



## Abstract

Since the origins of academia, student housing has predominantly remained segregated and has excluded many people groups. Over the course of academic history, many people groups were slowly allowed to attend university and college, with enrollments gradually expanding from solely white men of a certain class to now a wide spectrum of people. Yet the construct of housing in the academic context has largely remained separated by gender, either by floor or by building. Where do other gender identities fit into this norm and how can we make all types of students feel safe and supported? The goal of this project is to address this inadequacy by proposing a gender-inclusive student housing building for the new Virginia Tech Innovation Campus located at Potomac Yard. Through extensive research of student housing in addition to the history of gender and gendered spaces, "Ourhouse" evolved into an architectural solution to the lack of inclusivity. It takes the typical dorm-style student housing to another level by creating safe, genderless spaces while simultaneously catering to the needs of an individual student. The project raises questions of what it means to be inclusive and how we can normalize highly gendered spaces such as bathrooms. By incorporating communal spaces for bathrooms, kitchens, and laundry spaces, this can begin to remove the stigma surrounding gender within those spaces. Single-user restrooms are also available to those who may find that more comfortable. The variety of sizes, privacy levels, and porosity makes the residences agreeable and functional for anyone who lives there. It also retains the sense of community that students receive from living in conventional dorms. "Ourhouse" aims to be a model for the future of gender-inclusive housing that is expressed not only as a system but goes the extra mile by also being embedded within the architecture.

## General Audience Abstract

As teenagers become young adults and go off to university or college, a large part of their higher education experience is where they live. Student housing has been a special, yet short-lived space where students form their community and meet new friends. Unfortunately, traditional dorms have not always been the most supportive for all types of students and can sometimes lead to uncomfortable and unsafe living situations. Majority of student housing systems are separated by gender which poses an issue for students who do not fit in one of only two categories. Additionally, dorm-style living can provide a sense of togetherness, but isn't the best solution for students who may be older, have children, or elderly family members to take care of. This thesis investigates how student housing is not very well integrated into urban campuses and cities, and how it can cater to a wider range of students. How can gender-inclusive housing become integrated into the design of the building rather than remain a system that plugs in to existing buildings. This thesis explores the intersection of the housing typology of architecture with the life of a college student. Taking a master plan approach to the building, the residential section addresses the lack of important support spaces for students such as study areas, laundry facilities, and access to green spaces outside. The other programming within the building allow it to fit in with the rest of the new Virginia Tech Innovation Campus plan. This thesis aims to "un-gender" the highly gendered realm of student housing and allow all kinds of people to feel connected, secure, and confident as they navigate life at college and beyond.

This thesis is dedicated to my family and friends who have supported me throughout my academic journey. I love you all so much!

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## History: Student Housing Typology

Student housing as we know it today wasn't always about bringing students together or even to create a sense of community. One of the earliest dorms was the Indian College at Harvard University and was meant to separate Native American students and white students. Anti-diversity was embedded in the typology and segregated gender and race for hundreds of years. Most universities and colleges were primarily only for men for a very long time, while women were anchored in the domestic sphere. Many early college buildings were often just one building crammed with different educational program ranging from classrooms, to faculty apartments, to libraries. During the 18th and 19th centuries, religion guided the sorting of students in their dorms. Religious freedom expressed itself in the way of new colleges that were rooted in those religions. By the late 19th century, private fraternities became more and more popular among white men. College social life was dominated by these extremely exclusive and prestigious groups. Fraternities indirectly caused a rift between men who were a part of them and men who weren't (often called "independents"). Fraternity houses were much fancier, better maintained, and well supported while "independents" fell into poor housing conditions. Although housing isn't solely to blame, and racial and religious discrimination was prevalent, it did contribute to the segregation of students. During the early 20th century, many colleges were determined to patch up this rift by building new residence halls "to serve as a democratic alternative to the elitist fraternity".



Fig. 1 "Lucy Diggs Slow, dean of women at Howard University...stands in front of the newly completed women's dormitory with the national professional organization of deans of women in February 1932." (Yanni, 2019)

Pre-WWII dorms would often face private courtyards as a way to create a more comfortable housing experience. College deans wanted to establish a sense of community within these dorms that were similar to that of fraternities, but these dorms still perpetuated barriers for black students. Black and white students were not allowed to live together and black students were often given sub-par housing options. Howard University in Washington DC prided itself as a historically black university with a thriving dorm environment. Howard's women's dorms protected its residents as it was entirely enclosed and the inner courtyard had limited entrances. Women's dorms were still designed with domesticity in mind and that was where a woman was to learn how to be a good hostess, wife, and mother. Residence halls promoted socializing and elevated social behaviors. Looking at student housing today, there are still some remnants of separation and discrimination especially with how gendered it is. College life is a transformative time for students and where they live while they are going to school is just as important as the quality of their education. Creating safe, accessible, and inclusive student housing is not only necessary it should be normalized and prolific throughout America.



Fig. 2 "The University of Wisconsin's Adams and Tripp Halls, pictured here..., were designed to level class distinctions." (Yanni, 2019)

# Taxonomy of Student Housing

Georgia Tech has a gender-inclusive housing program in place for students to be a part of. The plans below show some of the student housing buildings at Georgia Tech and the ones highlighted with a red square are some of the newer buildings with better amenity spaces. Some of the key areas that are lacking in most outdated student housing buildings are varying sizes of study spaces, single user restrooms, and laundry services on each floor. They were usually considered an afterthought.

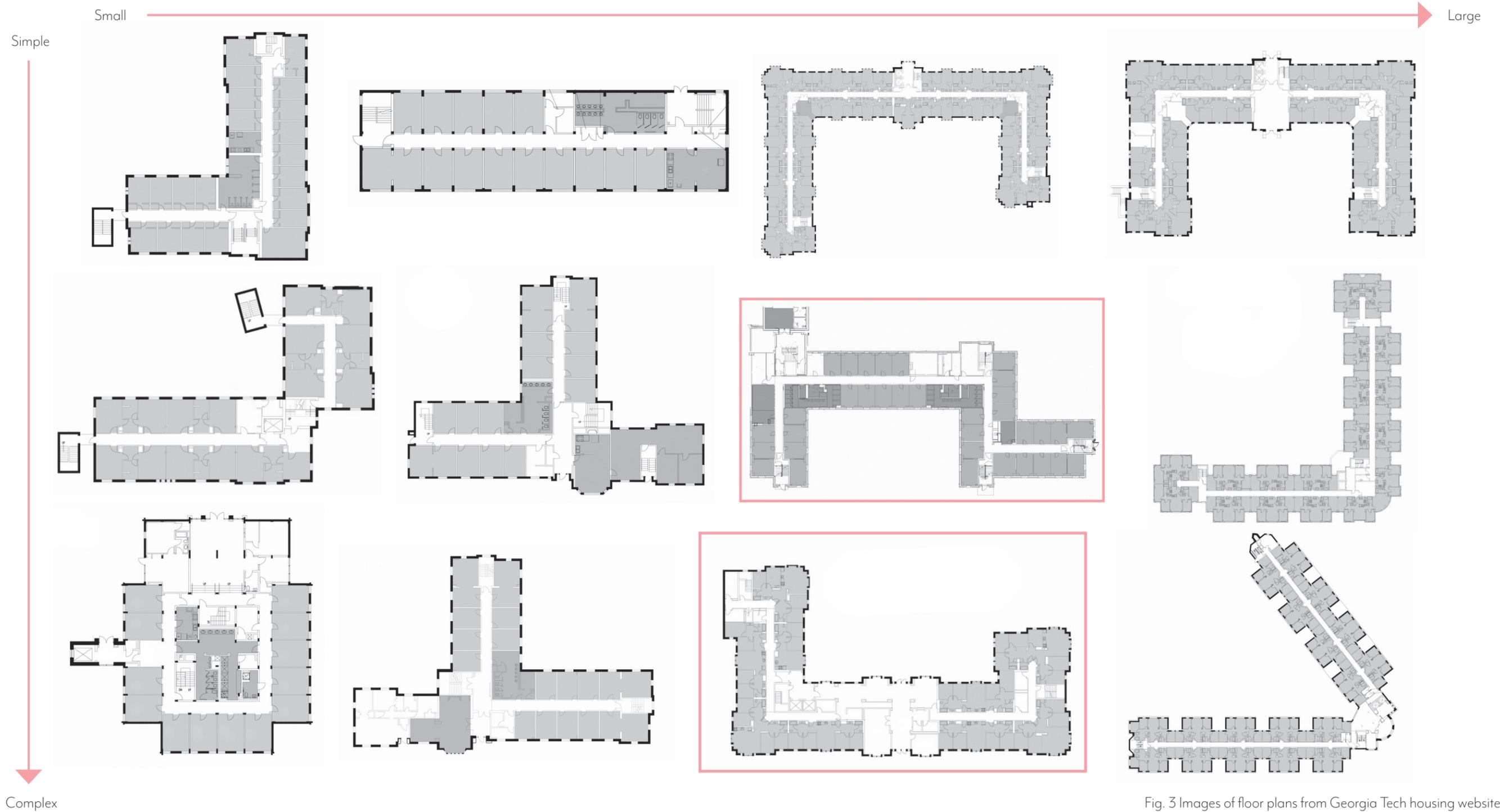


Fig. 3 Images of floor plans from Georgia Tech housing website

## Student Housing at the WAAC

The Washington-Alexandria Architecture Center currently has The Gallery building as their student housing which is only a few blocks away from the school. It is very convenient for students, but is not fully accessible to all. To reach any room, you have to take stairs to get there. Some rooms have loft spaces that are only accessible by stair. Students have the option to live in groups of 2-4 and are separated by gender. After the spring of 2022, The Gallery will be unavailable to students of WAAC as Virginia Tech has eliminated it as an option for student housing. The Virginia Tech Foundation owns the building and Residence Life runs it but has not taken the care or responsibility to maintain the building and claims that students do not use it when plenty of students have shown interest in living there. The back and forth between main campus and the WAAC has caused great uncertainty and stress among the students and faculty at the WAAC. Some students have chosen to live off campus in metro DC area and in Alexandria because of the lack of guarantee of university provided student housing. For many, university housing is more affordable and reliable than trying to get a 12-month lease in an apartment building or as a paid guest in a house. Without this option, students end up at expensive apartments which they may have to stay in longer than their allotted time at the school.

