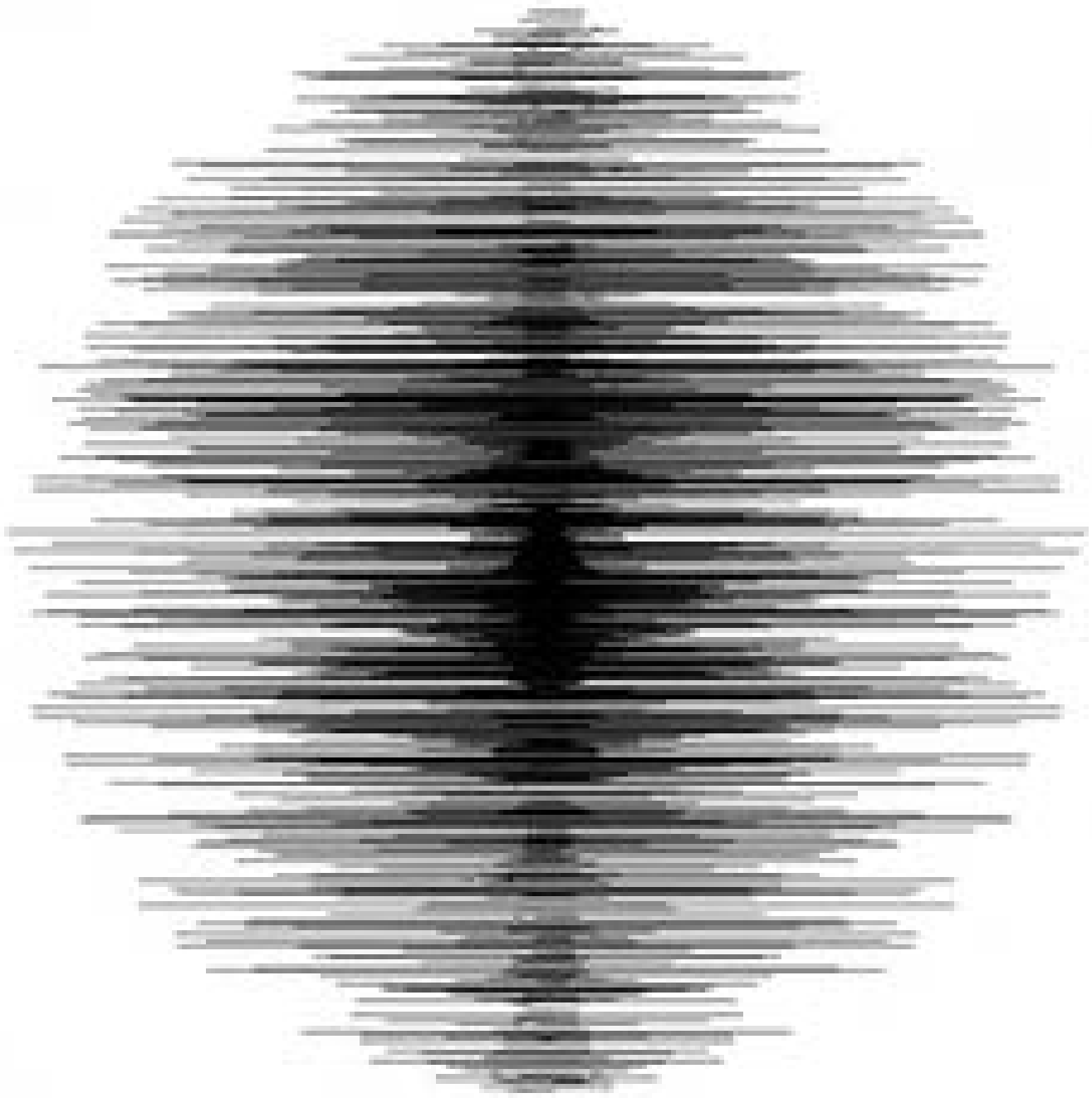

Graduate Architecture Portfolio

Selected works by

Maria Doku

Columbia University Master of Architecture

www.MariaDoku.com

My work explores the intersection of sustainability, systems thinking, and social impact through architecture. This portfolio highlights projects that combine research, design, and environmental awareness to create thoughtful, adaptable, and context-responsive spaces. Each project reflects a commitment to designing with intention and curiosity across scales and disciplines.

Maria Doku
Columbia University M.Arch

Maria Doku

Master of Architecture at Columbia GSAPP

Selected Works

02 - 05 Documenting the Massena Border Station
ADR I: Andrea Chiney

06 - 07 Greenpoint School in Collaboration with Alexandra Zhao
Designing Spaces for Children: Anna Knoell

08 - 09 Columbia Center for Spatial Research
Professor: Laura Kurgan

10 - 13 Speculative Archaeology in Collaboration with Rilka Li
Advanced IV Studio: Nahyun Hwang

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Documenting the Massena Border Station: Architectural Drawing & Representation I QGIS

As part of my Architectural Drawing and Representation I course, I conducted a detailed visual and spatial analysis of the Massena U.S. Border Station, designed by Smith-Miller + Hawkinson Architects and completed in 2004. This project focused on unpacking the architectural logic and symbolic weight of a civic building situated at the edge of national territory—where issues of identity, control, and movement are made spatially explicit.

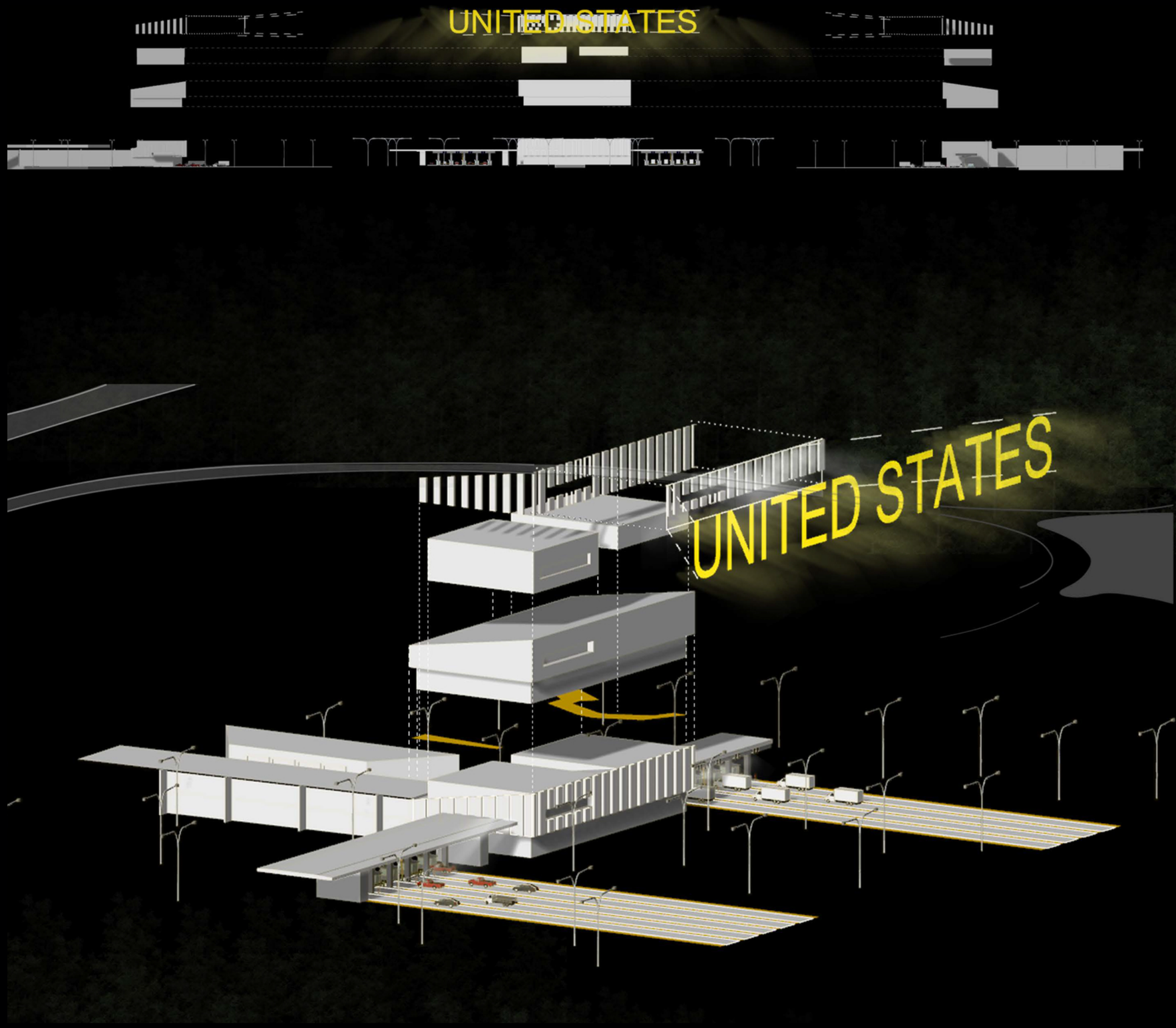
The study involved producing a series of measured and interpretive drawings, including plans, sections, axonometric projections, and analytical diagrams. Through these, I explored how the building organizes its program across zones of surveillance, inspection, and circulation—using spatial hierarchy and material transitions to delineate degrees of access and authority. Particular attention was given to the role of transparency and opacity in shaping visibility, and to the tectonic expression of materials such as steel, concrete, and glass in relation to the building's institutional function.

By drawing through orthographic projection and exploded axonometric formats, I examined how architecture can choreograph movement, frame views, and express the tension between openness and control. The process of redrawing and reinterpreting the building helped me understand how representational tools can uncover underlying design intentions and expose the social, political, and psychological dimensions of space.

This project reinforced my ability to use drawing as a critical method of inquiry—not only to communicate architecture but also to question and interpret it. Through the lens of the Massena Border Station, I developed a deeper appreciation for the ways in which architecture operates at the intersection of function, symbolism, and lived experience—particularly within infrastructures of state and civic authority.

Architectural Drawing and Representation I

Fall 2021 | Professor: Andrea Chiney


UNITED STATES
UNITED STATES

Greenpoint School: A Civic Anchor For Learning and Community

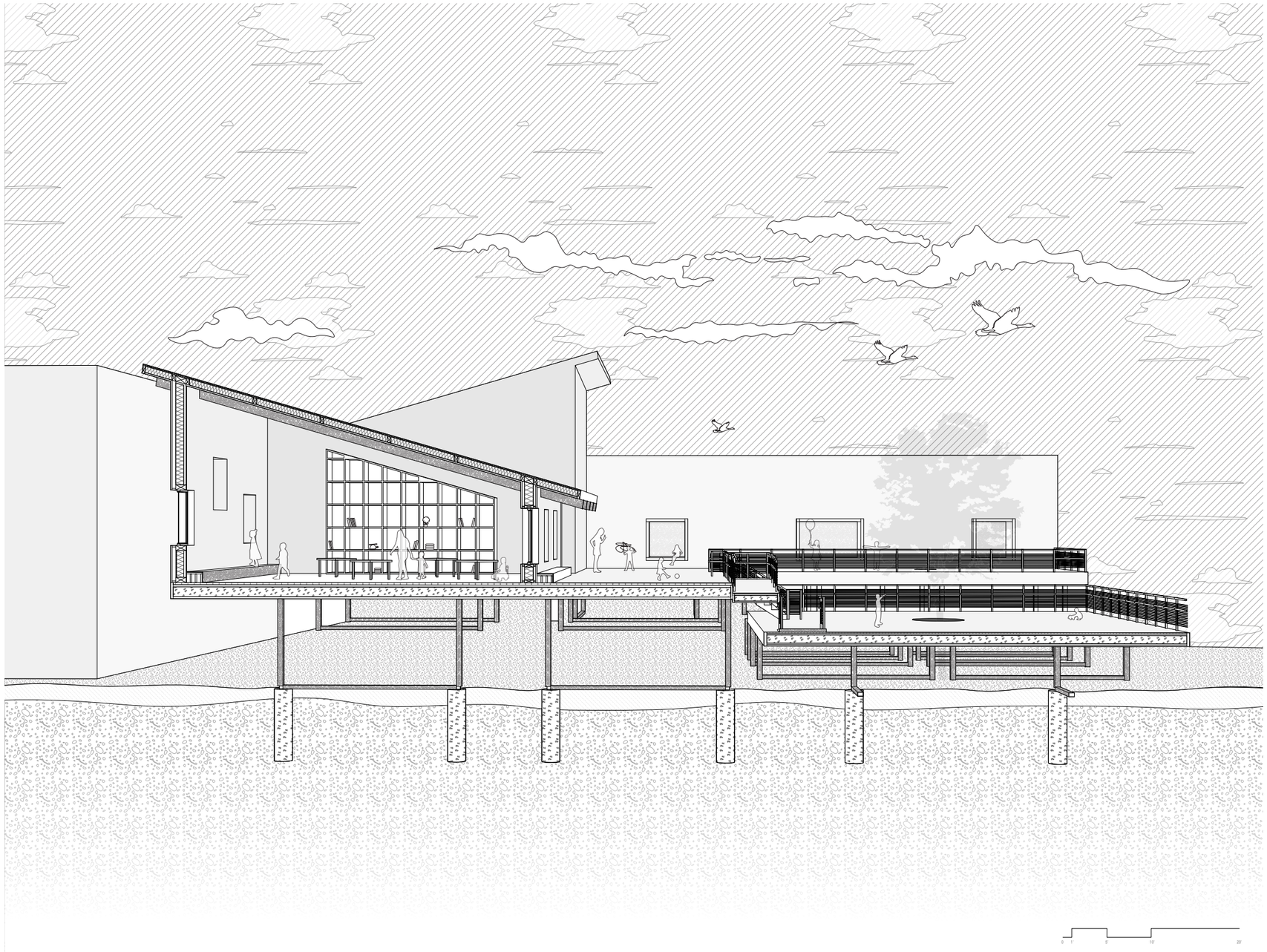
This project proposes a new public school located in Greenpoint, Brooklyn, designed to serve as both an educational institution and a civic gathering space within the neighborhood. Set within a dynamic urban context—where residential enclaves meet remnants of industrial infrastructure—the design reflects the dual character of its environment: robust and adaptable, yet welcoming and responsive to the needs of young learners and their communities.

The school is organized in sectional bands that alternate between academic and communal programs. Classrooms and laboratories are layered with shared spaces such as libraries, dining areas, and recreational zones, promoting interaction across age groups and disciplines. Breakout spaces punctuate the circulation zones, allowing for informal learning, collaborative work, or quiet retreat. These are framed by operable partitions, giving students and teachers the ability to shape their environment to suit changing activities and pedagogical needs.

Central to the spatial organization are four vertical lattice columns that act as light wells and circulation anchors. Two of these shafts house spiral staircases, encouraging fluid movement between floors, while all four introduce natural light deep into the building's floor plates. These cores not only support the structure but also serve as symbolic and spatial centers—orienting users and framing moments of openness and connection throughout the school.

Materially, the building balances solidity and lightness. A durable exterior skin responds to the site's industrial heritage, while transparent and operable facades at the street level invite public engagement. The ground floor opens to the sidewalk and the adjacent park, functioning as an open lobby, gallery, and event space. This threshold blurs the boundary between school and city, encouraging the local community to participate in school life beyond formal instruction.

The Greenpoint School explores how architecture can support not just learning, but belonging. It aims to create a place where students are both nurtured and empowered, and where education becomes part of a larger civic and spatial dialogue.



In Collaboration with Alexandra Zhao

Designing Spaces for Children | Professor: Anna Knoell

Mapping Social and Environmental Risk in NYC with QGIS

This project employed QGIS to visualize the intersection of demographic and environmental risk across New York City, using data from the U.S. Census Bureau and NYC Open Data. The goal was to uncover spatial relationships between racial population patterns and climate vulnerability, informing a broader conversation around equity and resilience in the urban fabric.

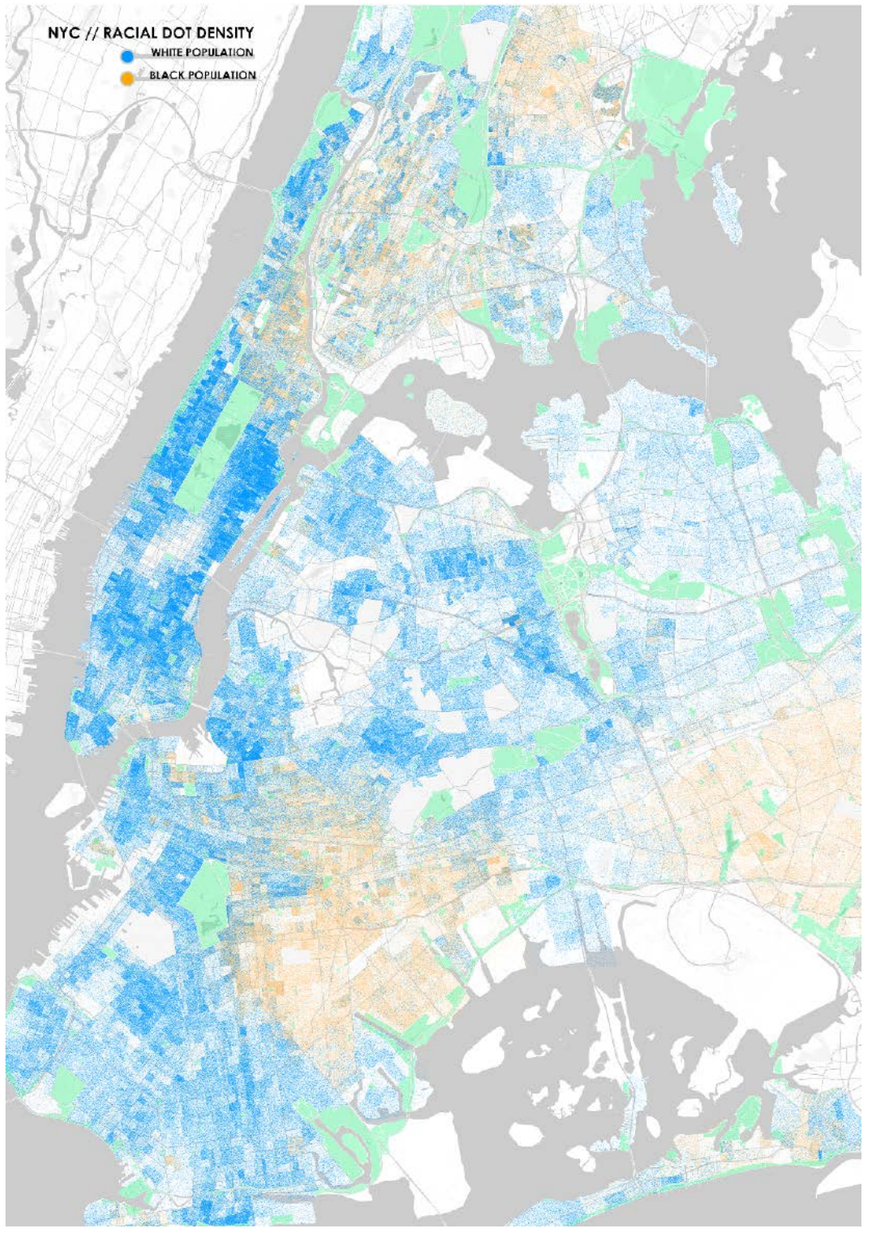
The first map visualizes the geographic clustering of Black and White populations across the five boroughs, using 2020 Census data at the census tract level. By applying choropleth and dot density techniques, the map highlights persistent patterns of residential segregation and demographic concentration—particularly in neighborhoods shaped by historical zoning, redlining, and housing policy.

The second map overlays FEMA-designated moderate and high-risk flood zones with urban infrastructure and housing density. This visualization reveals how areas with elevated flood risk often coincide with communities that may also experience social vulnerability. By cross-referencing population data with environmental hazard zones, the map raises critical questions about urban planning, emergency preparedness, and the equitable distribution of risk mitigation efforts.

Together, these maps illustrate how geospatial analysis can support a more nuanced understanding of urban inequities—where social and environmental factors often compound. The project demonstrates my ability to synthesize large-scale datasets into clear, actionable visual narratives that inform architectural research, site analysis, and design priorities.

Columbia Center for Spatial Research Asssistant

Professor: Laura Kurgan



Speculative Archaeology – Unearthing and Repairing the Urban Ground in Newburgh, NY

This project investigates how architecture can engage in acts of careful repair by responding to the overlooked and fragmented histories embedded in the urban ground. Located in Newburgh, New York—a city shaped by post-industrial transitions and mid-20th-century urban renewal policies—the site was once a densely inhabited residential neighborhood. During the 1960s and 70s, it was subject to large-scale demolition under federally funded redevelopment programs. Like many cities across the country, Newburgh saw entire communities displaced, with few of the promised reinvestments materializing.

Today, the site bears the physical traces of this incomplete erasure: half-buried brick walls, abandoned stairwells and basements, severed utility lines, and residual topographies left behind by vanished homes. These remnants, though subtle, form a tactile archive of memory and loss. Rather than viewing the site as a blank slate, this project asks how architecture might treat the ground as a witness—an active repository of lived experience.

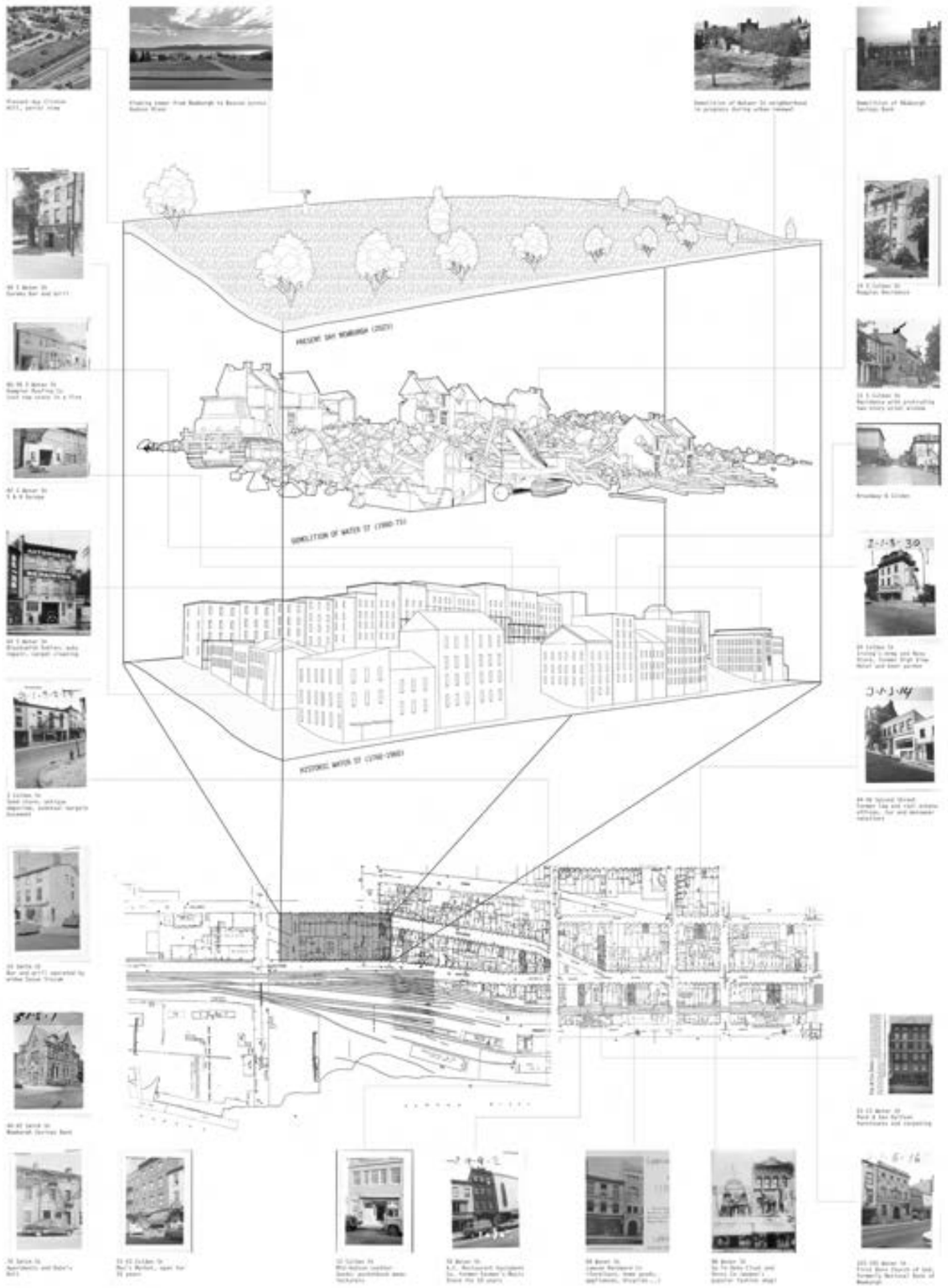
Through a combination of mapping, field documentation, and material study, the project explores how architectural intervention can reveal, rather than replace, what remains. The proposed design introduces a series of light-touch elements—raised platforms, skeletal pavilions, and framed voids—that respond directly to the site's existing conditions. These insertions mark and amplify what was once there, offering spatial cues for reflection, encounter, and quiet reengagement. The design invites movement through and around former thresholds, asking visitors to walk the footprints of the past while imagining new futures.

