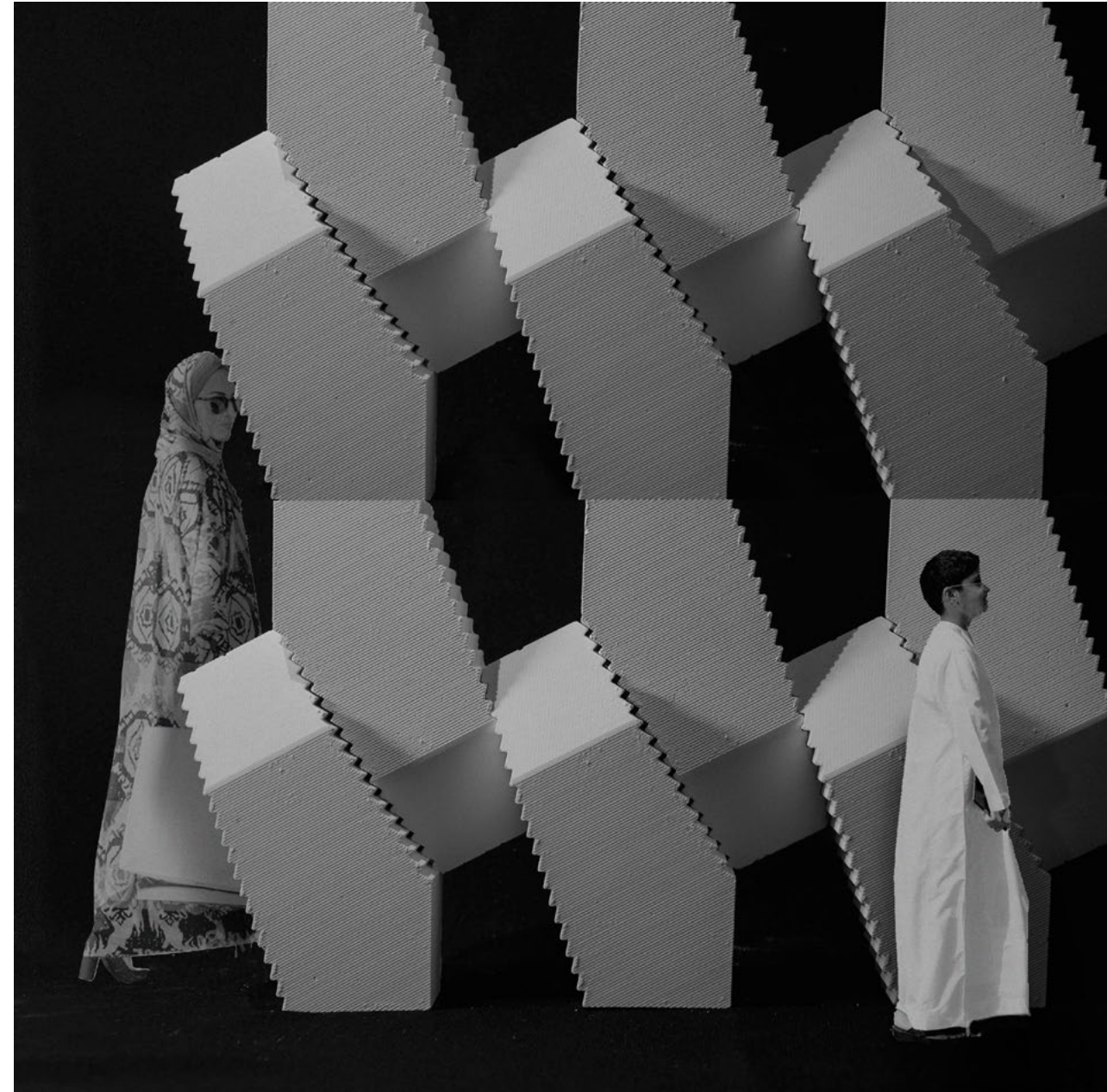
tactile traction | *form study*

TRANSITIONAL GEOMETRIES
INSTRUCTOR: JOSHUA JORDAN

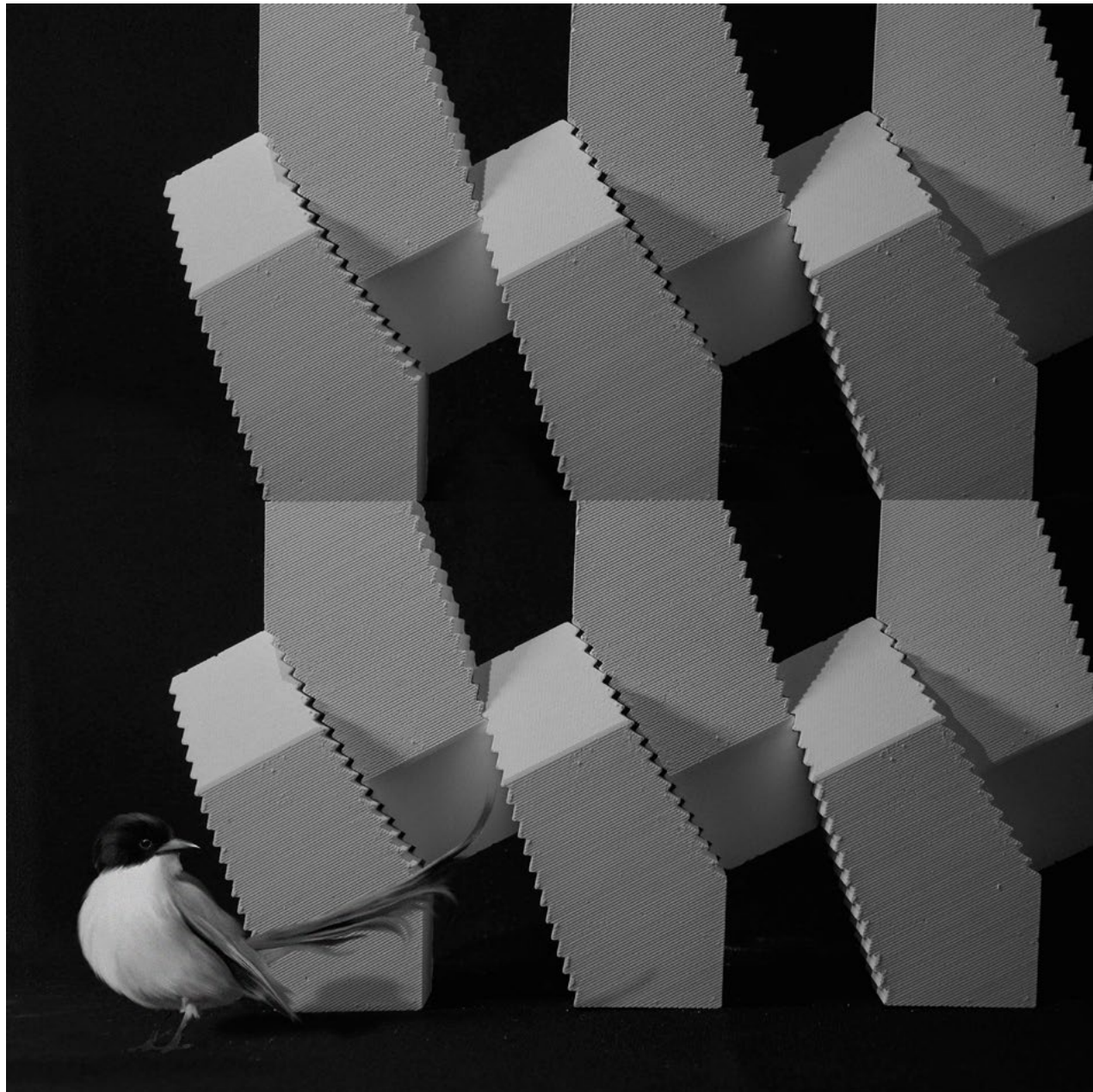
Tactile Traction are a unique five-sided irregular brick. The irregularity of the form and the surface striations allow for varied tiling opportunities creating screens of varied shapes and openings. Not only do the striations provide textured variation, but they also act as a connection detail through the traction provided by its tactility.



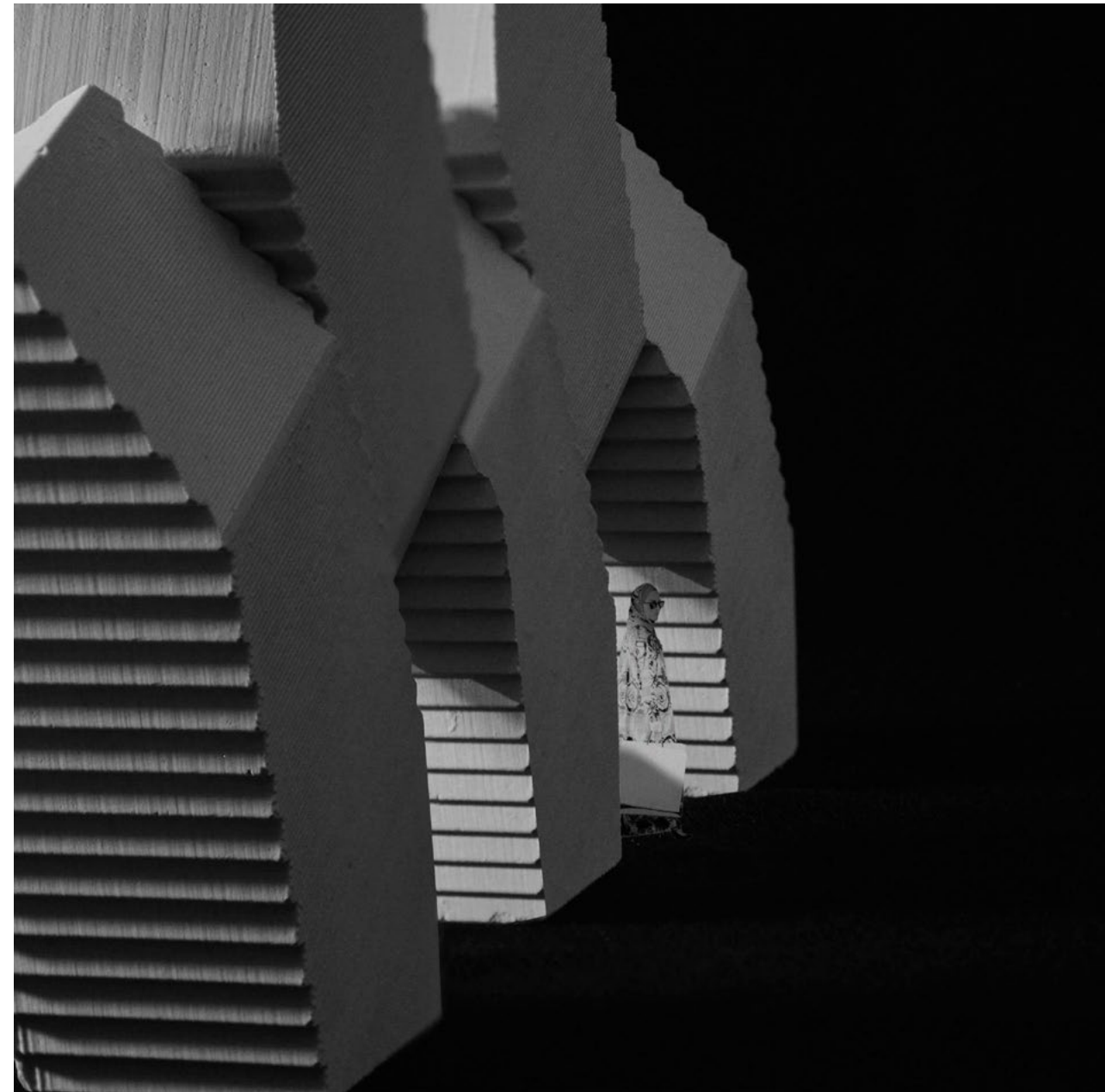
original tile



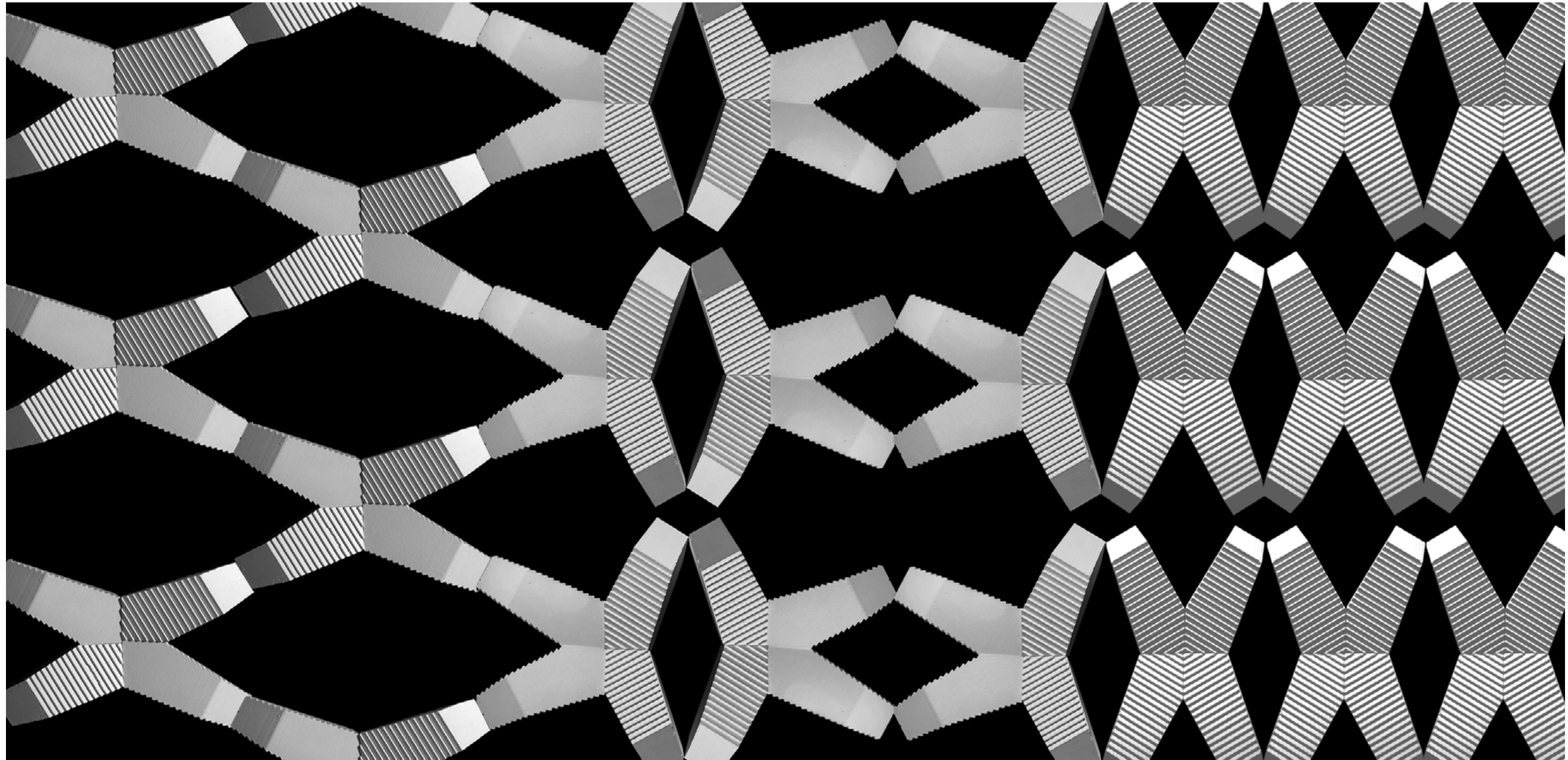
tiling screen



tiling screen



tile colonnade



tiling variations



HOME//WORK (IN)COMPLETE HOUSING TYPOLOGY

SOUTH BRONX, NY
FALL 2020
INSTRUCTOR: ADAM FRAMPTON
WITH: ADAM VOSBURGH

Thinking of housing in terms of incomplete/complete prioritizes thinking of systems over architecture. For our proposal, we frame the completion of housing through the coalescence of work within the domestic realm.

Living with COVID has stretched the role of housing by collapsing living and working in the same space. Current housing models do not allow for such a co-existence to occur without significantly altering living conditions. In this temporary, yet new normal, how can we design for not only a flexibility of living, but also for one of work?

Home/Work is a new typology of housing made up of a series of skinny towers housing units where living and working can coalesce.

03.01 SITE OBLIQUE

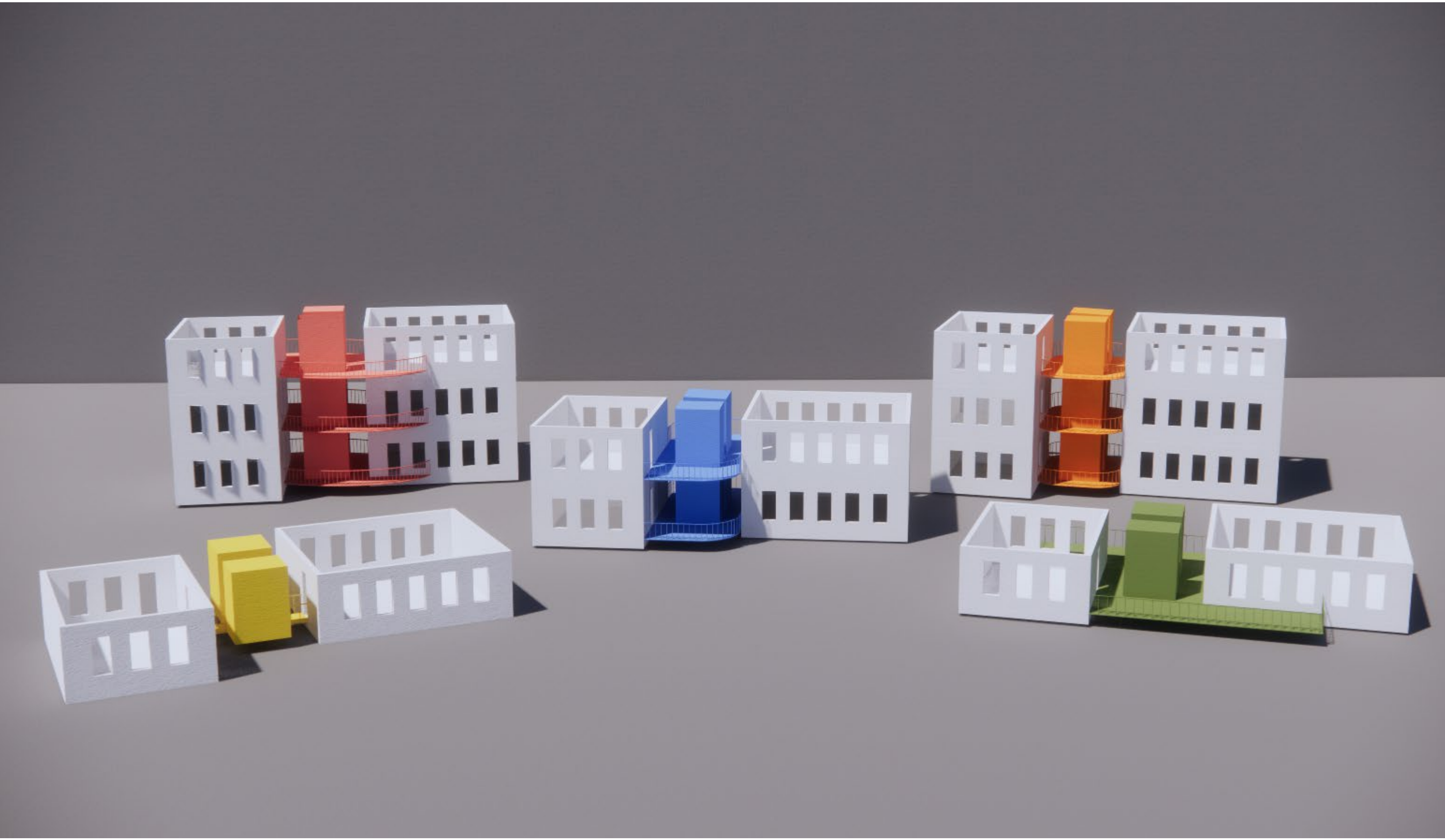
We propose framing the home as an agglomeration of expanded mechanical systems that wouldn't normally be found in a multi-unit apartment building, in order to provide flexibility more akin to a high-tech office space.

This takes place within a raised floor system supported above CLT slabs and bar joists. The joists provide a depth that enable opportunities for sectional differences of the raised floor system that clear the structural and mechanical grid.

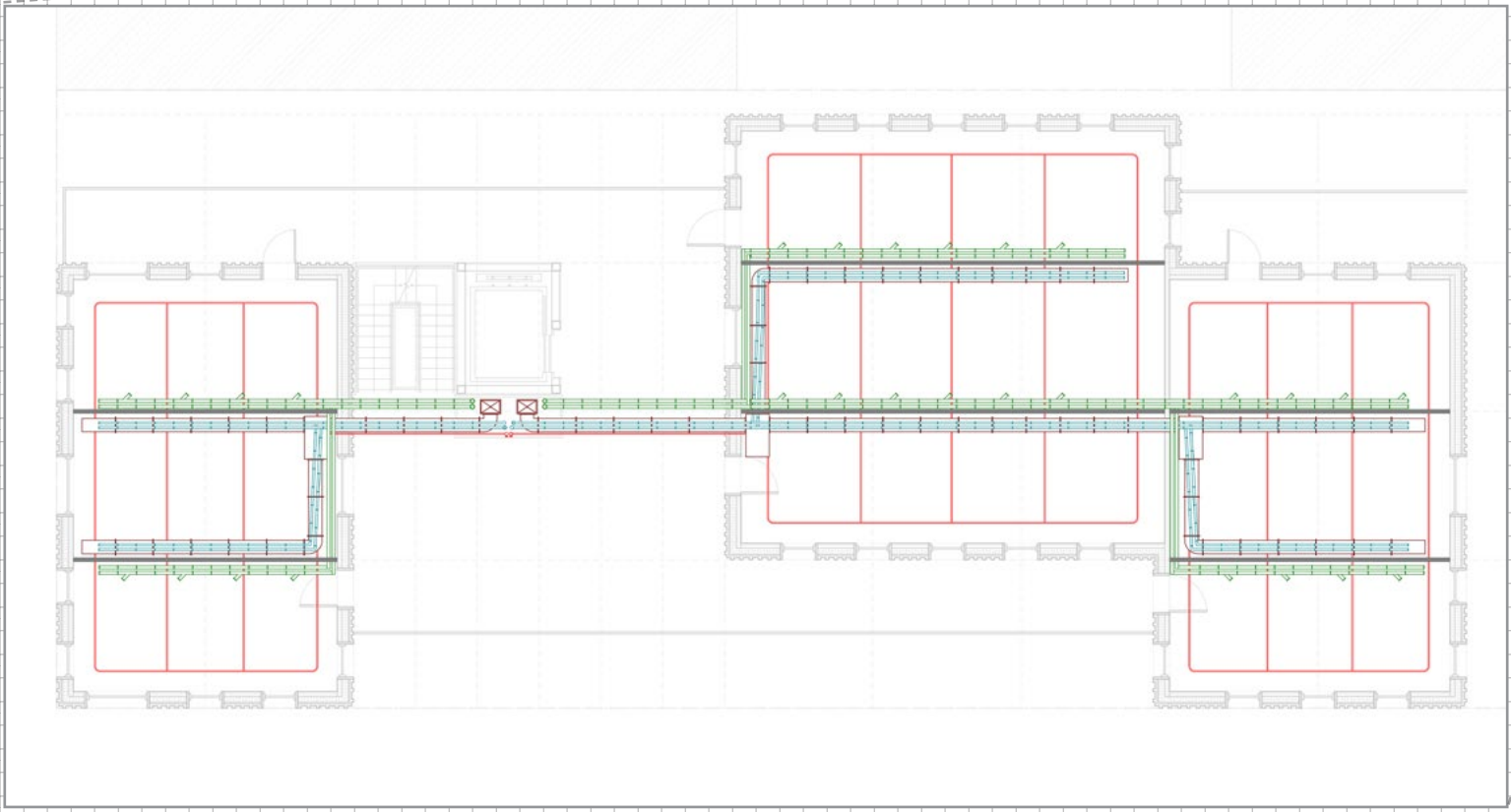
This system allows for occupants to pursue various work life combinations that would otherwise be not possible in typical housing; the unfinished condition of the unit holds a world of possibilities for the occupant's needs.