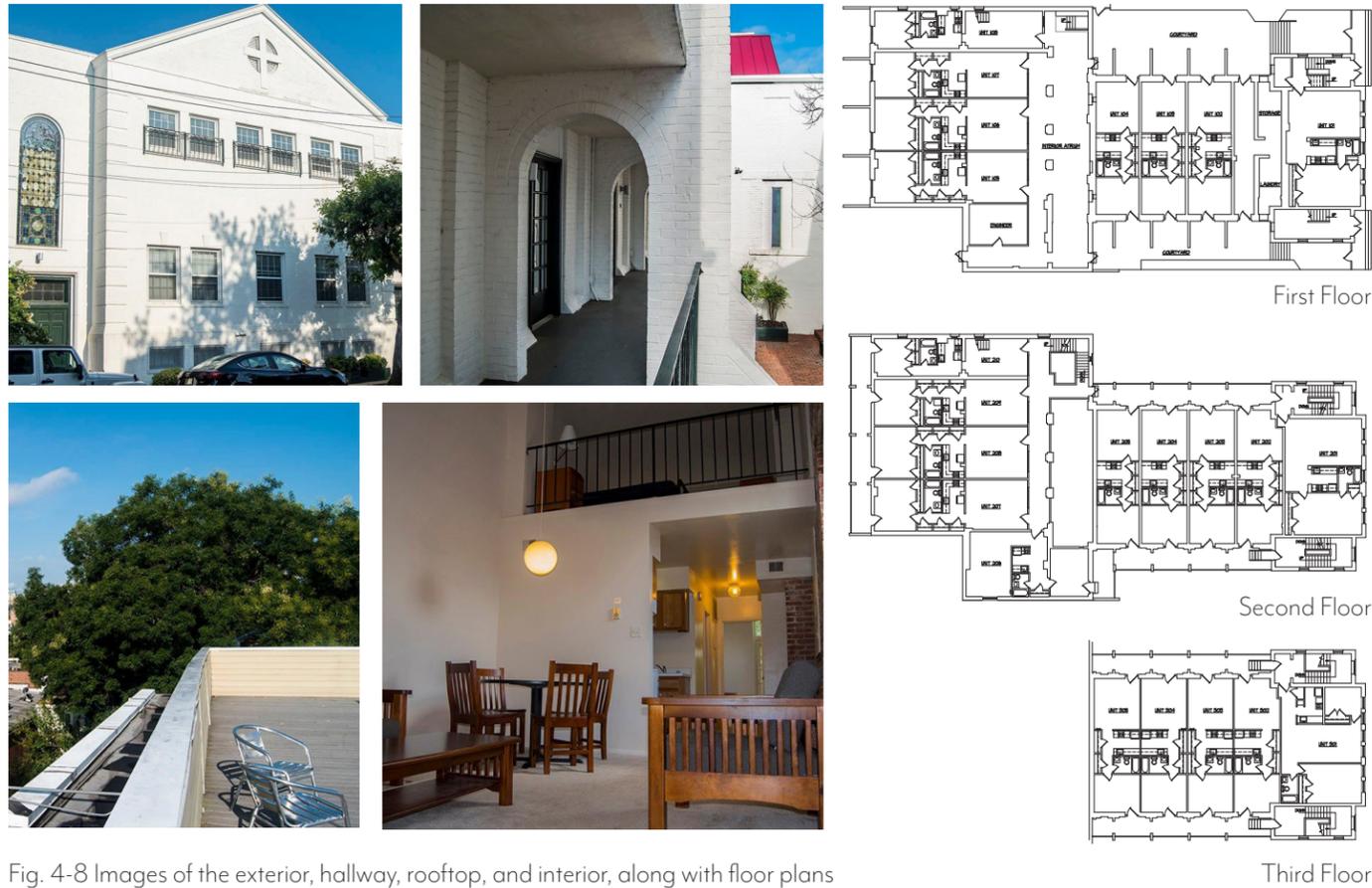


Fig. 4-8 Images of the exterior, hallway, rooftop, and interior, along with floor plans

## Gender-Inclusive Housing (GIH)

Campus Pride compiled a list of colleges and universities on their website that provide a gender-inclusive housing (GIH) program for their students. Some universities have had these programs in place as early as 2003! Currently there are 272 colleges and universities on this list. While some schools have included gender-inclusive housing as an option on their student housing applications, other schools have established a more integrated and inclusive program in place. Massachusetts College of Art and Design has “Themed Living Opportunities” for their students which includes substance free housing, LGBTQIAA housing, single sex housing (the default), and co-ed housing. On almost every gender-inclusive housing policy I found stated that this program is not intended for people in romantic relationships. Some policies also stated that students didn’t need to give a reason to the university as to why they wanted to live in GIH.

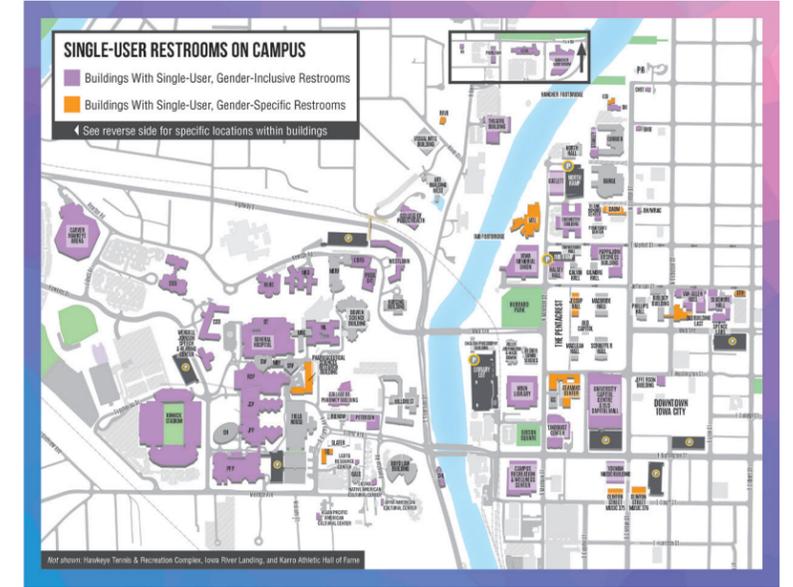


Fig. 9 The University of Iowa has an amazing map to find gender-inclusive restrooms on campus.



Fig. 10 Students gathered in a dorm room to study.

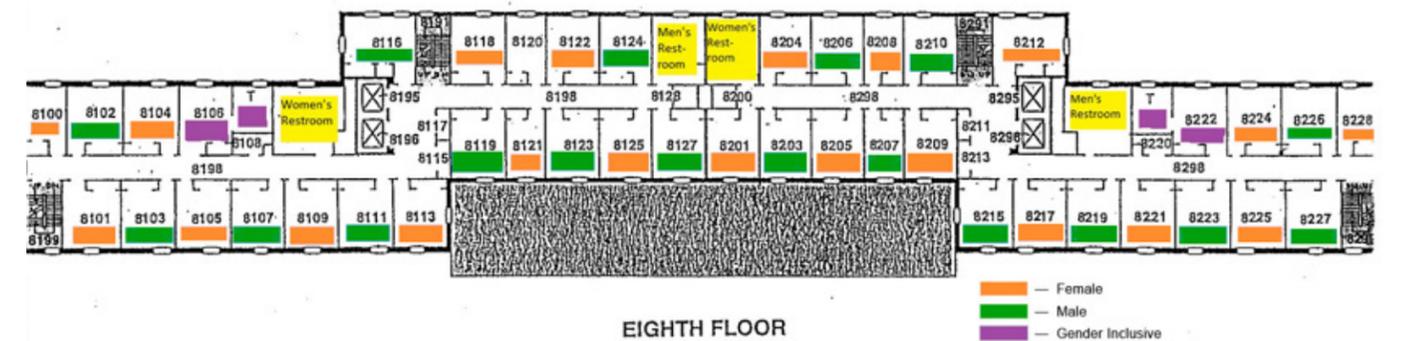


Fig. 11 Here are examples of how the University of Maryland has integrated gender-inclusive housing options into their traditional dorm-style layouts. Those units are marked in purple.

## Space + Gender

Many spaces are inherently gendered such as the kitchen, bathrooms, sports facilities, bars, and many more. Generally spaces are usually separated into masculine and feminine, but where do people outside the binary fit into spaces? How do people on the gender spectrum experience spaces differently? How can we “ungender” spaces that lean heavily towards male or female?

Hope Kelham’s photography focuses on queer bodies and the oppression of all genders: “This body, gender & privilege, explores how much privilege humans have, or do not have, in the spaces they enter. Specifically, the series explores how perceived gender and clothing preferences alter how a body can move freely in the setting of a bathroom. I asked my models to dress in their choice outfit but requested they push the concept of what is “feminine” or what they consider “masculine” - my models and I did a lot of talking about unnecessary binaries behind the scenes. Depending on what they chose, we both discussed being photographed in a men’s only or women’s only restroom. These photographs are trying to talk about how no one, regardless of appearance, sexuality, or gender, should be discriminated against or harassed. Bathrooms shouldn’t have to be gendered spaces, instead, safe and intimate spaces. All we should be concerned about when we use the restroom is how long we wash our hands for” (Kelham 2020).