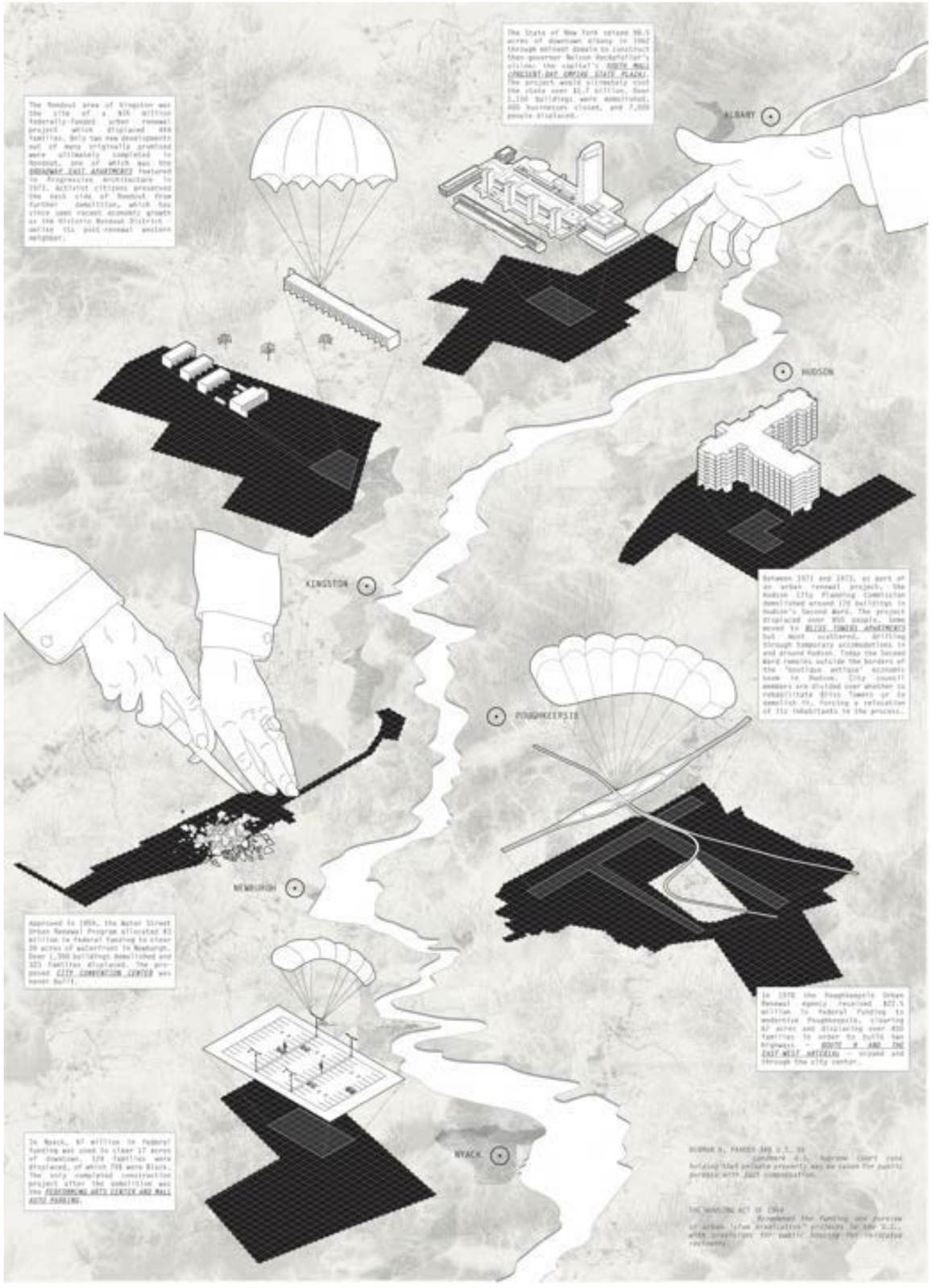
At the same time, the project is deeply rooted in the present-day context of Newburgh. While the city faces significant economic and environmental challenges—including high rates of poverty and increasing flood risk—it is also home to vibrant grassroots organizations, mutual aid networks, and a rising generation invested in community-led change. The interventions proposed here are intentionally small in scale but cumulative in impact, encouraging adaptable, phased transformation rather than top-down redevelopment.

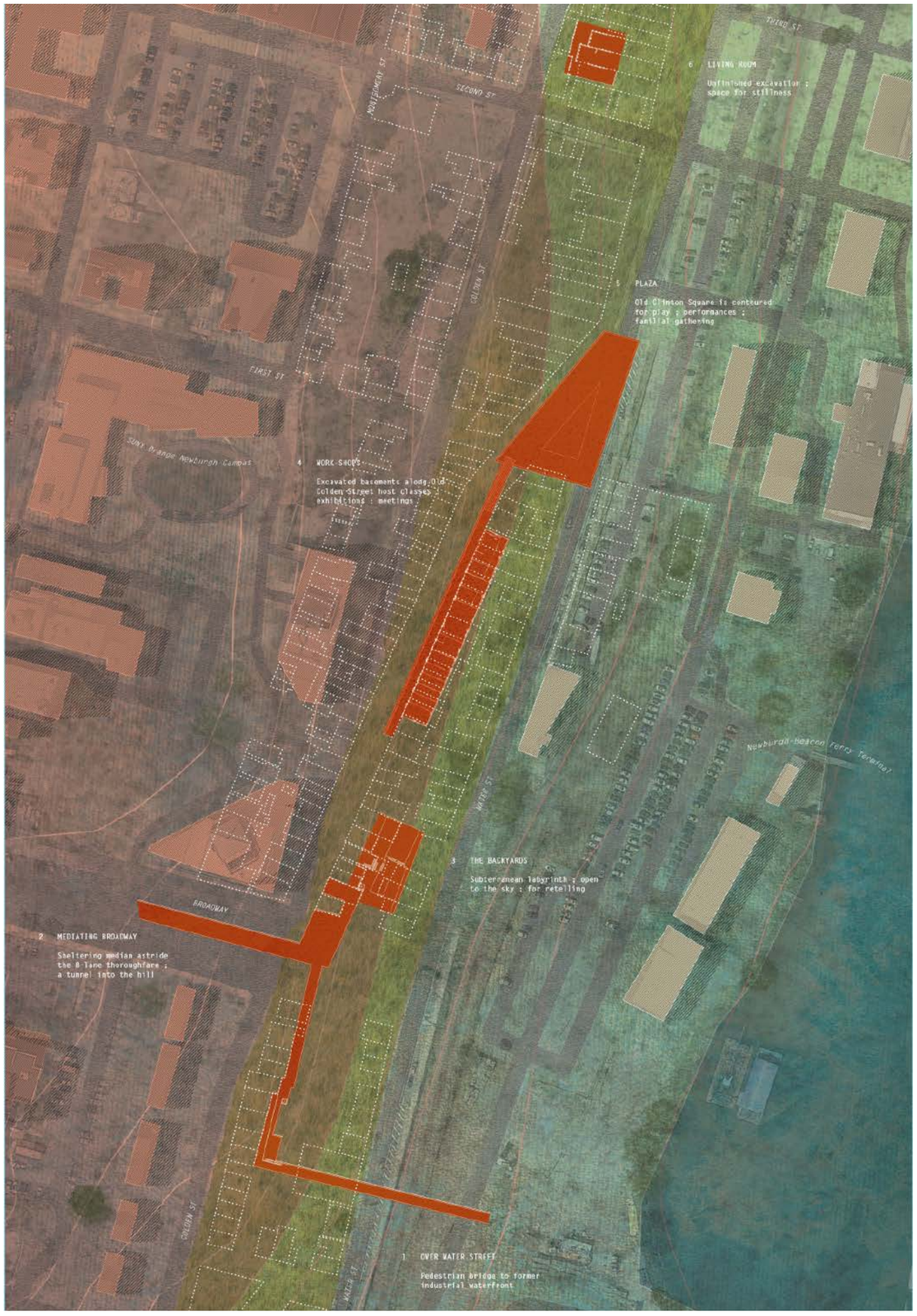
Ultimately, Speculative Archaeology proposes an alternative approach to urban design—one that prioritizes memory, care, and continuity over erasure and replacement. It frames architecture not as a solution to history, but as a means of listening to it—of marking what was, acknowledging what remains, and making space for what could be.

In Collaboration with Rilka Li

Advanced IV Studio | Spring 2023 | Professor: Nahyun Hwang




The Rondout area of Kingston was the site of a $35 million federally-funded urban renewal project which displaced 456 families. Only two new developments out of many originally promised were ultimately completed in Rondout, one of which was the BROADWAY EAST APARTMENTS featured in Progressive Architecture in 1971. Activist citizens preserved the east side of Rondout from further demolition, which has since seen recent economic growth as the Historic Rondout District unlike its post-renewal western neighbor.
The State of New York seized 98.5 acres of downtown Albany in 1962 through eminent domain to construct then-governor Nelson Rockefeller's vision the capital's EMPIRE MALL (ANCIENT DAY EMPIRE STATE PLAZA). The project would ultimately cost the state over $1.7 billion. Over 1,150 buildings were demolished, 4000 businesses closed, and 7,000 people displaced.
ALBANY
HUDSON
KINGSTON
POUGHKEEPSIE
NEWBURGH
NYACK
Between 1971 and 1973, as part of an urban renewal project, the Hudson City Planning Commission demolished around 170 buildings in Hudson's Second Ward. The project displaced over 850 people, some moved to MILOS TOWERS APARTMENTS but most scattered, settling through temporary accommodations in and around Hudson. Today the Second Ward remains outside the borders of the "boutique antique" economic zone in Hudson. City council members are divided over whether to rehabilitate Milos Towers or to demolish it, forcing a relocation of its inhabitants in the process.
Approved in 1958, the Water Street Urban Renewal Program allocated $3 million in federal funding to clear 36 acres of waterfront in Newburgh. Over 1,300 buildings demolished and 323 families displaced. The proposed CITY CONVENTION CENTER was never built.
In 1970 the Poughkeepsie Urban Renewal Agency received $22.5 million in federal funding to modernize Poughkeepsie, clearing 67 acres and displacing over 850 families in order to build two highways - ROUTE 9 AND THE EAST WEST MATRIXES - around and through the city center.
In Nyack, $7 million in federal funding was used to clear 17 acres of downtown. 174 families were displaced, of which 75% were Black. The only completed construction project after the demolition was the PERFORMING ARTS CENTER AND MALL AUTO PARKING.


THIRD ST
SECOND ST
MONTGOMERY ST
FIRST ST
SUNY Orange Newburgh Campus
6 LIVING ROOM
Unfinished excavation ; space for stillness
5 PLAZA
Old Clinton Square is contoured for play ; performances ; familial gathering
4 WORK SHOPS
Excavated basements along Old Colden Street host classes ; exhibitions ; meetings
COLDEN ST
3 THE BACKYARDS
Subterranean labyrinth ; open to the sky ; for retelling
BROADWAY
2 MEDIATING BROADWAY
Sheltering median astride the 8-lane thoroughfare ; a tunnel into the hill
WATER ST
1 OVER WATER STREET
Pedestrian bridge to former industrial waterfront
Newburgh-Beacon Ferry Terminal

Atrium Negotiation – Intergenerational Social Housing in Mott Haven

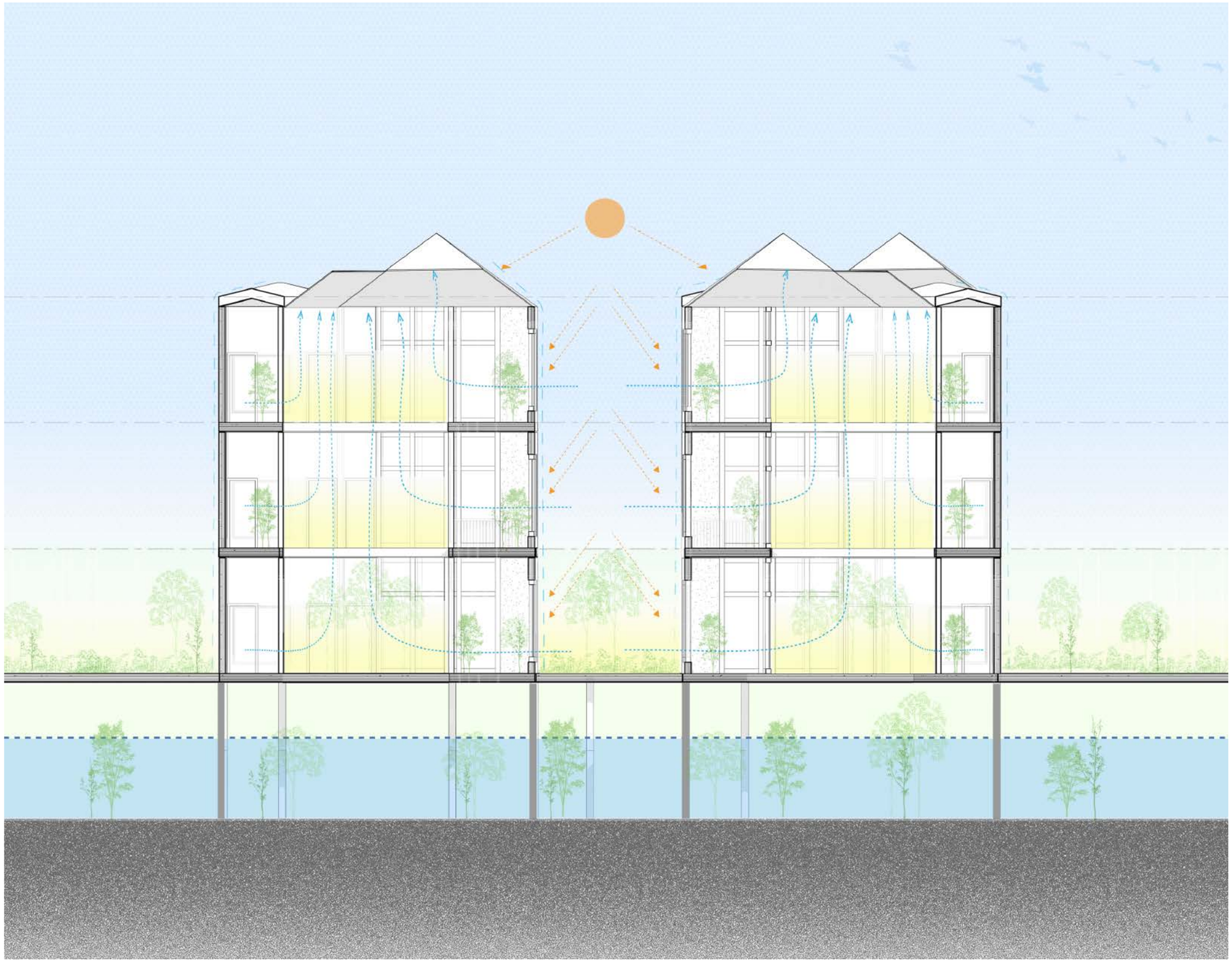
Located in the flood-prone neighborhood of Mott Haven, New York, this intergenerational social housing project responds to the environmental, spatial, and social complexities of its context. Elevated on a system of structural stilts, the architecture addresses the increasing risk of flooding due to climate change while reimagining the urban ground as a shared, multifunctional zone. The raised housing volumes not only ensure long-term resilience and safety for residents but also liberate the ground plane—creating open-air spaces that support circulation, communal gathering, gardening, and potential future programming.

The project is organized around a series of communal atriums—semi-enclosed vertical voids that act as both social condensers and environmental moderators. These shared spaces are punctuated with vegetation and light wells, encouraging informal interaction among residents across generations and family structures. In this way, the atrium becomes a negotiated living space: part garden, part street, part room—mediating between private dwellings and the broader community fabric.

The housing units themselves are designed with flexibility and dignity in mind. Compact and efficient, each unit includes adaptable layouts and multi-functional furniture systems that allow spaces to transform depending on changing household needs. Bedrooms can convert into workspaces, living rooms can expand for social gatherings, and partition elements create varying degrees of privacy—all supporting both long-term stability and short-term accommodation for guests or caretakers.

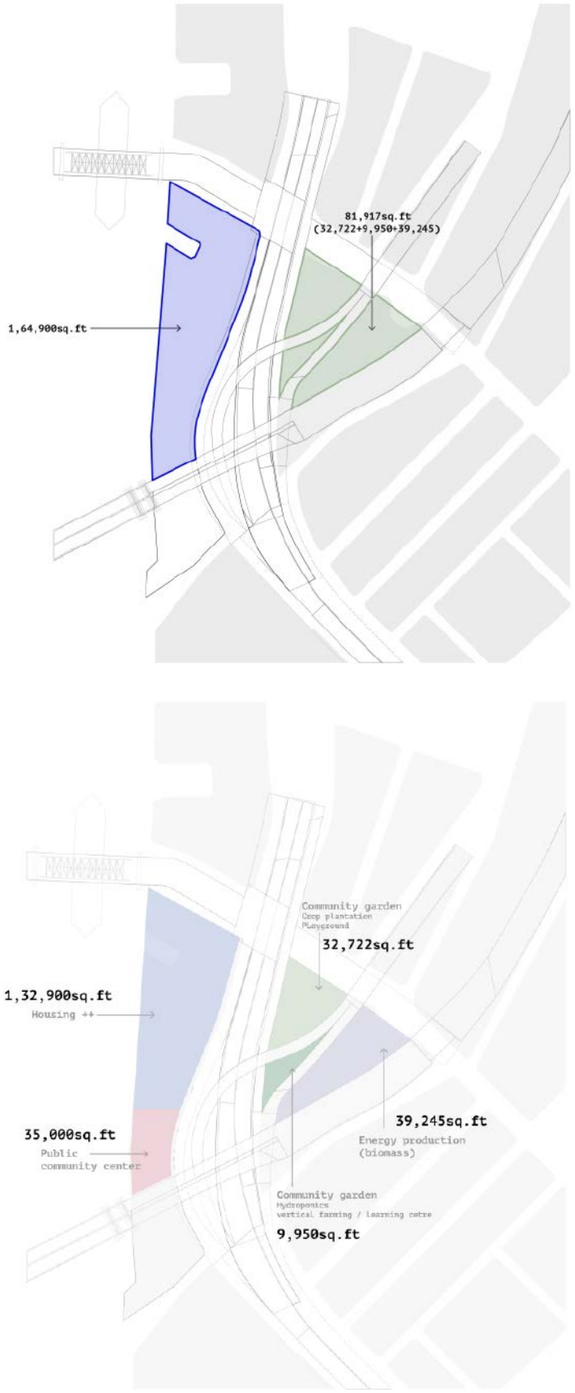
This flexibility extends to the social logic of the project. Units are grouped to support varying household sizes and forms, from single adults to multigenerational families, encouraging a spectrum of interdependence. Shared balconies, clustered entries, and visibility across the atrium promote casual encounter without sacrificing personal boundaries.

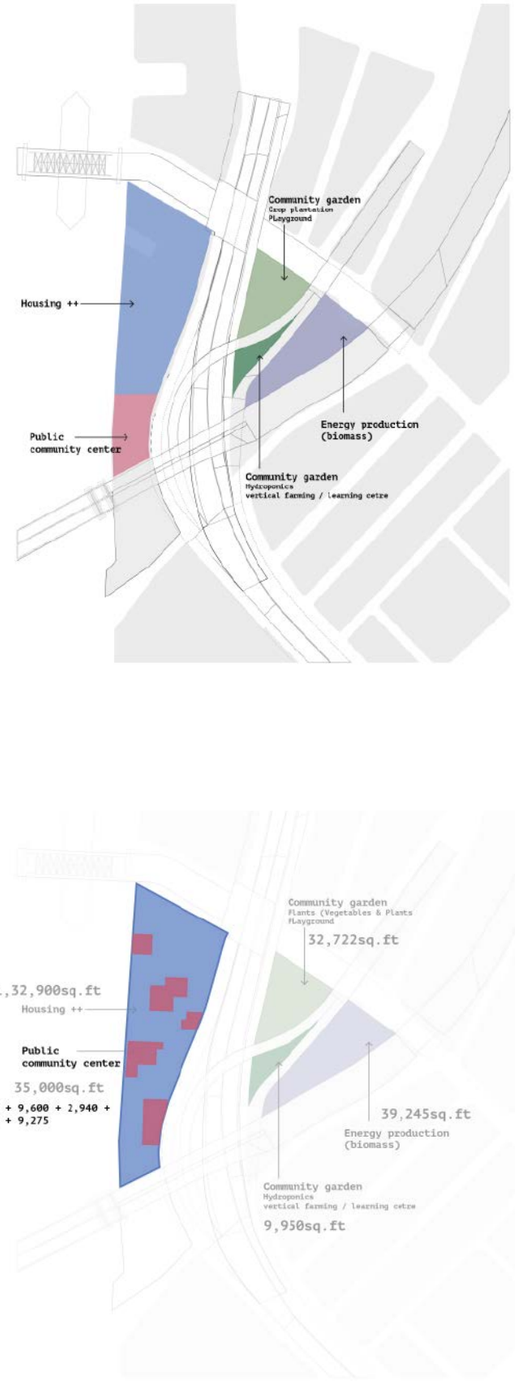
By addressing environmental risk, spatial adaptability, and social inclusion in tandem, the project proposes a model for future urban housing that is resilient, relational, and rooted in care. In Mott Haven—a neighborhood shaped by infrastructural neglect and cultural strength—this design acts not only as shelter but as a framework for shared life and community possibility.



