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College of Environmental Design, Department of Architecture

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Section I: Introduction

About Me

I grew up on a cattle ranch in Northern California, where hard work, independence, and resilience were instilled in me from a young age. As one of seven children and the only dwarf in my family, I quickly learned how to adapt to a world not always built with me in mind. My earliest inspiration for architecture came from helping my mom design her dream home. We started with magazine clippings, piecing together floor plans and ideas at the kitchen table, and later I began experimenting with computer programs to bring those visions to life. That childhood creativity sparked a passion that has shaped my career path ever since.

Eager to pursue this interest, I graduated high school early and attended Sierra College, where I earned an AS in Architectural Drafting and Engineering Support along with multiple AAs and certificates in architectural specialist drafting. While there, I gained hands-on experience as a tutor and lab assistant, supporting students in engineering and drafting, and as an intern at Domum Architecture, where I worked on design drawing sets, construction documents, and code research.

Putting myself through school without financial assistance required me to balance full-time work with full-time study, which strengthened my discipline and commitment. After transferring to Cal Poly Pomona in 2021, I expanded my architectural knowledge while working for Sustainable Energy Group, where I built their solar drafting department, and later joined Hunsaker and Associates as a planning and civil drafter. These roles allowed me to bridge design education with real-world application, honing both technical and creative skills.

At Cal Poly Pomona, my dedication has been recognized with multiple Outstanding Architecture Student awards, the Architecture Chair's Choice Award, interim exhibitions, and a third-place in the 2025 CASH Student Design Competition. Now in my final year, I look forward to pursuing a career focused on inclusive, sustainable, and community-oriented architecture—creating spaces that unite accessibility with beauty, green design, and opportunities for families to thrive.



Figure 1: Concept Image showcasing family and stacked housing with backyards

Abstract

This project explores how a single building can meaningfully support family life in the city by merging housing, childcare, and neighborhood services into a unified architectural ecosystem. Located in Lincoln Heights—a community defined by young families, limited resources, and a lack of accessible private outdoor space—the proposal responds directly to social, environmental, and economic pressures identified in the program and site research. The design introduces a terraced massing strategy where each residential unit receives a private yard, bringing the spatial and emotional value of suburban outdoor living into a dense urban context. These shifted platforms create a rippling form that enhances airflow, daylight, and opportunities for planting, allowing nature to permeate every level. Each yard follows the Single Family Home urban ratio of 40/60 in unit footprint to outdoor space.

Beneath the residential terraces, a community-support level integrates daycare reducing the daily burdens families face while strengthening neighborhood networks. A public ground floor anchors the building with a market, and book café that promote walkability and family life while protecting the daycare from the street face. Together, these layers operate as a “vertical family city,” providing stability, connection, and shared opportunity. The project reframes multi-family housing as a holistic support system—an environment designed not only to house families, but to help them thrive.

The Problematic: How to achieve the American dream of house with backyard in a dense urban environment while providing a meaningful family support system? How can the design seamlessly integrate family-centered living and green communal spaces within mixed residential-commercial programs that foster, promote, and support family living?

Cities are increasingly inhospitable to the very families who most depend on their services, opportunities, and cultural networks. In neighborhoods like Lincoln Heights—defined by young households, working-class residents, limited incomes, and dense living conditions—the challenges of raising children are compounded by the high cost of housing, long commute times, fragmented childcare access, and a severe lack of safe, usable outdoor space. These inequities create a daily burden that forces many families to choose between remaining rooted in their communities or relocating to the suburbs in search of stability, support, and a sense of belonging. This condition forms the central problematic of the project: How can architecture transform the dense urban building into a complete support system for family life, rather than a series of units stacked in isolation?

Traditional multi-family typologies prioritize efficiency and density at the expense of livability and human-scaled outdoor access. Families need more than adjacency—they need support structures that align with their daily rhythms and provide opportunities for growth, connection, and autonomy. Among these needs, the presence of a private yard is especially significant. For generations, the suburban home with a yard has embodied the American Dream: a place where children play freely, parents find respite, and families experience stability and independence. In dense urban environments, this foundational element of childhood—safe outdoor play—is often lost. As a result, many children are pushed indoors, turning increasingly to digital devices for engagement rather than physical activity, exploration, or social interaction. The absence of private outdoor space has become not only a spatial shortcoming but a cultural and developmental one.

This thesis argues that reintroducing the yard into urban family housing is both a social and environmental imperative. A yard for each unit becomes a tool for restoring childhood play, encouraging daily contact with nature, and strengthening the emotional foundation of home. It also offers an alternative to the land- and energy-intensive model of suburban expansion. By bringing the yard upward—into terraces integrated within a dense footprint—the project suggests that families can experience the emotional benefits of suburban life while contributing to a more environmentally sustainable urban future.

The design agenda therefore proposes a new model for multi-family housing that merges residential, social, and economic infrastructures into a single, interdependent architectural system. It investigates whether a dense building can deliver the spatial and emotional benefits of suburban living while embedding the community resources families depend on. The question is not only formal, but deeply social: Can one building meaningfully support the daily life cycle of families, creating an environment where they can not merely reside, but thrive?

To address this, the project focuses on two primary strategies: typological reinvention and programmatic integration.

First, the typology is reimagined through the introduction of a private yard for every unit. A terraced massing system creates outdoor spaces at each residential level—spaces for gardening, play, gathering, and moments of solitude. These terraces restore a sense of autonomy and connection to nature, translating the core promise of the suburban yard into a vertical urban model. By shifting the massing horizontally, the building ensures adequate sunlight, airflow, and visibility, transforming the façade into a living terrain that supports families physically and emotionally. These terraced backyards also follow the urban scale single family home ratio of 40/60 outdoor space to house footprint size.

Second, the program strategy positions family support systems as the building's core infrastructure. A daycare for four different age groups servicing over 50 children not only supports the buildings children but the neighborhood's as well, bringing the neighborhood within the project. This program is protected from the street view allowing privacy and safety for the children while allowing for the convenience of close accessible childcare which reduces the daily stresses of urban family life.

Facing the street on the ground floor, a public neighborhood market, and book café activate the street edge, promote walkability, and anchor the building in the cultural and economic rhythms of Lincoln Heights. These essential programs like the neighborhood market saves family time and money to give back into their family. There is no current grocery store within or nearby Lincoln Heights making this program essential for family prosperity. This ground plane is not merely a podium but a family support system supporting both local needs and everyday convenience.

Collectively, these strategies form a holistic architectural ecosystem—a Vertical Family City—that challenges the limitations of conventional multi-family housing. By merging private yards, community programming, and neighborhood-serving commerce into a single organism, the project proposes a new housing paradigm centered on accessibility, dignity, and family-centered living.

Ultimately, this thesis contends that architecture can play a transformative role in restoring the foundational elements of childhood, strengthening families, and redefining what the American Dream can look like in an ecologically responsible, financially stable, socially connected urban future.

Section II: Site Research



Figure 1: Site Axon with purple shadow of Site

Site Research

The combined plots at 1784 N Albion St, 1780 N Albion St, 306 S Ave 17, and 312–314 S Ave 17 sit in a distinctive area of Los Angeles where history, culture, and future potential intersect. Nestled near the Los Angeles River and framed by views of the mountains and downtown skyline, the site reflects both the layered past of the Lincoln Heights and Chinatown edge and the city’s growing vision for livable neighborhoods.

Historically, this area developed in the late 19th and early 20th centuries as one of the city’s earliest suburban tracts, later reshaped by railroads, warehouses, and industry. Residential enclaves, like those along Albion Street, provided housing for working-class families—often immigrant communities who contributed to the growth of Los Angeles’s industries. The neighborhood also evolved with schools, small markets, and cultural gathering spots that anchored daily life. Although some historic buildings have been lost or repurposed, the area retains a distinctive mix of homes, industrial buildings, and civic landmarks that embody its resilience and diversity.

Breweries and wineries also played a key role in the district’s development, tying it to Los Angeles’s industrial and cultural heritage. The nearby Pabst Brewery, once one of the largest employers in the area, was later transformed into the Brewery Art Colony, now one of the world’s largest live-and-work artist communities. This adaptive reuse preserved the industrial character of the site while cementing the area’s reputation as a hub for creative production. Similarly, the San Antonio Winery, established in 1917 nearby, has endured as a family-run institution and remains the only producing winery in Los Angeles. Its survival through Prohibition and urban change is a testament to the neighborhood’s adaptability and cultural roots. Together, these landmarks highlight a history where industry, community, and creativity intersected, offering a foundation that a new multi-family complex could honor and extend.

In recent years, the district has transitioned away from heavy industry toward a more balanced urban fabric. Old factories have become lofts and art studios, while parks and greenways along the river have reintroduced natural landscapes. Creative hubs such as Keystone Art Space sit alongside restaurants, shops, and schools, reflecting the growing importance of culture and community in shaping the neighborhood. This shift signals a future that emphasizes walkability, mixed-use development, and stronger ties to the river and open space.

Looking ahead, city planning efforts such as the Cornfield Arroyo Seco vision (CASP) anticipate transforming this district into a model of urban village living. The long-term framework encourages pedestrian-oriented development, open space, and housing integrated with neighborhood services. The goal is to replace outdated industrial corridors with vibrant mixed-use neighborhoods that provide homes close to parks, schools, transit, and small businesses. Within this vision, multi-family projects are seen not simply as housing but as cornerstones of livable and sustainable community design.

A family-focused multi-family complex on this site would be a natural fit. The scale of the plots allows for clustered housing that can integrate shared courtyards, gardens, and terraces while still maintaining density. Family-oriented apartments would bring long-term stability and vibrancy to the neighborhood. By aligning with these principles, the project could activate the street edge with a neighborhood market, connect to the Los Angeles River, and provide open spaces that echo the historic patterns of gathering and recreation in Lincoln Heights. This not only supports the city’s broader vision but also directly benefits the community by adding homes for families where schools, parks, and culture are already within walking distance.

Ultimately, the site represents a rare opportunity to create housing that is not only functional but also deeply connected to its setting. Rooted in the history of railroads, industry, breweries, and wineries, and oriented toward a future of sustainability, creativity, and family-centered living, a multi-family complex here would embody the evolving urban character of Los Angeles. It would provide homes while creating a framework for connection—to neighbors, to culture, and to the natural landscape—making it a meaningful addition to the city’s fabric.



Figure 2: Site Collage view of the site highlighting the local church, adjacent park, Keystone Art Space, and visual connection to the Los Angeles skyline.



Figure 3: General Site Program Map

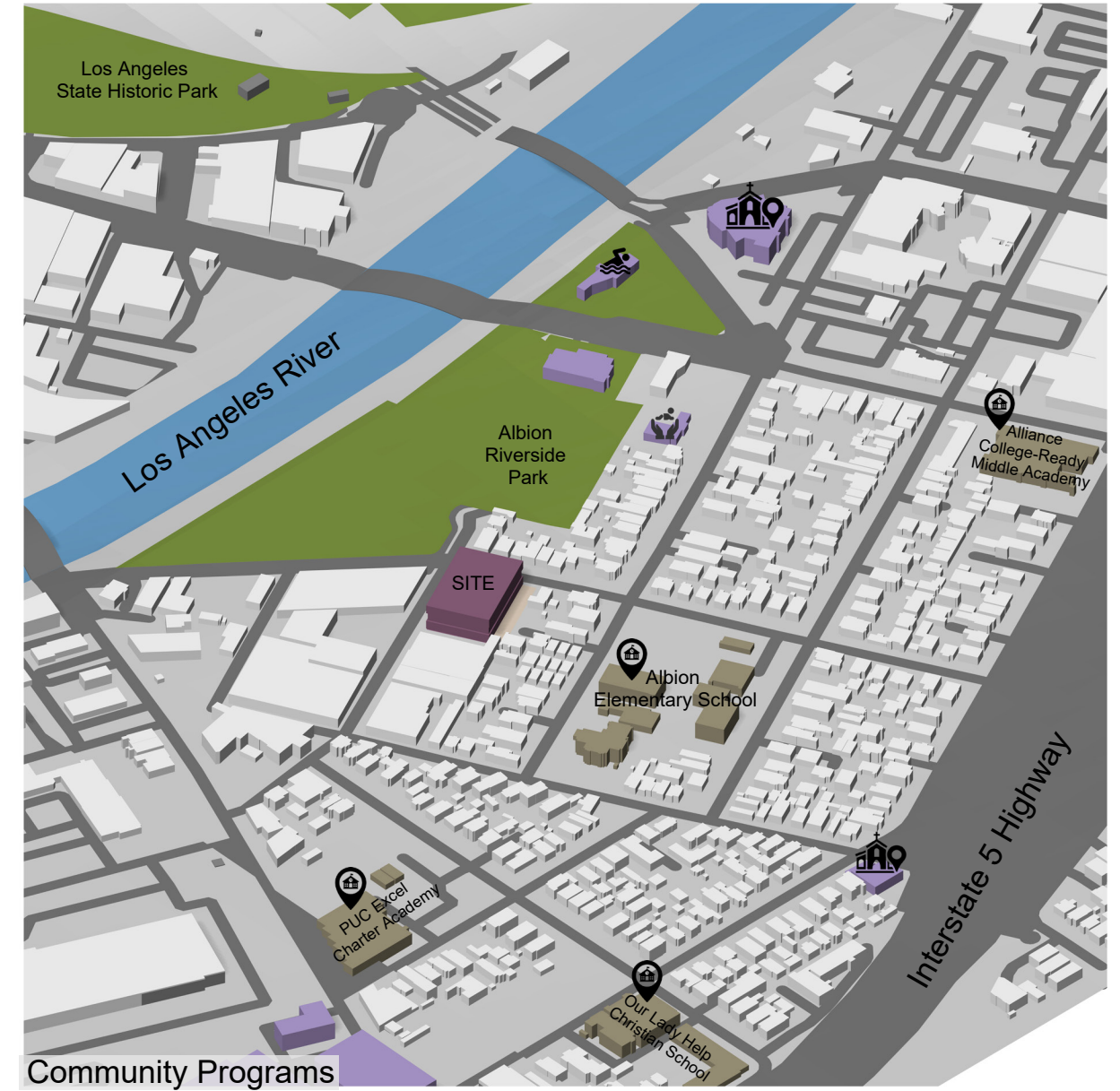


Figure 4: Community Programs, Churches, Schools, Daycares, Parks, etc.

Demographic Profile

The area falls within ZIP code 90031, which contains roughly 36,800 to 37,300 residents living in about 11,900 to 12,200 households (average household size ~3.0 people). The median age is approximately 36.9 years, placing this neighborhood in line with—or slightly younger than—the broader region.

Racially and ethnically, the neighborhood is predominantly Hispanic/Latino, accounting for more than 60 percent of the population, with a significant Asian minority (around 20–25%) and smaller proportions of White, Black, and multi-racial residents. A substantial share of residents are foreign-born, making up approximately 42–43% of the community. Linguistic diversity is also evident: nearly a quarter of residents report that they speak English “not well” or not at all.

Economically, the median household income is in the mid-\$60,000 range (circa \$62,119) for 90031. Poverty estimates suggest that nearly one in five households faces economic challenges. Renter-occupancy is high, with many households in multi-family or apartment settings.

Educational attainment in the area trends lower than county averages: only a small share hold bachelor’s or higher degrees (about 15% or lower). Typically, many residents have a high school diploma, some college, or vocational credentials.

This demographic profile signals a diverse, working-class community with families and young adults forming the bulk of household types. The prevalence of renting, moderate incomes, and mixed educational levels highlight both challenges and opportunities — particularly with respect to equitable housing, neighborhood-serving amenities, and culturally responsive design. A family-oriented multi-family development in this context can contribute meaningfully by providing stable housing, promoting social integration, and supporting local services tailored to a richly varied population.

Demographic Profile - Lincoln Heights / 90031

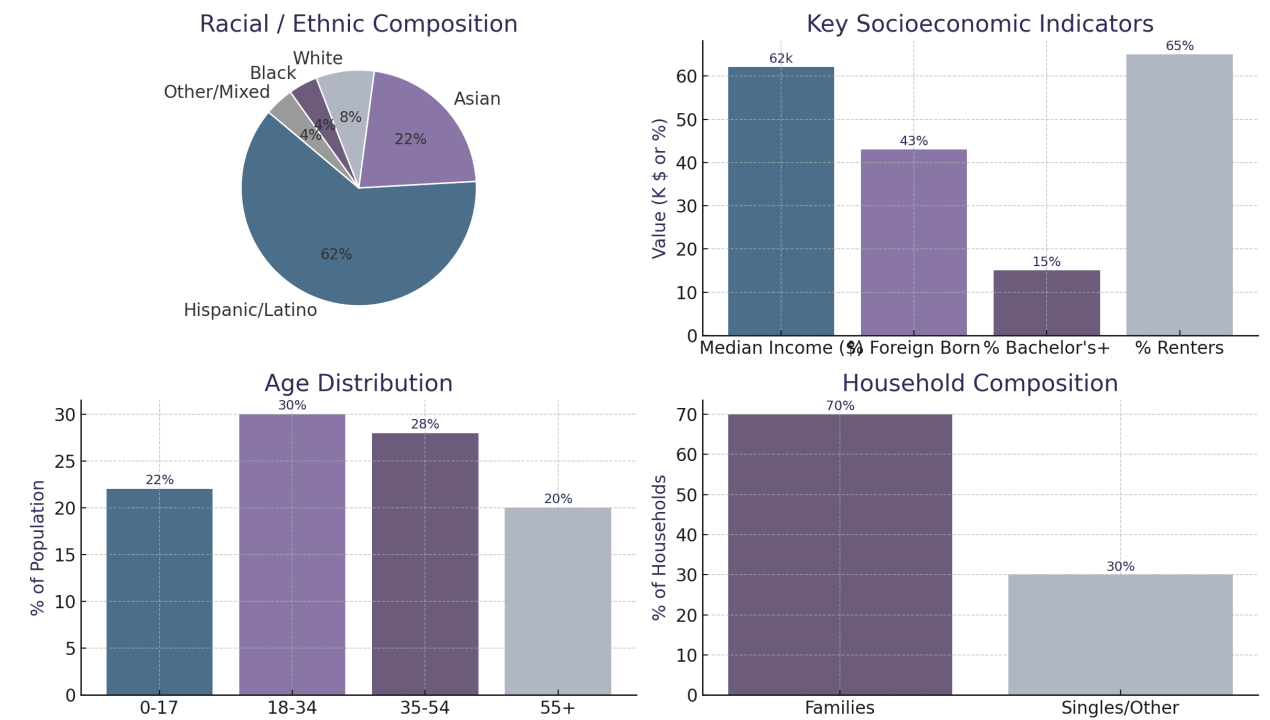


Figure 5: Demographic Diagrams

Zoning Code Data

Zoning Basic Information:

Address on Site: 1784 N Albion St.
 1780 N Albion St.
 306 S Ave 17
 312-314 S 17

APN's on Site: 5447029002
 5447029003
 5447029007
 5447029008

Zip Code: 90031

Zoning: UV(CA) (Urban Village) (CASP)

Lot Size: 24,750 SF (165'x150')

Coverable Lot Area: 85% FAR: 3:1

Residential Setback: 30'

Buildable SF: 74,250 SF

Project Building Size: 62,300 sf

Use Limits: Residential Max 90% Retail Max 20%

Units: 20

Building Levels: 5

Floor Area Ratio (FAR):

-Base FAR: 1.5:1 to 3:1 (projects with >15 units limited to 1.5:1 unless ≤75% residential FAR or using Affordable Housing Bonus).

