WORK. IN PRO-GRESS.

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WORK. IN PROGRESS. A PORTFOLIO BY SAMUEL BAGER. M. ARCH. COLUMBIA GSAPP. WORK.

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As students and members of the field of architecture, very often are we in search of how we can make things fit the way we think they should. We like things that are orderly and regular, things that fit a narrative we create, things that fit within the theme of a portfolio.

Sometimes we create rules when we begin the process of designing—rules that become arbitrary constructs within which we must try and fit our 'solutions'. Often, we lose sight of what is critical to the project, the community, the environment, and so on.

My approach to designing changes with every prompt I receive and every project I begin—because unique problems require unique solutions. Although my design language and process are constantly changing and adapting, my design philosophy has never wavered: "solve more problems than you create." Is it simple? Yes. Shouldn't this be considered the bare minimum? Absolutely. But are all architects and designers always making sure they address this problem in some capacity? Unfortunately, no.

As a student and a lifelong learner, I like to believe that in the field of architecture we all follow an unwritten rule of leaving a place better than it was found—an ideal that was instilled in me at a very young age by my grandmother. But, as I continue to learn more about the real world, I'm worried my rose-coloured lenses are beginning to fade.

These projects are not complete, I don't think they ever will be, to be honest. These projects stand to represent an ideology that a project and its body of work should not be placed in the archives, but rather operate as a point of reference to inform the strategies and methods of improvement used for future designs. More importantly, these projects are representations of my learning process—ways for me to become a better designer—a designer who will not fall short in giving back more than what is taken away. In other words, a designer who will do more than the bare minimum.

MBIA GSAPP. WORK. IN PROGRESS. A PORTFOLIO BY SAMUEL BAGER. M. ARCH. COLUMBIA GSAPP. WORK. IN PROGRESS. A PORTFOLIO BY SAMUEL BAGER. M. ARCH. COLUMBIA GSAPP. WORK. IN PROGRESS. A PORTFOLIO BY SAMUEL BAGER. M. ARCH. COLUMBIA GSAPP. WORK. IN PROGRESS. A PORTFOLIO BY SAMUEL BAGER. M. ARCH. COLUMBIA GSAPP. WORK. IN PROGRESS. A PORTFOLIO BY SAMUEL BAGE

Inversion, Conversion, and Adaptation of the AT&T Long Lines Building

Since construction completed on AT&T's windowless, 30-story tower at 33 Thomas Street in 1975, the building has embodied its original design intention: an impenetrable granite-clad fortress bolstered to support nuclear fallout and keep those privileged within safe from the city.

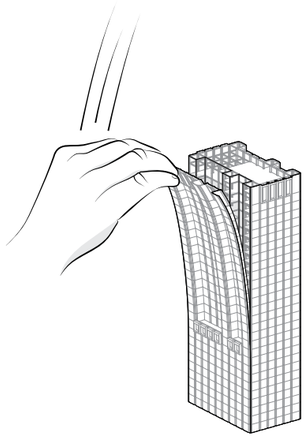
The first act was simple – to remove the facade, expose the building's over-sized, regularized structure (necessary for the telephone infrastructure housed within), invert it as an active participant in the city, and re-program it by sandwiching affordable housing units to the north and south and inserting a robust social infrastructural program (including theatre, library, art studios, gymnasium, rooftop pool, etc.) in between. Taking advantage of the building's deep floor plates allows space for new vertical circulation cores clinging to the east and west faces and a light, tensile and operable ETFE skin re-wrapping the building's exposed frame.

While providing essential climatic performance and rendering the building as a ghost of its former self, the plastic wrapper facade inverts the building radically from solid, granite sculpture to green, translucent monolith.

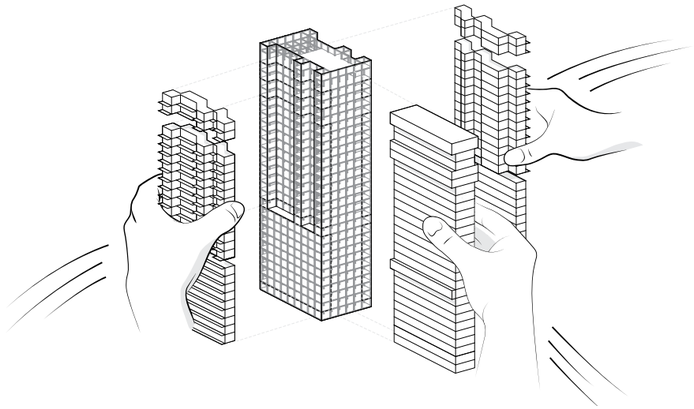
LOCATION TRIBECA, NEW YORK
COURSE ADVANCED STUDIO V
CRITIC WONNE ICKX
TERM FALL 2022
COLLABORATOR BLAKE KEM

01

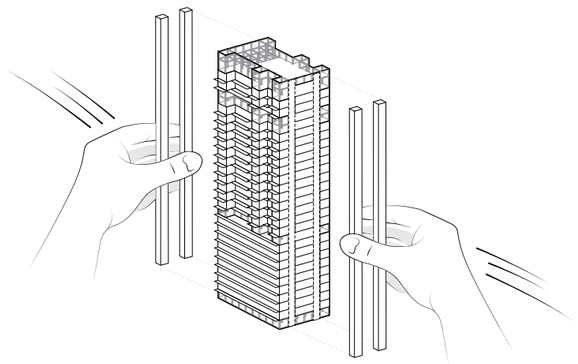
*01*_33 THOMAS / RE-WRAPPED



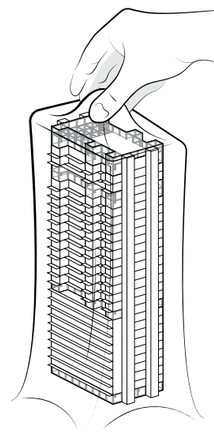
1.0 Peel Existing Facade



2.0 Sandwich Residential Units & Interior Program



3.0 Express Egress

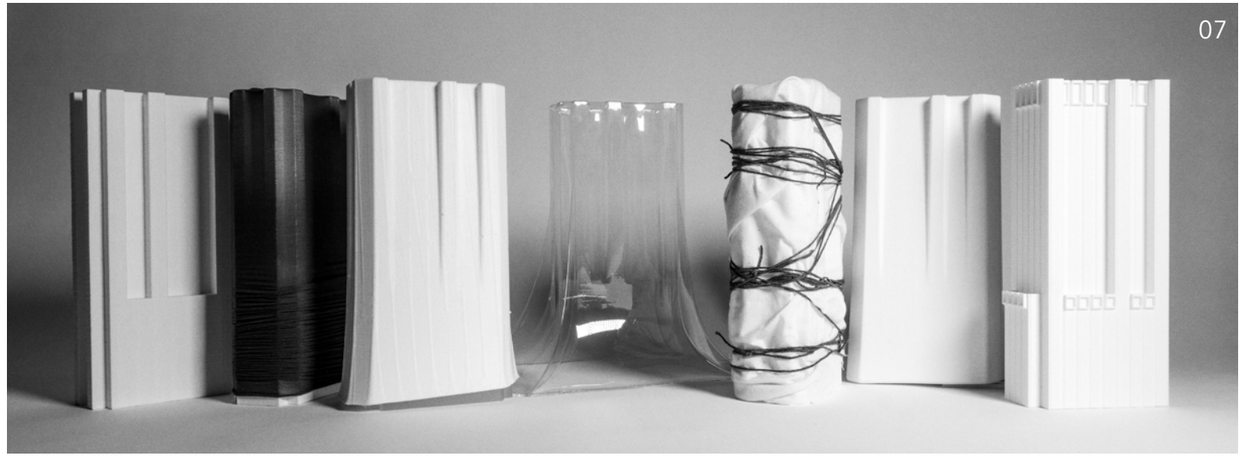


4.0 Drape Facade Over Structure

Massing Diagram

01_33 THOMAS / UN-WRAPPED

Existing Images of 33 Thomas



Massing Models

Facade Isometric Render

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New roof garden with public pool reclaims important elevated space for general accommodation

Transparent, operable skin (manufactured from thin single-layer ETFE typically used for greenhouses) recalls monolithic massing of existing structure and provides essential thermal and weather performance

New vertical circulation cores on the east and west elevations are attached to the existing structure like armatures, allowing the new floor plates to remain as open and flexible as possible

ETFE skin lifts up at the base to emphasize its difference from existing structure and provide backdrop for public plazas surrounding the open ground floor

Church St.

South Elevation

L29 (POOL DECK)
ELEV. 538'-0 "

L28 (LOUNGE + LOCKERS)
ELEV. 515'-0"

L27 (MECHANICAL)
ELEV. 497-6"

L26 (DANCE HALLS)
ELEV. 480'-0"

L25 (MEZZANINE)
ELEV. 462'-6"

L24 (MULTI-PURPOSE SPACE)
ELEV. 445'-0"

L23 (OFFICE)
ELEV. 427'-6"

L22 (CO-WORK)
ELEV. 410'-0"

L21 (CO-WORK)
ELEV. 392'-6"

L20 (SOCIAL ATRIUM)
ELEV. 375'-0"

L19 (MEDICAL ADMIN.)
ELEV. 356'-6"

L18 (MEDICAL WAITING)
ELEV. 338'-0"

L17 (SOCIAL ATRIUM)
ELEV. 319'-6"

L16 (LOUNGE)
ELEV. 300'-6"

L15 (LAUNDRY)
ELEV. 283'-0"

L14 (MECHANICAL)
ELEV. 265'-6"

L13 (KINDERGARTEN)
ELEV. 248'-0"

L12 (EXERCISE TERRACE)
ELEV. 230'-6"

L11 (LIBRARY)
ELEV. 213'-0"

L10 (LIBRARY)
ELEV. 195'-6"

L09 (SOCIAL ATRIUM)
ELEV. 178'-0"

L08 (ART STUDIO)
ELEV. 160'-6"

L07 (EXHIBITION SPACE)
ELEV. 143'-0"

L06 (SOCIAL ATRIUM)
ELEV. 125'-6"

L05 (THEATRE BOH)
ELEV. 108'-0"

L04 (THEATRE MEZ.)
ELEV. 90'-6"

L03 (THEATRE)
ELEV. 73'-0"

L02 (PRE-FUNCTION + REST.)
ELEV. 55'-6"

L01 (COMMUNITY ROOM)
ELEV. 38'-0"

B01 (PARKING + MECH.)
ELEV. 17'-6"

B02 (PARKING + MECH.)

Upper level multi-purpose space (with suspended running track) can be utilized for large community banquets, music recitals, sporting events, and much more

Oversized circulation corridor between residential units and inner social infrastructure serves as essential buffer between public and private programs

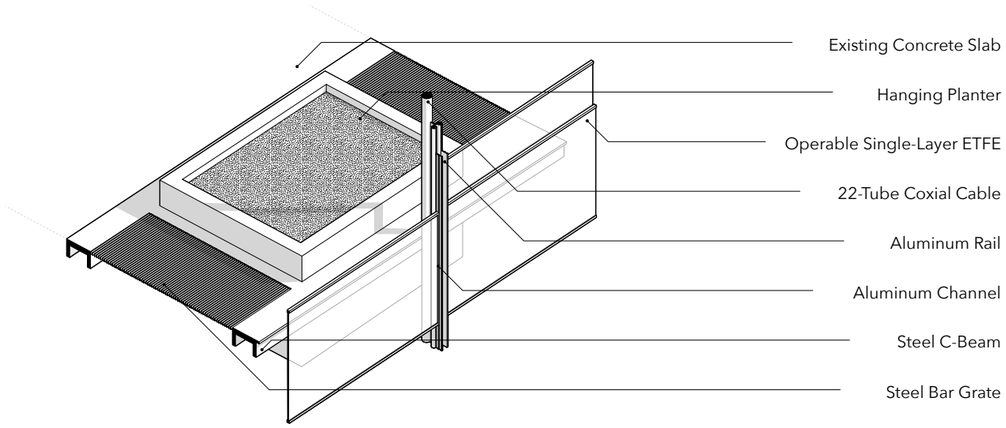
Publicly accessible exercise terrace and garden patio at existing setback serves as collective gathering space between upper and lower units

"Units" adjacent to large spacial infrastructural spaces such as public restrooms, changing rooms, etc.

Thomas St.

Worth St.

Cross Section

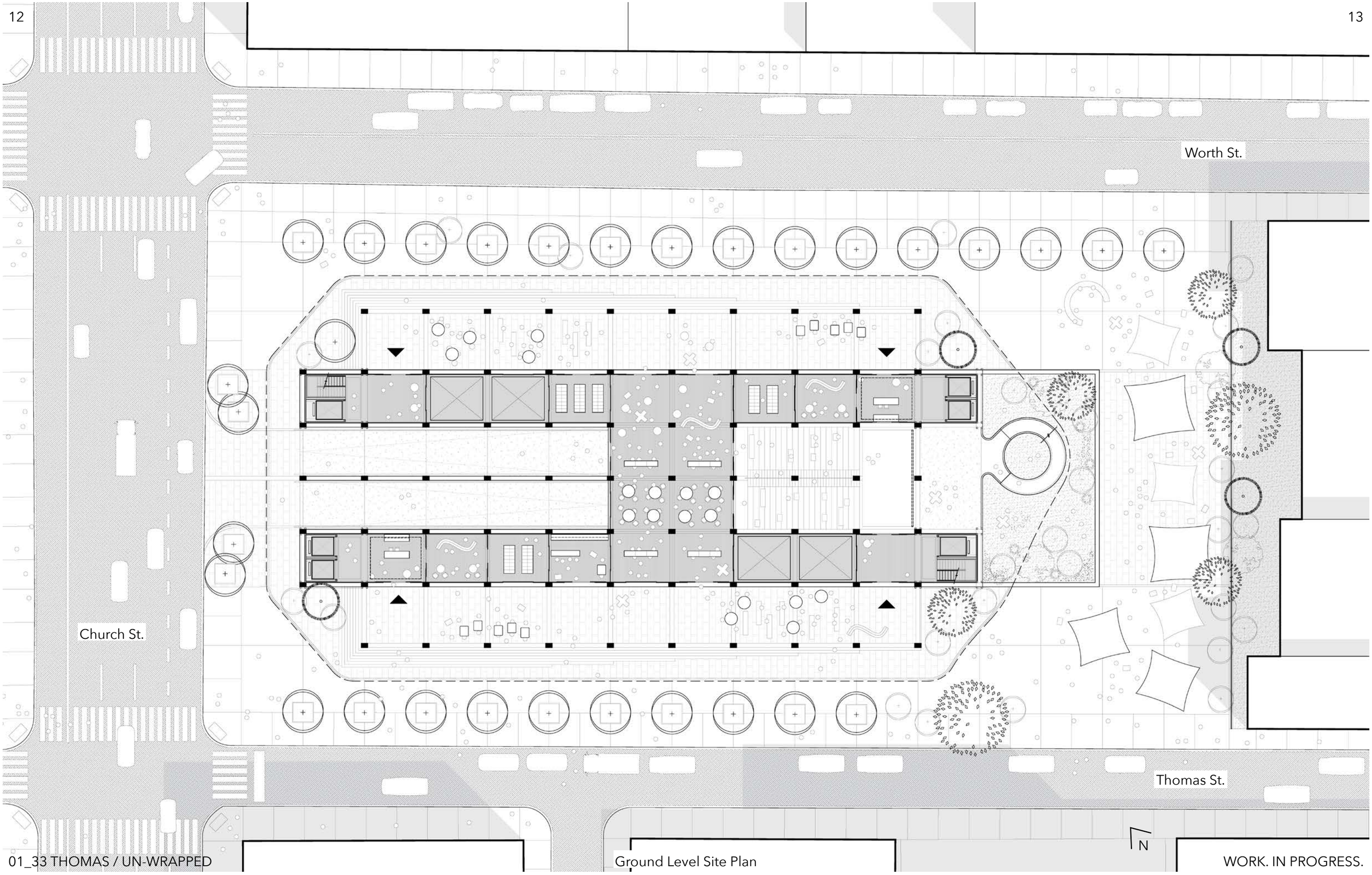


Facade Structure Isometric

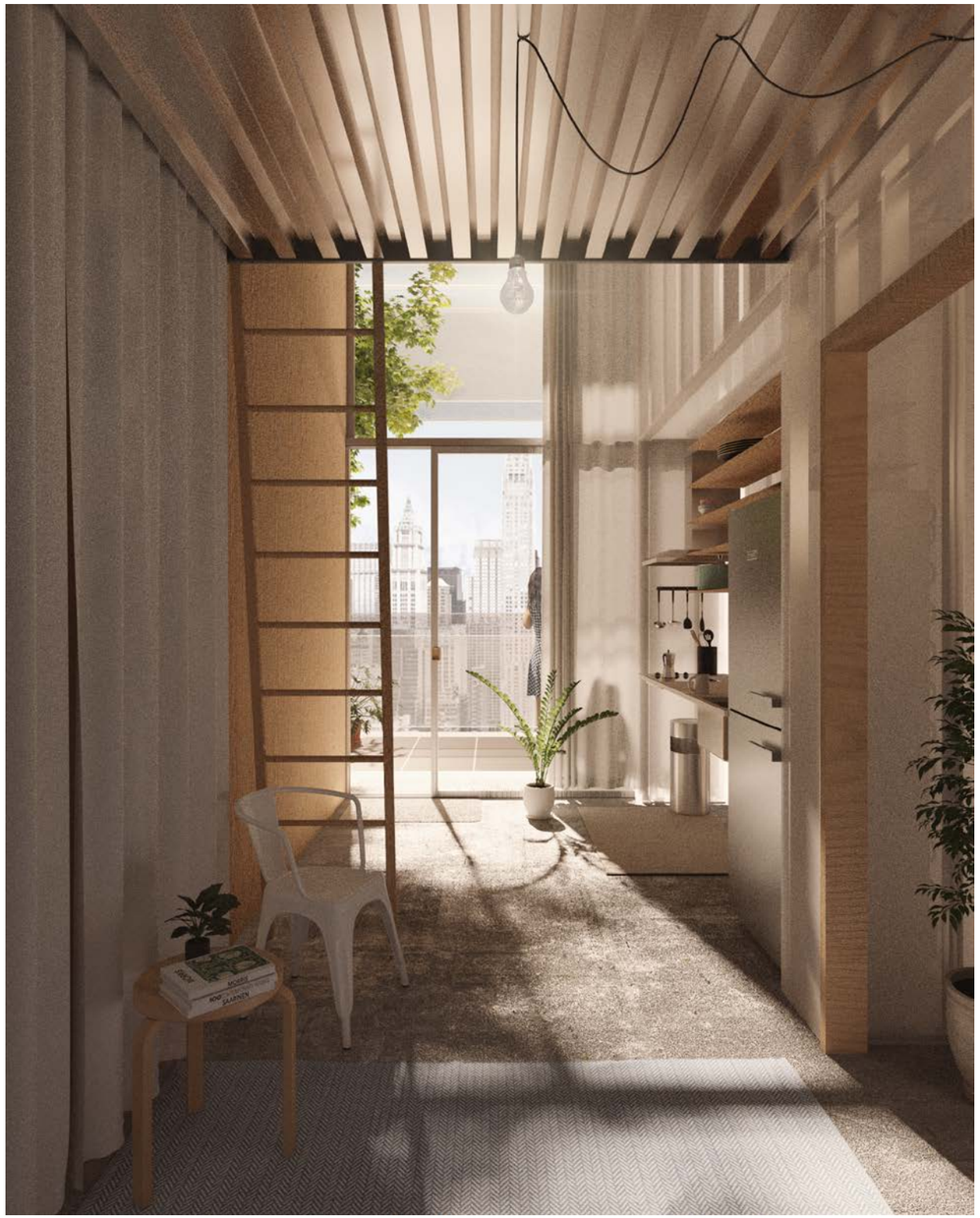
Balcony Perspective

Render of Pedestrian Approach

WORK. IN PROGRESS.