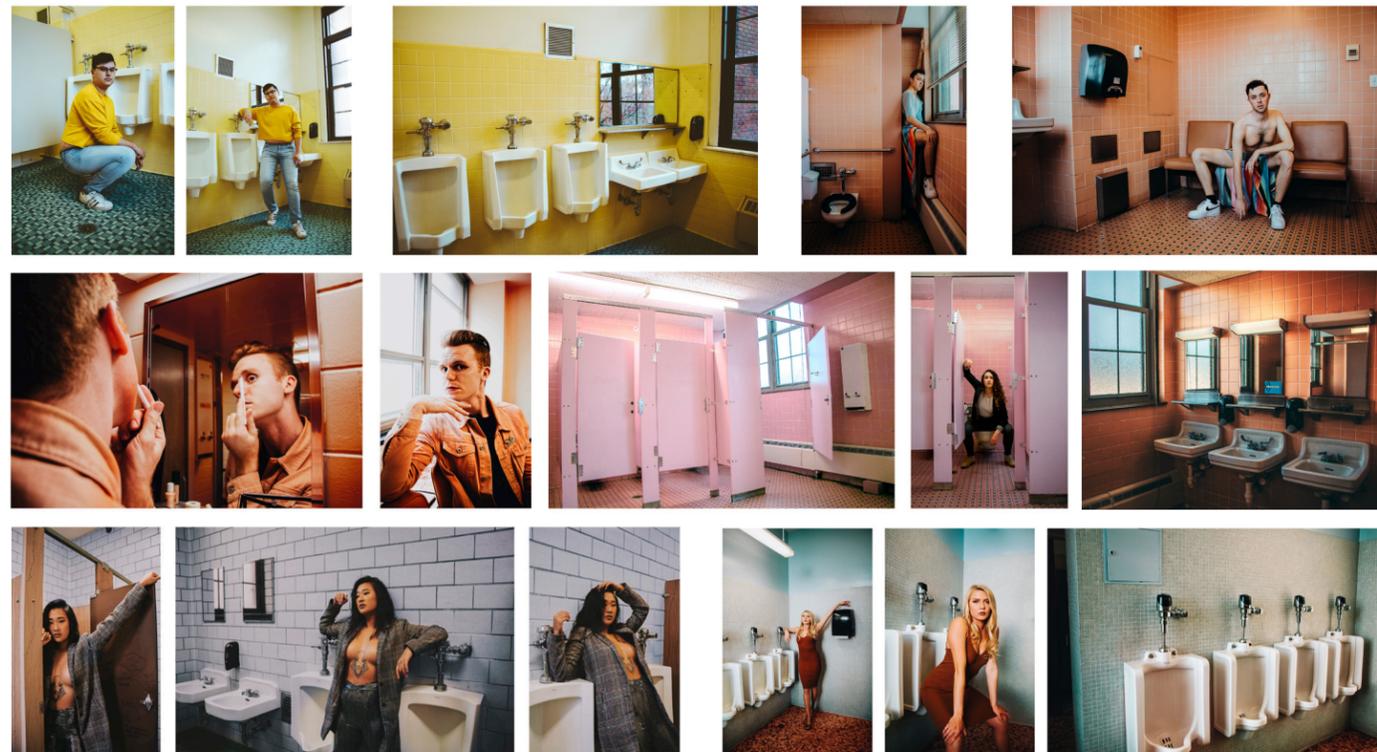


Fig. 12 "Gender & Privilege", Purdue University's Undergraduate Exhibition, 2020

## Gender-Inclusive Restrooms

"Unstalled" is an inclusive bathroom located at Gallaudet University in Washington D.C. designed by MixDesign. It highlights the social aspect of bathrooms by integrating a lounge space near the entrances. The simple yet open plan within allows for accessibility for all types of users. Calling attention to the bathroom helps “ungender” the space, just as the name of the design alludes to.

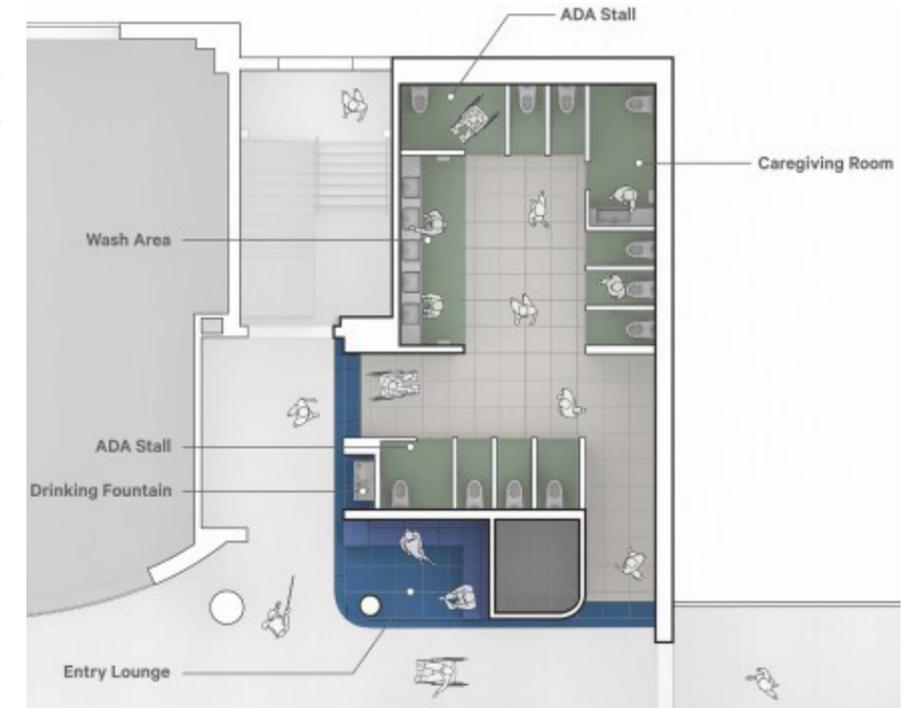


Fig. 13 (Right) "Unstalled" floor plan with different areas labeled



Fig. 14 (Above) Photograph of the inside of the bathroom

Rhode Island School of Design Student Success Center designed by WORKac and completed in 2019. Each stall is a different shape in plan and has a color associated to it. The stalls are carved out of the walls creating a cave-like space that feels very private while the openness of the washing station produces juxtaposing moments.

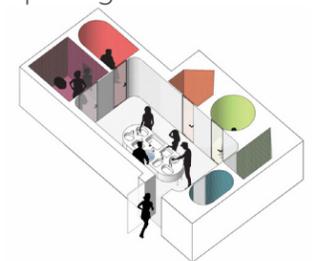


Fig. 15 Axonometric plan

## Space + Gender

Q: What does queer mean?

A: Originally, it meant odd or strange but now serves as an umbrella term for sexual minorities who are not heterosexual and/or cisgender.

Q: What does non-binary mean?

A: Let's break it down: binary meaning "having two parts" as in male and female so non-binary refers to anyone who does not identify as exclusively male or female. This could mean identifying as neither, both, or an entirely other gender or genders.

Q: What does genderqueer and genderfluid mean?

A: Genderqueer is similar to non-binary and is like an umbrella term which includes gender identity and gender expression. Gender identity and gender expression can be related to one another or completely separate. A cisgender gay man can choose to express himself in a very feminine way by wearing dresses or having long hair for example. Genderfluid people may switch genders use different pronouns as they feel appropriate.

### Pronouns and how to use them:

Many non-binary people choose not to use she/her or he/him pronouns. Some of the most common pronouns include they/them, e/ey, ve/ver, xe/xem, and ze/zie. There are many "non-traditional" pronouns so it is always best to ask someone their pronouns when you meet them. Using pronouns can be tricky, but with practice and repetition, it will become easier. Pronouns are not scary!

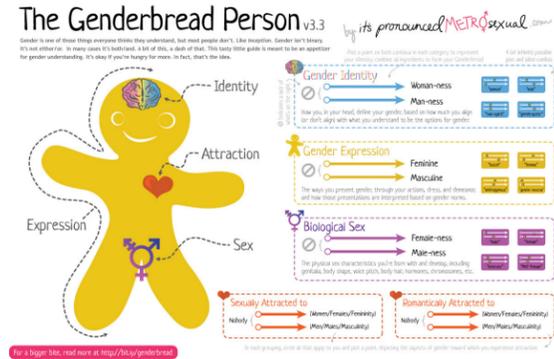


Fig. 16 The Genderbread Person

Fig. 17 Infographic for gender-specific and gender-neutral pronouns

## History: Gay + Lesbian Bars

Bars all over the world have become culturally safe spaces for queer people. Some of the oldest gay bars date back to the late 1700s. It is important to note that these were exclusively for gay men. In the 1970s there were about 2,500 gay bars in America, and now about 1,400 of those remain. Unfortunately, many gay bars are subjected to attacks and violence from outsiders. A notable attack was the mass shooting at Pulse, a gay nightclub and bar in Orlando, Florida on June 12, 2016. 49 people were killed and another 53 were wounded. It is considered the deadliest act of violence against LGBTQ+ people in the United States.

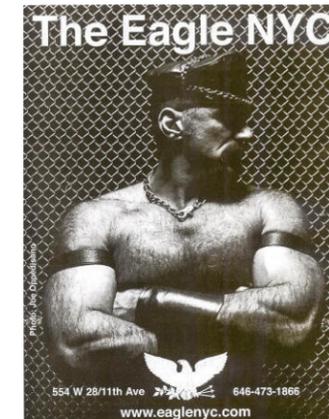


Fig. 18 The Eagle, NYC



Fig. 19 Black Cat, San Francisco



Fig. 20 Atlantic House, Provincetown, Mass.

The first lesbian bar opened in San Francisco in 1936 and was called Mona's 440 Club. In the late 1980s, there were around 200 lesbian bars across America, and now only about 20 remain. The Lesbian Bar Project has been raising money to help save those remaining bars and prevent any more from closing down. Lesbian bars are just as important in creating safe and inclusive spaces for women as gay bars are for men.



Fig. 21 Club Laurel, Los Angeles



Fig. 22 Lexington Club, San Francisco



Fig. 23 My Sister's Room, Atlanta

## Bathroom Bonding: A Freshman Year Saga

This article written by Toshali Katyal for the Daily Californian (2015) recalls the adventures a freshmen in a gender-inclusive bathroom in a dorm at University of California, Berkeley:

The college transition is understood in common discourse as the greatest change in a young person's life — a chance for self-exploration and new beginnings. But this change is as much physical as mental. The idea of home itself shifts from the comfort of the singular familial home to communal living in small spaces. Mothers and siblings are replaced with total strangers overnight. Adapt and socialize, freshmen are told — or else. This is how the collegiate residence hall narrative begins. And if it doesn't end with a horror story, it often ends with intimate friendships — a group of individuals brought together by circumstance and stuck together by common experience and affection. But how does this actually happen? The close living atmosphere of the residence halls is an integral part of every freshman college experience. Perhaps it is simply situational: the exchange of first introductions or small talk in the hallways that gradually grows longer and less awkward. But what makes UC Berkeley's unique? What really ties the floor together to form a tight-knit community of friends? I believe that freshman-year communities are born in the dingy, clustered and much-dreaded co-ed bathrooms. I am a freshman myself, living in one of the oldest residence halls on campus, Unit 3, after 18 years with a room and bathroom of my own. For myself and my peers, many of whom were so used to living in the privacy of our homes, learning how to live with a huge group of unknown people on a residence hall floor is a surprisingly drastic transition — like a never-ending summer camp. As freshmen, we can learn to live in one of two ways: by restricting our interactions to obligatory hi's and hello's, or by simply befriending the humans who live just a few centimeters away from our personal space. While some linger in the hallway and leave their doors open to socialize, others choose to cherish the single private space they have and stay inside their rooms. But no matter how hard anyone tries to live apart from the communal residence hall environment, the one space that is common to all and cannot be avoided is the bathroom. The politics of a residence hall bathroom are endless. Six sinks and shower stalls are open to use for everyone, but certain stalls are reserved for standing. This makes for many an awkward moment when a male floormate enters a sitting stall. If a girl needs to use the restroom but the sitting stalls are occupied, she is left with no other option but to use the bathroom of another floor, for which she'll get weird looks from residents of that floor as if she had walked into a "Game of Thrones" convention wearing a Hogwarts robe. Timing, poise and good humor are crucial to coming out on top in the bathrooms. The moment of inner relief upon entering the bathroom to a quiet and unoccupied space never lasts very long. No matter what time of day you walk in, someone will either already be in the space or follow in after you. Often, you're left to guess whose shoes are resting quietly in the stall next to yours. Do you acknowledge your peers when they're in a closed sitting stall or simply let it be? In the first week of school, when names and faces were just as hazy as class schedules, freshman Jackie Villana from Unit 3 Priestley experienced the forced intimacy of UC Berkeley bathrooms firsthand. "I was taking a shower, and the guy in the stall next to me dropped his Cal I Card in my stall, so I waited outside his shower until he came out to give it back to him," Villana said. "That's how we became friends." There is something about the living conditions in the residence halls that makes it difficult to feel homesick for too long. Because everyone is going through similar emotions when living away from home, it's not hard to find something in common to bond over. Tammy Wang, a freshman living in Unit 3, was showering next to two floormates when they decided to turn the activity into a dance party. "We were playing classic Disney songs from our childhood and got really into it," Wang said. "It was such a great way to feel at home, even in the worst place on our floor." The dance party resulted in a waitlist for the shower that night. Wang's floor doesn't have a common lounge, so the bathroom is the main watering hole. Pedro Chinchilla remembers a time when almost the entire floor was in the bathroom to play 20 questions. "We were asking each other some deep questions, like our future children's names, while brushing our teeth," Chinchilla said. Adjusting to a new setting, school, schedule and social life can be a huge struggle for freshmen, but knowing that there are people struggling with similar issues can make the transition more bearable. Freshman-year housing at UC Berkeley is an experience that brings together people from all over the world to share moments of brushing teeth next to one another, mutual embarrassments of seeing a guy walk into a sitting stall and early-morning complaining about the struggle of 8 a.m. classes. As much as we question our sanity as we return day after day to dirty bathrooms and loud floors, they're a rite of passage and the base of our communities that we'd be more comfortable but less bonded without.

## Queer Spaces

Organizations like SAGE (Services & Advocacy for Gay, Lesbian, Bisexual, and Transgender Elders) advocate for safe and inclusive spaces geared towards the elderly population. They also have an HIV and Aging Policy in place to "meet the needs of long-term survivors and LGBT older people living with HIV" (SAGE, n.d.). One of their big initiatives is housing. The Ingersoll Senior Residences apartment building will be one of the largest LGBTQ-oriented housing for elders in America and the first in New York City. Many LGBTQ elderly find it difficult to afford rising rent prices and may not have access to the specialized care they need. The elderly in general are often neglected, and especially those who are LGBTQ are often isolated and in unsafe conditions.



Fig. 24 An elderly man holding a SAGE poster



Fig. 25 The new Ingersoll Senior Residences apartment building

The Los Angeles LGBT Center just opened housing for LGBTQ youth located in the heart of Hollywood. The building contains 25 apartments for young adults under the age of 24. It features lively bedrooms, a community room with a kitchen, a library and computer lab, and supporting administrative offices. It is estimated that between 11% and 40% of youth who identify as LGBTQ experience homelessness.



Fig. 26 Common room and kitchen



Fig. 27 Interior of unit



# History of Potomac Yard

## History:

- Originally had plantations here in the 18th century
- Most of the land was owned by the Swann and Daingerfield families
- Congress chartered the Alexandria Canal Company in 1830 so it became a transportation hub around that time
- Railroad development began in the 1850s
- The new Alexandria Union Station opened in 1905 and the new switching yard - Potomac Yard - which opened in 1906
- “Pot Yard” as it was called attracted thousands of workers who settled in Del Ray and St. Elmo areas
- It was one of the busiest rail yards in the Eastern United States, processing thousands of cars daily
- The old overhead catenary was dismantled in the 1980s
- The facility was identified as a toxic waste site in 1987
- It was finally decommissioned in 1989

## Redevelopment:

- It was immediately declared a Superfund site and in 1995 the EPA approved a cleanup plan and was finished up by 1998 (used to be a brownfield land)
- Potomac Yard Center, a strip mall, was completed in 1997 after the site was approved for retail use in 1995
- The new Virginia Tech Innovation Campus broke ground in September 2021
- Masterplan is set to be finished by 2024

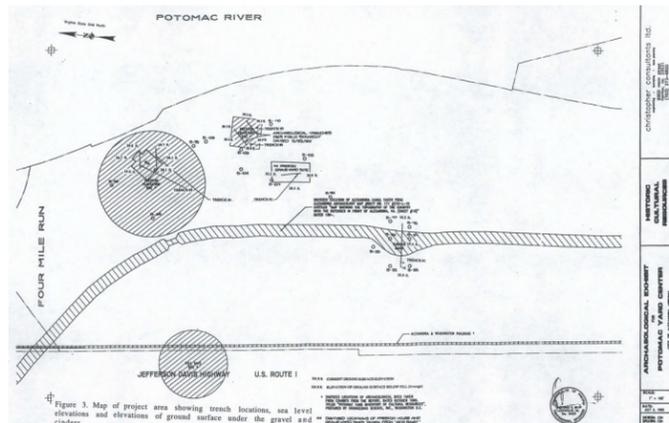


Fig. 28 Site of Preston Plantation



Fig. 29 The rail yards

## Potomac Yard Park

- Construction began in 2009 and it opened at the end of 2013
- It has a water fountain, playgrounds, and sports fields within 24 acres
- It borders train tracks carrying freight and Virginia Railway Express commuter rail



Fig. 30 The water fountains at Potomac Yard Park

## Transportation

- A bus runs from Crystal City to Potomac Yard and it opened in 2014
- Plans for a streetcar was canceled in 2014
- A new Metro station is under construction and will open in 2022



Fig. 31 Rendering of the new Potomac Yard metro station

# Interpreting the Broader Site Context

- ▲ Thrive
- Learn
- Connect

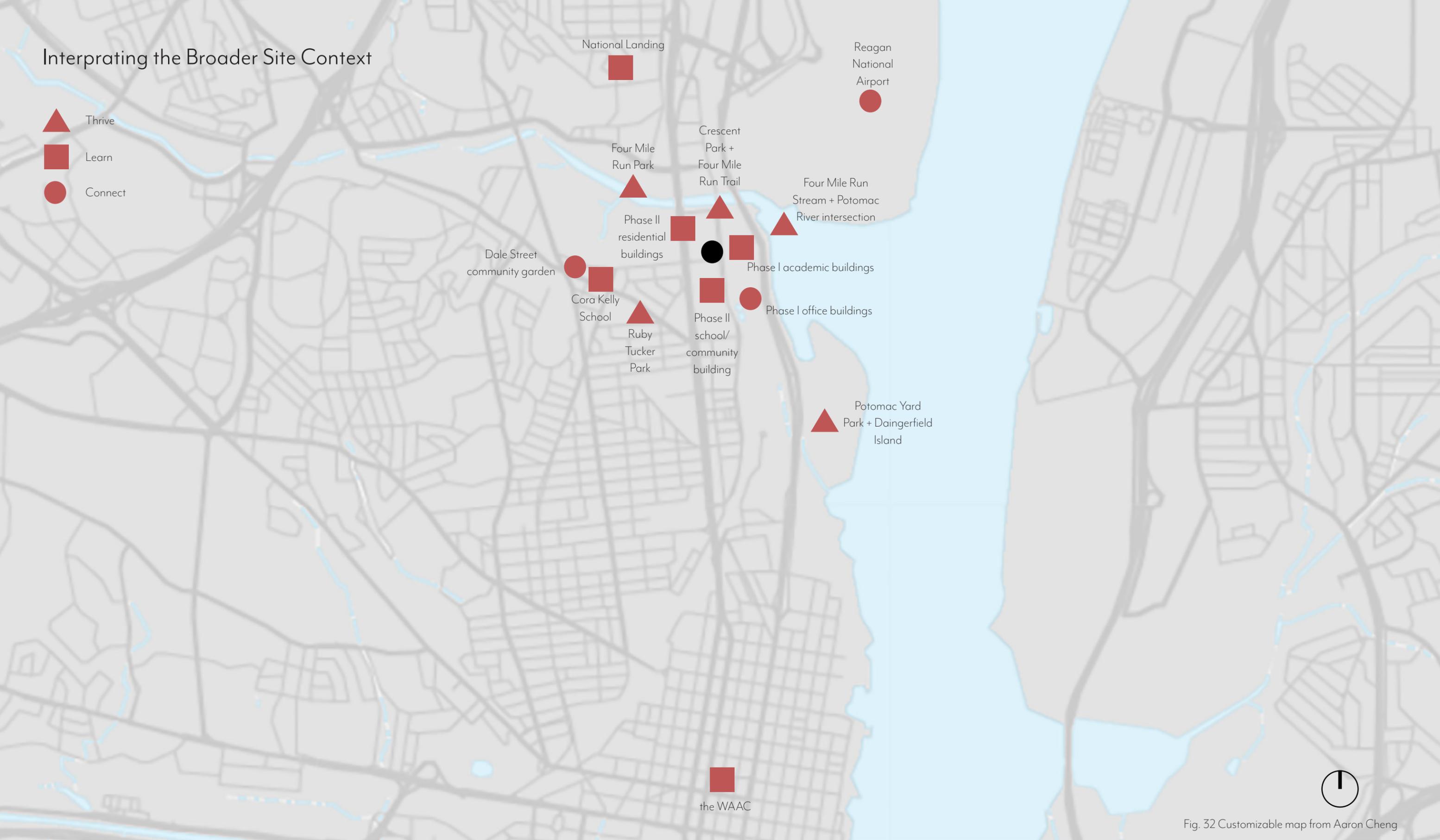
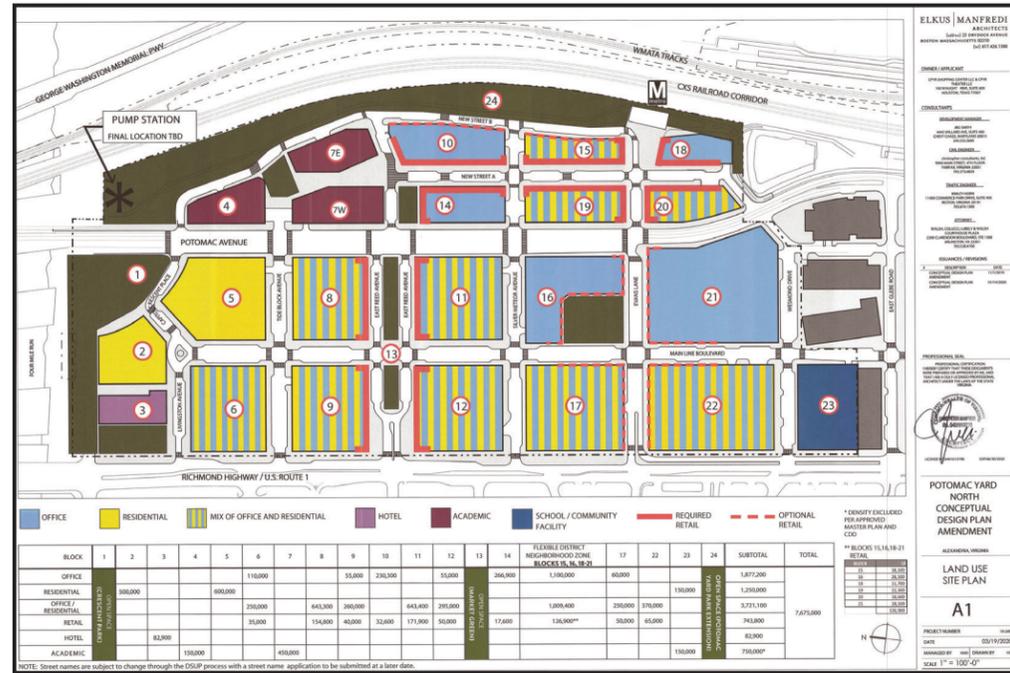