Setbacks:

- Street-facing retail: 0'–5' maximum.
- Professional office/live-work: 0'–10' maximum.
- Industrial uses: 0'–10' maximum.
- Residential ground floor: 0'–15' maximum.

Height:

- Average project height cannot exceed maximums; parapets may extend 42 inches beyond.
- Shadows on parks/open space limited to 1.5 hours on Dec 21 (10am–2pm)

Height: Standard: Min: 20'-Max Avg 60'

Project: Max 64' (Max Avg 45')

* 94.069 CLEARANCE OF OVERHANGING PROJECTIONS OVER STREETS AND SIDEWALKS. - OVERHANG PROJECTIONS SUCH AS BALCONIES, AWNINGS, CANOPIES, MAY EXTEND OVER BUT NOT OCCUPY 2/3 OF SIDEWALK WIDTH. ALL PROJECTIONS MUST HAVE A VERTICAL CLEARANCE FROM SIDEWALK OF 10-15'.

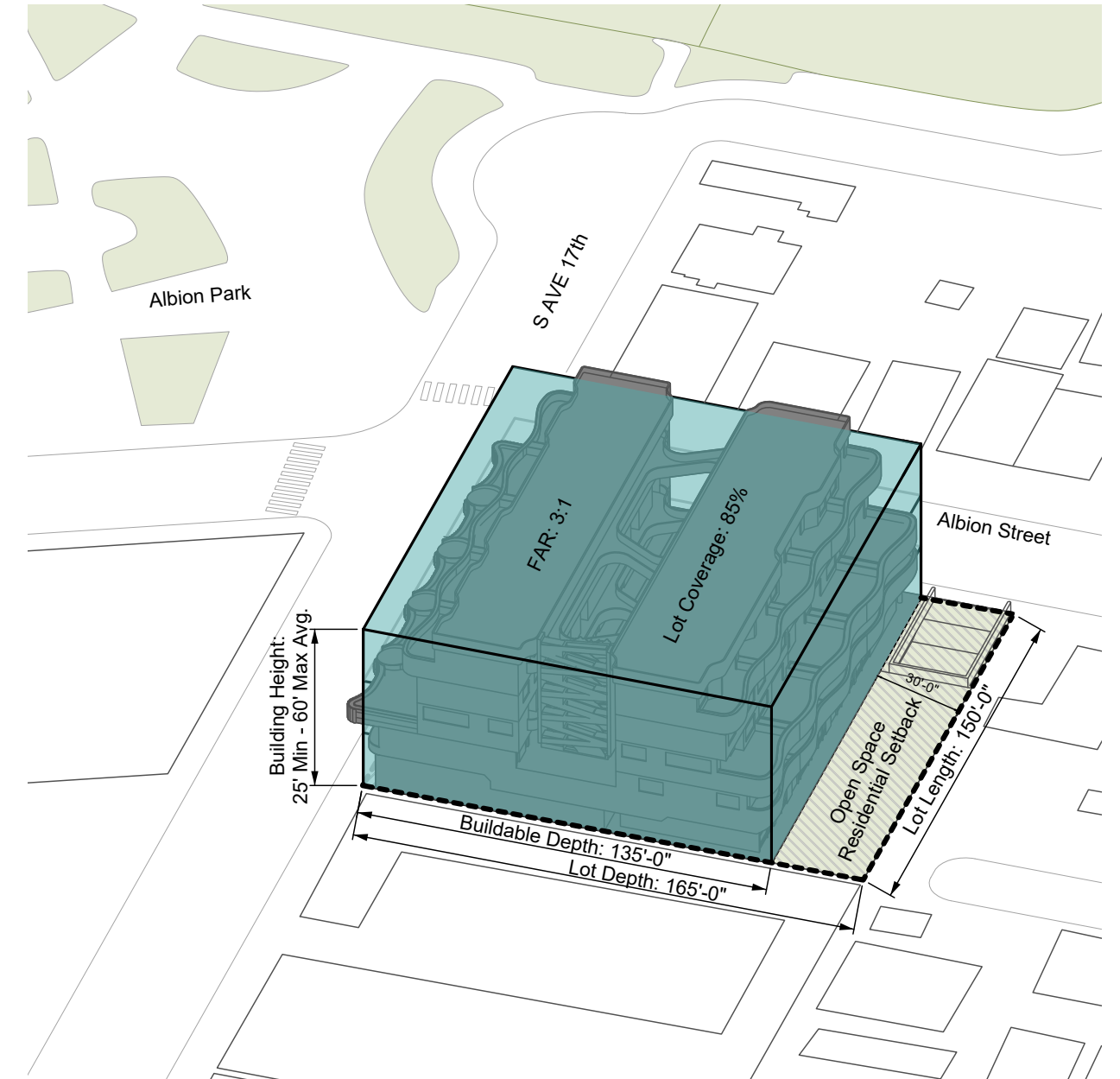


Figure #: Zoning Diagram

Section III: Program & Users Selection



Program Research

The proposed program envisions a family-centered, mixed-use community that merges housing, childcare, and retail into one integrated architectural ecosystem. Grounded in the context of Lincoln Heights—an area with deep cultural roots and a working-class demographic—the project responds directly to the social and economic realities of Los Angeles families. The program’s goal is to provide stability, convenience, and opportunity by interweaving residential life with community infrastructure that supports all generations.

At its foundation, the housing component transitions from single-family typologies to higher-density multi-family living, offering a mix of apartment types to accommodate varying household structures. Families with working parents often face the dual challenge of childcare and limited access to affordable services; this program addresses that need by placing a daycare within the residential complex itself. The proximity between home and childcare allows parents to maintain employment without the logistical strain of commuting long distances, strengthening both family bonds and neighborhood networks.

Neighborhood Market and book café spaces at the street level play a dual role. Functionally, they help offset operational costs through commercial rent, but more importantly, they anchor the development in its urban fabric. The inclusion of a coffee shop and neighborhood market activates the street edge, increases walkability, and provides everyday services that support residents and neighbors alike. These public-facing programs transform the project from a private residential block into a civic hub—one that fosters connection and vibrancy while contributing to the local economy.

The interrelation among program elements is critical to the project’s success. Vertical and horizontal adjacencies are carefully orchestrated: public functions occupy the ground floor for accessibility and visibility; semi-public community programs form the backbone of the project; and private residential units occupy the upper levels. Shared courtyards and terraces knit these layers together, creating visual and spatial connections that allow residents, children, and visitors to coexist while maintaining safety and privacy. This project will reinforce interdependence—families can drop children at daycare, pick up groceries, and grab their morning coffee or go to bookclub without ever leaving the site.

Case studies such as Kampung Admiralty (WOHA), Sugar Hill Development (Adjaye Associates), and Bill Sorro Community (Kennerly Architecture) demonstrate how layering community services with housing produces measurable social benefits. These precedents informed the affinity between childcare and residential life: when these functions overlap physically, they strengthen the social infrastructure of the neighborhood.

Ultimately, this program represents a new urban paradigm for families: a “live–learn–work” ecosystem where architecture serves as a framework for everyday family support. By combining family housing with accessible childcare, daily essentials, the project promotes interdependence, resilience, and belonging. It transforms housing into more than shelter—it becomes a living network that uplifts the people it serves and reflects the evolving needs of contemporary family life in Los Angeles.

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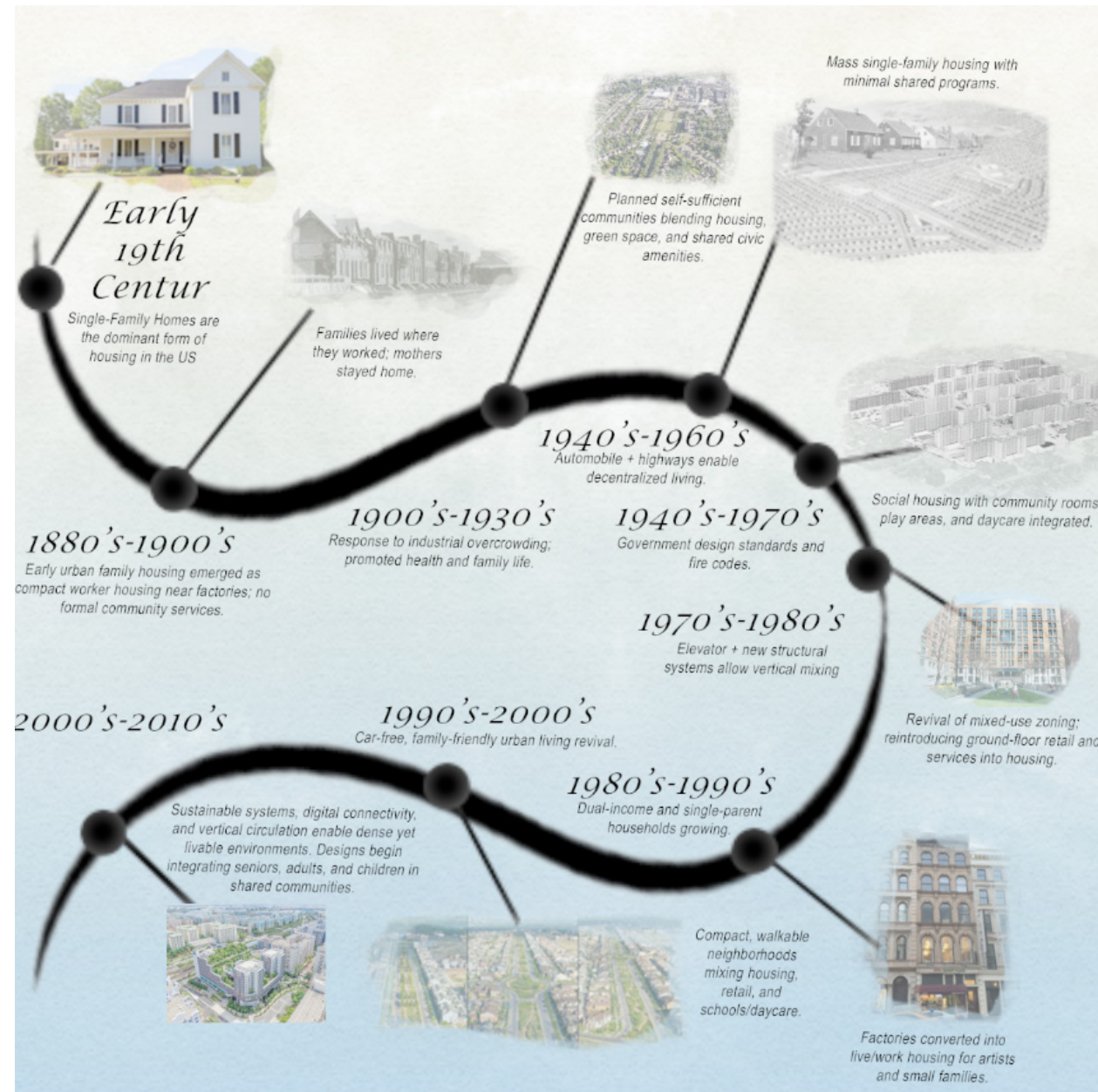
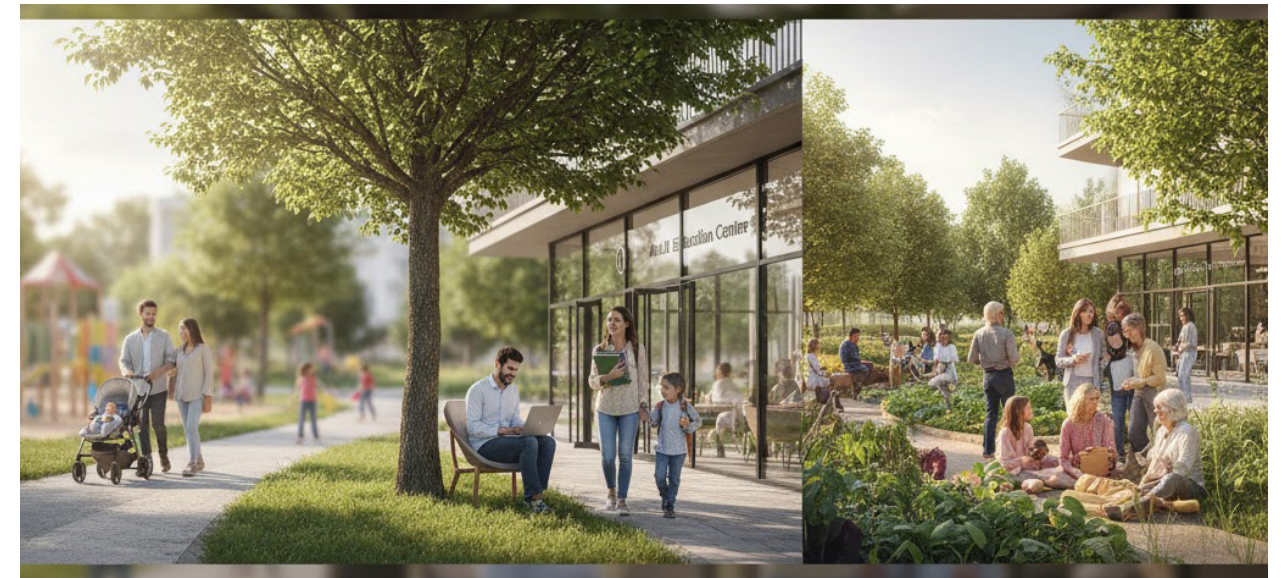


Figure #: Program History Diagram



User Profile

The primary users are working families and young adults in Lincoln Heights who balance work, childcare, and daily needs within a dense urban neighborhood. The project provides residential apartments with private yards, giving families direct access to outdoor space, privacy, and the feeling of a single-family home while remaining within the city. This is especially important for children, who benefit from having safe outdoor space for play, growth, and daily connection to nature.

The project also considers multi-generational living by allowing some units to support grandparents, extended family members, or flexible rental opportunities. This gives households more options for shared childcare, financial support, and long-term adaptability while still maintaining a sense of privacy and independence.

The program responds to daily neighborhood needs through a much-needed Neighborhood Market, offering convenient access to food and essentials in an area with no grocery store options. A daycare supports working parents by keeping childcare close to home, while a resident fitness center promotes wellness within the building. The Bookstore Cafe provides a relaxed place for teens, young adults, and residents to gather, study, read, or connect. Together, these programs create a supportive, family-centered residential ecosystem rooted in convenience, flexibility, wellness, and community life.

Program Analysis 2

1180 Fourth Street
 Mithun-Solomon + Kennerly Architecture and Planning
 San Francisco, CA.
 2014

Program	NSF
Lobby	4,270
Community Room	5,220
Teen Room	2,460
Retail	16,200
Green Space	55,700
Laundry	4,800
Misc	22,800
Studio Apartments	880
1 Bedroom Apartments	34,500
2 Bedroom Apartments	38,600
3 Bedroom Apartments	62,400
Total NSF	192,130
Total GSF	216,000

Grossing Factor

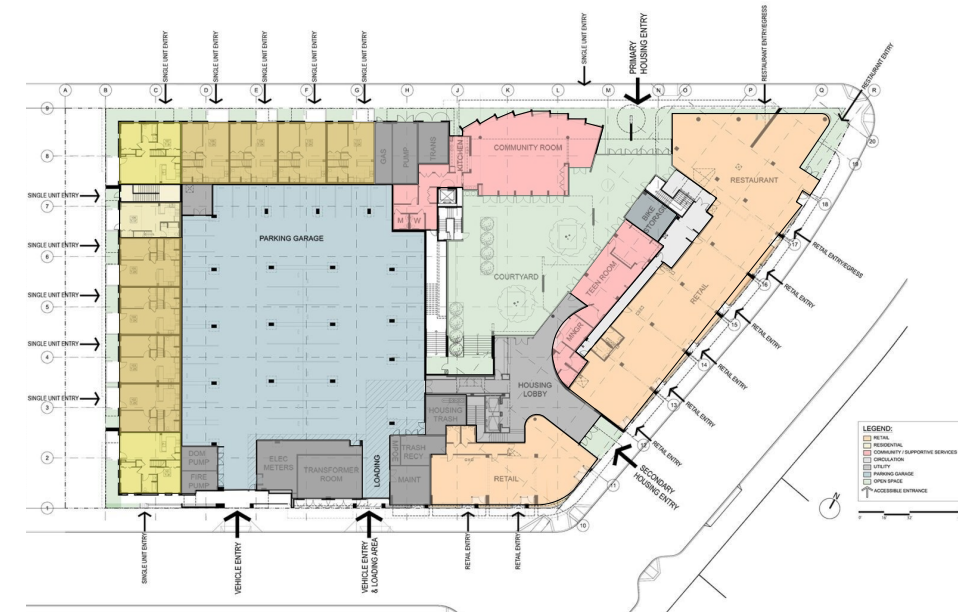
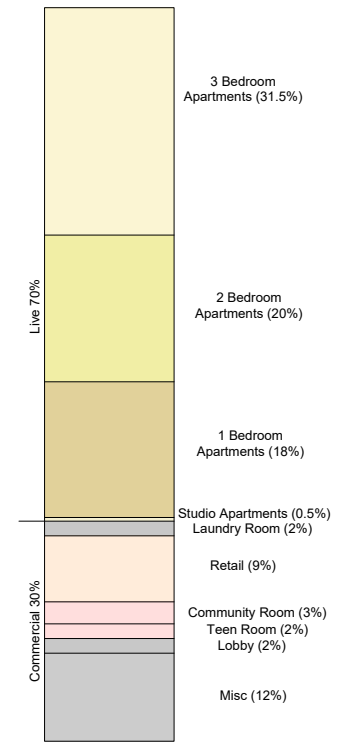
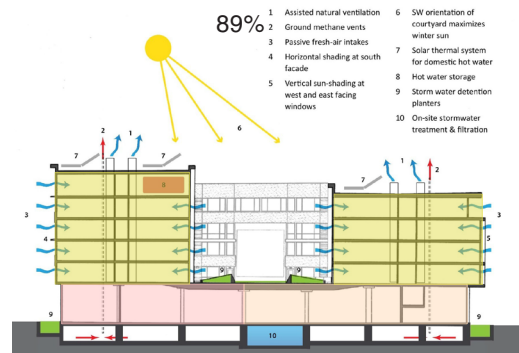