03.03 SITE ELEVATION



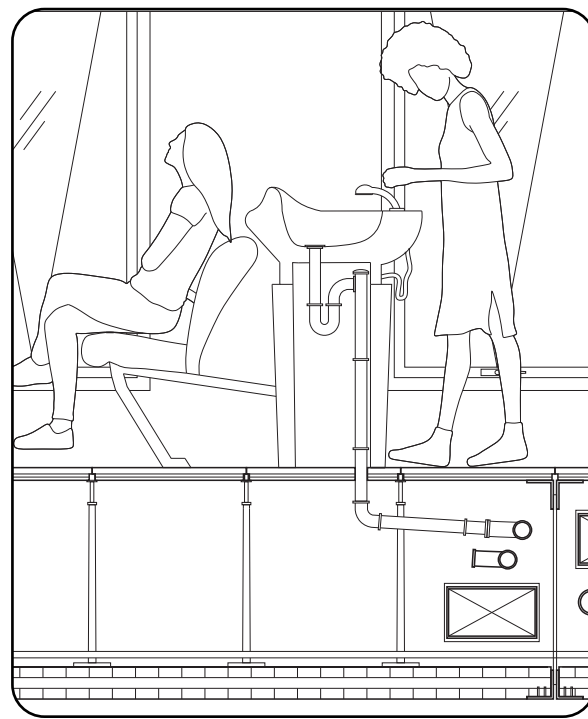
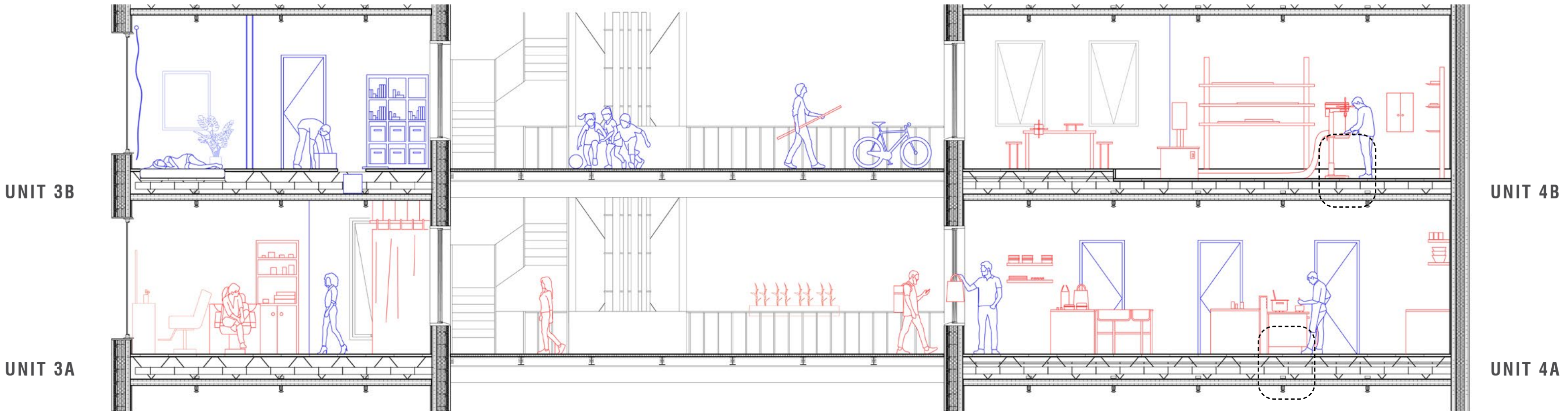
03.02 TYP. CORE MODULE STUDY MODELS



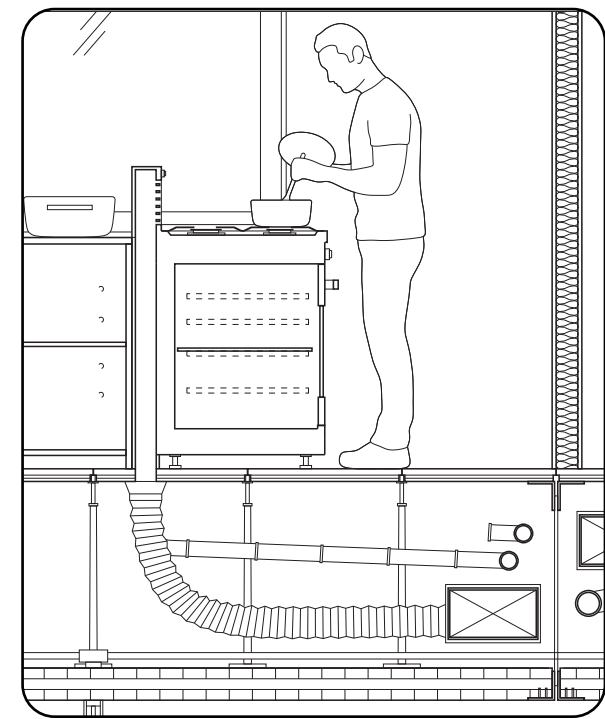
03.04 FRAGMENT MECHANICAL NETWORK
 03.05 GROUND & TYPICAL FLOOR PLAN



03.06 THICKEN FLOOR SYSTEMS UNDER CONSTRUCTION



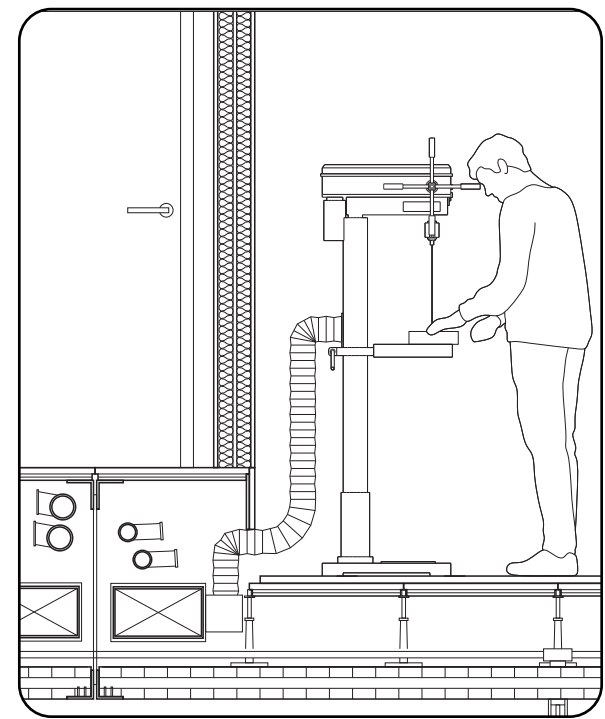
3A | HAIRDRESSER



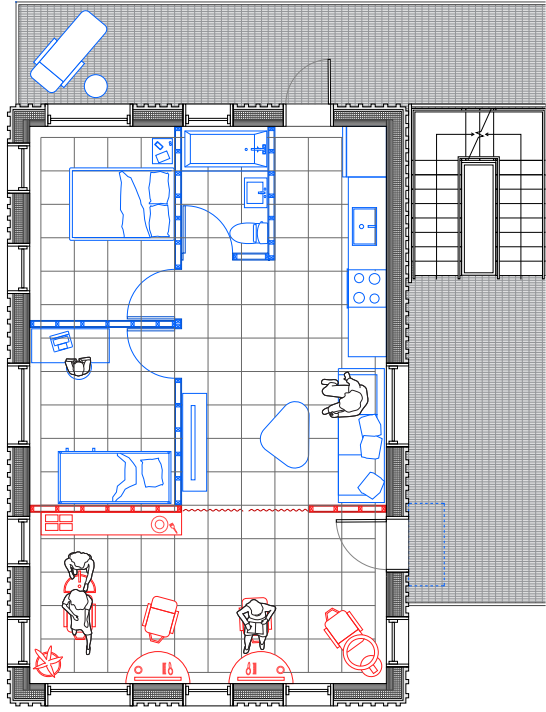
3B | CATERERS



4A | ROOMMATE



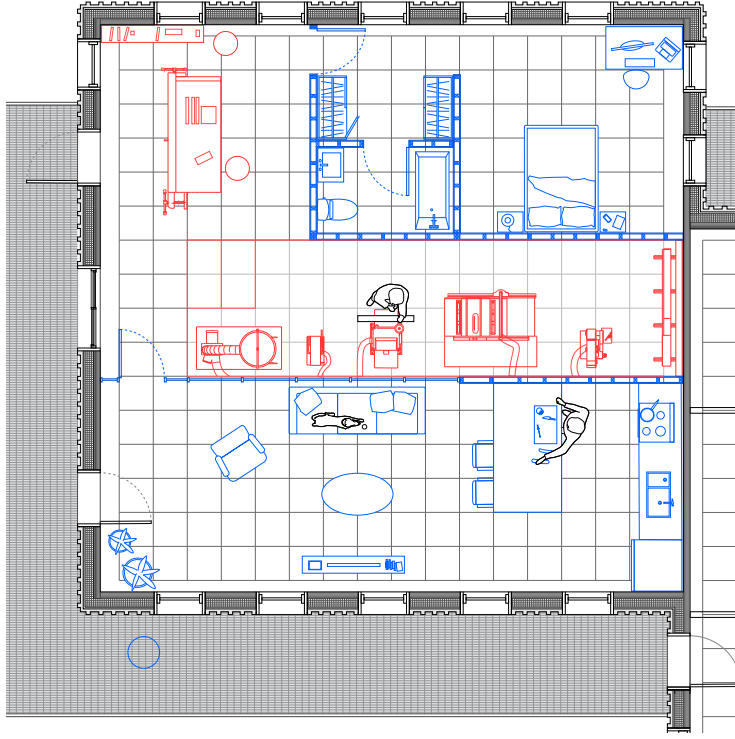
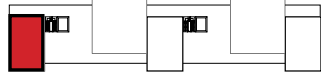
4B | WOODWORKER



Unit 3A | The Hairdresser



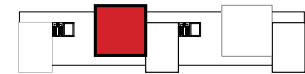
LIVE WORK



Unit 4B | The Woodworker



LIVE WORK





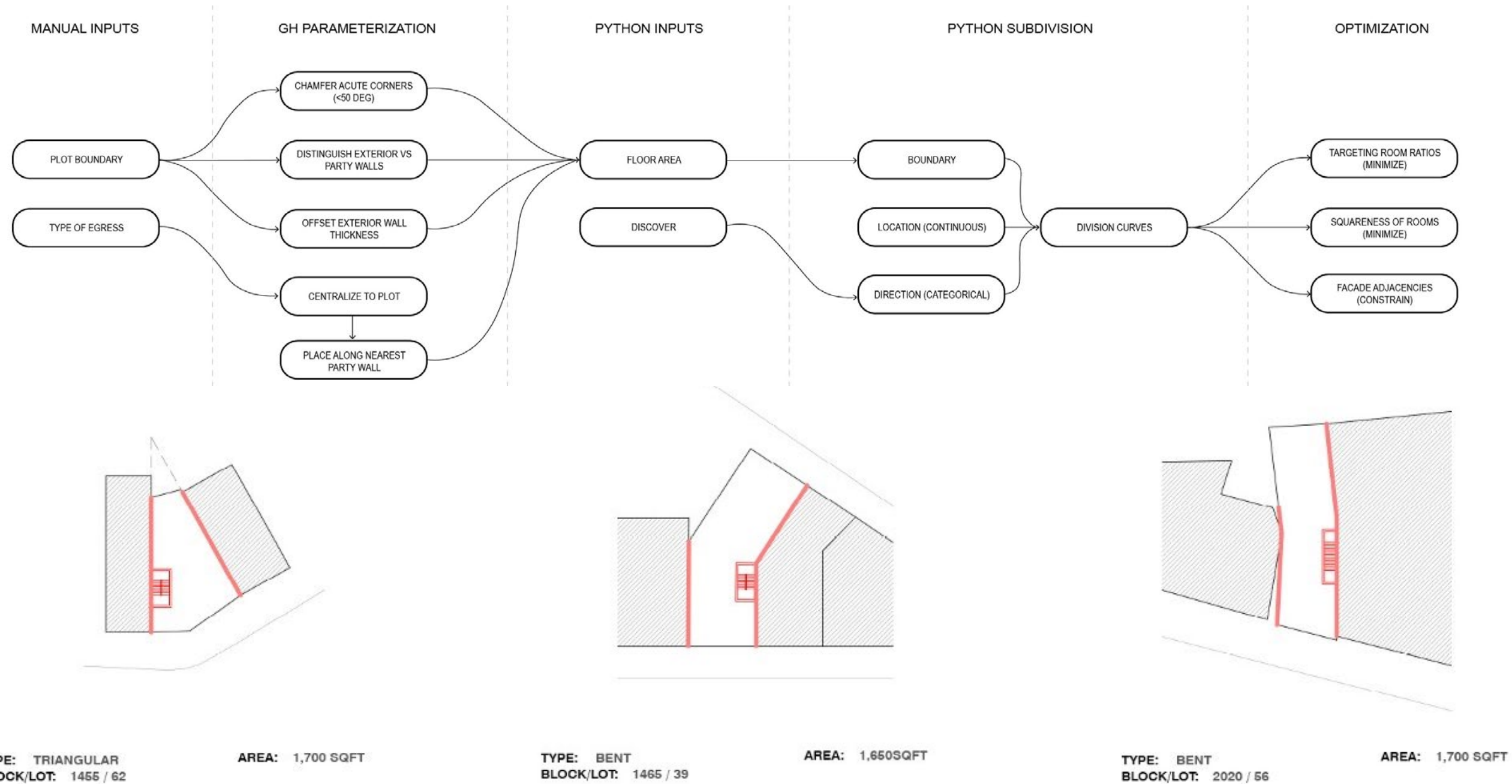
03.08 SHARED EXTERIOR TERRACE



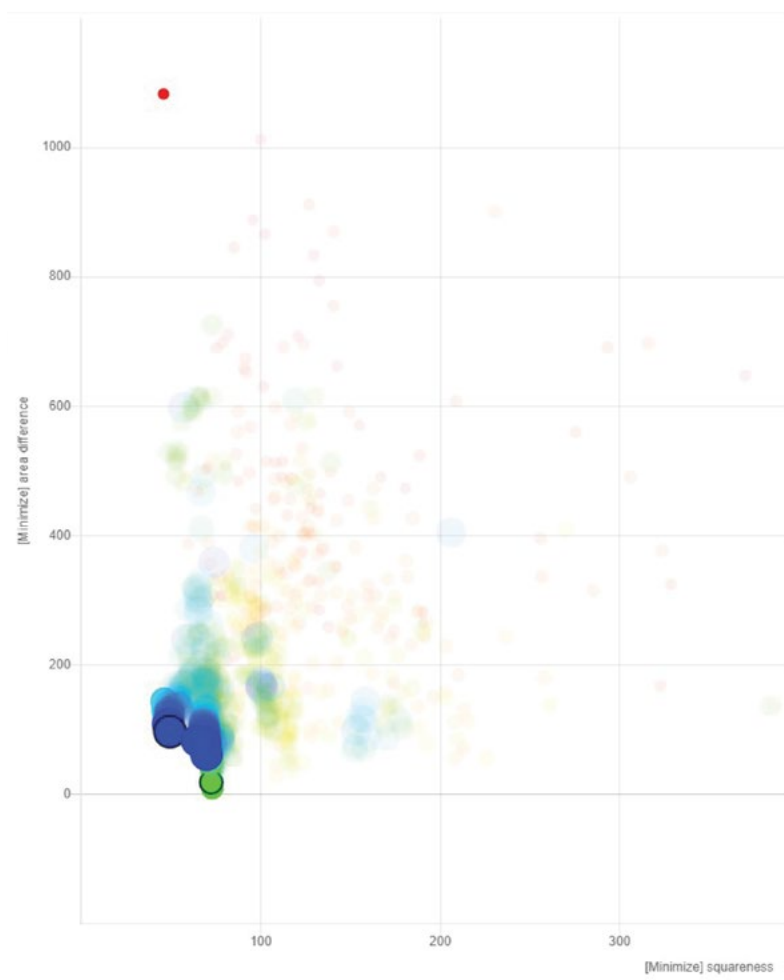
irregular | spatial study

GENERATIVE DESIGN
 INSTRUCTOR: DANIL NAGY
 WITH: JIYONG CHUN, SIERRA HECKMAN, SEONGGEUN HUR

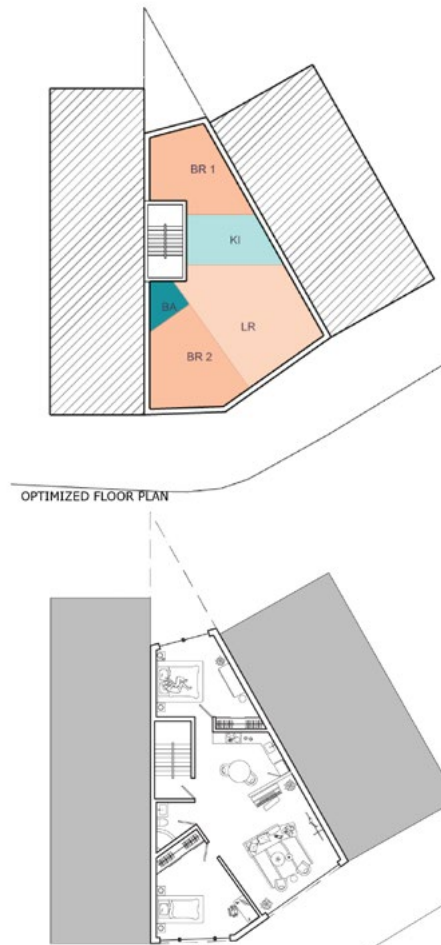
Irregular is a spatial optimization exercise exploring the best way to optimize organization of New York City's varied irregular plots. The size and irregularity of these plots have often left them under built or underutilized. Using Python and Grasshopper to identify potential parti walls and window walls of the plots, we were able to create a script that would sub divide the plot area to create a 2 bedroom housing unit. By running the script through a Genetic Algorithm optimization, we were able to test the script to produce spatial organization that produced minimum sized rooms to code in reference the plot's formal irregularity.



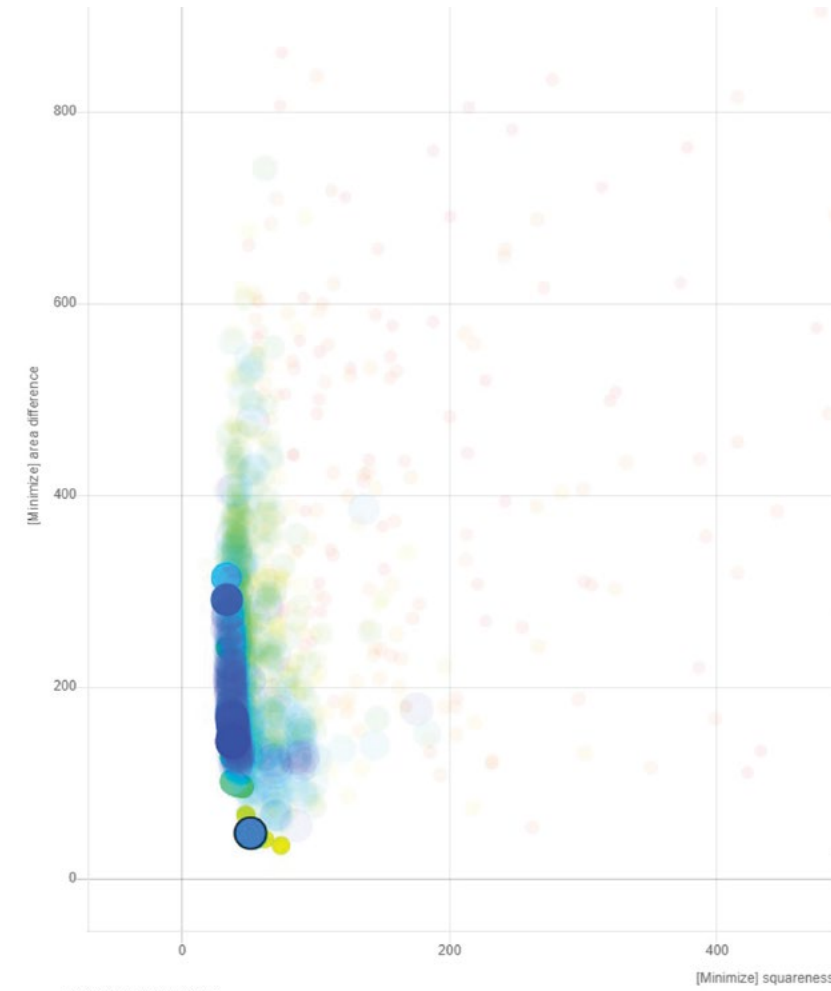
generative script + selection of lots



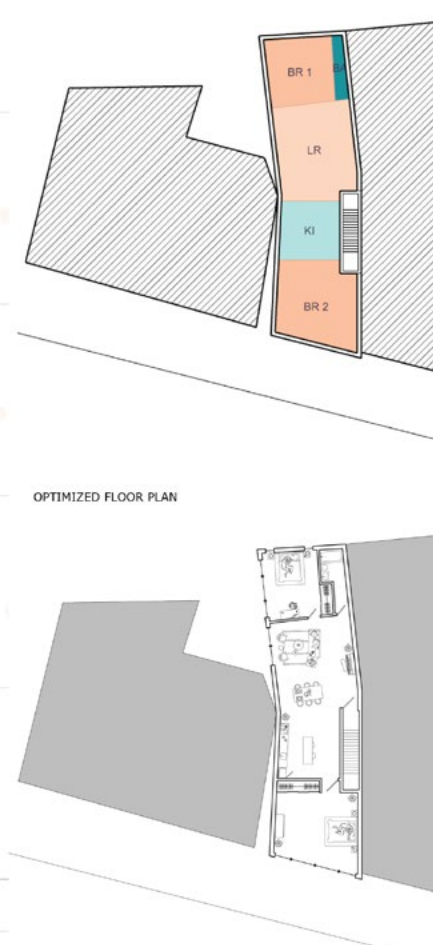
DISCOVER OPTIMIZATION



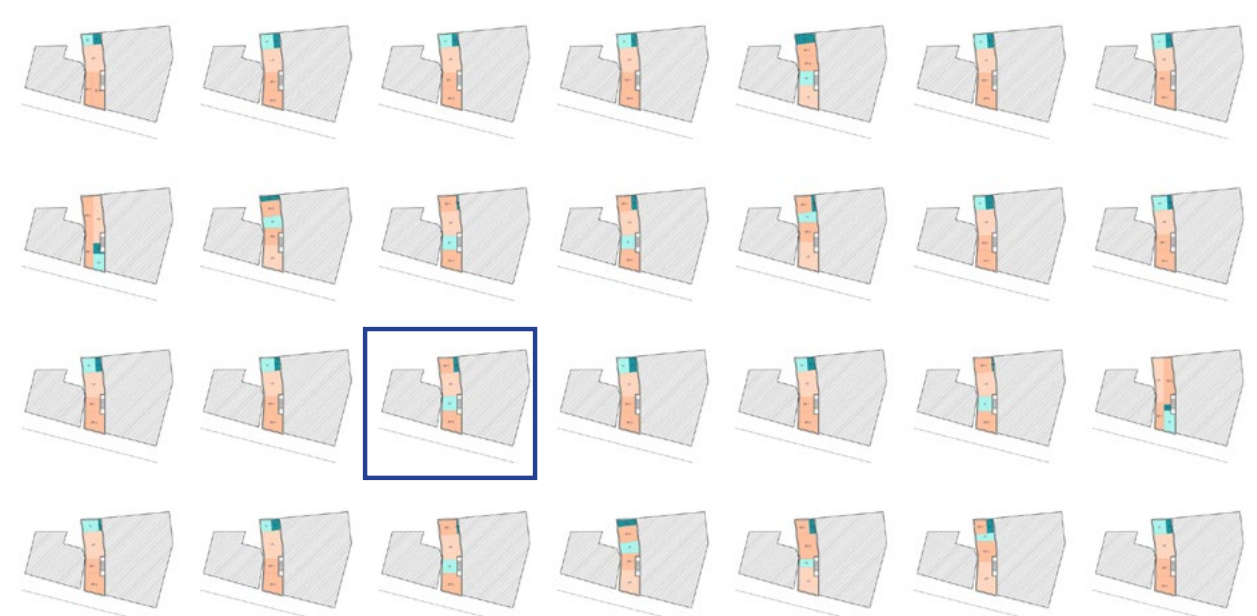
DESIGNER'S FLOOR PLAN



DISCOVER OPTIMIZATION



DESIGNER'S FLOOR PLAN



GREENE COUNTY

FAMILY OF WOODSTOCK
COMMUNITY CENTER,
WALK-IN & COUNSELLING

ULSTER COUNTY RESOURCE
RECOVER AGENCY (COLLECTION &
COMPOSTING CENTER)