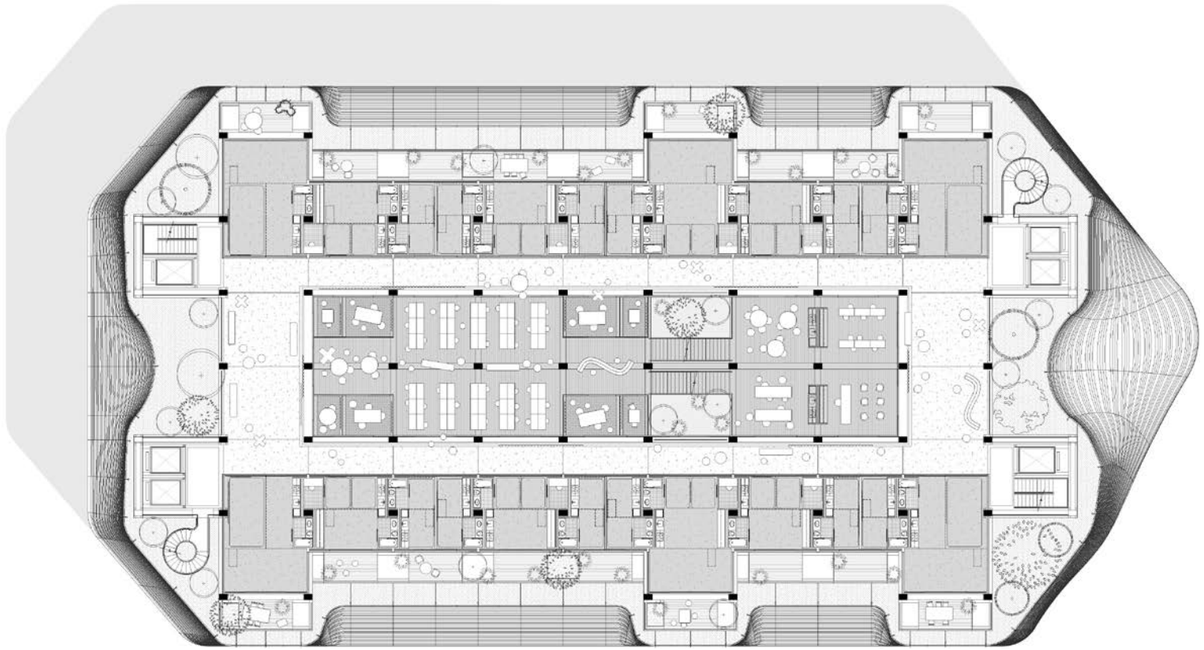


Ground Level Site Plan

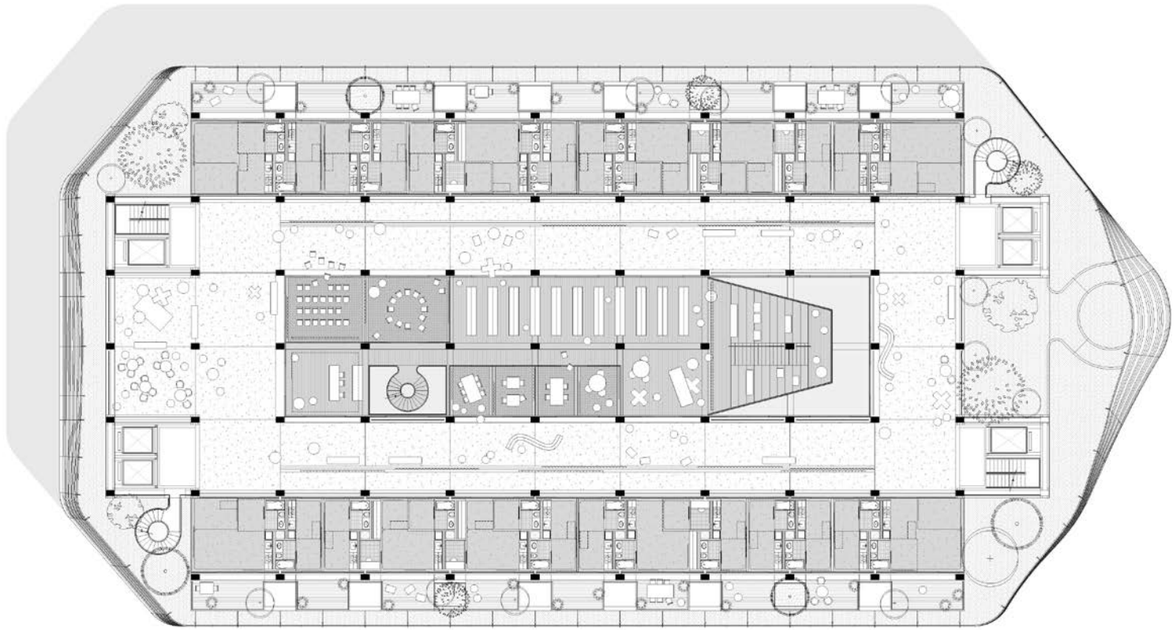


Interior Render of Studio Unit

Interior Render of 1 Bedroom Unit

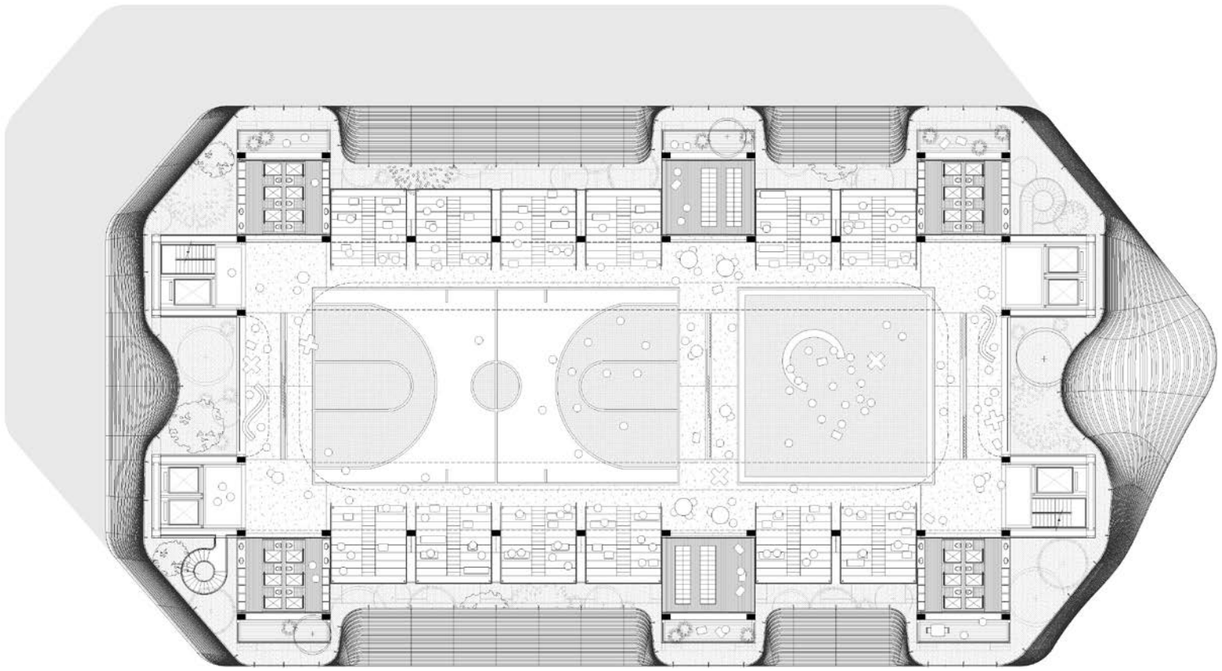


Typical Upper Level Floor Plan - Co-Working Space

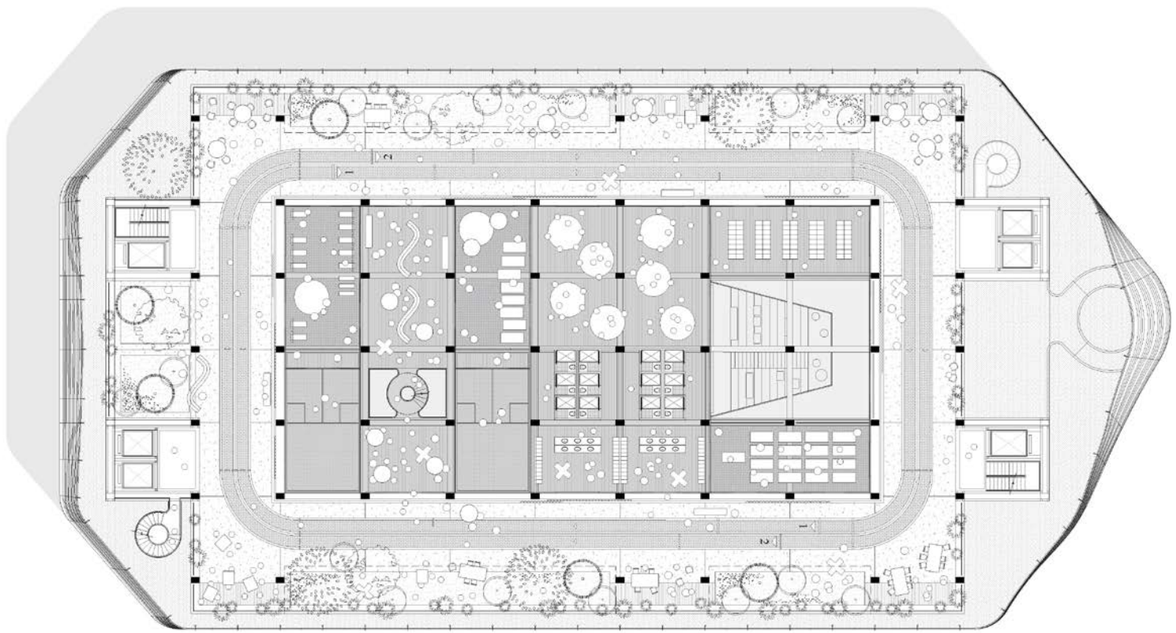


Typical Lower Level Floor Plan - Library

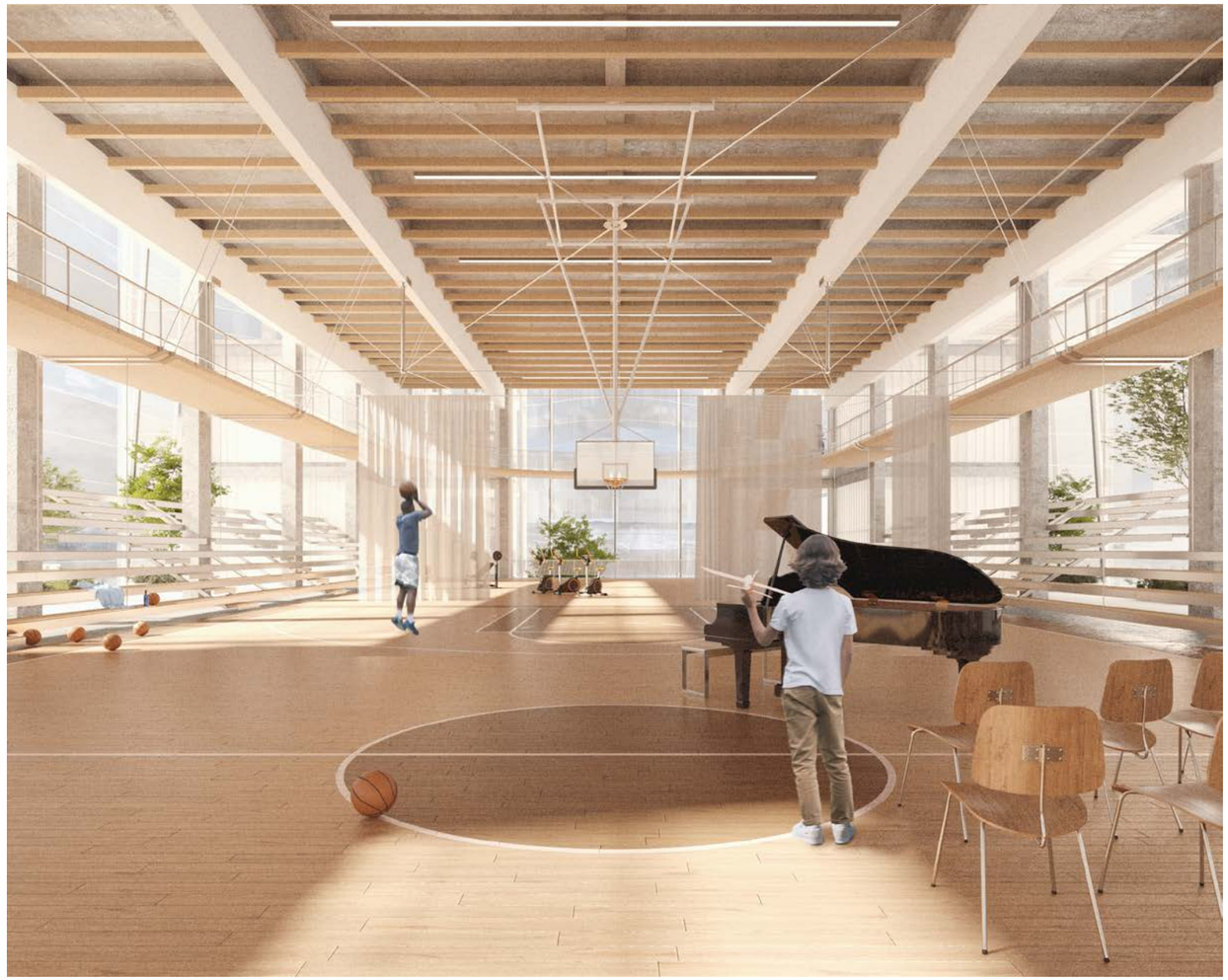
Render of Library, from Corridor



Multi-Purpose Space Floor Plan

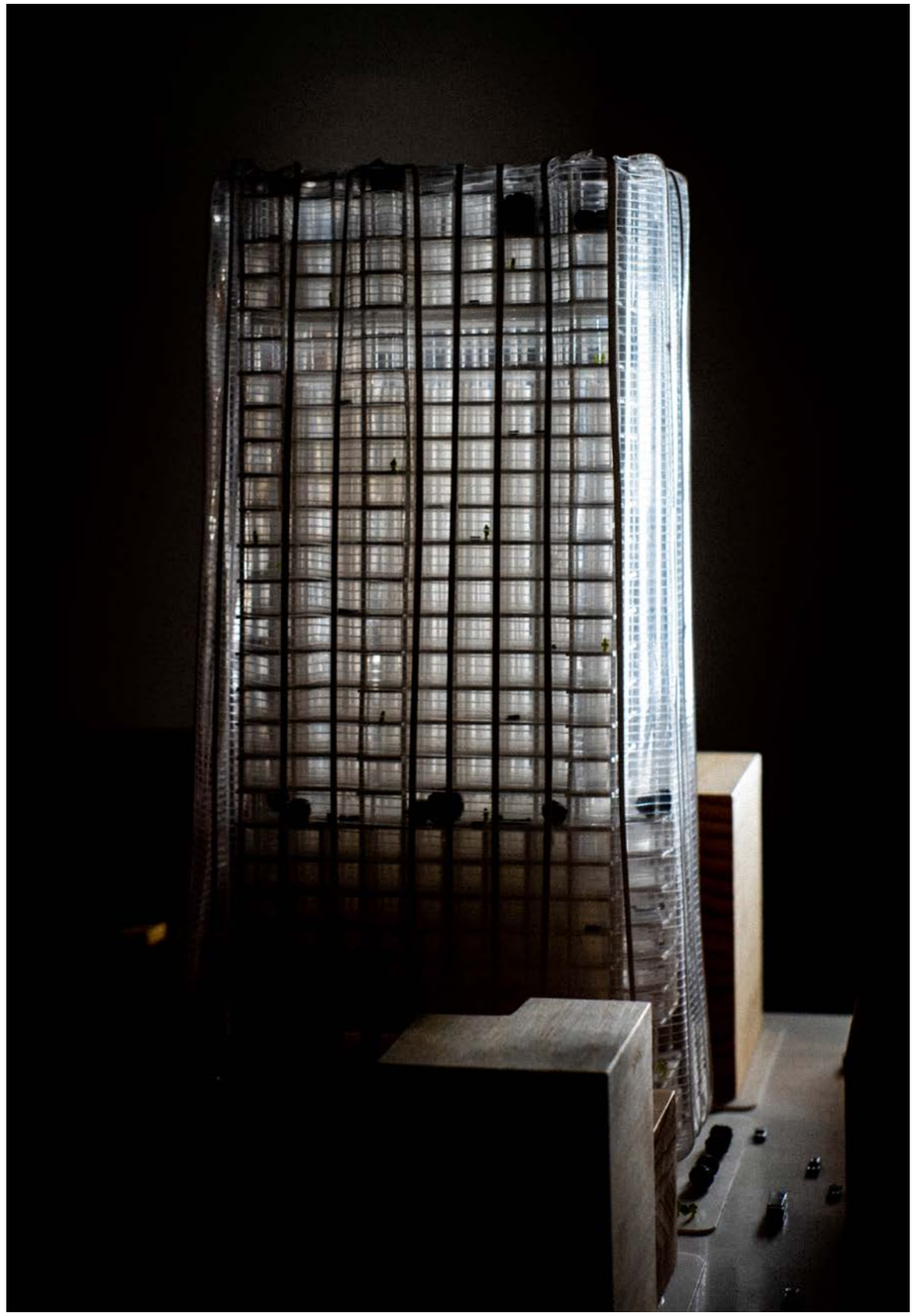


Terrace Floor Plan



Render of Multi-Purpose Space

01_33 THOMAS 7 UN-WRAPPED Entry Render



Model Photograph

Labadi, a historic community in Accra, has suffered greatly from urban dispossession. Despite losing 80% of its land to expropriation, the community has continued to thrive and adapt, particularly in the now vacant International Trade Fair (ITF) site. Constructed in the 1960s, the ITF has played a complex role in the community's history, from its initial purpose of showcasing Ghanaian nationhood to its later use by small business owners who appropriated the voids between pavilions. In 2021, the government demolished the remaining structures without notice, leaving the site abandoned.

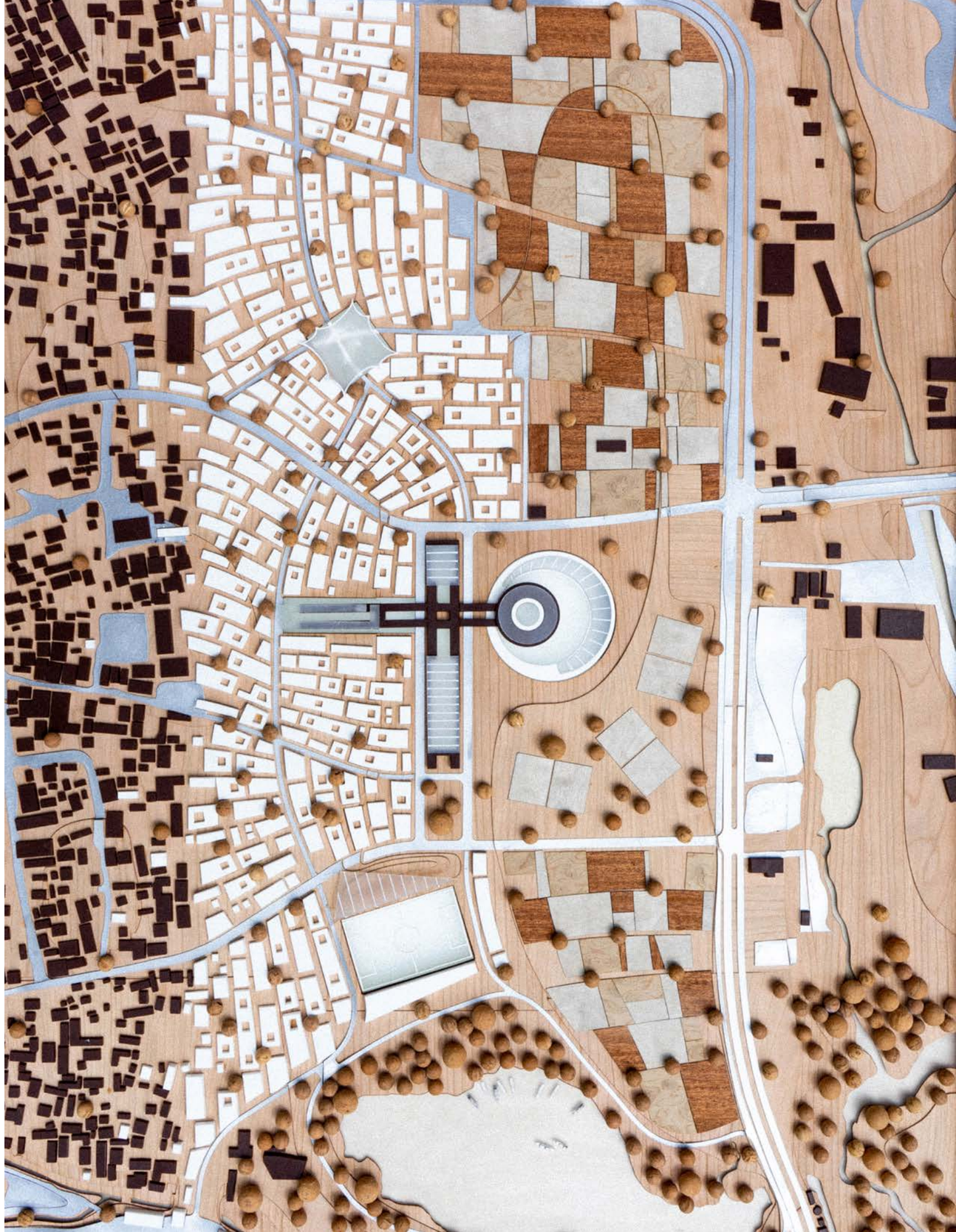
This project aims to negotiate civic space and existing infrastructure by repurposing the ITF site into a sustainable and vibrant community hub. The design features a removal of the highway that cut Labadi off from its agricultural land, creating a strong relationship between the community and the land that once belonged to them. A new system of Housing and an agricultural band occupy a large portion of the site, restoring localized livelihoods and providing opportunities for sustainable growth while still utilizing existing building practices and technology.

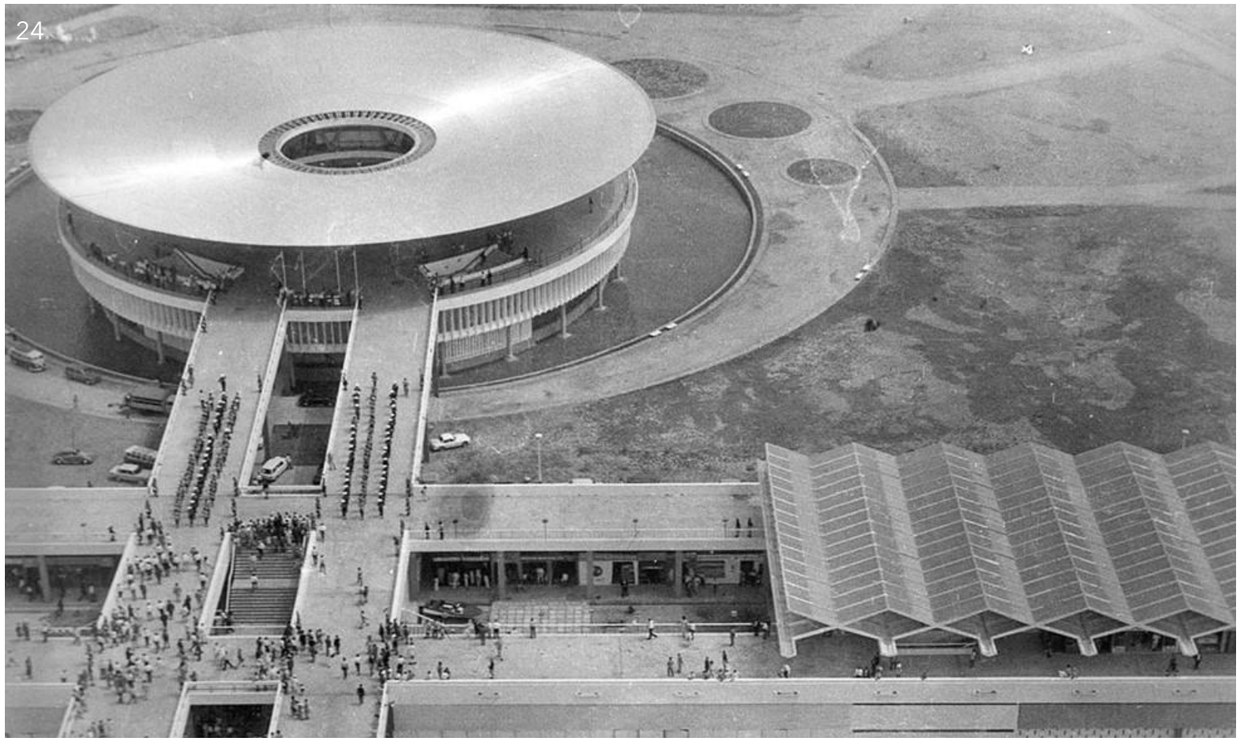
The formalized architecture includes a market, a football field, and schools to address the struggling national and local education system. These spaces will encourage community engagement, providing a gathering place for people of all ages. By prioritizing sustainable practices, we aim to create a new model for urban development that recognizes the value of community and the importance of preserving history.

LOCATION ACCRA, GHANA
COURSE ADVANCED STUDIO VI
CRITIC GARY BATES
TERM SPRING 2023
COLLABORATOR BLAKE KEM

02

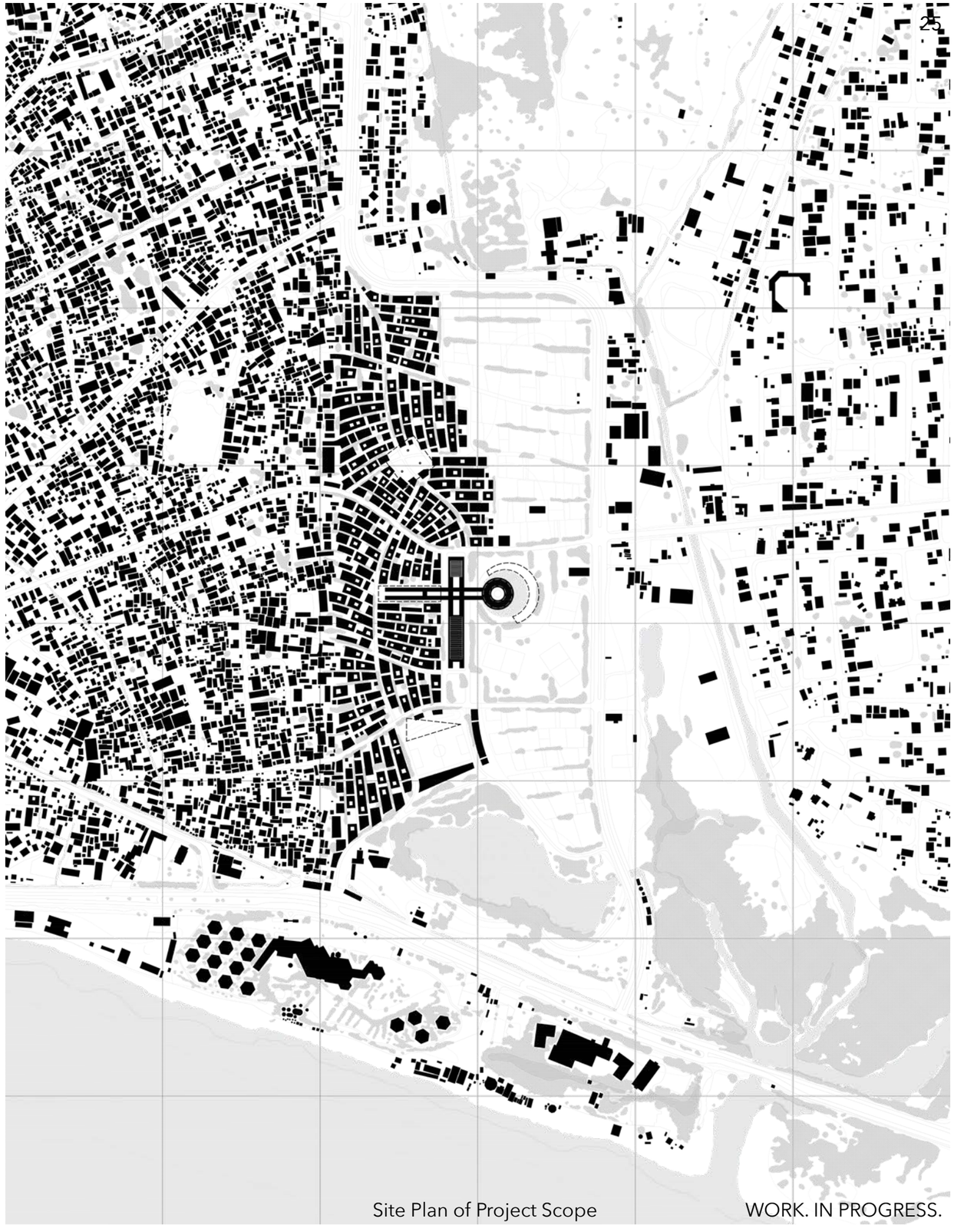
*02*_ALL ROADS LEAD TO LABADI





Aerial Photograph of Ghana's International Trade Fair in 1970

02_ALL ROADS LEAD TO LABADI Photo of ITF Grounds in 1970



Site Plan of Project Scope

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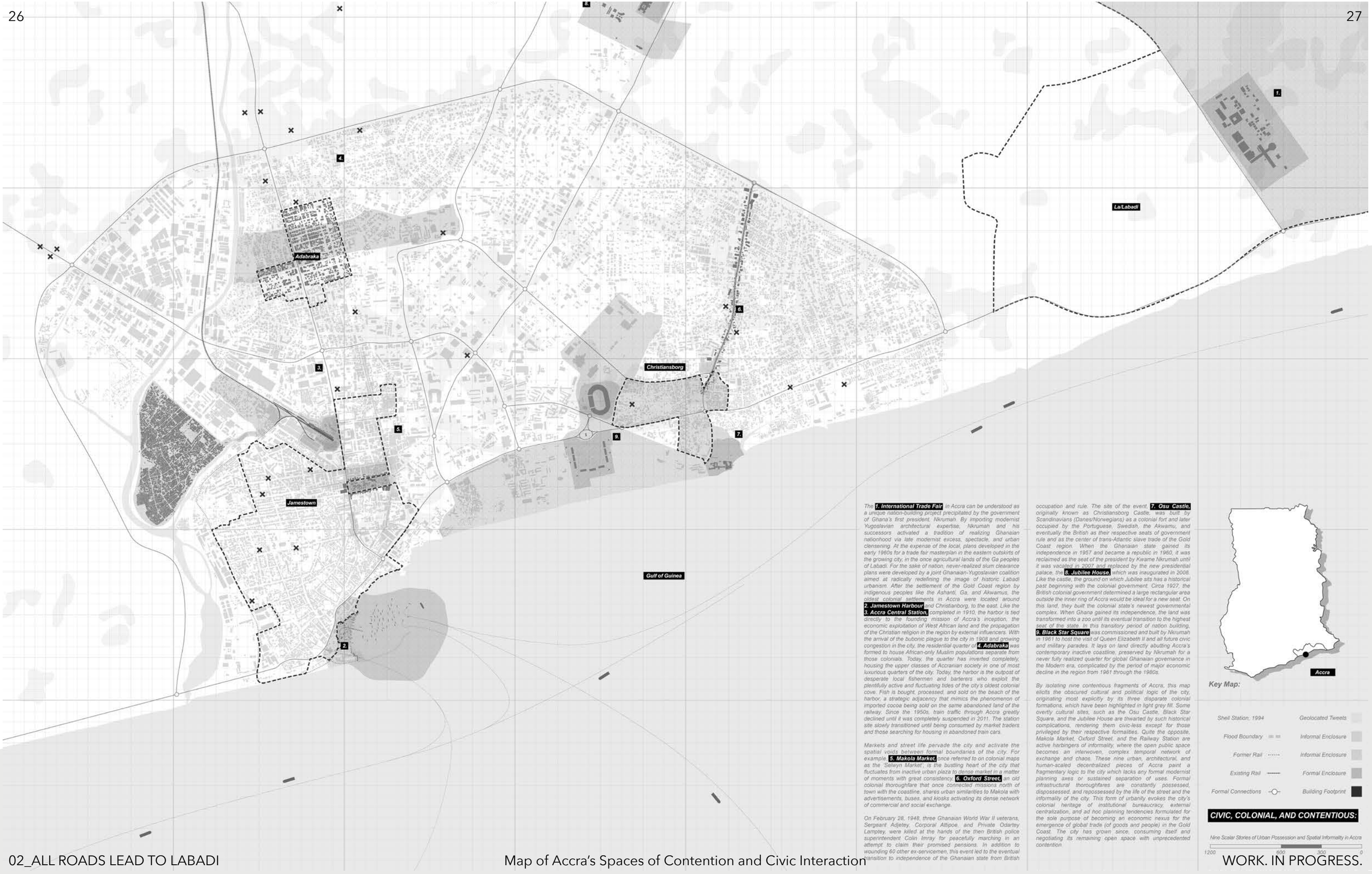


The **1. International Trade Fair** in Accra can be understood as a unique nation-building project precipitated by the government of Ghana's first president, Nkrumah. By importing modernist Yugoslavian architectural expertise, Nkrumah and his successors activated a tradition of realizing Ghanaian nationhood via late modernist excess, spectacle, and urban clensening. At the expense of the local, plans developed in the early 1960s for a trade fair masterplan in the eastern outskirts of the growing city, in the once agricultural lands of the Ga peoples of Labadi. For the sake of nation, never-realized slum clearance plans were developed by a joint Ghanaian-Yugoslavian coalition aimed at radically redefining the image of historic Labadi urbanism. After the settlement of the Gold Coast region by indigenous peoples like the Ashanti, Ga, and Akwamus, the oldest colonial settlements in Accra were located around **2. Jamestown Harbour** and Christianborg, to the east. Like the **3. Accra Central Station,** completed in 1910, the harbor is tied directly to the founding mission of Accra's inception, the economic exploitation of West African land and the propagation of the Christian religion in the region by external influencers. With the arrival of the bubonic plague to the city in 1908 and growing congestion in the city, the residential quarter of **4. Adabraka** was formed to house African-only Muslim populations separate from those colonials. Today, the quarter has inverted completely, housing the upper classes of Accranian society in one of most luxurious quarters of the city. Today, the harbor is the outpost of desperate local fishermen and barterers who exploit the plentifully active and fluctuating tides of the city's oldest colonial cove. Fish is bought, processed, and sold on the beach of the harbor, a strategic adjacency that mimics the phenomenon of imported cocoa being sold on the same abandoned land of the railway. Since the 1950s, train traffic through Accra greatly declined until it was completely suspended in 2011. The station site slowly transitioned until being consumed by market traders and those searching for housing in abandoned train cars.

Markets and street life pervade the city and activate the spatial voids between formal boundaries of the city. For example, **5. Makola Market,** once referred to on colonial maps as the 'Selwyn Market', is the bustling heart of the city that fluctuates from inactive urban plaza to dense market in a matter of moments with great consistency. **6. Oxford Street,** an old colonial thoroughfare that once connected missions north of town with the coastline, shares urban similarities to Makola with advertisements, buses, and kiosks activating its dense network of commercial and social exchange.

On February 28, 1948, three Ghanaian World War II veterans, Sergeant Adjetey, Corporal Attipoe, and Private Odartey Lamptey, were killed at the hands of the then British police superintendent Colin Imray for peacefully marching in an attempt to claim their promised pensions. In addition to wounding 60 other ex-servicemen, this event led to the eventual transition to independence of the Ghanaian state from British occupation and rule. The site of the event, **7. Osu Castle,** originally known as Christiansborg Castle, was built by Scandinavians (Danes/Norwegians) as a colonial fort and later occupied by the Portuguese, Swedish, the Akwamu, and eventually the British as their respective seats of government rule and as the center of trans-Atlantic slave trade of the Gold Coast region. When the Ghanaian state gained its independence in 1957 and became a republic in 1960, it was reclaimed as the seat of the president by Kwame Nkrumah until it was vacated in 2007 and replaced by the new presidential palace, the **8. Jubilee House,** which was inaugurated in 2008. Like the castle, the ground on which Jubilee sits has a historical past beginning with the colonial government. Circa 1927, the British colonial government determined a large rectangular area outside the inner ring of Accra would be ideal for a new seat. On this land, they built the colonial state's newest governmental complex. When Ghana gained its independence, the land was transformed into a zoo until its eventual transition to the highest seat of the state. In this transitory period of nation building, **9. Black Star Square** was commissioned and built by Nkrumah in 1961 to host the visit of Queen Elizabeth II and all future civic and military parades. It lays on land directly abutting Accra's contemporary inactive coastline, preserved by Nkrumah for a never fully realized quarter for global Ghanaian governance in the Modern era, complicated by the period of major economic decline in the region from 1961 through the 1980s.

By isolating nine contentious fragments of Accra, this map elicits the obscured cultural and political logic of the city, originating most explicitly by its three disparate colonial formations, which have been highlighted in light grey fill. Some overtly cultural sites, such as the Osu Castle, Black Star Square, and the Jubilee House are thwarted by such historical complications, rendering them civic-less except for those privileged by their respective formalities. Quite the opposite, Makola Market, Oxford Street, and the Railway Station are active harbingers of informality, where the open public space becomes an interwoven, complex temporal network of exchange and chaos. These nine urban, architectural, and human-scaled decentralized pieces of Accra paint a fragmentary logic to the city which lacks any formal modernist planning axes or sustained separation of uses. Formal infrastructural thoroughfares are constantly possessed, dispossessed, and repossessed by the life of the street and the informality of the city. This form of urbanity evokes the city's colonial heritage of institutional bureaucracy, external centralization, and ad hoc planning tendencies formulated for the sole purpose of becoming an economic nexus for the emergence of global trade (of goods and people) in the Gold Coast. The city has grown since, consuming itself and negotiating its remaining open space with unprecedented contention.