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Program Analysis 3

Sugar Hill Development
 Adjaye Associates
 New York
 2014

Program	NSF
Museum	12,800
Community Room	4,900
Green Space	55,700
Non-Profit Space	22,800
Day Care	6,900
Studio Apartments	30,350
1 Bedroom Apartments	13,200
2 Bedroom Apartments	39,800
3 Bedroom Apartments	17,400
Total NSF	148,150
Total GSF	172,665
Grossing Factor	86%

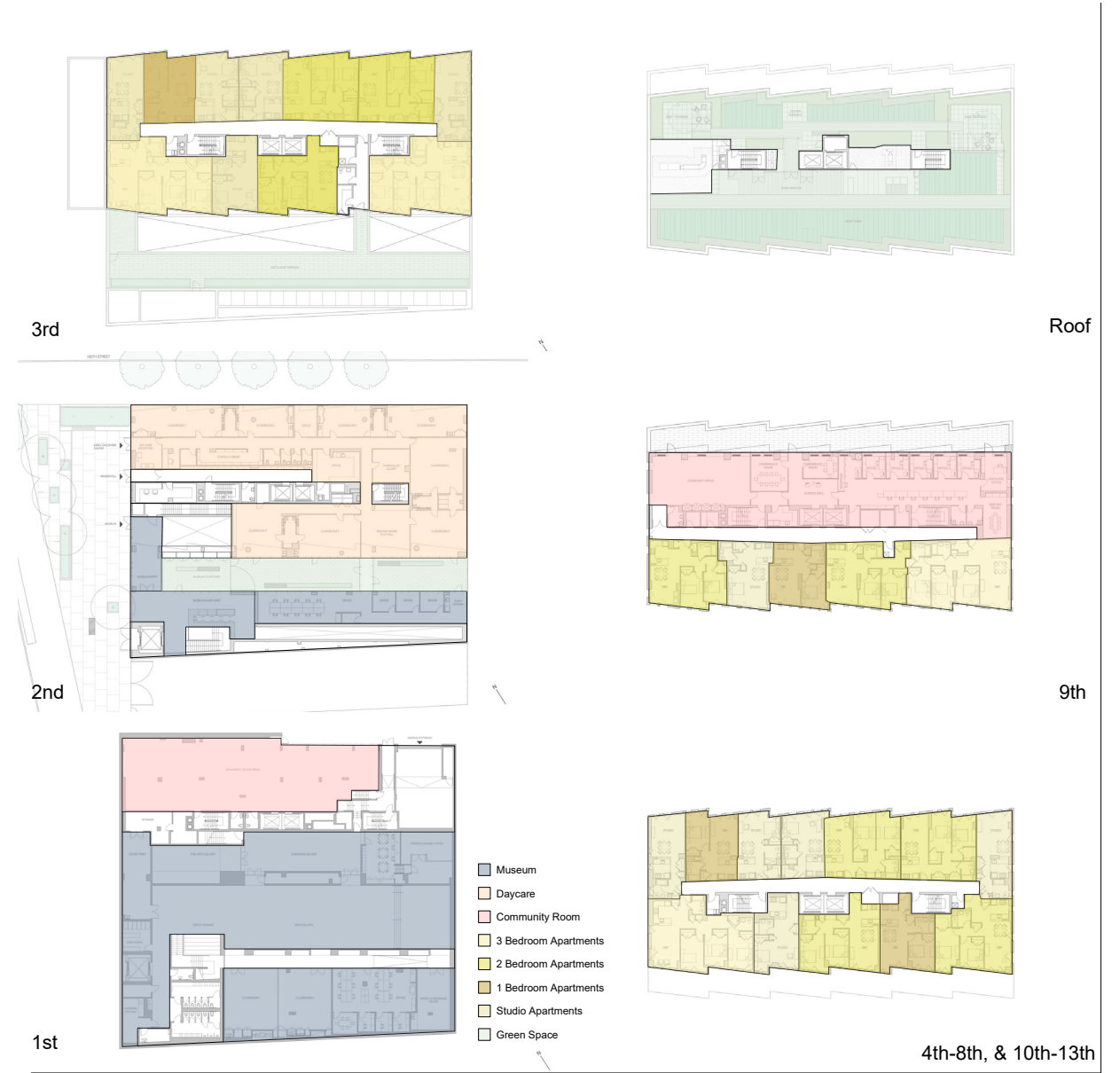
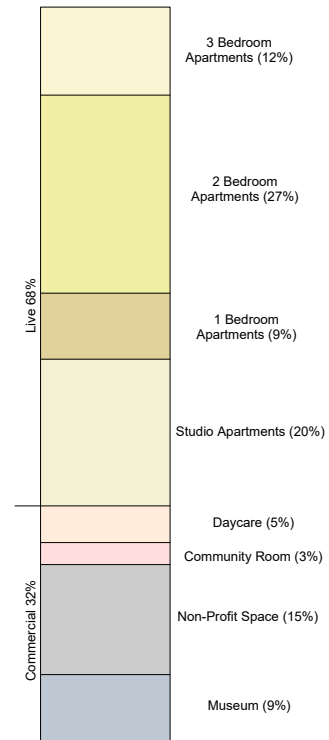
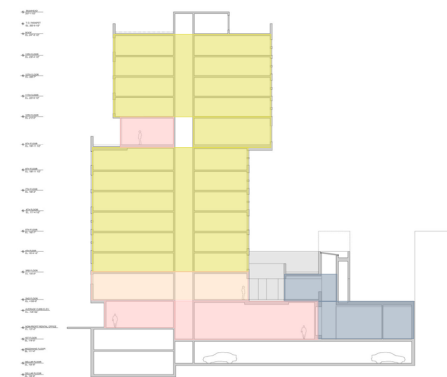


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Generic Program

The Backyard Estates
 Volheim Architecture Design
 Los Angeles, CA
 2026

Program	NSF
Commercial: 29%	(16,300)
-DayCare (10%)	5,800
-Cafe (5%)	2,500
-Convience Store (14%)	8,000
Communial Residential: 11%	(6,300)
-Residential Office Center (3%)	1,600
-Residential Fitness Center (5%)	3,000
-Residential Lobby (3%)	1,700
Housing: 60%	(33,900)
-1 Bedroom Apartment (5%)	2,800
-2 Bedroom Apartment (5%)	2,800
-3 Bedroom Apartment (20%)	11,300
-4 Bedroom Apartment (30%)	17,000
Total NSF	56,500
Total GSF	74,250
Grossing Factor	86%
Outdoor/Green Spcae	33,300

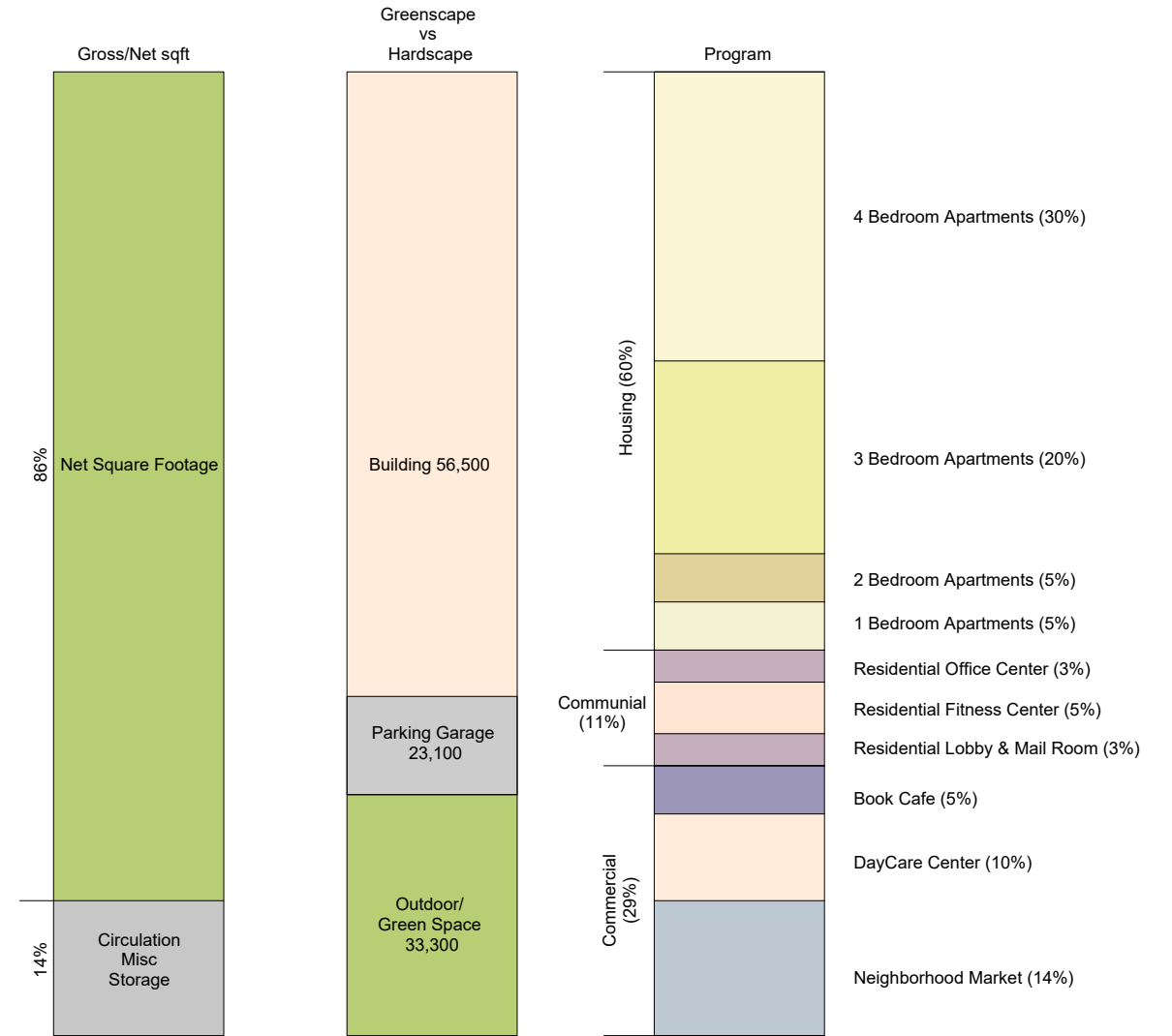


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Section IV: Research & Design Studies

Precedent Building Massing & Organization Strategies

This precedent comparison examines the Karl Miller Center at Portland State University (Behnisch Architekten + SRG Partnership) and the Byblos Town Hall in Lebanon (Hashim Sarkis Studios), focusing on how massing and circulation strategies shape public engagement. Both projects use bi-level or under-mass entry conditions, creating thresholds that function less as single doorways and more as spatial transitions between city and interior.

At the Karl Miller Center, the massing is organized as two primary volumes—an existing renovated structure and a new angular addition—connected by a multi-story atrium. The building is entered under and between these masses, enabling movement from different campus elevations and blending circulation with public gathering. The atrium becomes the organizational heart, visually and physically linking interior programs, study terraces, and circulation bridges.

Similarly, Byblos Town Hall lifts and elevates part of its mass, forming a shaded civic plaza beneath. Entry occurs below this lifted volume, framing arrival as a communal moment rather than an isolated threshold. Internally, programs are arranged around a central civic void, with circulation emphasizing collective public presence.

In both projects, massing and sectional entry strategies reinforce openness, public gathering, and shared spatial identity.

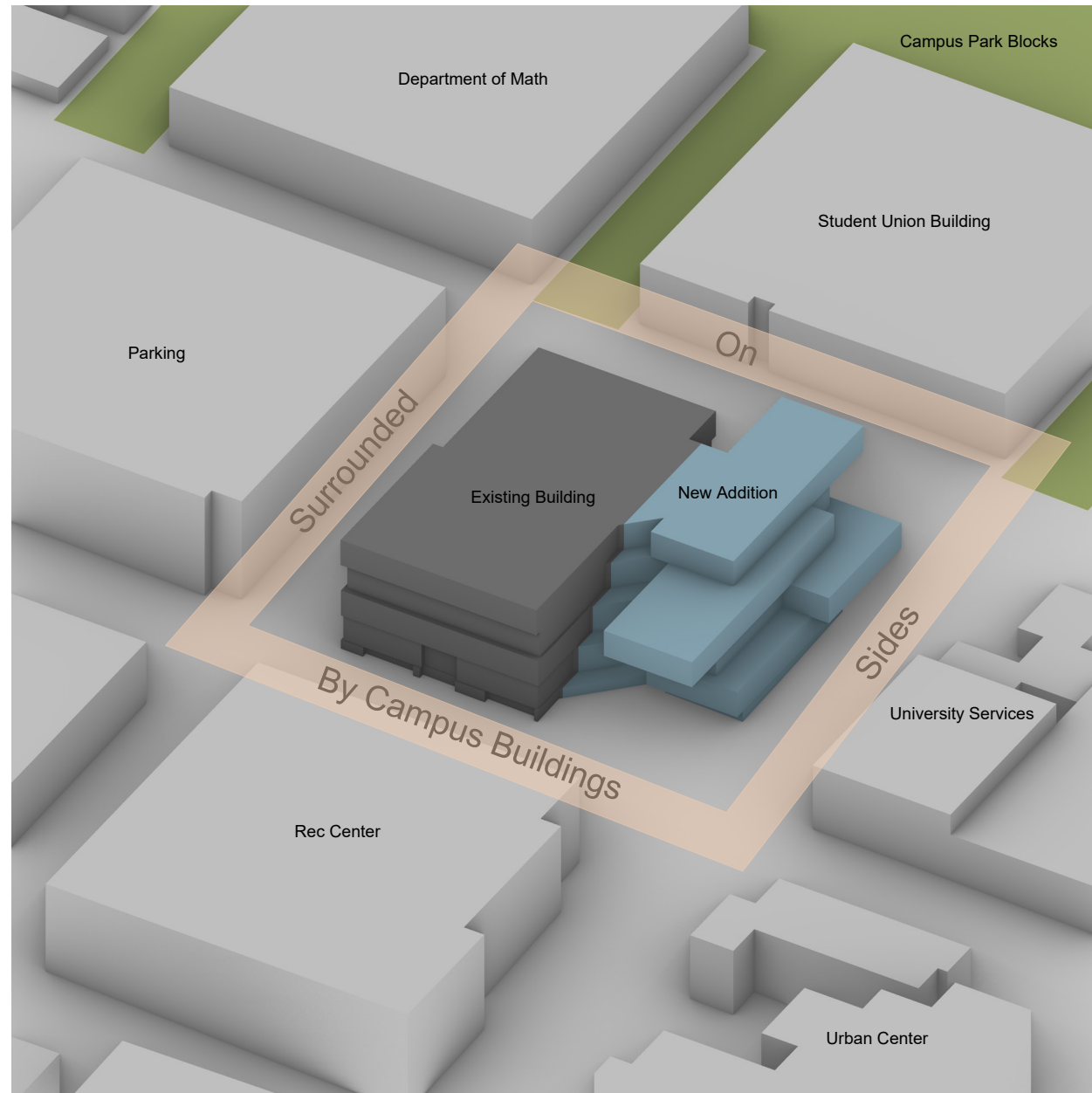


Figure 1: Portland University Base Massing, Surrounding context, 360 surrounding views, New vs old building additions.

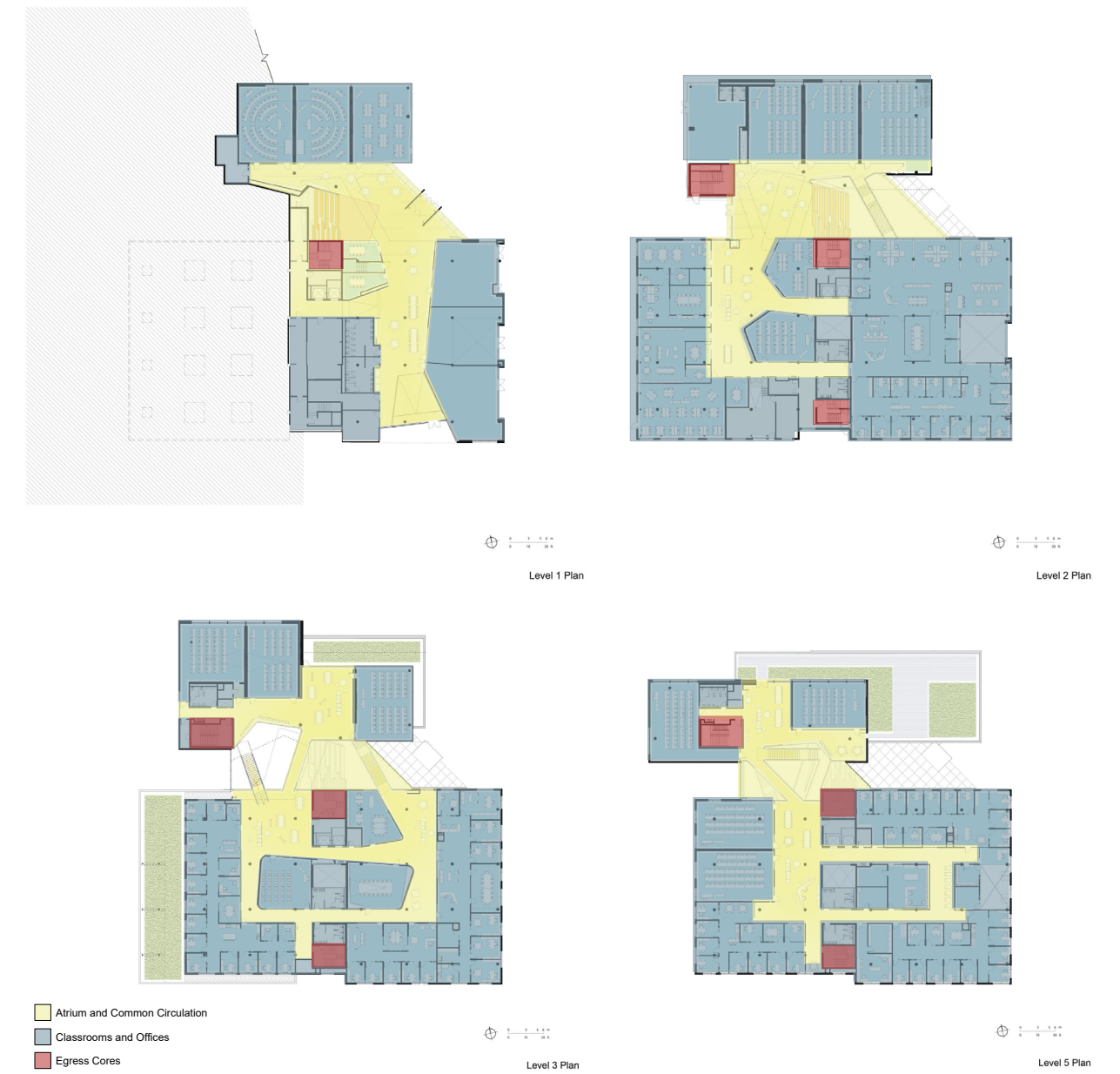
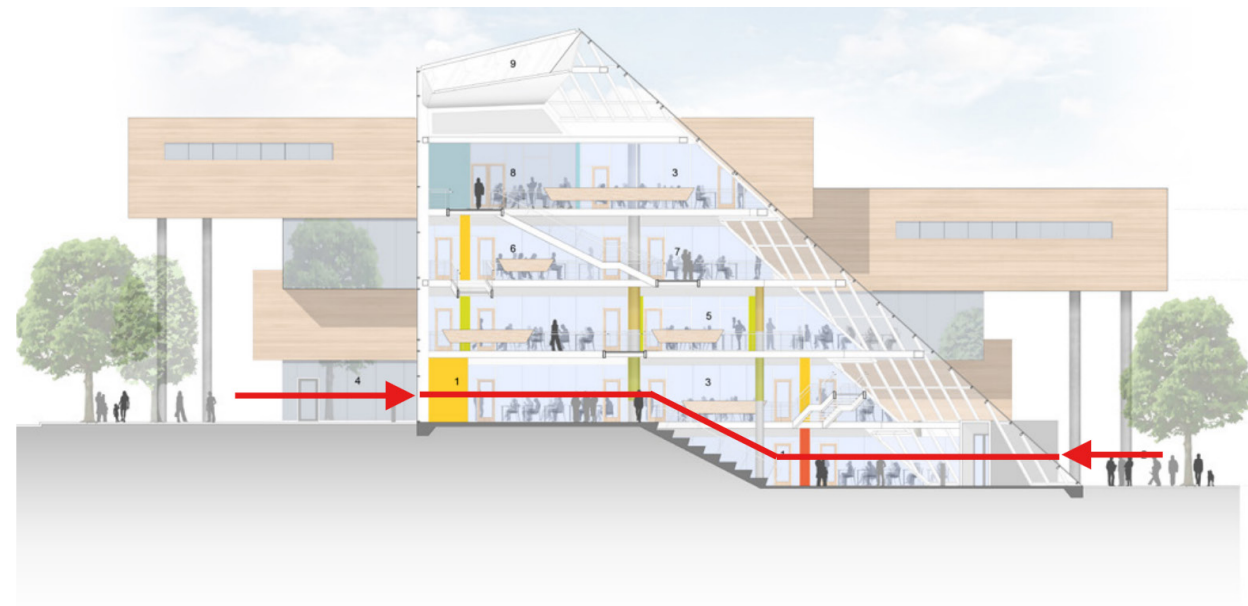