MIDWAY I: 6 BEDS TRANSITIONAL
LIVING PROGRAM FOR ADOLESCENT
16-20

DARMSTRADT SHELTER: 23
BEDS FOR SUD TREATMENT

FAMILY INN: 27 BEDS
FOR FAMILIES

ULSTER COUNTY

MIDWAY II: 6 BEDS
TRANSITIONAL LIVING
PROGRAM FOR 16-20

FAMILY OF ELLENVILLE COMMUNITY,
FOOD PANTRY, ADULT CASE
MANAGEMENT, COUNSELING CENTER

FAMILY OF NEW PALTZ
COMMUNITY CENTRE

SULLIVAN COUNTY

LEGEND

- FOW SHELTERS & SERVICES
- ▲ RECYCLING & TRANSFER CENTERS
- ✕ FOW FOOD PANTRIES & KITCHENS
- ▨ FOW FARM NETWORK

POPULATION DENSITY PER SQUARE MILE

- <100
- 100 - 250
- 250 - 500
- 500 - 1000
- 1000 +

— BUS ROUTE (20MIN FROM CITY CENTER)

This is a catalogue of explorations in **Remediation.**

Revitalization.
Resiliency.
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RESTORE & REWILD COMMUNITY REHABILITATION HUB

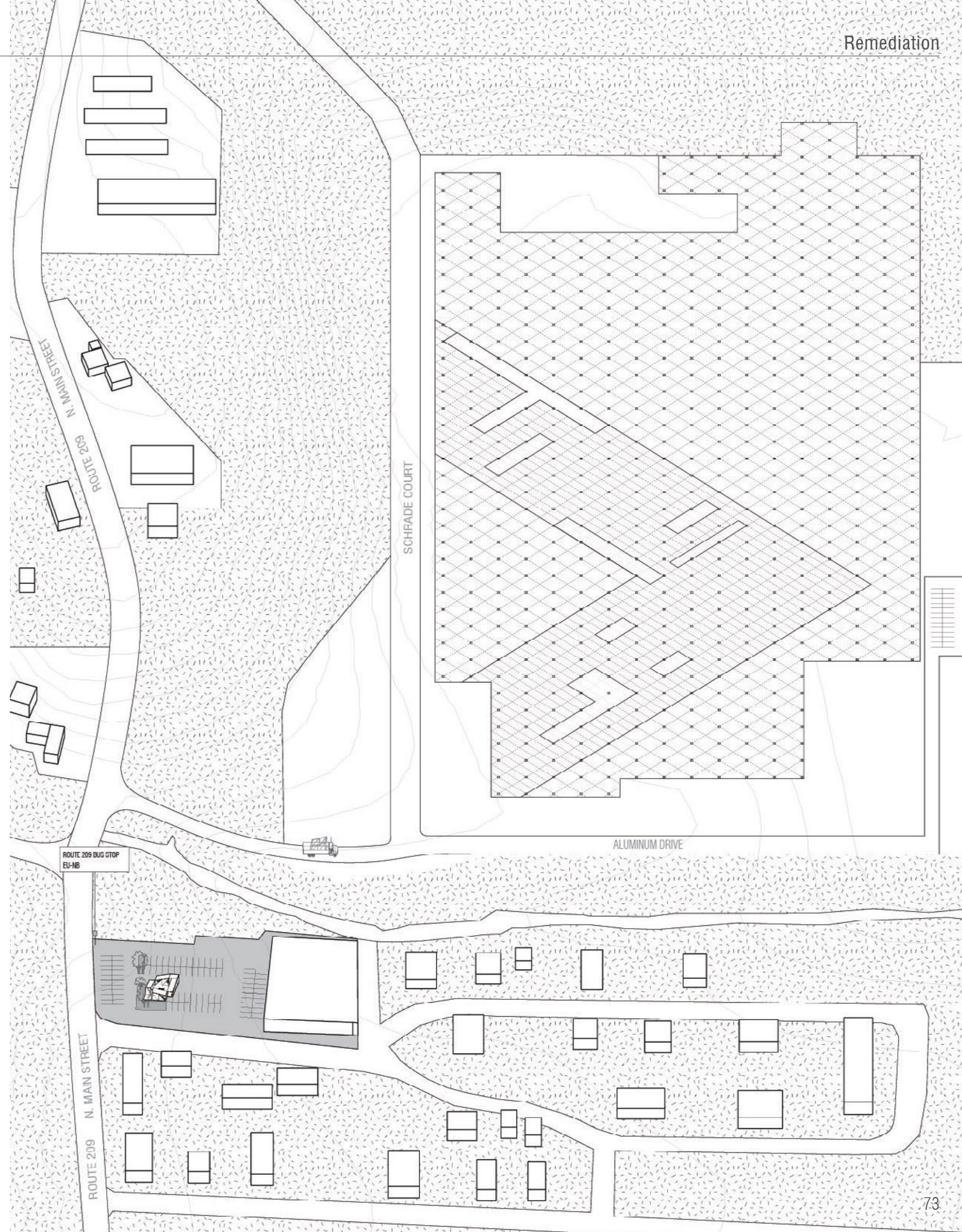
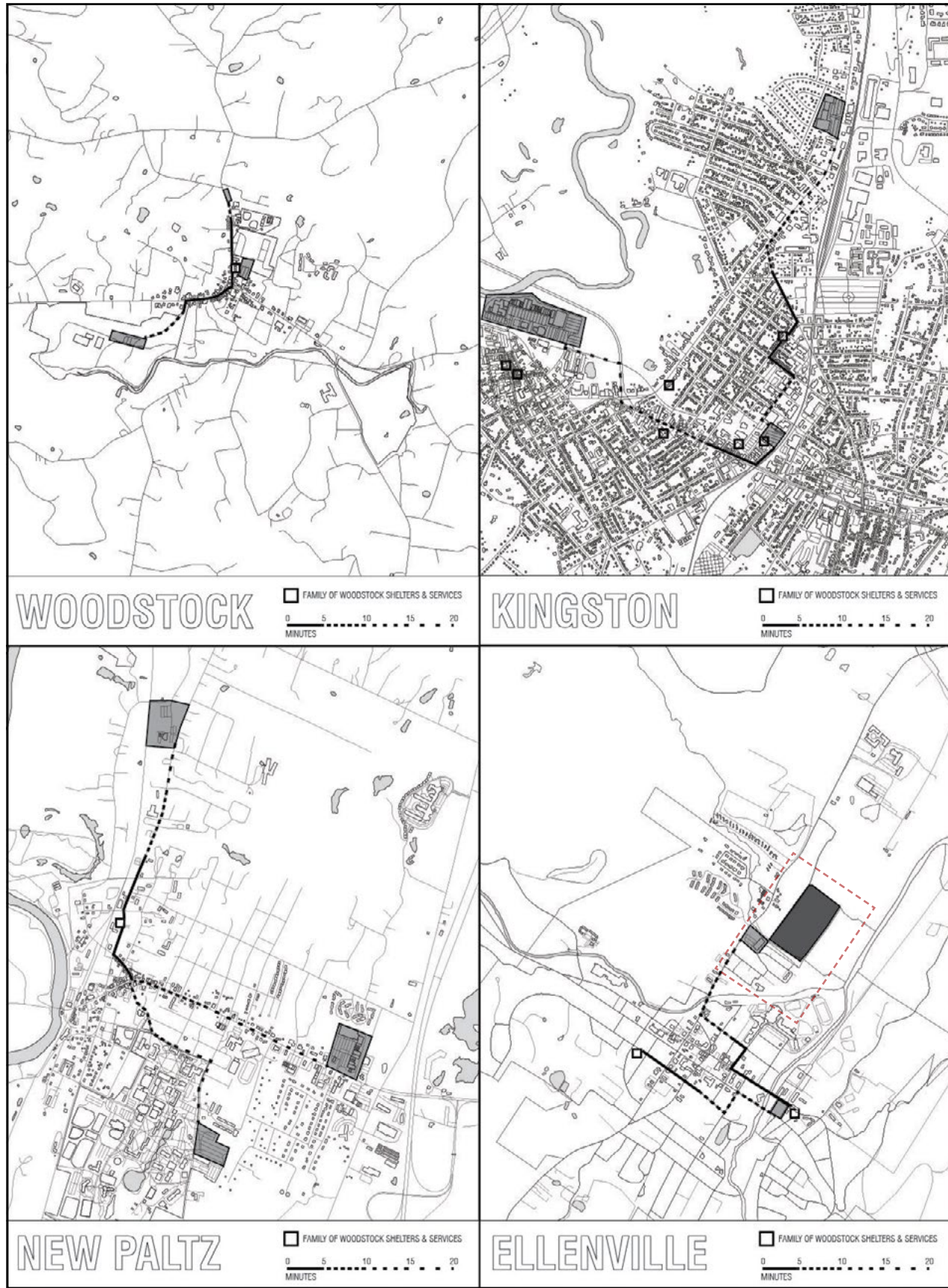
ULSTER COUNTY, NY
SPRING 2021
INSTRUCTOR: PHU HOANG
WITH: ADELIN CHUM

Restore & Rewild aims to look closely at the needs of each town in Ulster County and strengthen the community in three steps: resiliency through health, security through food and nutrition, and sustainability through secure livelihood and land. In Ellenville, this includes focusing on at-risk youth and young adults who are looking to further their education and gain the skills to participate within the larger community.

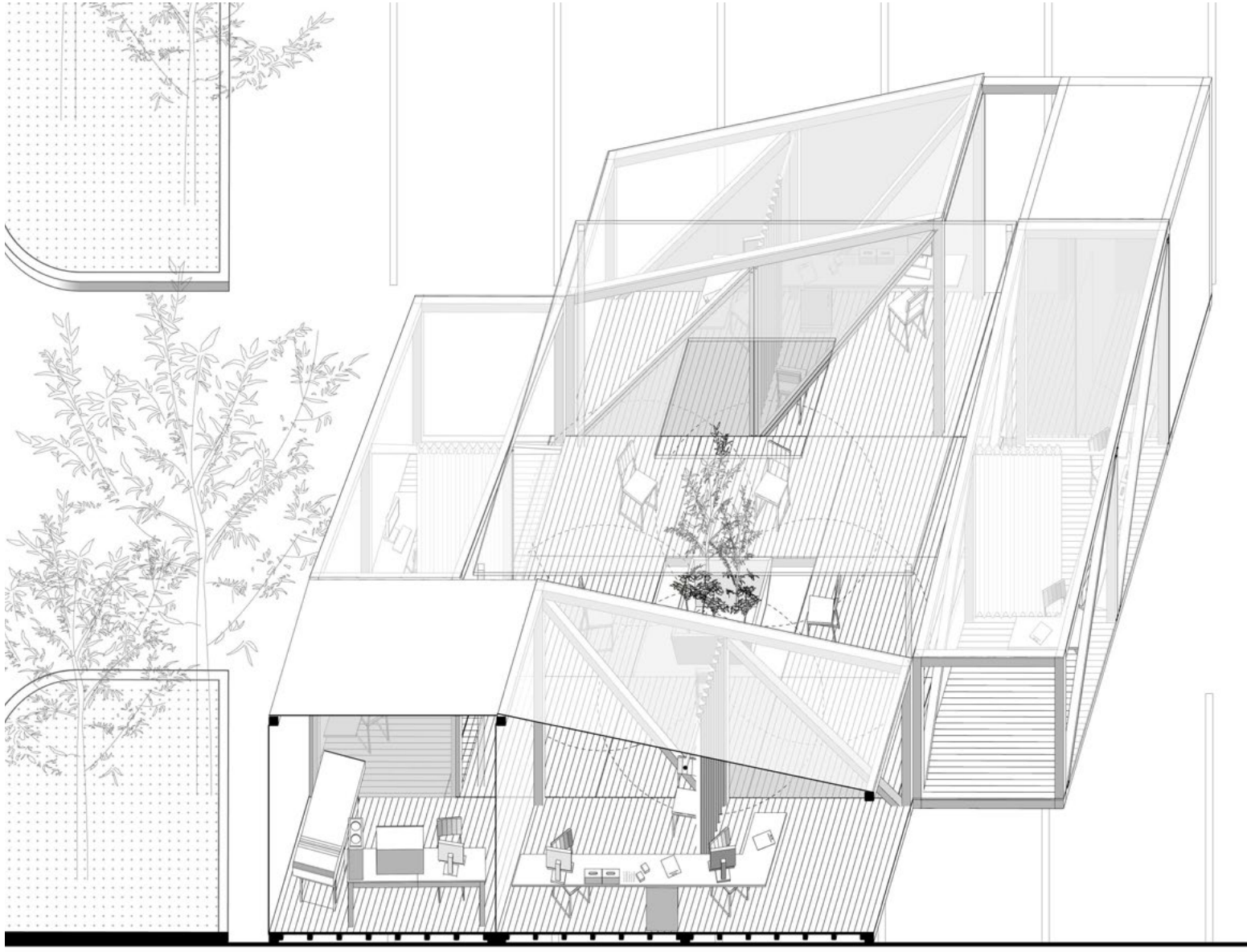
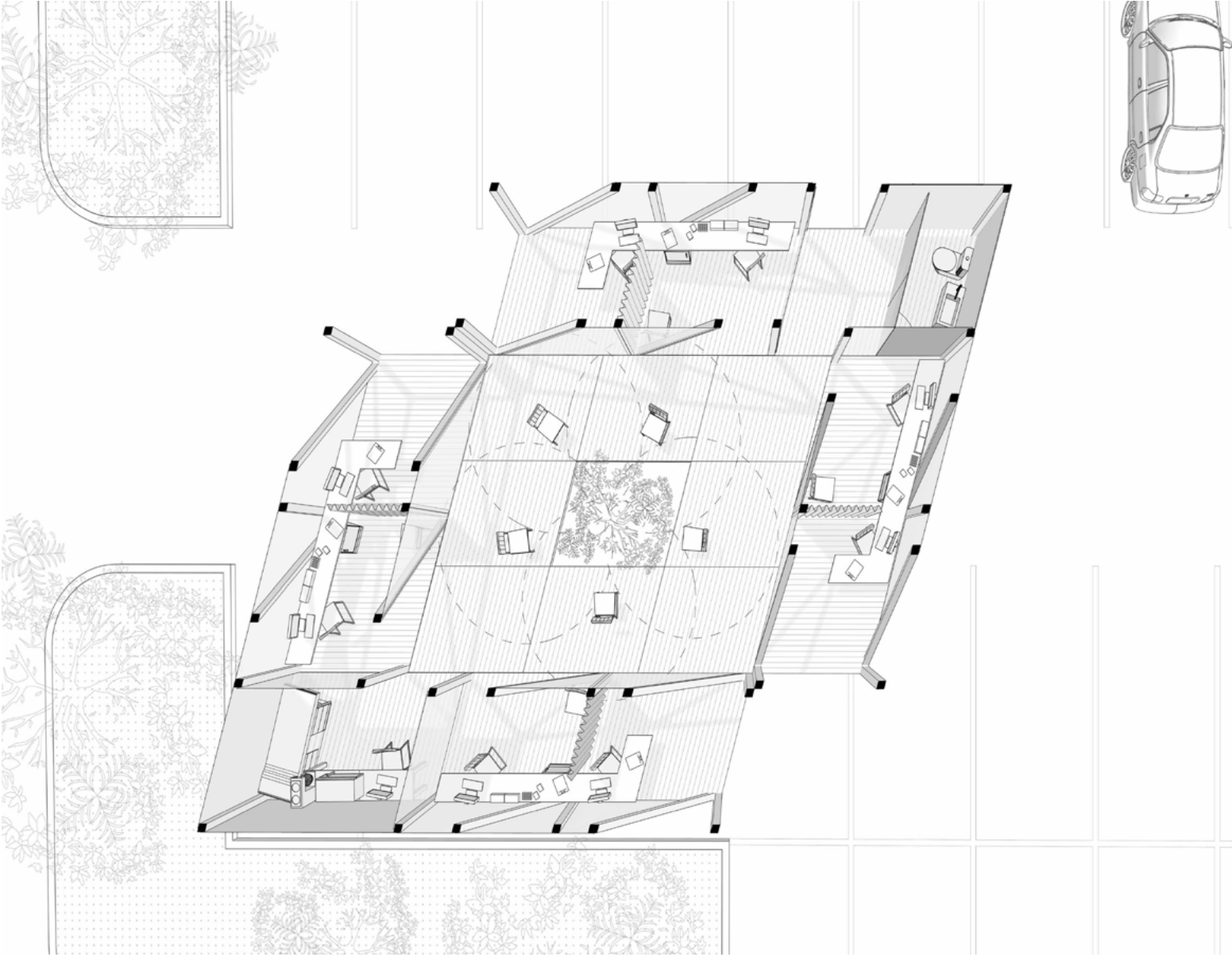
Located on what used to be a metal manufacturing facility's concrete pad, the project begins as a rapid deployment of several vaccination centers and a series of phytoremediation strategies as a way to begin to restore the health of both the community and the land.

By planting within the existing exposed column grid of the previous facility and strategically scoring lines for additional plant growth, within the year there will be a natural disintegration of the concrete allowing for smaller blocks to be repurposed or removed from the site.

The project will continue to expand across our site sitting within the remediation process to include programs of urgent care, housing, green career training and in the distant future a small scale timber manufacturing facility.

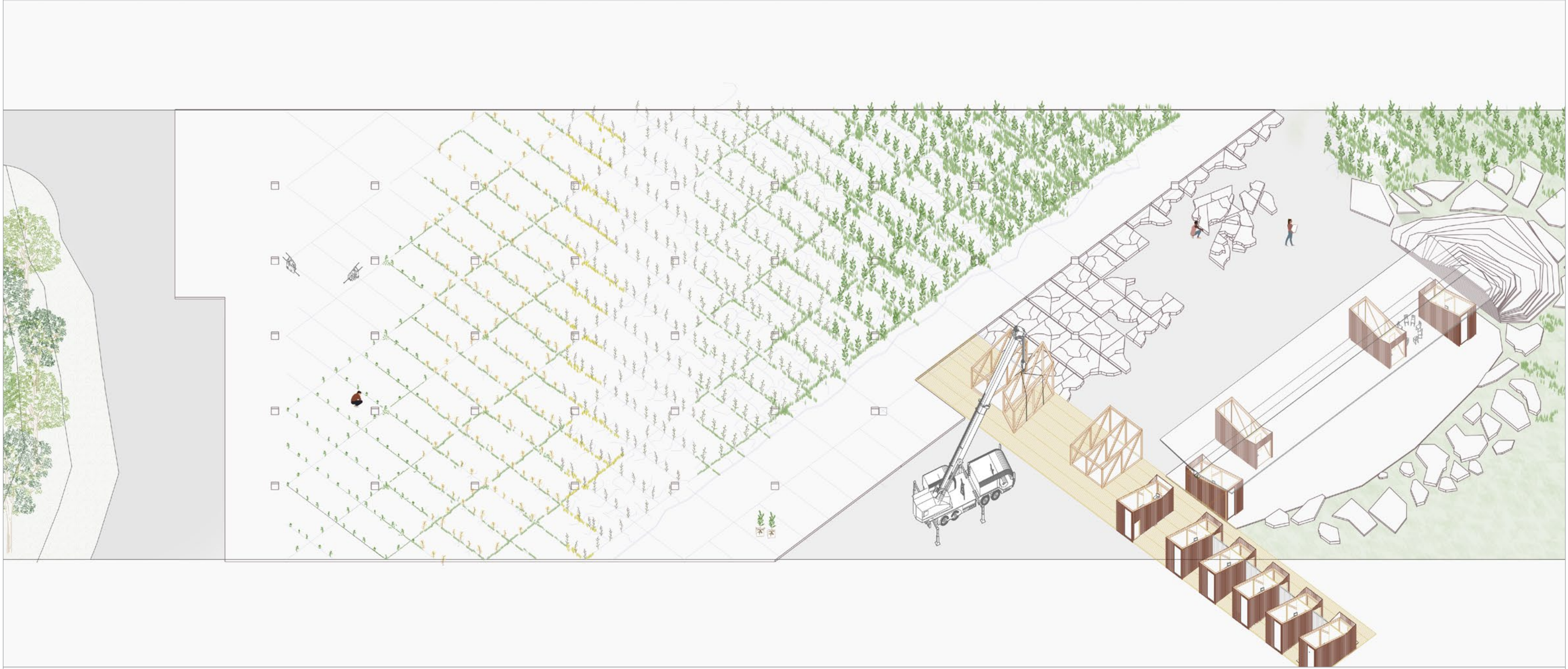


04.02 NETWORK OF PROPOSED VACCINATION MODULES ACROSS ULSTER COUNTY
 04.03 PHASE 1 VACCINATION IN ELLENVILLE AND ADJACENT PHASE 2 SITE