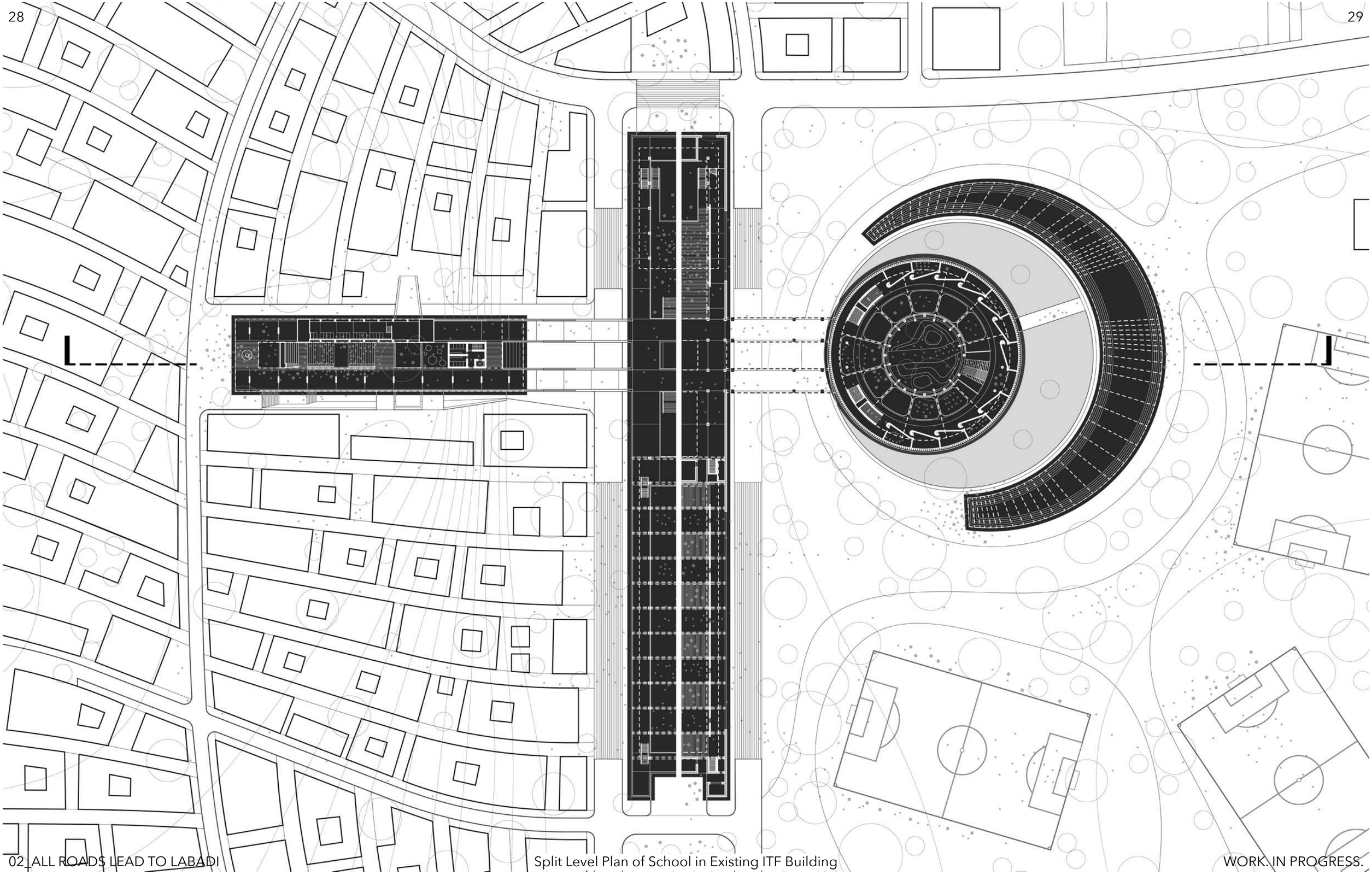
Key Map:

Shell Station; 1994
Flood Boundary
Former Rail
Existing Rail
Formal Connections
Geolocated Tweets
Informal Enclosure
Informal Enclosure
Formal Enclosure
Building Footprint

CIVIC, COLONIAL, AND CONTENTIOUS:

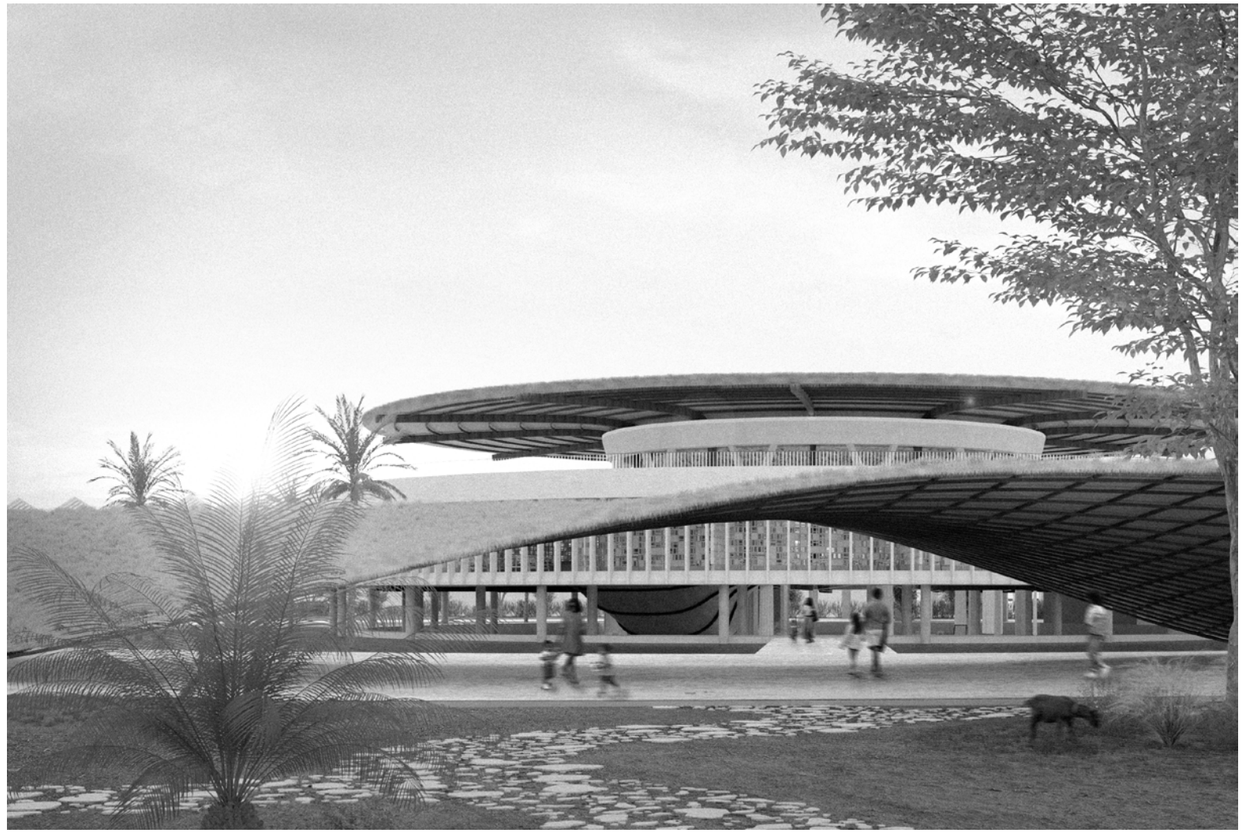
Nine Scalar Slices of Urban Possession and Spatial Informality in Accra

1200 600 300 0

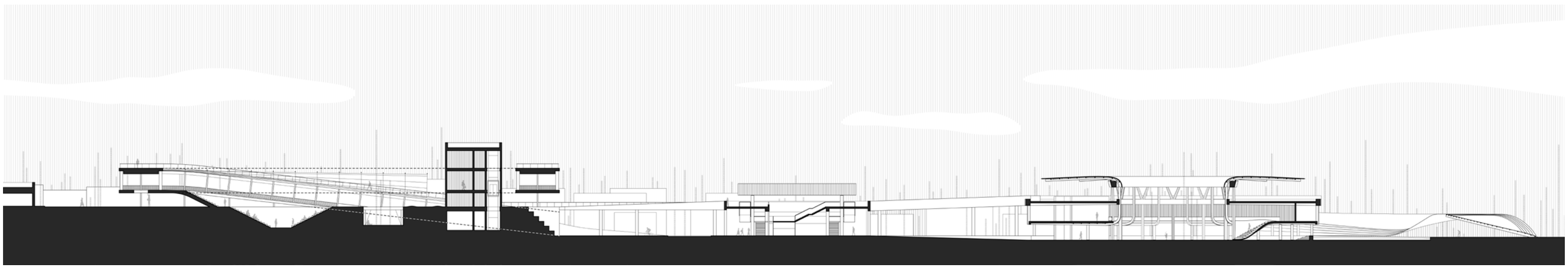


Split Level Plan of School in Existing ITF Building

Interior View of Trade School in Existing ITF Pavillion A

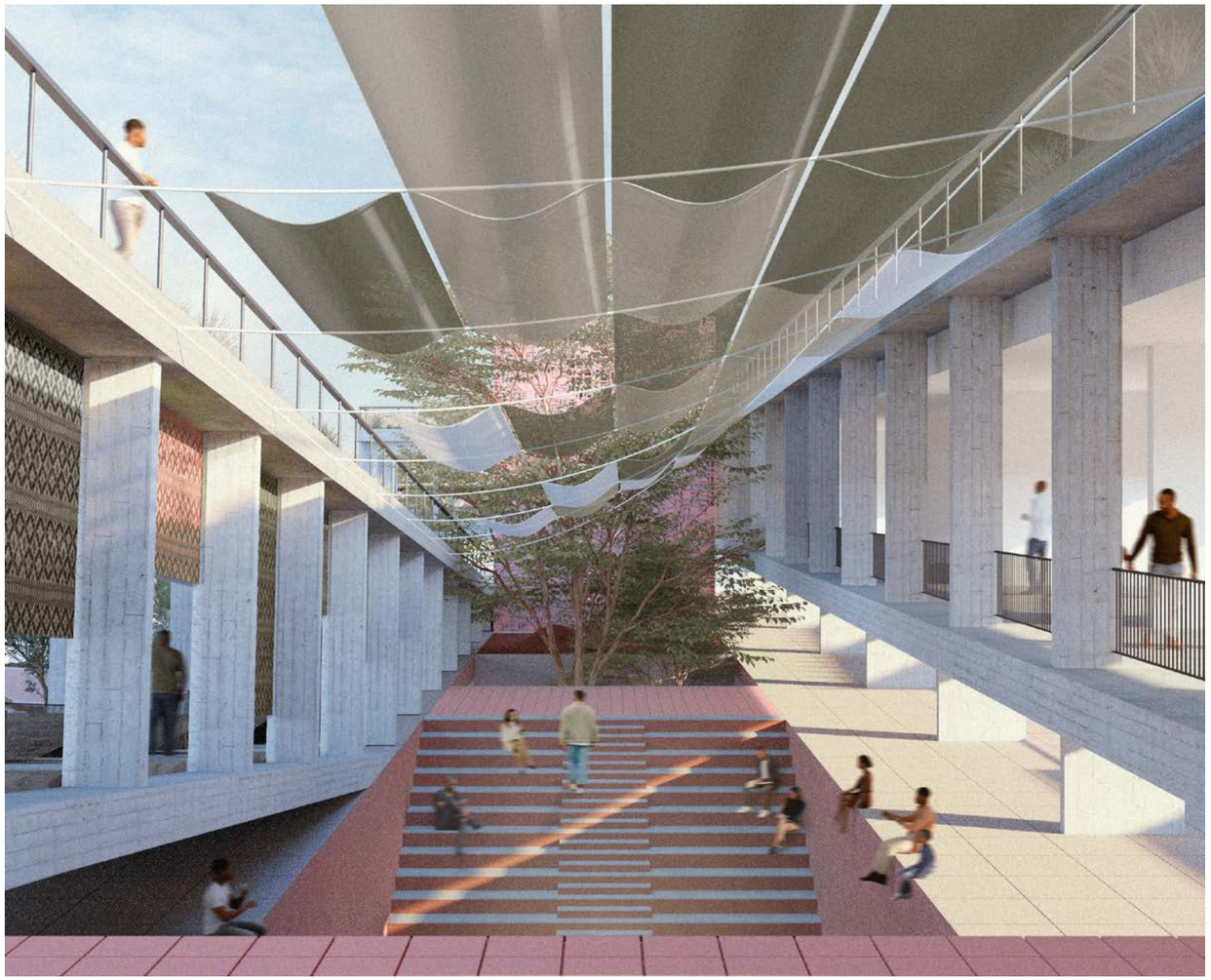


Exterior Render of School in Existing ITF Round Pavillion



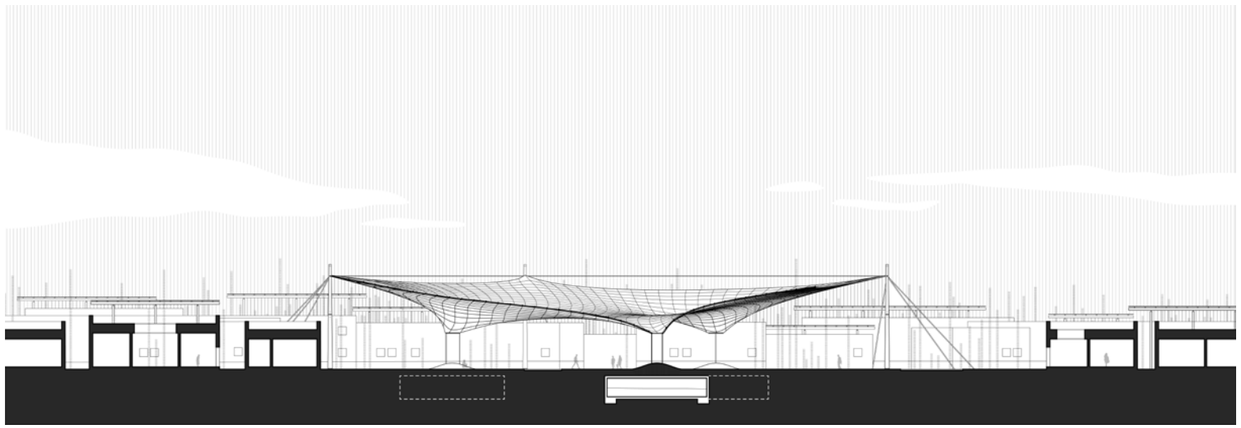
Section of New High School, Trade School, and Elementary in Existing ITF Building

Interior View of Elementary School in Existing Round Pavillion

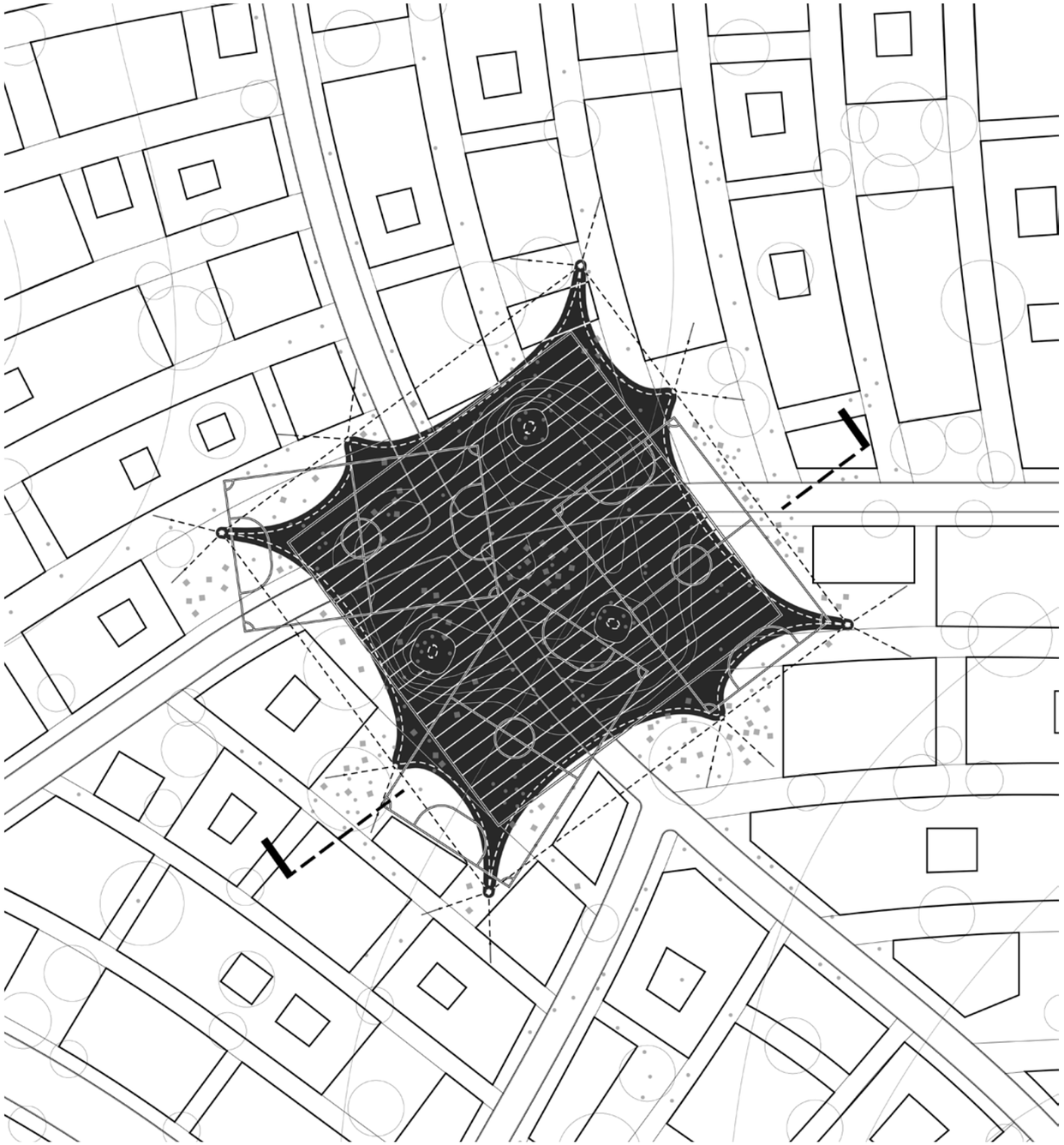


Render of Forum Inside New School on Existing ITF Ramp

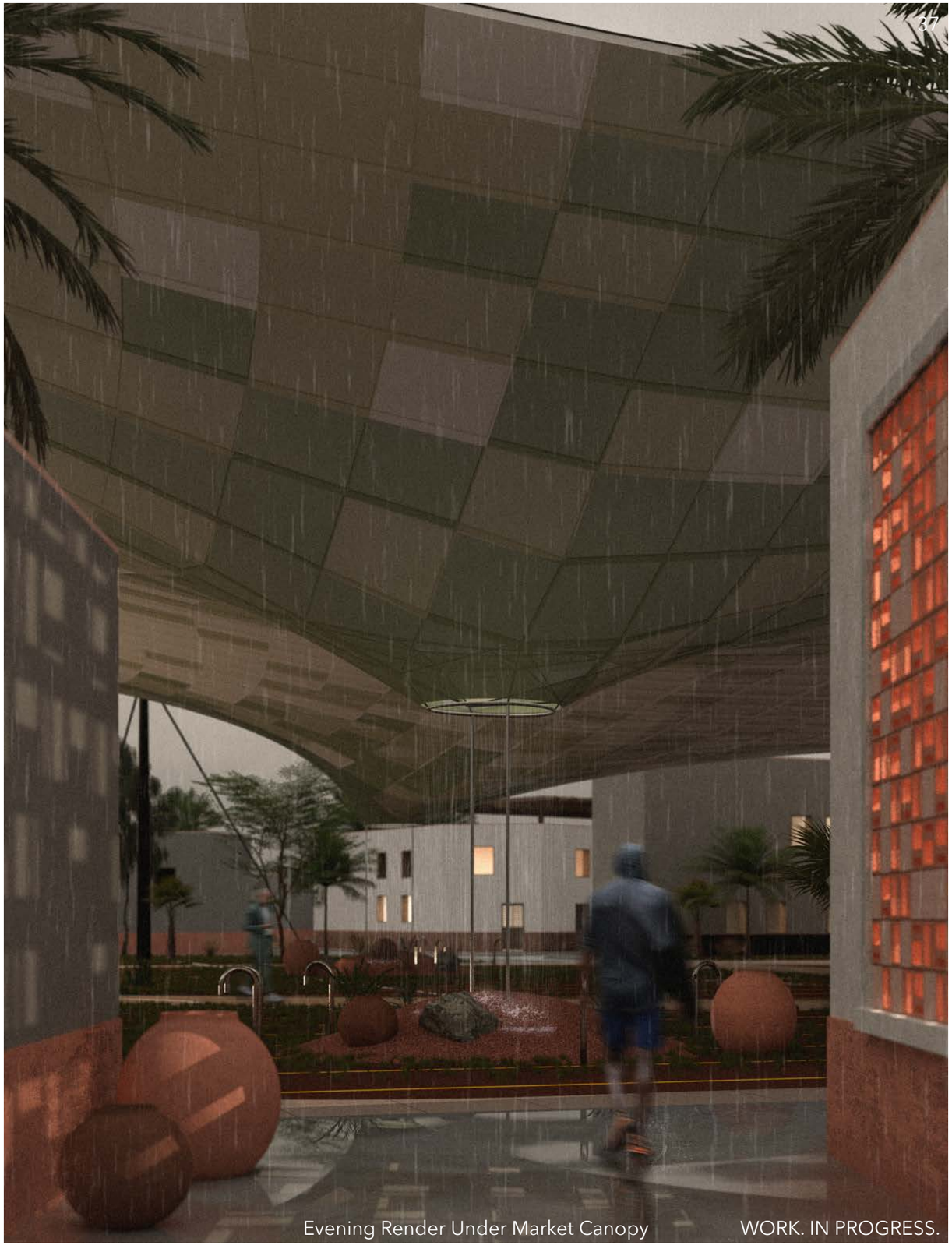
View of Market Canopy from Rooftop of New Housing Typology



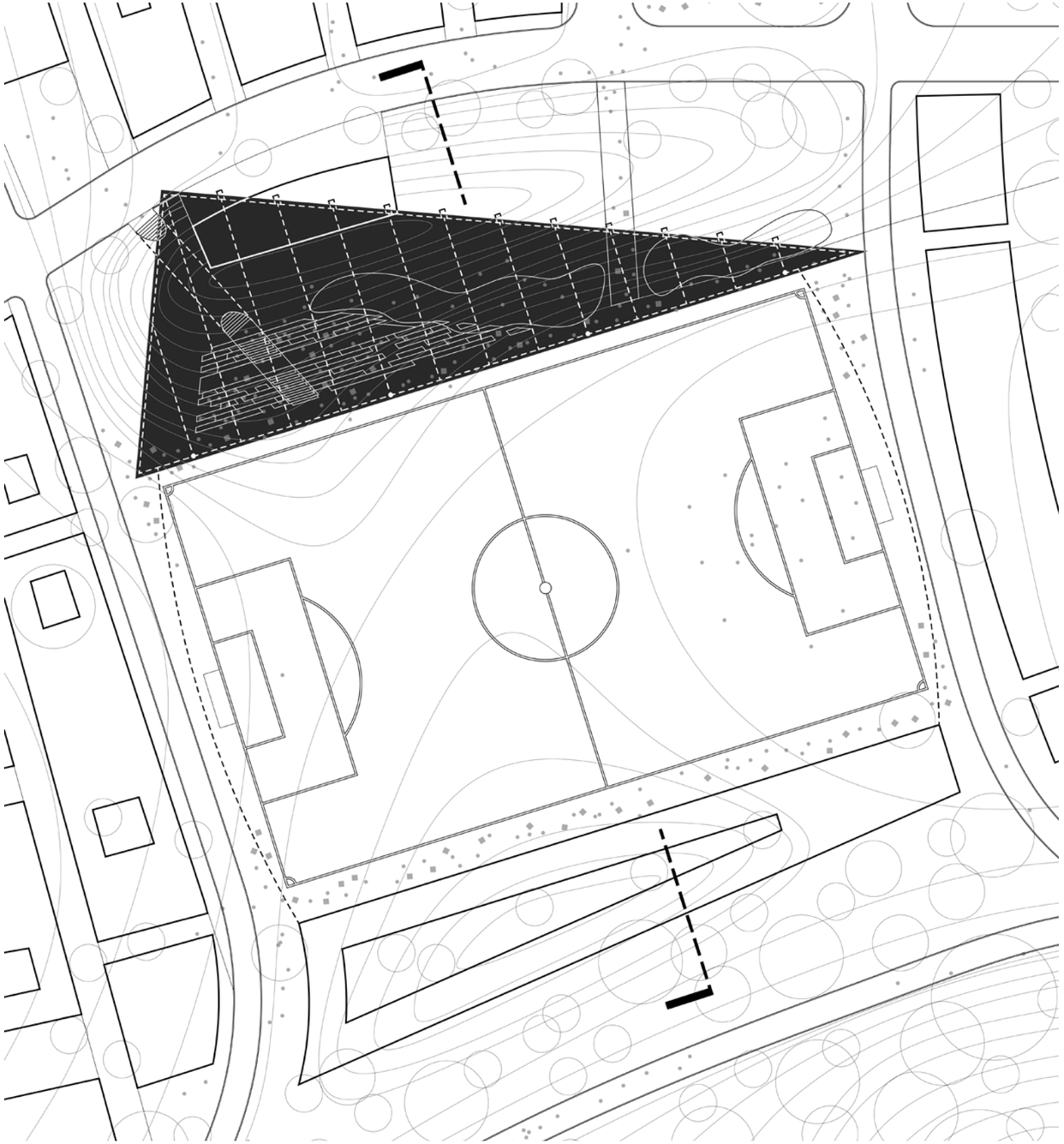
Section of Market



Plan of Market Canopy and Underlying Programs

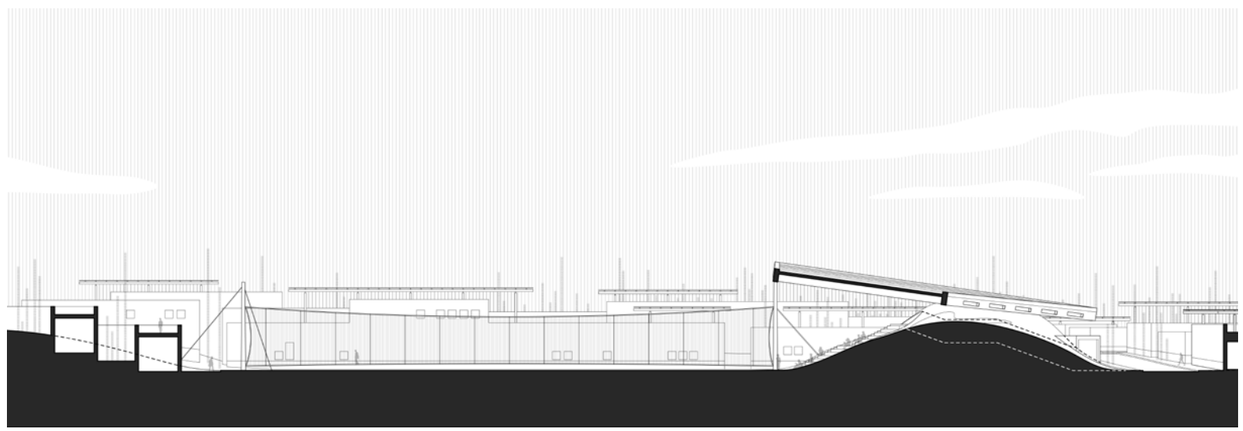


Evening Render Under Market Canopy WORK. IN PROGRESS.



Plan of Football Field and Shading Structure

Render of Football Field on Existing Urban Void



Section of Football Field

02_ALL ROADS LEAD TO LABADI Model Photograph

Illuminated Model Photograph WORK. IN PROGRESS.

View of New School on Existing ITF Entrance Ramp

Designed with the intent to complement nature by contrasting its delicacy with massiveness, fluidity with rigidity, and ever-changing qualities with permanence, these Monuments To Nature act as a blank canvas for nature to grow, change, and weather for the rest of time. These monuments have an aim to outlast the human experience and survive well into a post-human future.

The monuments are dedicated to the three main principles of our environment: air, land, and water. Because of our tendencies to selfishly mistreat and destroy elements of nature for our benefit, each of the three monuments consists of solid, two-foot-thick concrete walls. The narrative paradox created by designing monuments dedicated to nature—hoping they act as a blank canvas yet still using an unnatural material, shows how we as humans have still not found a way to design architecture that can resiliently and responsibly withstand nature's forces while still using materials occurring naturally in our environment.

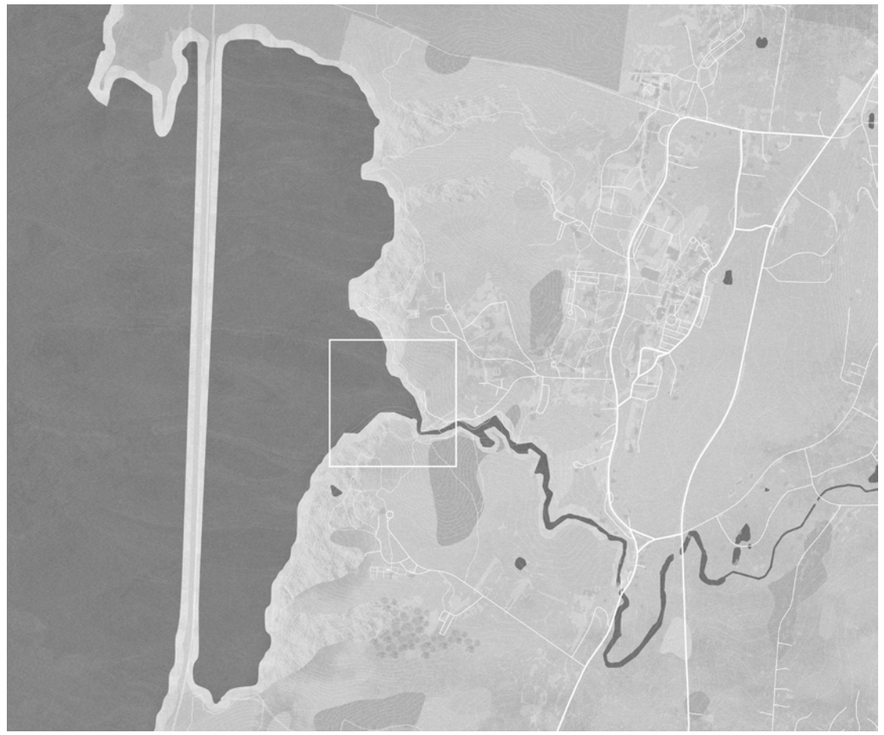
One's experience on site concludes at the only formal 'building' inside of which is a cantilevered gallery of some of nature's most beautiful objects—each of which are behind glass or rope. This furthers the idea that the only time one can truly appreciate nature and be fully immersed in its beauty is when one is outside, not when it is curated. The light timber and polycarbonate construction of the gallery is designed to decay over the course of 15-30 years. Only the monuments to nature are designed to survive.