Figure 2: Portland University, Program Plan Parti Diagram



East-west section

Figure 3: Entry Section Showing Bi-Level Entries. Shows Main Entry's Under Massing Program with Atrium Connection

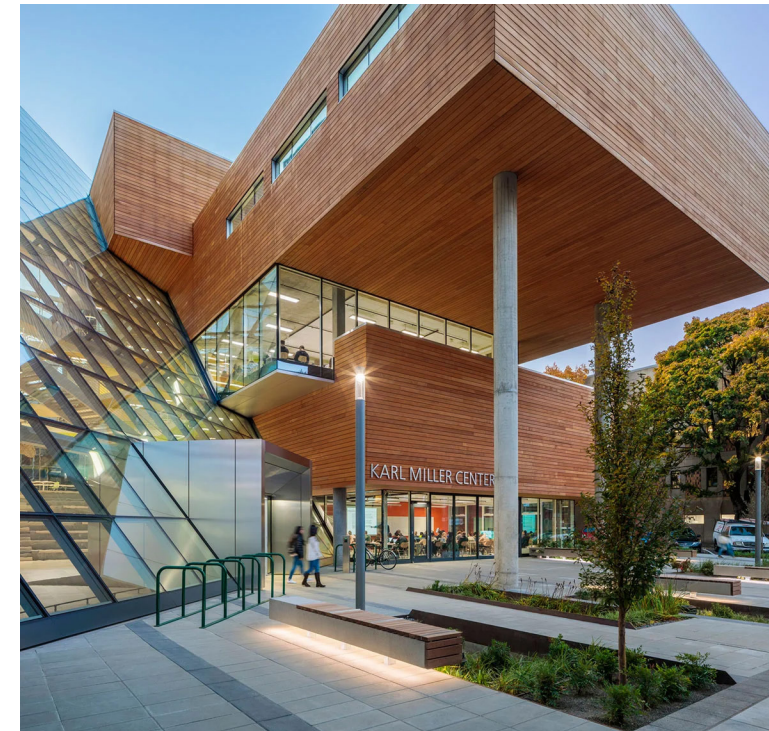
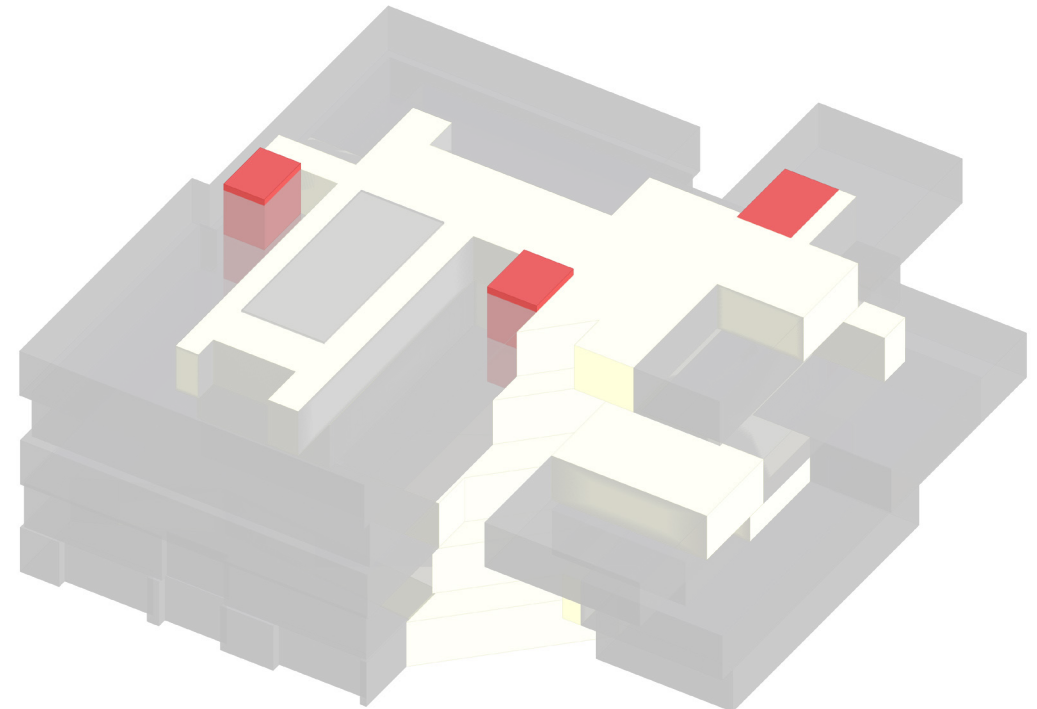


Figure 4-5: Main Entries to building from North/West and South/East show casing entry under program massing



■ Egress Cores
■ Main Circulation
■ Building Program Mass

Figure 7: Axon Diagram showing Main Circulation and Egress Cores

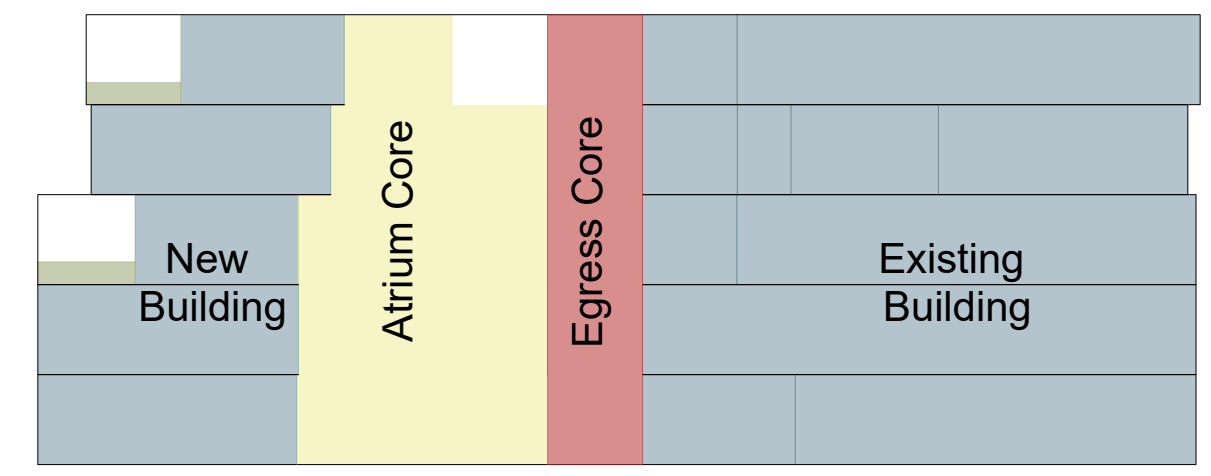


Figure 8: Program Section, Main Atrium Showcasing Separation Between New Building and Existing Building

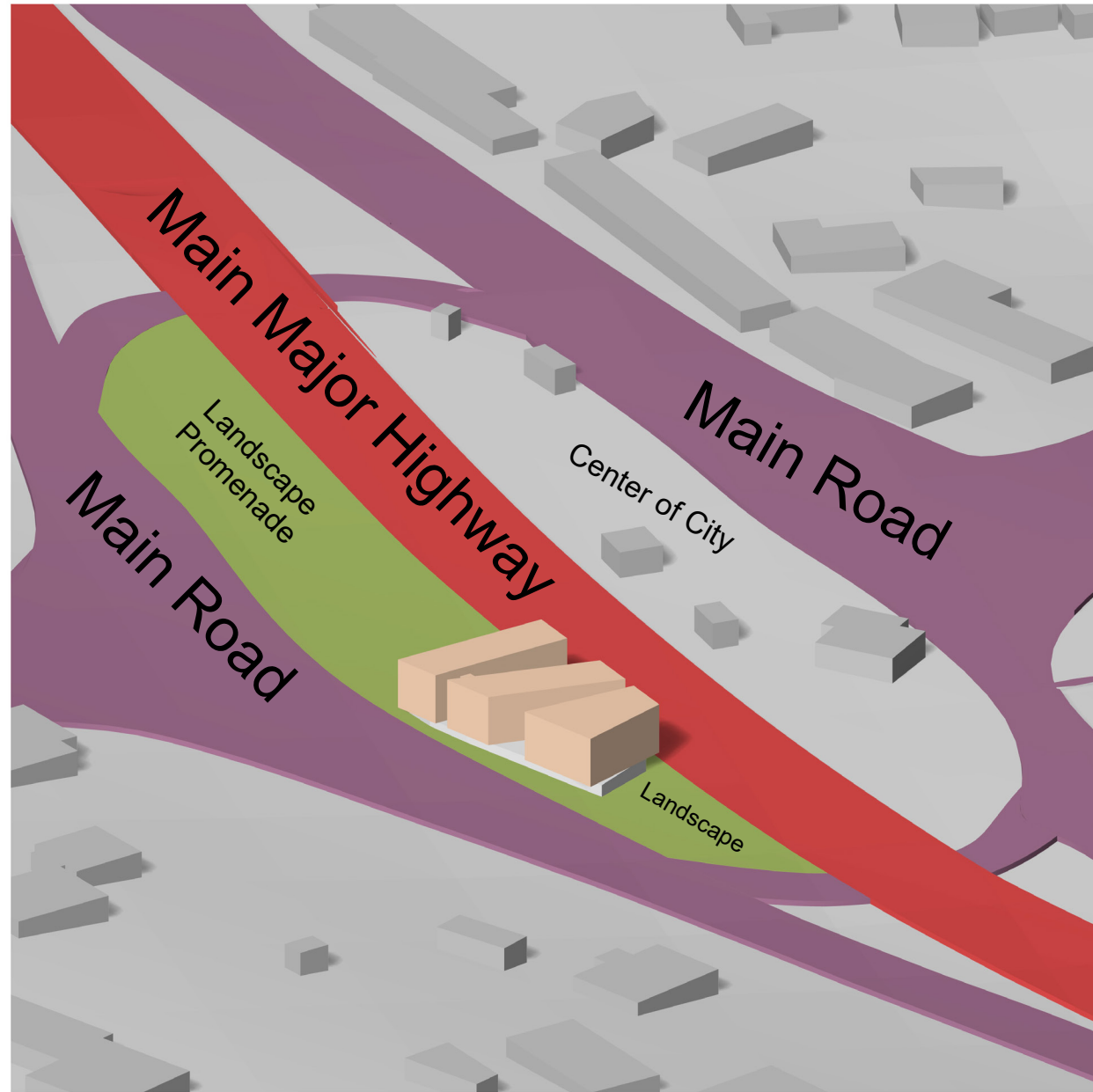


Figure 9: Site Relation Diagram. Byblos Town Hall Site is Sandwiched between main highway and main road at the center of the city.

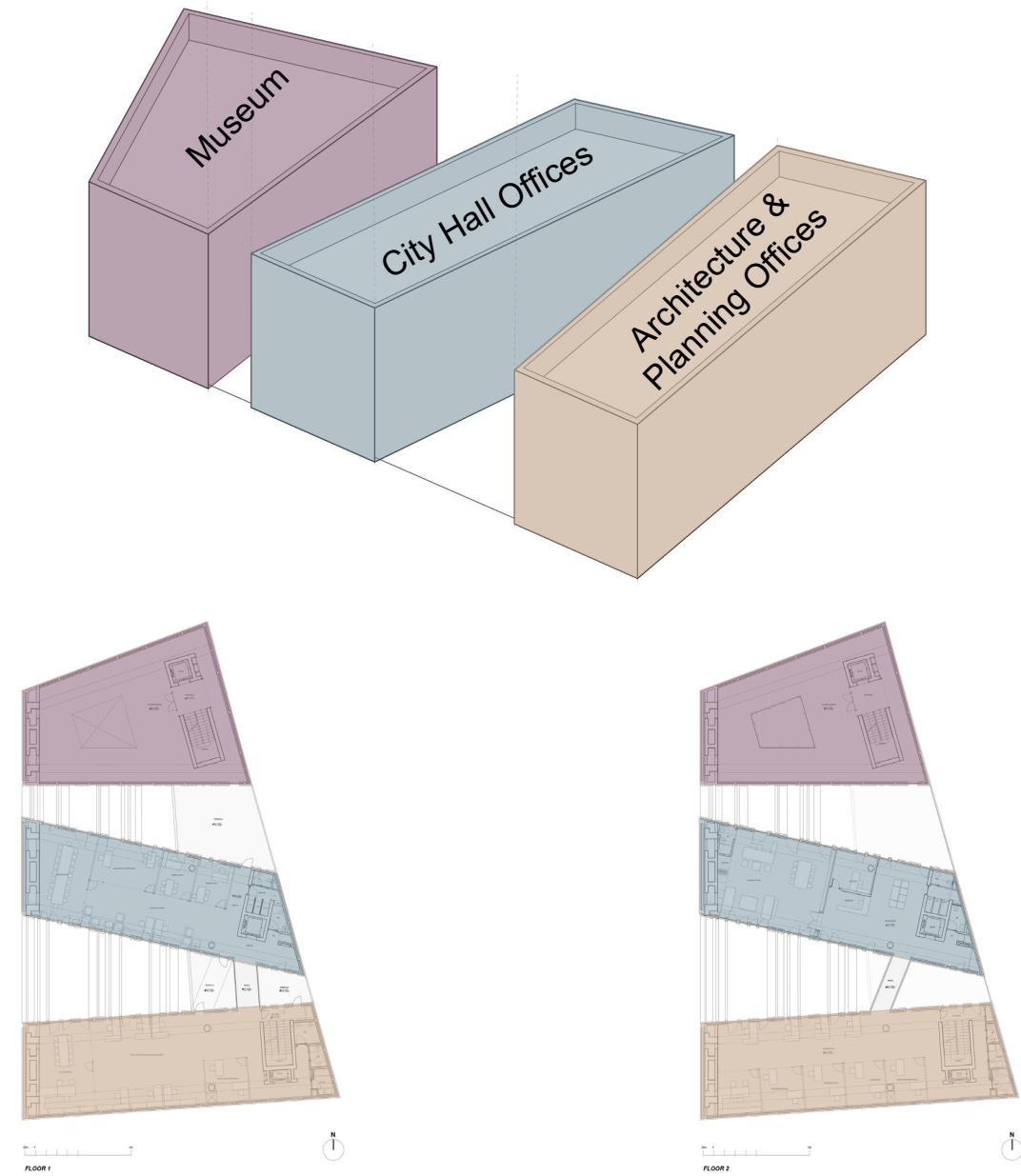


Figure 10: Main Massing Building Shape

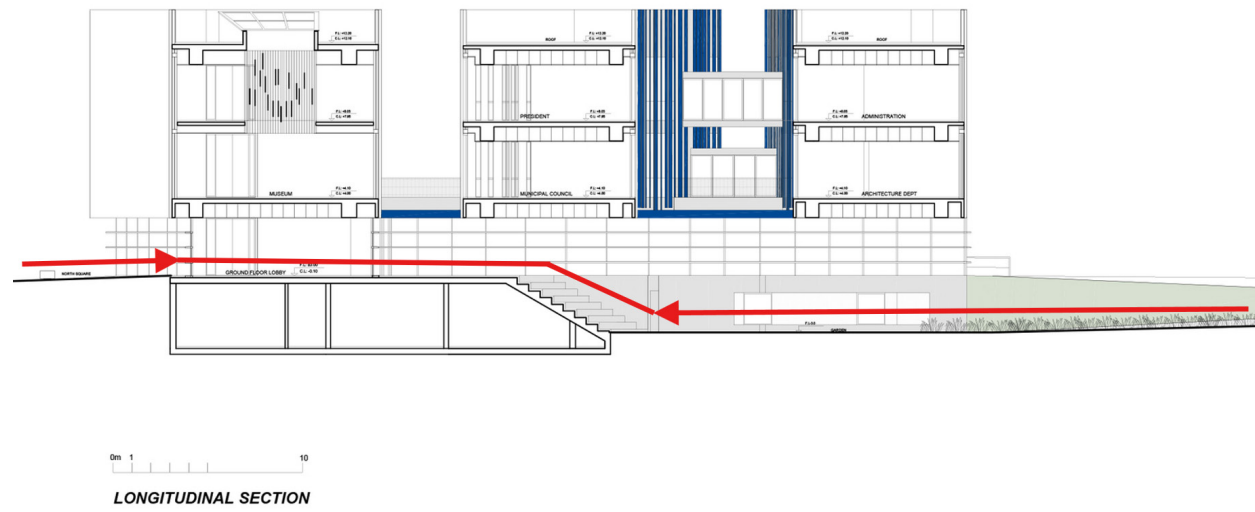
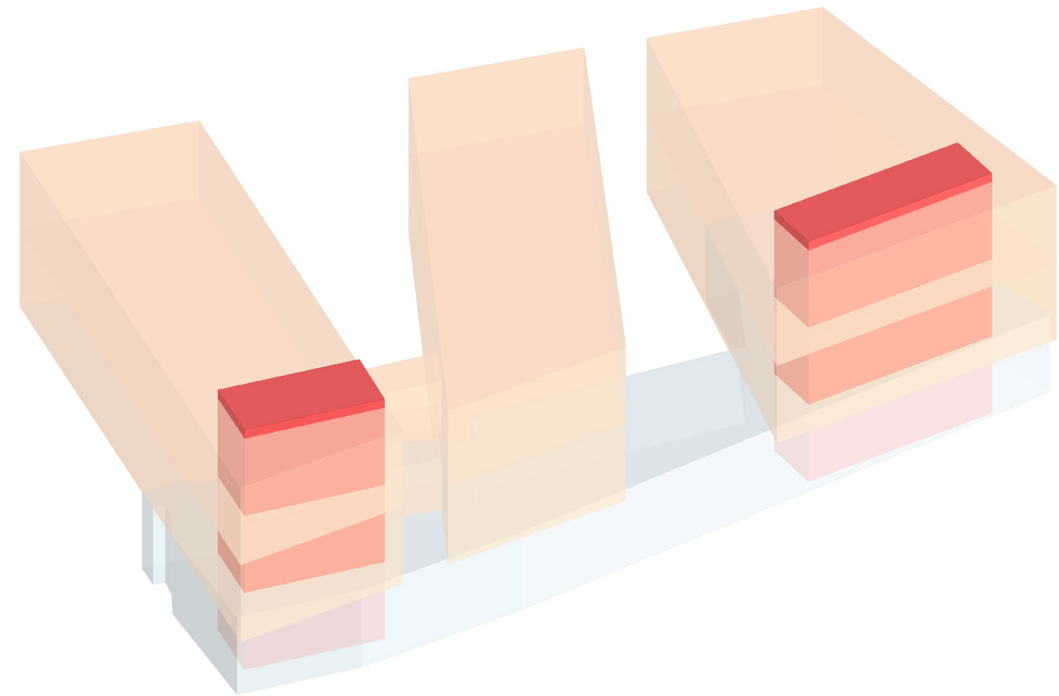