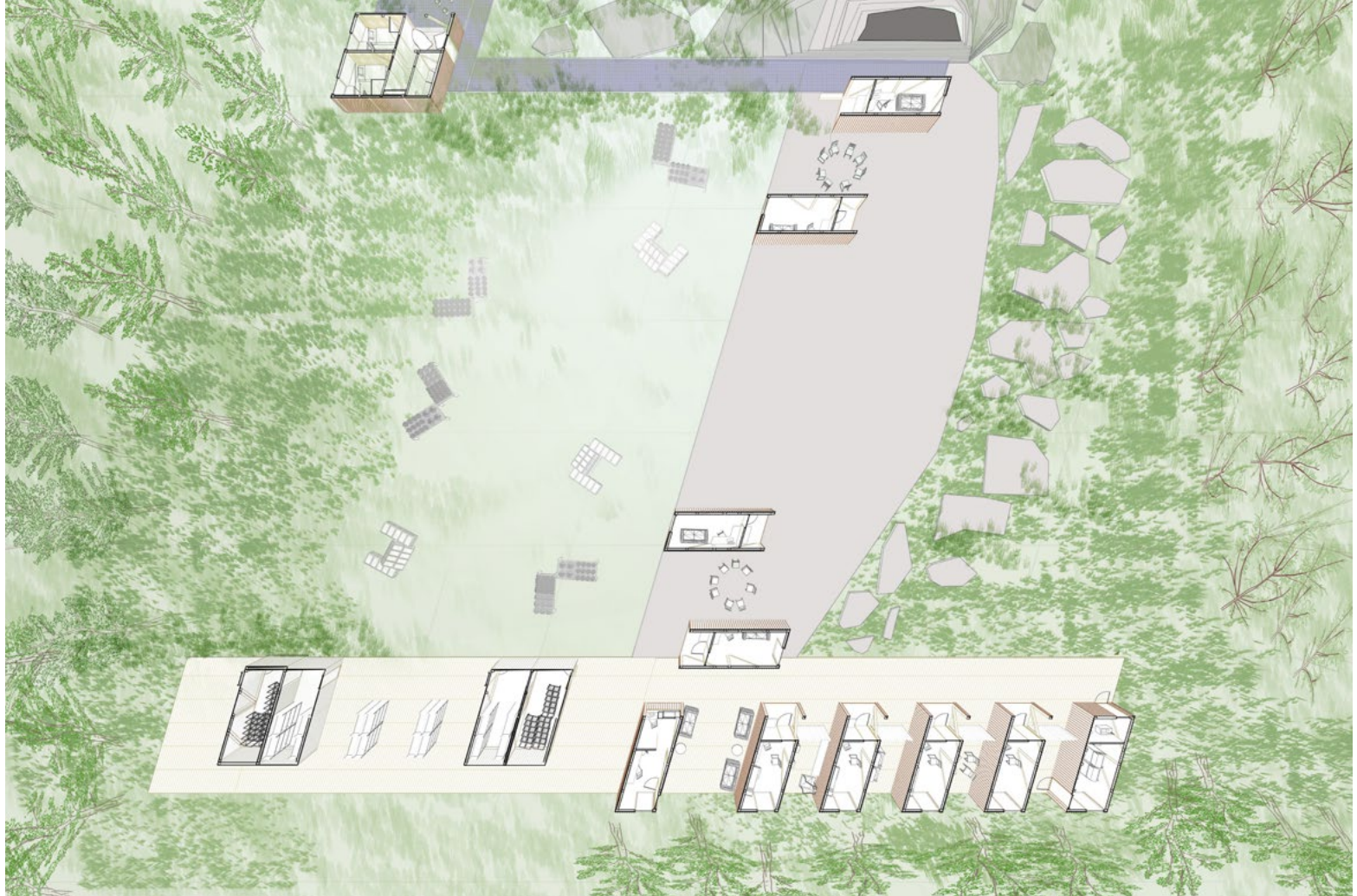
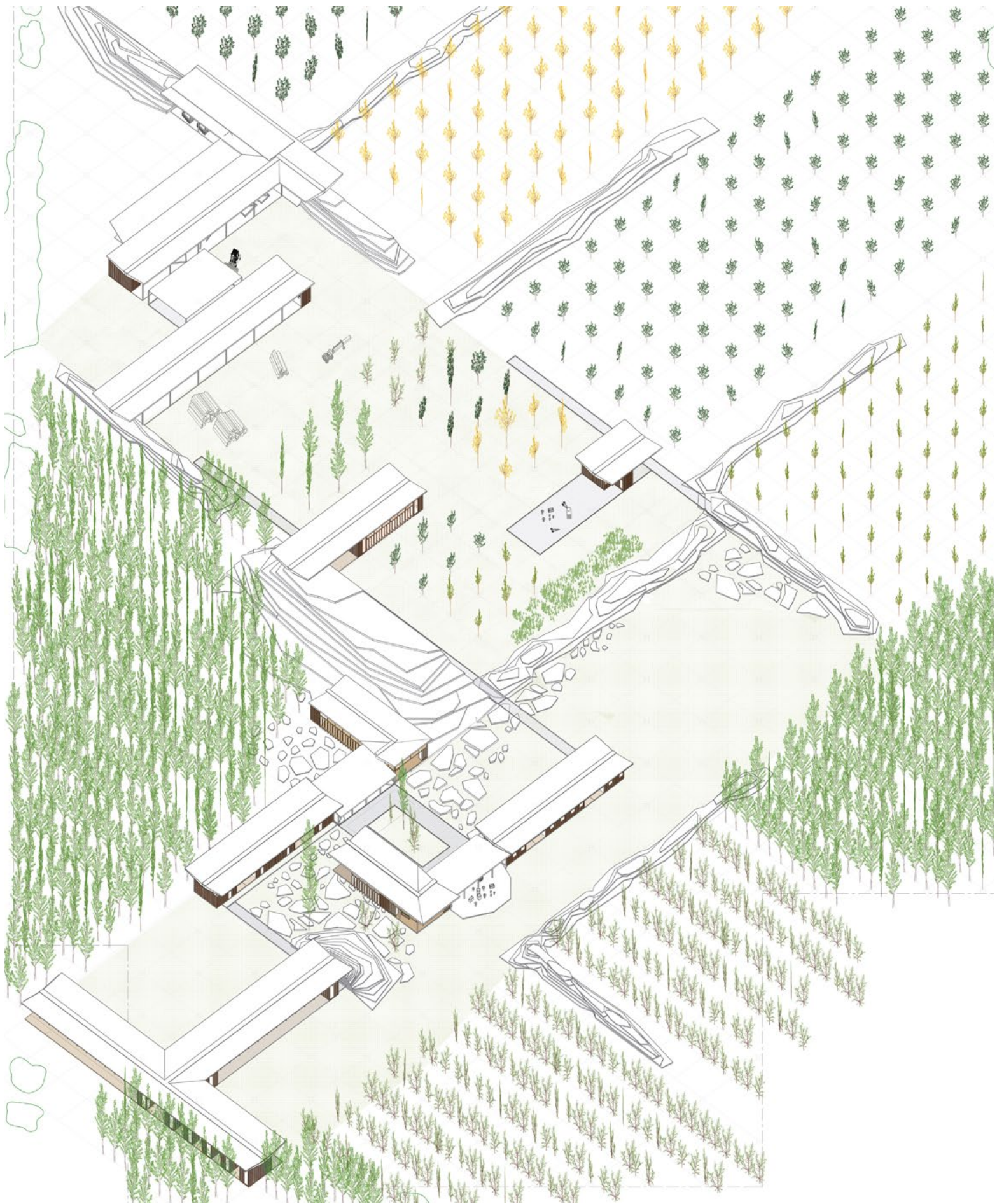


04.04 PHASE 1 VACCINATION POD

04.05 PHASE 1 VACCINATION POD



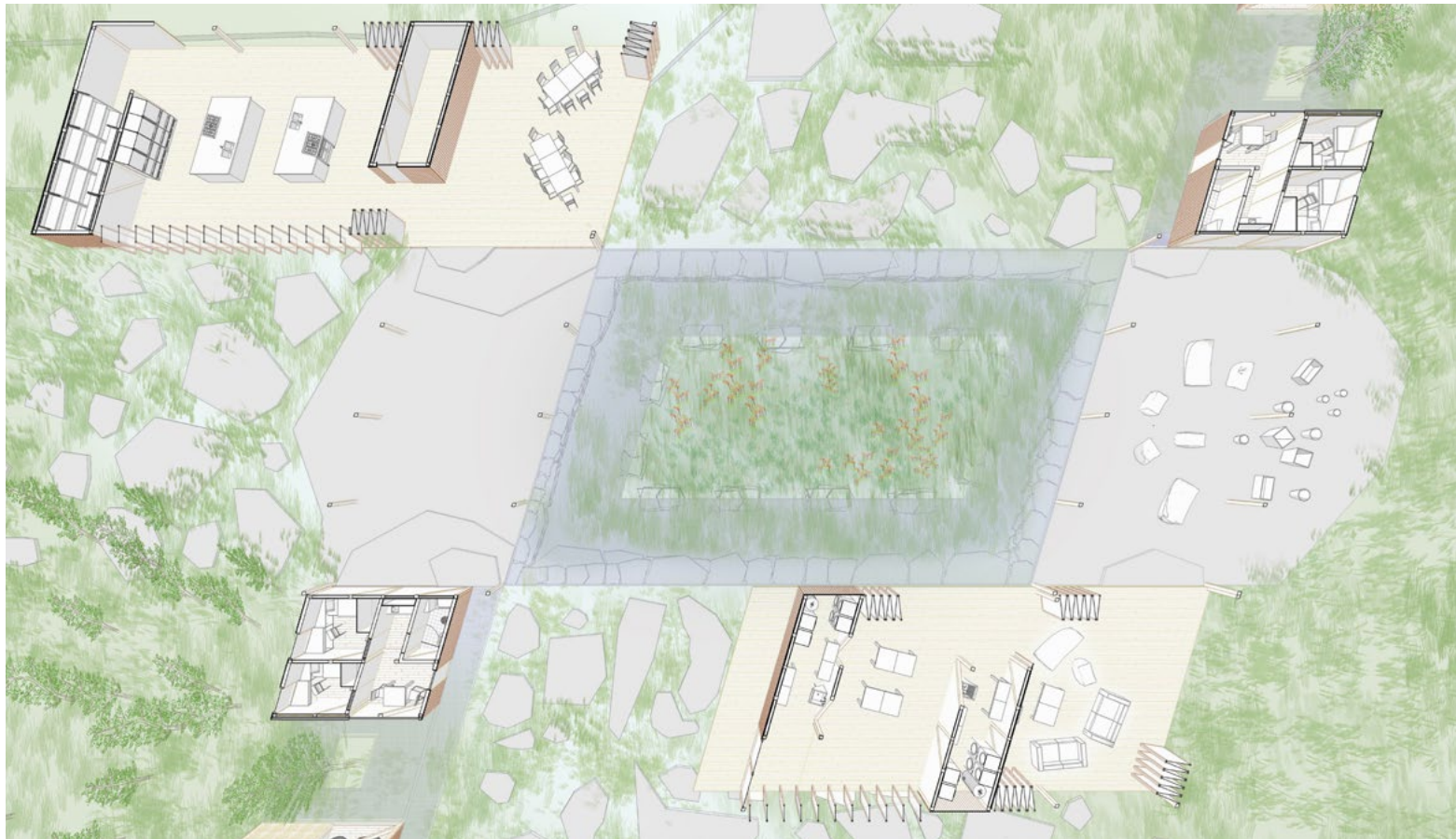
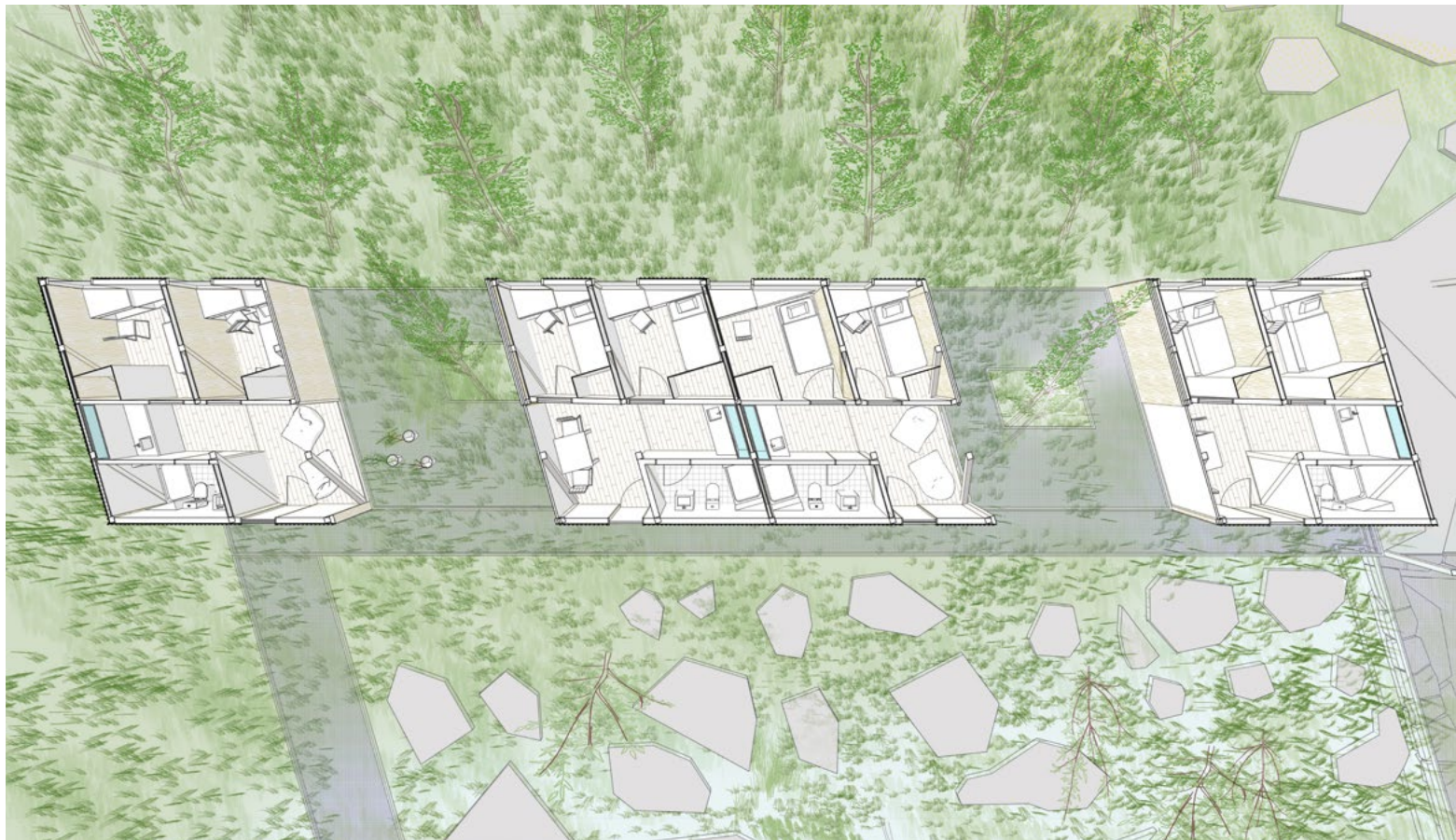
YEAR 0 SCORING CONCRETE PAD - PLANTING POPLAR SAPLINGS YEAR 1 CRACKED CONCRTE REMOVAL - VACCINATION MODULE ARRIVAL FOR YEAR 1
 PHASE 1 PHASE 2



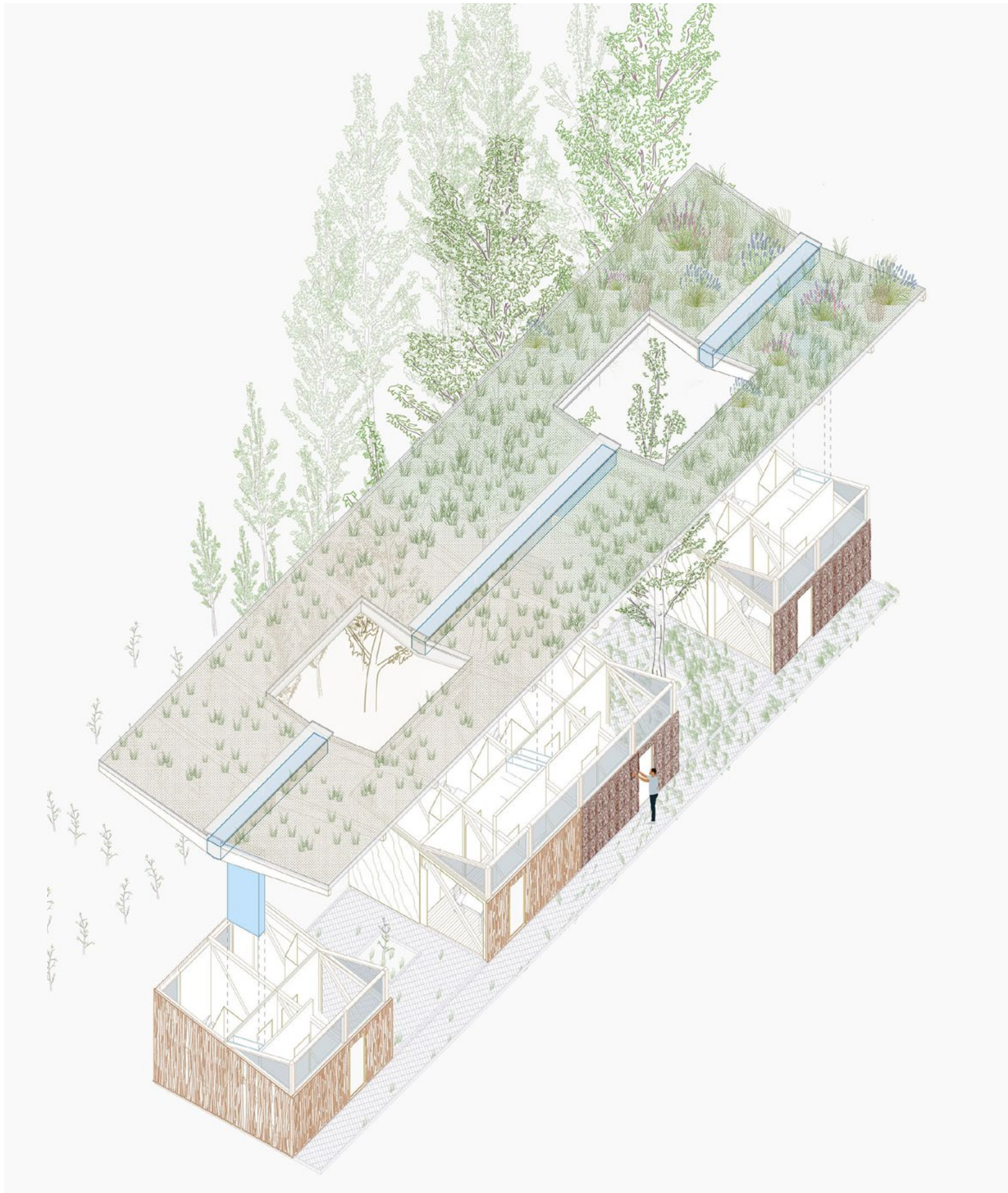
04.06 PHASE 2 RESILIENCY HUB - YEAR 5 SITE OBLIQUE
 04.07 PHASE 2 RESILIENCY HUB - URGENT CARE & COUNSELLING



YEAR 1 REPLANTING POPLAR OUTSIDE BUILD AREA - USING DEAD BRANCHES FOR FACADE YEAR 1 REPLANTED TREES REMEDIATE REST OF SITE YEAR 2
 PHASE 2 PHASE 2



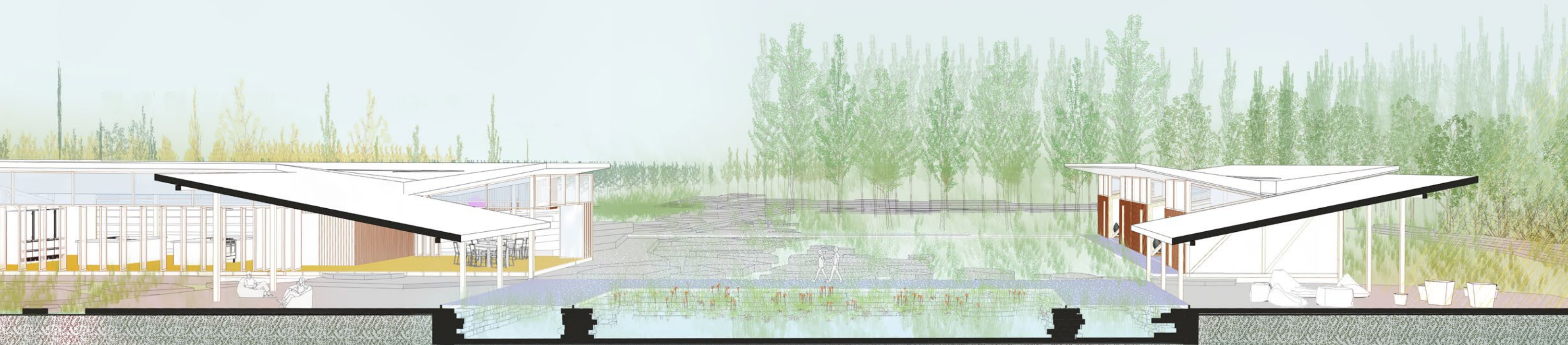
04.08 PHASE 2 HOUSING QUARTERS - YEAR 5



04.09 REWILDING HOUSING - A TIMELAPSE



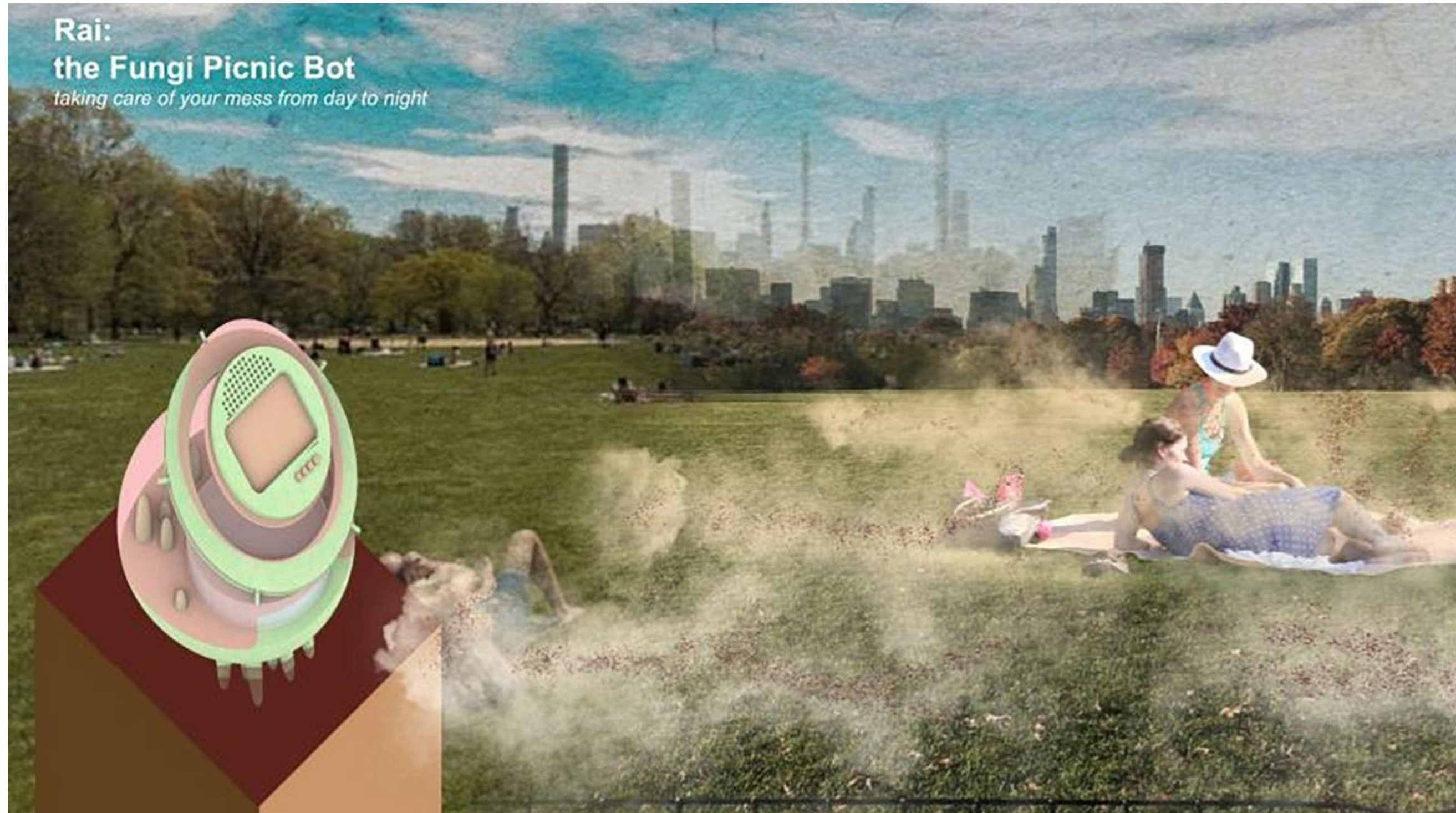
YEAR 5 PLANTING SLOW GROWING TREES FOR OUTER SITE REMEDIATION PHASE 3 YEAR 10 CLT LIGHT MANUFACTURING - COMPLETE REMEDIATION - REWILDING SITE PHASE 3 YEAR 15



rai: the fungi bot | speculative study

MAKING KIN WITH BIO MATERIALS
INSTRUCTOR: CHRIS WOEBKEN
WITH: ADELIN CHUM, JULES KLEITMAN

In a speculative world in the future where human occupation on earth has left it scarred and toxic, rai: the fungi bot, is the personalized tool that people must carry to undo their marks on the planet. Using fungal computing, rai is able to test the ground for toxicity levels and can thus calculate which fungal spores must be ejected to carry necessary remediation of the land post human activity.



speculative scenario



component parts



This is a catalogue of explorations in **Regeneration.**

- Revitalization.
- Resiliency.
- Reinvention.
- Remediation.
- Readaptation.