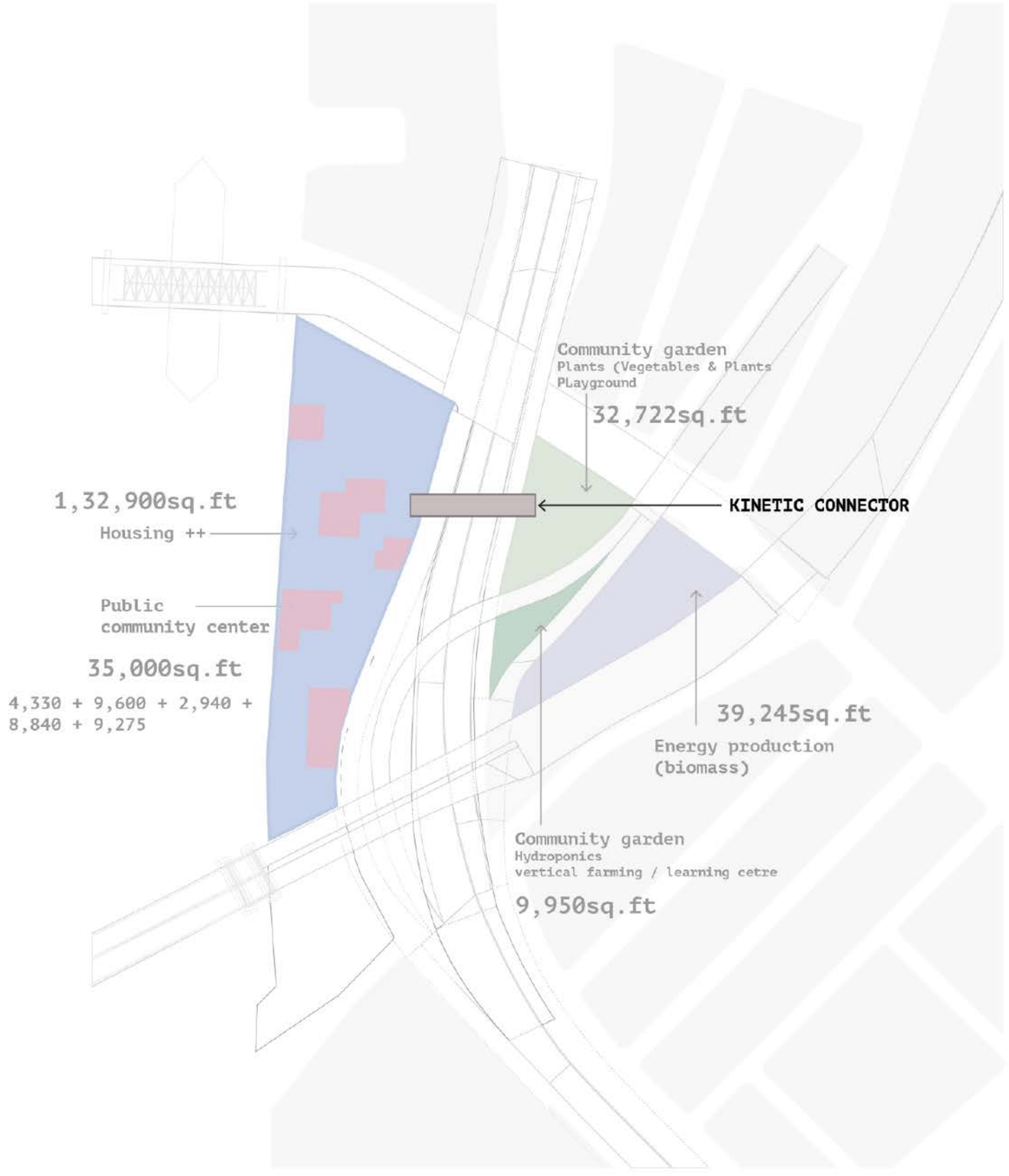
In Collaboration with Maithili Jain

Core Studio III | Fall 2022 | Professor: Gary Bates

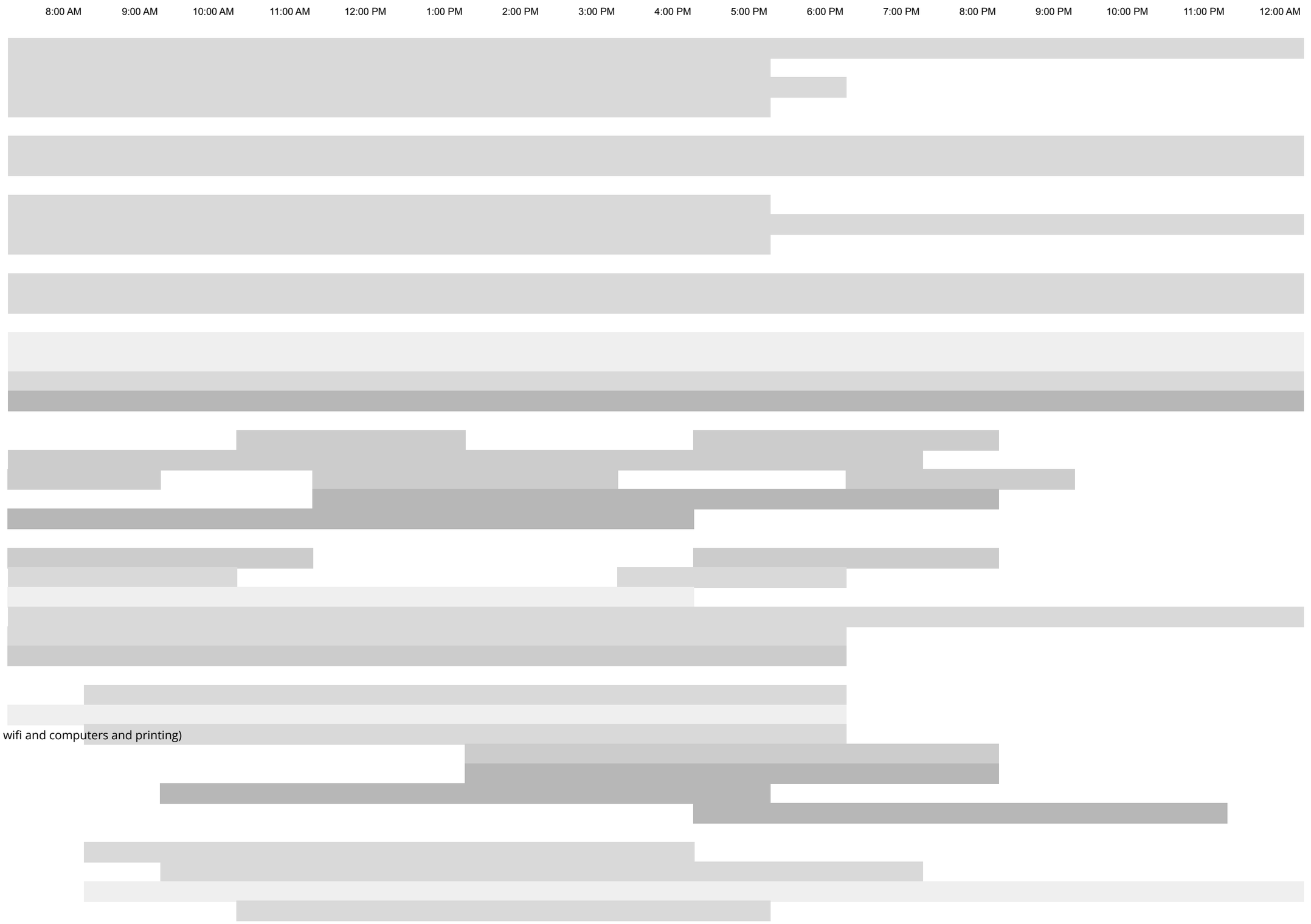




Integrating HOUSING ++ and
the PUBLIC COMMUNITY CENTER



Integrating HOUSING ++ and
the PUBLIC COMMUNITY CENTER


8:00 AM
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5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
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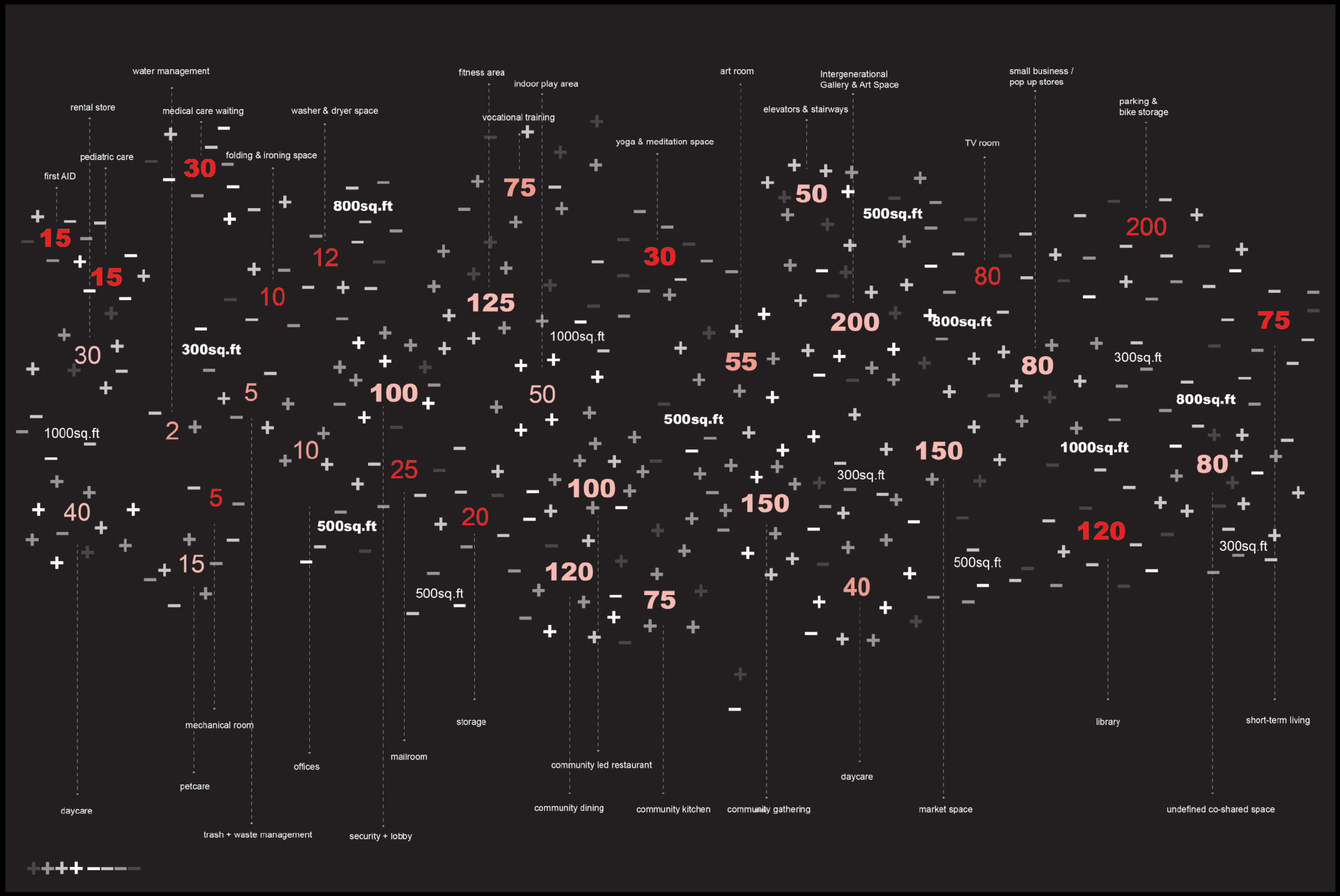
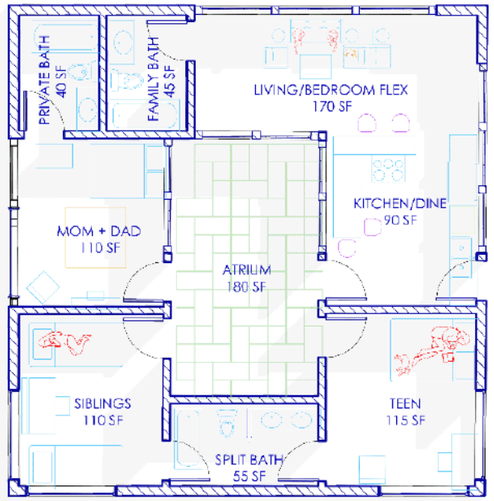
12:00 AM
Lobby
Security Desk / Reception / Entry
Offices
Storage
Mailroom
Core
Elevators
Stairways
Services
Trash / waste recycling
Water management
Mechanical Room
Laundry
Washers & Dryers
Folding & Ironing Space
Units
Micro-units
Studios
1 BR
Shared family units
Kitchen & Dining
Community Kitchen
Community Garden / vertical garden
Commnity Dining Area
Community-led Restaurant
Market Space / Farmers market
Health
Fitness area / Gym
Yoga / meditation room
Mental Health Counselling Spaces
First AID facility
Pediatric Care
Medical care waiting area
Learning Spaces
Library / Reading Spaces
Quiet Spaces / rooms
Vocation Training + Lounge (access to wifi and computers and printing)
Art Room
Indoor play area
Community Gathering Space
TV Room (/projector room)
Community Supporting
Daycare centre
Pet centre
Short-term living Spaces
Furniture Rental + Thrift Shops

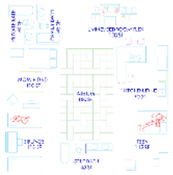


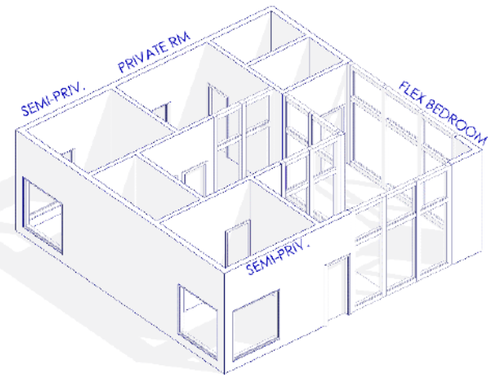
water management
rental store
medical care waiting
washer & dryer space
pediatric care
folding & ironing space
first AID
fitness area
indoor play area
vocational training
yoga & meditation space
art room
Intergenerational Gallery & Art Space
elevators & stairways
small business / pop up stores
parking & bike storage
TV room
800sq.ft
500sq.ft
300sq.ft
1000sq.ft
500sq.ft
300sq.ft
800sq.ft
1000sq.ft
300sq.ft
500sq.ft
500sq.ft
500sq.ft
300sq.ft
mechanical room
petcare
daycare
trash + waste management
offices
security + lobby
mailroom
storage
community dining
community led restaurant
community kitchen
community gathering
daycare
market space
library
undefined co-shared space
short-term living

UNIT TYPE No. 1

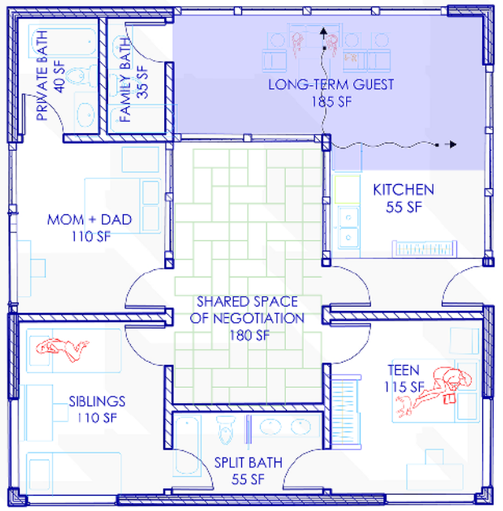
DUPLEX STYLE - TYPICAL FLOOR PLAN







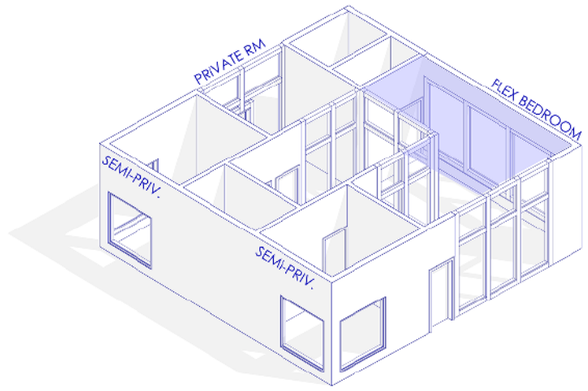
LONG-TERM GUEST CONFIGURATION



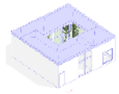
NEGOTIATION: LIVING/GUEST FLEX

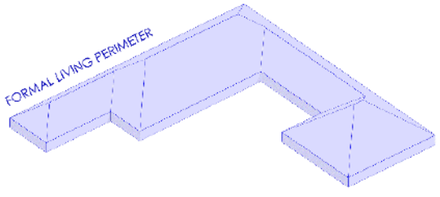
LONG-TERM GUEST STAYS WITH FAMILY

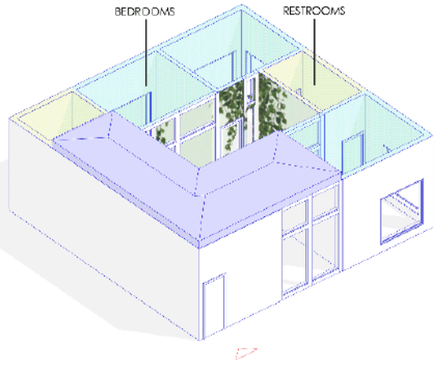
scenarios: grandparent(s) move-in,
adult child moves home
(shared for rent/tenant)



UNIT TYPE No. 1







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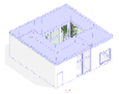
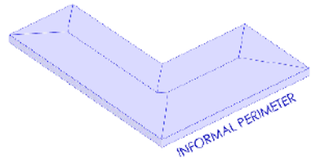
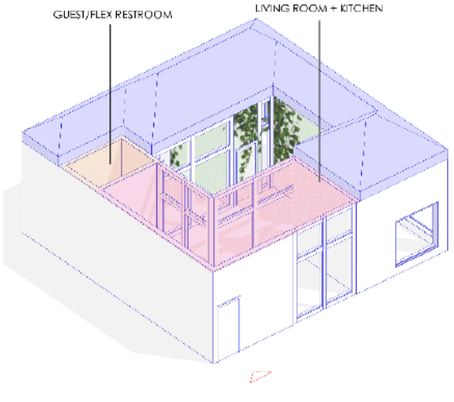
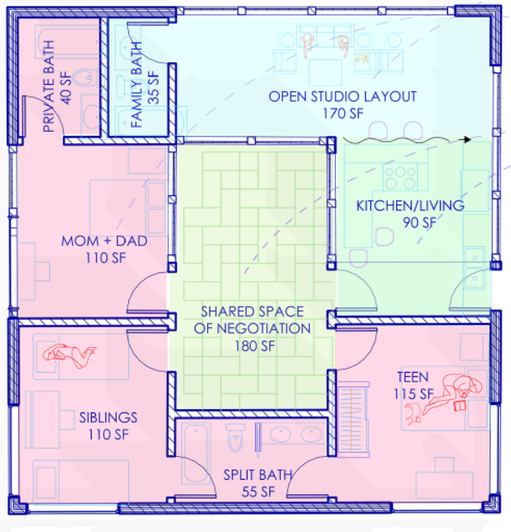


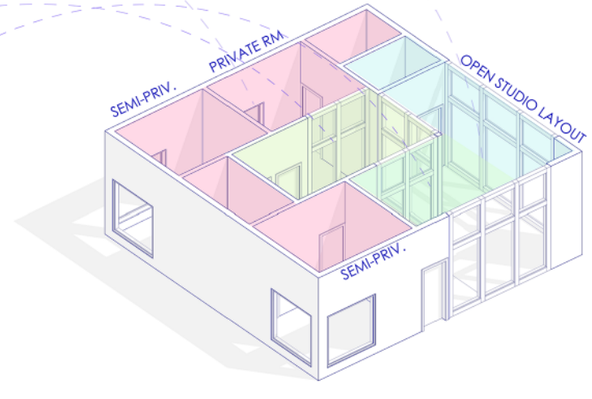




2 PERSONS / UNIT CONFIGURATION

USER 1: 205 SQ. FT., USER 2: 430 SQ. FT. , SHARED = 270 SQ. FT.





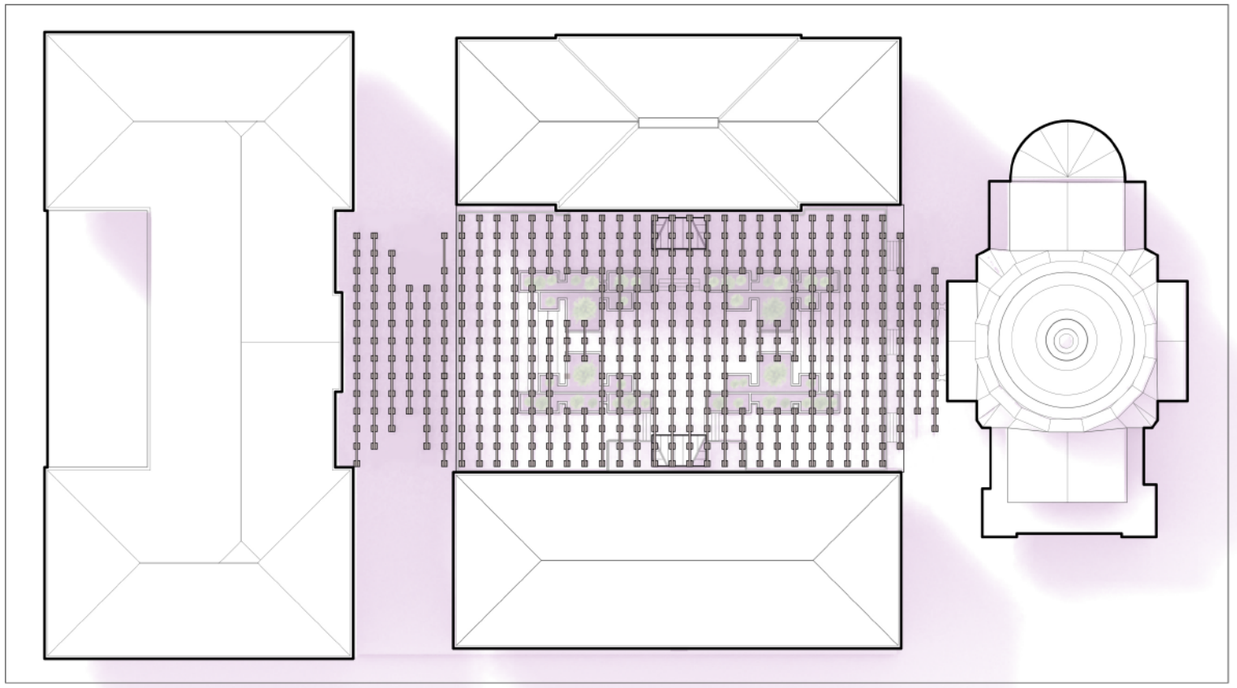
Family A
Family B
Family C
Public Activity
Family D
Family D
Public Activity
Stairway to public housing
Office
Reception
East 135th Street
Hudson River

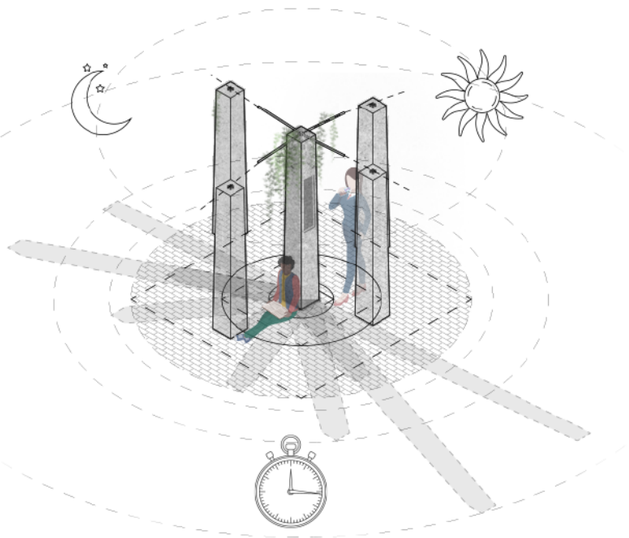
PACE

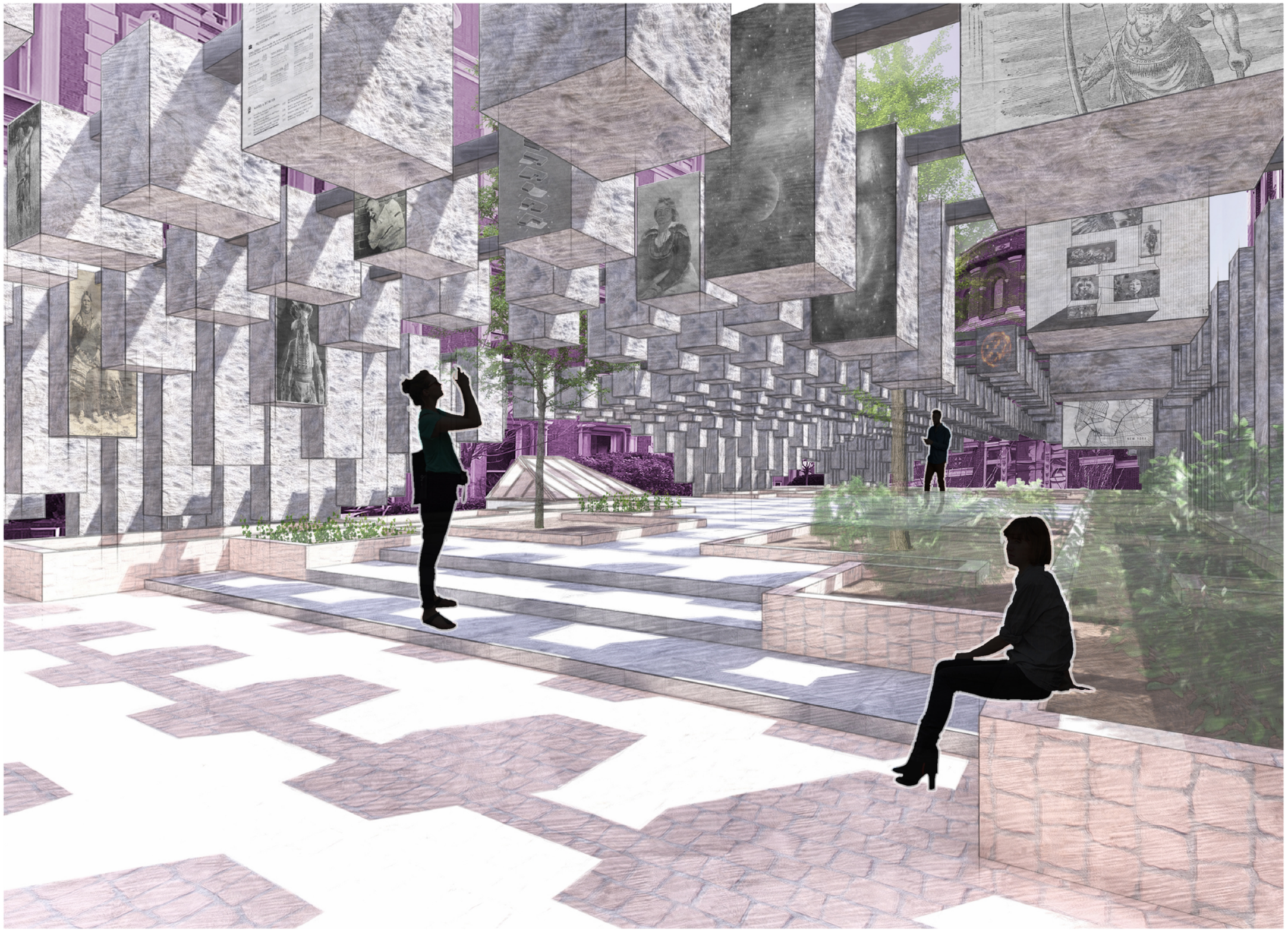
A destination transient in nature–designed for waiting, meeting, beginning, and ending one's journey–this pavilion structure serves as a key component to the connectivity of its surrounding spaces. Linking the activities of Avery to Fayerweather Hall, this pavilion makes use of suspended stone structures–held in place through a tensile support system. Varying in heights, these fragmented pieces of stone are hung above, expressing a geological dimension and reflection, gently guiding the user from space to space, evoking a sense of 'pace' through time. The form of the pavilion projects light and shadow interplay at the ground level, enriches the presence of the space, and it's an indicator of the passage of time as the pattern grows bigger and smaller.