LOCATION ANNONDALE-ON-HUDSON, NEW YORK
COURSE ADVANCED STUDIO IV
CRITIC ROBERT MARINO
TERM SPRING 2022
COLLABORATOR BRENNAN HEYWARD

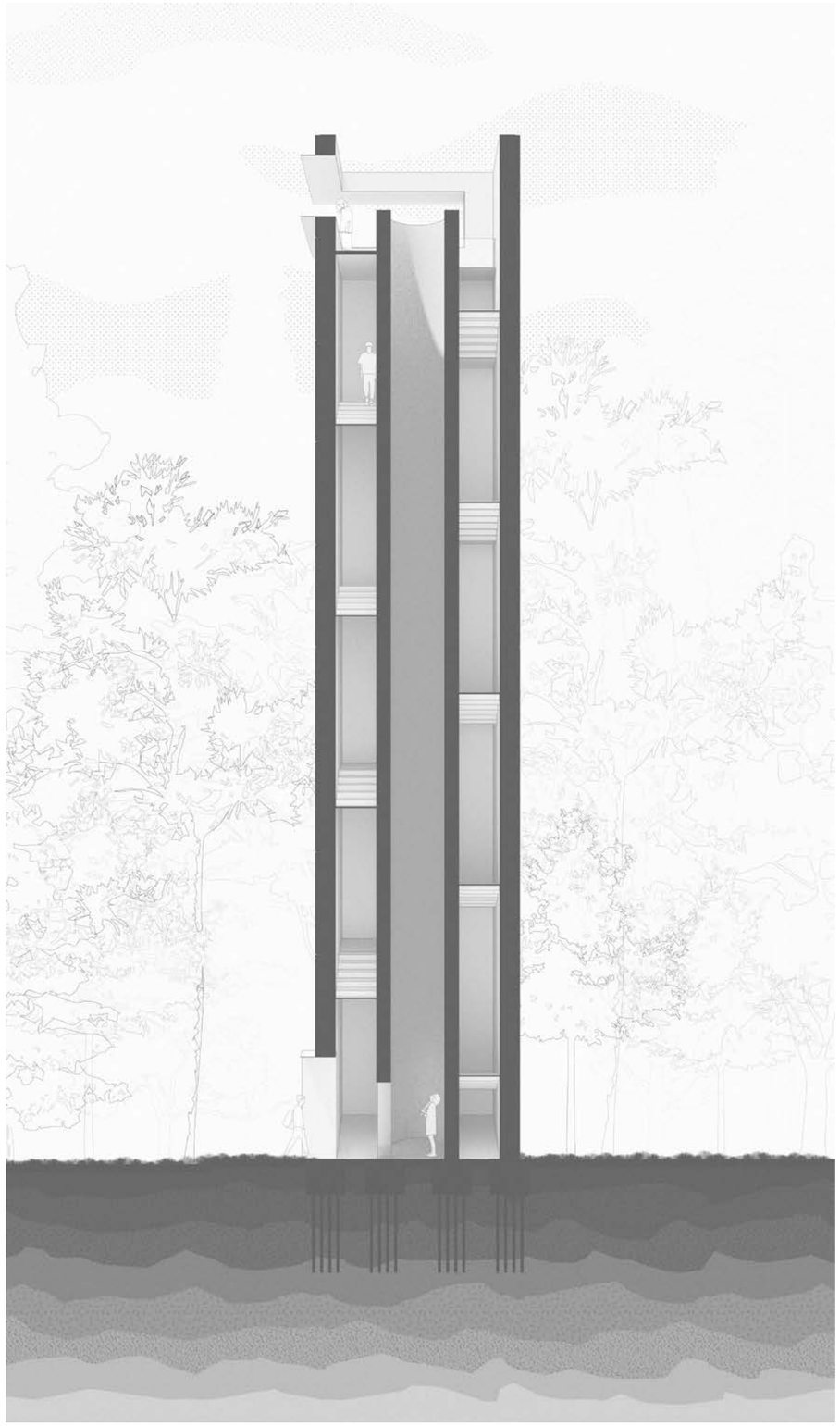
03

*03*_MONUMENTS TO NATURE

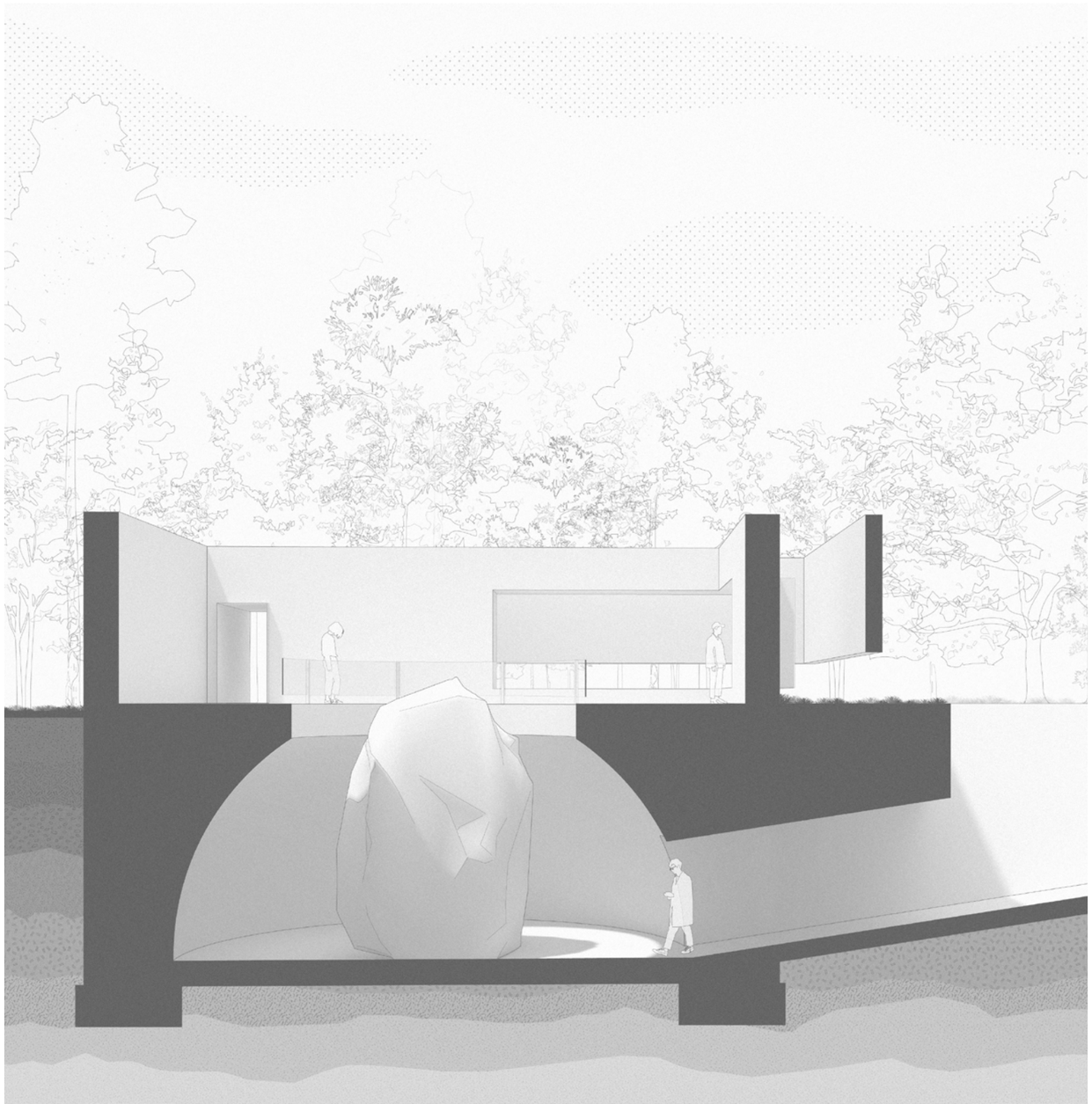
Region Map



Context Map

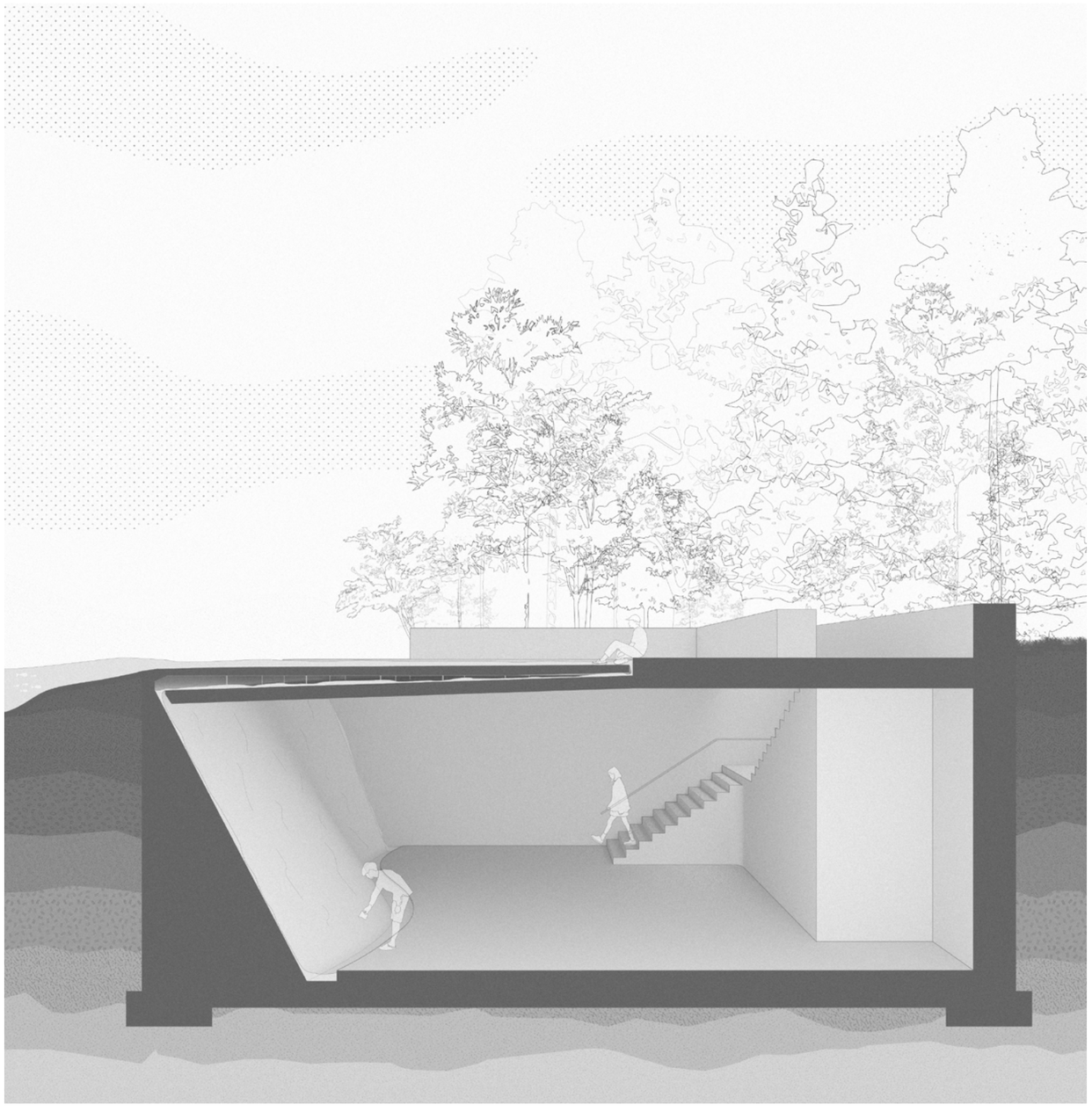


Monument to Air Section Perspective



Monument to Earth Section Perspective

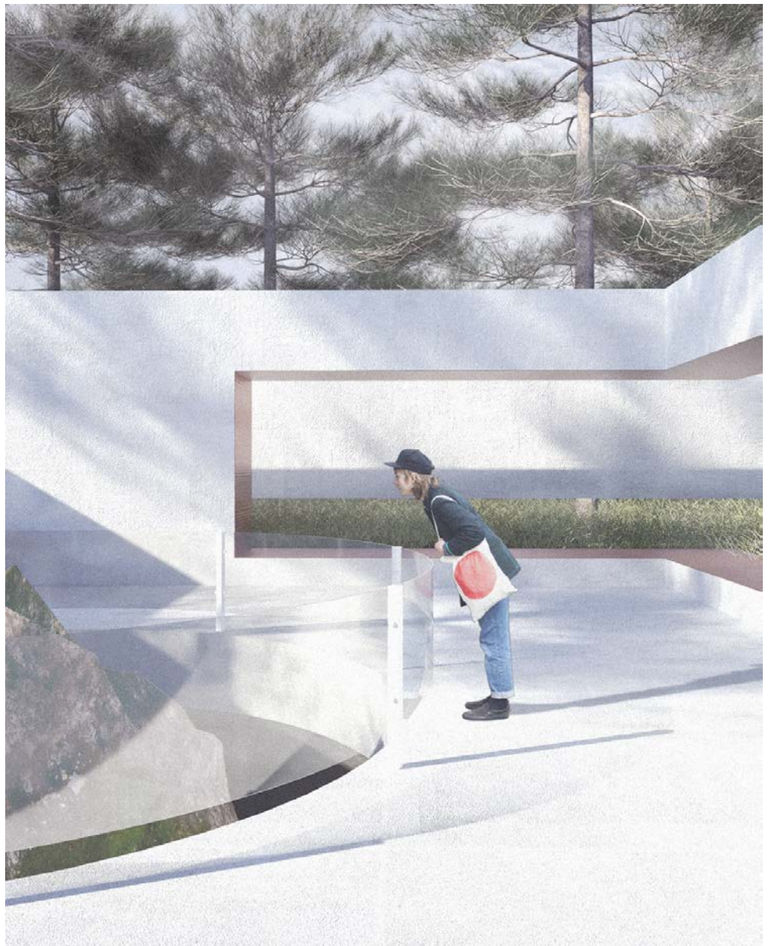
Monument to Earth WORK. IN PROGRESS.



Monument to Water Section Perspective

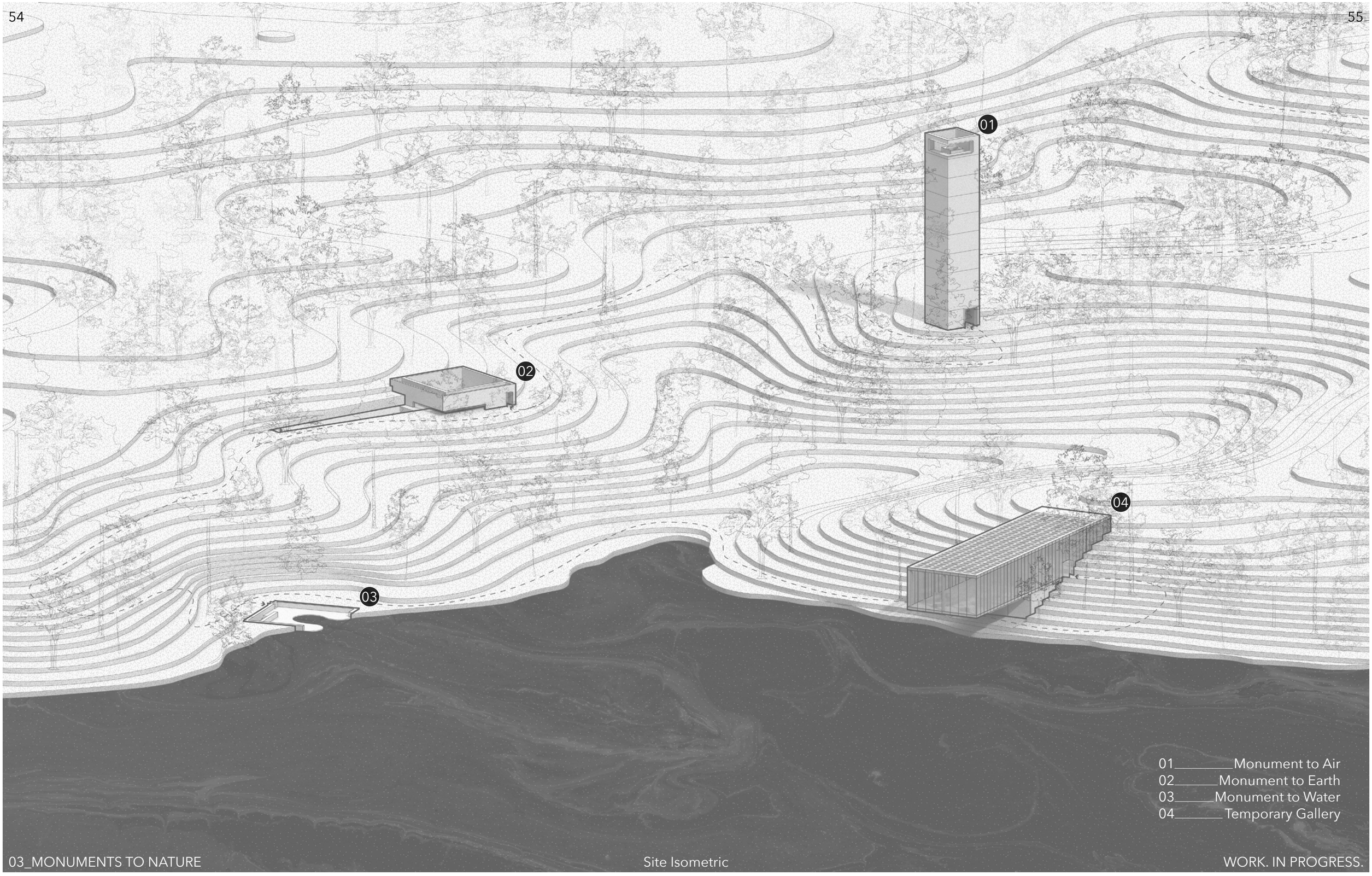
Monument to Water

Monument to Air



Monument to Earth

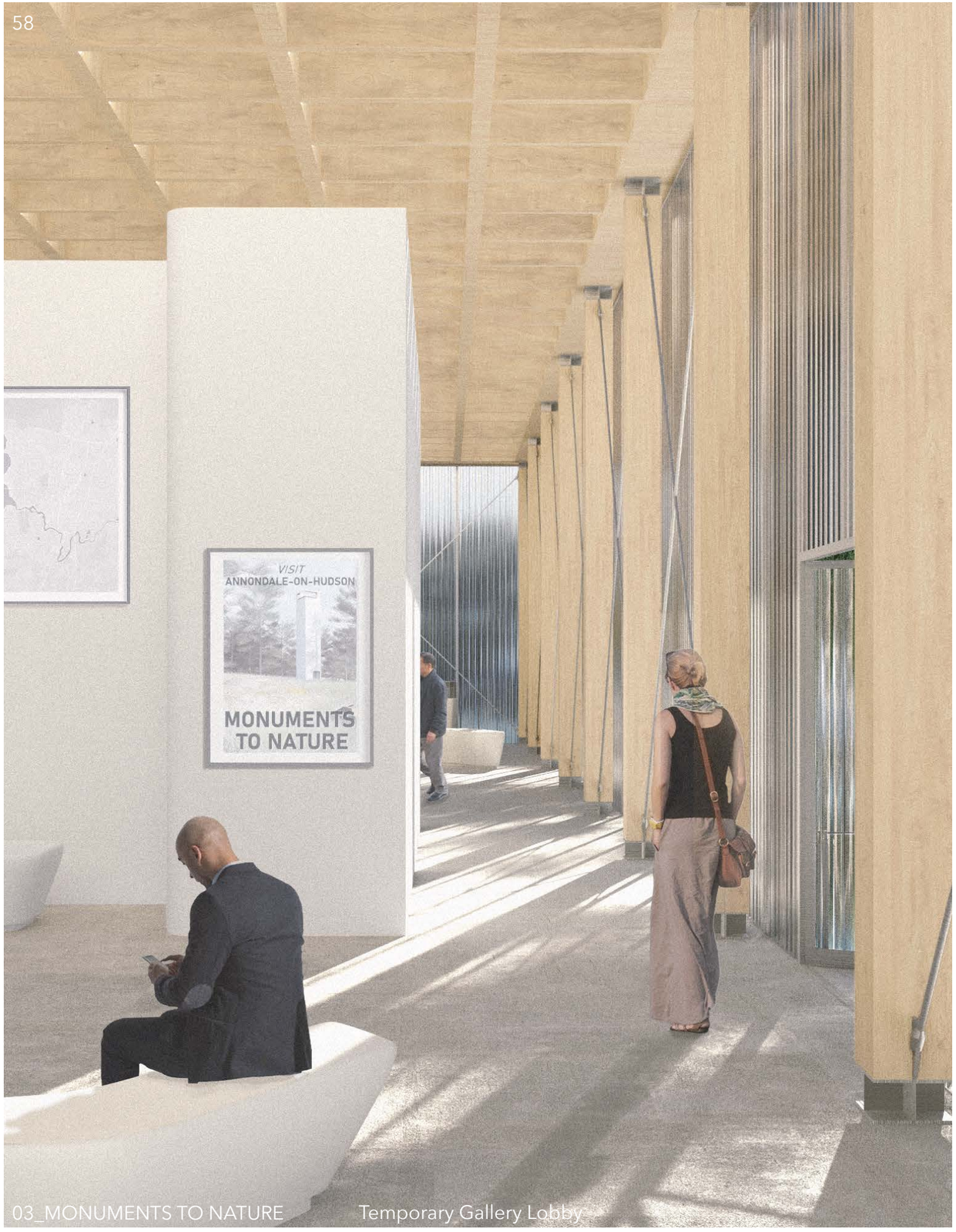
Monument to Water



01_____Monument to Air
02_____Monument to Earth
03_____Monument to Water
04_____Temporary Gallery

Site Isometric

Render of Approach to Temporary Gallery



03_MONUMENTS TO NATURE Temporary Gallery Lobby

Temporary Gallery Exhibition Space WORK, IN PROGRESS.

Temporary Gallery Entry

Centered on the concept of implementing flexible living solutions to a stagnant and rigid housing system, MOD:LIVE aims to provide a space that can adapt to the changes and flows of the cycles of life at various scales–from day to day, month to month, and decade to decade.

In an effort to undercut the traditional manufacturing costs of housing and reduce the rate of vacancy, our flexible modular system can adapt to the everyday desires of our occupants while maintaining low levels of variance within prefabricated elements and reducing redundancy when combined with site-specific architectural moments.

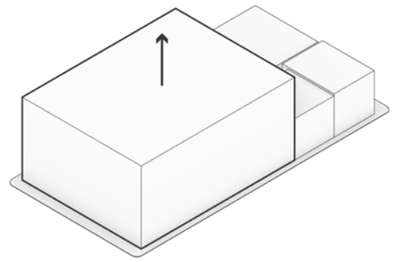
On the interior of the units, walls can be pivoted and folded to accommodate diverse living situations, whether it be to create a new bedroom, expand a living room, or create more space for dining. This concept of flexibility is also translated to the exterior through a mechanical louver system that can be compressed, expanded, or rotated to accommodate the many occupants and their preference for incident sunlight, and privacy. These changes to the louvered systems represent each of the unique individuals residing in our project and the variety of ways they may choose to use their own living space. In addition to being able to adapt to the needs of the user on the inside, their desired changes to quality of daylight and privacy are ultimately expressed on the facade of the building's exterior.