EXTRACTIONS OF TOMORROW

MATERIAL ECOSYSTEM OF DUNE SAND BIO-BRICKS

NIGERIA, AFRICA
FALL 2021
INSTRUCTOR: DAVID BENJAMIN

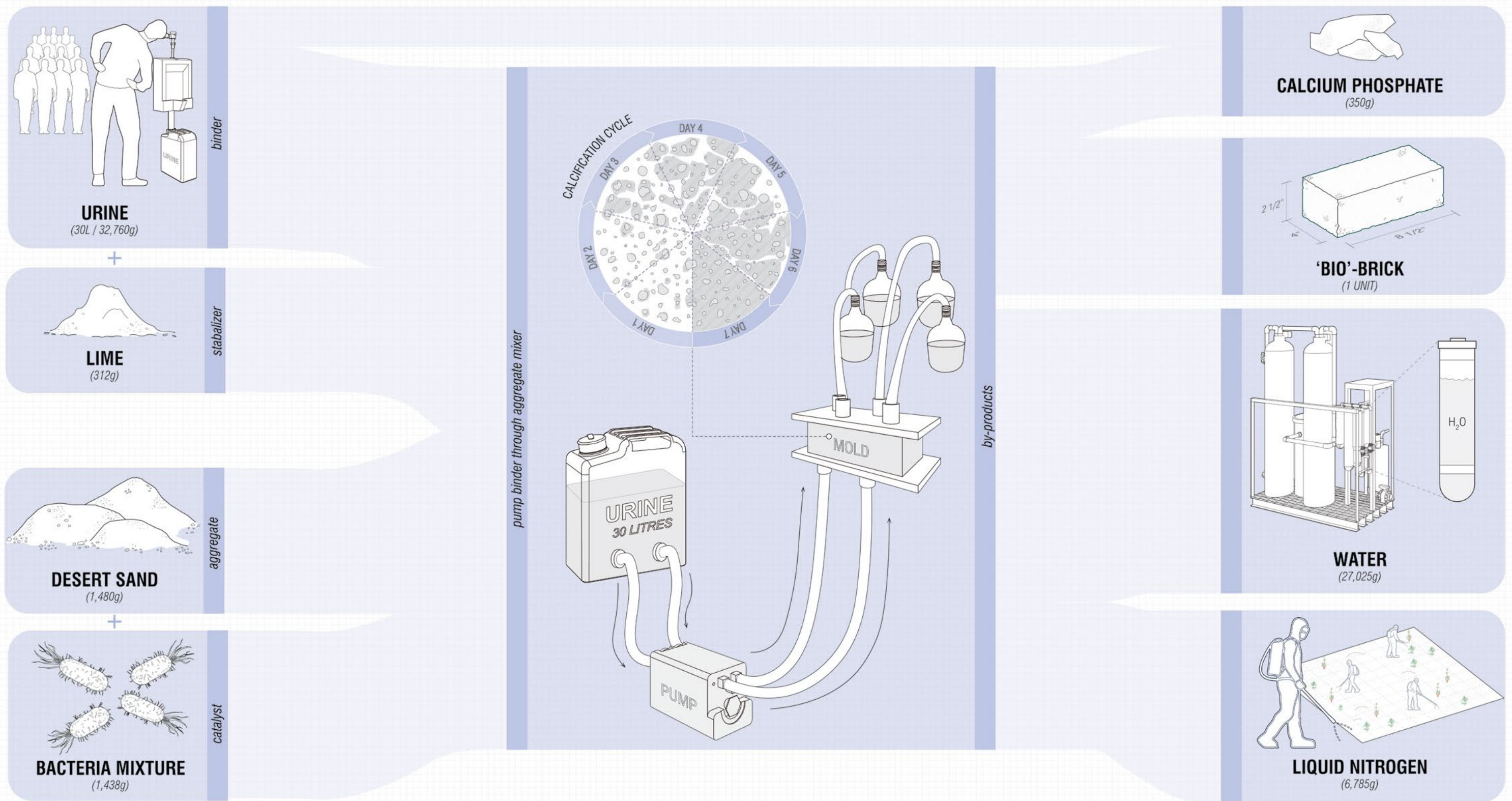
Extractions of Tomorrow is a two-pronged production ecosystem that promotes light extractive and regenerative methods in production to restore old economies, as well as create new economic opportunities within the Sub Saharan African region. The proposal hopes to reverse the extent of desertification that has led to a large portion of land degradation within the Sub Saharan context, forcing residents to migrate and become national climate refugees.

This project investigates the potential to introduce dune sand as a construction material in an attempt to mitigate sand scarcity in the construction industry today and tap into an already available vast resource, thus reducing pressure on the sand industry and potentially help reduce the spread of desertification across the African, and even global, context.

New research in the past decade has shown the rise of Microbial Induced Calcite precipitation as a new biological process that uses enzymatic reactions of bacteria with urea to 'grow' bricks by calcifying around fine dune sand, thus binding it together. Building off of this research, the project proposes the use of Dune sand along with human urine, and bacteria in a zero waste, heat free process to produce outputs of a new type of 'bio-brick'

The project imagines agencies like the African, Caribbean and Pacific Group of States (ACP) that are partnered with the Green Wall Initiative, to expand their portfolio to assist local communities and governments to sustainably extract desert sand for production whilst also providing guidance to restore and manage fragile ecosystems.

05.01 BRICK PRODUCTION CENTER



INPUTS

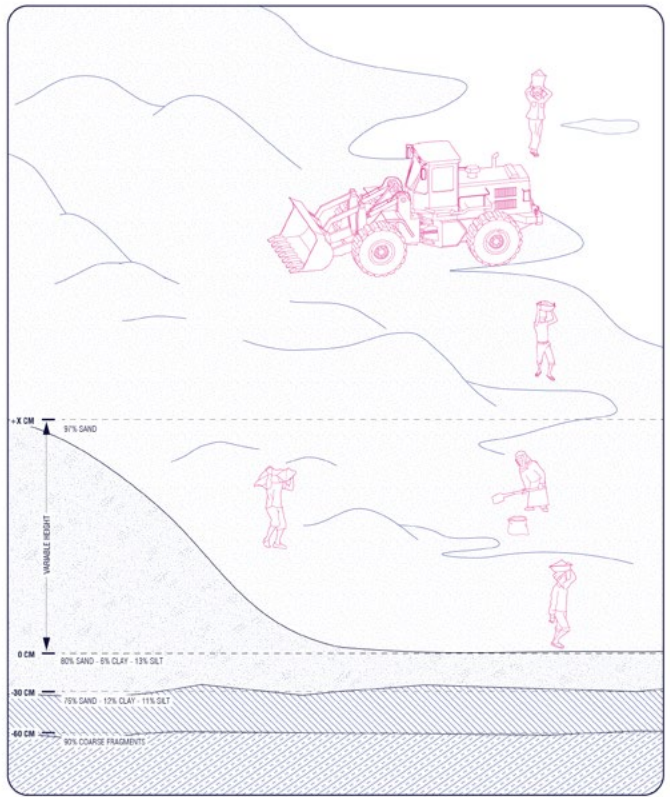
PROCESS

OUTPUTS



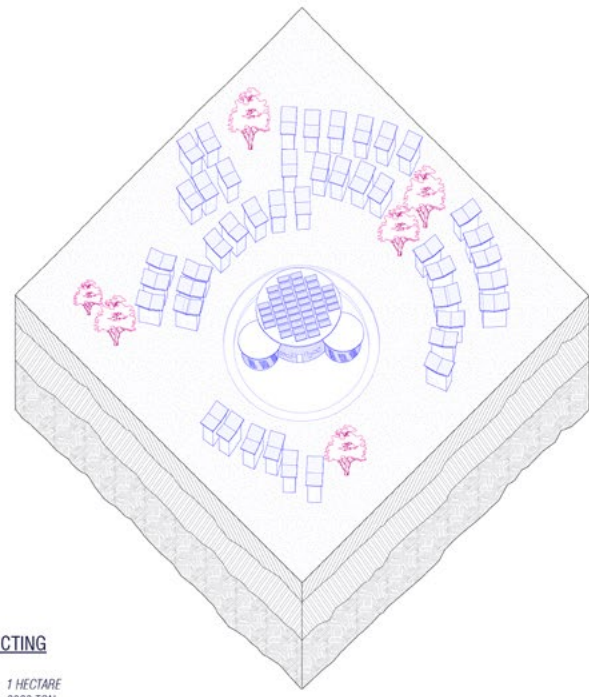
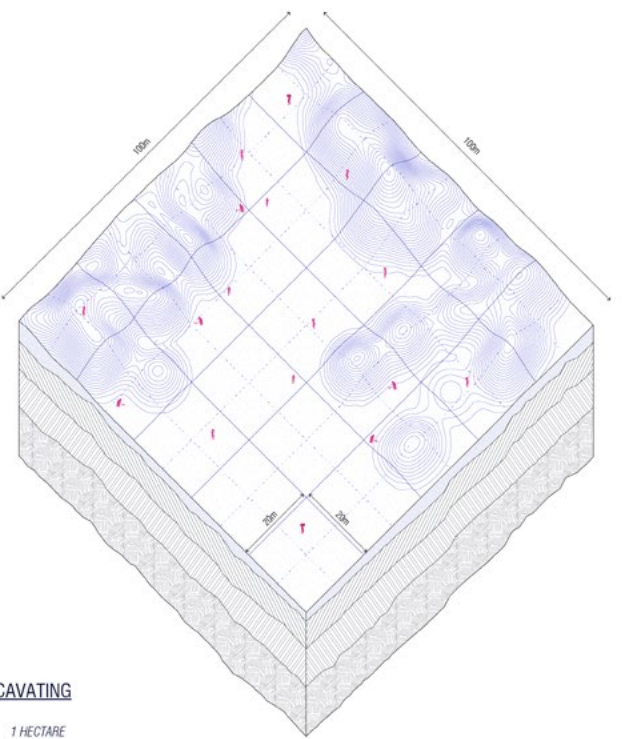
05.03 CAST DUNE SAND BIO-BRICK





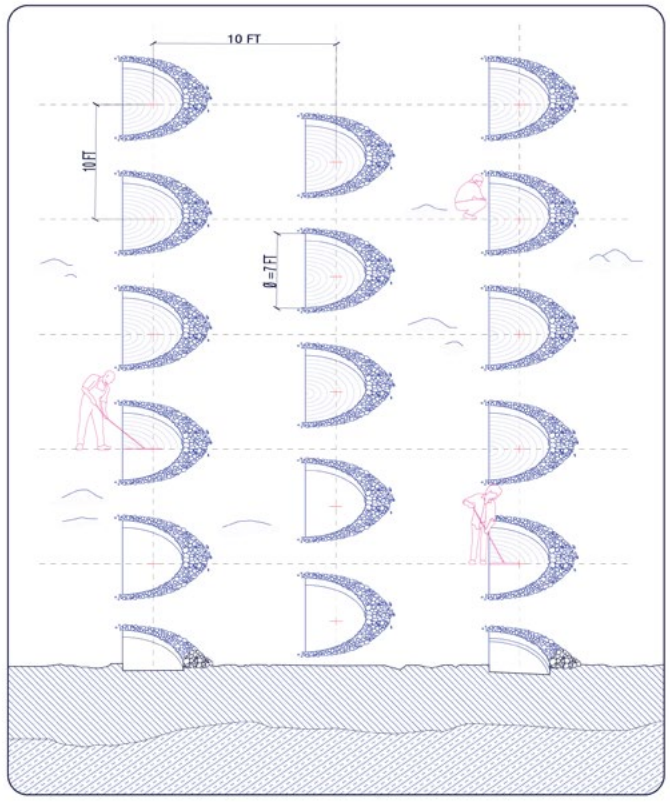
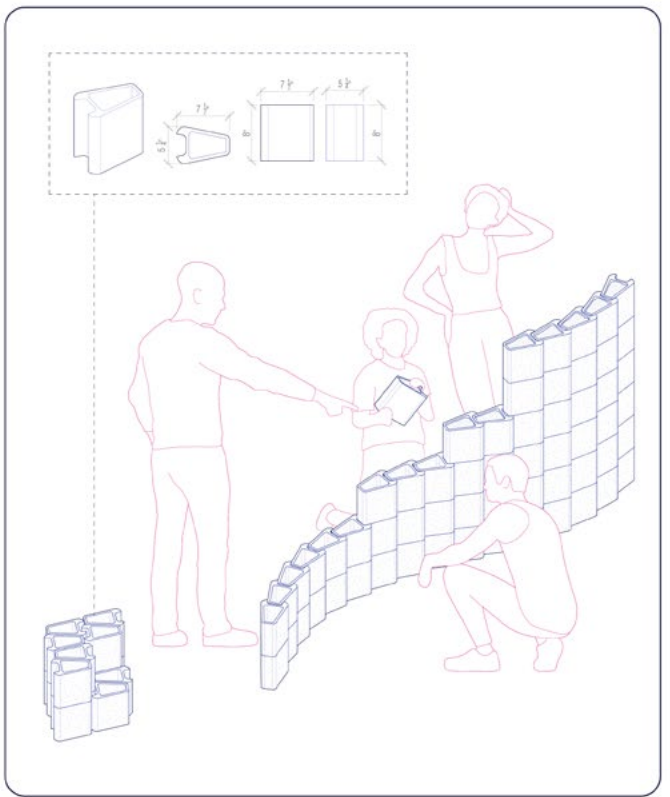
I. LIGHT EXCAVATING

AREA: 1 HECTARE
 VOLUME: 3000 TON
 LABOUR: 25 WORKERS
 TIME: 2 WEEKS



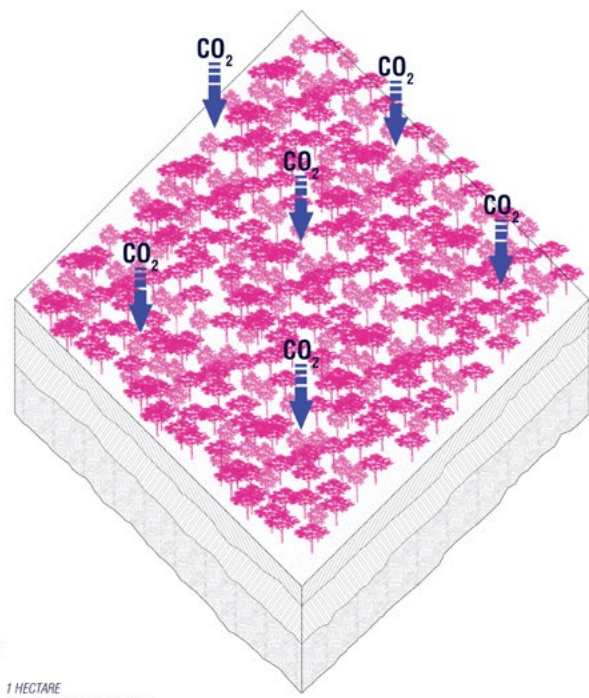
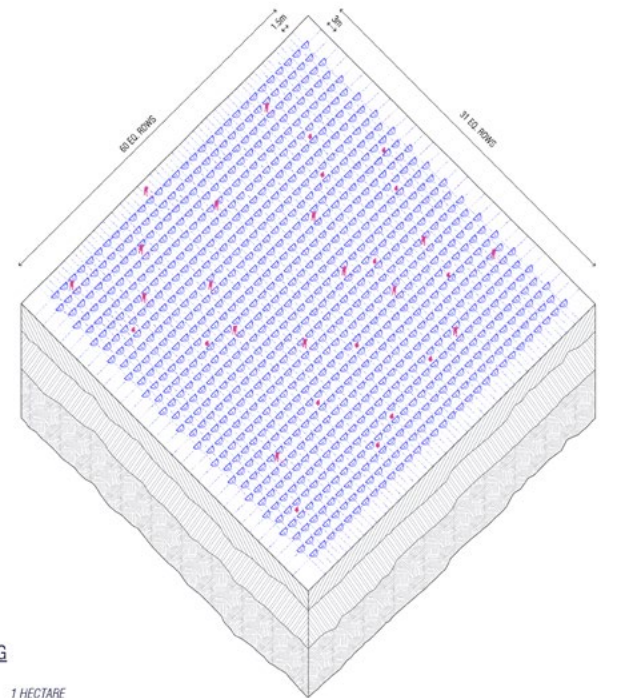
III. CONSTRUCTING

AREA: 1 HECTARE
 VOLUME: 3000 TON
 LABOUR: 100 WORKERS
 TIME: 32 WEEKS ?