With the possibility to be used interchangeably, the stone above may be shifted in place–allowing for a variety of program uses. A container for student and visitor activity, the pavilion not only serves as a backdrop to the existing flow of traffic or a resting point; this pavilion also serves the more formal roles of a student gallery and presentation space.

In Collaboration with Andrew Magnus. Luz Auyon, Kerol Kaskaviqi, Yusuf Urlu







Wildfire Information Landscape: Learning from the Burn

This project envisions a Wildfire Information Center as a landscape rather than a building—a place where children and families can move through stories of fire, recovery, and resilience embedded directly into the terrain. Located in the wake of the Dixie Fire in Northern California, the design engages with a scarred yet recovering environment, offering an immersive educational experience rooted in ecological cycles and collective memory.

The landscape is shaped by fire—its contours trace the path of destruction, its materials draw from both ash and regrowth. Trails wind through zones that represent stages of wildfire impact, from charred remnants to thriving regrowth areas. Along the way, learning nodes appear: shaded pavilions, interactive ground installations, and sculptural markers that offer scientific, cultural, and emotional context. These spaces use touch, sound, and play to engage children of various ages, transforming the site into an outdoor classroom alive with story and inquiry.

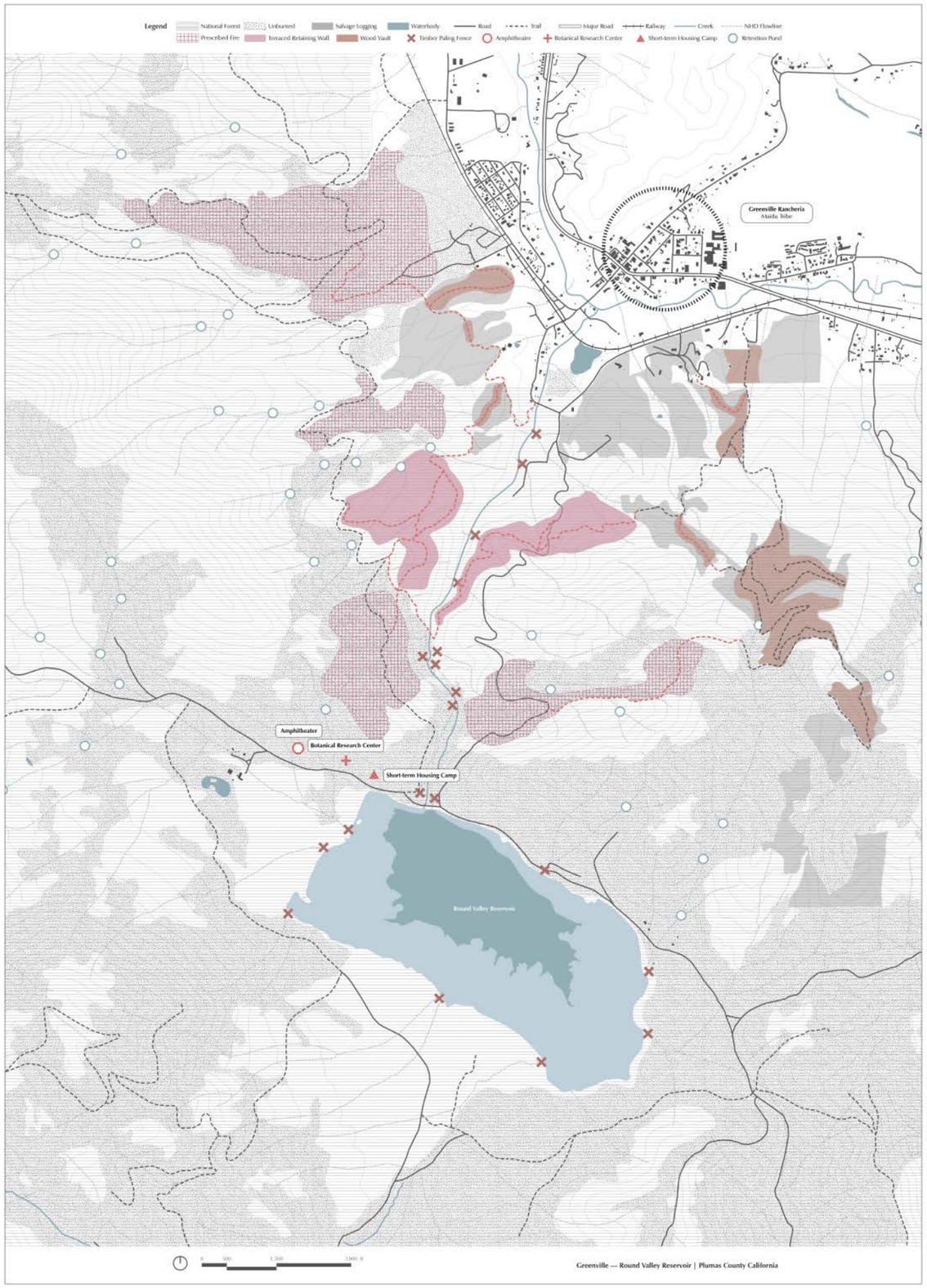
Rather than shielding visitors from the reality of fire, the landscape invites direct engagement. Native fire-adapted plantings demonstrate ecological succession and resilience. Biochar paths absorb carbon while referencing the burned past. Earthworks redirect runoff and slow erosion, modeling land stewardship techniques. The terrain is designed to be touched, climbed, planted, and observed—foregrounding the experience of recovery as a collaborative, physical act.

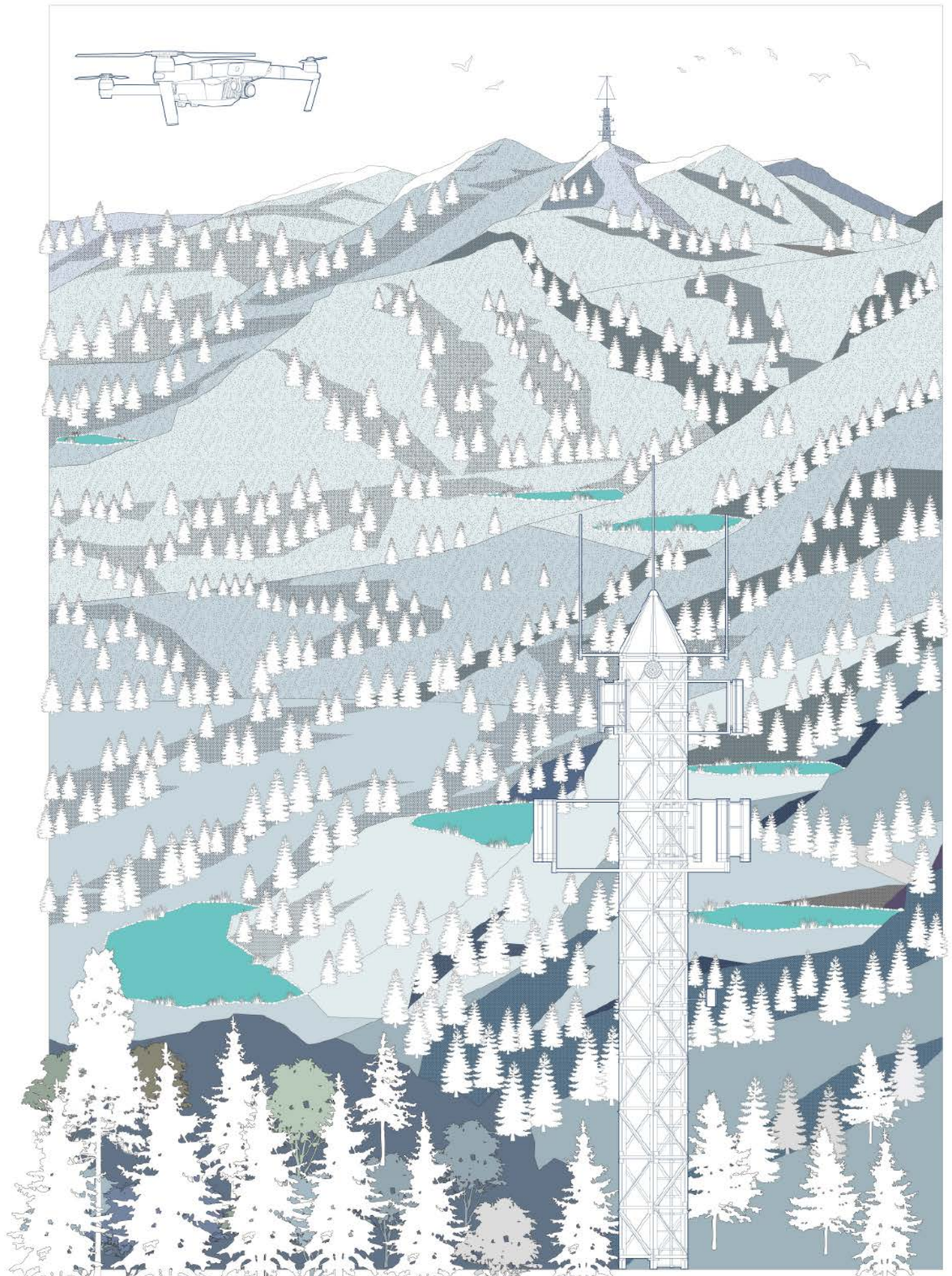
At its heart is a clearing—a flexible gathering space for workshops, storytelling, or community reflection. It serves not as a memorial but as a hopeful commons, centered on regeneration. Surrounding elements—such as lookout points, soil labs, and fire tower fragments—tie visitors back to the scale and scope of the Dixie Fire, encouraging both awe and understanding.

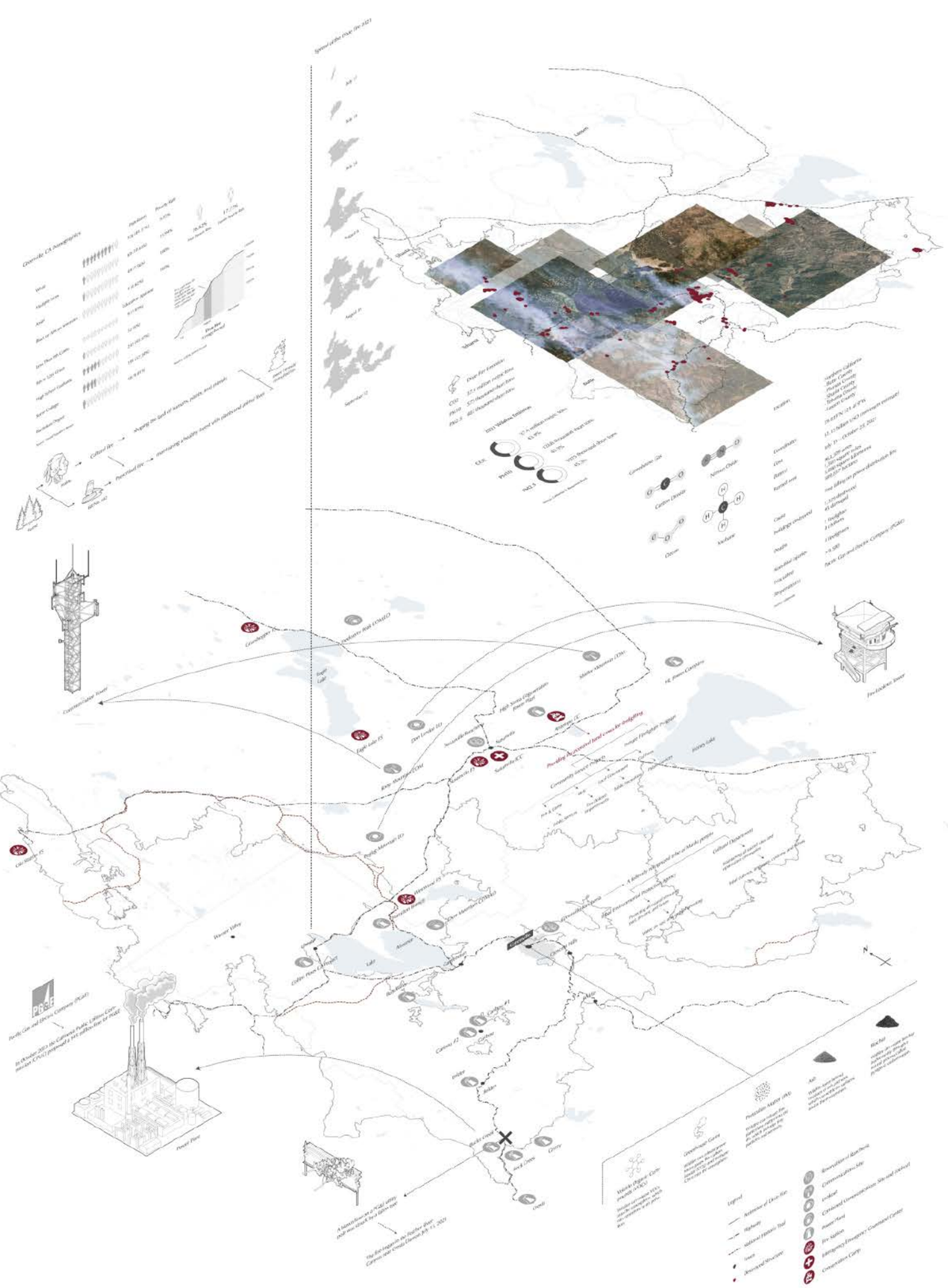
This is not a park in the traditional sense. It is a didactic terrain, a landscape that teaches. It merges interpretation with ecology, play with memory, and design with regeneration. The Wildfire Information Landscape invites us to inhabit the threshold between loss and growth, and to equip the next generation with the tools—and imagination—to live with fire, rather than in fear of it.

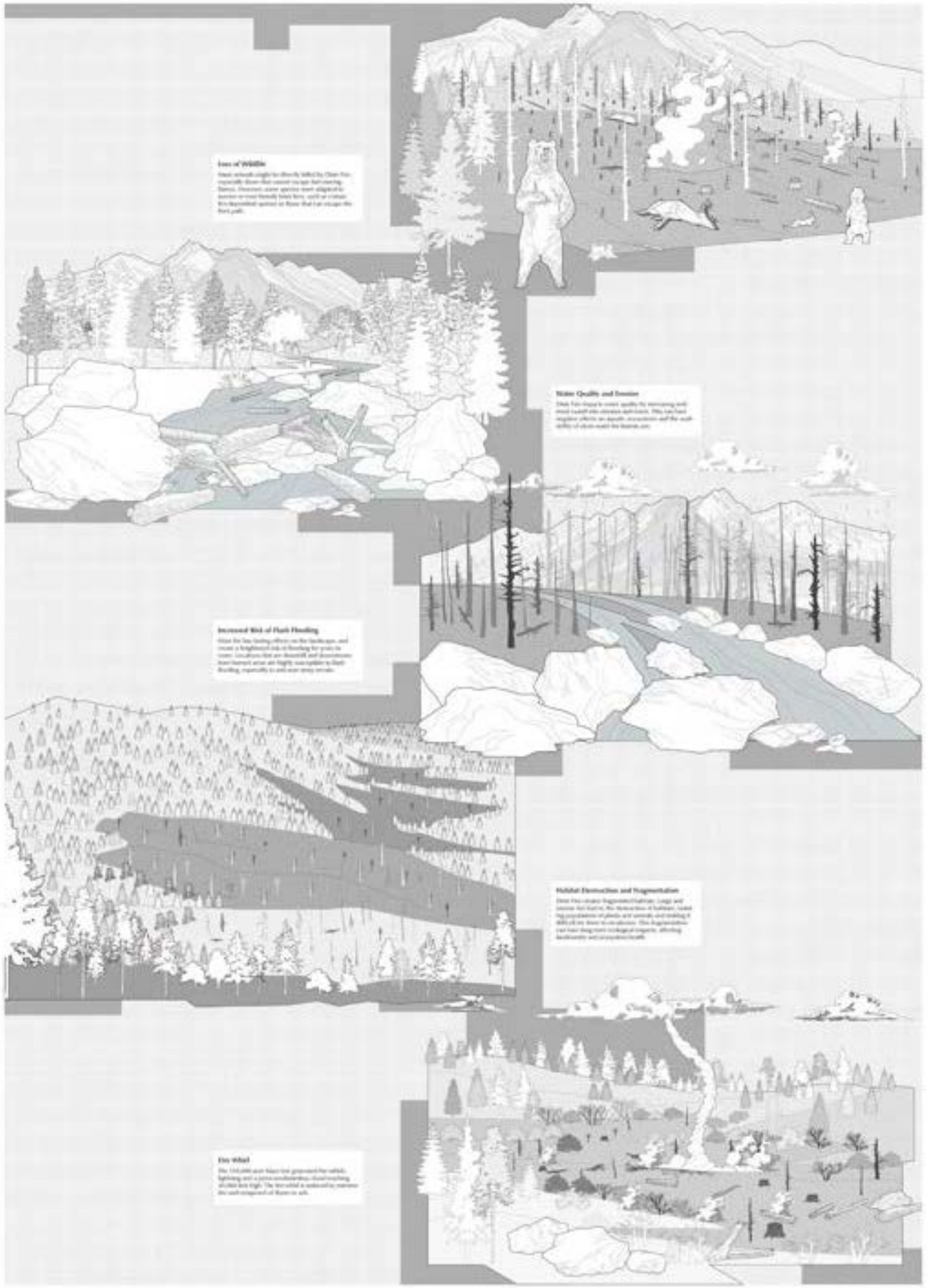
In Collaboration with Hansheng Zhu

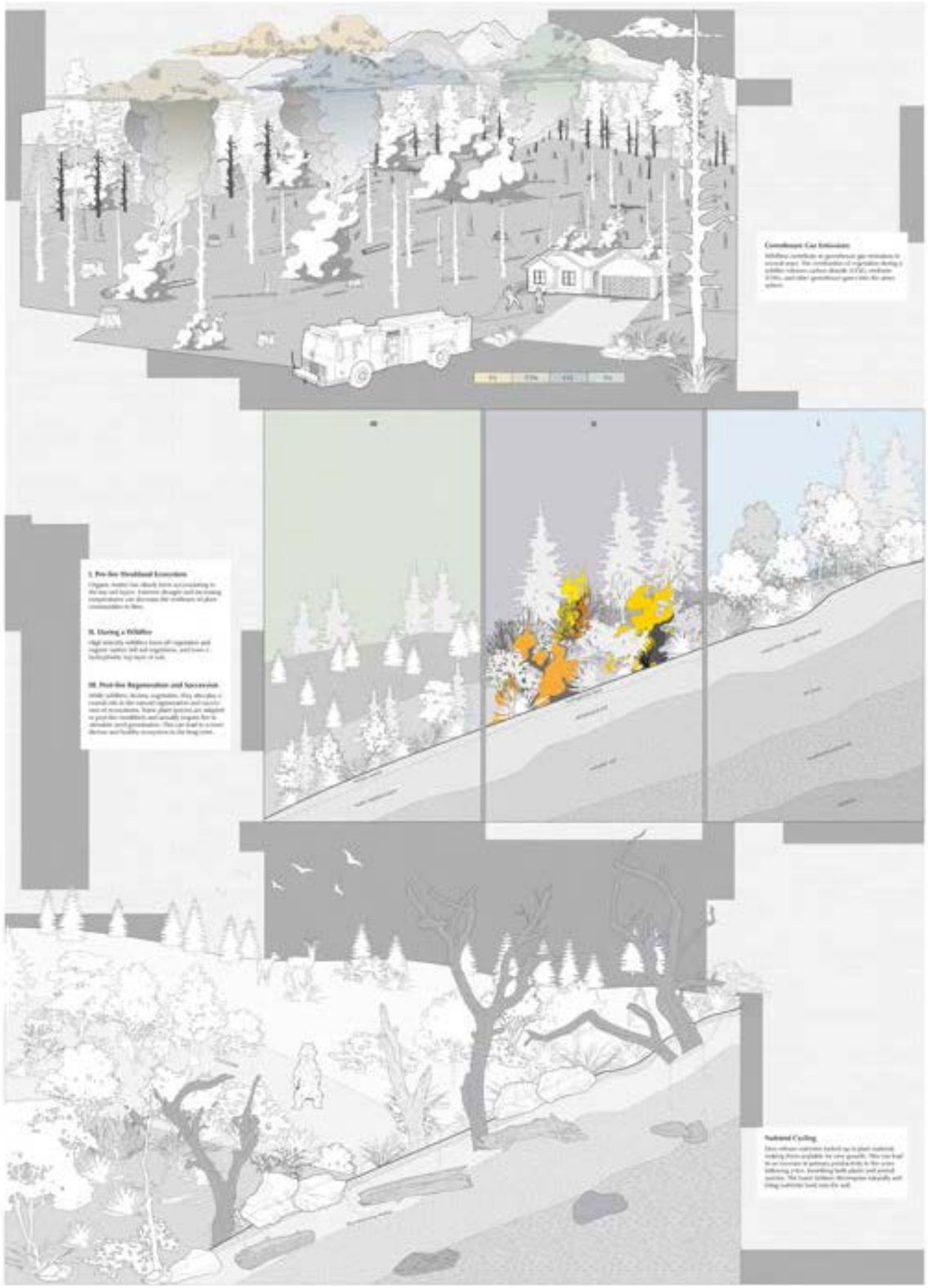
Advanced V Studio | Fall 2023 | Professor: Nahyun Hwang

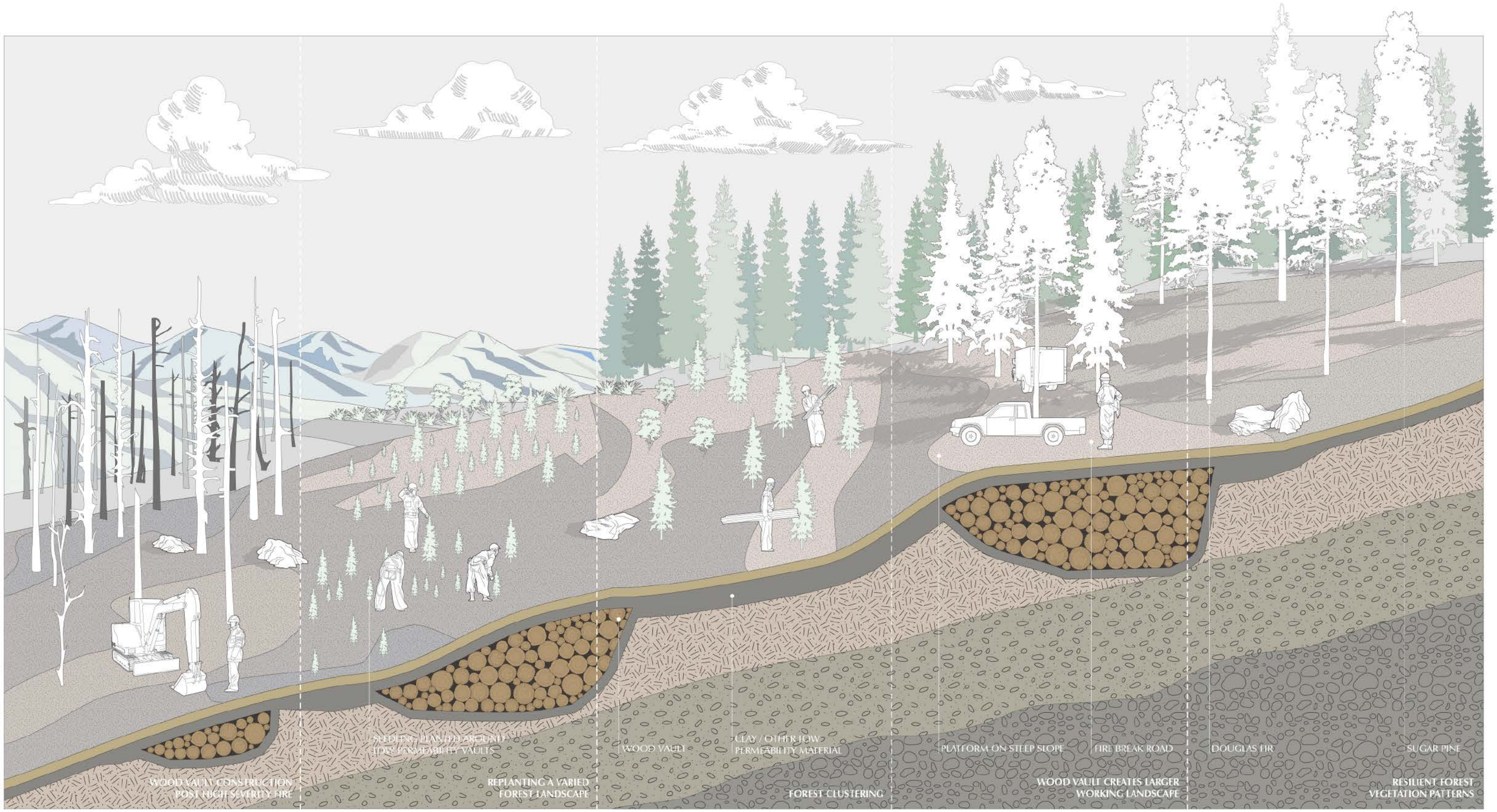

Legend
National Forest
Unburned
Salvage Logging
Waterbody
Road
Trail
Major Road
Railway
Creek
NHD Flowline
Prescribed Fire
Terraced Retaining Wall
Wood Vault
Timber Paling Fence
Amphitheater
Botanical Research Center
Short-term Housing Camp
Retention Pond
Greenville Rancheria
Maidu Tribe
Amphitheater
Botanical Research Center
Short-term Housing Camp
Round Valley Reservoir
0
500
1,500
3,000 ft
Greenville — Round Valley Reservoir | Plumas County California