Fig. 32 Customizable map from Aaron Cheng

# Masterplan at North Potomac Yard + Potomac Yard Metro Station



The new Virginia Tech Innovation Campus was designed by SmithGroup with additional buildings to be designed by Boston-based firm Elkus Manfredi Architects. The proposed land use site plan shows the different programming for phases I and II of the campus. Phase I is east of Potomac Avenue and Phase II is west of that street. Most is set to be mixed-use with required and optional retail. There will also be a few offices and academic spaces, with only two buildings set as fully residential. A new Potomac Yard Metro stop is set to open in the Fall of 2022. This will add a stop between Braddock Road and Ronald Reagan National Airport. Both blue and yellow lines will continue through this new stop.

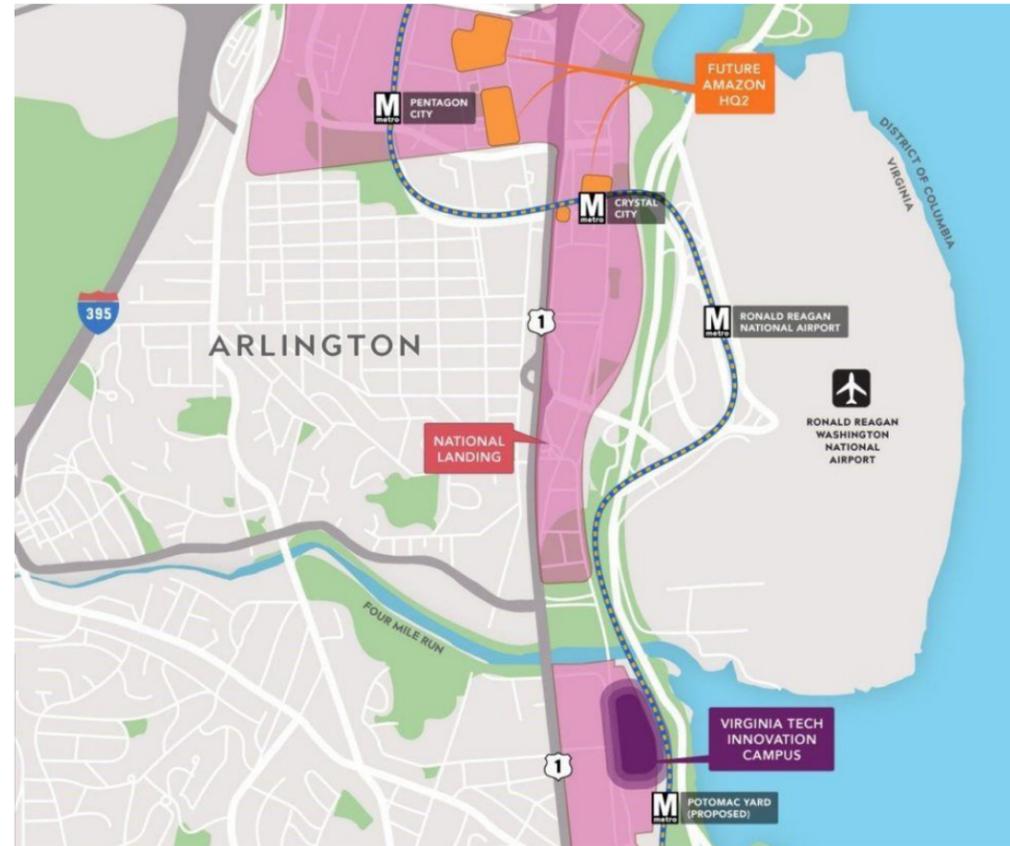


Fig. 33 (Above) Conceptual masterplan by Elkus Manfredi Architects Fig. 34 (Below) Metro map including the new Potomac Yard stop

# North Potomac Small Area Plan

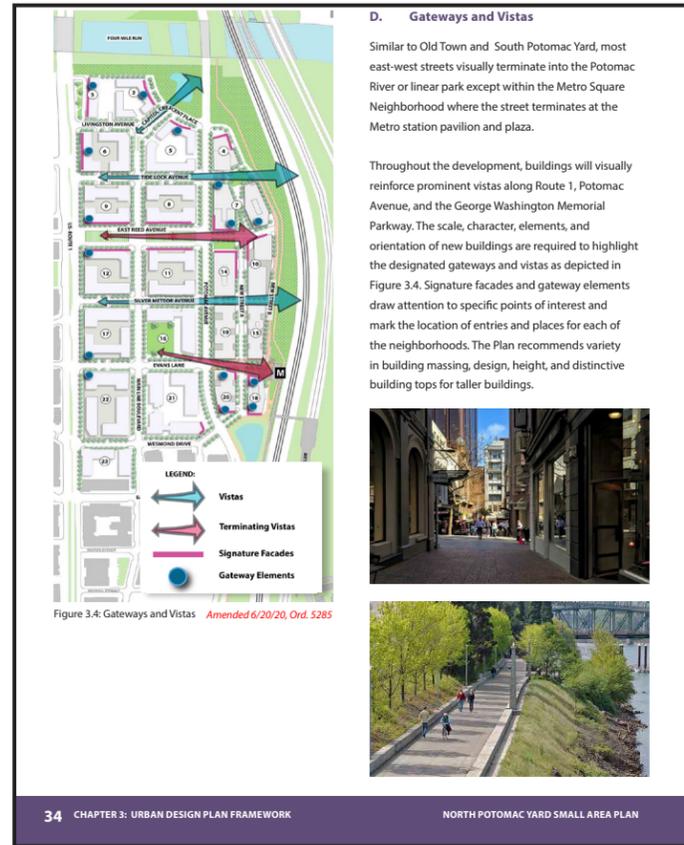


Table 4.3. Development Summary Amended 6/20/20, Ord. 5285

BLOCK #	PRINCIPAL LAND USE	OFFICE (SF)	RESIDENTIAL (SF)	OFFICE OR RESIDENTIAL (SF)	RETAIL (SF)	HOTEL (SF)	SCHOOL / CIVIC USE (SF)	3,4 TOTAL
1	OPEN SPACE (CRESCENT PARK)	0	0	0	0	0	0	0
2	RESIDENTIAL	0	500,000	0	0	0	0	500,000
3	HOTEL	0	0	0	0	82,900	0	82,900
4	SCHOOL/ACADEMIC	0	0	0	0	0	(150,000) <sup>1</sup>	(150,000) <sup>1</sup>
5	RESIDENTIAL	0	600,000	0	0	0	0	600,000
6	OFFICE/RESIDENTIAL	110,000	0	250,000	35,000	0	0	395,000
<b>CRESCENT GATEWAY NEIGHBORHOOD TOTAL</b>		<b>110,000</b>	<b>1,100,000</b>	<b>250,000</b>	<b>35,000</b>	<b>82,900</b>	<b>(150,000)</b>	<b>1,577,900</b>
7	SCHOOL/ACADEMIC	0	0	0	0	0	(450,000) <sup>1</sup>	(450,000) <sup>1</sup>
8	OFFICE/RESIDENTIAL	0	0	643,300	154,800	0	0	798,100
9	OFFICE/RESIDENTIAL	55,000	0	260,000	40,000	0	0	355,000
10	OFFICE	230,300	0	0	32,600	0	0	262,900
11	OFFICE/RESIDENTIAL	0	0	643,400	171,900	0	0	815,300
12	OFFICE/RESIDENTIAL	55,000	0	295,000	50,000	0	0	400,000
13	OPEN SPACE (MARKET GREEN)	0	0	0	0	0	0	0
14	OFFICE	266,900	0	0	17,600	0	0	284,500
<b>MARKET DISTRICT NEIGHBORHOOD TOTAL</b>		<b>607,200</b>	<b>0</b>	<b>1,841,700</b>	<b>466,900</b>	<b>0</b>	<b>(450,000)</b>	<b>2,915,800</b>
<b>FLEXIBLE DISTRICT NEIGHBORHOOD TOTAL</b>		<b>1,100,000</b>	<b>0</b>	<b>1,009,400</b>	<b>126,900</b>	<b>0</b>	<b>0</b>	<b>2,236,300</b>
17	OFFICE/RESIDENTIAL	60,000	0	250,000	50,000	0	0	360,000
22	OFFICE/RESIDENTIAL	0	0	370,000	65,000	0	0	435,000
23	COMMUNITY FACILITY / AFFORDABLE HOUSING	0	150,000	0	0	0	(150,000) <sup>1</sup>	150,000
<b>METRO SQUARE NEIGHBORHOOD TOTAL</b>		<b>1,160,000</b>	<b>150,000</b>	<b>1,629,400</b>	<b>241,900</b>	<b>0</b>	<b>(150,000)</b>	<b>3,181,300</b>
24	OPEN SPACE (POTOMAC YARD PARK EXTENSION) <sup>12</sup>	0	0	0	0	0	0	0
<b>TOTAL (SF)</b>		<b>7,675,000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

Fig. 35 A few pages from the North Potomac Small Area Plan from the City of Alexandria Government website, 2020



**The History of Potomac Yard: A Transportation Corridor through Time**  
By Francine W. Bromberg, Alexandria Archaeology

The area that became Potomac Yard has a long history of serving as a trade and transportation corridor. From prehistoric times through the present, these level terraces paralleling the Potomac River provided a north/south pathway for moving people and goods. While the modes of transportation changed - from foot to horse and stagecoach, then to canal boats, and later to trains and automobiles, the landform remained an important link in the route connecting people and places throughout the course of history.