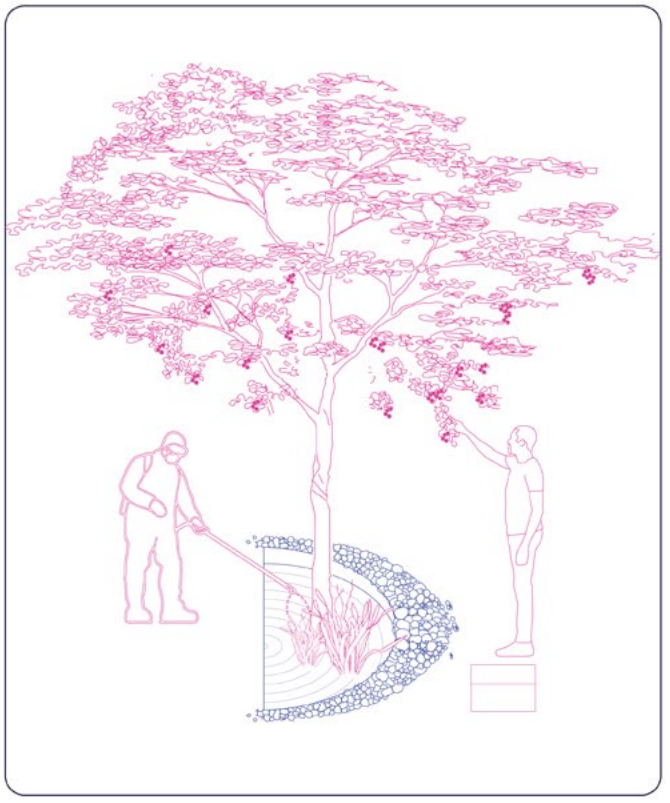
II. PLANTING

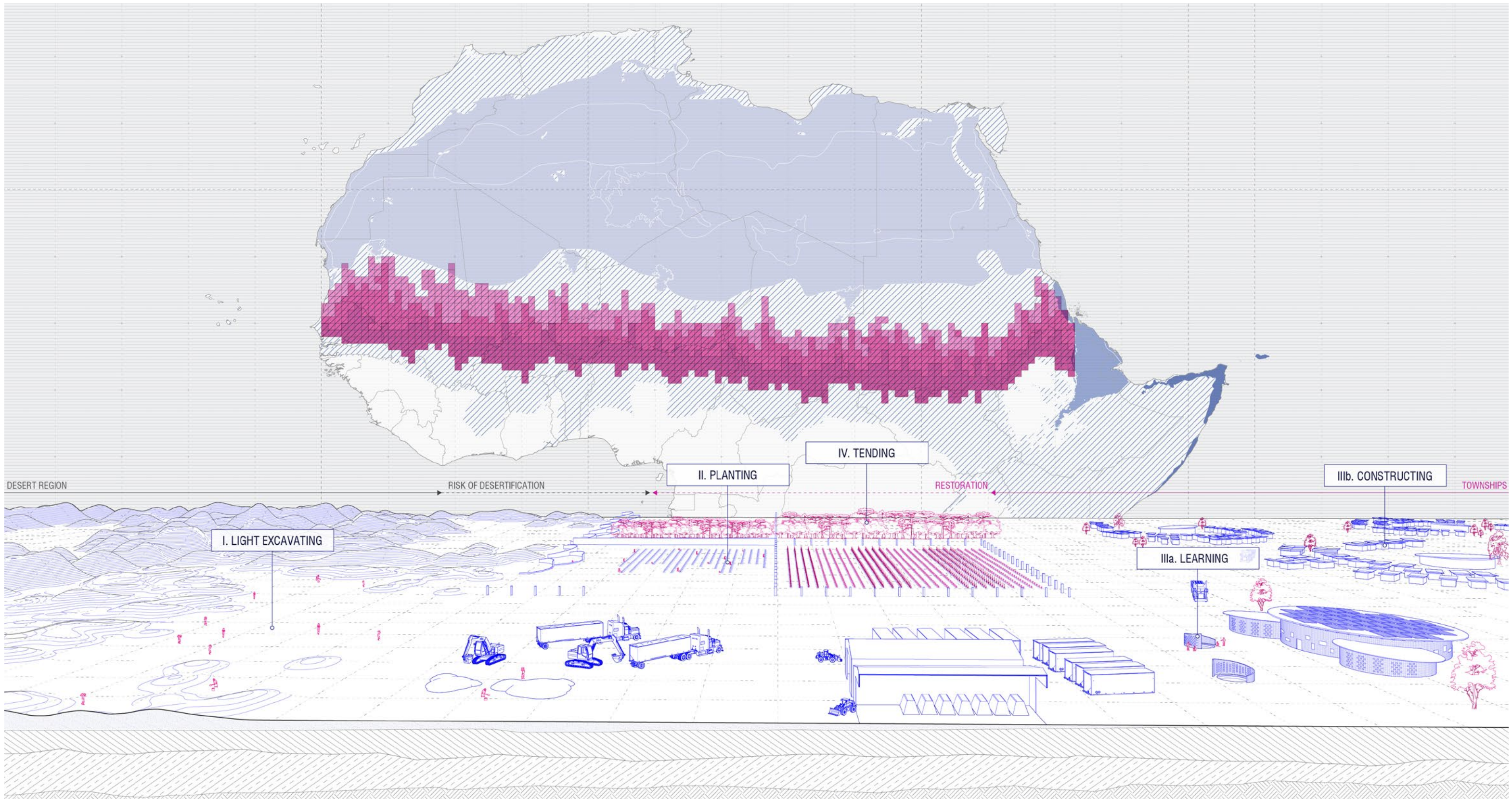
AREA: 1 HECTARE
 PLANTING: 930 PITS
 LABOUR: 30 WORKERS
 TIME: 1 WEEK

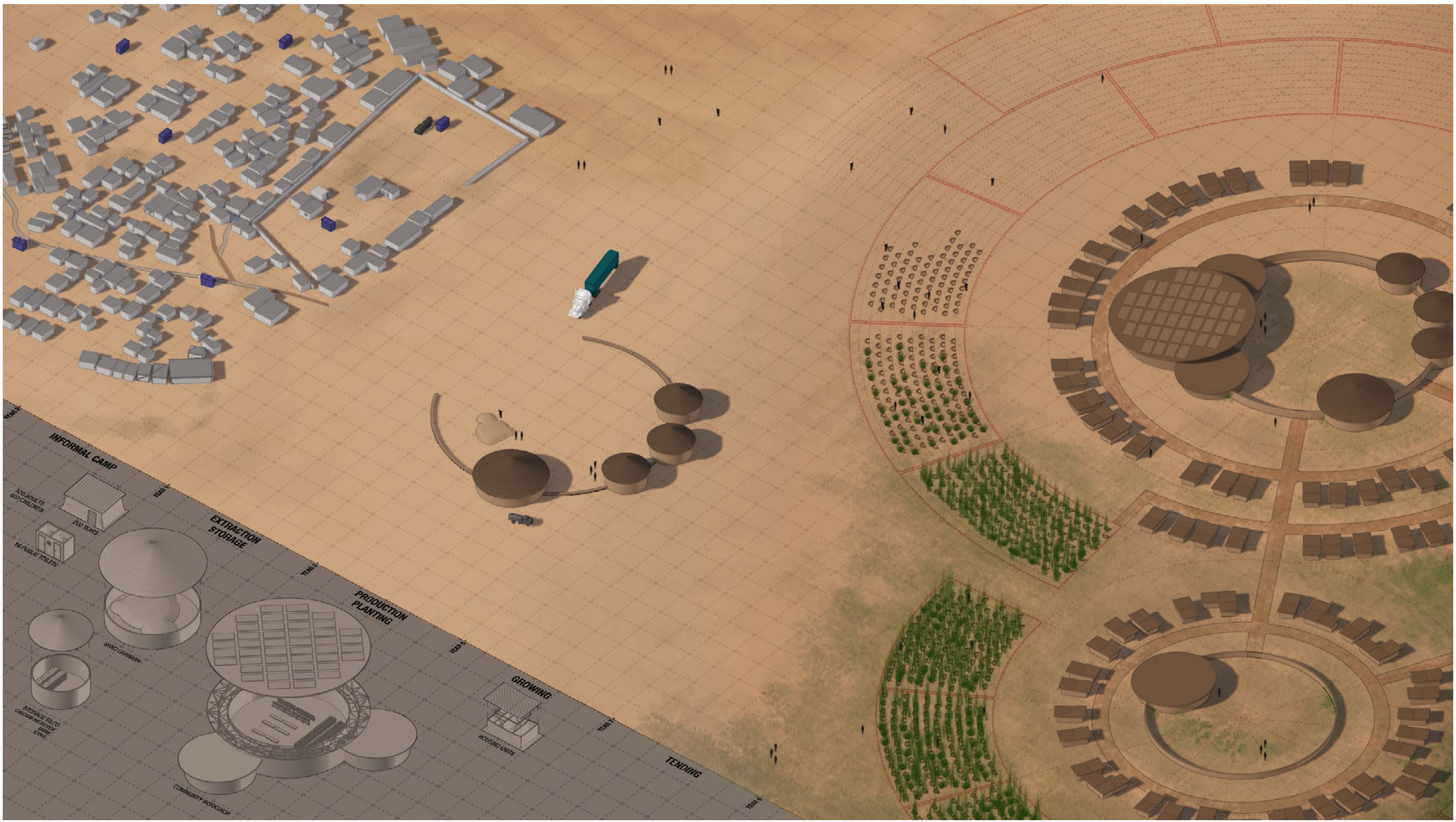


IV. TENDING

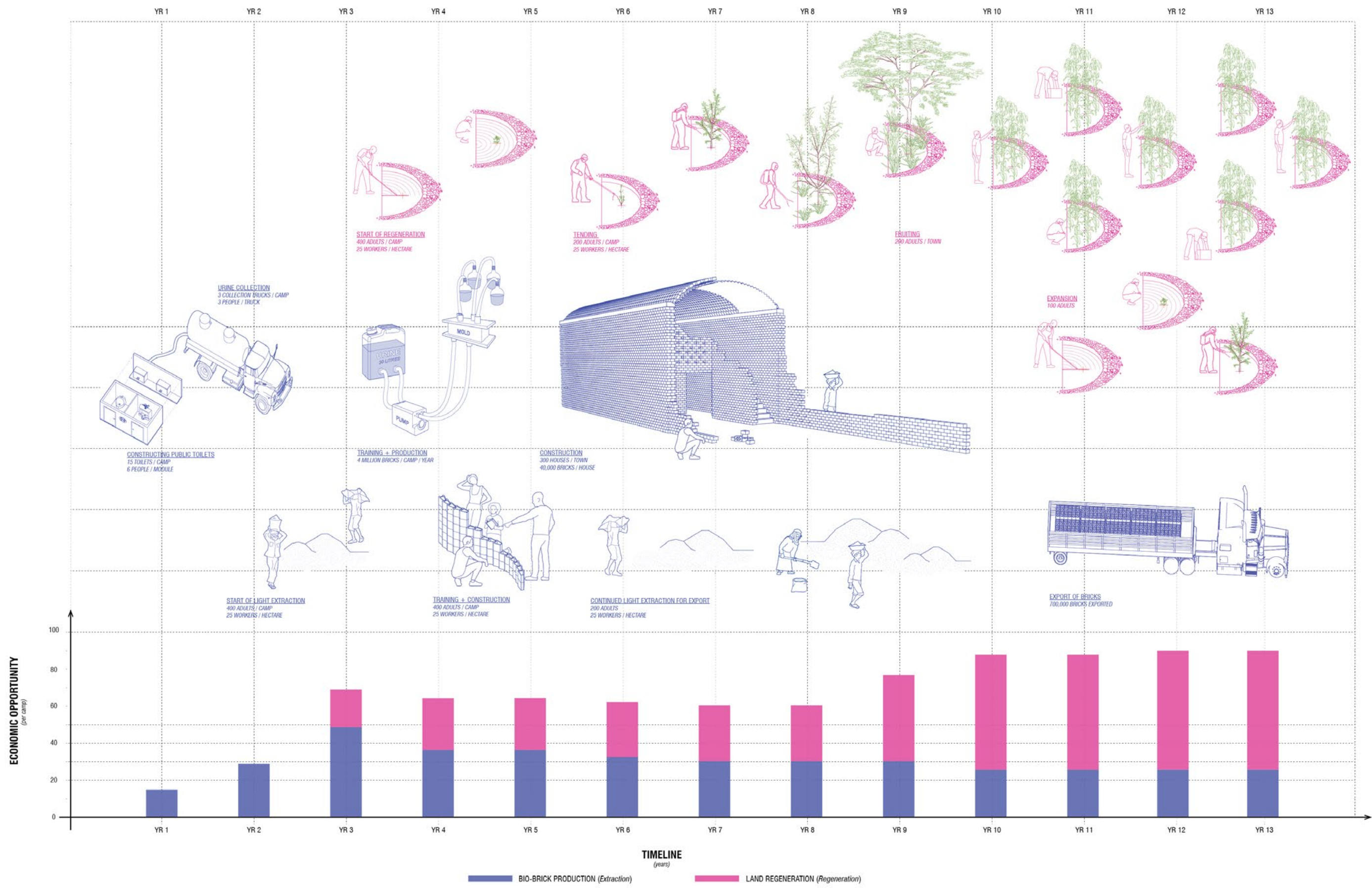
AREA: 1 HECTARE
 VOLUME: 24,670 kgCO₂ SEQUESTERED
 LABOUR: 25 WORKERS
 TIME: 3 YEARS





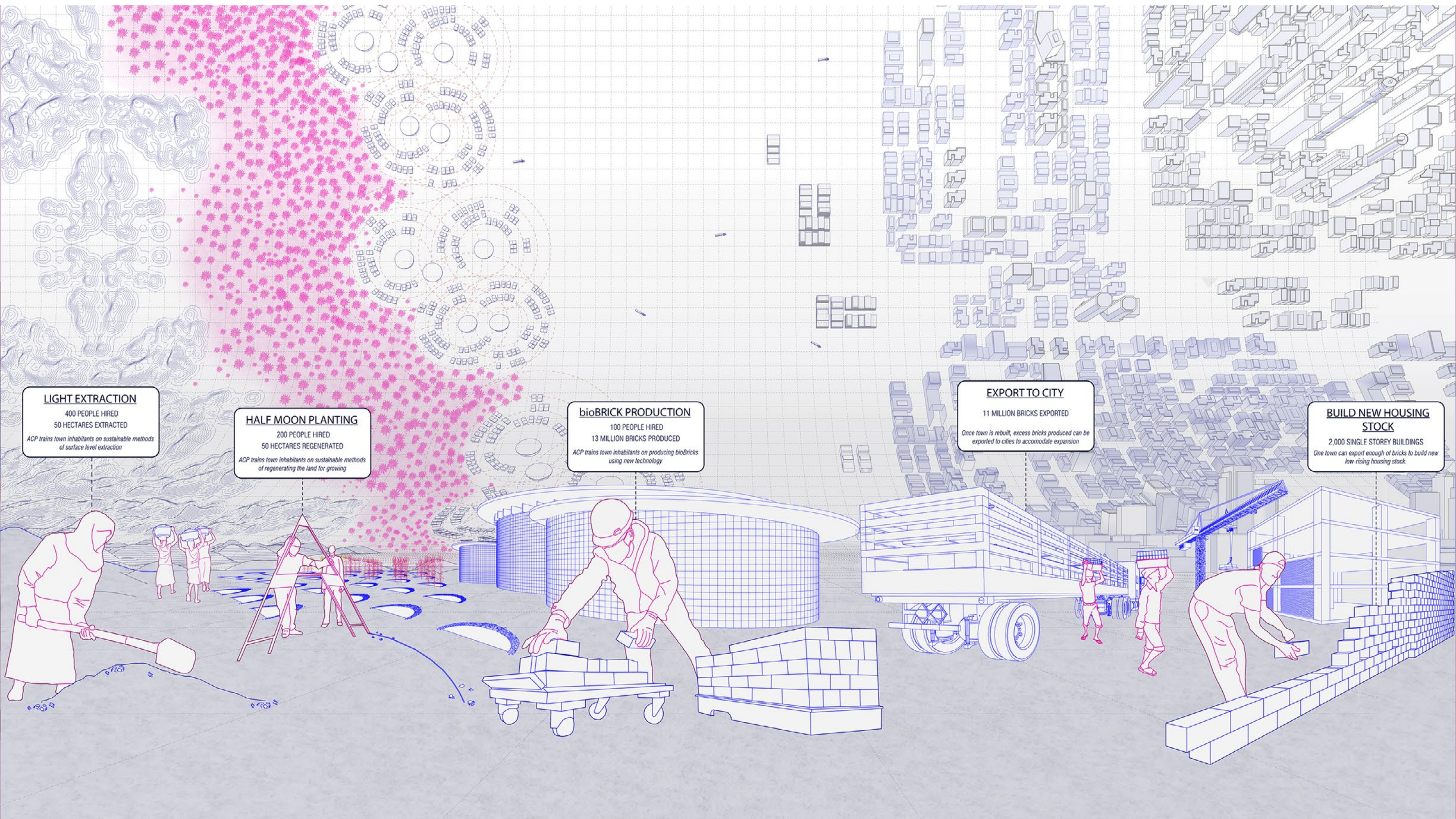


05.06 FORMALIZATION OF IDP CAMPS THROUGH BIO-BRICK PRODUCTION





05.08 BEFORE & AFTER LAND EXTRACTION & REGENERATION



LIGHT EXTRACTION
 400 PEOPLE HIRED
 50 HECTARES EXTRACTED
ACP trains town inhabitants on sustainable methods of surface level extraction

HALF MOON PLANTING
 200 PEOPLE HIRED
 50 HECTARES REGENERATED
ACP trains town inhabitants on sustainable methods of regenerating the land for growing

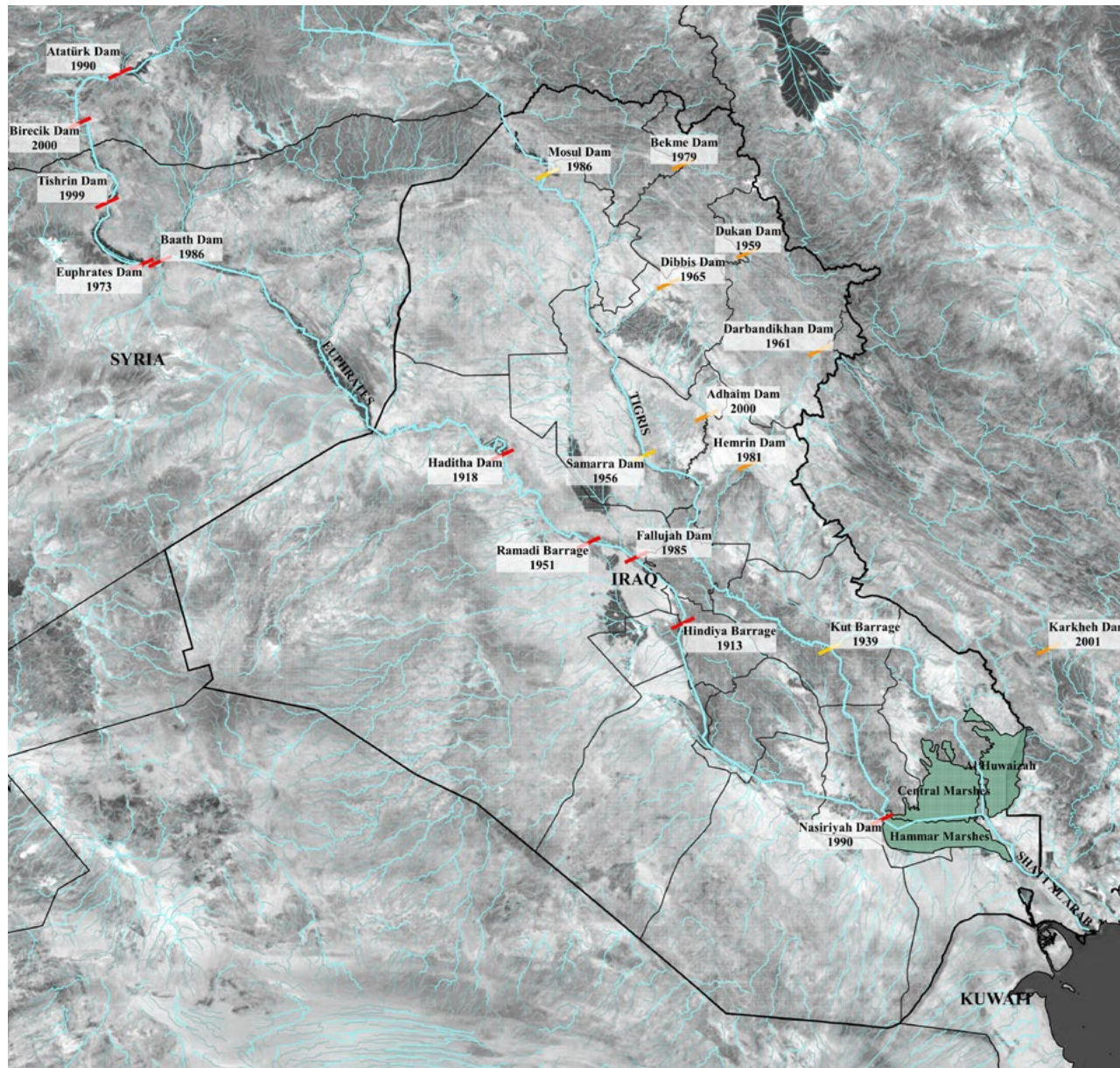
bioBRICK PRODUCTION
 100 PEOPLE HIRED
 13 MILLION BRICKS PRODUCED
ACP trains town inhabitants on producing bioBricks using new technology

EXPORT TO CITY
 11 MILLION BRICKS EXPORTED
Once town is rebuilt, excess bricks produced can be exported to cities to accommodate expansion

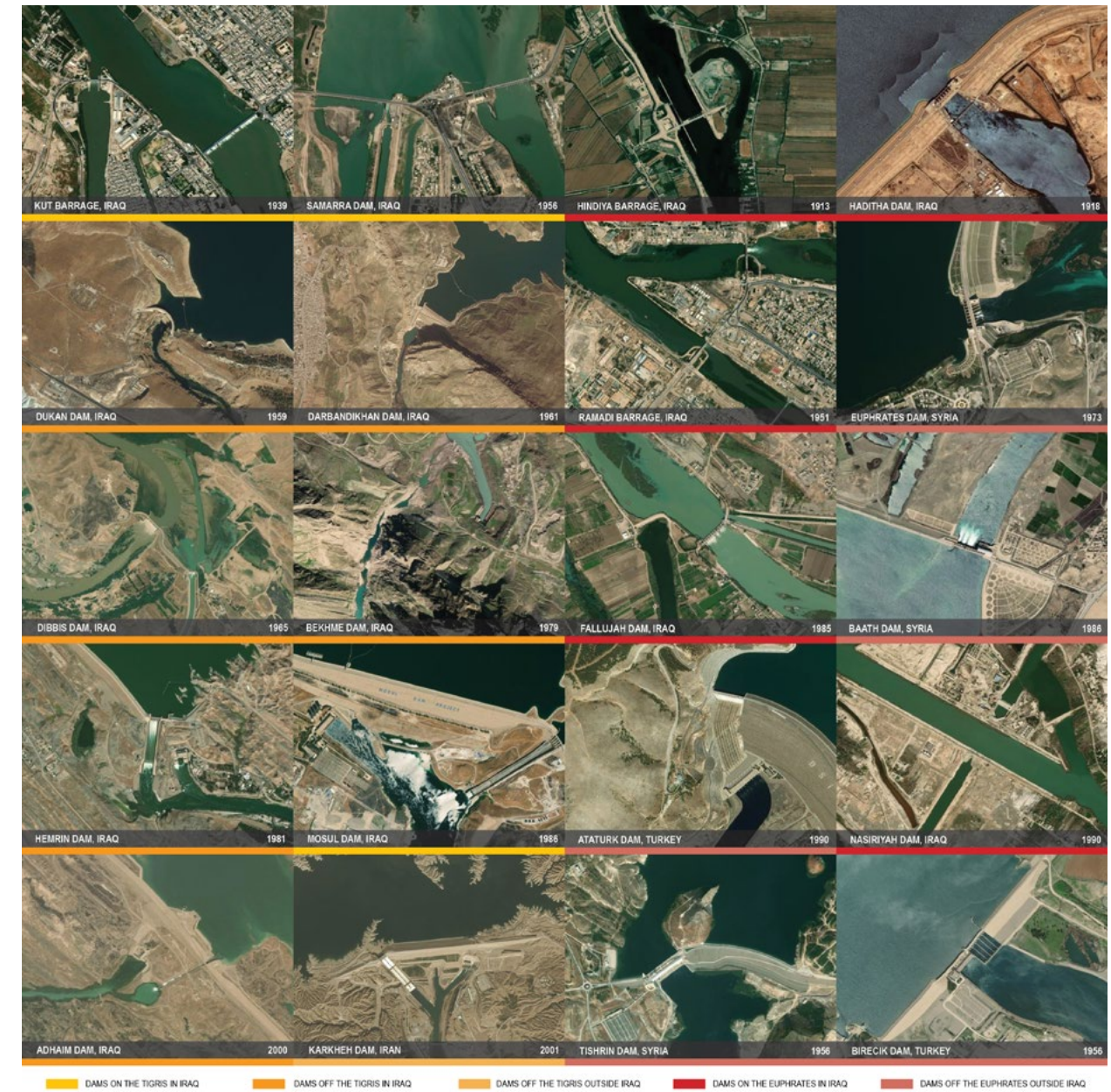
BUILD NEW HOUSING STOCK
 2,000 SINGLE STOREY BUILDINGS
One town can export enough of bricks to build new low-rising housing stock.

ma'dan tribes of iraq | urban study

CONFLICT URBANISM
 INSTRUCTOR: LAURA KURGAN
 WITH: FARAH ALKHOORY

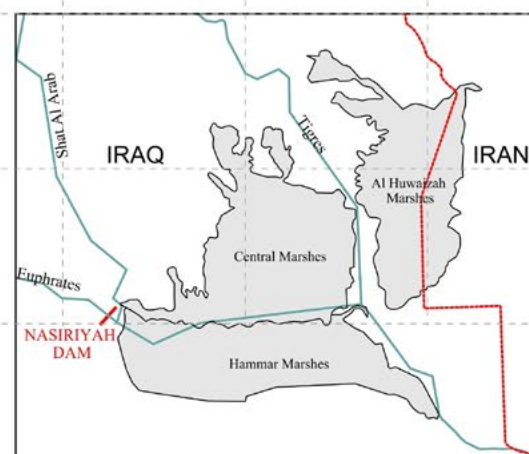
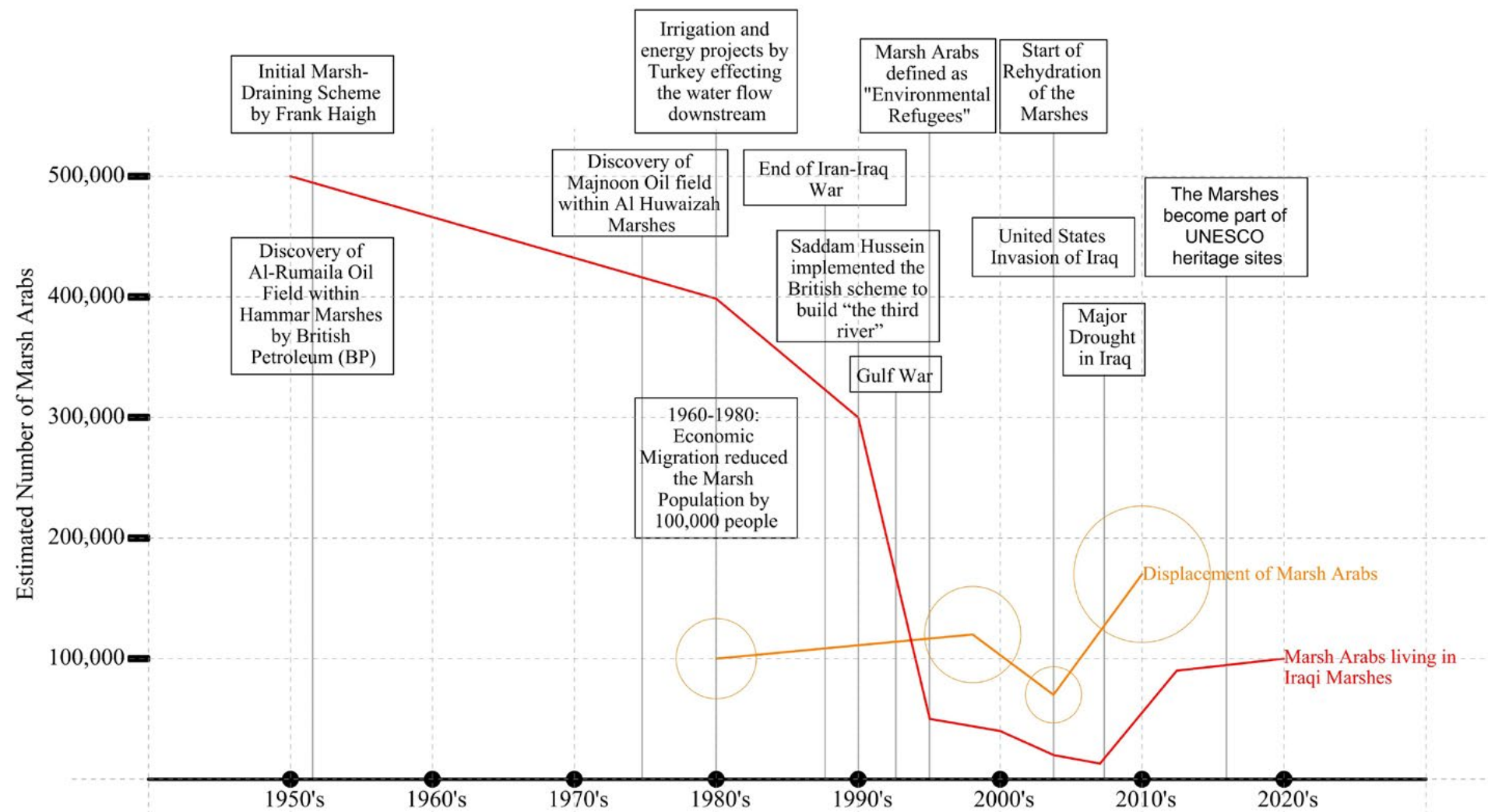


map of all dams

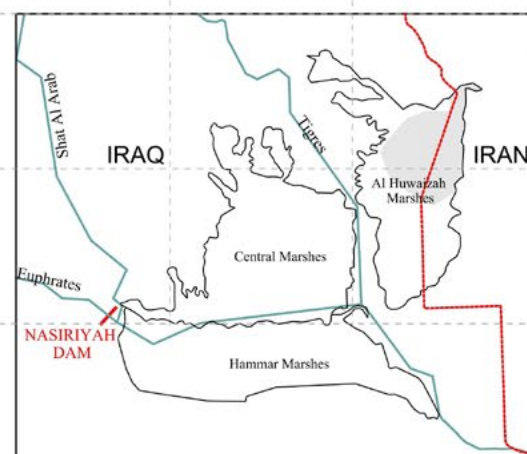


satellite imagery of all dams

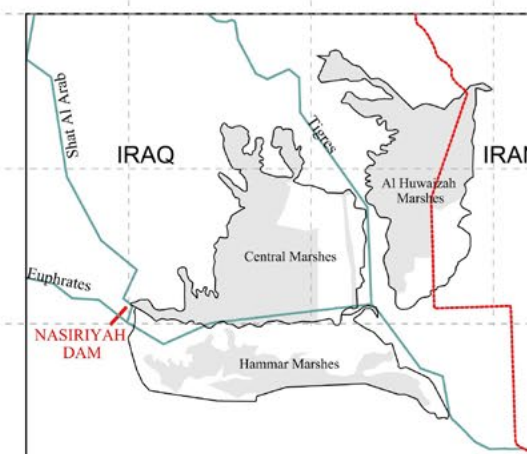
The geographical significance of the Marshlands of southern Iraq, made the Marshes susceptible to the process of modernization, irrigation, warfare, drought and oil extraction. As a result the Marsh Arabs became a displaced marginalized community in Iraq. This research uses critical mapping analysis tools to highlight the ecological consequences on the livelihood of the Ma'dan Tribes through years of conflict and how despite the apparent restoration of the Marshlands, ecological conditions remain unfavorable for their return to previous modes of living - rendering the political move of restoration a failure in essence.