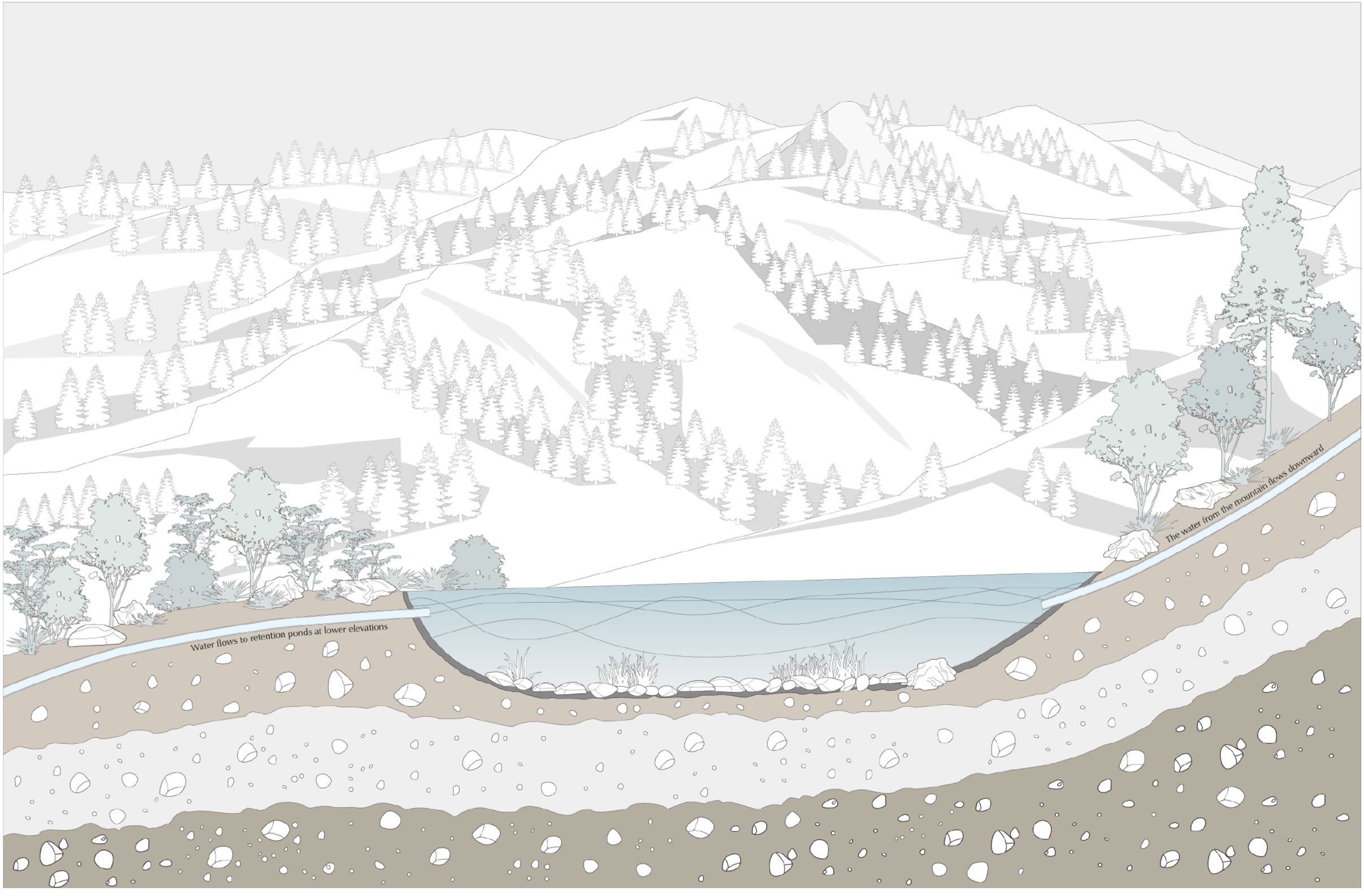



Prehistory to 1542
Northeastern Indigenous Tribes
1770
Spanish Period
1848
Golden Rush
1910
Transportation Development
2021
Dixie Fire
WE CAN'T WORK IN A WILDFIRE
NO PG&E BAILOUT
FIRE VICTIMS FIRST


Loss of Wildlife
Water Quality and Erosion
Increased Risk of Flash Flooding
Habitat Destruction and Fragmentation
Fire Whirl


Greenhouse Gas Emissions
I. Pre-fire Threshold Ecosystem
II. During a Wildfire
III. Post-fire Regeneration and Succession
Nutrient Cycling


WOOD VAULT CONSTRUCTION POST HIGH SEVERITY FIRE
SEEDLING PLANTED AROUND LOW PERMEABILITY VAULTS
REPLANTING A VARIED FOREST LANDSCAPE
WOOD VAULT
CLAY / OTHER LOW PERMEABILITY MATERIAL
FOREST CLUSTERING
PLATFORM ON STEEP SLOPE
FIRE BREAK ROAD
WOOD VAULT CREATES LARGER WORKING LANDSCAPE
DOUGLAS FIR
SUGAR PINE
RESILIENT FOREST VEGETATION PATTERNS


The water from the mountain flows downward
Water flows to retention ponds at lower elevations

In the summer of 2021, the Dixie Fire ignited in Northern California, quickly becoming one of the state's largest and most destructive wildfires. Fueled by dry vegetation, heat, and strong winds, the fire consumed nearly a million acres, reducing forests, towns, and homes to ash. The once-clear sky turned orange, and the air thickened with smoke, marking the onset of a devastation that would leave an indelible mark on the land.

Greenville, a historic town nestled in the Sierra Nevada, was nearly erased in the fire's wake. Its wooden buildings, many dating back to the Gold Rush era, were reduced to rubble in mere hours. Homes, schools, and businesses—symbols of a community built over generations—disappeared. What remained was a ghost town of charred foundations and twisted metal, leaving those who returned to face the stark, almost surreal emptiness of what was once their home.

The destruction, however, was not limited to the physical. Entire communities were displaced, families torn apart, and livelihoods lost. The fire exposed the vulnerability of rural towns dependent on fragile infrastructure and growing climate extremes. The aftermath was one of grief, confusion, and a dawning realization that the forces of nature were no longer an occasional threat but a regular, urgent reality.

Yet amidst the destruction, small gestures of resilience emerged—surviving fragments, neighbors helping each other, and quiet acts of recovery. These moments hinted at the possibility of renewal, though it would be a renewal marked by transformation rather than a return to what was.

The Dixie Fire was not merely a disaster—it was a warning, a stark reminder that our relationship with the land is shifting. It challenges us to rethink how we build, how we adapt, and how we prepare for a future that is no longer predictable.

Misting the Akalyptos: Reclaiming Communal Space for Climate Resilience

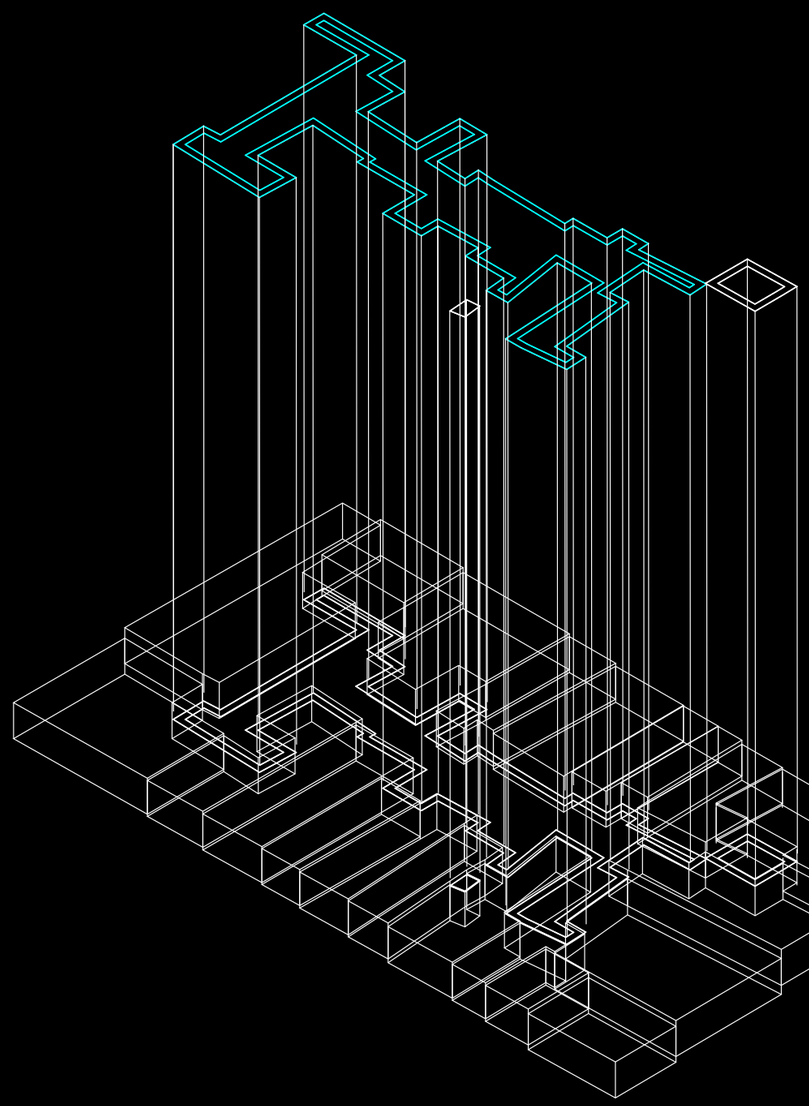
"Misting the Akalyptos" seeks to reimagine the akalyptos, the often-overlooked uncovered courtyard found in postwar Greek apartment buildings, as a site of environmental resilience and communal restoration. Originally designed as a functional but residual space for light, ventilation, and air circulation, the akalyptos has historically been used for informal activities such as drying laundry, growing plants, or storing items. However, its potential as a meaningful architectural feature has been largely overlooked. This project aims to reclaim the akalyptos as a dynamic microclimatic commons that not only mitigates the growing problem of urban heat but also promotes shared space and social interaction among residents.

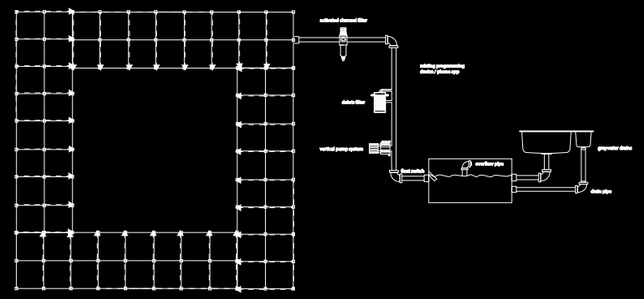
The design introduces a lightweight scaffolding system that integrates seamlessly with the existing building structures, providing the necessary support for a misting apparatus powered by greywater from sinks and showers. The misting system is programmable, designed to respond to real-time environmental conditions such as temperature and humidity, offering evaporative cooling and shade. This intervention transforms the akalyptos from a passive void into an active, seasonal gathering space, bringing comfort and relief to residents during the hottest months. The greywater reuse adds an element of sustainability, recycling domestic water in a way that reduces freshwater consumption and further enhances the system's eco-friendly approach.

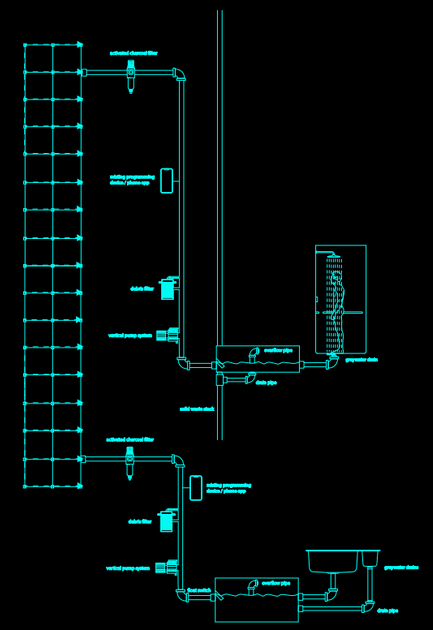
Beyond its environmental benefits, the project reimagines the akalyptos as a space of social and cultural significance. It offers a platform for communal gathering, reflection, and respite—encouraging residents to engage with the space in new ways. The scaffolding becomes an infrastructure of care, providing both physical relief from the heat and fostering a sense of collective responsibility and environmental stewardship. By reactivating this once-forgotten architectural feature, the project transforms the akalyptos into a valuable asset for the community.

This intervention offers a low-tech, low-cost strategy that can be deployed in various urban settings, making it adaptable to different apartment blocks and neighborhoods. It addresses key issues of spatial inequality and climate vulnerability in dense urban housing, providing a flexible model for how overlooked spaces can be reimagined to offer both environmental and social benefits. Through this project, the akalyptos is not only redefined as a climate-responsive space but also as a cultural and communal asset, promoting a shared sense of well-being in the face of urban environmental challenges.

Advanced Studio VI | Spring 2025 | Professor: Lydia Kallipoliti







The akalyptos, a characteristic feature of postwar Greek apartment buildings, exists in a variety of configurations, each shaped by its relationship to light, ventilation, and spatial organization. These configurations can be categorized into three main types: closed, open, and clustered. Each type offers distinct advantages and challenges in terms of environmental performance, social interaction, and adaptability.

Closed Akalyptos: Enclosed on all sides by building facades, these courtyards provide a sense of privacy but are often poorly ventilated and receive limited natural light. Their compact and sheltered nature tends to trap heat, making them less effective in terms of cooling and airflow. While these spaces are typically used for storage or utility purposes, their closed nature also limits potential for communal interaction or adaptation for new functions. Interventions in closed akalyptos must consider how to introduce airflow and temperature regulation without compromising privacy.

Open Akalyptos: In contrast to the closed type, open akalyptos are exposed to the elements, with minimal barriers separating them from the surrounding environment. These courtyards benefit from greater natural light and airflow, which can reduce thermal discomfort and improve ventilation. However, their openness can also leave them vulnerable to environmental exposure, such as wind, rain, and excessive heat. The open nature of these spaces allows for more public engagement but can also diminish privacy and comfort. Interventions here must focus on controlling exposure while maintaining airflow and light, enhancing comfort without sacrificing openness.

Clustered Akalyptos: The clustered akalyptos configuration, commonly found in larger multi-unit housing complexes, consists of multiple courtyards arranged in close proximity, often with shared access points. This arrangement blends private and communal space, offering a balance of openness and enclosure. The clustered setup allows for more flexibility, as individual courtyards can be adapted for personal or communal use. They provide opportunities for social interaction while still allowing for privacy and autonomy. This configuration, though complex, presents the greatest potential for creating adaptable, multi-functional spaces that can be tailored to both individual and collective needs.

Each of these types of akalyptos presents unique challenges and opportunities for environmental design. Understanding these variations allows for a more nuanced approach in retrofitting or transforming the akalyptos into a sustainable, community-focused space that responds to the needs of both the environment and its residents.

AKALYPTOS

An akalyptos is an uncovered inner courtyard typical of Greek apartment buildings, especially in Athens. Surrounded by walls and open to the sky, it functions as a private light well and ventilation shaft within the dense urban block. Though often hidden from the street, it plays a vital role in the building's environmental performance and offers a modest yet essential connection to the outdoors.

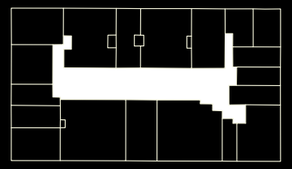
1 ENCLOSED

Fully enclosed and not accessible from the street

Maintains a singular, uninterrupted spatial form

Acts as a private light and air well within the apartment block

Reinforces introverted, inward-facing domestic architecture



2 OPENED

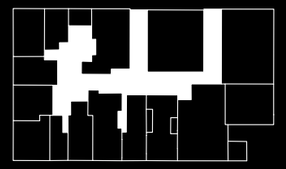
Connected to the public realm through visible or physical openings

Reduces the sense of enclosure and privacy

Acts as a transitional space between street and interior units

May serve both communal and circulation functions

Subject to external noise, light, and views—blurring private/public boundaries



3 FRAGMENTED

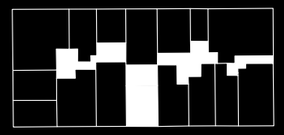
Broken into smaller courtyards or voids, often irregular in shape

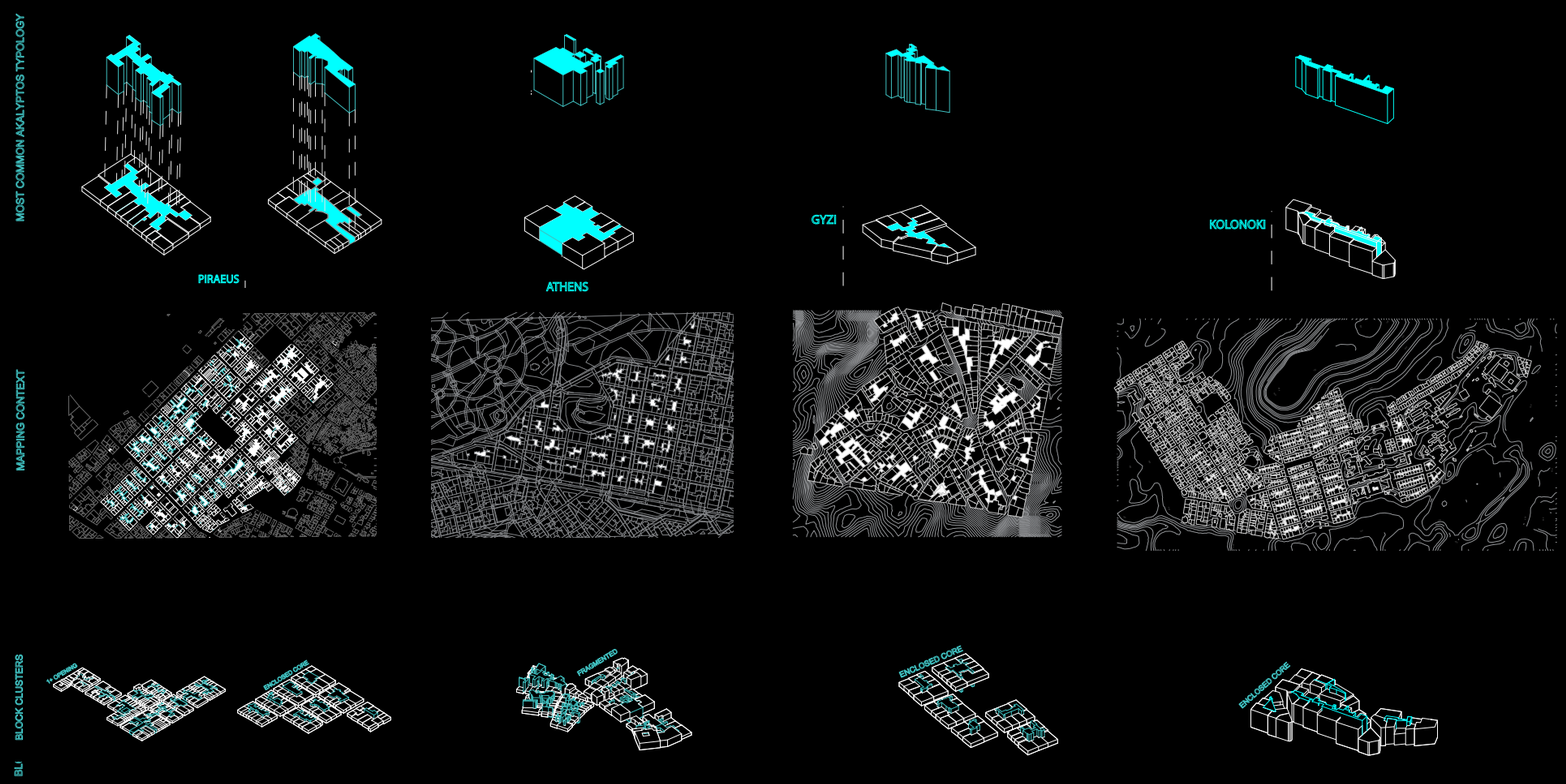
Shared between multiple units or buildings, reducing spatial coherence

May open partially to the street or neighboring properties

Functions more as residual space than intentional design

Less effective as a central light/air source due to division and exposure





Cooling the akalyptos is a critical aspect of enhancing its functionality and livability, particularly in the face of increasing urban heat. These courtyards, once designed primarily for ventilation and light, are often subjected to extreme temperatures due to their exposure to the elements or their confined, heat-retentive nature. As urban heat islands intensify, the need for effective temperature regulation within residential spaces like the akalyptos becomes more pressing. Without proper cooling, these spaces can exacerbate thermal discomfort, leading to increased health risks for residents, particularly in densely populated areas where outdoor space is limited.

Cooling the akalyptos addresses both environmental and social challenges. For one, it offers a way to combat the rising temperatures that affect many urban neighborhoods, creating a cooling effect that benefits the surrounding building and residents. The introduction of a misting system, powered by greywater, is an efficient and sustainable solution. The evaporation process cools the air, providing thermal relief during the hottest months, and enhances the overall comfort of the space. This not only makes the akalyptos more habitable during summer months but also improves air quality by reducing dust and pollutants that accumulate in hot, stagnant air.