Figure 11: Entry Section Showing Bi-Level Entries. Shows Main Entry's Under Massing Program with Lobby Connection

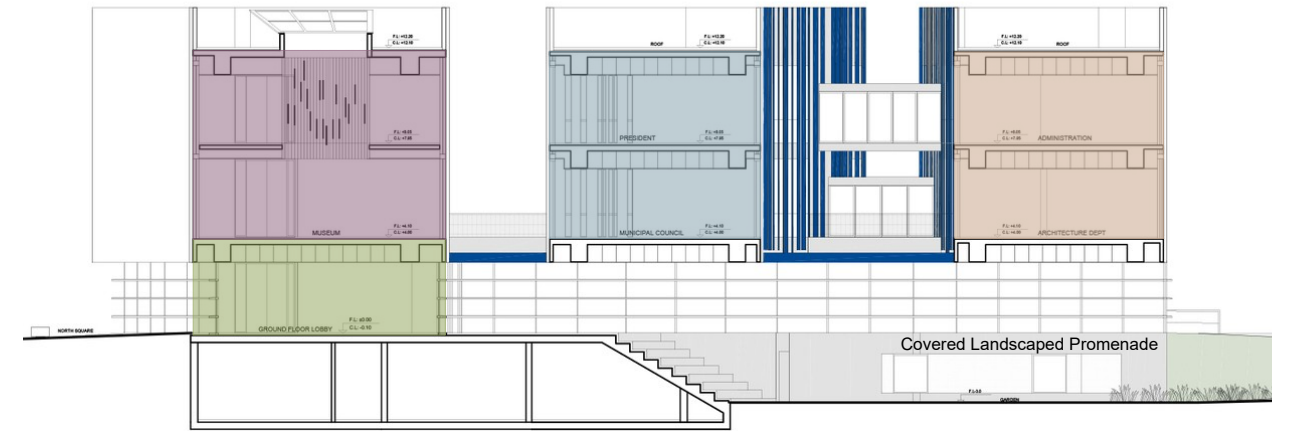


Figure 12: Main Entry to building from under program massing.



- Egress Cores
- Main Building Massing
- Basement

Figure 13: Axon Diagram Showing Egress Cores



0m 1 10
LONGITUDINAL SECTION

- Museum
- City Hall Offices
- Architecture & Planning Office
- Lobby

Figure 14: Section Showcasing Each Main Program Massing

Specific Inquiry and Indexing

These four projects demonstrate distinct strategies for embedding greenery directly into residential architecture, each using the section as a tool to merge landscape with living space. The Valley Towers (MVRDV) operates as a carved, three-dimensional topography where the building mass is eroded to create stepped terraces. Every one of the 198 apartments receives a uniquely shaped balcony defined by “grow boxes” that replace standard guardrails, transforming façade edges into thick, planted buffers. With roughly 13,500 plants integrated into these cantilevered forms, the project creates a living envelope where greenery becomes part of the structural rhythm. The section emphasizes shifting floorplates and cascading gardens that visually, spatially, and ecologically connect the units.

Mountain Dwellings (BIG + JDS) differs by using a single, sloped sectional strategy that resembles a mountainside. All apartments have deep grass terraces—larger and more yard-like than typical balconies—because they sit on top of the unit below. The terraces are soil-rich, expansive, and supported by a major watering system, making them the closest to true private gardens. Sectionally, the project is linear, stepping consistently upward to maintain direct sunlight and generous planting depth.

Tao Zhu Yin Yuan (Vincent Callebaut) contrasts both approaches through its spiraling geometry. Instead of stepping or carving, the entire tower rotates, producing shifting, wraparound 165 m² sky gardens for every residence. With more than 23,000 plants and up to 14 trees per floor, this project achieves nearly 5x the required green coverage. Its cross-section reveals how the twisting structure increases plantable surface area, surrounding units with continuous vegetation that performs thermally, environmentally, and visually.

The IT Building (Ambrosi I Etchegaray) presents the most compact and integrated strategy. Here, garden spaces emerge from balcony planters and light-well gardens embedded directly into structural beams. These boxes collect rainwater runoff and cool, shade, and ventilate apartments. Compared to the large terraces of the other projects, these gardens are smaller but more technically interwoven with the building’s environmental systems.

Together, these examples display four distinct sectional models—eroded terraces, sloped garden roofs, spiraling sky gardens, and structurally embedded planters—highlighting the diverse possibilities for integrating green space into contemporary residential architecture.



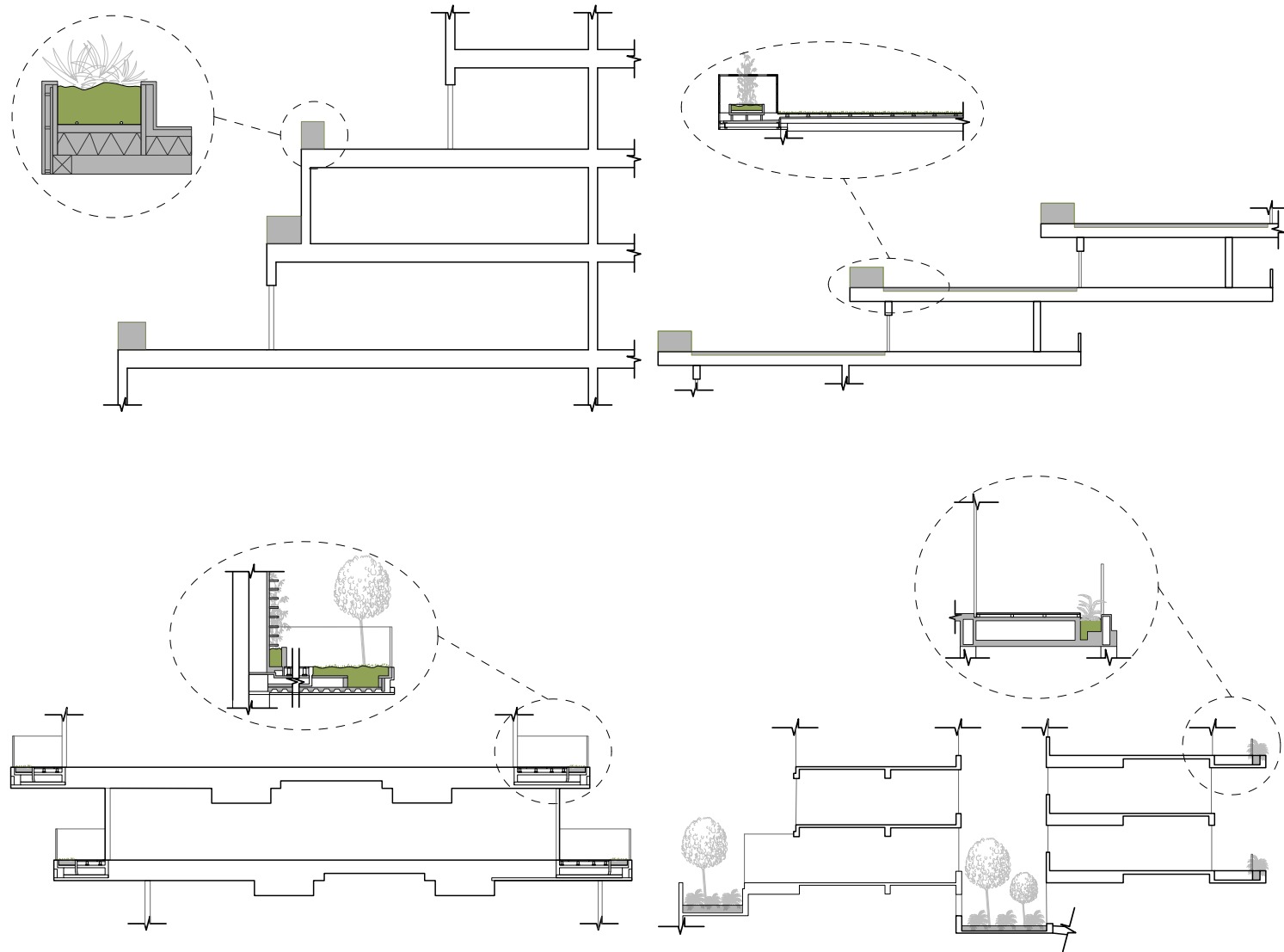
First Inquiry: List of Buildings

First set of projects being analyzed (from left to right, top to bottom)

1. The Valley Towers, MVRDV, Amsterdam, The Netherlands, 2022
Each of the 198 apartments has planter gardens that line their balconies as well as common areas.
2. Mountain Dwellings, PLOT = BIG + JDS, Copenhagen, Denmark, 2008
All of the apartments in the 10-storey building have roof gardens that consist of a grass terrace and garden planters.
3. Tao Zhu Yin Yuan Apartment Building, Vincent Callebaut Architectures, Taipei, Taiwan, 2020
Each floor occupies 2 apartments each of which has grass treed terraces (min 14 big trees per floor) with shrubs and plants and ground floor green spaces.
4. IT Building, Ambrosi I Etchegaray, Ciudad de México, Mexico, 2016
The apartments have rear balconies and gardens. Each apartment is connected to light wells and balconies that become garden spaces. The balconies contain gardening boxes with views of vegetation for the majority of the interior spaces. These boxes are implanted into the perimeter beams level with the slabs in order to receive the rain runoff.



Figure 1-4: Left to right, top to bottom, exterior images of case studies described on next page.

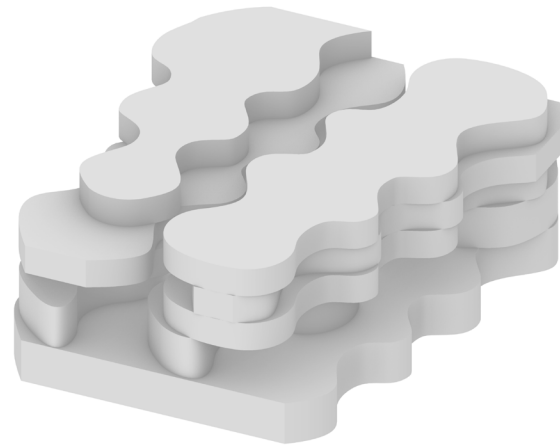
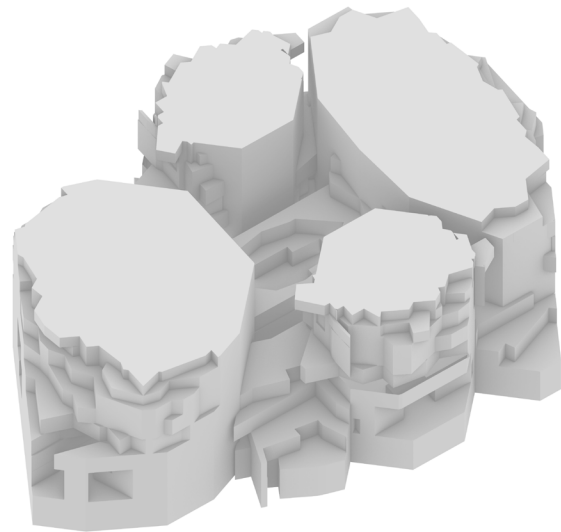
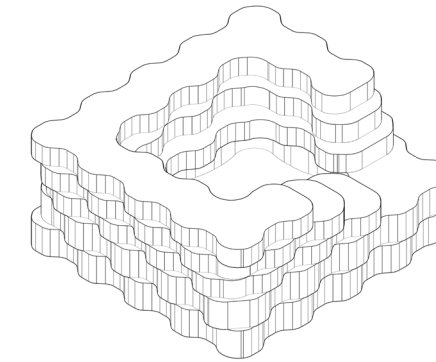
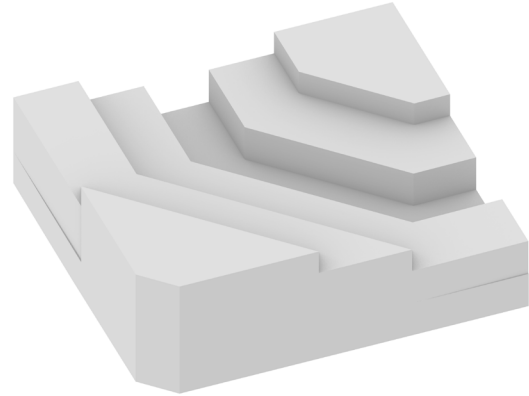
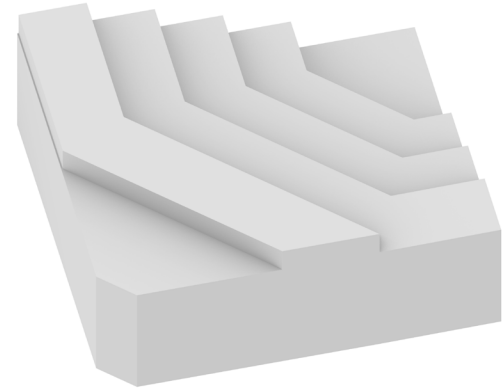


First Inquiry: Conclusions

First set of projects being analyzed (from left to right, top to bottom)

1. The Valley Towers, MVRDV, Amsterdam, The Netherlands, 2022
Each of the 198 apartments has a unique floorplan Cantilevered apartments, hosts approximately 13,500 young plants, shrubs, and trees. The Valley grow boxes act as balcony barriers instead of just using glass rails
2. Mountain Dwellings, PLOT = BIG + JDS, Copenhagen, Denmark, 2008
All of the apartments in the 10-storey building have roof gardens that consist of a grass terrace and garden planters. The building has a huge watering system which maintains the roof gardens. These terraces because they are stacked on top of each other and above a parking garage are large and deep.
3. Tao Zhu Yin Yuan Apartment Building, Vincent Callebaut Architectures, Taipei, Taiwan, 2020
Tao Zhu Yin Yuan covers its open spaces with trees, planting approximately 23,000 trees (min 14 big trees per floor), shrubs and plants on the ground floor garden, the balconies and terraces of each household. The annual carbon absorption reaches around 130 tons with green coverage at 246%, which is nearly 5 times higher than local regulation. - 165 m² of ambient sky garden for each unit. This detail was drawn as cross section instead of long section like the others to better show how the gardens relate to the units that shift from each other.
4. IT Building, Ambrosi I Etchegaray, Ciudad de México, Mexico, 2016
The apartments private areas at the back of the site with a view of rear balconies and a garden. Each apartment is connected to light wells and balconies that become garden spaces. These provide natural ventilation and shading that help maintain thermal comfort within the building without the use of any heating or cooling systems. The balconies contain gardening boxes were integrated with the intention of creating views of vegetation for the majority of the interior spaces. These boxes are implanted into the perimeter beams level with the slabs in order to receive the rain runoff, in such a way that each element works in unison with the elements surrounding it.

Figure 1-4: Left to right, top to bottom, Sectional images of case studies described on next page.



Test Fit 1: Name of Test Fit (for example: The Ramp)

Starting out the Test Fit Assignment I created four Study projects first to explore different massing qualities for the site. The first study was stepping down to the residential area with a higher side on the commercial public side this allows for large green spaced yards but at a consequence of thicker floor plate sections without light available. The second study lessened the thickness and allows for a central communal corridor on the second floor being private and public accessible, although the thickness is still a bit much. These two first studies were site responsive, the third study was scaled, cut and shift and glue together of a case study "The Valley" which provided for unique forms and an interesting central space. The last study was a ripple response with lessons from the previous layered and shifting studies with central spaces. Although the central space and balconies are to confined or small.

Study: Pros

- 1 -Stepped Large Yard Design
- 2 - Stepped Large Yard Design with central corridor
- 3 - Unique Carved Design with Private Center
- 4 - Shifting rippled layered design with middle communal corridor.

Cons

- Thick corner with too deep of program without light
- Where does the corridor go? Thick Corner
- Scaling Issue and Jagged Nature
- Dark corridor, needs more spacing.



Figure 1: Site Figure Ground, Project's relationship to surrounding site.