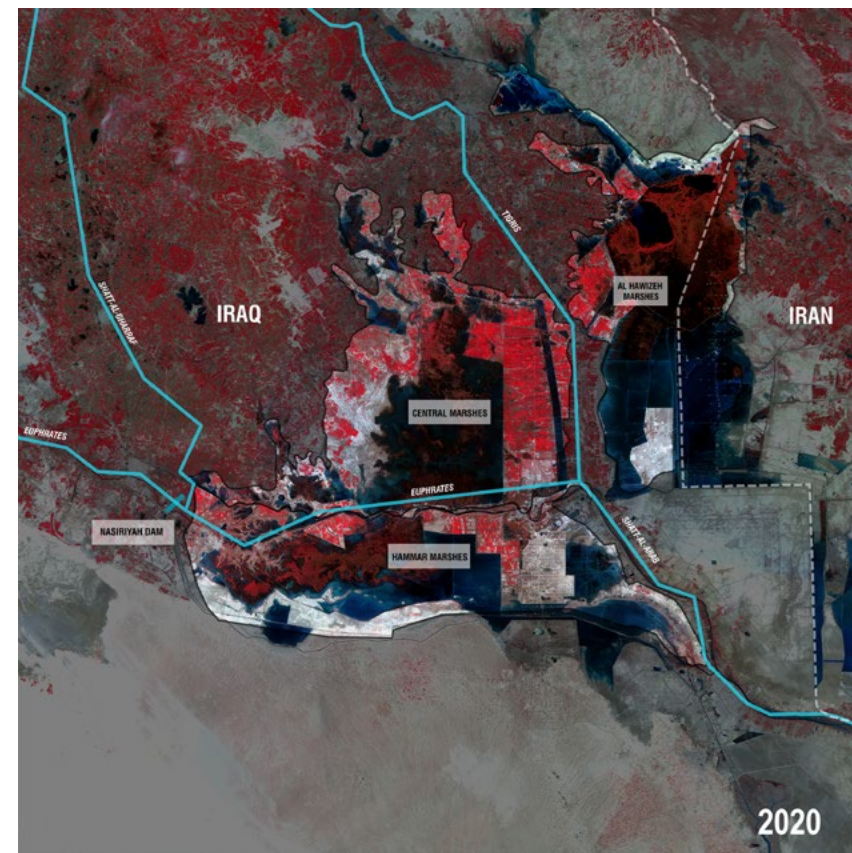
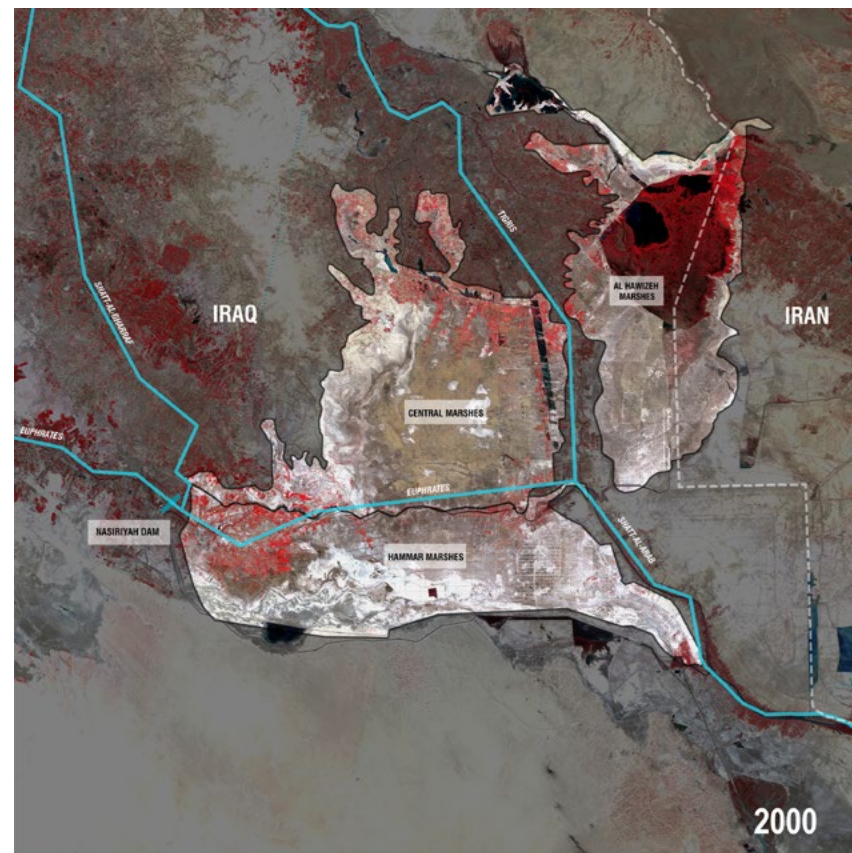
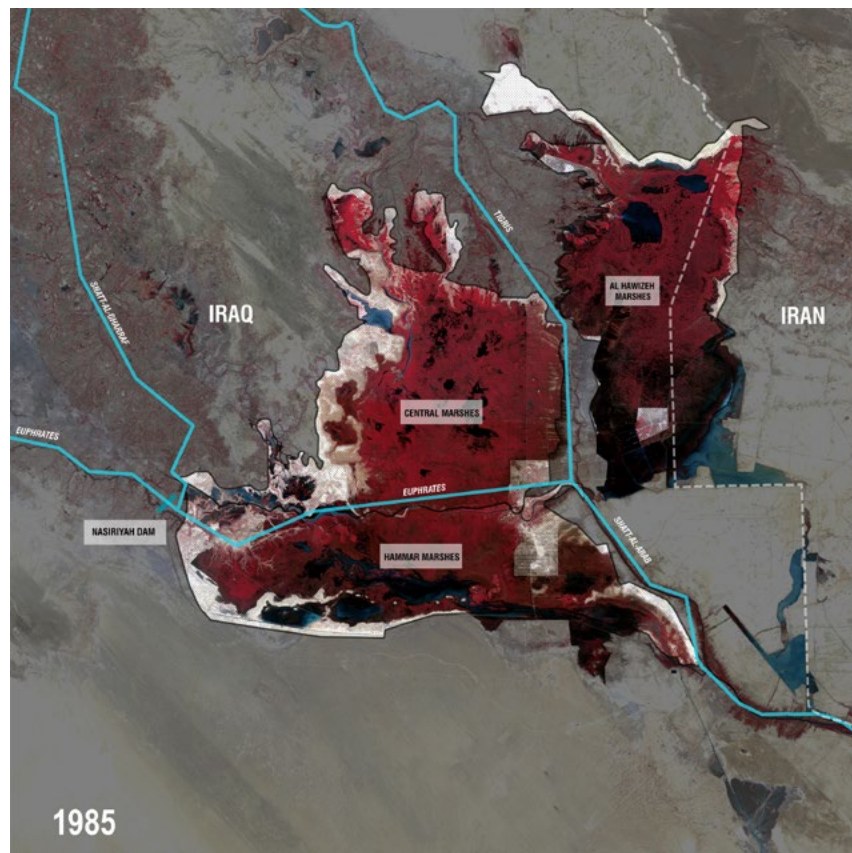
1973: Water extended 3121 Sq.km in the central Marshes, 2728 Sq.km in the Hammar Lake and 3717 Sq.km in the Huwaizah Marshes



2000: Water extended 0%-25% after the draining of the Marshes

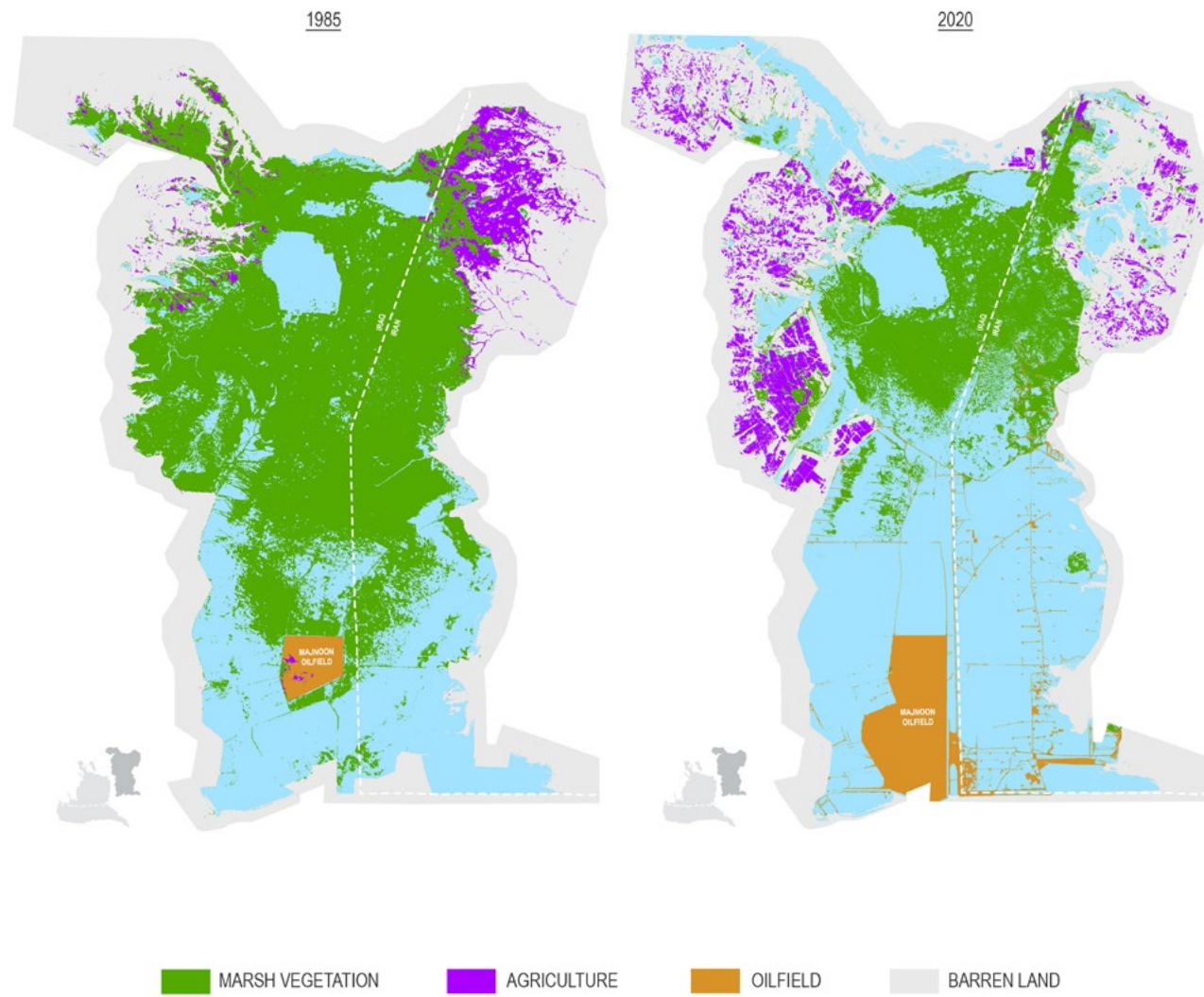


2020: Water extended 50%-75% after the Rehydration of the Marshes



landcover images showing drainage and reflooding of marshes

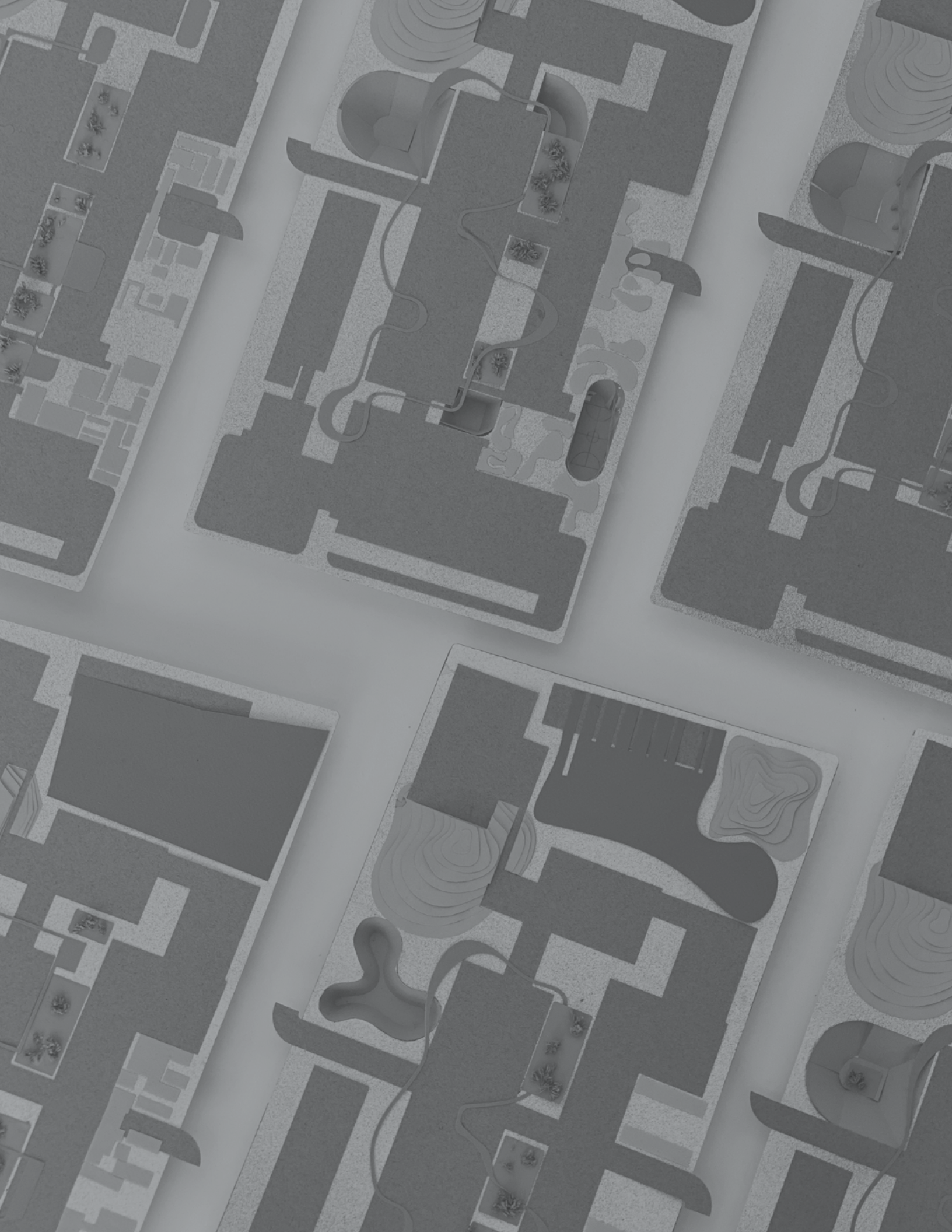
AL HUWAIZAH MARSH



landcover classification of quality of marsh water



satellite imagery showing increasing oil field activity



Revitalization.
Resiliency.
Reinvention.
Remediation.
Regeneration.

This is a catalogue of explorations in Readaptation.



GROUND MATTER

FIELD OPERATIONS FOR THE POST INDUSTRIAL LANDSCAPE

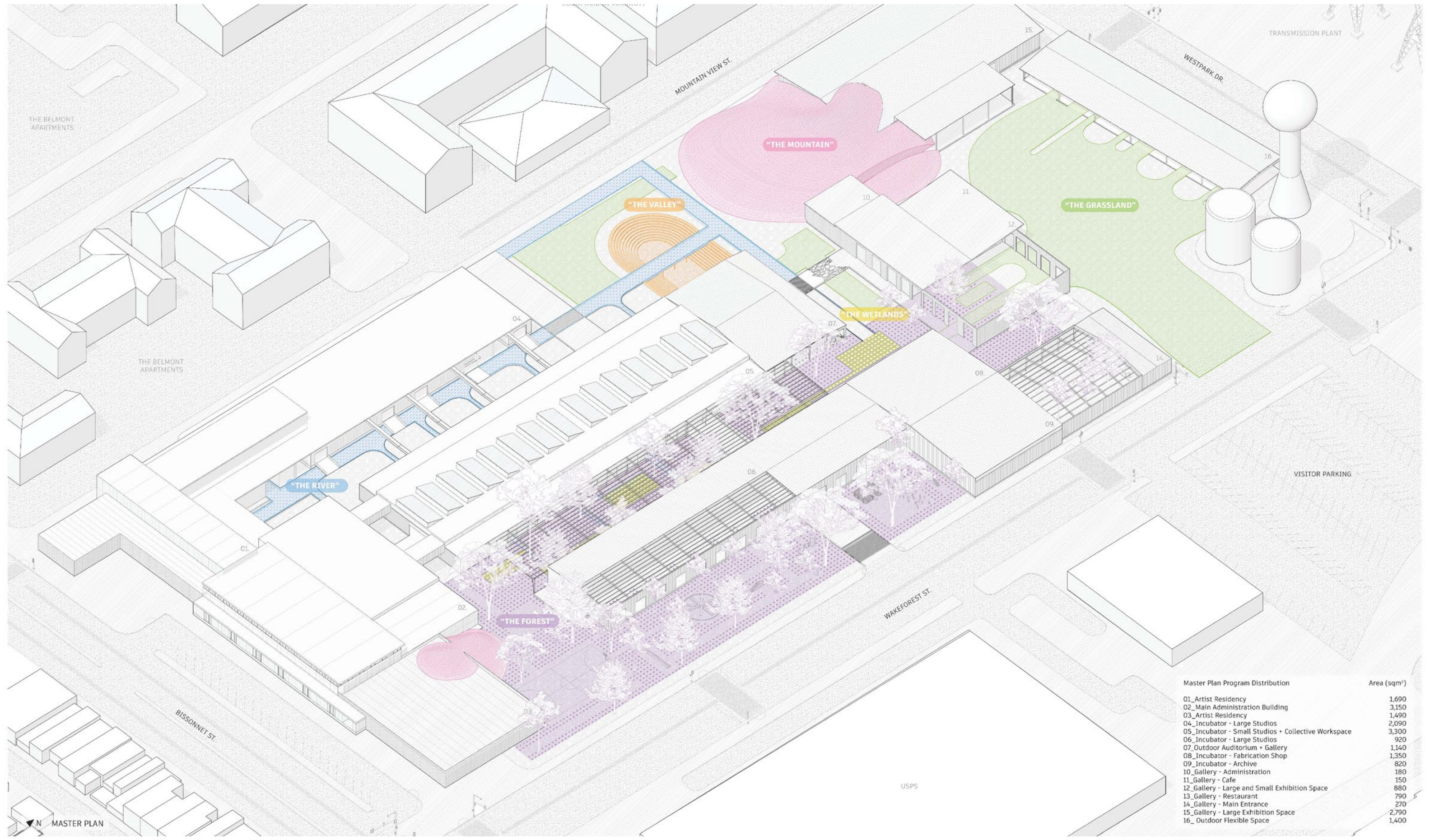
HOUSTON, TEXAS
 SPRING 2022
 INSTRUCTOR: WONNE ICKX
 WITH: BIANCA LIN

Ground Matter is a prototypical proposal to reimagine the role of adaptive reuse for a decommissioned Coca-Cola Bottling Plant in Houston, Texas. The project responds to the urban condition of impervious surfaces prevalent across Houston's cityscape and proposes a new post-industrial landscape that aims to bring permeability to the site.

Past storms like Hurricane Harvey, have caused serious damage to the city due to this imperviousness. By looking closely at the existing site, it is apparent that most of the grounds consist of asphalt and concrete hardscapes. With the high risk of natural disasters hitting the city, it is inevitable that the site will be flooded again in the foreseeable future.

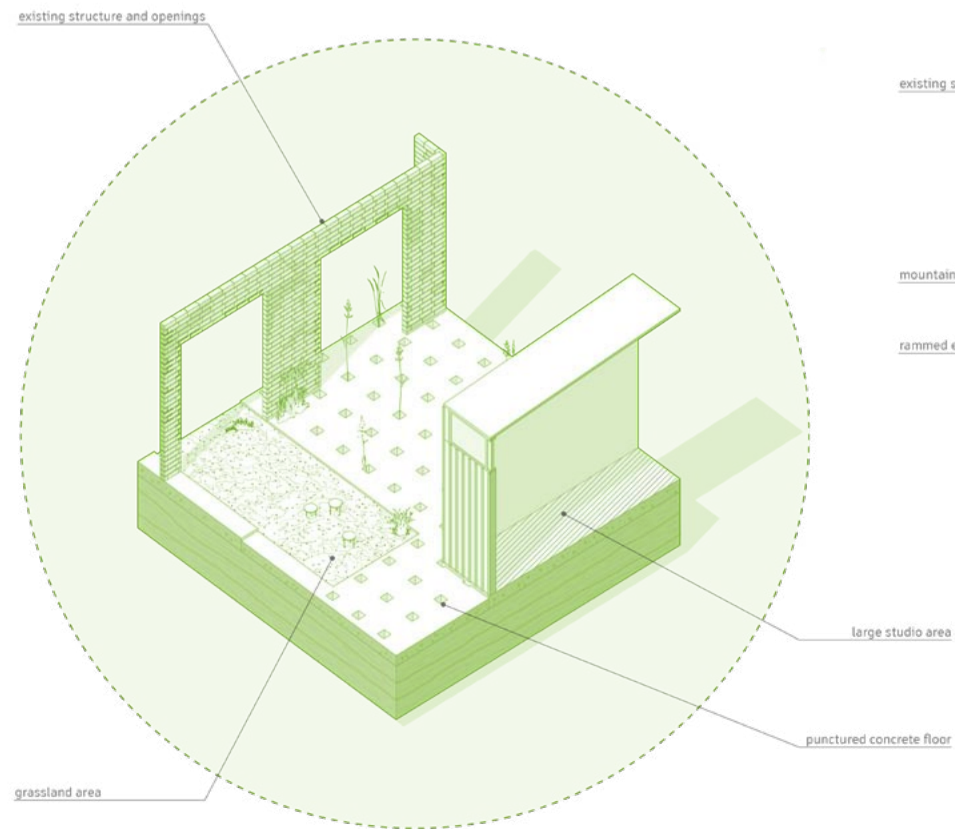
The existing buildings on site are minimally intervened into, with most of the design focusing on the ground surface between the existing structures. Five ground 'operations' of excavating, perforating, routing, skinning and stacking are implemented across the site to create new typologies of landscapes such as a Valley, Forest, River, Wetland, Grassland or Mountain.

These typologies either 'eat' into or 'stack' onto the existing buildings to enhance their operational and programmatic capabilities. Ground Matter is thus a post industrial landscape and a localized manifesto to tackle an urgent urban condition through the blurring of edges between built architecture and natural landscape that is operationally responsive and responsible but also programmatically varied and provocative to provide settings of occupation.