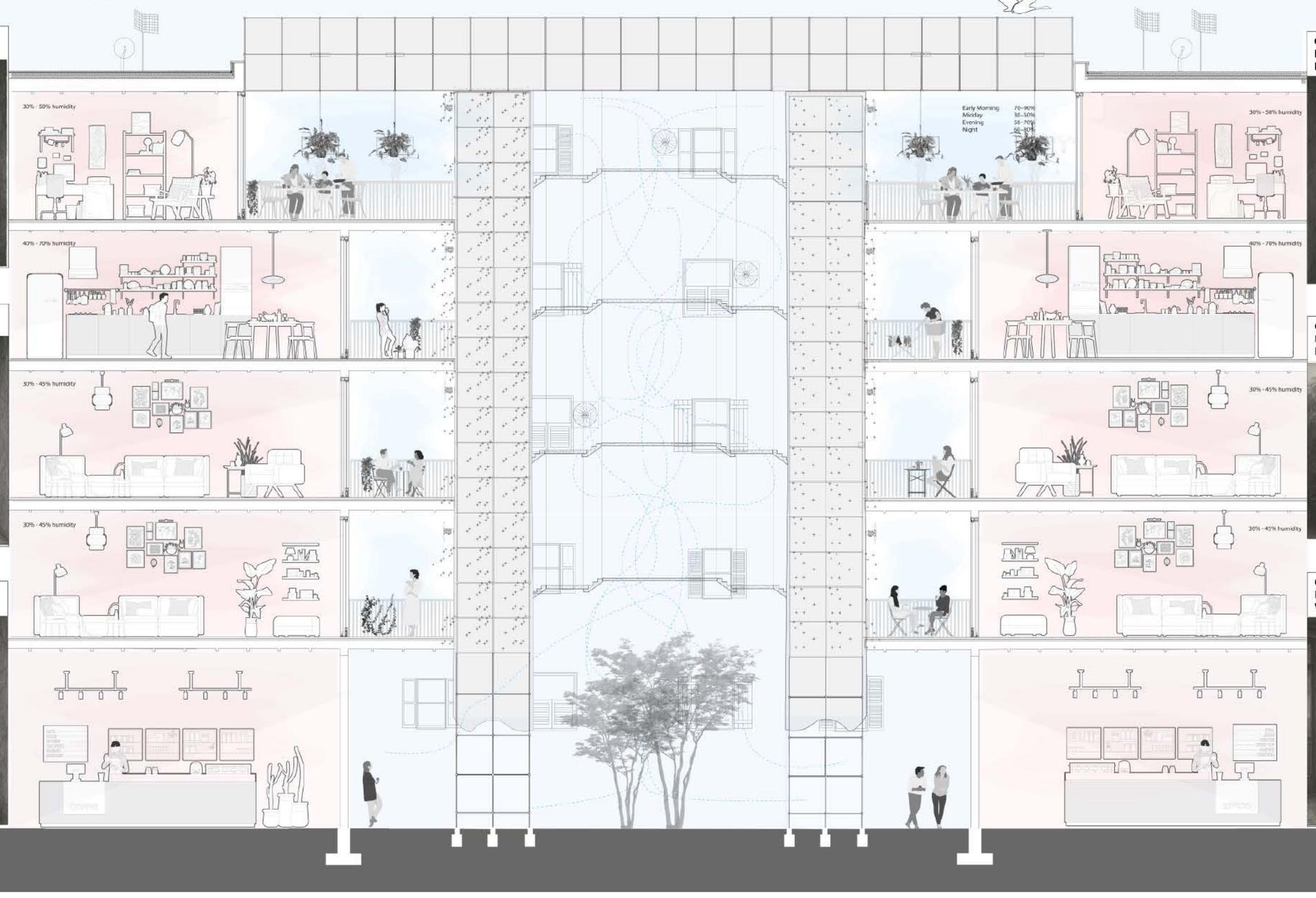
More importantly, cooling the akalyptos reclaims it as a communal space for residents to gather, socialize, and relax in comfort. Without cooling, these courtyards are often underused or neglected, further isolating residents from each other and from the broader community. By providing a more comfortable microclimate, the cooling process fosters greater interaction, allowing the akalyptos to become a hub for shared experiences and connection. This transformation is key to addressing social isolation in urban environments and promoting a sense of communal well-being.

In a broader context, cooling the akalyptos aligns with sustainability goals, helping to reduce the demand for energy-intensive air conditioning systems, and lowering overall energy consumption. By adapting existing urban infrastructure to support climate resilience, the project offers a low-cost, low-tech intervention that can be applied to a wide variety of apartment blocks. Cooling the akalyptos not only improves the physical environment but also provides a model for integrating environmental solutions with community-centered urban design.

CONDITION 1:
Early Morning Moisture in the Akalyptos

CONDITION 2:
Midday Dryness on the Balcony

CONDITION 3:
Afternoon Shaded Courtyard Cooling



CONDITION 4:
Evening Humid Recovery in Apartment Interiors

CONDITION 5:
Balcony Mist Evaporation after Watering Plants

CONDITION 6:
Nighttime Air Exchange through Open Windows

Play as Pedagogy: A Free-Plan School for Children

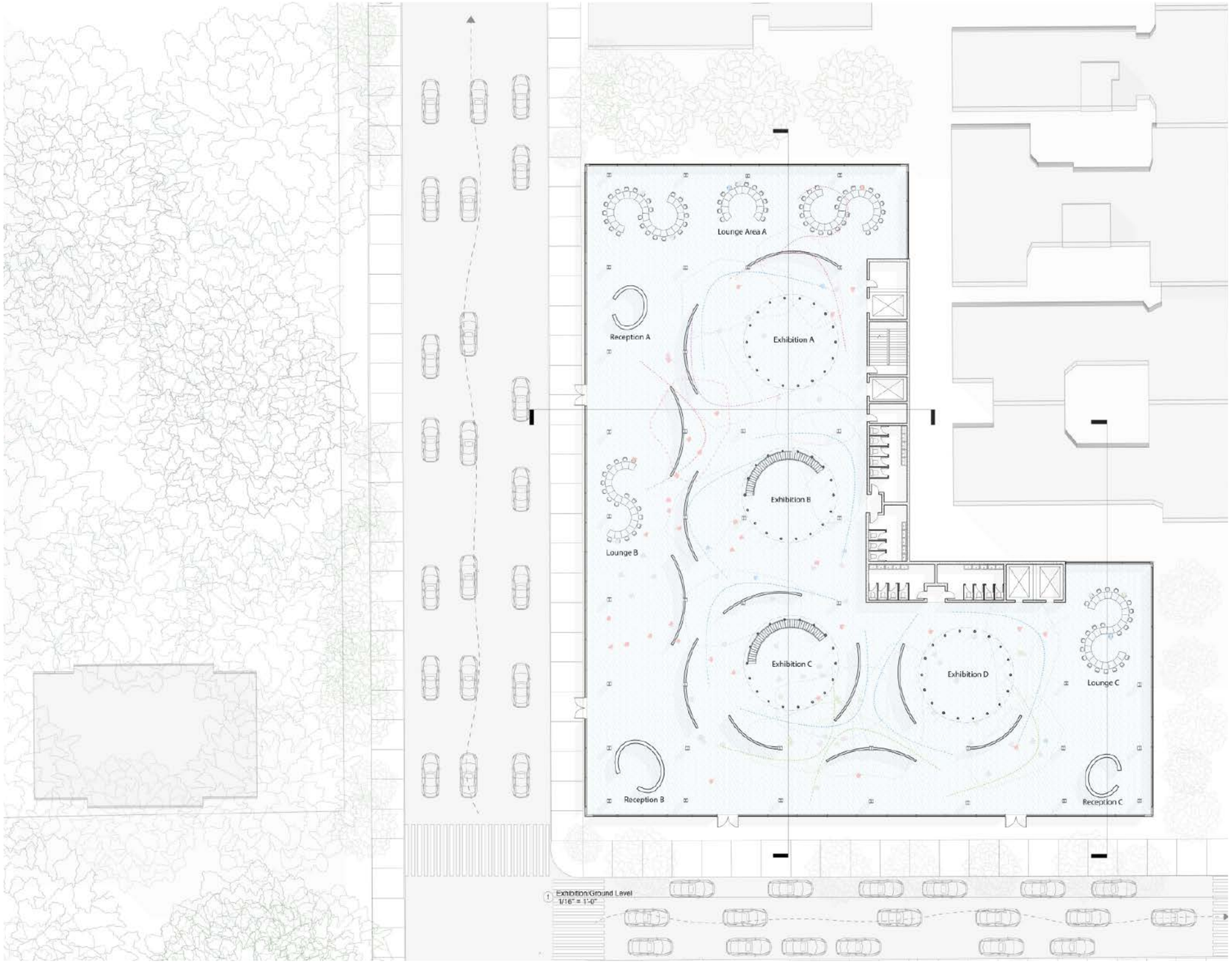
This project reimagines education by integrating play, movement, and creativity directly into the architecture. Rejecting traditional classrooms and hallways, the design uses a free-plan layout that fosters fluidity and interaction. A central spiraling staircase acts as both a vertical circulation system and a social hub, connecting multiple levels and encouraging students to explore and engage across spaces. This dynamic feature fosters a sense of openness, where learning extends beyond confined rooms and becomes an ongoing process of discovery and interaction.

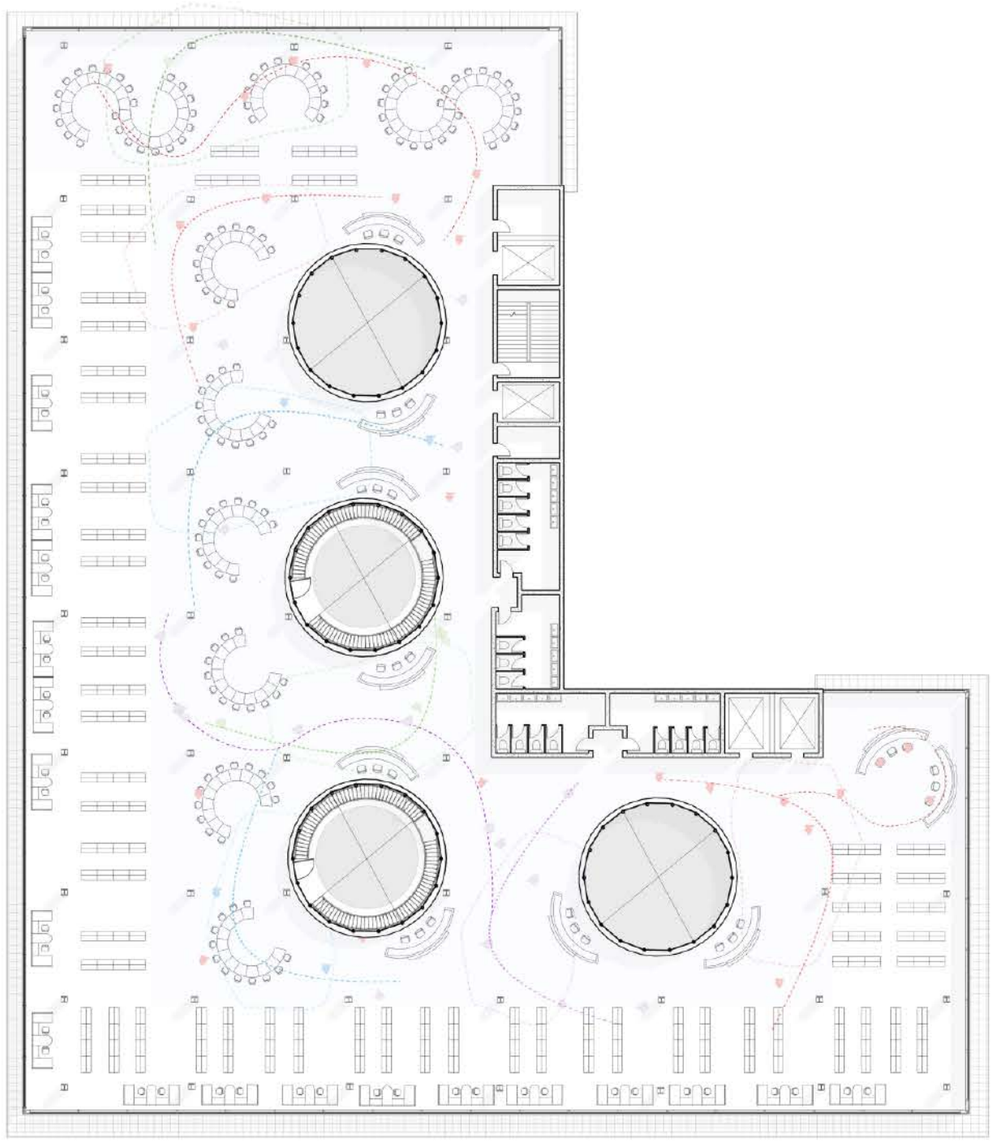
The ground floor functions as a public gallery, showcasing student work and blurring the boundary between school and community. This space invites families and visitors into the heart of the building, where exhibitions and events can unfold. Large windows and soft thresholds create transparency, making the learning process visible and celebrated. The gallery space serves as a civic hub, reinforcing the connection between the school and its surroundings.

Above, classrooms spill into shared terraces and informal learning areas, with circulation spaces designed to be more than just functional. Hallways, stairs, and nooks become active zones for socialization, play, and exploration. Modular walls and movable furniture allow for flexible configurations, ensuring that the building can adapt to different teaching methods and evolving needs. This flexibility is key to creating a responsive, adaptable learning environment.

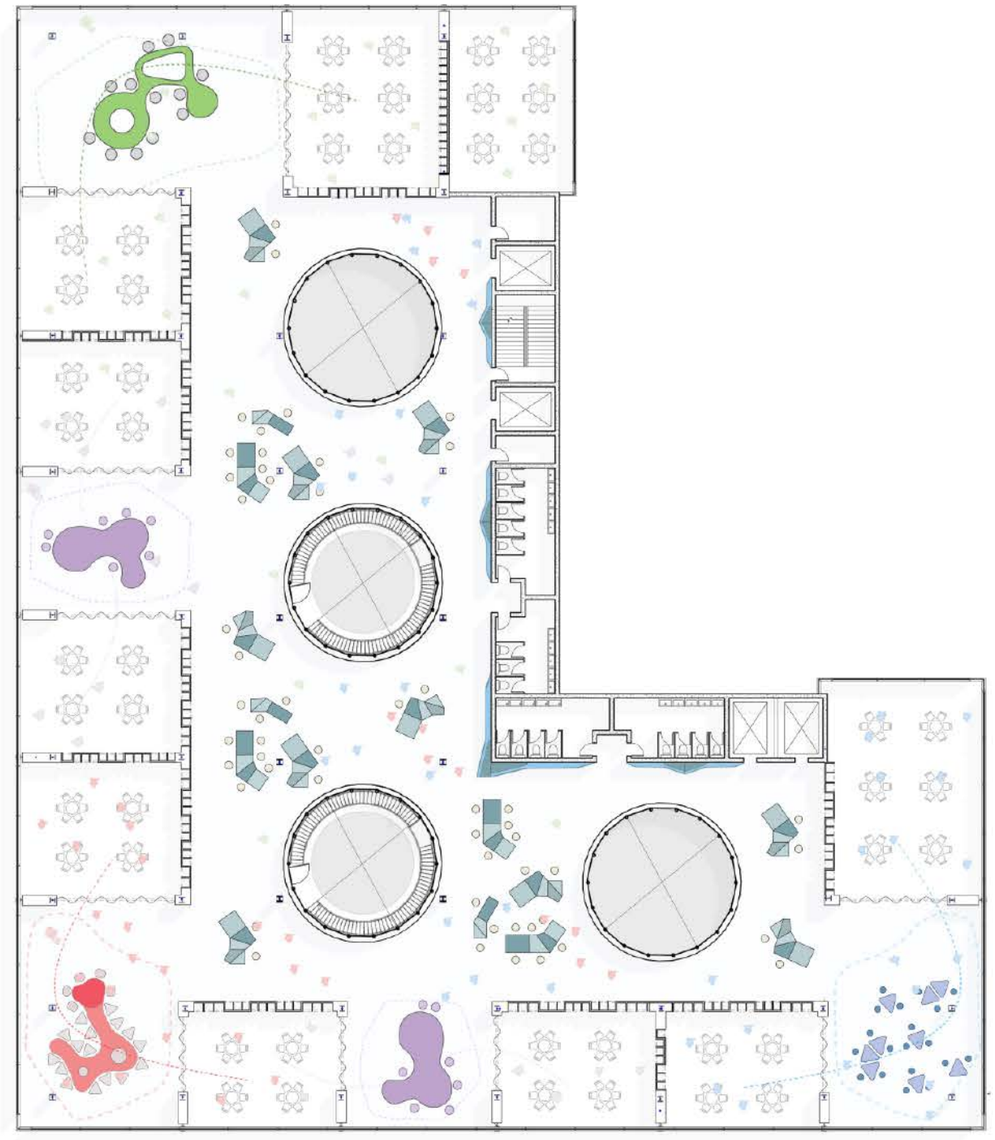
Every element of the architecture is child-scaled and interactive. Stairs become seating, railings invite climbing, and corners offer spaces for quiet reflection. These thoughtful design choices create an environment that encourages agency, imagination, and physical engagement. By blending play and learning, the building itself becomes a teacher, fostering creativity and spatial awareness. This school is a flexible framework, supporting the evolving needs of students and providing a dynamic space for learning and growth.

Core Studio II | Spring 2022 | Professor: Erica Goetz

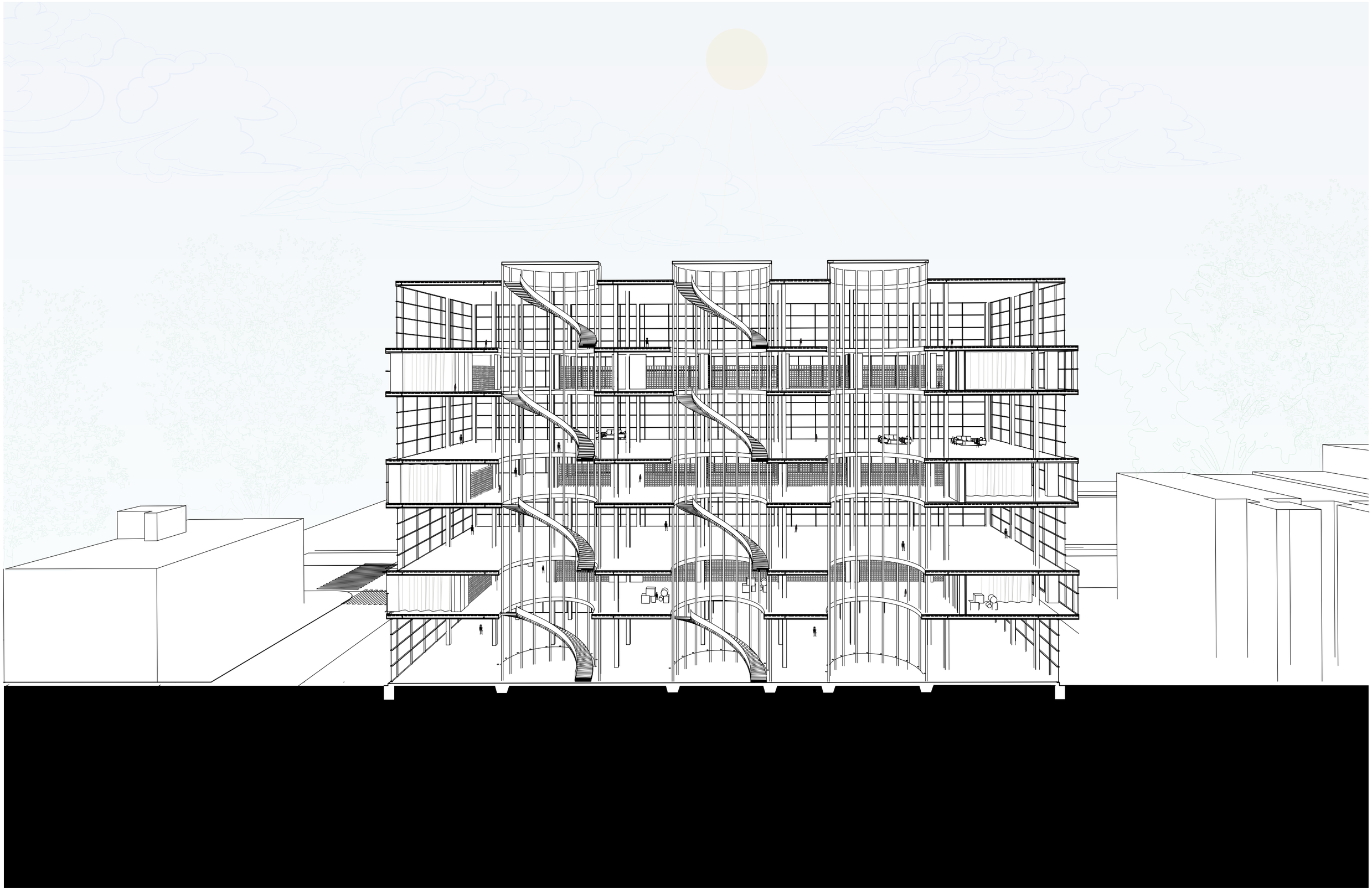




Library Level
1/16" = 1'-0"



Classroom Level
1/16" = 1'-0"



Play as Pedagogy: A Free-Plan School for Children

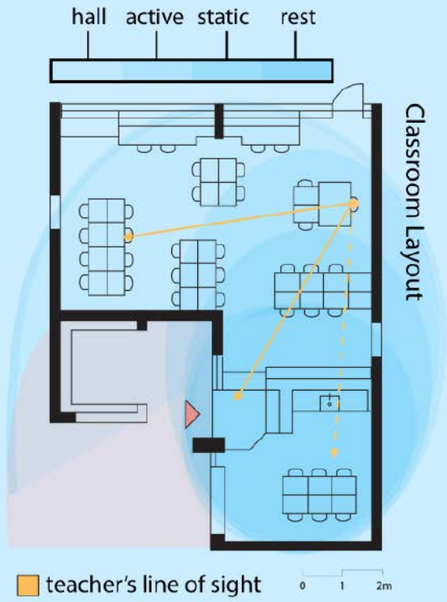
The Delft Montessori School, designed by Herman Hertzberger between 1960 and 1966, provided a crucial lens through which I began to rethink the relationship between architecture and education. Hertzberger's approach radically departs from the traditional school as a system of enclosed classrooms and corridors. Instead, he imagines a learning environment as a dynamic, social landscape—one that supports autonomy, informal interaction, and spatial exploration. His architecture recognizes the child not as a passive recipient of instruction, but as an active inhabitant capable of navigating, interpreting, and even reshaping their surroundings.

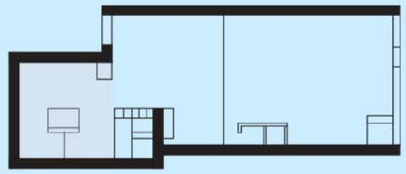
Through a series of analytical drawings, I examined the spatial strategies that enable this vision: the layering of thresholds, the use of mezzanines and half-levels to create sectional transparency, and the transformation of circulation into a stage for learning and play. In Hertzberger's school, there is no "leftover" space. Every stair, landing, window bay, and platform is designed to be used—sat on, climbed over, leaned into. These embedded affordances support the Montessori principle of self-directed activity and choice, while also promoting communal life through visibility and proximity.

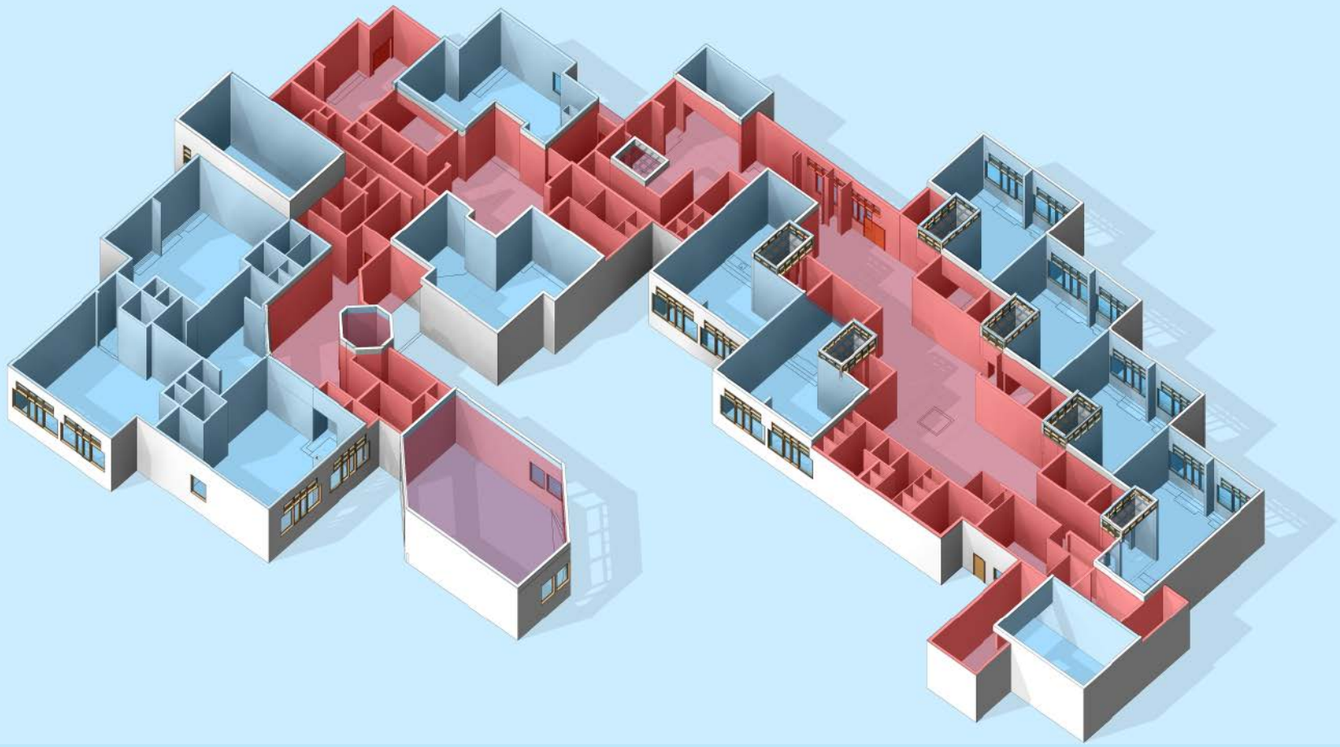
What I found especially compelling was how Hertzberger uses architectural elements to blur boundaries between movement and learning. Corridors act as extensions of classrooms, allowing teaching to spill outward and giving children freedom to pause, gather, or retreat. Rather than framing play as a separate zone, his design treats it as a continuous part of the learning experience. These observations deeply informed my own project, in which the school becomes a free-plan landscape centered around a spiraling core—part stair, part amphitheater—that creates both physical and visual connections between levels.