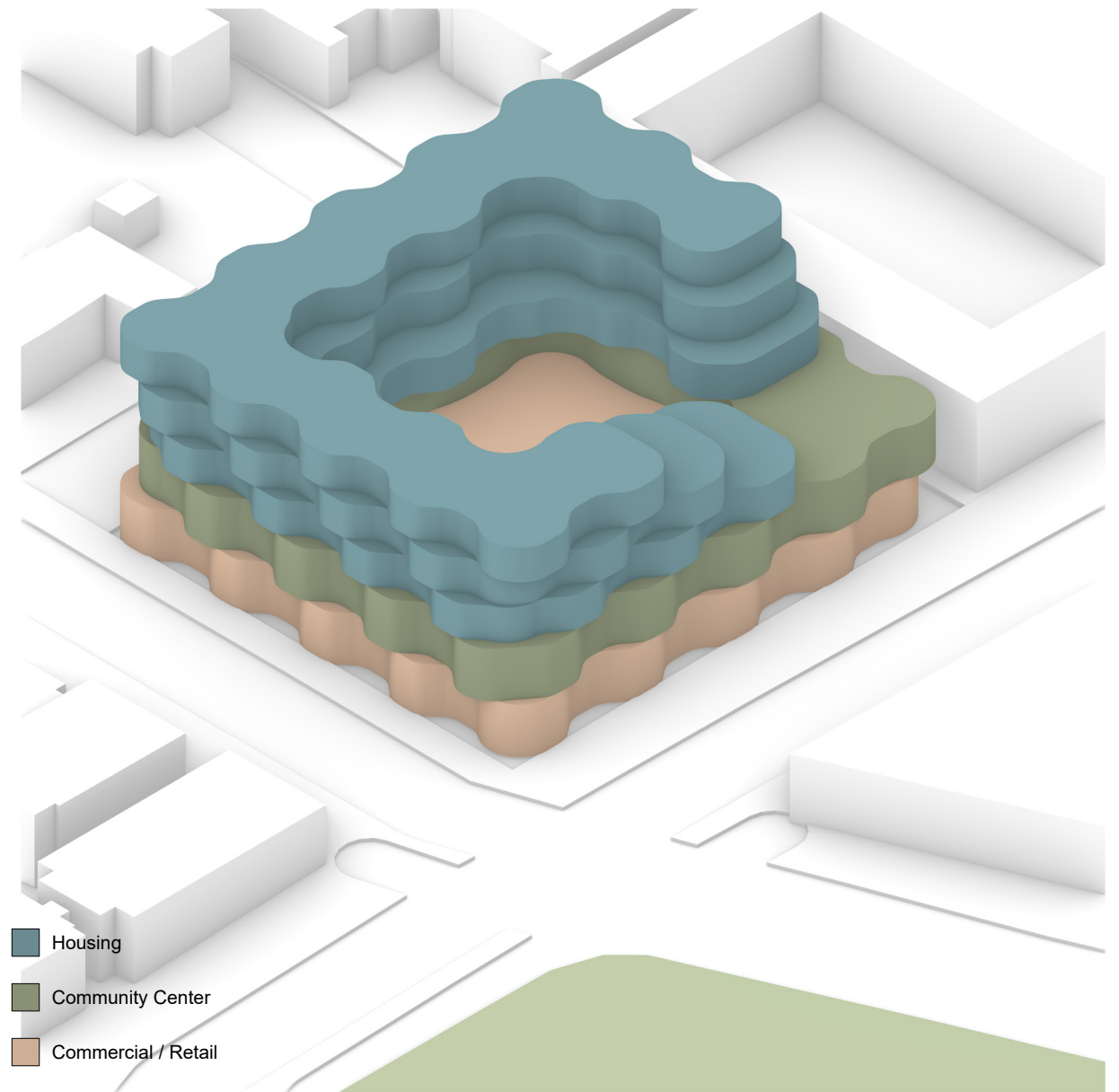


Figure 1: Program Massing Iso

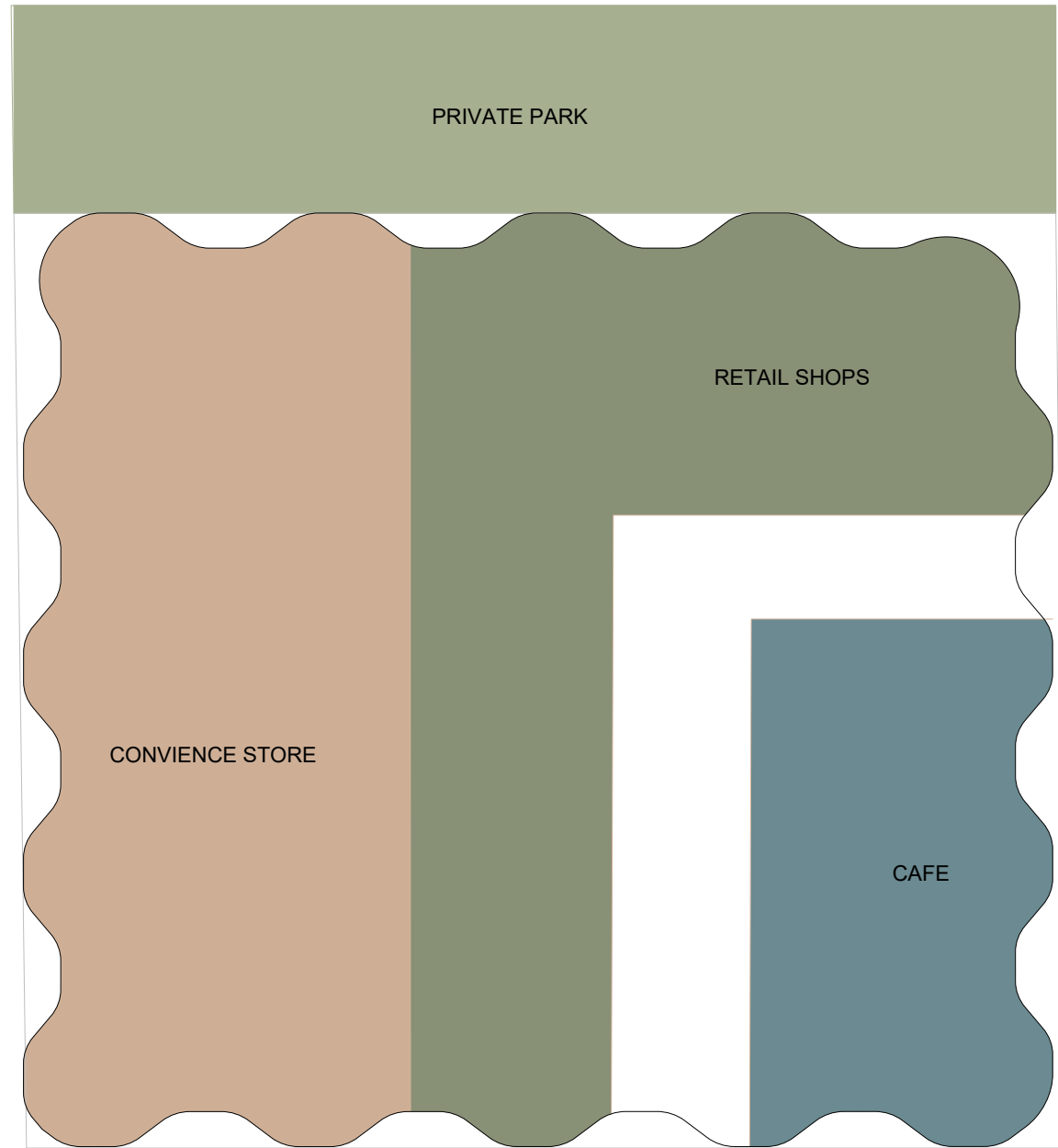


Figure 1: Conceptual Figure Plan Program Diagram, 1st Floor

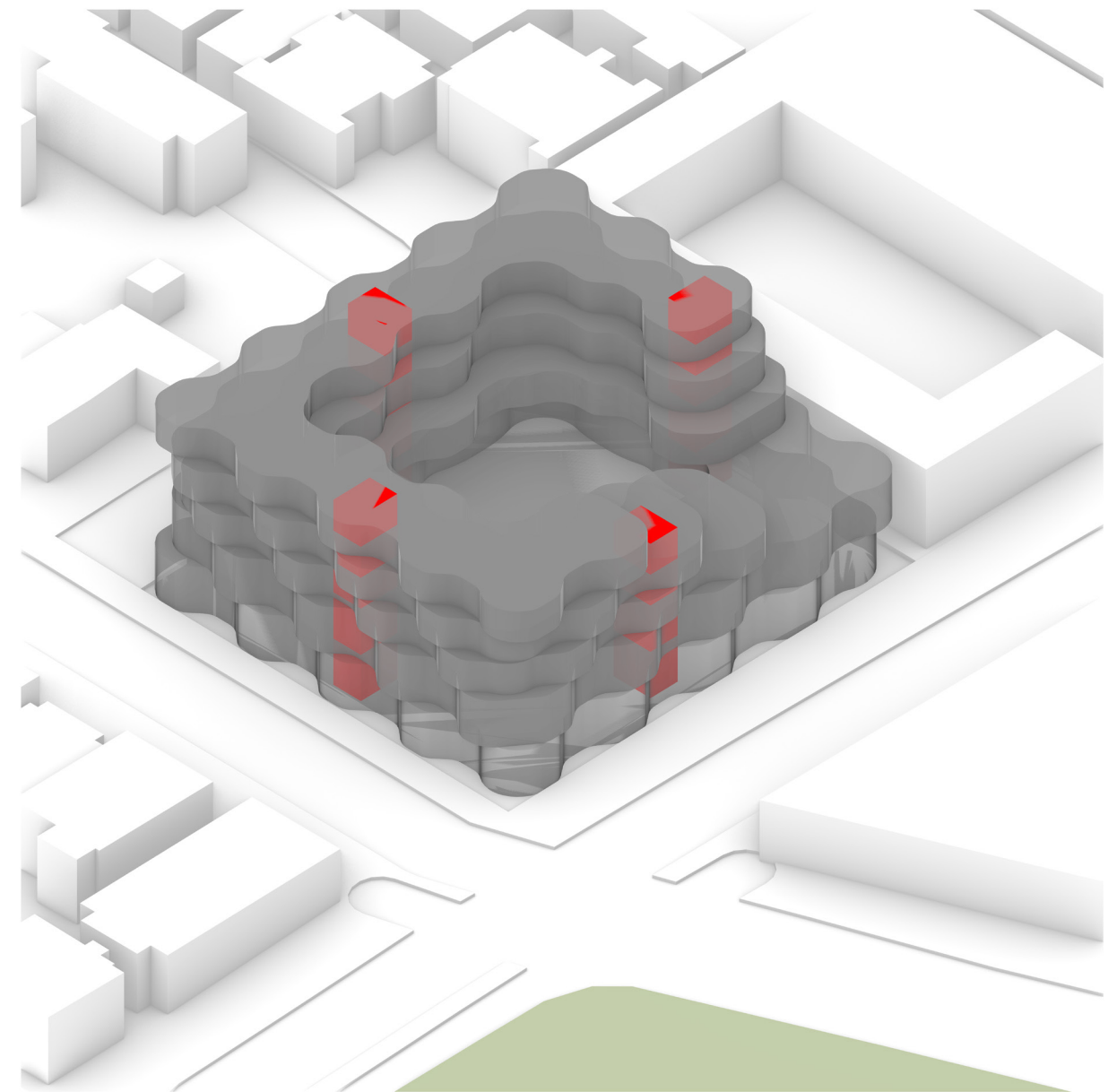


Figure 1: Circulation cores, Iso view

Test Fit X (1 or 2): Strategy

After reviewing the first four study test-fit models, I observed that it was pertinent to adopt a stepped massing strategy that opens the project to the community while ensuring generous daylight into the residential yards. The final massing embraces this approach by carving a large central courtyard, reducing floor-plate depth, and creating a shared open space that becomes the social heart of the development. This central void is reinforced in the main axonometric study, where the massing terraces upward in continuous layers shaped through soft curves and ripples. These formal shifts not only support natural light penetration but also produce offset private yard conditions for each unit, preventing direct stacking and introducing a sense of movement and individuality across the façade.

The massing further organizes program vertically: commercial and retail uses anchor the ground floor, activating the street edges; community-center programs occupy the second level, which is secure yet publicly accessible and opens directly to a semi-private courtyard terrace; and the housing levels rise above, stepping back to create additional outdoor spaces and improved views. Circulation cores placed at the corners support efficient vertical movement and reinforce the building's legible perimeter frame around the courtyard.

Overall, the massing strategy leverages the ripple geometry to produce a dynamic form that is simultaneously porous, community-oriented, and environmentally responsive. The result is a building that feels sculpted by light, circulation, and outdoor living—aligning the architectural concept with the project's social and spatial goals.

Test Fit X (1 or 2): Assessment

The current massing strategy successfully establishes a strong architectural identity through its stepped, ripple-shaped terraces and central courtyard. The tiered form creates a clear hierarchy of public, semi-public, and private zones while ensuring natural light reaches deep into the building. The use of curved stepping improves privacy between adjacent units and produces individualized outdoor balcony–yard conditions. At the urban scale, the massing activates the site edges with ground-floor commercial uses and introduces a protected second-level community terrace that supports the project's social mission. These are meaningful strengths that align the architectural expression with the goals of community engagement, sunlight access, and differentiated residential experiences.

However, several limitations in the current configuration restrict both programmatic capacity and functional performance. While the terraces create yard-like balconies, the resulting outdoor areas are not yet large enough to serve the intended use as meaningful private yards. Additionally, with only five total floors allowed, and three of them dedicated to housing arranged solely around the perimeter, the massing lacks the depth and infill potential needed to reach the desired residential unit count. The large central courtyard—while spatially compelling—reduces the buildable footprint to a degree that compromises overall density. The project may need to explore reducing the courtyard size, adjusting the stepping logic, or introducing partial infill bars or bridging elements to expand housing capacity while retaining access to light and outdoor space. Further refinement should balance sculptural form with feasibility, program needs, and long-term adaptability.



Figure 1: Final Test fit model 3D print on 3D printed Site



Figure 1: Final Test fit model 3D print on 3D printed Site

Section V: Project Design (Spring ARC 4611A)

Site Design Strategy

The site design strategy for The Backyard Estates responds directly to the physical constraints, social needs, and environmental opportunities of Lincoln Heights. The project is organized as a layered and stacked building, using stepped massing to maximize sunlight, preserve privacy, and provide meaningful outdoor space for every residential unit.

Rather than pursuing vertical density, the building limits residential units to 3 floors, 1 2-story level and 1 single story level, reinforcing a domestic scale that feels more like a house than an apartment. Each unit is paired with a private yard sized at approximately 60% of the unit's ground-floor footprint, ensuring that outdoor space is functional rather than symbolic. This strategy restores a critical element of the American Dream—the backyard—within a dense urban environment, allowing children to play outdoors safely and encouraging families to engage with nature daily.

Massing is carefully oriented to optimize solar access for these yards, stepping back as the building rises to reduce self-shading and maintain consistent daylight across terraces. The building envelope softens toward adjacent residential contexts, while more active public uses define the street edge. This terracing also reduces perceived bulk and improves thermal performance through planted surfaces.

Pedestrian access is prioritized along Albion Street, where clearly defined entrances connect residents, community users, and visitors to their respective program zones. Vehicular access, including underground parking, loading, and service functions, is consolidated along South Avenue 17 to minimize street disruption and maintain a pedestrian-friendly frontage. Drop-off zones for daycare and community uses are located near primary entries for safety and convenience.

Public and semi-public exterior spaces—including a central courtyard and elevated shared landscapes—are strategically positioned to foster visibility, safety, and social interaction. The façade integrates planting, setbacks, and transparency to express the building's layered program while reinforcing its identity as a family-oriented environment rooted in outdoor living.

Lincoln Heights

Located between LA River and I-5
Corner of Albion Street and 17th Avenue
Across from Albion Riverside Park
5 Nearby Schools



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VERTICAL BACKYARDS FOR A HEALTHIER CITY

A FAMILY-CENTERED HOUSING MODEL THAT PUTS NATURE, COMMUNITY AND CHILDREN FIRST.

This building reimagines urban living by giving every home the space to grow—through private outdoor yards, shared green spaces, and a connection to a larger neighborhood ecosystem.

A NEW WAY TO LIVE IN THE CITY
Vertical Backyards brings the best of suburban living into the city—private yards, trees, and open space—without sacrificing walkability, community, or sustainability.

9,740 SF
LAWN GREEN SPACE
On terraces, yards and common areas

5,120 SF
GREEN ROOF
Extensive green roof reduces heat and manages stormwater

48%
GREEN SPACE
Private yards = 45-48% of each lot (~60% of enclosed ground-floor footprint)

UP TO 4°F
COOLER MICROCLIMATE
Trees and green roofs reduce the island effect

20
MULTI-GENERATIONAL FAMILIES
Homes designed for multi-generational living and community

DAYCARE
A safe, nurturing environment with a dedicated outdoor playground.

NEIGHBORHOOD MARKET
Fresh food and daily essentials within steps of home.
Neighborhood market downstairs reduces routine grocery car trips and transportation emissions.

COFFEE SHOP
A local gathering place that activates the street and builds community.

PLANTING INVENTORY

- 4** RAYWOOD ASH TREES
Courtyard canopy trees provide shade, beauty, and habitat.
- 20** TOYON TREES
Roof-top trees in planters thrive in LA's climate and support pollinators.
- 24** ANNA APPLE TREES
Fruit trees in private yards teach, nourish, and connect children to nature.
- 7** DESERT WILLOW TREES
Drought-tolerant and native, ideal for private yards and planters.

PRIVATE OUTDOOR YARDS
Every home has up to 45-48% private outdoor space—real yards for play, growing food, relaxing, and connecting as a family.

ENVIRONMENTAL BENEFITS THAT LAST

CARBON SEQUESTRATION FROM PLANTING STRATEGY
4,386-5,825 lbs CO₂ / year
≈ 2.0-2.6 metric tons CO₂ / year

EQUIVALENT TO:
≈ 5,000-6,700 miles driven by an average gasoline car

REDUCING ROUTINE GROCERY CAR TRIPS
Neighborhood market downstairs reduces routine grocery car trips and transportation emissions.

STORMWATER CAPTURE
Green roofs and planters absorb and filter rainwater, reducing runoff.

COOLER MICROCLIMATE
Trees and green roofs help lower temperatures by up to 4°F.

BIODIVERSITY & HABITAT
Diverse planting supports birds, butterflies and beneficial insects.

CHILDREN WITH YARD ACCESS

- ✓ 40% more time in active play
- ✓ Better emotional well-being
- ✓ Lower stress and anxiety
- ✓ Stronger immune systems
- ✓ Higher focus and creativity
- ✓ Greater connection to nature

CHILDREN IN CITY APARTMENTS WITH NO OUTDOOR ACCESS

- X More sedentary time
- X Higher levels of stress
- X Less physical activity
- X Weaker immune response
- X Lower concentration
- X Disconnection from nature

FAMILY FIRST
Designed for families, multi-generational living and community connection.

NATURE EVERYWHERE
Trees, gardens and green spaces visible from every home and shared by all.

SUSTAINABLE LIVING
A building that heats the environment while supporting healthy, resilient families.

WALKABLE LIFESTYLE
Parks, schools, shops and coffee within walking distance—less driving, more living.

STRONGER COMMUNITIES
Shared spaces, local businesses and thoughtful design create belonging and pride.

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Building Design Strategy

The Backyard Estates is located in the Lincoln Heights neighborhood of Los Angeles, a historically working-class area shaped by early residential development, industrial infrastructure, and a strong community identity. The site occupies a prominent corner at Albion Street and South Avenue 17, adjacent to Albion Riverside Park and within walking distance of the Los Angeles River, Albion Elementary School, and surrounding neighborhood services. This proximity to public green space contrasts with the lack of private, family-scaled outdoor areas available to residents living in nearby multi-family housing.