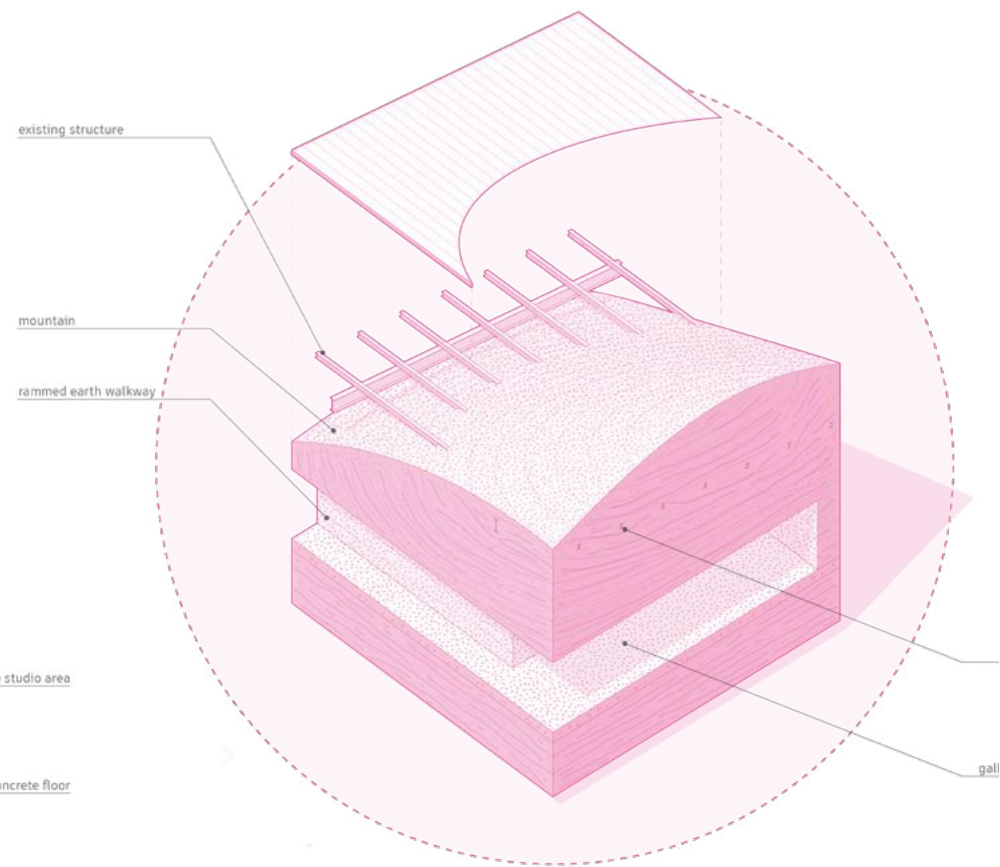


Master Plan Program Distribution	Area (sqm ²)
01_Artist Residency	1,690
02_Main Administration Building	3,150
03_Artist Residency	1,490
04_Incubator - Large Studios	2,090
05_Incubator - Small Studios + Collective Workspace	3,300
06_Incubator - Large Studios	920
07_Outdoor Auditorium + Gallery	1,140
08_Incubator - Fabrication Shop	1,350
09_Incubator - Archive	820
10_Gallery - Administration	180
11_Gallery - Cafe	150
12_Gallery - Large and Small Exhibition Space	880
13_Gallery - Restaurant	790
14_Gallery - Main Entrance	270
15_Gallery - Large Exhibition Space	2,790
16_Outdoor Flexible Space	1,400

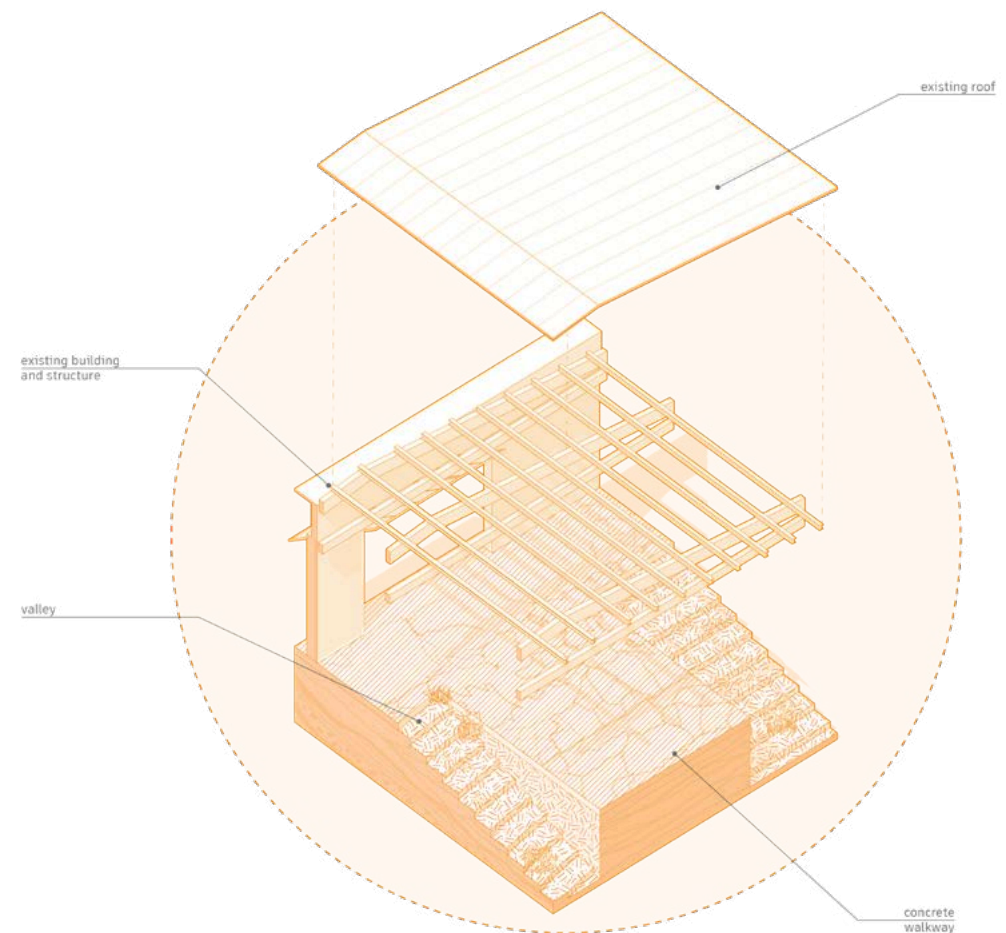
06.02 MASTER PLAN AXONOMETRIC



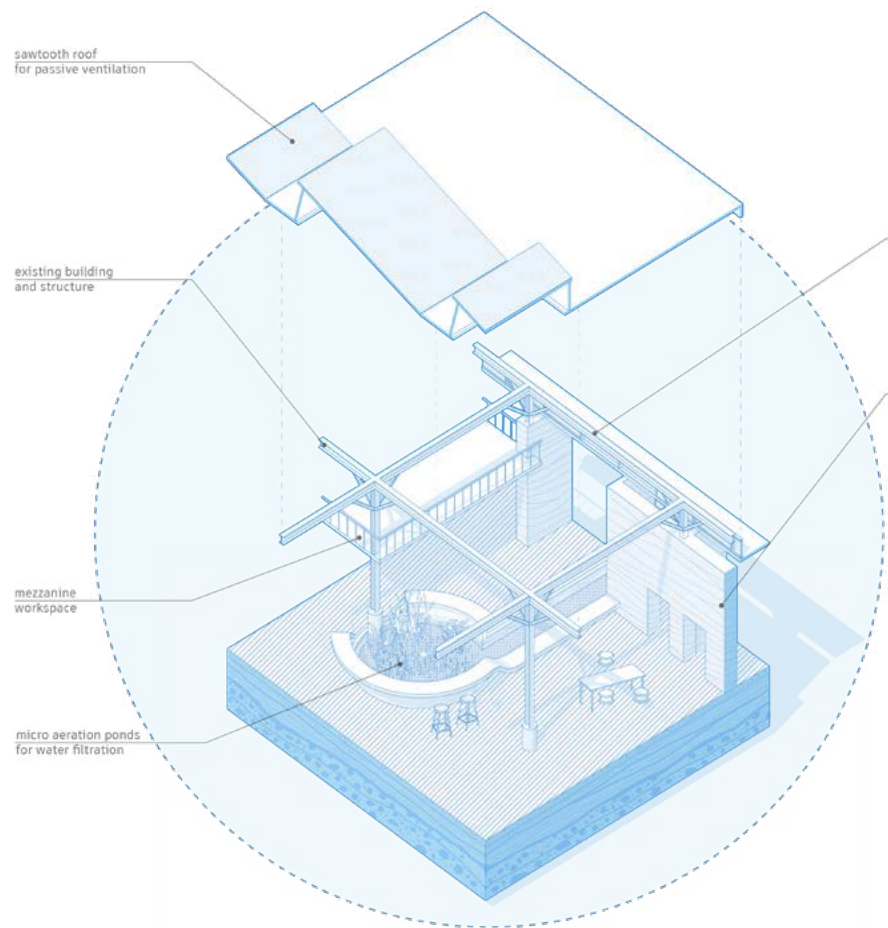
THE GRASSLAND



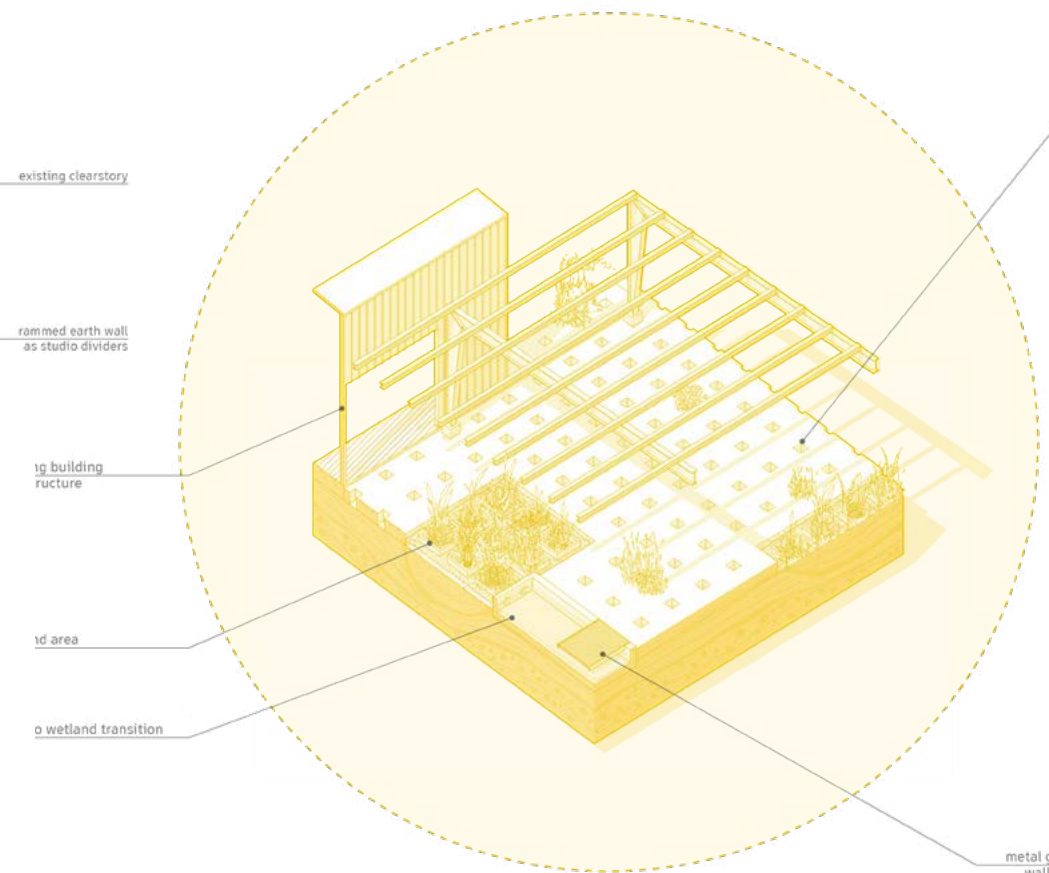
THE MOUNTAIN



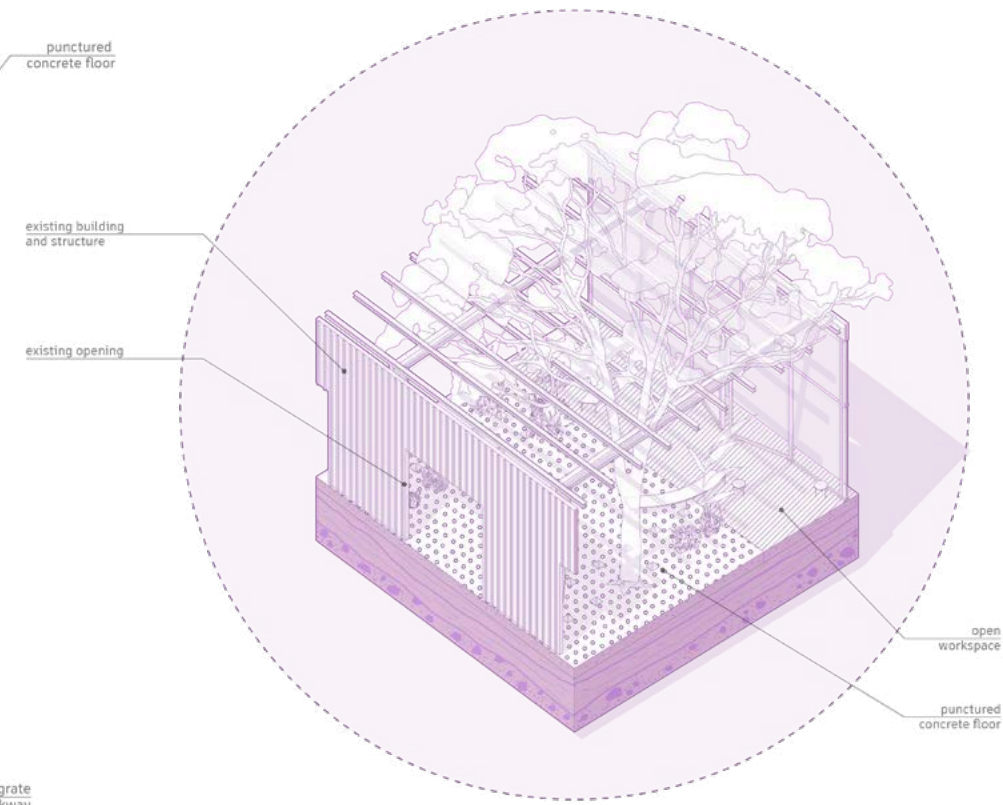
THE VALLEY



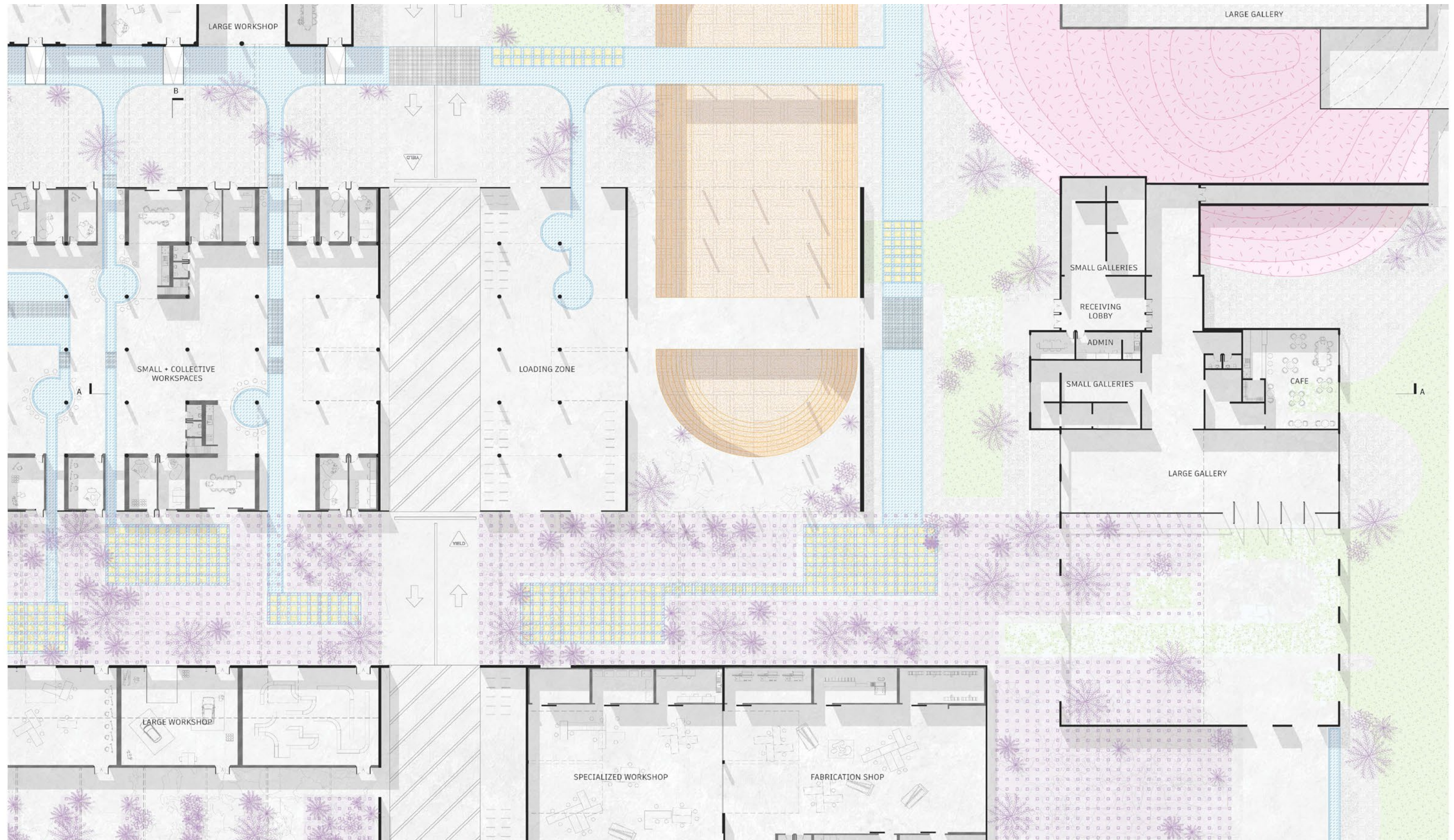
THE RIVER



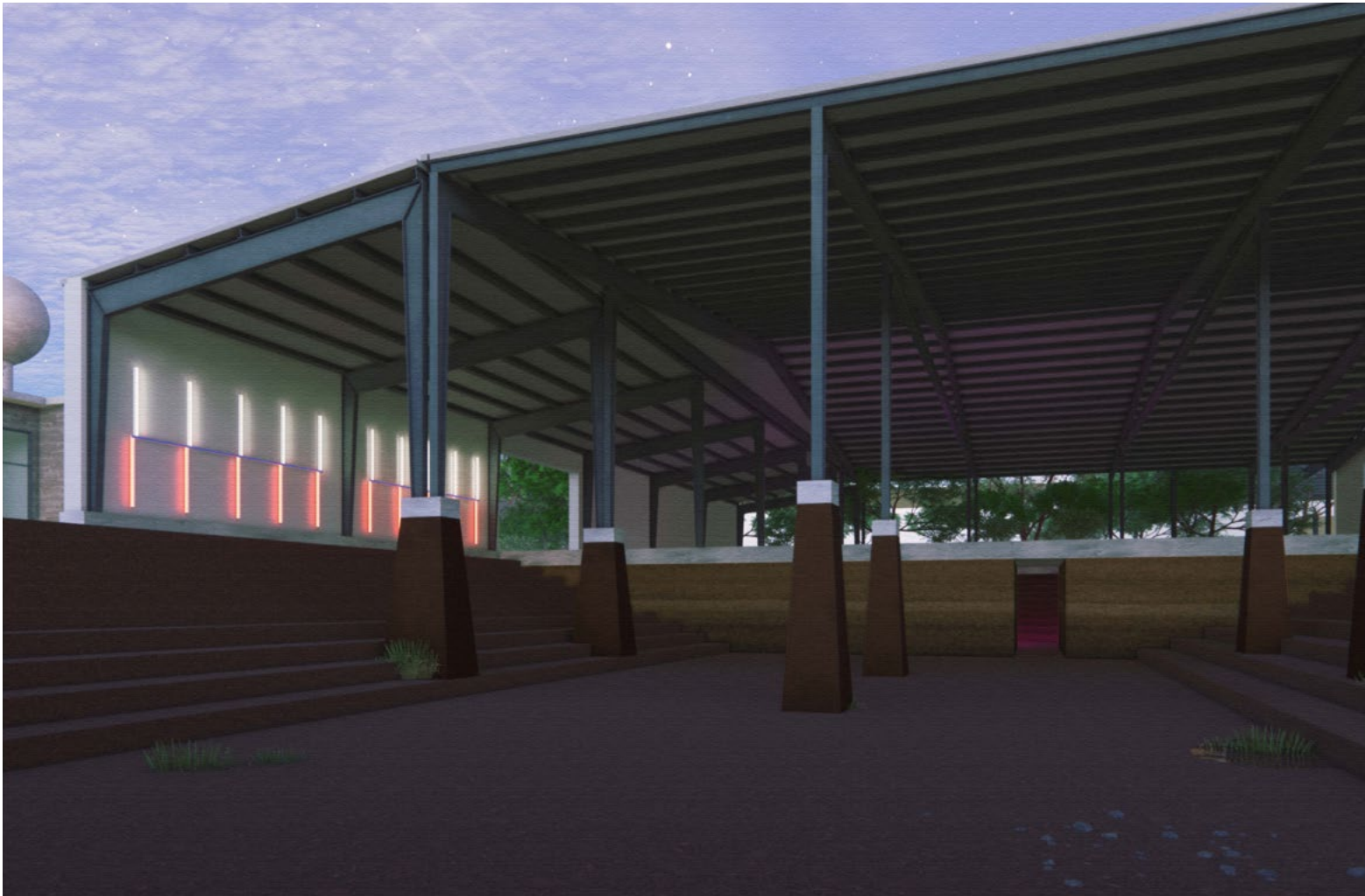
THE WETLAND



THE FOREST



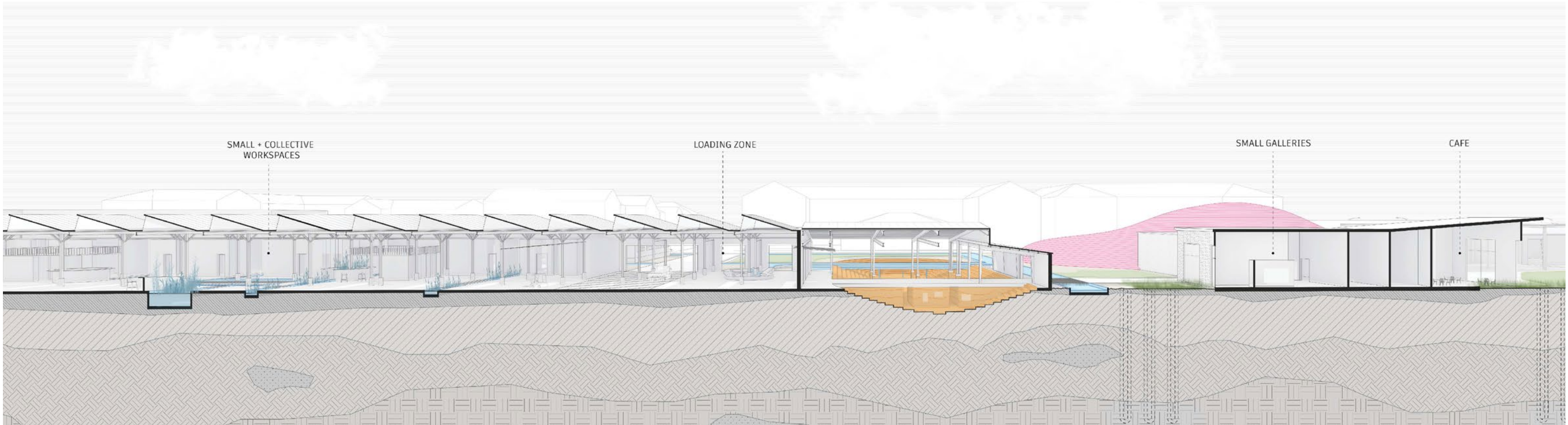
06.05 ZOOM IN PLAN



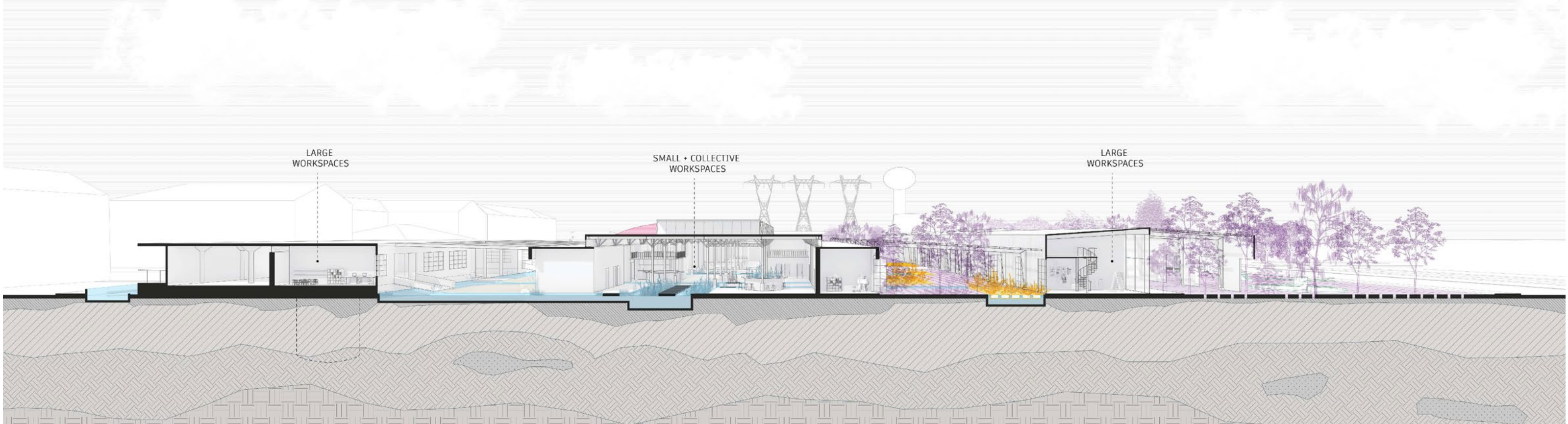
06.06 THE VALLEY



06.07 THE MOUNTAIN



06.08 LONGITUDINAL SECTION



06.09 CROSS SECTION



This was a catalogue of work developed over six semesters
at Columbia, GSAPP.

This was a catalogue of explorations in
Revitalization.
Resiliency.
Reinvention.
Remediation.
Regeneration.
Readaptation.

This was a catalogue of my interests in architecture.