LOCATION SOUTH BRONX, NEW YORK
COURSE CORE STUDIO III
CRITIC MICHAEL CATON
TERM FALL 2021
COLLABORATOR BRENNAN HEYWARD

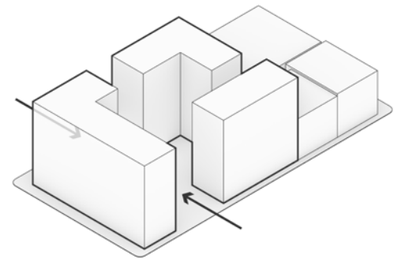
04

*04*_MOD:LIVE

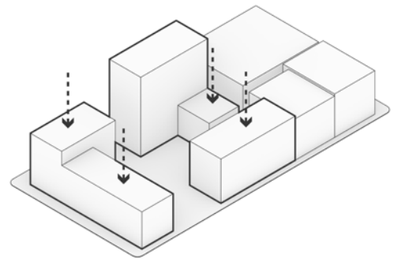
04_MOD:LIVE Southern Approach



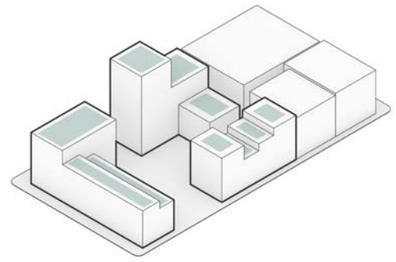
MAXIMUM EXTRUSION



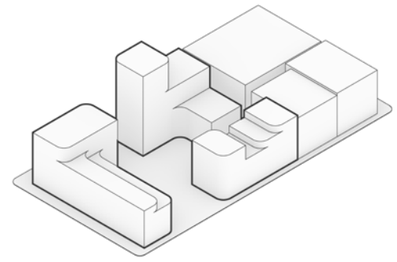
REMOVAL OF MASS FOR INTERIOR COURTYARD



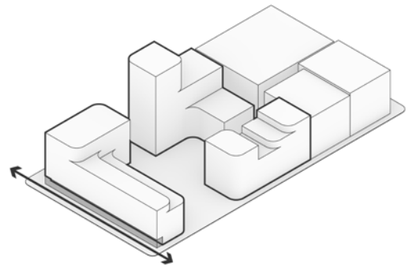
HEIGHT VARIANCE FOR SUN EXPOSURE



REMOVAL OF MASS FOR TERRACING

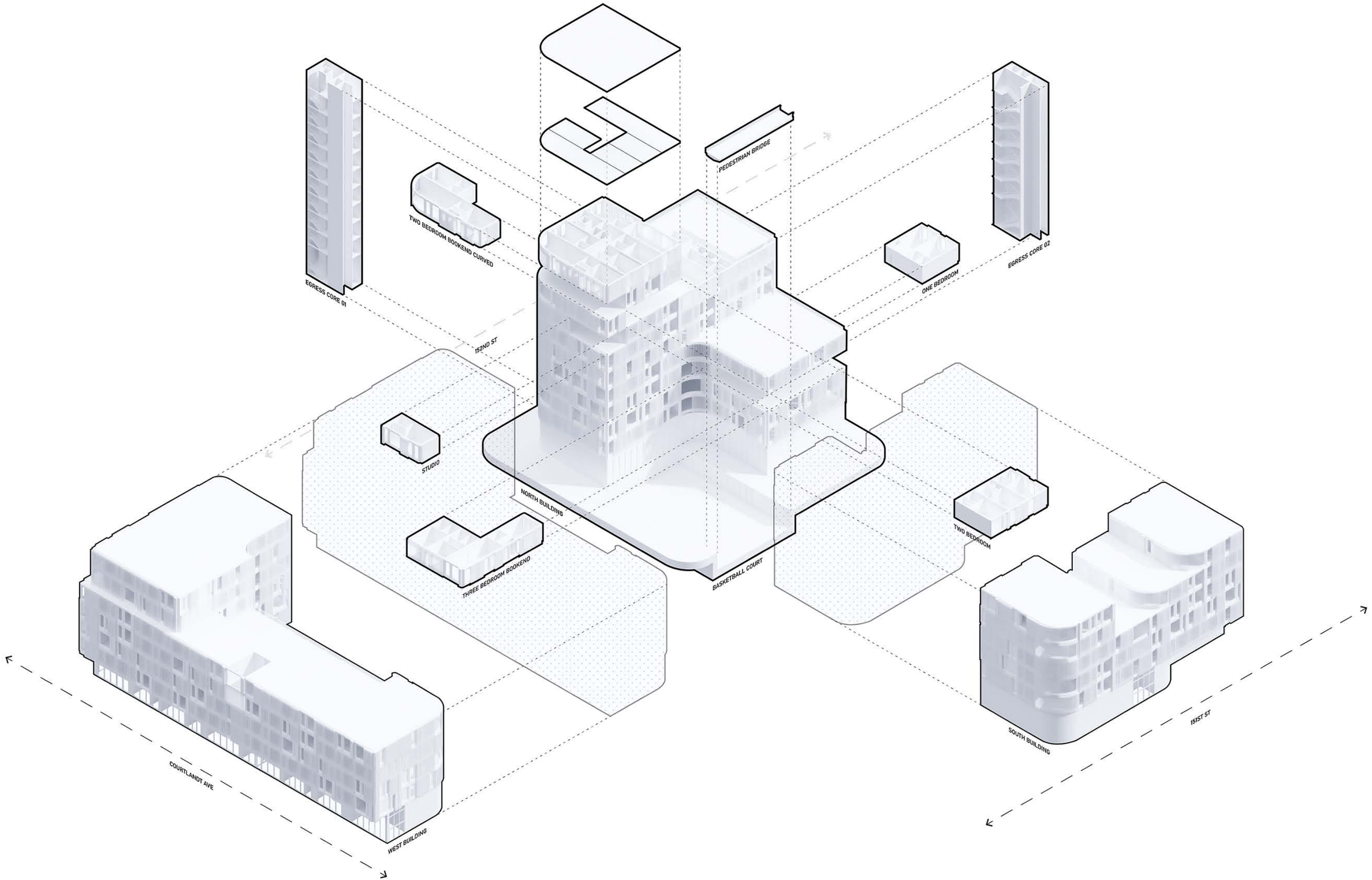


ARTICULATION OF MASS



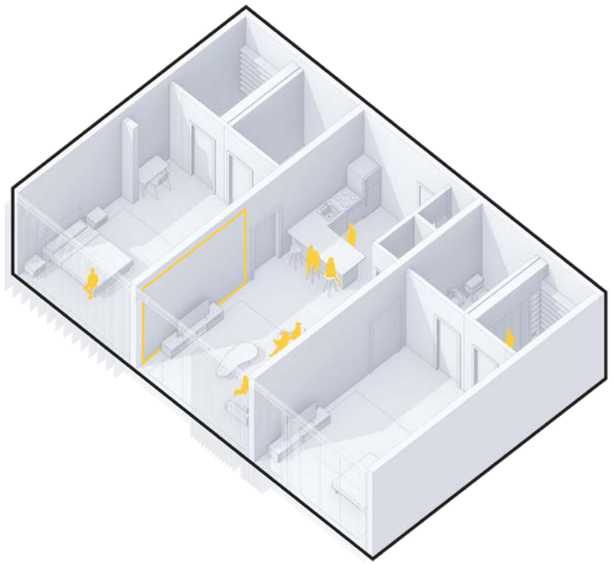
ALLOWANCE FOR COMMERCIAL GROUND LEVEL

Site Plan

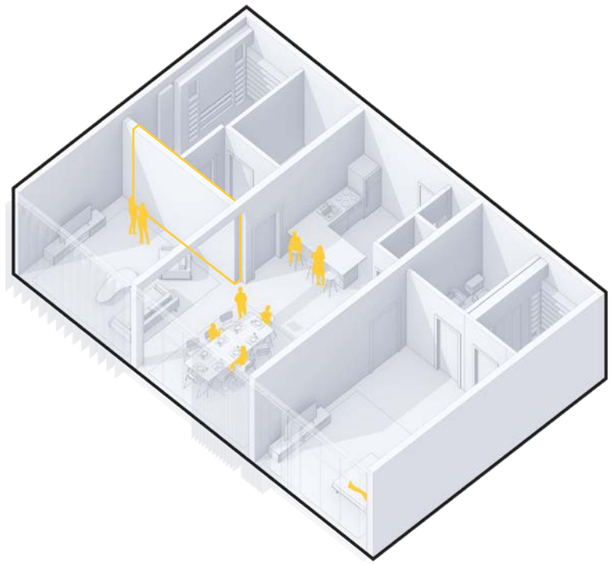


Exploded Unit Diagram

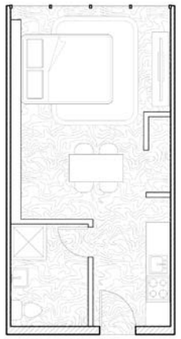
Massing Model Photography



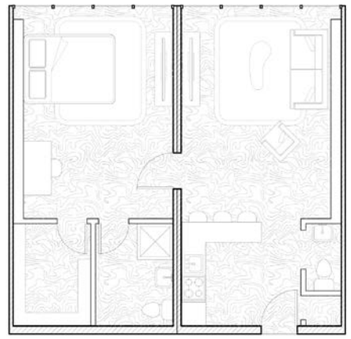
2 Bedroom Unit - Phase 1



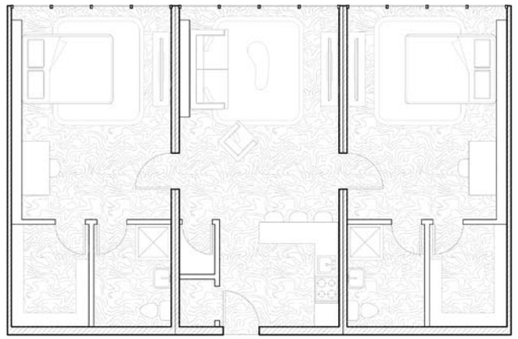
2 Bedroom Unit - Phase 2



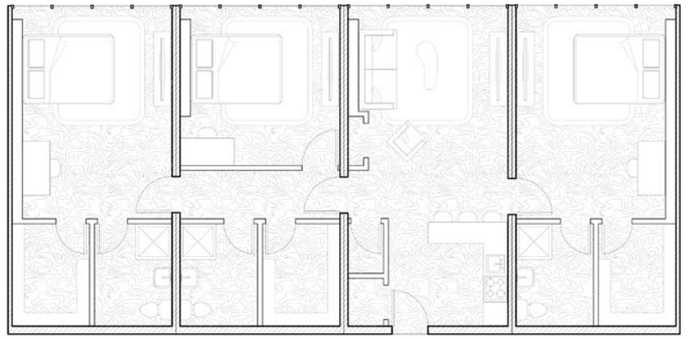
STUDIO



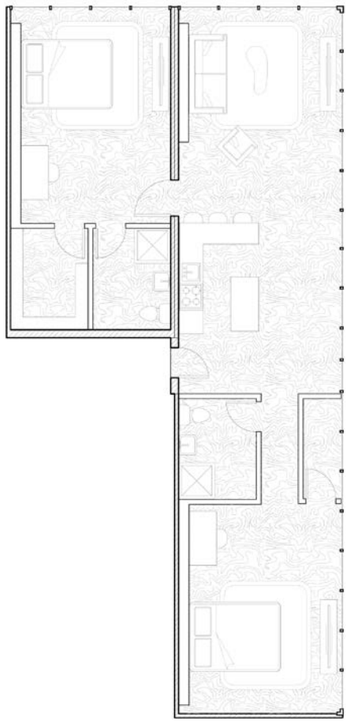
1 BR



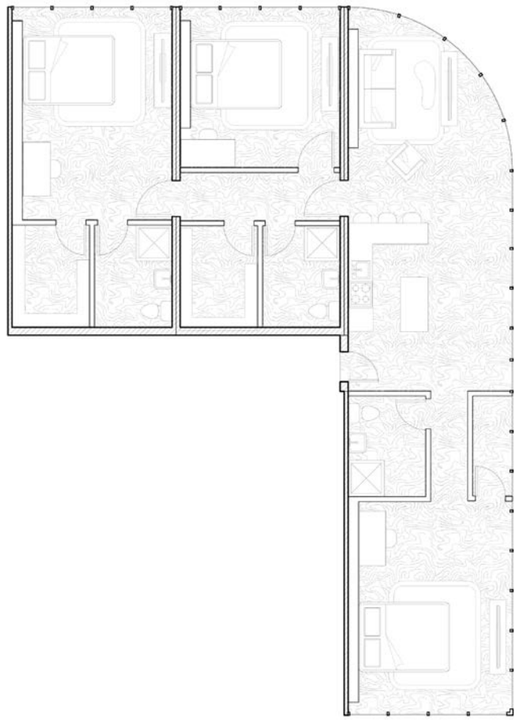
2 BR



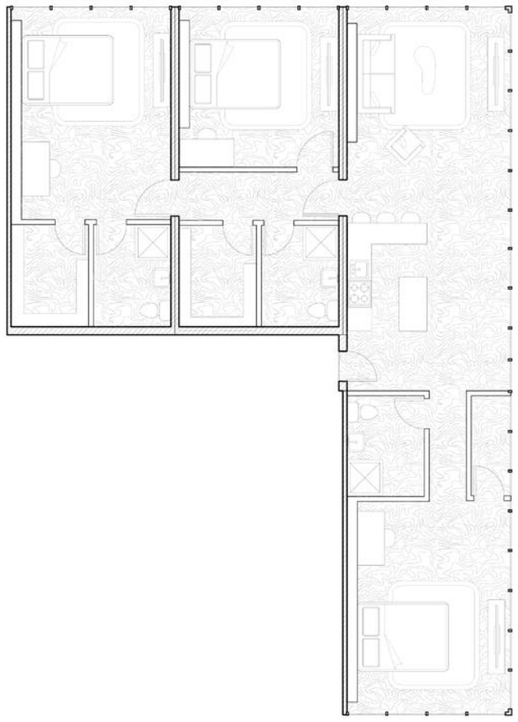
3 BR



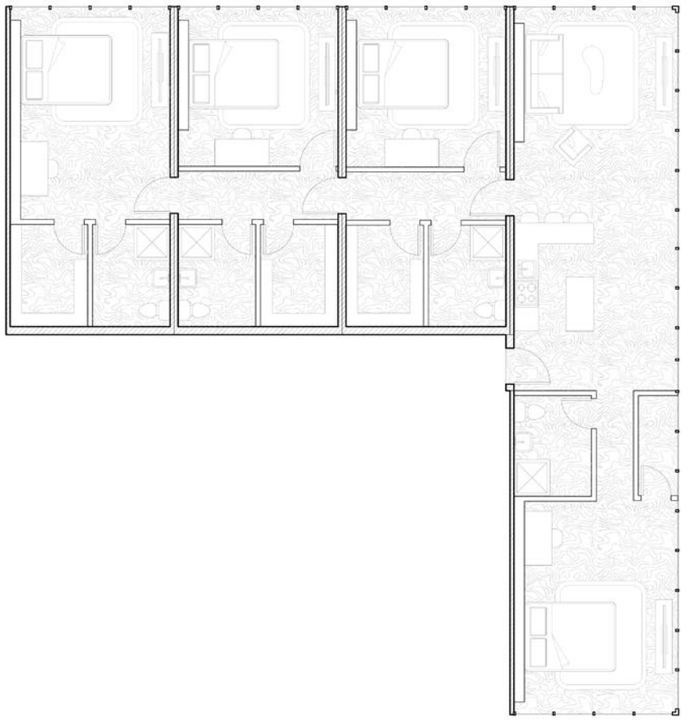
2 BR BOOKEND



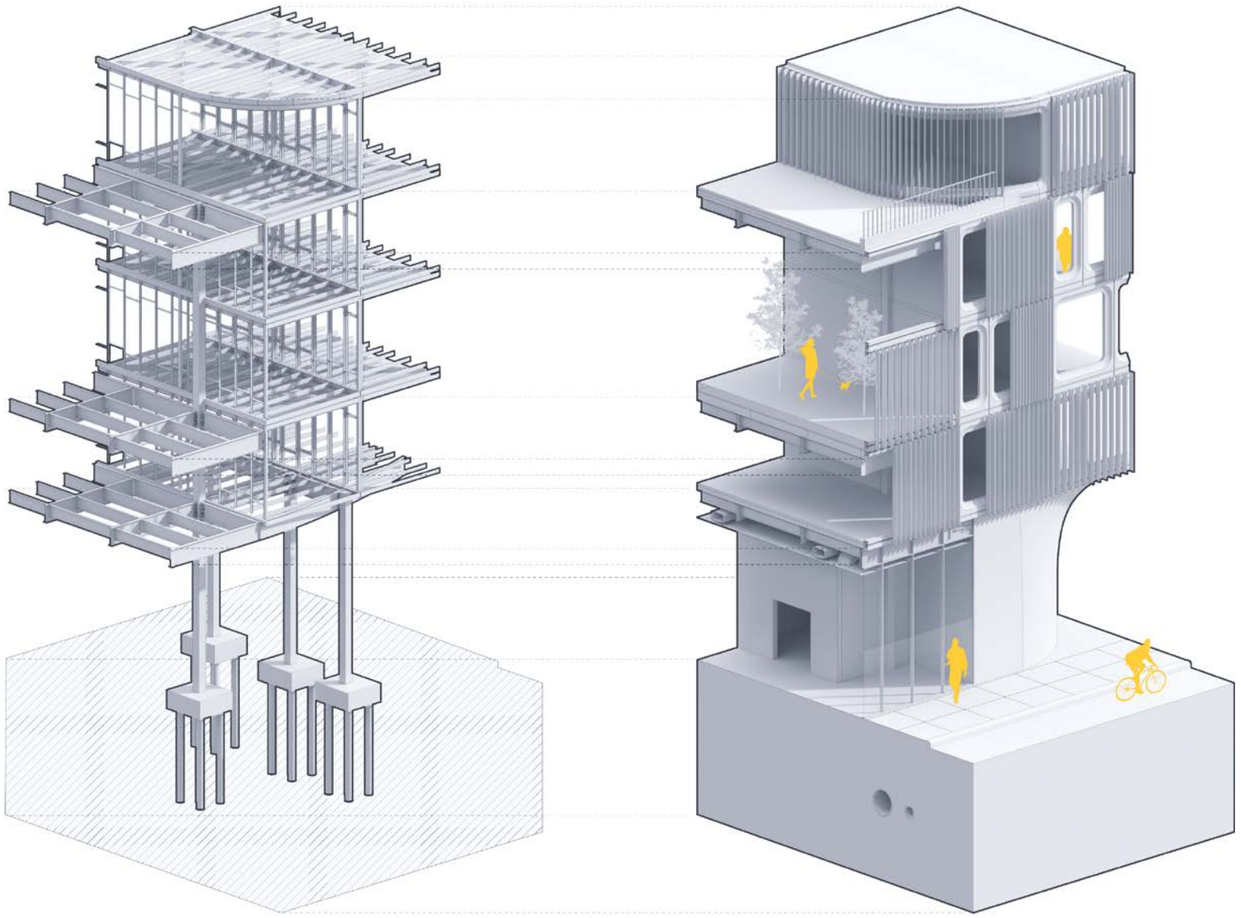
3 BR BOOKEND FILLET



3 BR BOOKEND

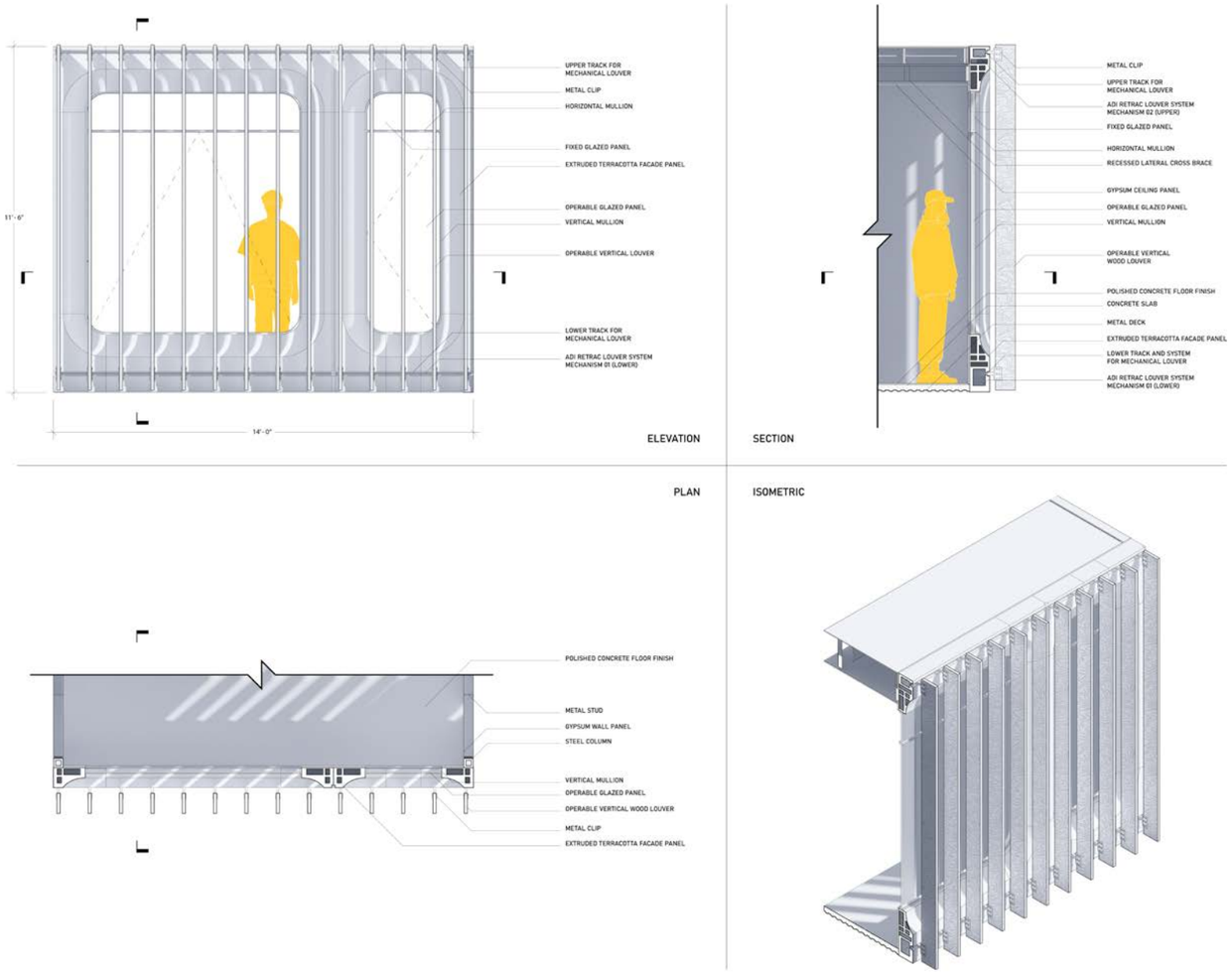


4 BR BOOKEND

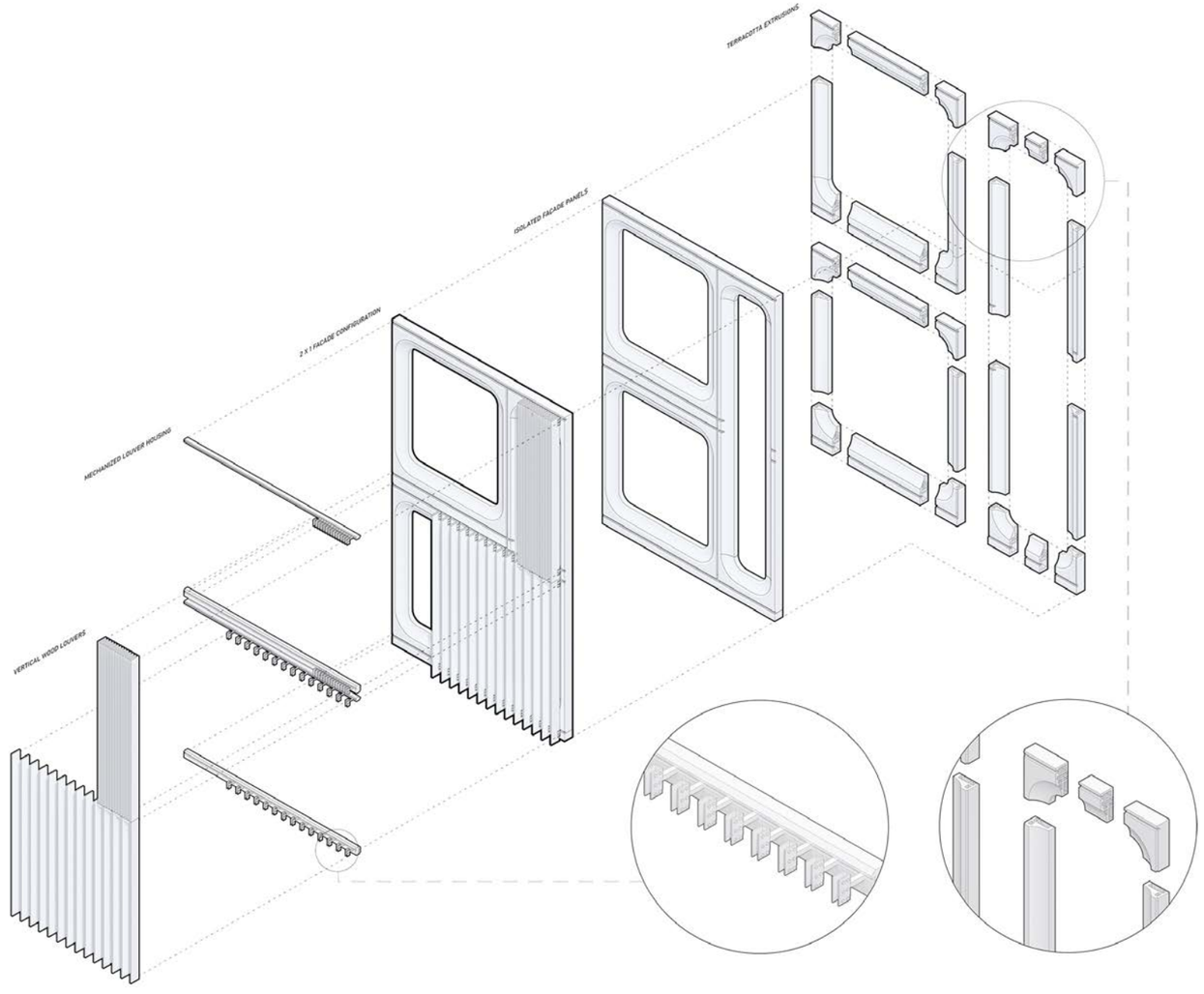


Structural Chunk Diagram

Interior Courtyard



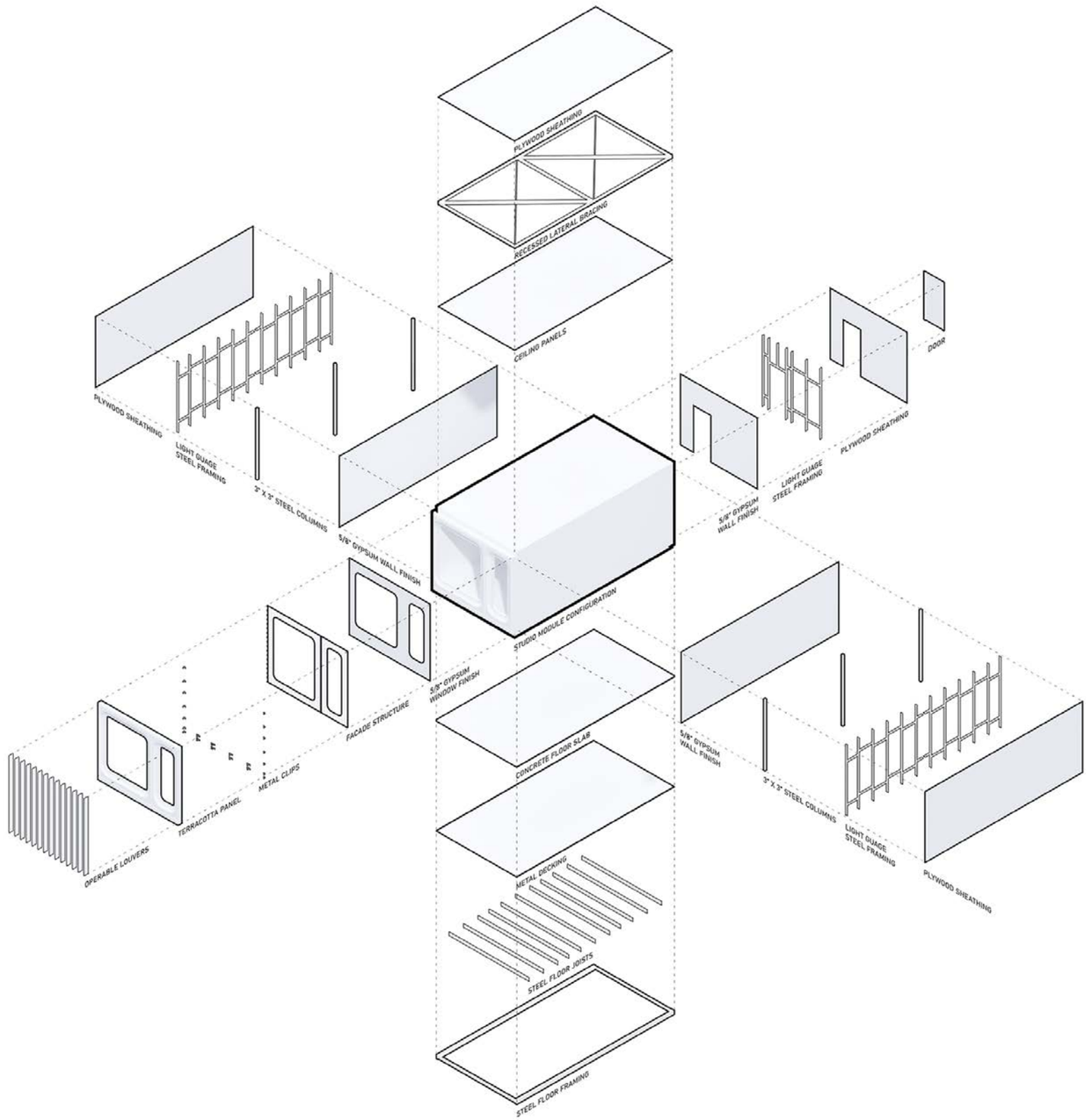
Facade Roadmap



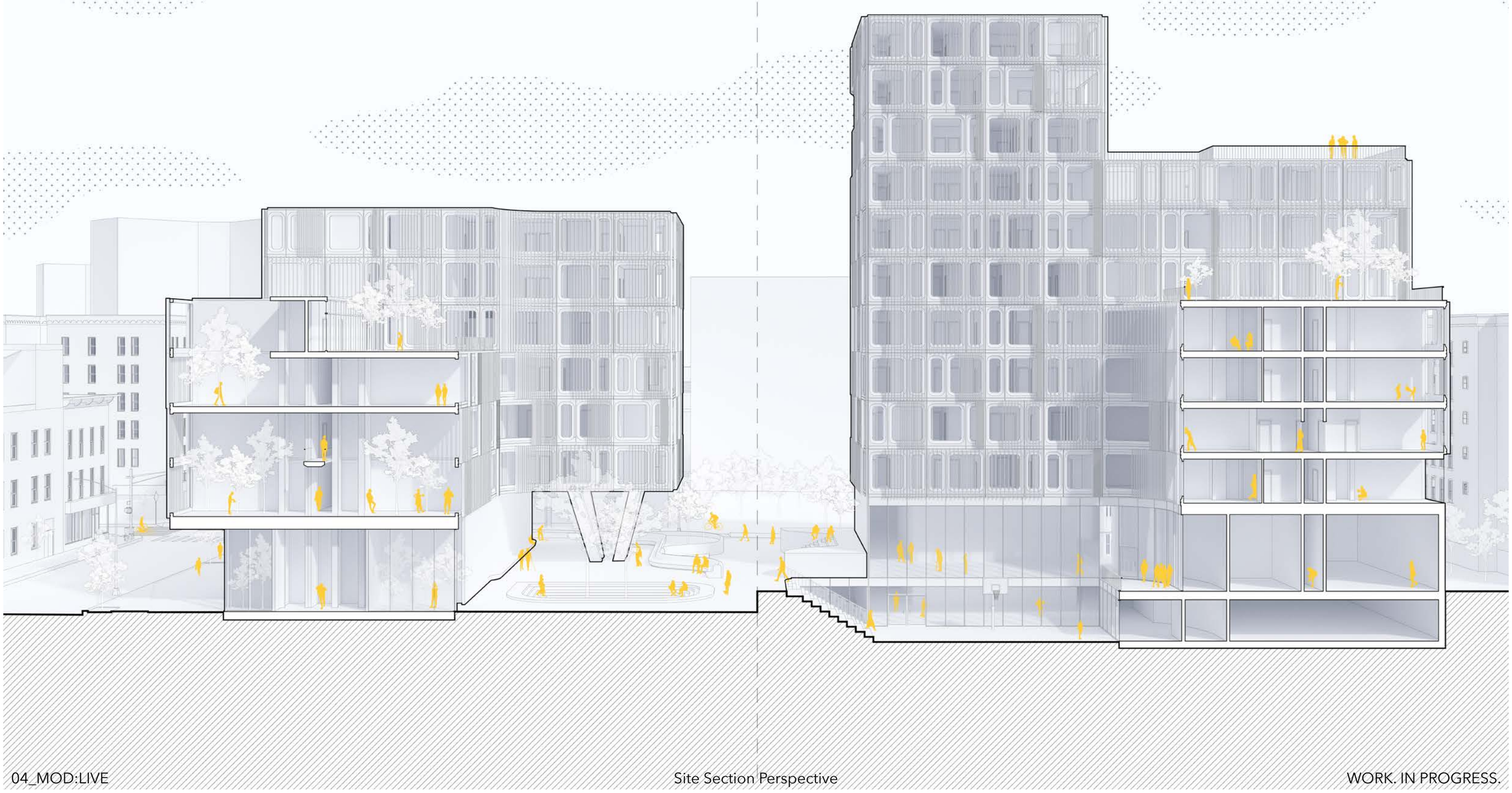
Facade Kit of Parts

Basketball Court

Rooftop Terrace



Unit Module Kit of Parts



Site Section Perspective

Designed and constructed by students in the "Outside-In Project" seminar during the Spring 2023 semester, this inflatable installation, titled *GSAPP x WORM* invites all kinds of interaction between user and pavillion. Visitors can walk through, play with, jump on, sit on, and lie down on the inflatable. The concept of a continuous line was employed to create simplicity in form for an ease of assembly and reduction in material cost and construction time frame. The pitched upper arms of WORM were designed to optimize incident sunlight to increase the efficiency of two mounted photovoltaic panels.