Topographically, the site is relatively flat, allowing flexibility in massing, circulation, and ground-floor program organization. Its orientation provides favorable southern and western solar exposure, which directly informs the project's stepped form, terraced residential organization, and private yard placement. Prevailing breezes from the river corridor further support passive ventilation strategies, reinforcing the integration of outdoor living spaces throughout the building.

Socially and economically, Lincoln Heights is home to many working families, young adults, renters, and multi-generational households. The project responds by prioritizing residential apartments with private yards, creating a housing model that gives families access to outdoor space typically associated with single-family homes while remaining within the city. Select units also consider multi-generational flexibility, allowing grandparents, extended family members, or rental opportunities to support childcare, affordability, and long-term adaptability.

The surrounding built context consists primarily of low- to mid-rise residential buildings, light industrial structures, and commercial storefronts, many of which prioritize density but offer limited outdoor amenities. In response, The Backyard Estates combines family-oriented housing with daily-life programs that support residents and the broader neighborhood. The ground floor includes a Neighborhood Market, addressing the lack of grocery access in Lincoln Heights; a daycare for working parents; a resident fitness center; and a Bookstore Cafe that provides a relaxed gathering place for teens, young adults, and residents.

Zoning under the Cornfield Arroyo Seco Plan supports mixed-use development with residential, community-serving, and limited retail uses. Rather than relying on a large community center or formal after-school program, the current program focuses on essential, everyday support: housing with yards, childcare, food access, wellness, and informal social space. Together, these strategies create a dense but livable residential ecosystem that supports family life, multi-generational flexibility, and community connection within Lincoln Heights.



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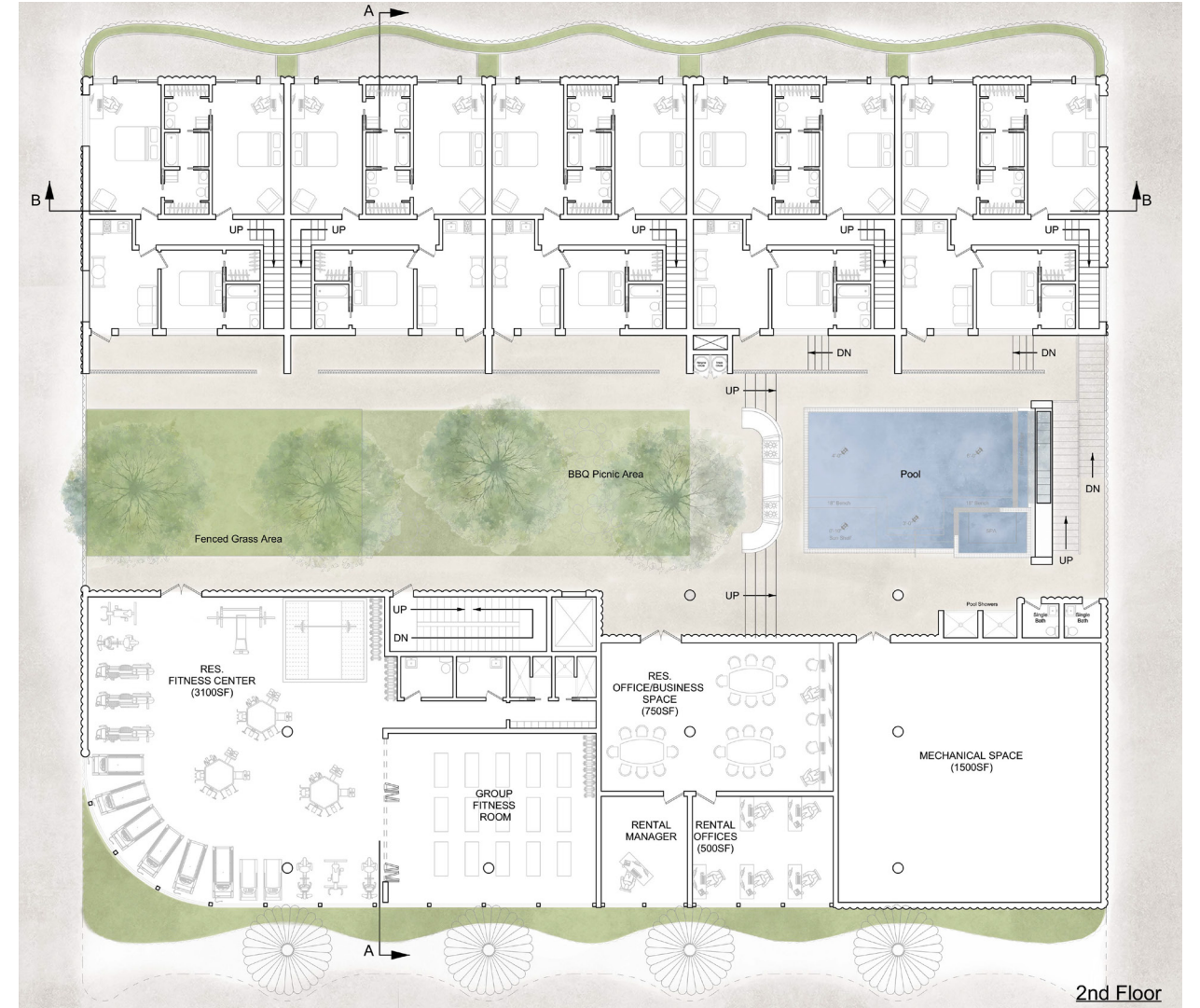


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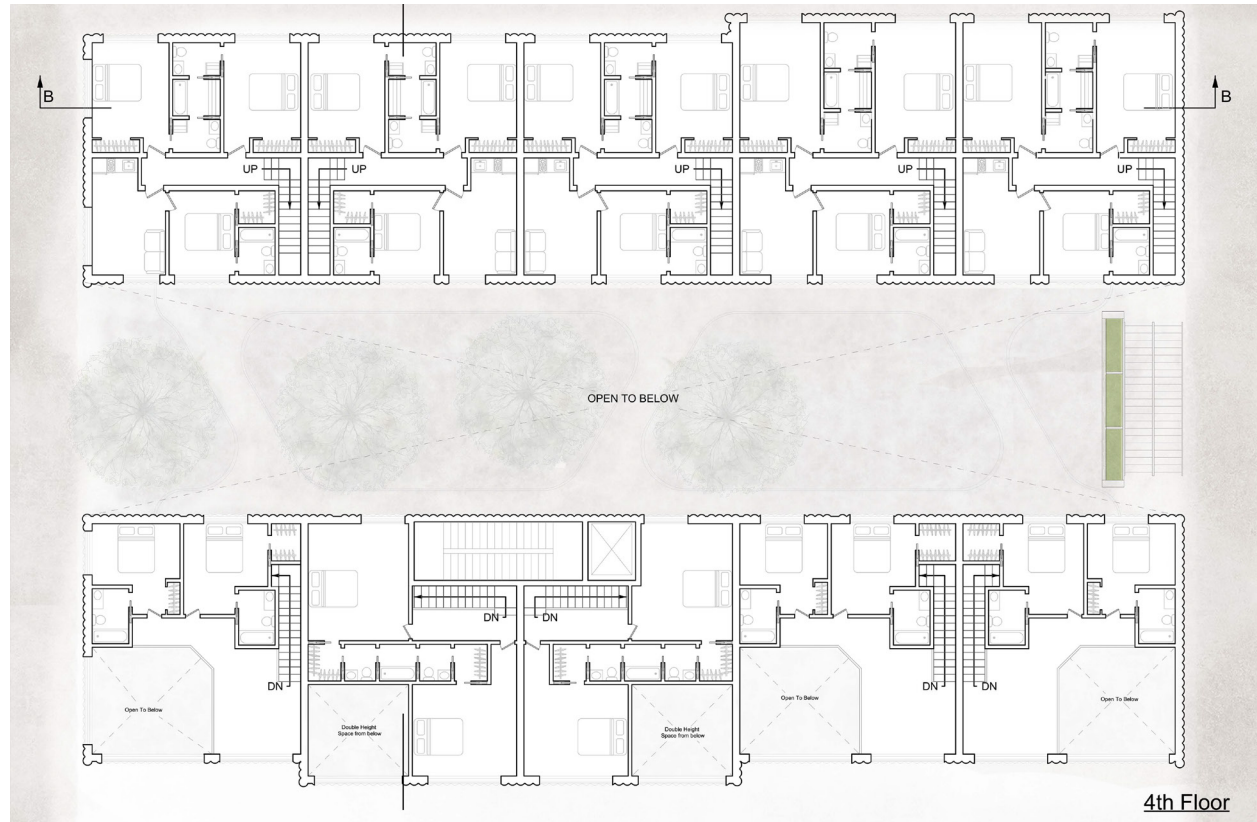


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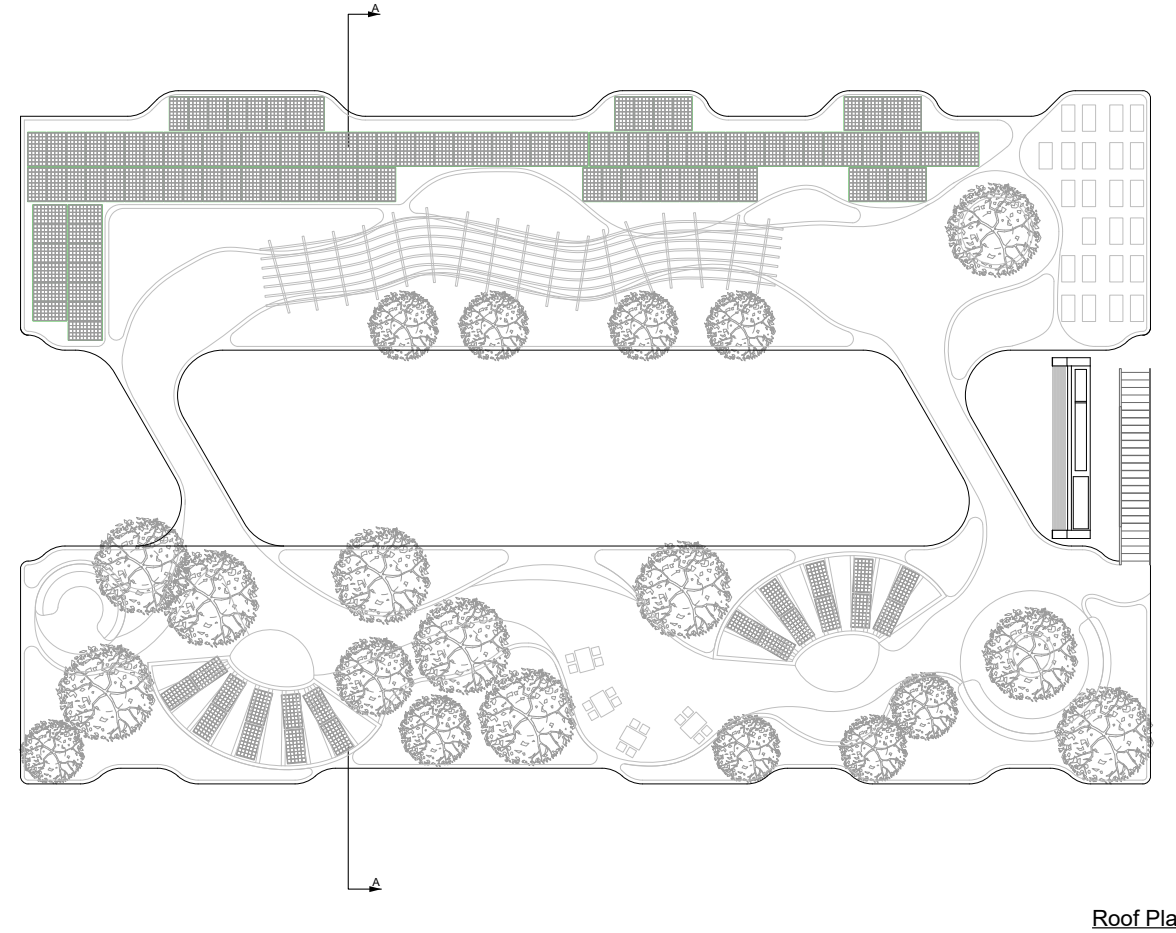


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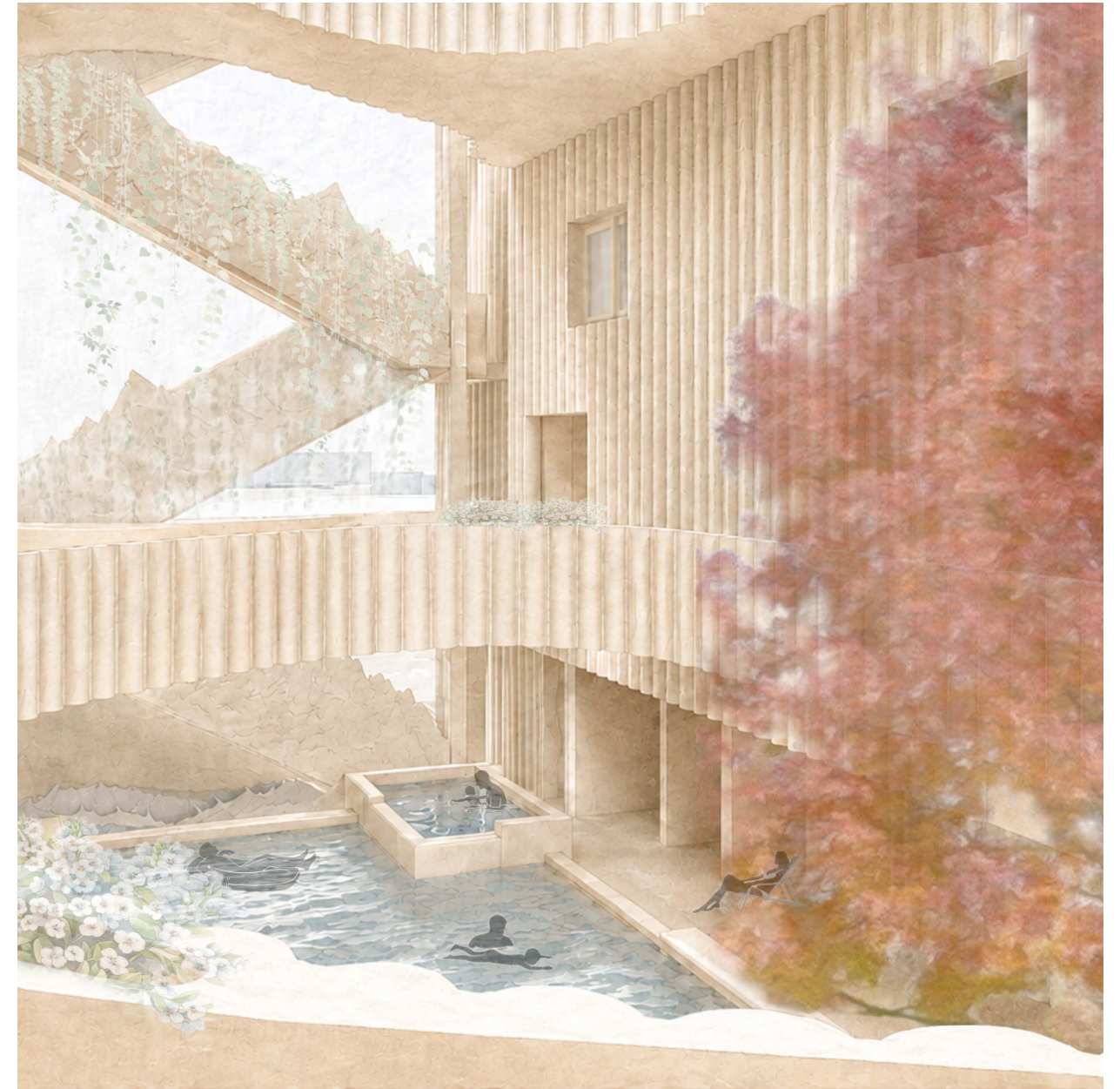


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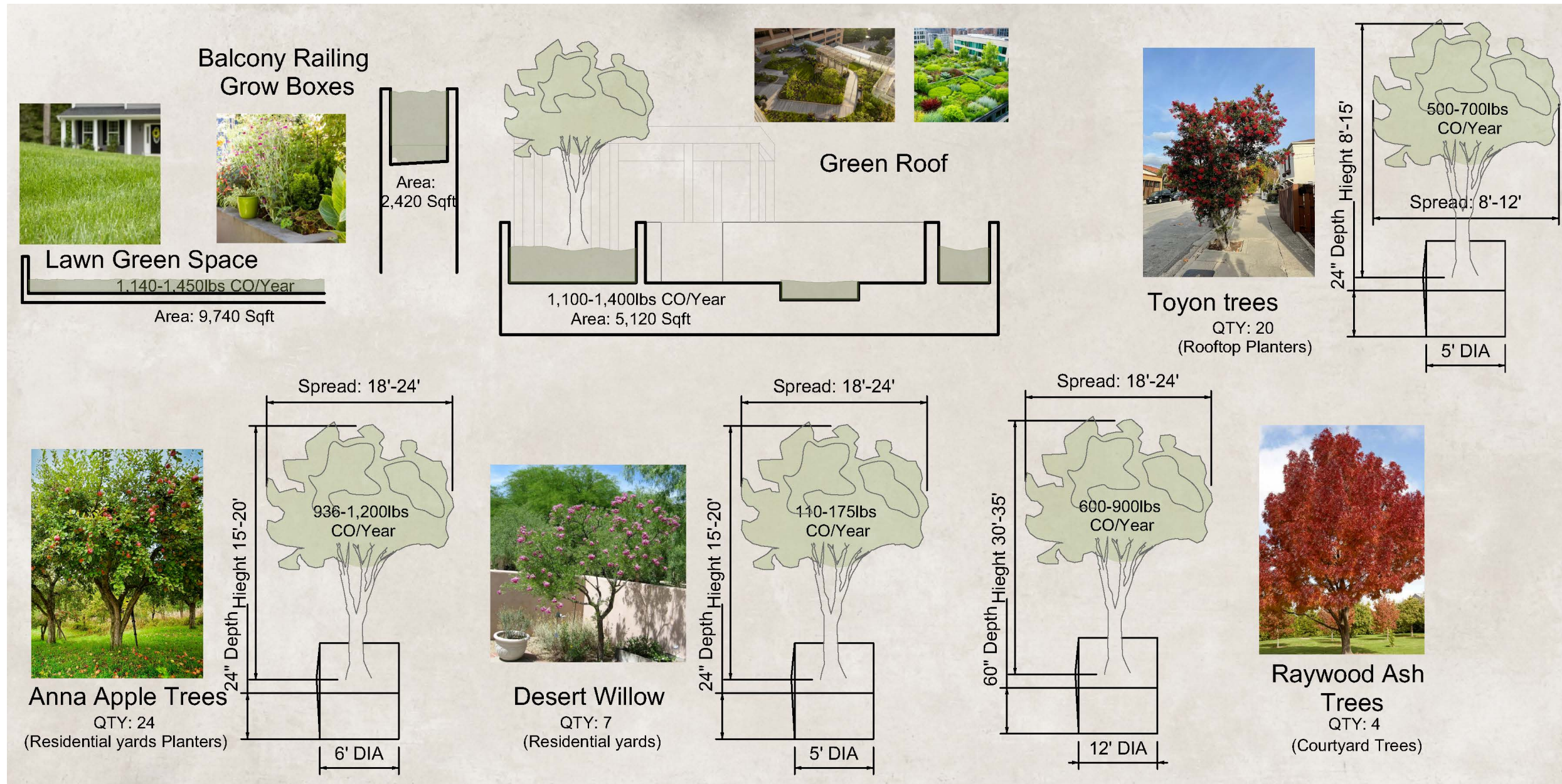