**Native American Occupation**

The word "Potomac" is thought to derive from an Algonquian Indian term meaning "where things are brought in" or a place for trade (National Museum of the American Indian 2008). Thus, even before the arrival of Europeans, the area was recognized as a transportation hub and center for the exchange of goods. While the river itself served as the major natural transportation corridor for Native Americans in their canoes, an old Indian trail purportedly followed the ridge from the Rappahannock to the Potomac and developed into present-day Telegraph Road in the local area (Netherton et al. 1978:20).

Bands of Native American hunters and gatherers may have traversed the area that became Potomac Yard as early as 13,000 years ago. More intensive occupation undoubtedly began about 5000 years ago when anadromous fish became abundant in the Potomac (Bromberg 1987). In addition, the nearby marshes, which formed as the glaciers melted, provided a wide variety of resources. Temporary encampments to exploit the marsh resources and take advantage of the reliable spring fish runs probably continued on the Potomac Yard terraces into the historic period, which begins with John Smith's voyage up the Potomac River in 1608. At that time, Smith recorded the locations of two nearby agricultural hamlets, Nameroughquend to the north (on what is now National Airport) and Assaomeck to the south (near Belle Haven), from which foraging parties could have departed for exploitation of the swamp and fish resources of the Potomac Yard property (Smith 1608).

## New Academic Building

The new Virginia Tech Innovation Campus academic building will be built on plot 7W (zoned as "academic") on the masterplan. These are a few renderings showing the building and surrounding campus. The project broke ground at the end of 2021 and is expected to be completed by the end of 2024. This building is part of Phase I of the masterplan which consists of the collection of buildings east of Potomac Avenue. Currently, there are no university funded student housing buildings planned for the new campus or anywhere near it.

In talking with Sven Shockey from SmithGroup, he mentioned a few key features of the building and how they want to set a precedent for the aesthetic of the new campus. The facade contains photovoltaic fins that help power the building and act as a shading device, with additional PV panels on the rooftop to capture more direct sunlight. The curtain wall at the ground level creates a welcoming and inviting entrance and allows for connections to the neighboring buildings.

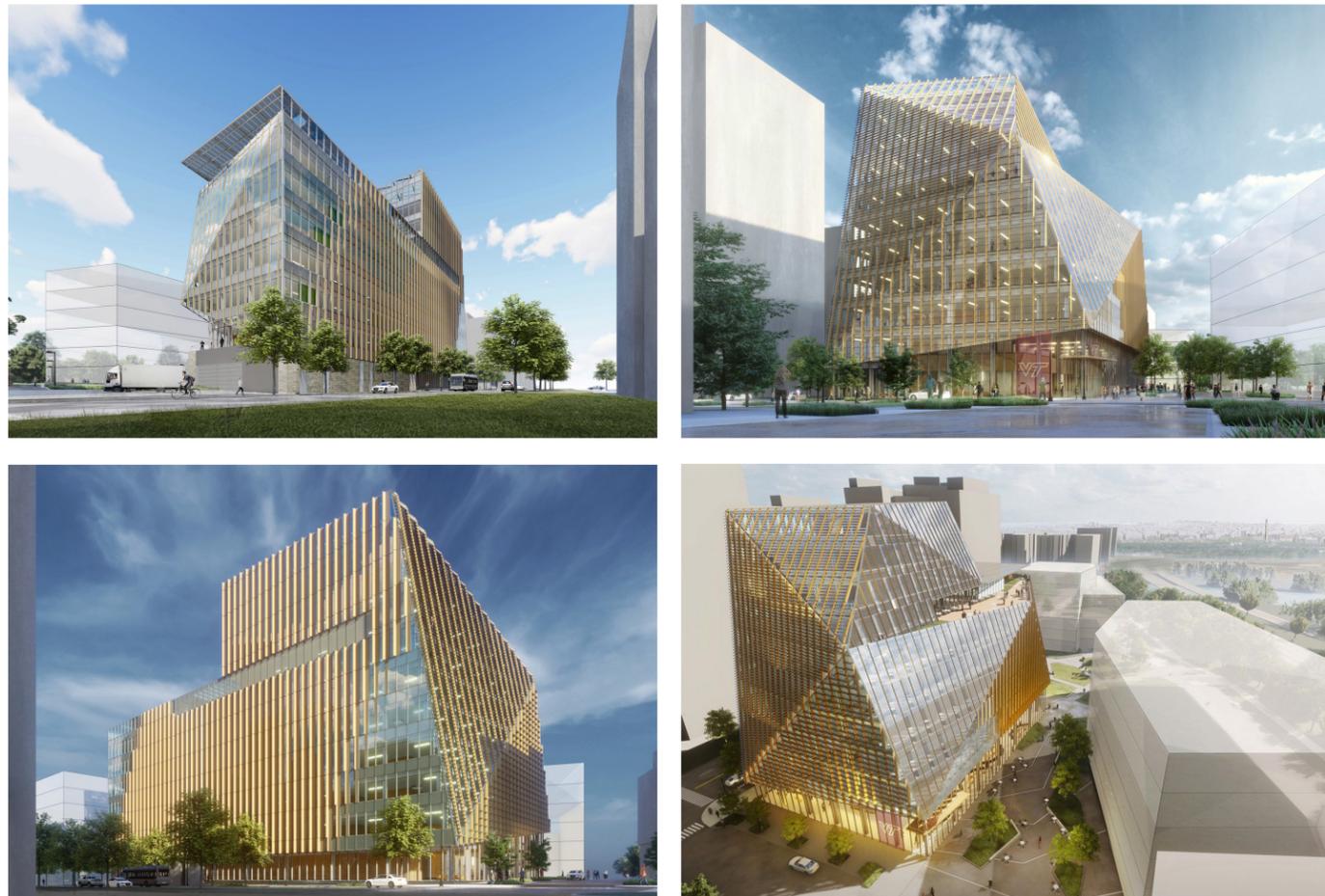


Fig. 36 Renderings of the new academic building

## Current Site

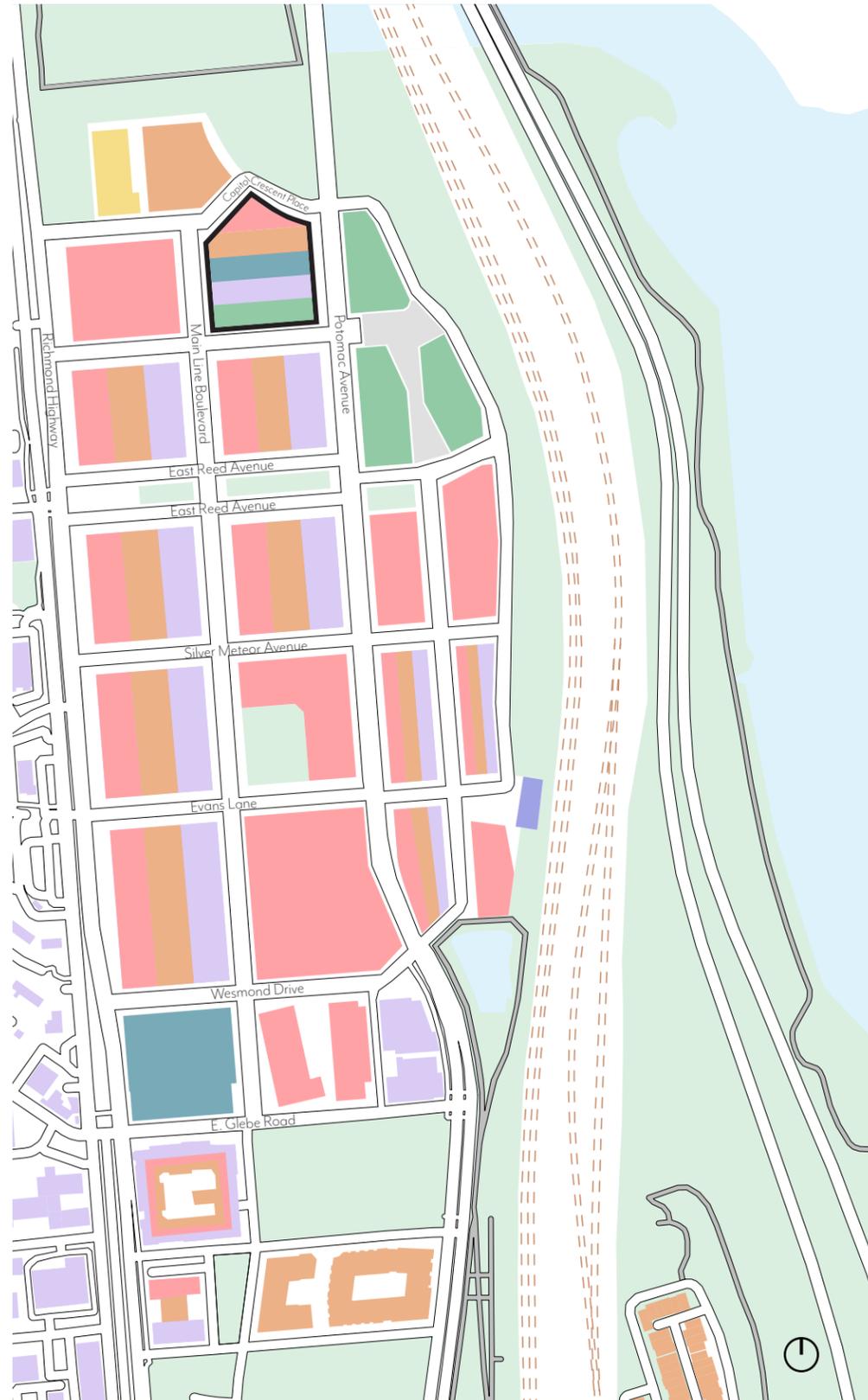


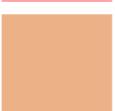
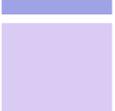
The area where Phase I will be built used to have an AMC movie theater which has since been torn down. The area where Phase II will be built currently has a mix of retail, commercial, and restaurants. The strip mall is called Potomac Yard Center. The existing site contains railroad tracks, active and inactive bridges, and some ongoing construction.