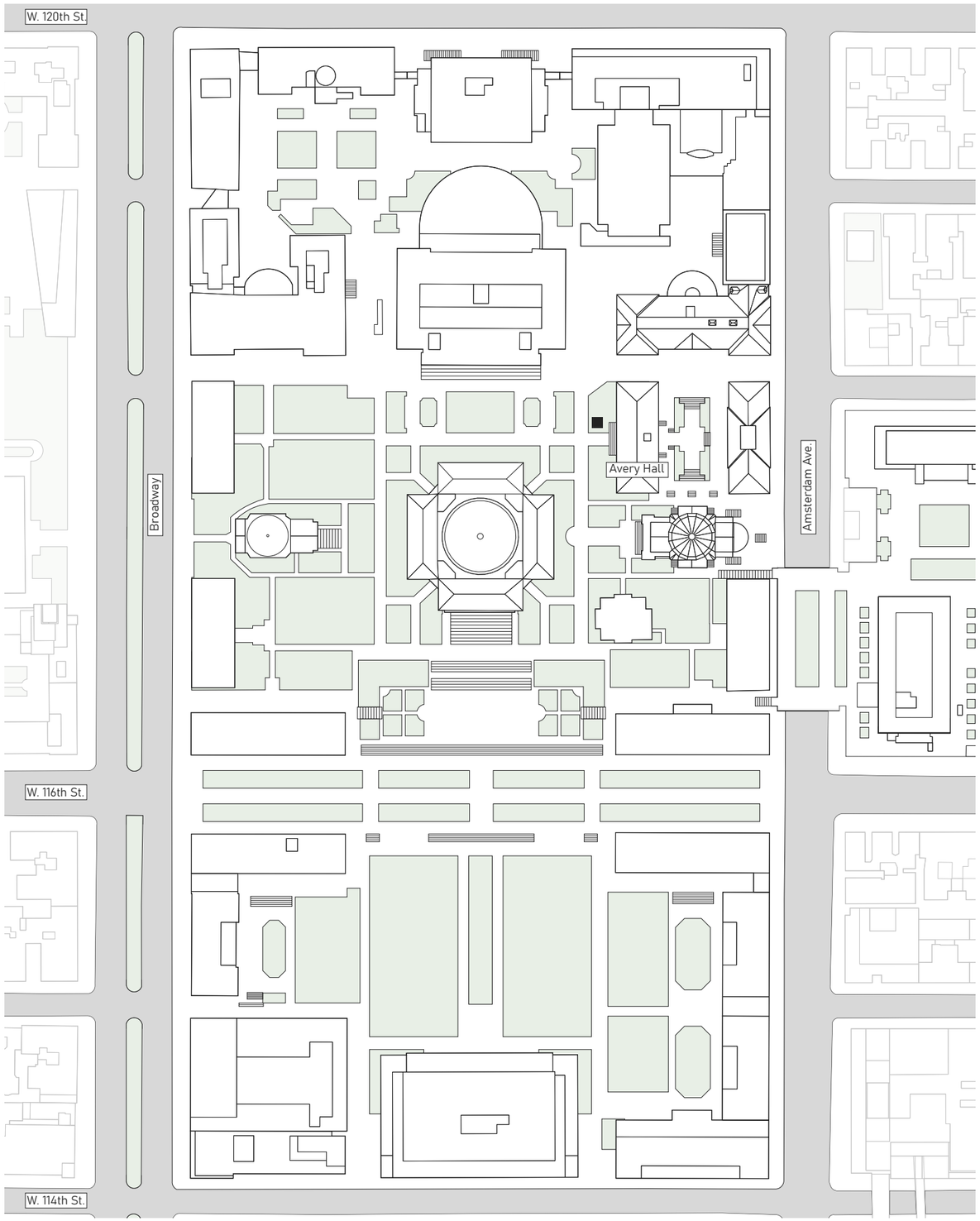
Anchored by weighted ballasts and filled with recycled foam, the lower section of WORM can accommodate any and all forms of interaction without impacting the structural performance or appearance of the inflatable. The economy of form allows for just a single blower to inflate the pavillion. Additionally, two industrial-grade colour-changing LED chords, and three charging cables, are powered by the PV's mounted atop WORM's Structure. Only one blower is used to keep this installation inflated.

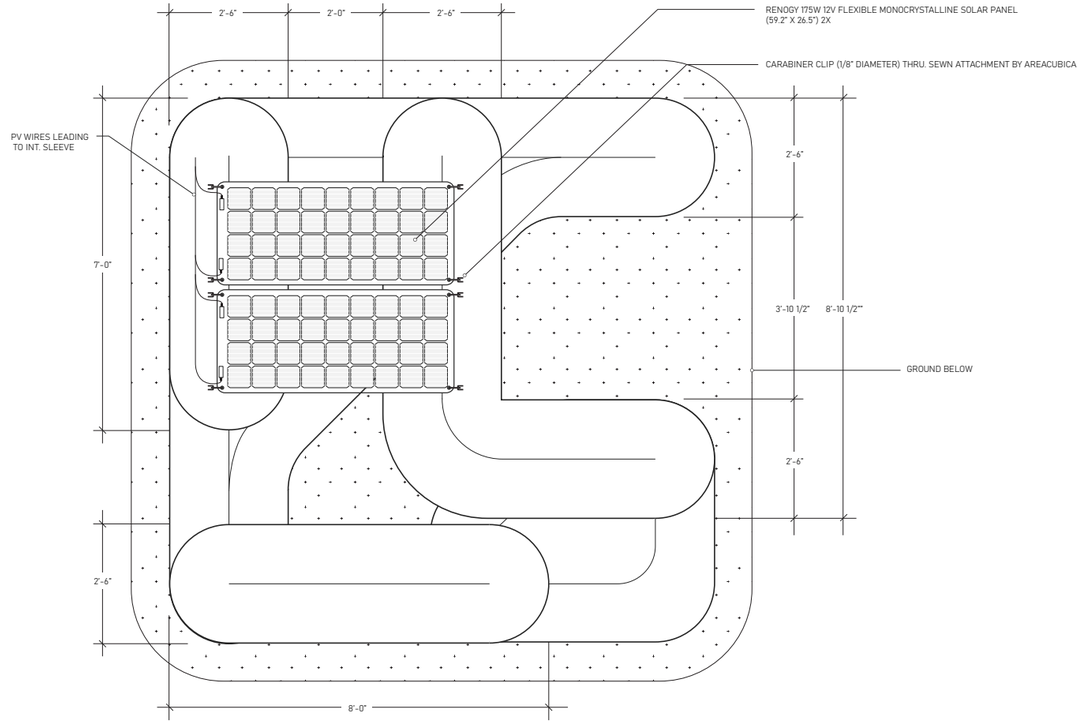
Sited immediately in front of Avery Hall, this installation was designed in part for Columbia GSAPP's "End of Year Show" and the school-wide graduation ceremony. This winning design proposal saw numerous design iterations and form optimizations throughout the course of the semester, but was ultimately built in just one day by the project team.

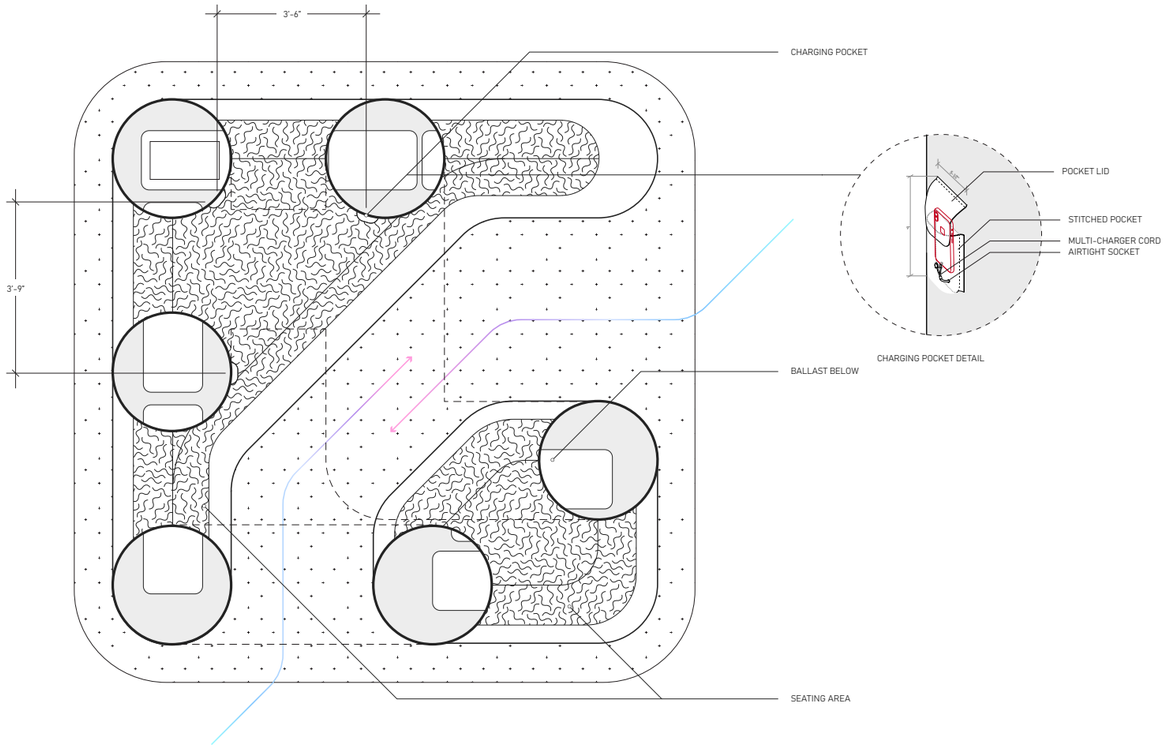
LOCATION_____**AVERY HALL, COLUMBIA UNIVERSITY**
COURSE_____**OUTSIDE-IN PROJECT**
CRITIC_____**GALIA SOLOMONOFF & LAURIE HAWKINSON**
TERM_____**SPRING 2023**
PROJECT TEAM_____**BRENNAN HEYWARD, VISHAL BENJAMIN, NICHOLAS RICHARDS, MARINA GUIMARAES, KELLY HE, DANIEL LI, & ZINA BERRADA**

05

*05*_WORM INFLATABLE







05_WORM INFLATABLE

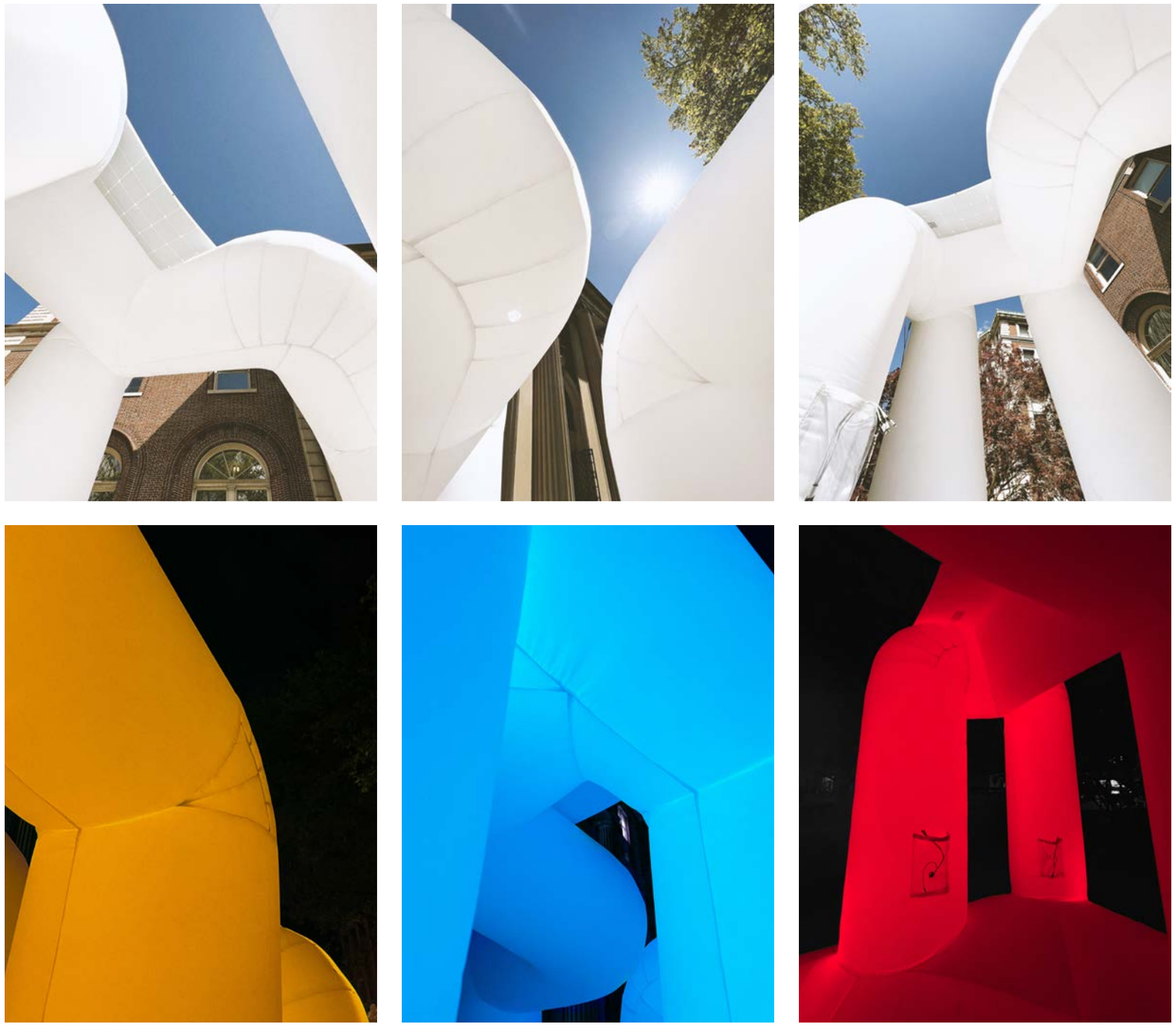
Context Plan of Worm on Campus

Roof Plan and Circulation Plan from CDs

WORK. IN PROGRESS.

05_WORM INFLATABLE Daytime Render of Inflatable

Nighttime Render of Inflatable WORK. IN PROGRESS.



Detail Photos of Worm

Photo of Illuminated Worm

"Jessica opened her eyes to the desert stillness, to the mounting warmth of the day. Restless heat devils were beginning to set the air aquiver out on the open sand. The other rock face across from them was like a thing seen through cheap glass.

A spill of sand spread its brief curtain across the open end of the fissure. The sand hissed down, loosed by puffs of morning breeze, by the hawks that were beginning to lift away from the clifftop. When the sandfall was gone, she still heard it hissing. It grew louder, a sound that once heard, was never forgotten."

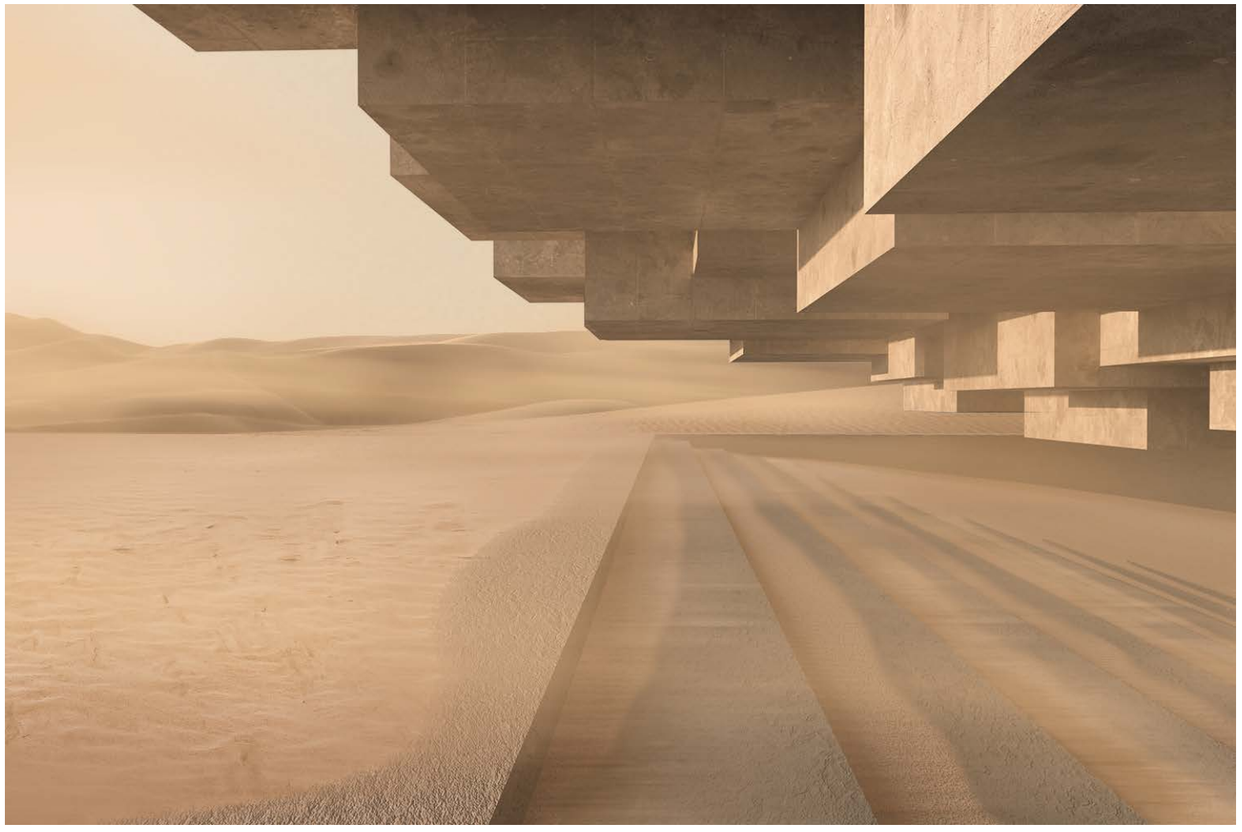
Herbert, Frank. *Dune,* Chilton, 1965.

This triptych of renders acts as an exercise in architectural visualization and storytelling. Inspired by the cold, desolate, and unforgiving landscape depicted in the novel *Dune*, these images tell the story of a lone explorer searching for anything safe or salvageable in a post-human, dystopian future. The images document three parts of the explorer's journey: discovery, approach, and the vast interior.

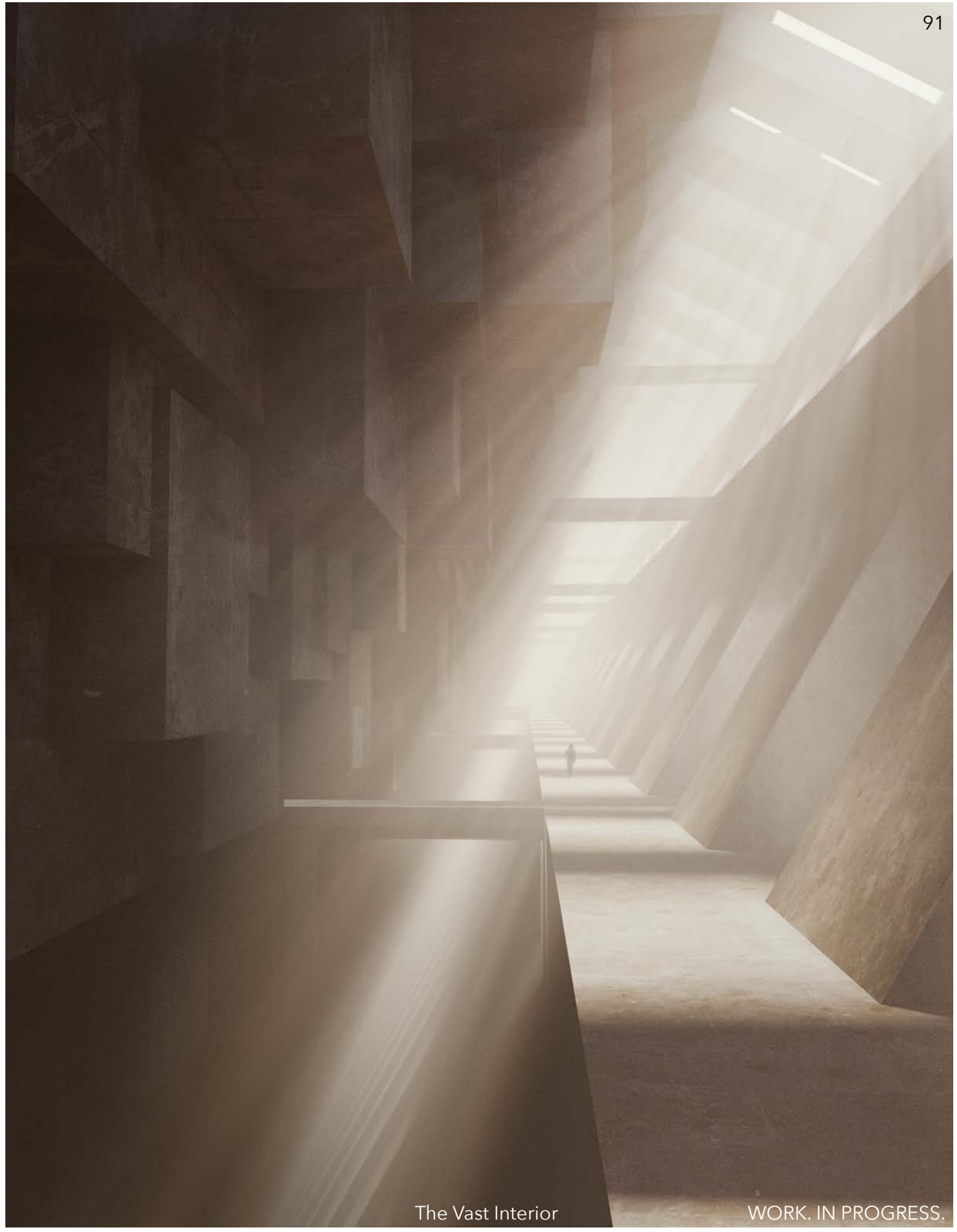
LOCATION _____ **A FUTURE NOT SO FAR AWAY**
COURSE _____ **ULTRAREAL**
CRITIC _____ **PHILLIP CRUPI**
TERM _____ **SPRING 2022**
COLLABORATORS ____ **BRENNAN HEYWARD & JOACHYM JOAB**

06

*06*_DUNE



The Approach



The Vast Interior

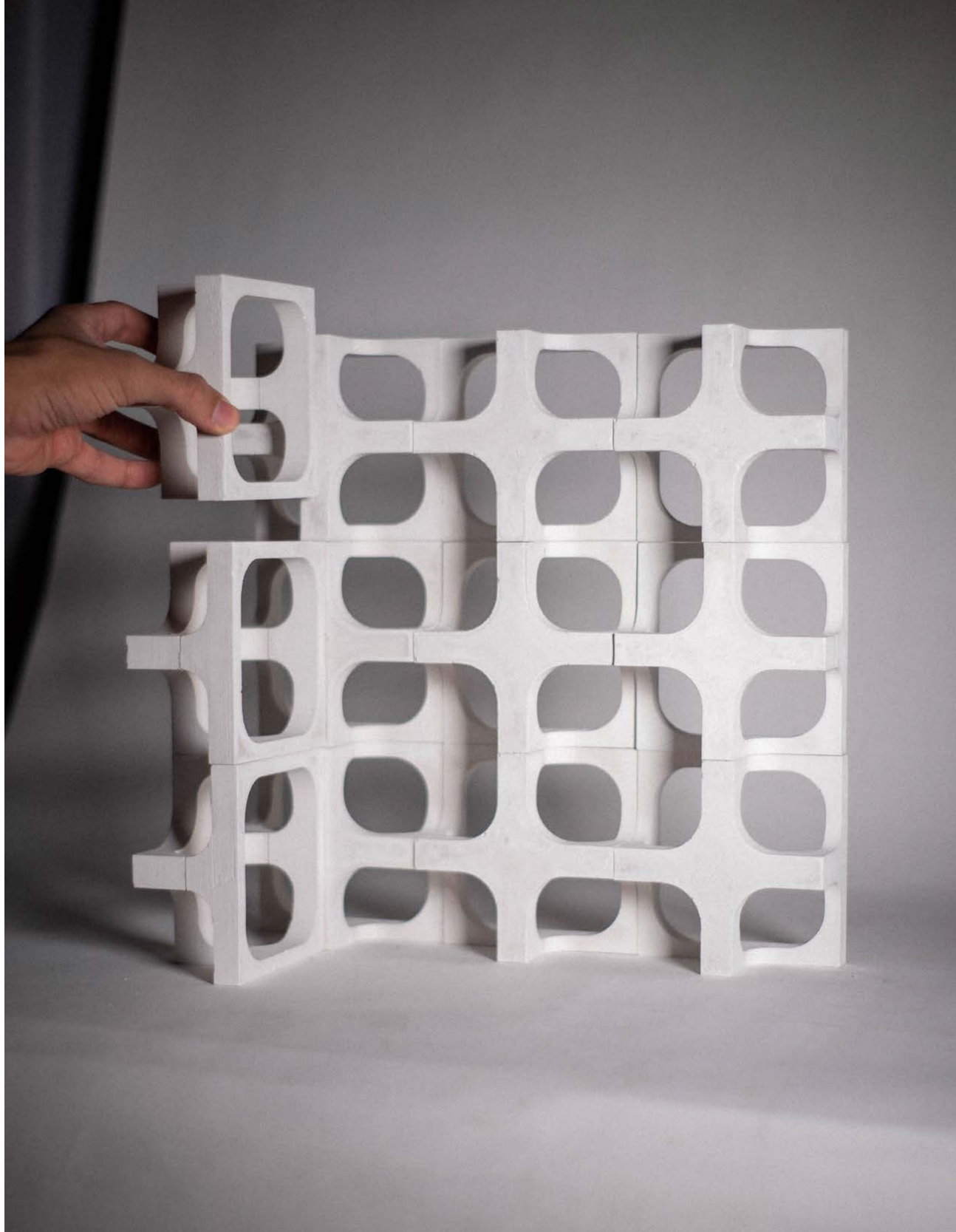
Through the process of 3D printing, silicone mould-making, and concrete casting, this project aimed to develop a series of tiles that aggregate to create an architectural screen. In addition to countless digital explorations, numerous iterations of concrete tiles were created to generate a distinct architectural detail. Drawings, animations, and photography were all digital tools that helped in the understanding, exploration, and development of tiles and their means of aggregation.

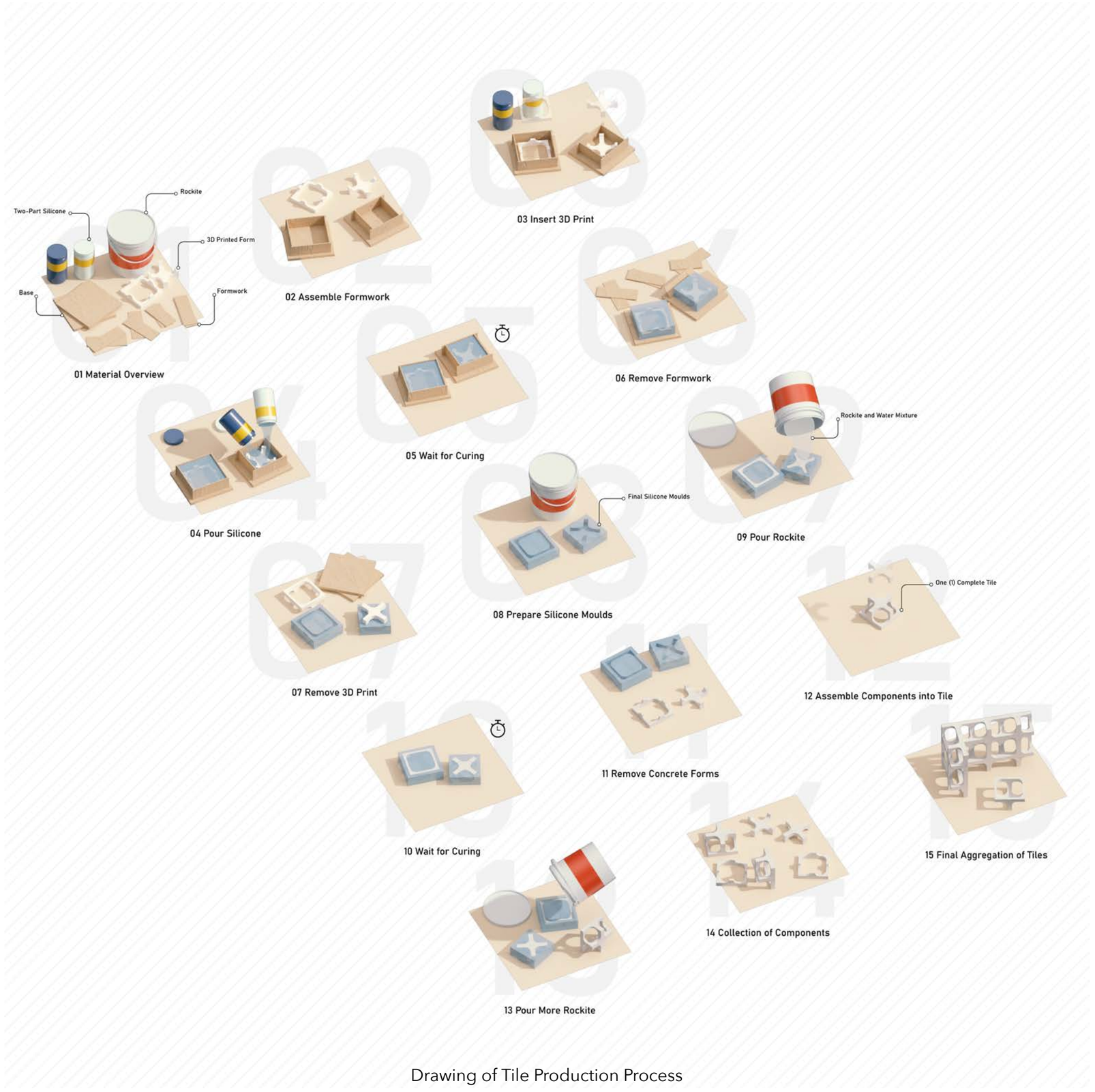
The arrangement of the tiles are loosely inspired by a basket-weave-like aggregation of three-dimensional forms. On their own, the tiles have two distinct faces—only upon being arranged together can it be understood that the tiles create identical patterns on the front and the back. An intricate balance of mass and void makes these tiles perfect for a full-scale architectural screen. They provide sufficient privacy for any interior space without sacrificing incident daylight.