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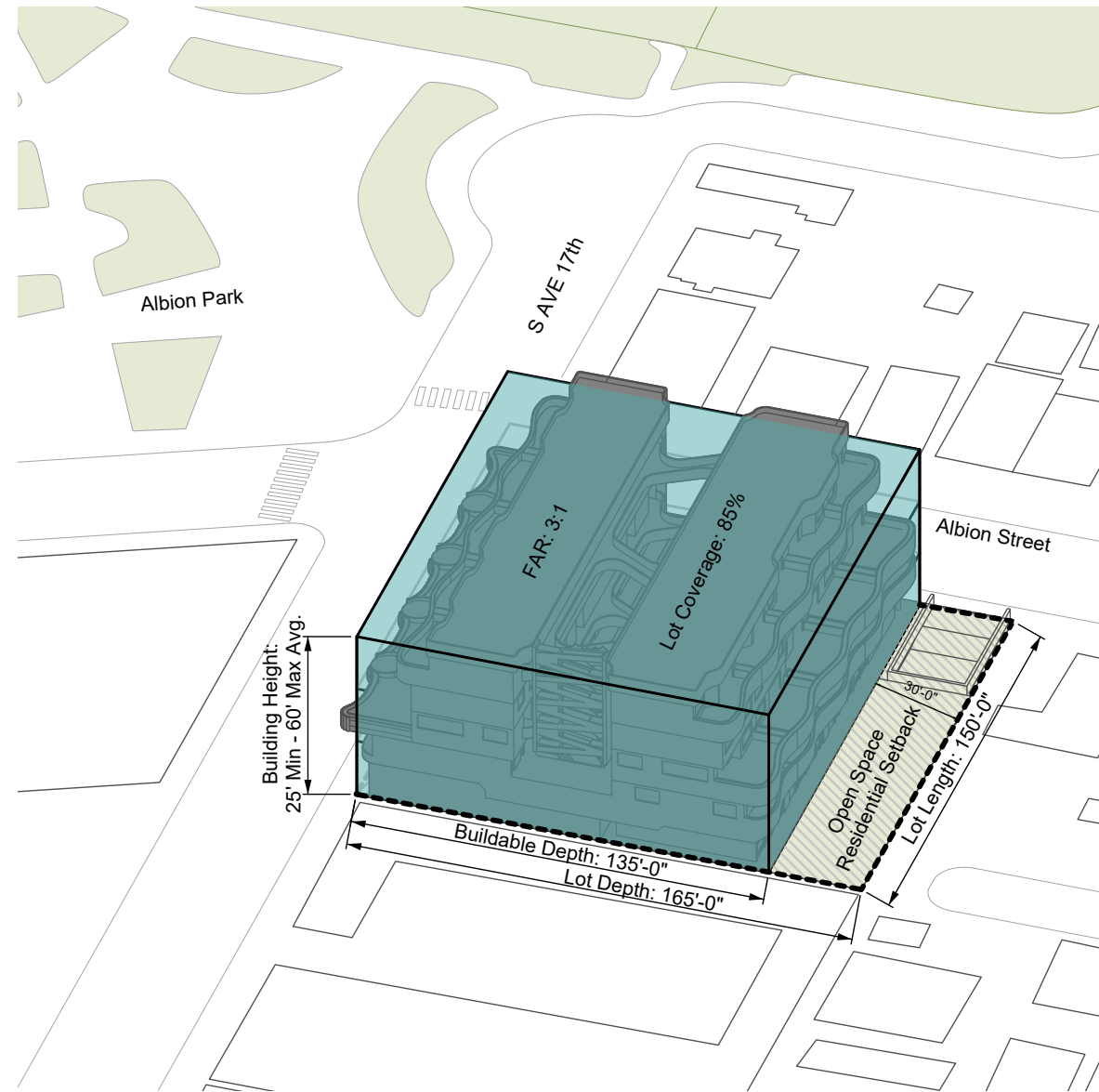
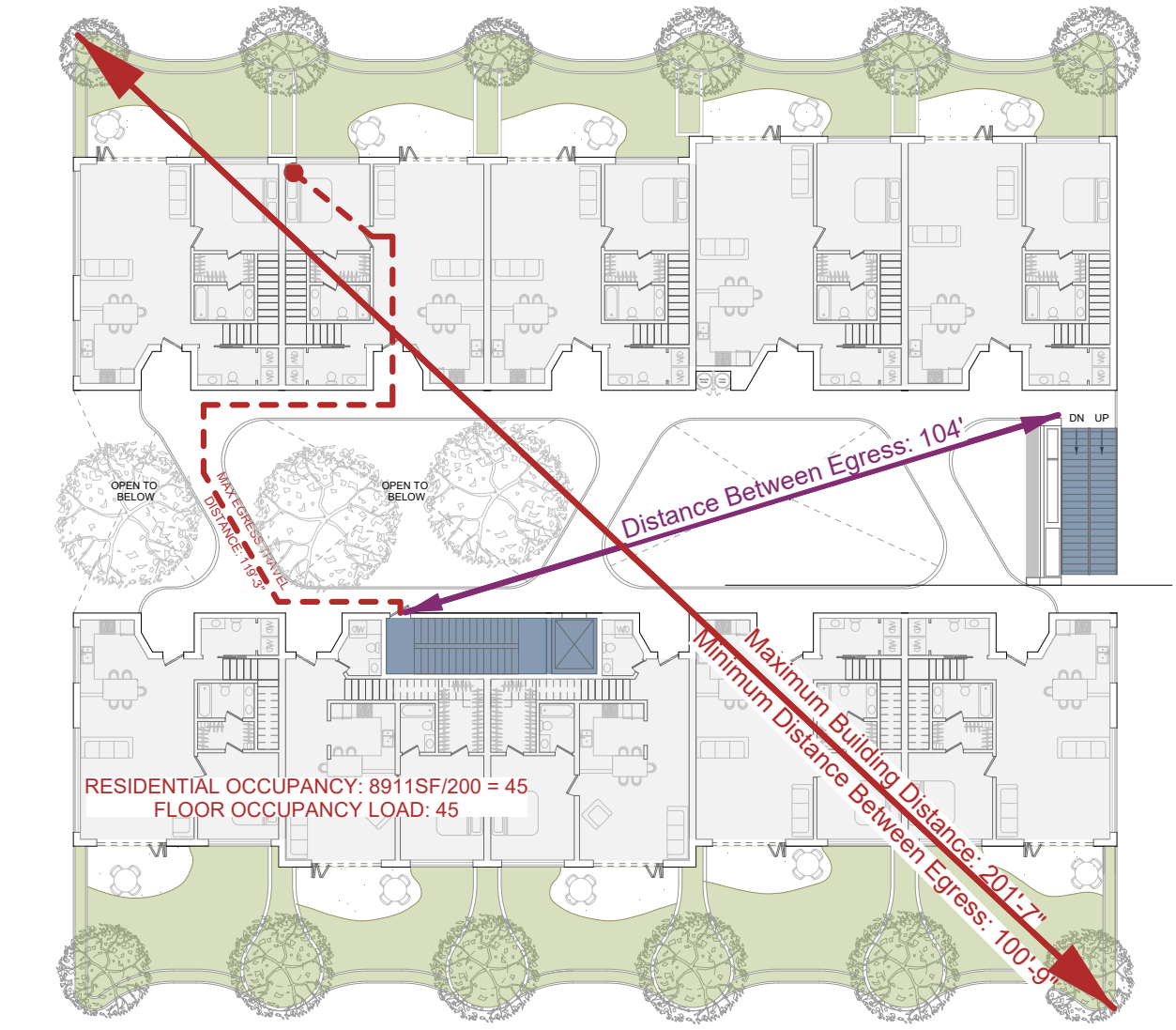
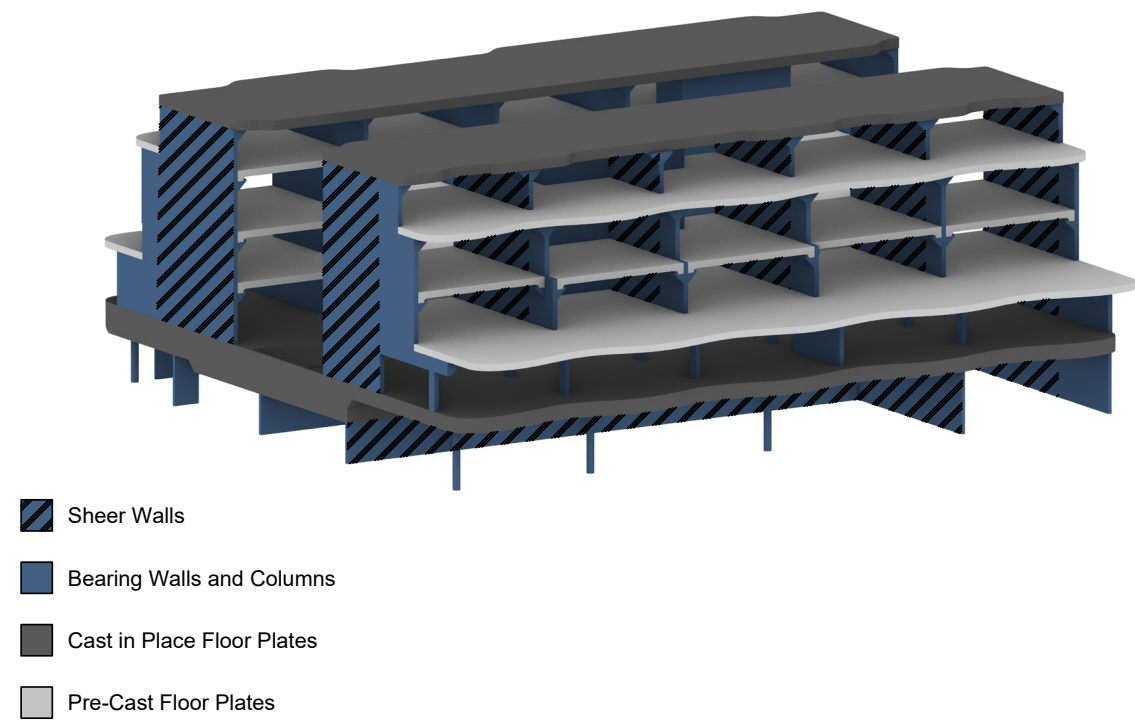


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3rd Floor Plan
EGRESS PLAN

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Structural Design Strategies

The structural system for The Backyard Estates is designed as a primarily concrete assembly, selected for its strength, durability, fire resistance, and ability to support the substantial gravity loads created by large occupiable backyard terraces with deep soil, planting, and trees. Concrete is the most appropriate material for this project because the size of the private yards and the weight of the landscape systems require a robust structural frame capable of spanning efficiently while limiting deflection. The primary vertical structure is organized around concrete bearing walls and columns on a repeated residential grid from Levels 2 through 5, with wall and column capital conditions at the slab interface to improve shear transfer and reinforce the slab at major support points. A thick cast-in-place concrete second-floor transfer plate establishes the upper residential grid independently from the ground floor, allowing the first floor to follow a different structural layout suited to the larger-span public programs below, including the market, daycare, and lobby. Above the transfer level, the residential floors use precast concrete floor plates for efficiency, repetition, and construction control, while the second floor and roof remain cast-in place to address transfer conditions, diaphragm continuity, and concentrated landscape loads. Concrete wall elements continue from the second floor through the roof, providing both vertical support and lateral stability.

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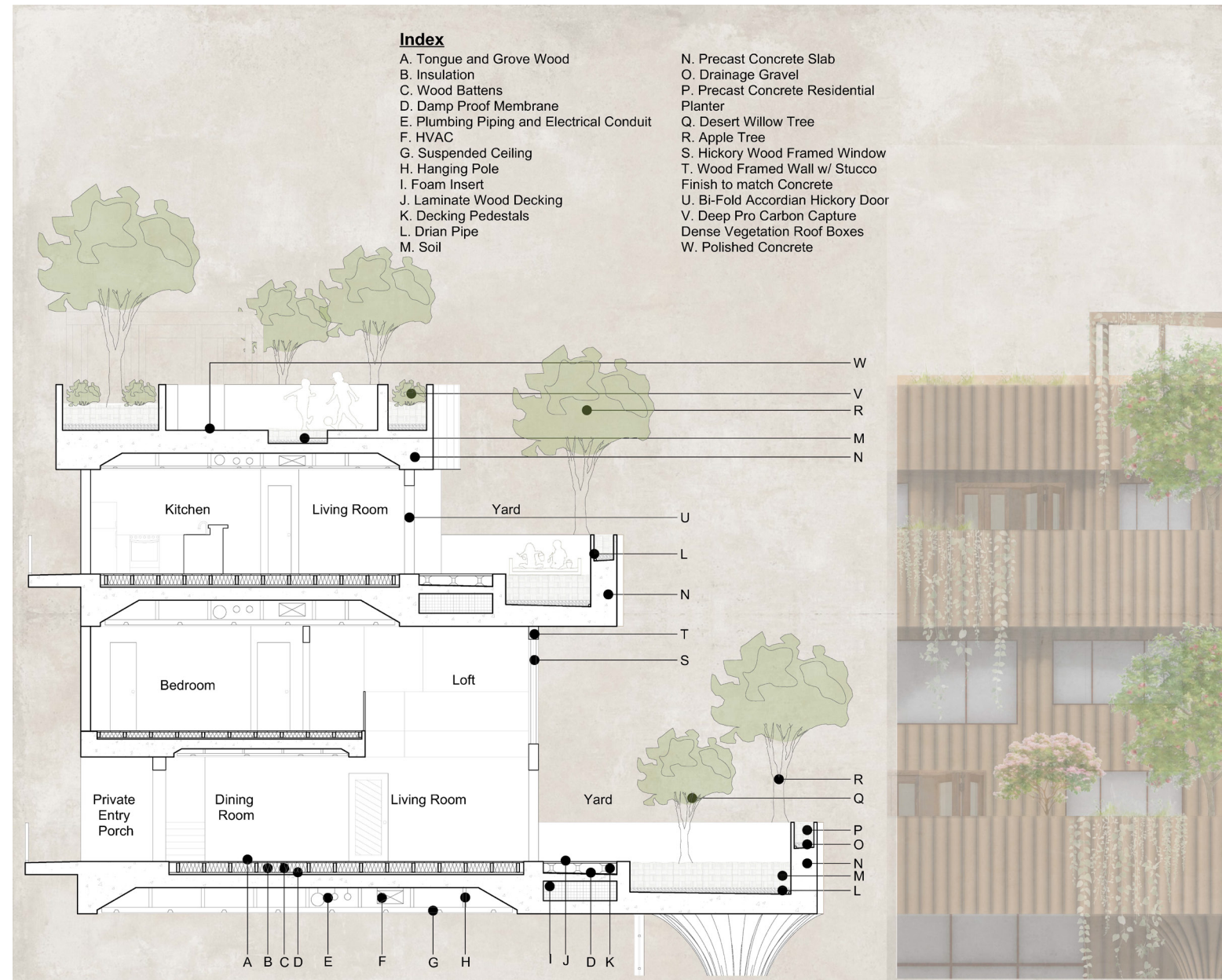


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Section VII: References / Background Material



Figure 2: Aqua Tower, Loewenberg Architects are the architect of record in Chicago, IL

Reflective Essay

For me, architecture has always been a puzzle waiting to be solved. From an early age, I was fascinated by the process of piecing ideas together to create spaces that both solve problems and bring dreams to life. That sense of discovery has stayed with me throughout my education, where I have come to see design as a layered process—starting with research and program, evolving through exploration of form and circulation, and ultimately merging technical precision with human experience.

When I approach a project, I begin by understanding the “client” or “project” at its core. What is most needed? What is most important? The answer to that question becomes the anchor for the rest of the design. I enjoy analyzing these needs, building programmatic solutions, and then treating the program like a puzzle. Once the pieces fit, the process shifts from problem-solving into spatial exploration. A building cannot be reduced to a series of extruded boxes; instead, it must be animated through form, material, landscape, and light. My inspirations often come from nature—its ripples, curves, and movements—as well as from architects like Zaha Hadid and SANAA, whose work embodies fluidity, integration, and bold rethinking of spatial conventions.

Two studios in particular influenced how I think about design. In the Museum of Contemporary Japanese Art studio, I was challenged to use ramps and circular forms to create a sense of fluid circulation. The experience taught me how simple geometric strategies, when consistently applied, can generate a rich spatial narrative. I also found joy in how circulation itself could become an experience, offering varied perspectives and light conditions. Later, in a Housing Studio, I designed a project that combined residential and commercial spaces while weaving in nature. Every apartment had its own yard with plants and a tree, while the building’s core contained a daycare that fostered community and supported families. This project reinforced my belief that architecture should not only house people but help them grow together.

The integration of commercial and residential programs also revealed another dimension of sustainability: not just environmental, but economic. When families live where they work, commuting is reduced, which drives down pollution while giving people more time with their loved ones. By situating shops, restaurants, and services just downstairs from where residents live, architects can help create self-sustaining economic ecosystems. These communities allow families to thrive in environments that are socially connected, environmentally conscious, and financially resilient.

One of the most compelling questions I return to in my work is how to design spaces that embrace both “abled” and “disabled” individuals without creating segregation. Too often, accessibility is treated as a separate system—ramps, elevators, or layouts that function apart from the “main” experience. This separation leads to isolation, missed opportunities, and costly retrofits when needs change. I believe architecture has the power to eliminate this divide by designing for inclusivity from the start. This is not just a technical problem, but a deeply social one, and one that requires formal exploration to find solutions that are both seamless and beautiful.

As I look ahead to my senior project, I am drawn to exploring how architecture can support multi-generational and multi-ability households within sustainable, nature-based environments. My goal is to create spaces where accessibility is not an afterthought but woven into the very fabric of spatial experience. This direction reflects both my social concerns and my formal interests: designing environments that are inclusive, family-oriented, and deeply connected to the natural world. Ultimately, I see design as a medium not only for building but for shaping more equitable, resilient, and meaningful ways of living together.