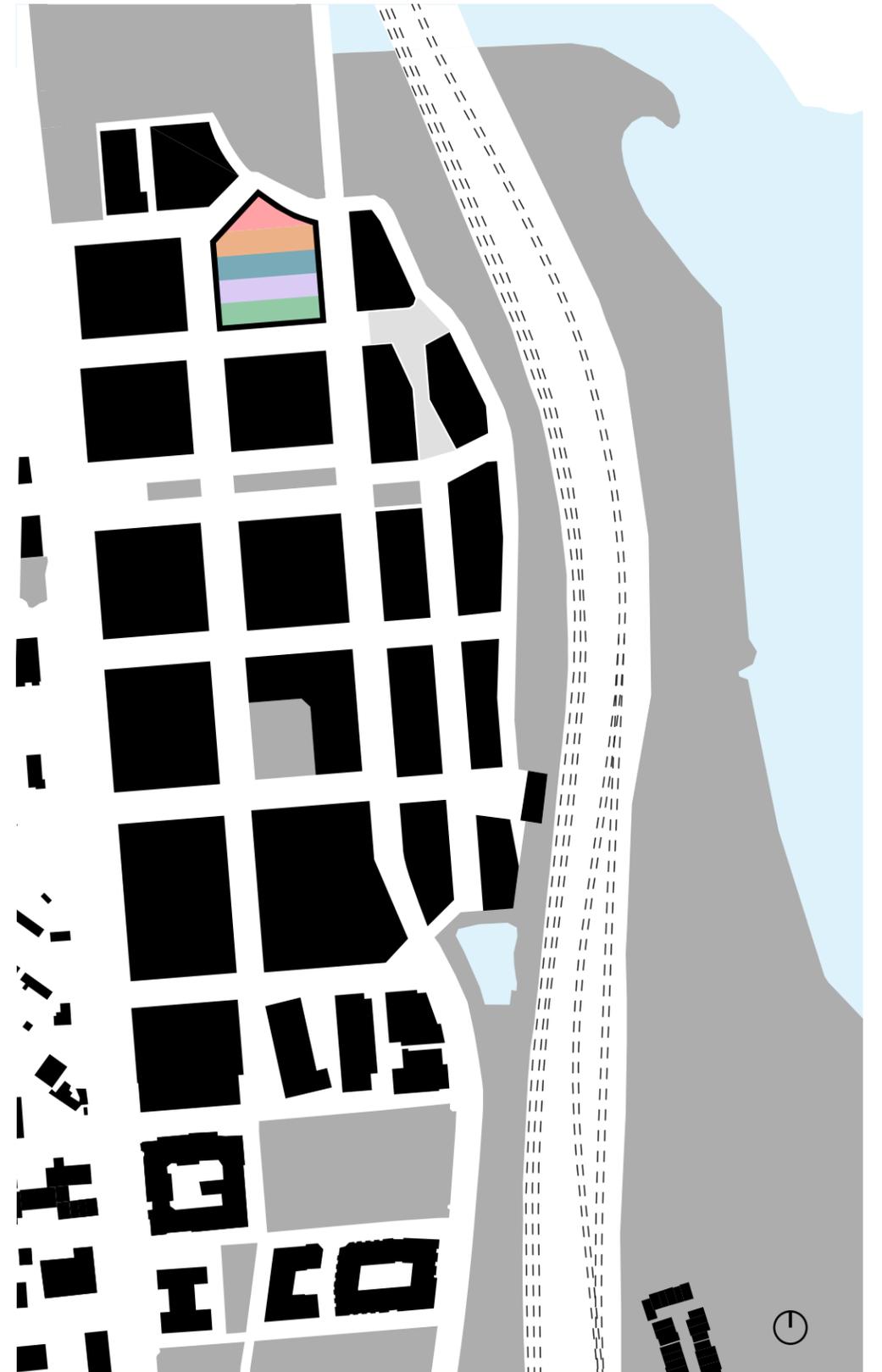


Fig. 37 Photographs of the existing site

# Proposed Site



-  Building
-  Green Space
-  Blue Space
-  Transportation
-  Hardscape
-  Office
-  Residential
-  Hotel
-  Academic
-  Community
-  Metro
-  Commercial





# Student Housing Precedents

I looked at a few laudable examples of student housing and multi-family residential buildings to how they handled the placement of different programs and reacted to their site contexts.

The Kim and Tritton Residence Halls at Haverford College in Pennsylvania took the route of the traditional dorm layout. Each room houses only one person, allowing privacy and independence while the open kitchen and lounge areas bring everyone together. The abundance of visual connections out towards the landscape establishes a sense of calm and renewal.

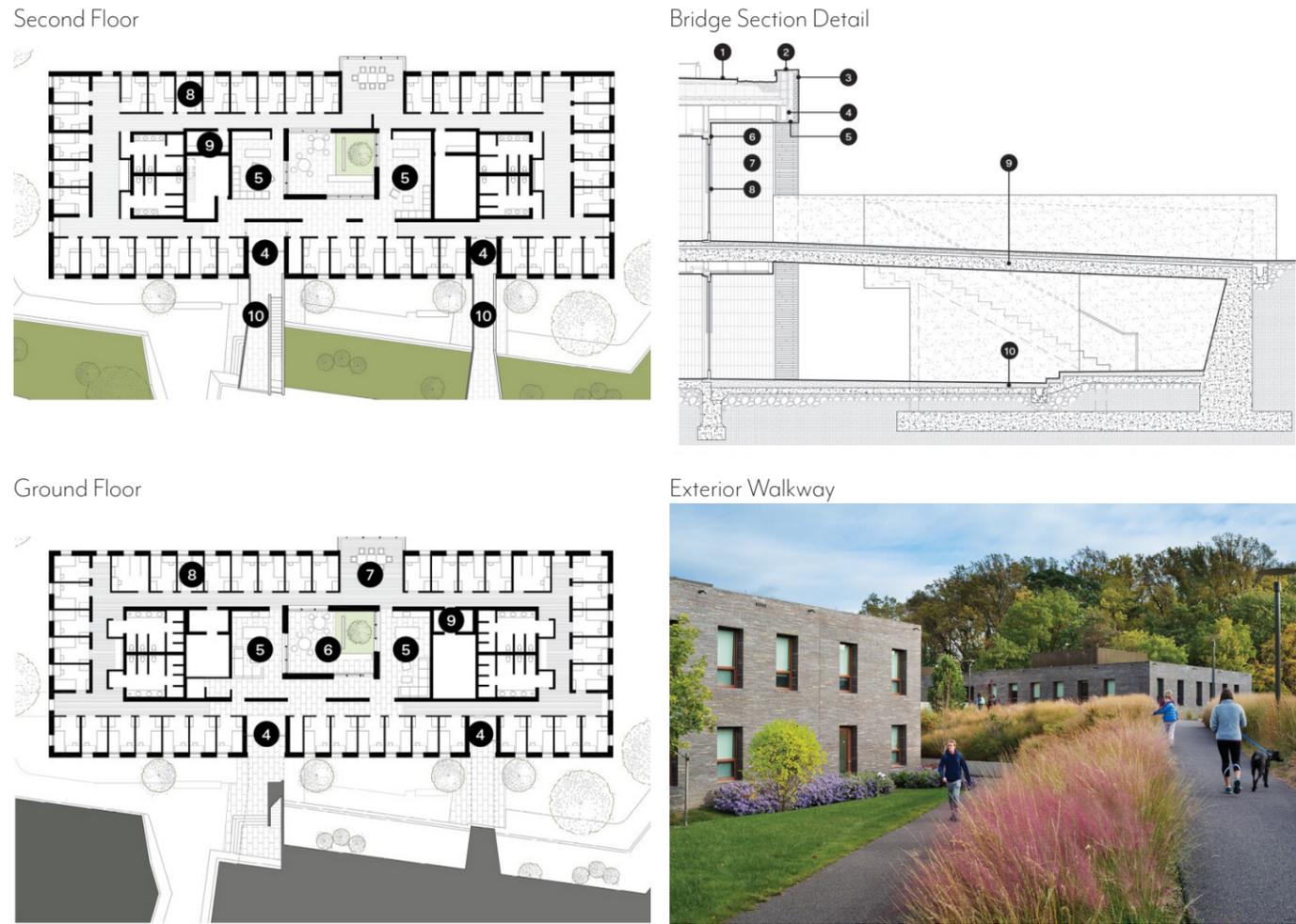


Fig. 38 - 41 Floor plans, section, and exterior perspective

North Hall at Rhode Island School of Design in Rhode Island employs a similar layout with dorm-style units. Each of the units has high ceilings which makes the small space feel a lot bigger and brighter. Each room features built in closet space with movable desks and beds for customizable layouts. The large windows look out onto the campus and let in plenty of light. This building is situated on a primary pedestrian walkway that connects other student housing buildings ending with RISD beach at the western end.