COURSE TRANSITIONAL GEOMETRIES
CRITIC JOSH JORDAN
TERM FALL 2022

07

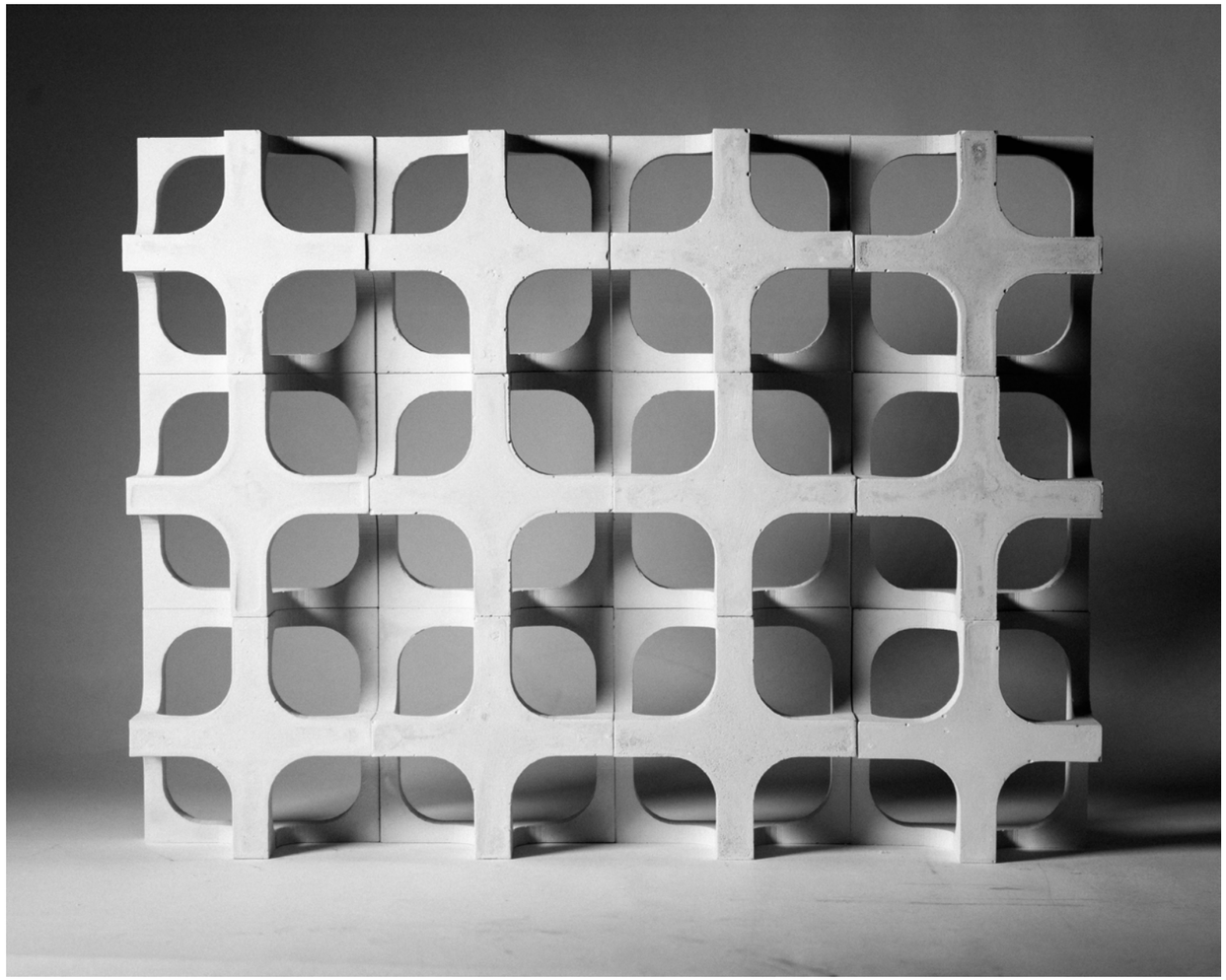
07_+TILE





Drawing of Tile Production Process

07_+TILE Bookend Arrangement of Tiles



Planar Arrangement of Architectural Screen

WORK. IN PROGRESS.

This Single-Use-Plastic (SUP) Pavillion takes inspiration from three biological strategies of three distinct organisms. The modularity and form of the structure was designed based on the skeletal structure of the Radiolarian—a marine microorganism whose structure can regenerate following a fracture.

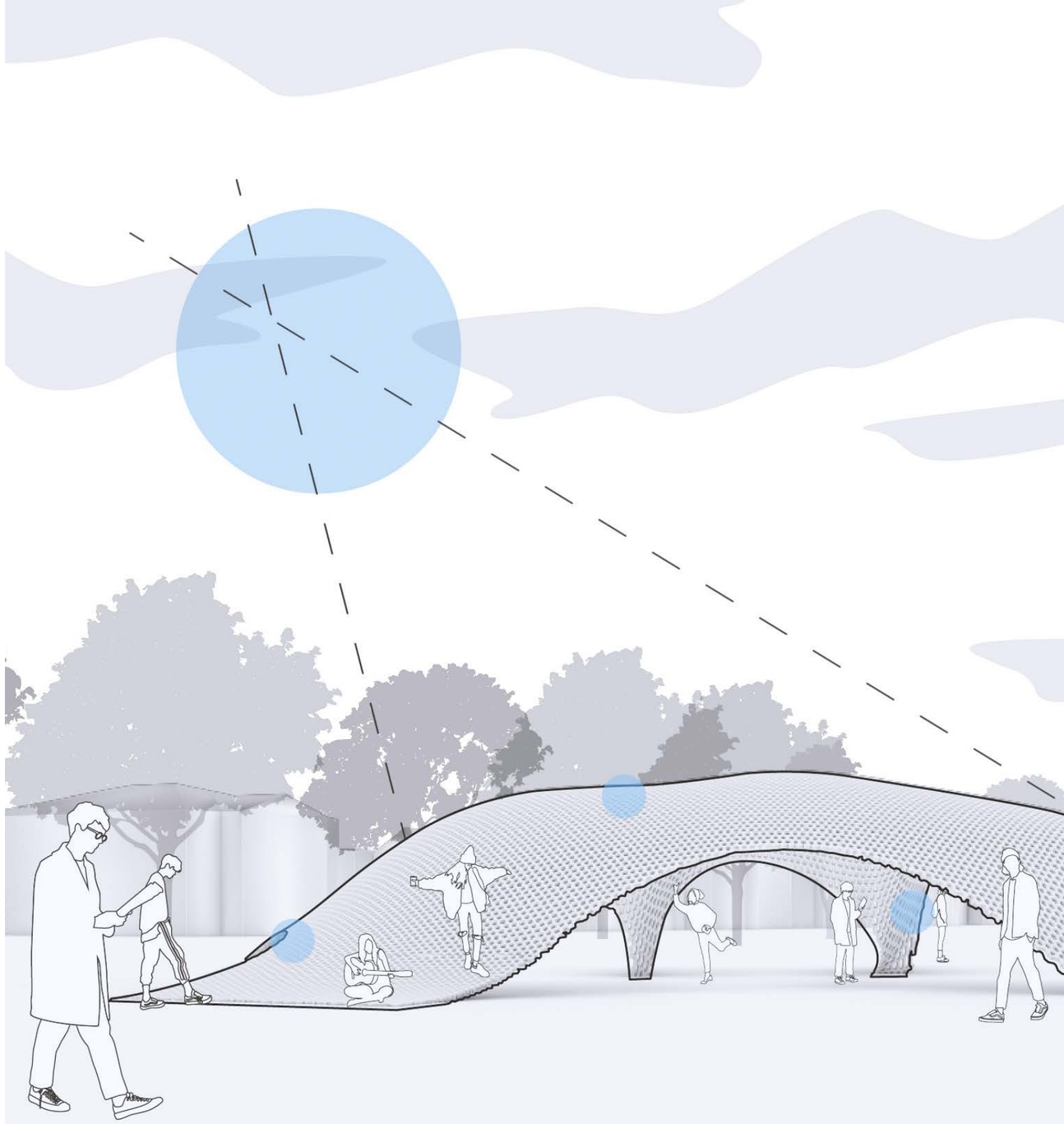
The (SUP)Pavillion operates in three stages. First, it leverages single-use plastic waste from locals—similar to the strategies used by the Burrowing Owl. In turn, the plastic that is placed within the voids of the structure helps in the diffusion of incident light—mimicking a strategy used by the Scarab Beetle, thus improving the thermal comfort for occupants and visitors. Lastly, once the voids in the structure are filled with discarded plastic, the waste is removed from the pavillion, processed, and formed into new modules to create a new (SUP)Pavillion.

Instead of plastic waste ending up in our oceans and landfills, this installation integrates a new closed-loop system within the single-use plastic industry.

LOCATION CENTRAL PARK, NEW YORK
COURSE FOOTPRINT, CARBON & DESIGN
CRITIC DAVID BENJAMIN
TERM FALL 2020

08

*08*_(SUP)PAVILLION



001_EXTRACTION

the process of creating a plastic bottle begins with extracting oil from the earth. this is done through the use of a pumpjack on land, and an offshore drilling rig when being extracted from the seabed of a body of water.

the EMBODIED ENERGY of the EXTRACTION of OIL for a SINGLE PLASTIC BOTTLE is 0.58 kWh (84 MJ/kg).

002_STORAGE & TRANSPORTATION

after being extracted from the earth by pumpjacks, the oil is stored in drums to then be transported to the refinery to be cleaned in preparation for processing into PET pelletes.

this is the 1st of 4 instances of transportation between sites throughout the production process.

as a whole, the various instances of TRANSPORTATION throughout the production process of a plastic bottle accounts for 29% of the EMBODIED ENERGY of a single plastic bottle. the value of the embodied energy of total transportation is 0.50 kWh/bottle.

003_REFINING & PROCESSING

once the oil drums arrive at the refining facility, the oil is cleaned so it can be processed. the now clean oil is transported to a plastics factory and transformed into PET pellets. the pellets are heated up and formed into uniformly-thin plastic sheets. the sheets are placed in bottle pre-forms thus creating an empty plastic bottle.

the empty bottles are transported again to a bottling plant where they are filled with water. At this point, there have been 3 separate instances of transportation between various facilities.

the EMBODIED ENERGY of REFINING and PROCESSING OIL into PET (polyethylene terephthalate) is 0.07 kWh per plastic bottle (9.83 MJ/kg). this process accounts for 38% of the embodied energy of a plastic bottle.

004_TRANS-PORTATION

after being formed into the shape of a bottle and filled with fluids, the bottles are then transported to commercial spaces and retailers all over.

this is the 4th and final instance of transportation.

005_RETAIL & STORAGE

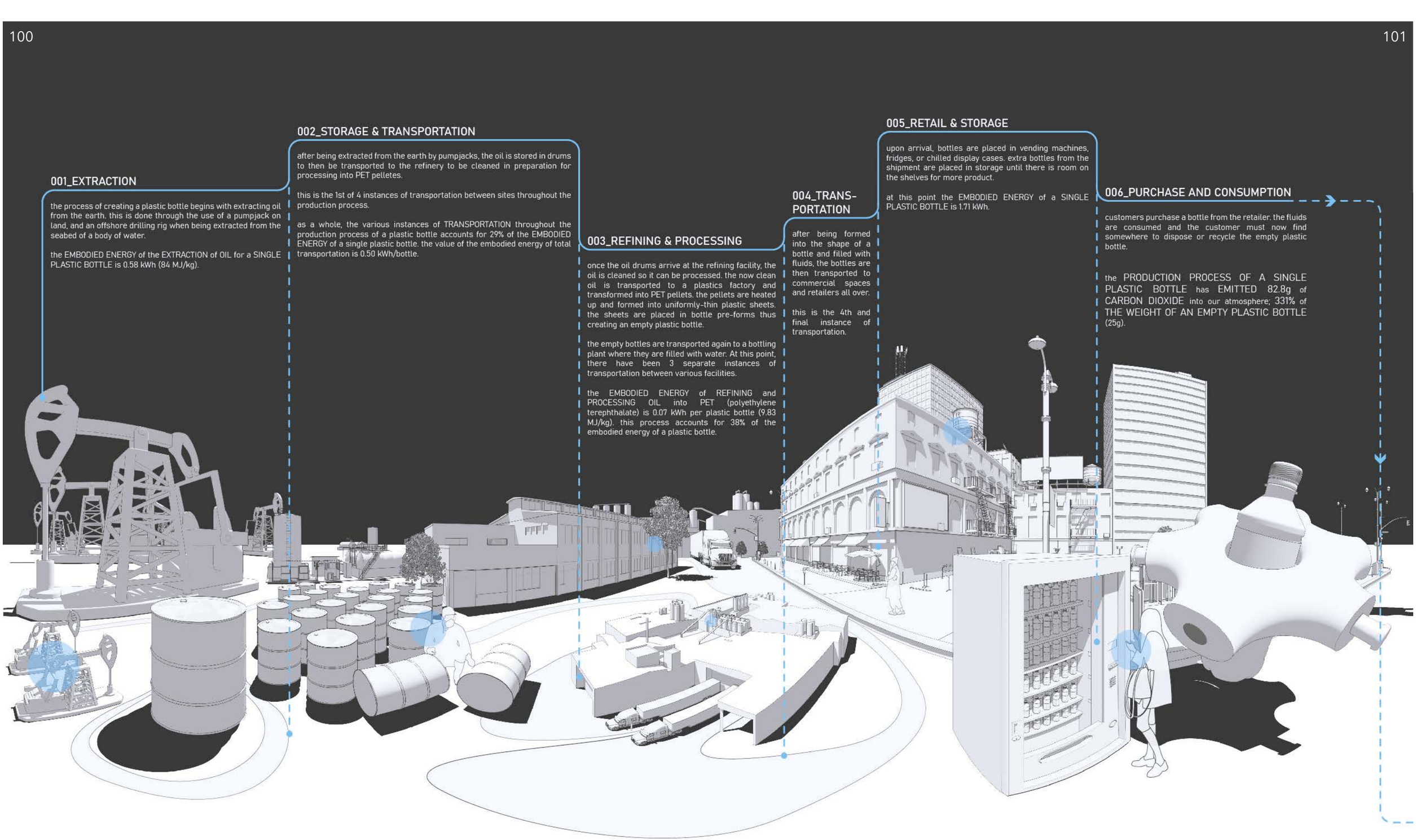
upon arrival, bottles are placed in vending machines, fridges, or chilled display cases. extra bottles from the shipment are placed in storage until there is room on the shelves for more product.

at this point the EMBODIED ENERGY of a SINGLE PLASTIC BOTTLE is 1.71 kWh.

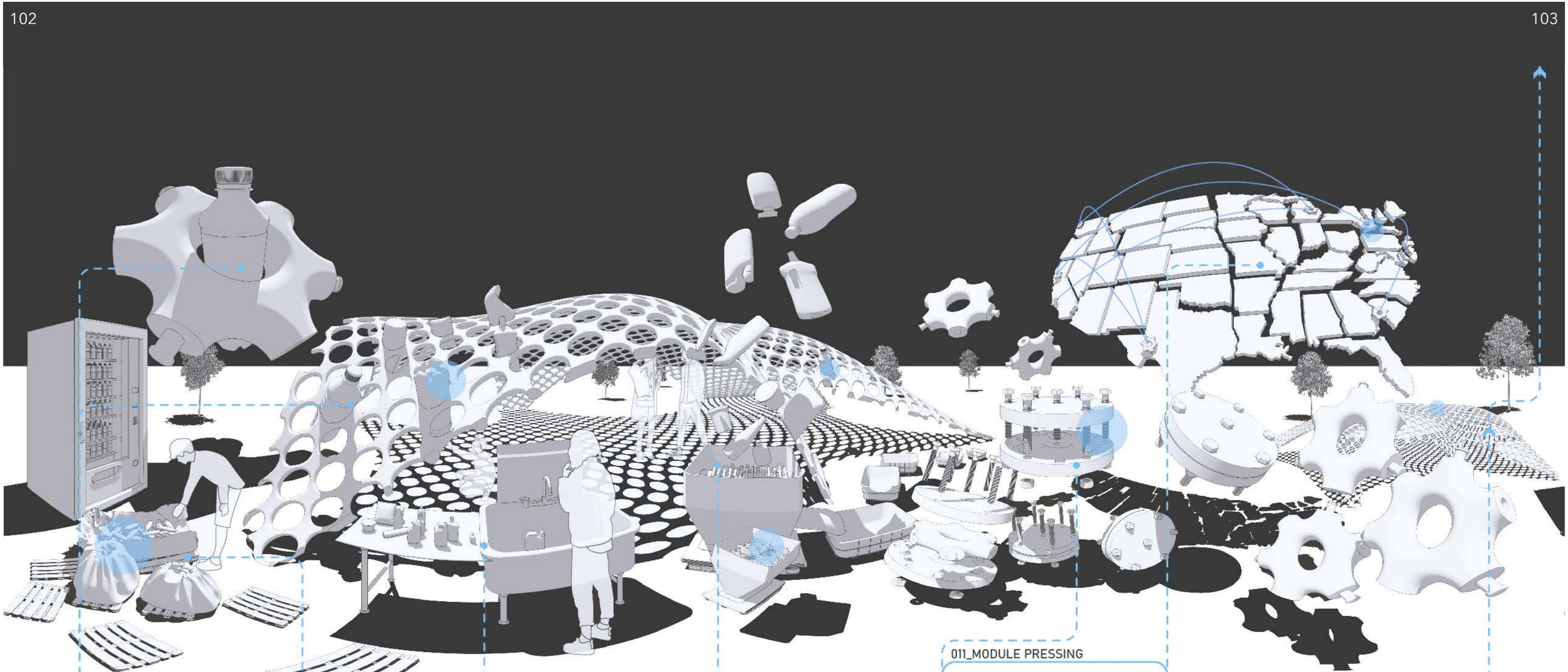
006_PURCHASE AND CONSUMPTION

customers purchase a bottle from the retailer. the fluids are consumed and the customer must now find somewhere to dispose or recycle the empty plastic bottle.

the PRODUCTION PROCESS OF A SINGLE PLASTIC BOTTLE has EMITTED 82.8g of CARBON DIOXIDE into our atmosphere; 331% of THE WEIGHT OF AN EMPTY PLASTIC BOTTLE (25g).



Phases of Plastic Production



007_DISPOSAL/PLACEMENT

instead of being disposed in the garbage or recycling, the pavillion DIVERTS SINGLE-USE PLASTICS like bottles, straws, ziploc bags, grocery bags, among others, FROM LANDFILLS and eventually ending up in our OCEANS.

the pavillion is seen as an attraction, thus incentivising people to place their plastics in the voids of the structure rather than throwing them away.

since waste is ultimately diverged from landfills and recycling plants, the EMBODIED ENERGY of the entire DISPOSAL process, 164,000 kWh is subtracted from the total embodied energy of the pavillion (0.5 kWh/bottle).

008_COLLECTION & SORTING

once the voids in the structure are filled with PUBLICLY-SOURCED PLASTICS, employees remove the items from the structure and sort them by material into large bags.

these bags are then transported to the production facility where they will be cleaned.

009_CLEANING

upon arriving at the production facility, employees begin cleaning each of the items of any residue that was left from its initial use.

once completely washed down, the plastics are left to dry to ensure no excess moisture is introduced to the shredding process.

the EMBODIED ENERGY of CLEANING enough plastic for a SINGLE MODULE is 1.29 kWh. it would take 10,578 kWh to clean enough plastic for an ENTIRE PAVILLION.

010_SHREDDING

after drying completely, the cleaned plastics are dropped into an industrial shredding machine that grinds the items into small, pellete-like pieces. any large pieces that pass through the machine are fed through again. the shredded plastic pieces drop into large bins and are moved to the pressing station

it takes 1520 kWh to SHRED ENOUGH PLASTIC FOR ONE PAVILLION (0.187 kWh/module).

011_MODULE PRESSING

the shredded plastic pieces are fed into a machine that heats up, melts, and extrudes the nearly-uniform shreds into individual module molds made from steel. while still hot, the entry hole is sealed and the entire steel mold is submerged in cool water.

once fully cooled, the steel molds are taken apart so the plastic module can be removed and any excess material can be cleaned off. modules vary in size and shape so there are a set number of steel molds for each module type.

the EMBODIED ENERGY of MELTING enough plastic for one pavillion is 795.4 kWh (0.097 kWh/module).

on average, it takes 1 kg of SHREDDED PLASTIC, or 40 plastic bottles, to produce a SINGLE MODULE. this means that approximately 328,000 bottles would go into the production process of a new pavillion.

012_TRANSPORTATION & ASSEMBLY

once all modules for the pavillion have been formed, they are collected, organized, and transported to a different public park in a different city. upon arrival, the pavillion is assembled and begins to leverage single-use plastic from locals so a new pavillion can be constructed again.

the embodied energy of transportation depends on the distance between each facility and its corresponding pavillion as well as the weight and carrying capacity of the transport vehicle. it would take 6.61 kWh to TRANSPORT 8200 kg of plastic 1 km.

each pavillion is constructed of 8200 modules and the TOTAL EMBODIED ENERGY OF ONE PAVILLION IS 12,942 kWh. 1.58 kWh/module.

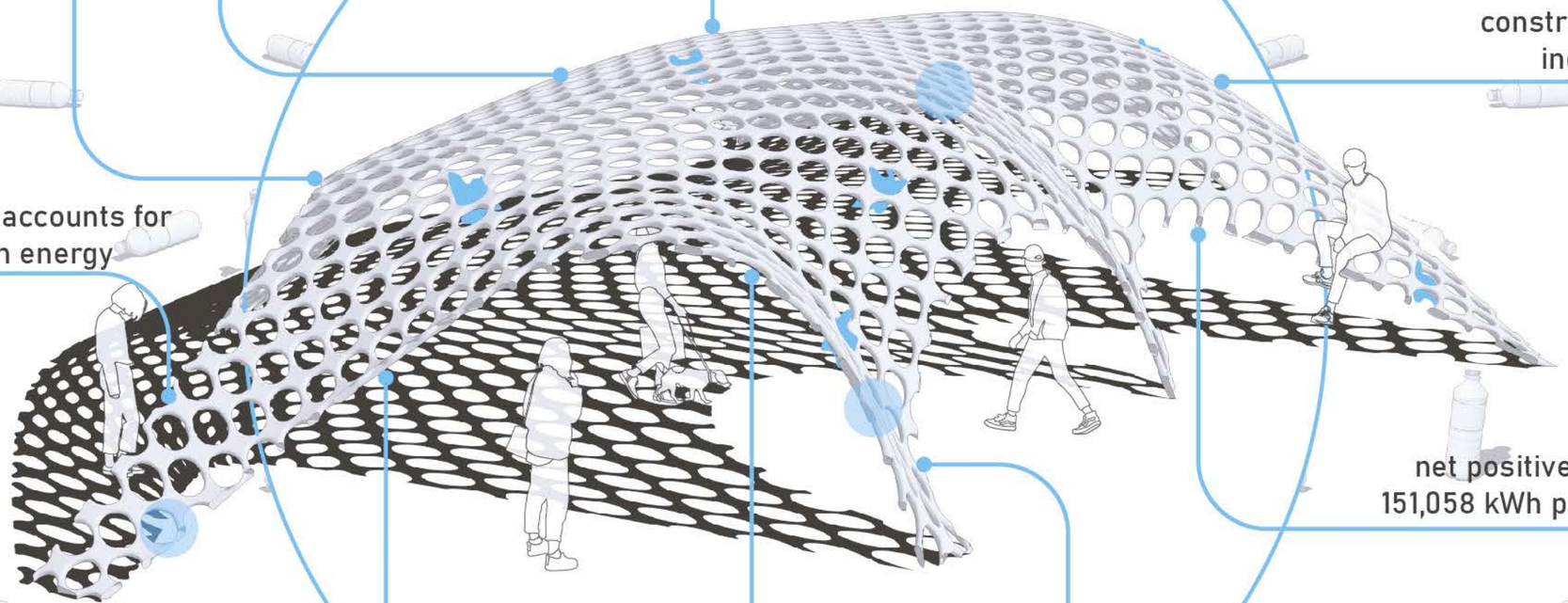
with the subtraction of the energy diverted from recycling plants, the pavillion is NET POSITIVE, SAVING A TOTAL of 151,058 kWh.

made from 328,000 plastic bottles (8,200 kg of plastic)

total of 164,000 kWh diverted prior to production process

plastic cleaning accounts for 81.7% of production energy

constructed from 8,200 individual modules



plastic shredding accounts for 11.7% of production energy

net positive savings of 151,058 kWh per pavillion

module pressing accounts for 6.15% of production energy

transportation accounts for 0.38% of production energy

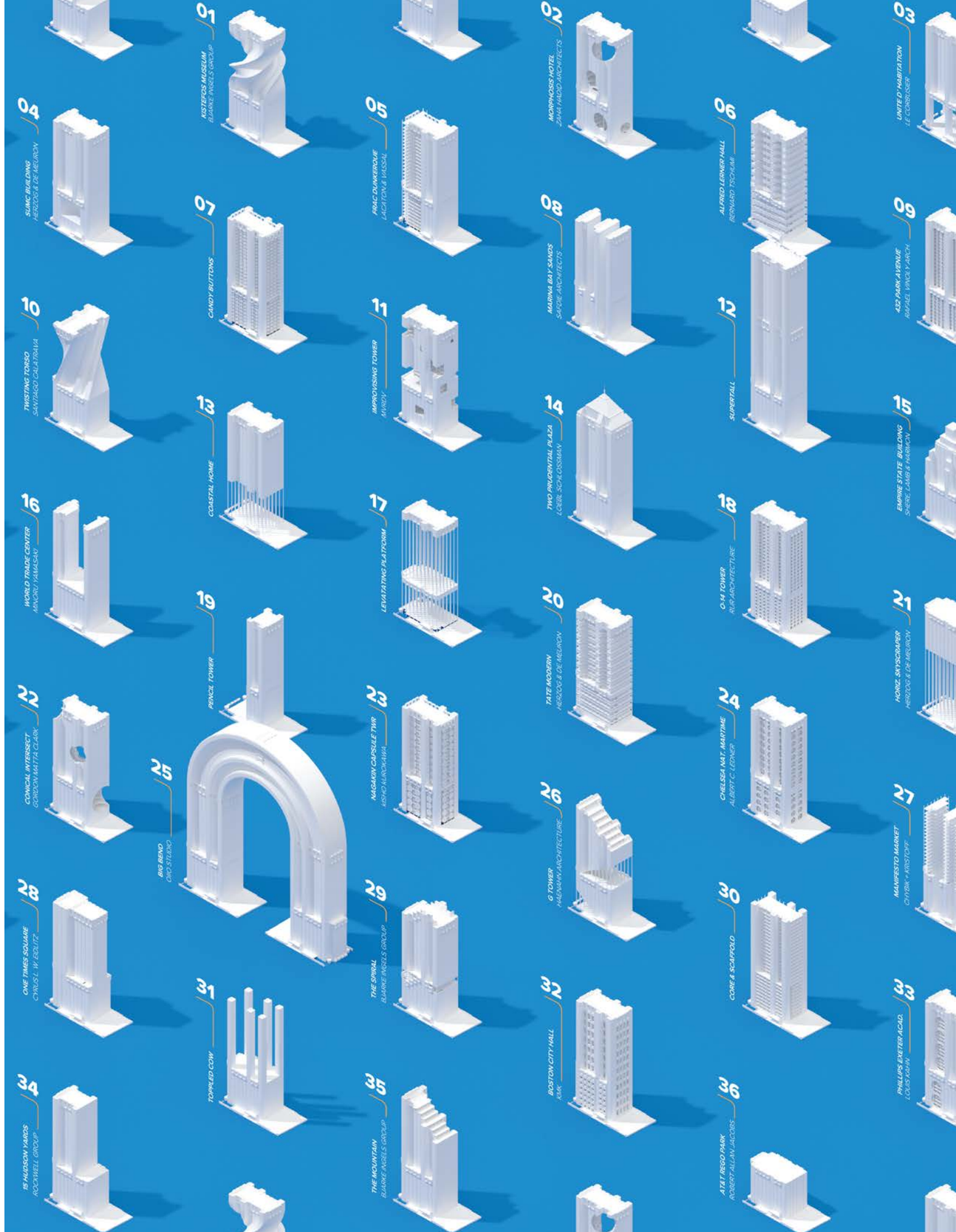
total embodied energy to produce is 12,942 kWh (-151,058 if diverted energy is included)

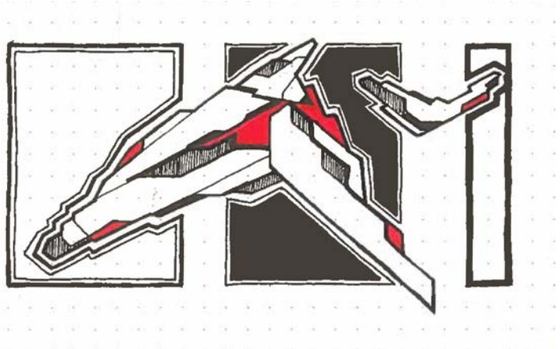
As designers in today's field of architecture, we've come to learn that role of an architectural designer is not as monodisciplinary and specialized as it may once have been. Instead, we as designers wear many hats—we explore techniques in graphic design, business, architectural visualization, model making, research, public speaking, history, personal branding, sales, and photography, among many other niches.