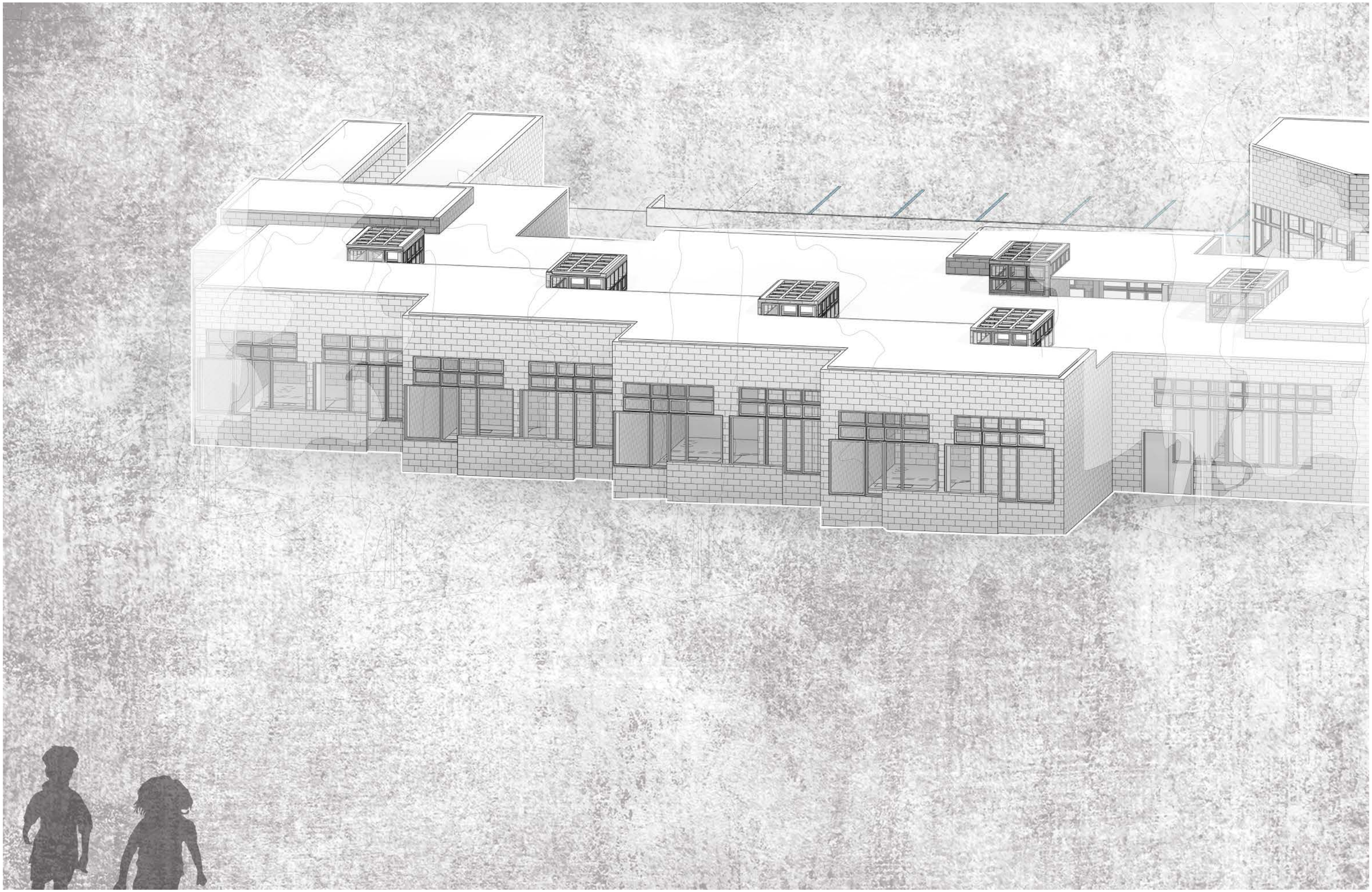
This precedent study sharpened my understanding of how architecture can participate in pedagogy. Like Hertzberger, I aimed to create a school that doesn't dictate behavior but invites interpretation—an environment that encourages movement, fosters curiosity, and cultivates a deep spatial awareness. By learning from Delft, I wasn't simply borrowing form, but engaging in a conversation about how design can embody trust, freedom, and the joy of discovery.

Core Studio II | Spring 2022 | Professor: Erica Goetz









Core I: The 215 Train Station

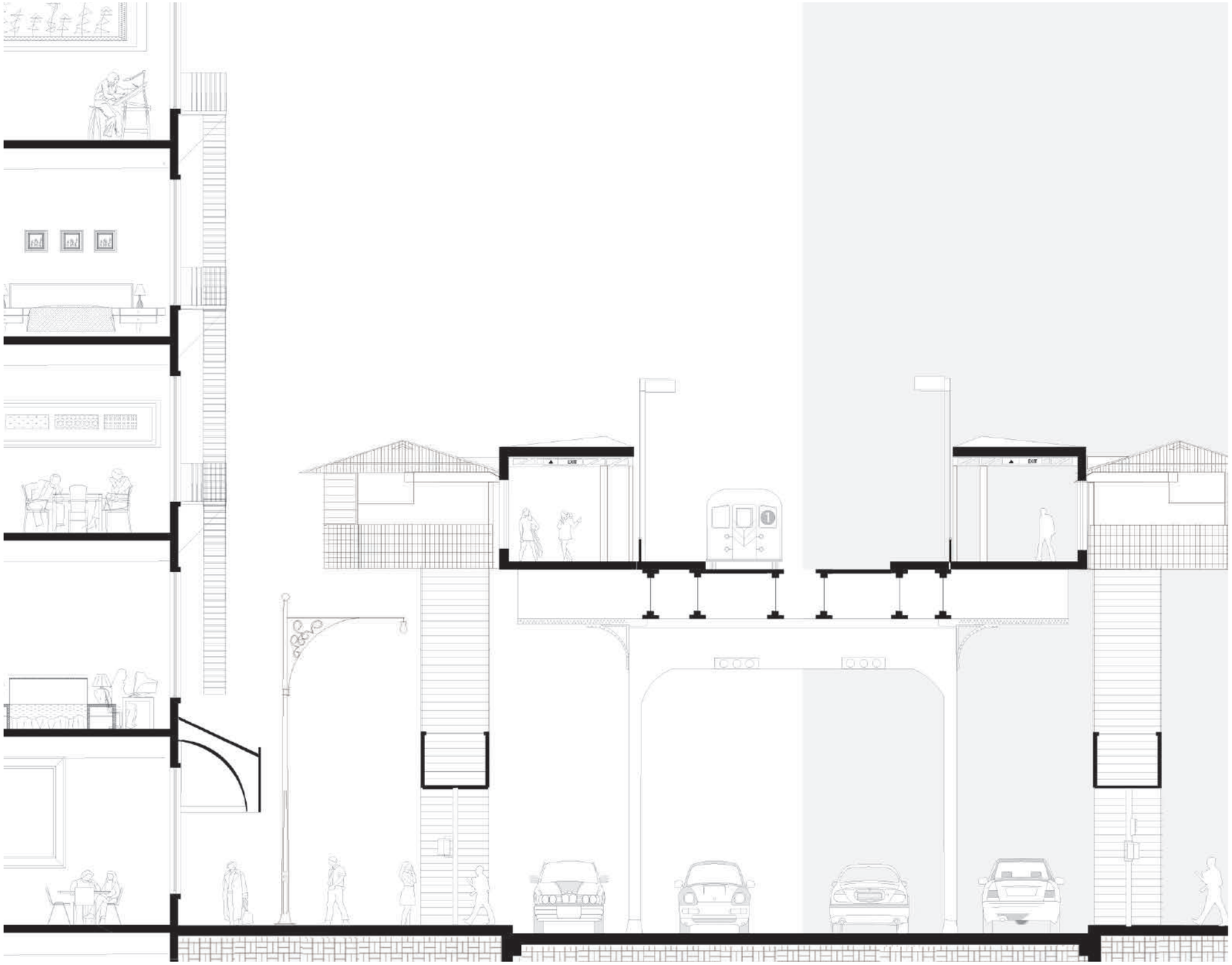
This project transforms the 215th Street subway station—an elevated and underutilized piece of infrastructure in northern Manhattan—into a vibrant mixed-use node that supports community-driven commerce, pedestrian connectivity, and cultural expression. Located in Inwood, a neighborhood defined by its working-class roots and rich immigrant heritage, the station is currently a barrier within the urban fabric: visually imposing, disconnected from street life, and surrounded by vacant or inactive ground space.

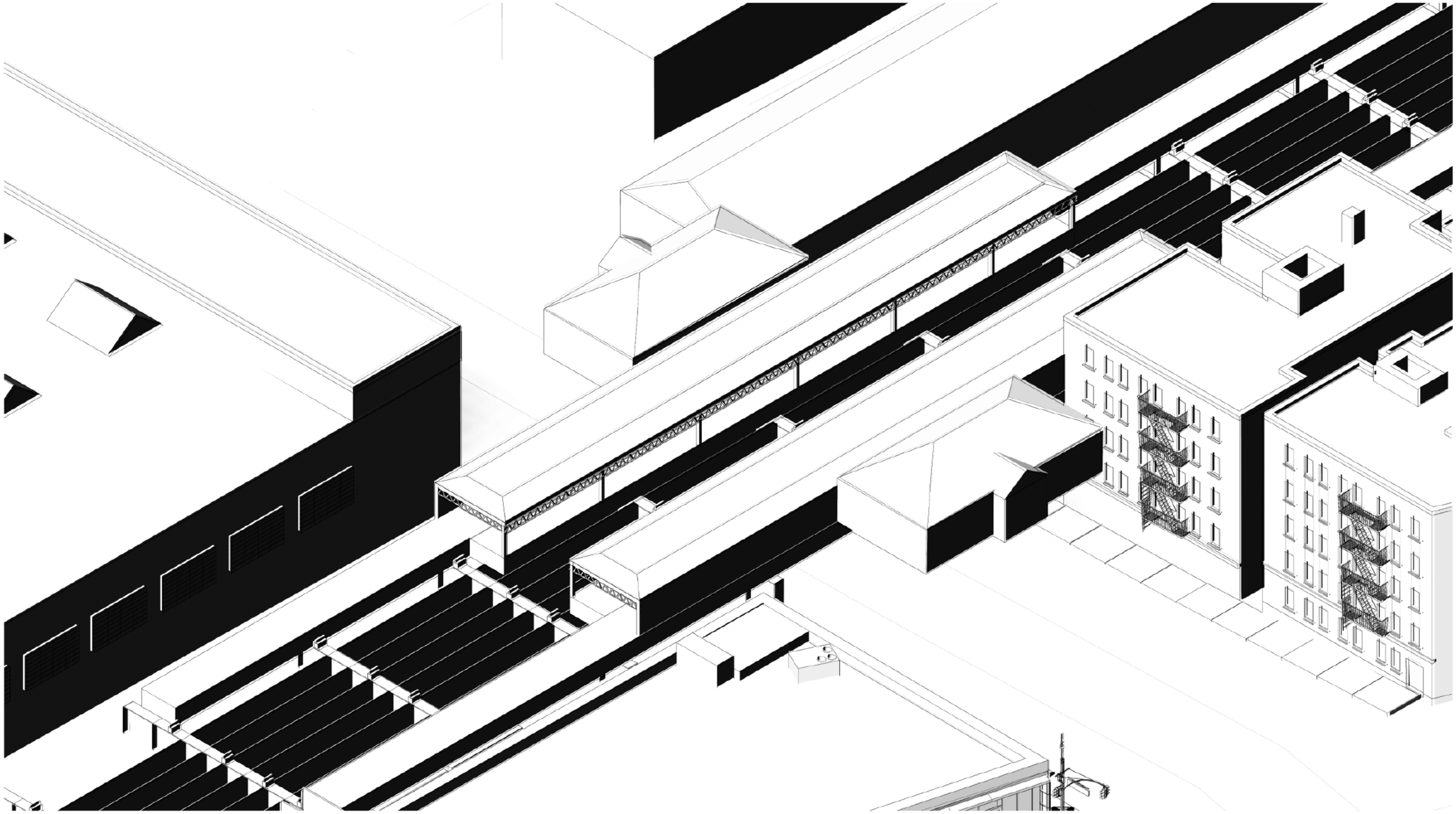
The design reclaims this void through strategic adaptive reuse, inserting a series of modular, lightweight storefronts beneath the existing elevated structure. These prefabricated retail units fit within the rhythm of the train viaduct and are constructed using sustainable materials that reference both the industrial history and evolving future of the neighborhood. The storefronts are intended for small, locally owned businesses—particularly BIPOC and immigrant entrepreneurs—offering affordable space in a city where such opportunities are increasingly rare.

Beyond retail, the revitalization introduces new civic infrastructure: widened sidewalks, shaded seating, bike racks, gathering nodes, and soft landscaping—all working together to create a more walkable, inclusive, and socially active streetscape. The movement of commuters becomes a spatial asset, bringing visibility and foot traffic to businesses and inviting a culture of lingering and interaction.

Architecturally, the intervention is minimal yet impactful—respecting the station's existing form while enhancing it with human-scaled, adaptable elements. The project operates on the belief that infrastructure can be more than functional—it can be beautiful, social, and rooted in place. By blending mobility with small-scale commerce and public life, the 215th Street Station Revitalization serves as a replicable model for equitable, transit-oriented design in underserved urban communities.

Core Studio I | Fall 2021 | Professor: Joshua Uhl





EXIT
EXIT
'S TIRES
INWOOD PIZZA
JOE'S MARKET &
DRIVE THROUGH

EXIT
EXIT

Architectural Technology IV: Snippets of Details

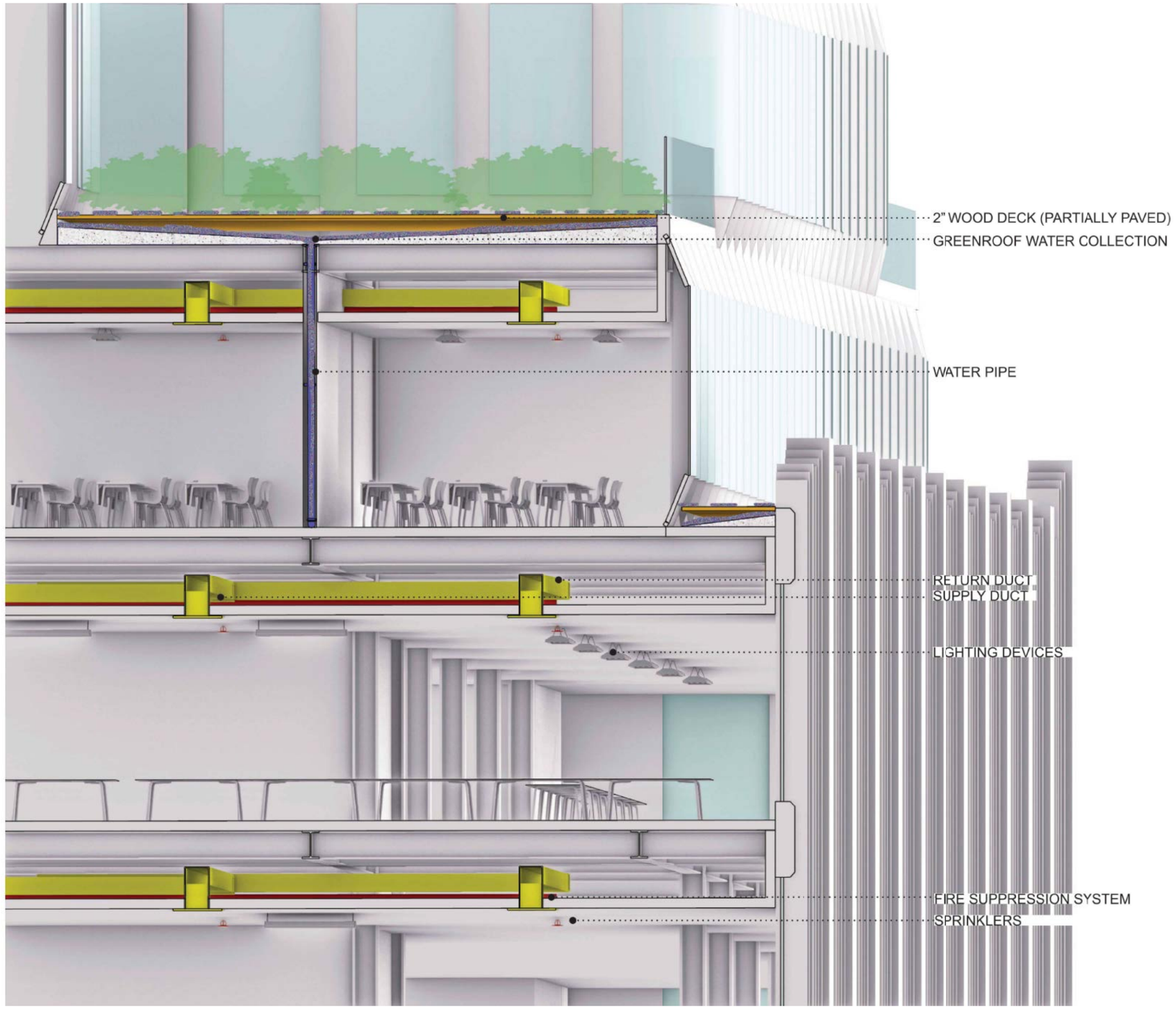
This project explores the design of a school as a layered system of learning, climate responsiveness, and structural clarity. Developed as part of Architectural Technology IV, the work focuses on the integration of environmental systems and material expression into the daily rhythms of educational space.

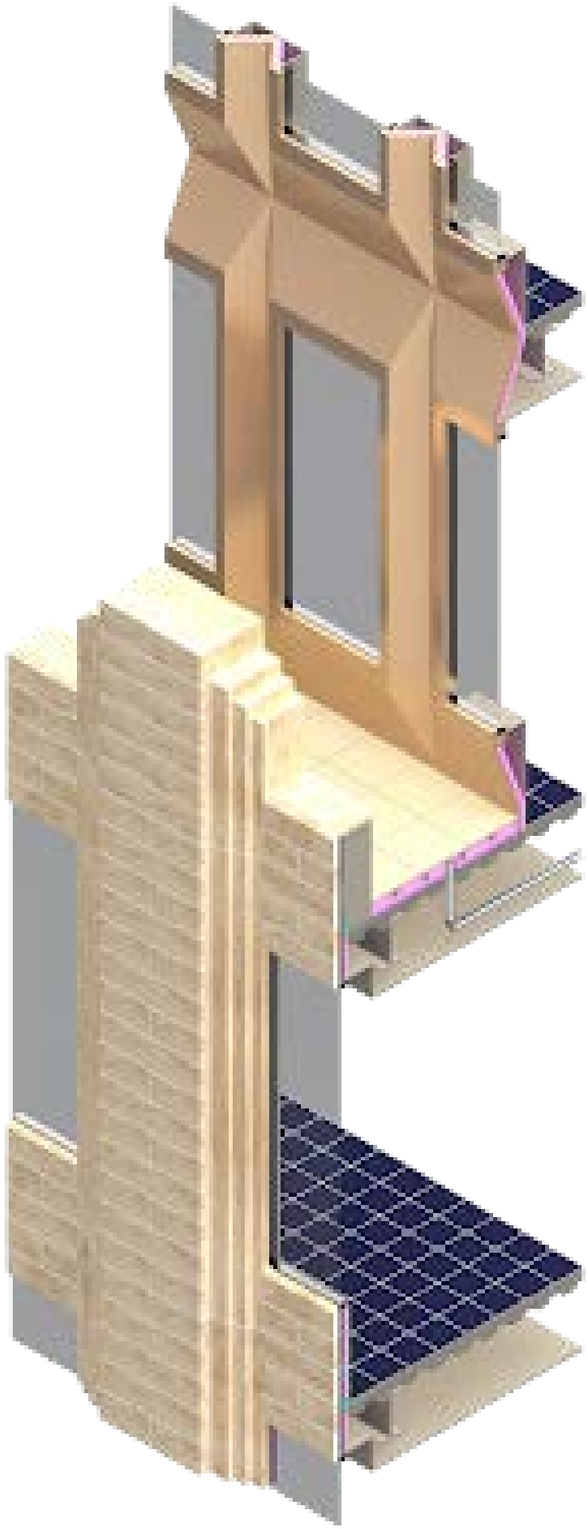
The school is conceived as both an infrastructure for knowledge and a responsive body in dialogue with its climate. Passive strategies—such as cross-ventilation, solar shading, and thermal mass—are embedded into the architecture and made legible to students and educators alike. Structural assemblies double as teaching tools, revealing how the building stands, breathes, and collects water.

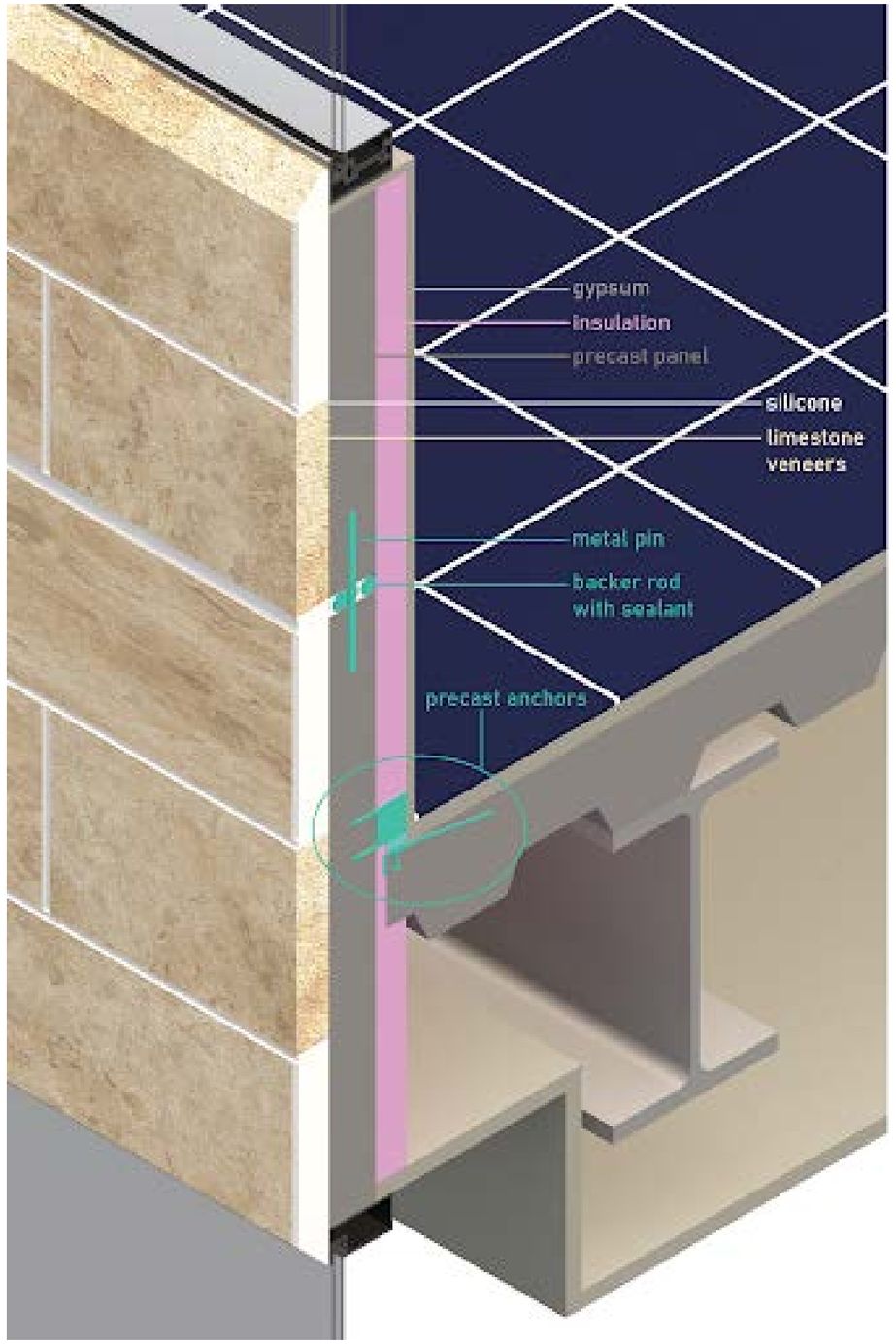
Included in the submission are detailed wall sections, structural diagrams, water reuse strategies, and thermal analyses, alongside physical models and drawings of key moments within the school: circulation thresholds, shaded courtyards, and classrooms calibrated to light and airflow. These technical documents highlight the interplay between material performance and user experience, where every joint, beam, and screen contributes to both shelter and pedagogy.

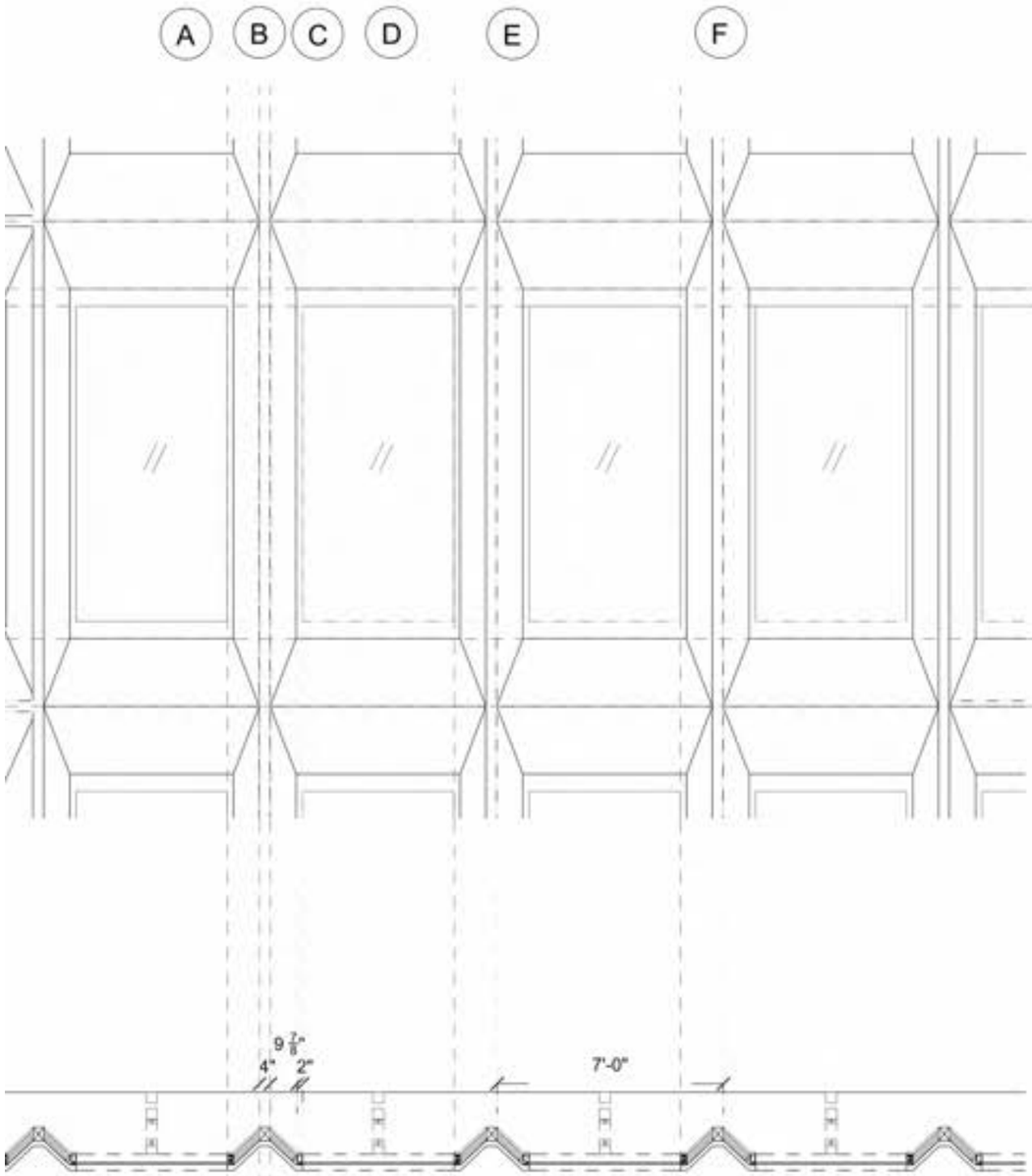
The result is a school that teaches through its very construction—an environment where climate, care, and curiosity meet through detail.

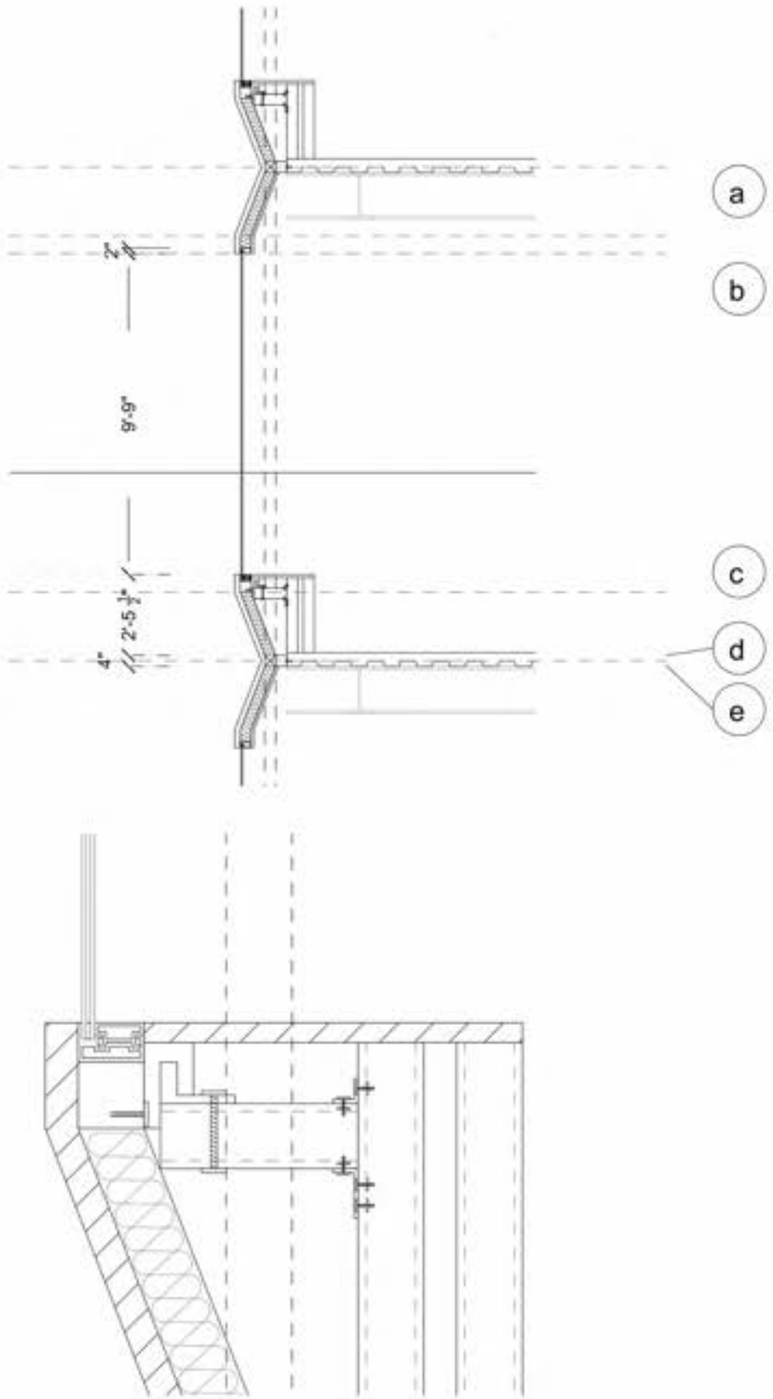
Advanced Technology IV | Professor: Berardo Matalucci

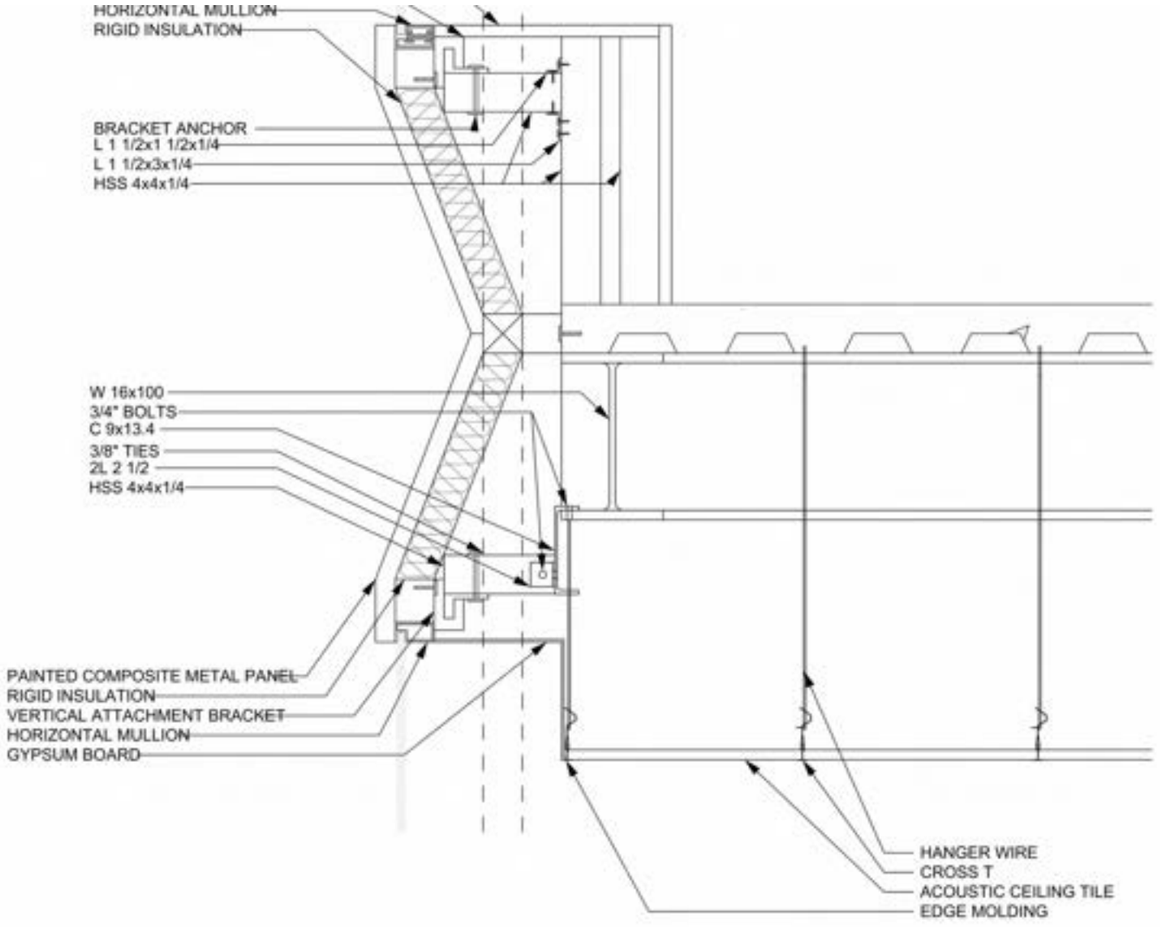


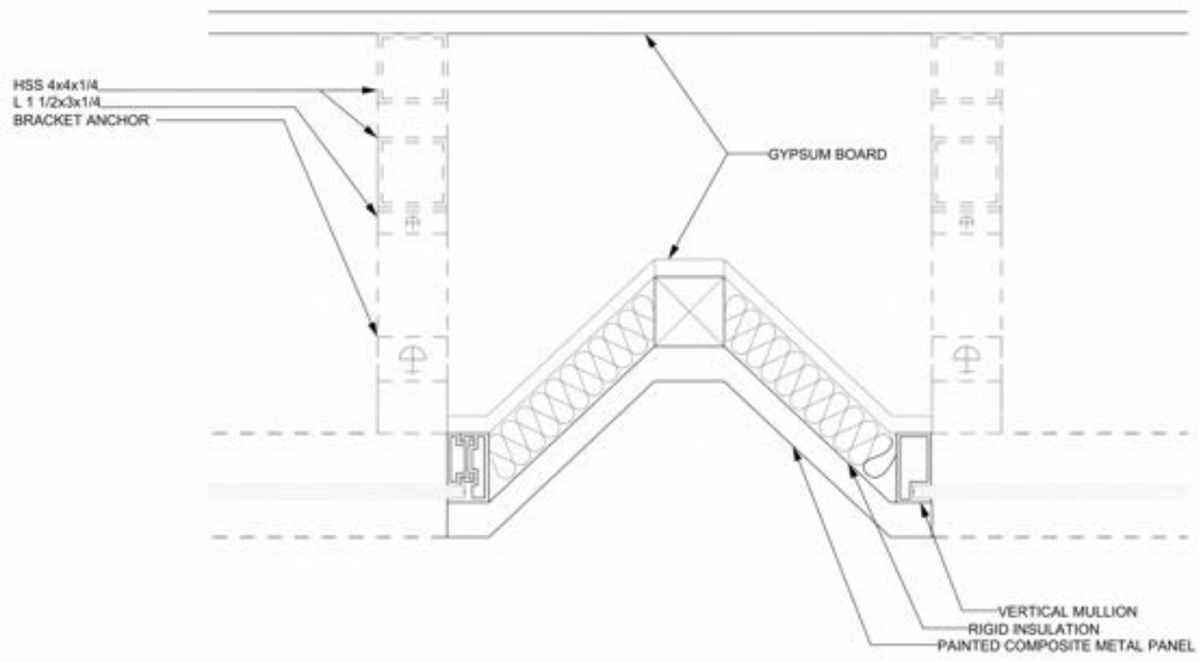


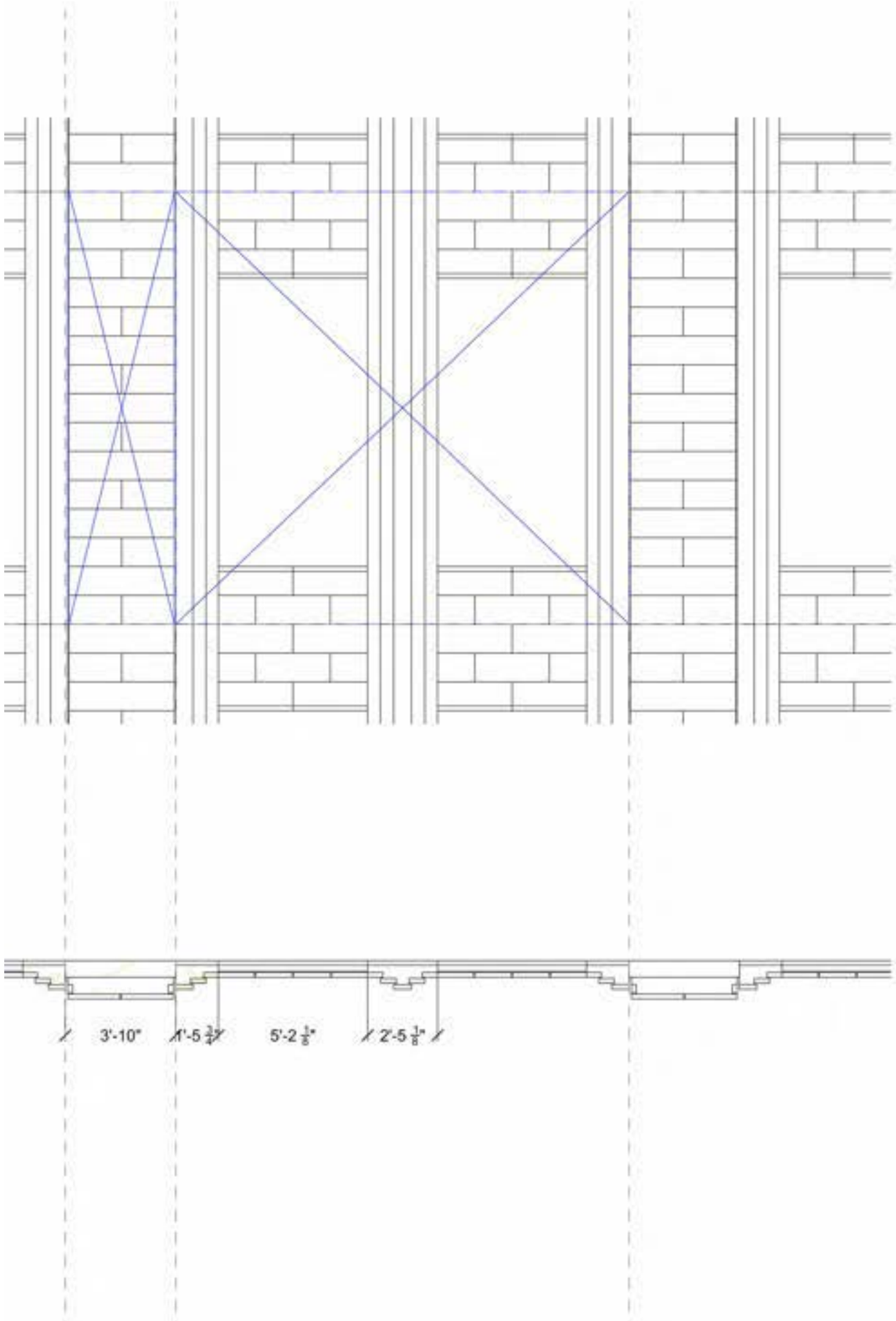

gypsum
insulation
precast panel
silicone
limestone
veneers
metal pin
backer rod
with sealant
precast anchors


A
B
C
D
E
F
9 7/8"
4"
2"
7'-0"


a
b
c
d
e
2"
9'-9"
2'-5 1/2"
4"


HORIZONTAL MULLION
RIGID INSULATION
BRACKET ANCHOR
L 1 1/2x1 1/2x1/4
L 1 1/2x3x1/4
HSS 4x4x1/4
W 16x100
3/4" BOLTS
C 9x13.4
3/8" TIES
2L 2 1/2
HSS 4x4x1/4
PAINTED COMPOSITE METAL PANEL
RIGID INSULATION
VERTICAL ATTACHMENT BRACKET
HORIZONTAL MULLION
GYPSUM BOARD
HANGER WIRE
CROSS T
ACOUSTIC CEILING TILE
EDGE MOLDING


HSS 4x4x1/4
L 1 1/2x3x1/4
BRACKET ANCHOR
GYPSUM BOARD
VERTICAL MULLION
RIGID INSULATION
PAINTED COMPOSITE METAL PANEL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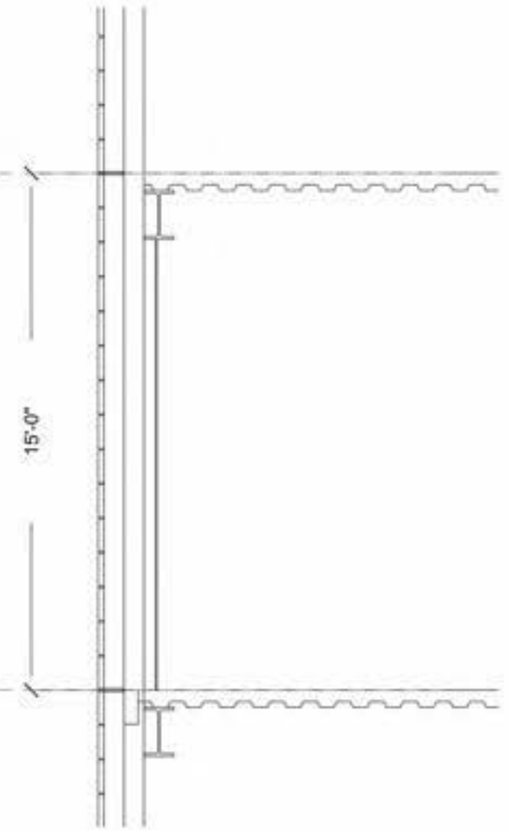
1'-5 3/4"
5'-2 1/8"
2'-5 1/8"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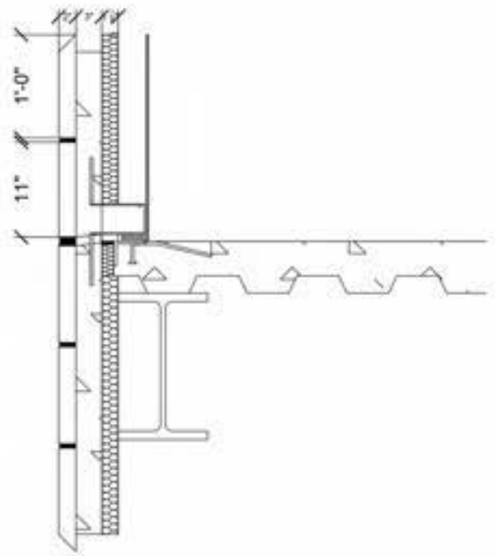
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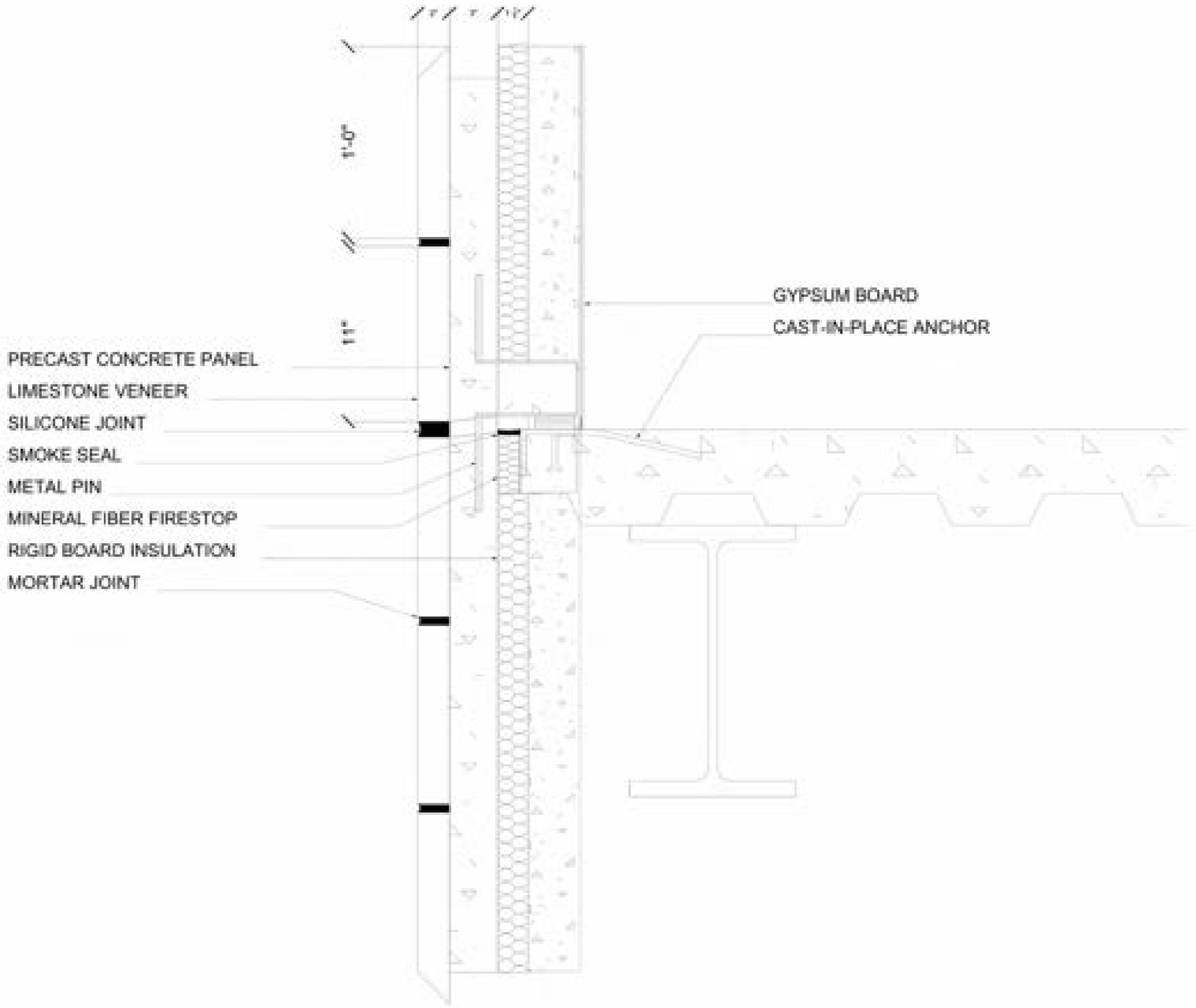
11"


1'-0"
1'-0"
GYPSUM BOARD
CAST-IN-PLACE ANCHOR
PRECAST CONCRETE PANEL
LIMESTONE VENEER
SILICONE JOINT
SMOKE SEAL
METAL PIN
MINERAL FIBER FIRESTOP
RIGID BOARD INSULATION
MORTAR JOINT

Maria Doku

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