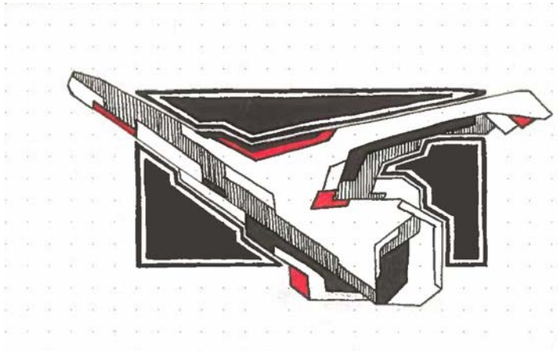
Misfits are not full projects. They are sketches, architectural models, case studies of real-world experiments, explorations in graphic design, architectural visualizations, etc. These images stand to represent my transdisciplinary approach to designing over the course of my time here at GSAPP. Together they represent the experimentation and exploration of a workflow that yields ideas and designs that will eventually become full projects.

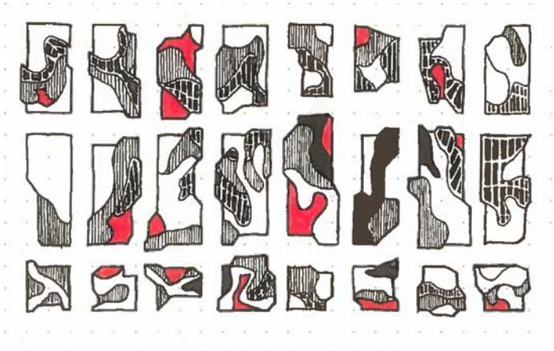
This selection of multidisciplinary work is a reminder to myself that the process behind each project holds value. From the numerous errors to countless iterations, and from the many trials to small and intimate moments of inspiration.

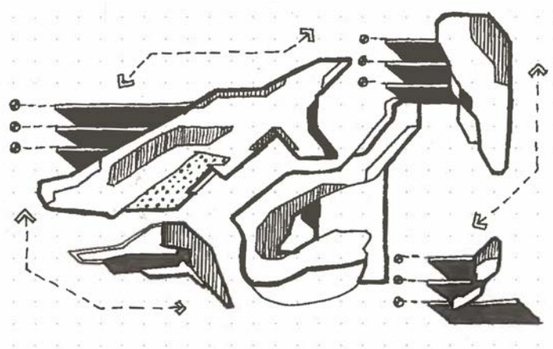
*09*_MISFITS

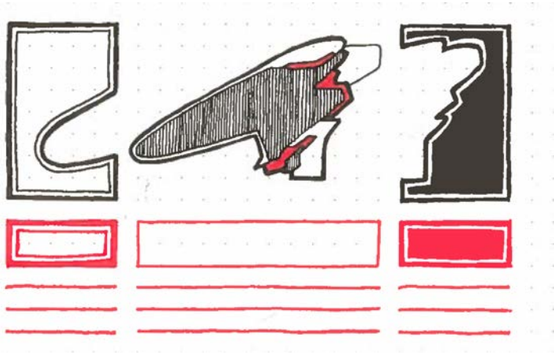


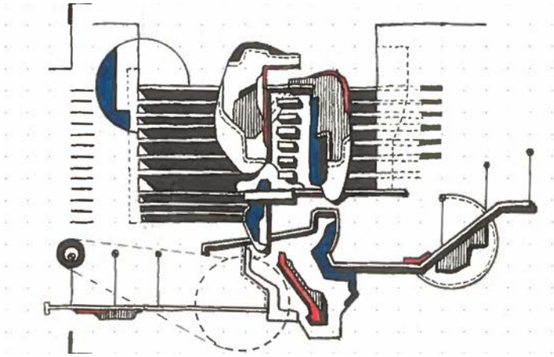


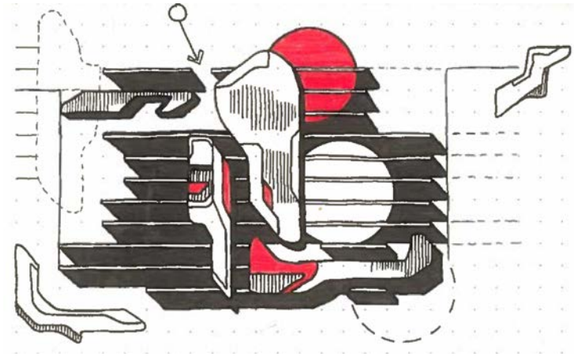


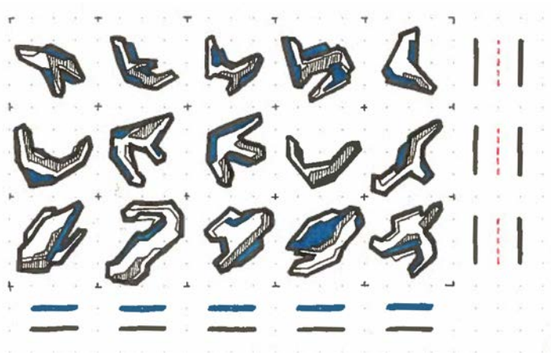


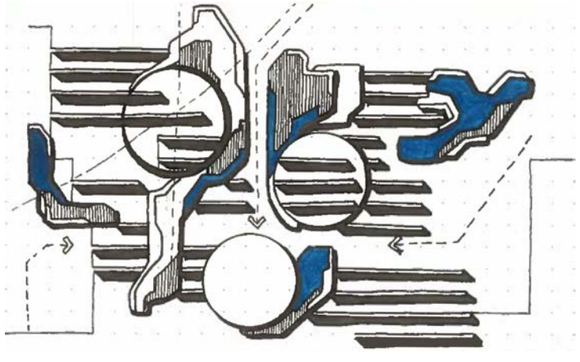


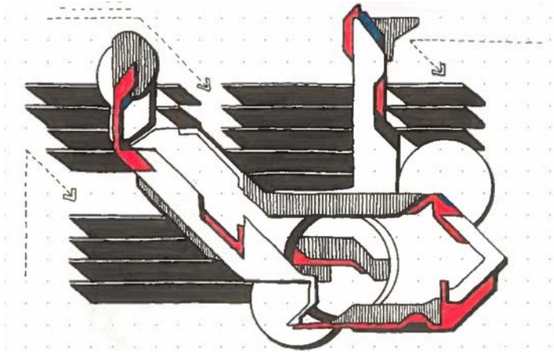


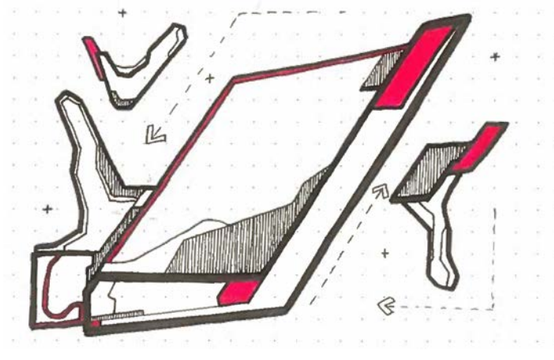


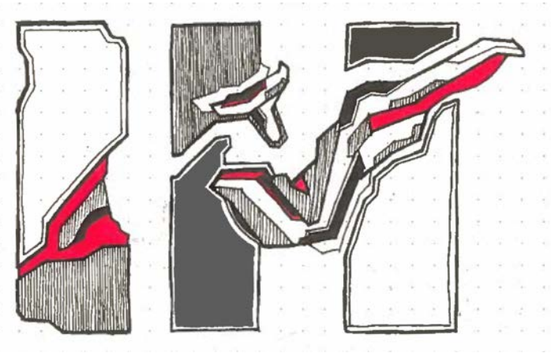




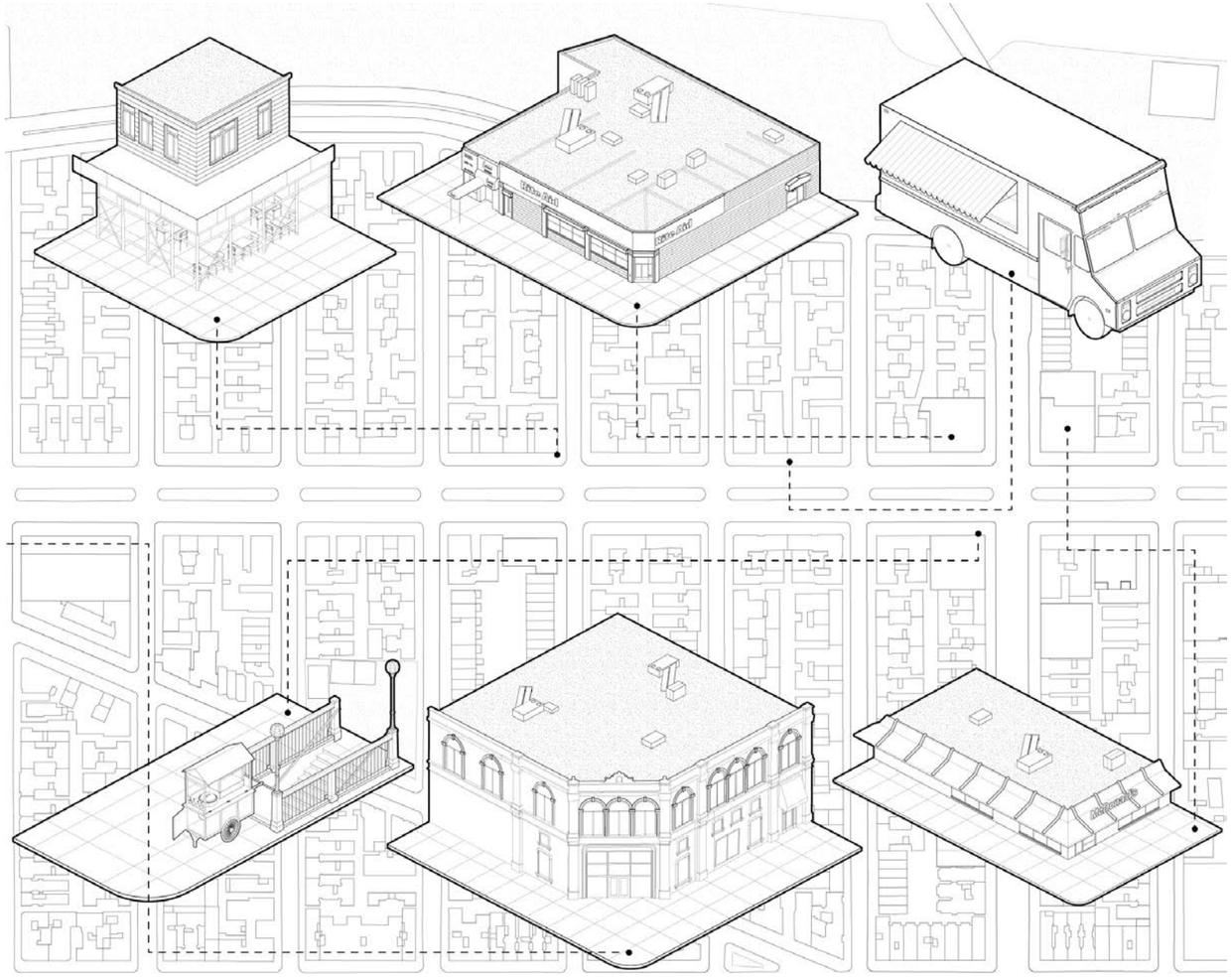






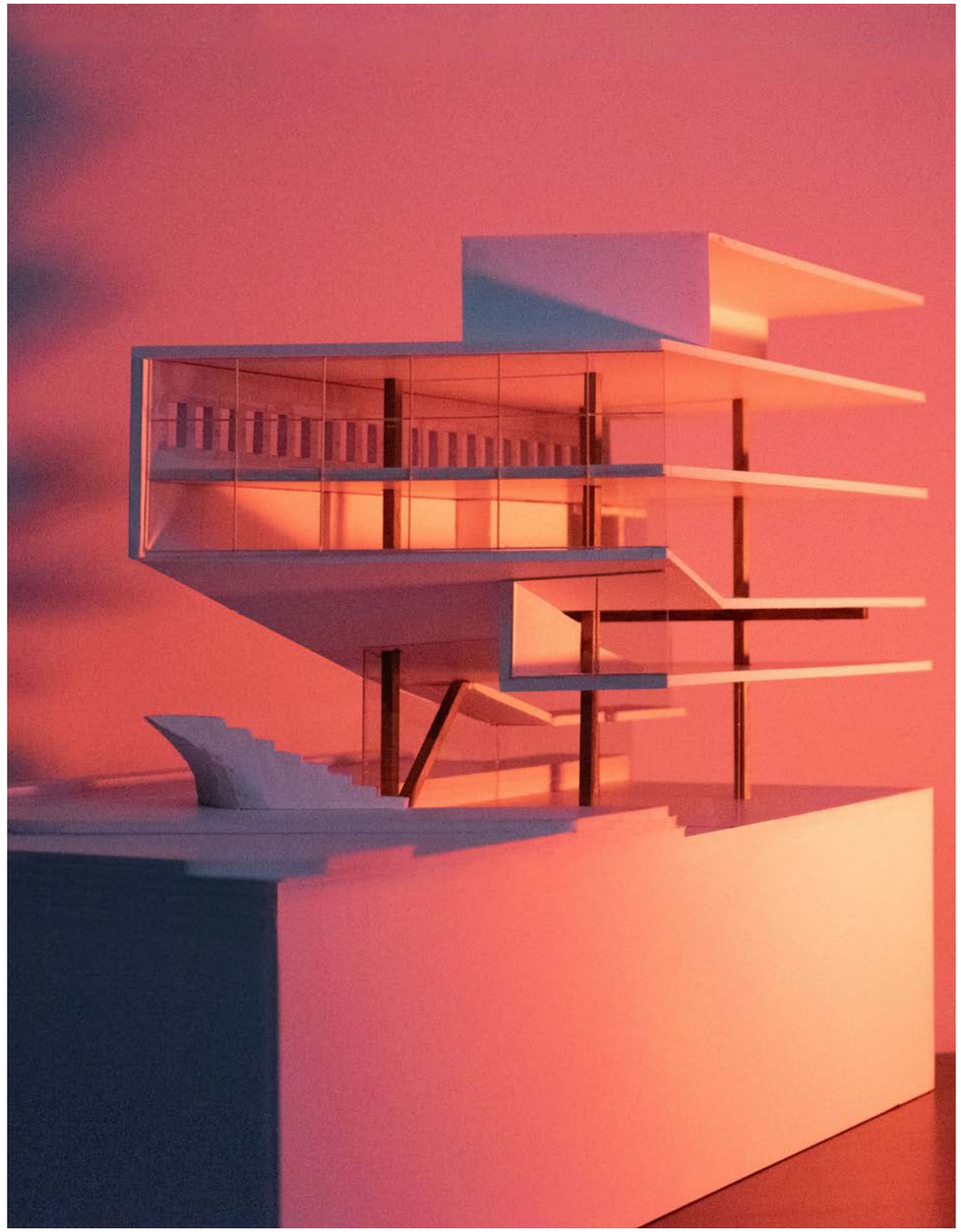


5” x 3” Exploration Sketches for ADR II

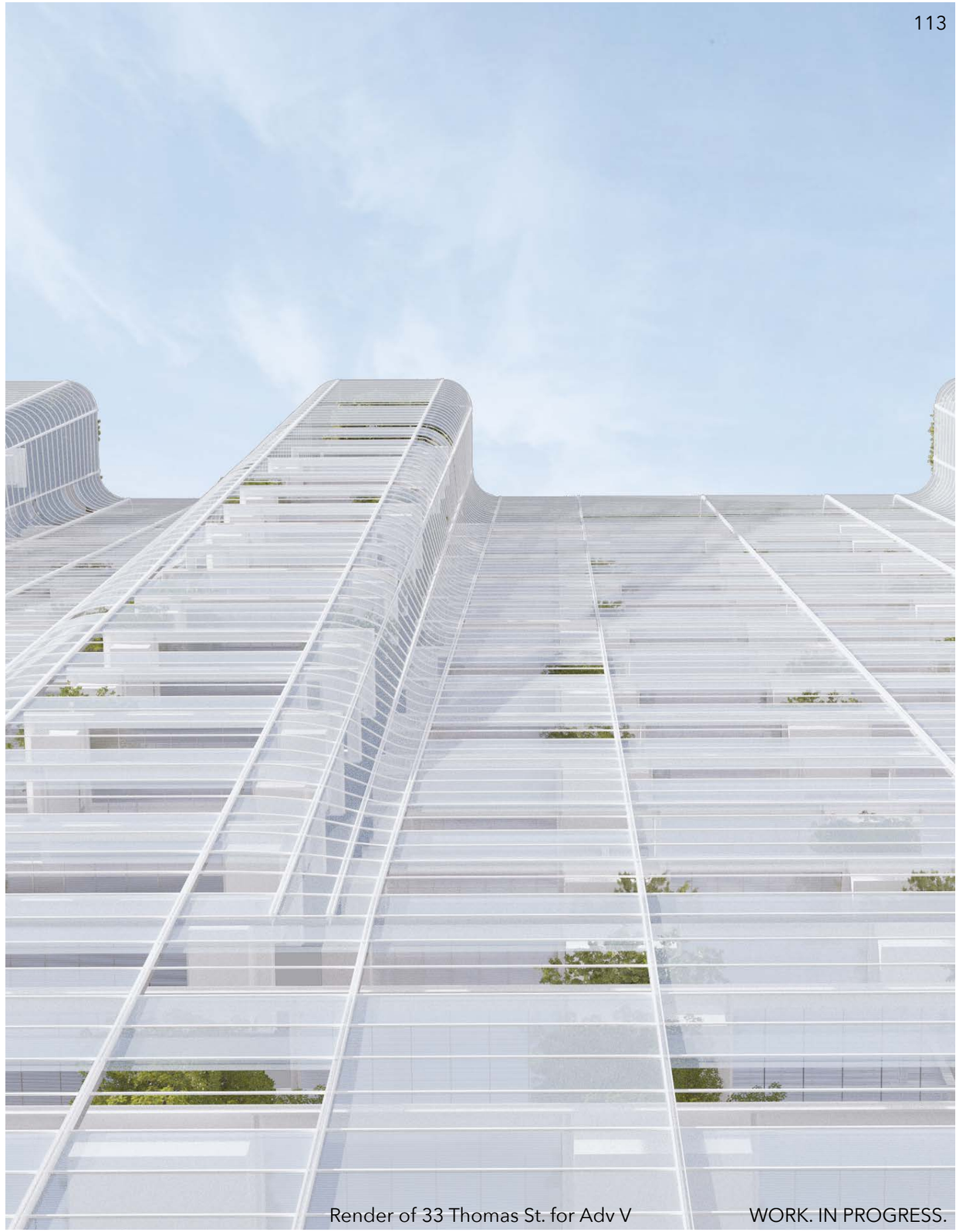


Corner Typologies in West Harlem for Core I

Model Photograph for a Culinary Institute in West Harlem for Core I

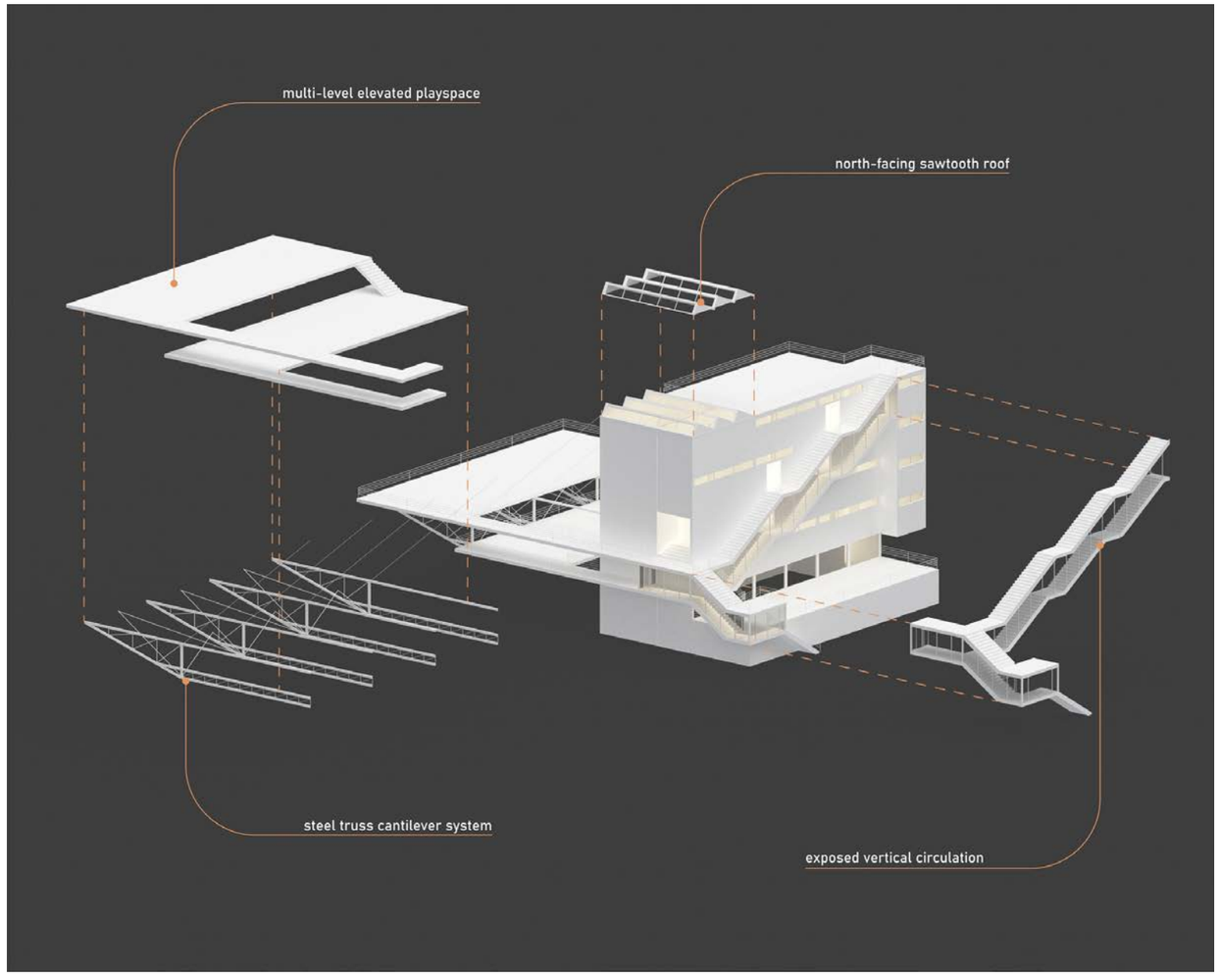


Model of DS+R's Alice Tully Hall for ADR I

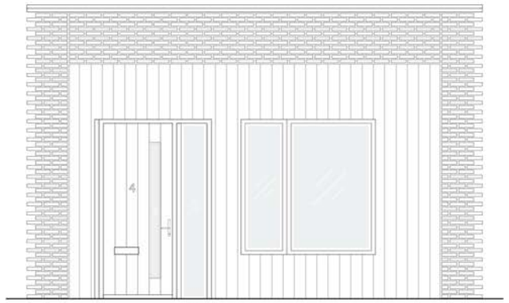


Render of 33 Thomas St. for Adv V

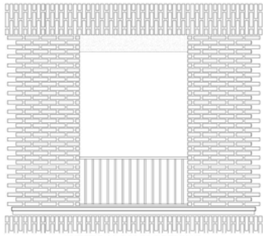
Classroom Render for Core II



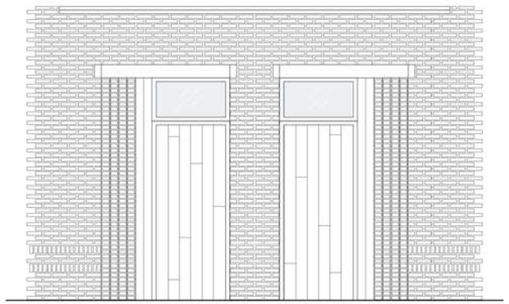
Exploded Axonometric of Hannes Meyer's Petersschule for Core II



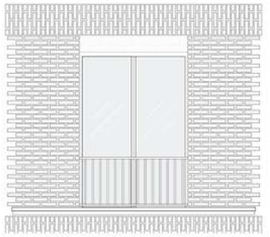
SINGLE RESIDENCE ENTRY



WEST BALCONY OPENING

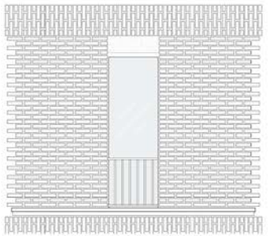


DOUBLE RESIDENCE ENTRY



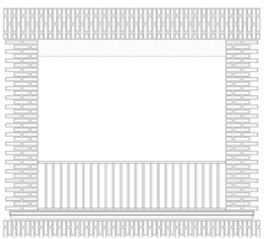
WEST JULIET BALCONY OPENING

STOREFRONT ENTRY



SOUTH WINDOW OPENING

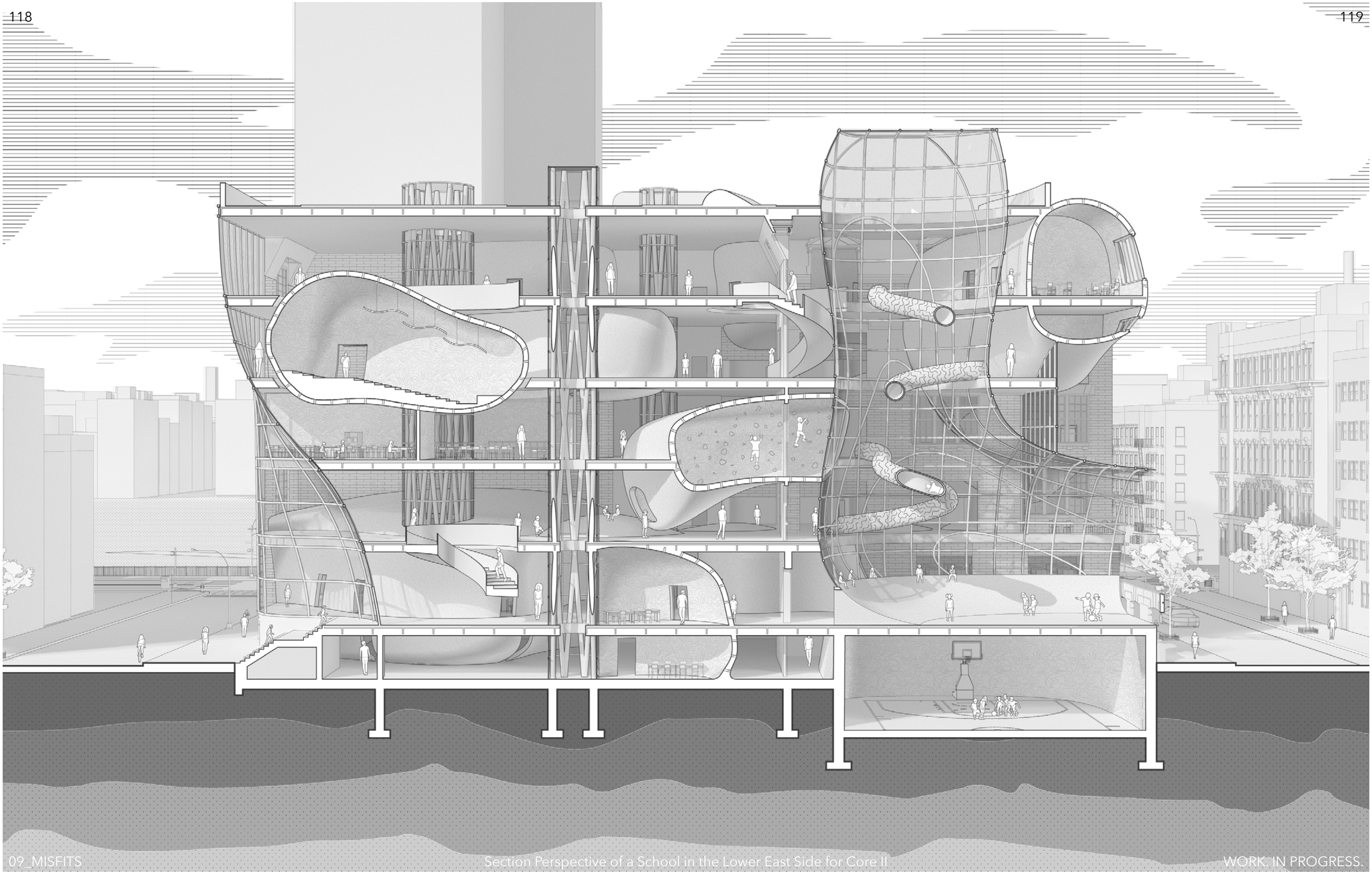
COMMON LOBBY ENTRY



SOUTH BALCONY OPENING

Kings Crescent Section Model for Core III

Kings Crescent Taxonomy of Thresholds for Core III



Section Perspective of a School in the Lower East Side for Core II

WORK.

IN PROGRESS.

WORK.

IN PROGRESS.

A PORTFOLIO BY SAMUEL BAGER.

M. ARCH. COLUMBIA GSAPP.