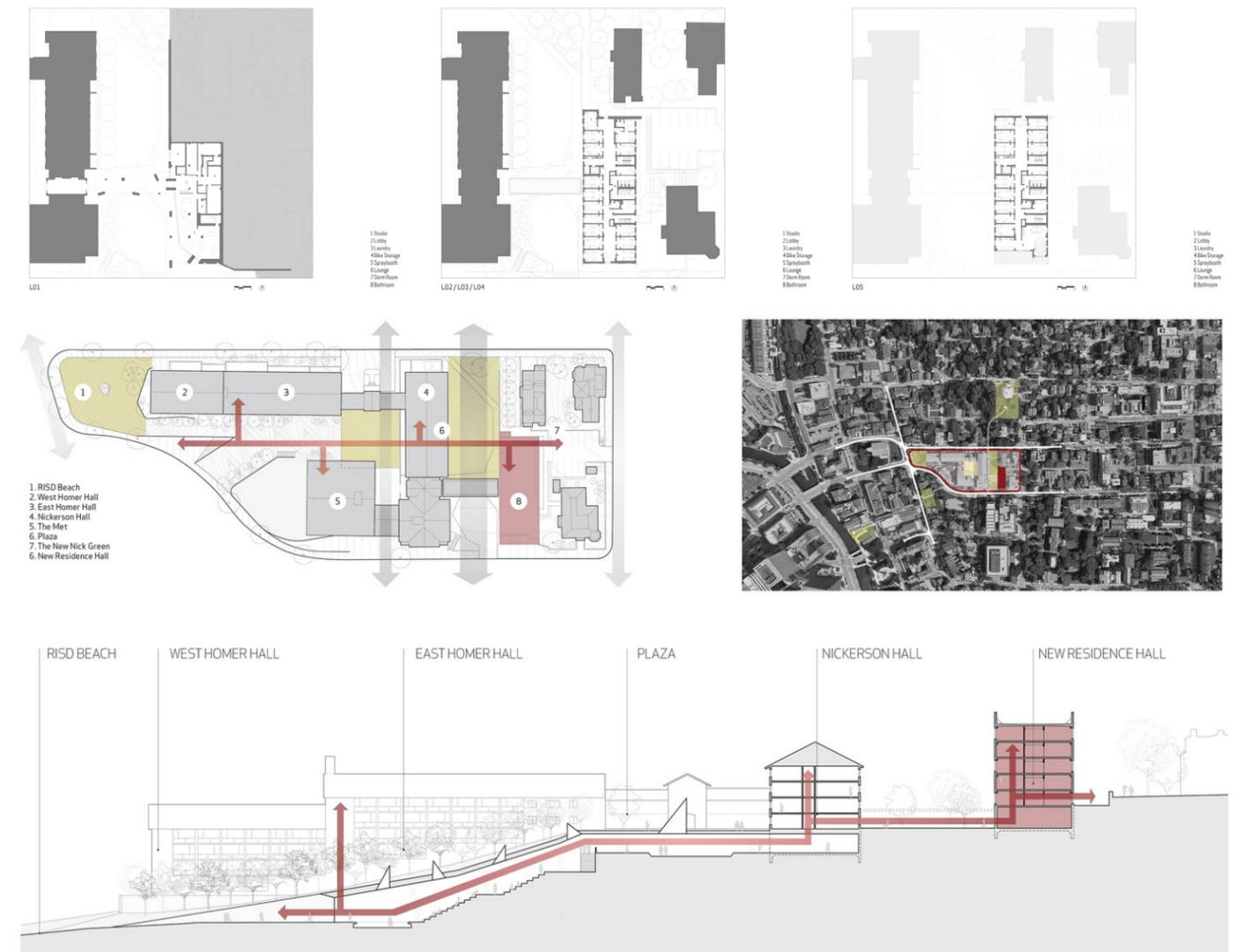


Fig. 42-45 Floor plans and a site plan/section

## Multi-Family Housing Precedents

AARhus, in Aarhus, Denmark takes advantage of the site by pulling up the corners of the building and by giving almost every unit its own balcony. The central courtyard brings back some green space to the docks and water here.

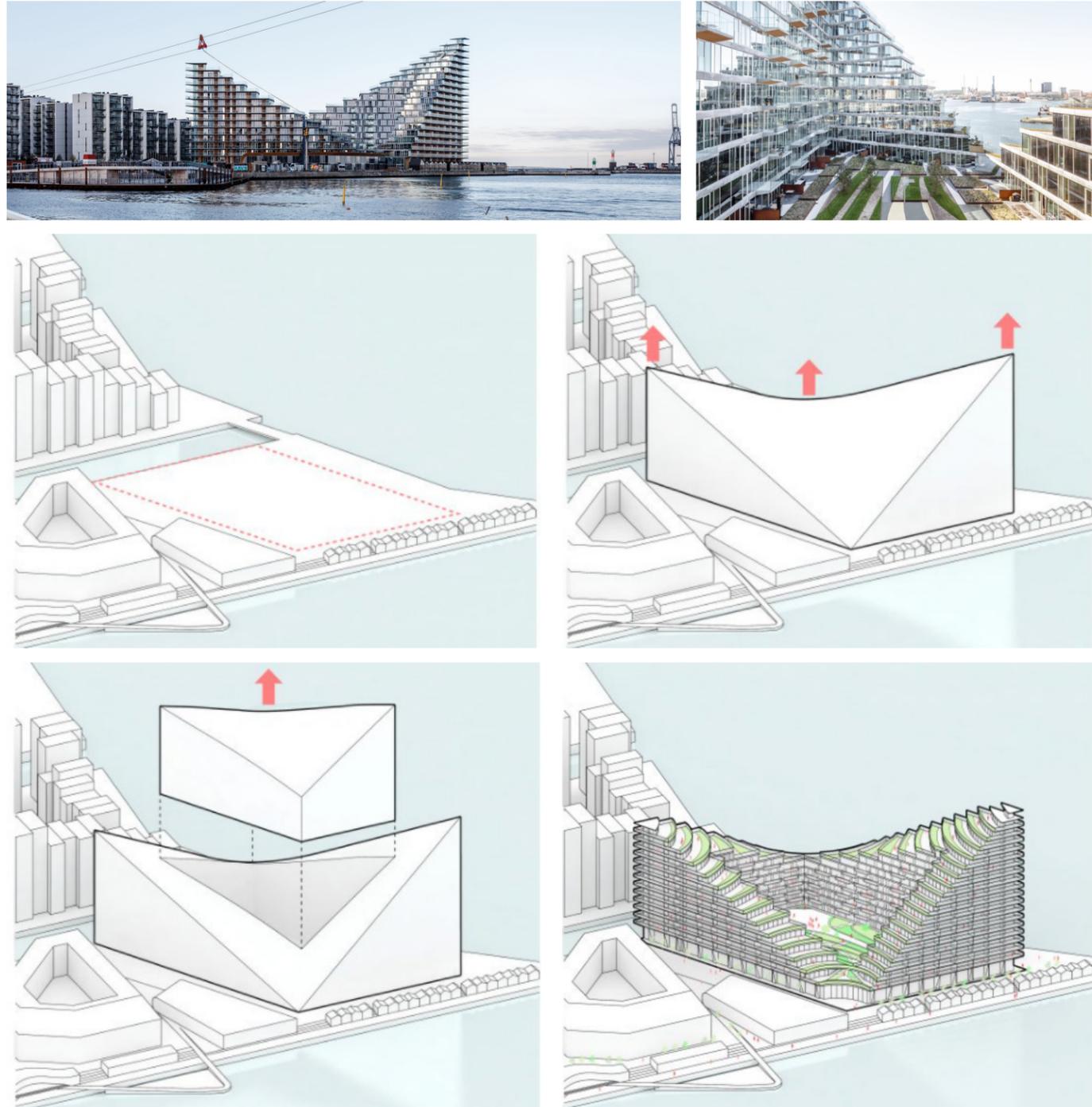


Fig. 46-51 Exterior views and massing diagrams

79&PARK in Stockholm, Sweden also employs the stepped terraces to allow more sun exposure to each unit and the central courtyard. The green roofs are a small oasis for residents to enjoy nature and to enhance the biodiversity of the area.

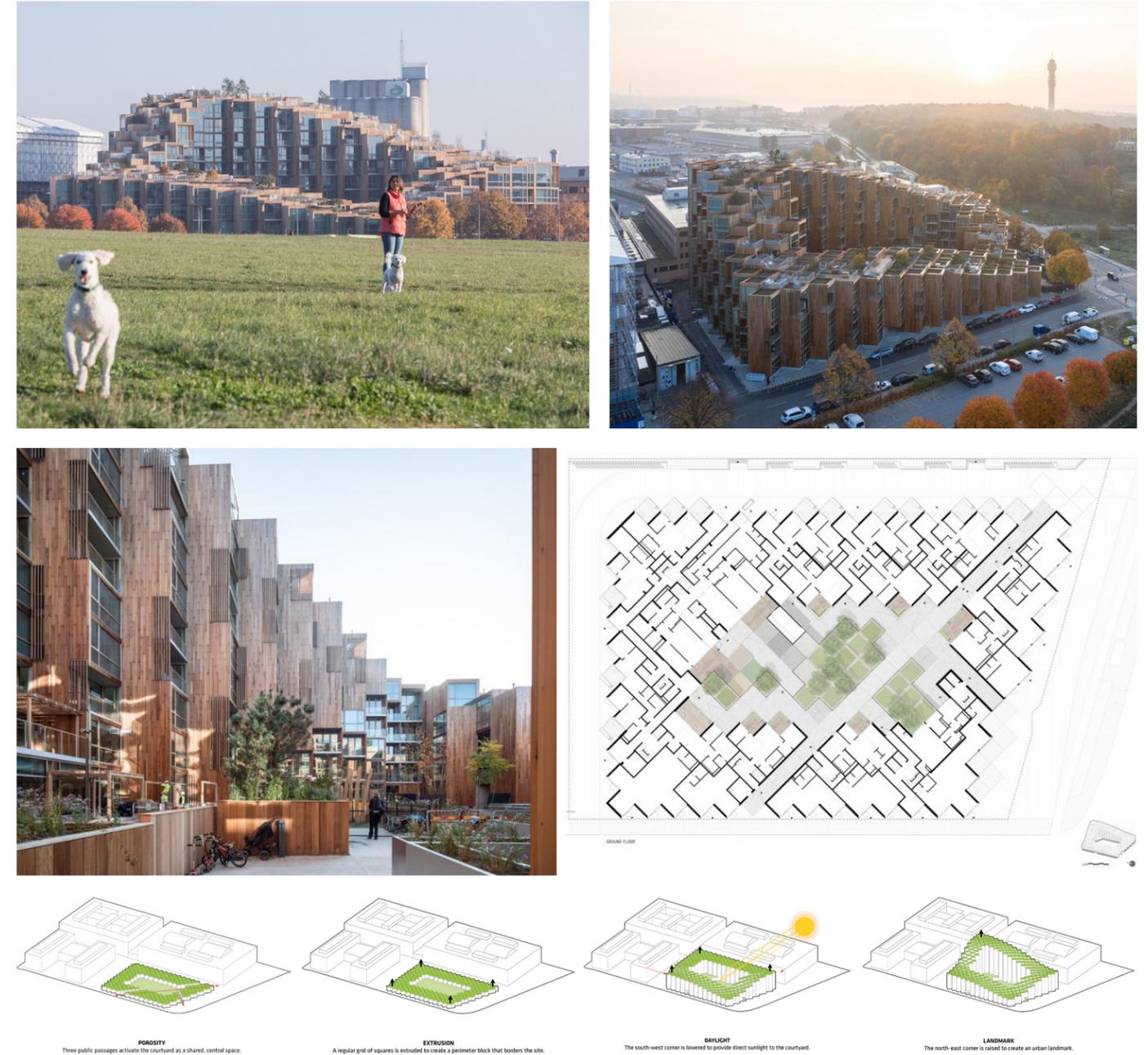
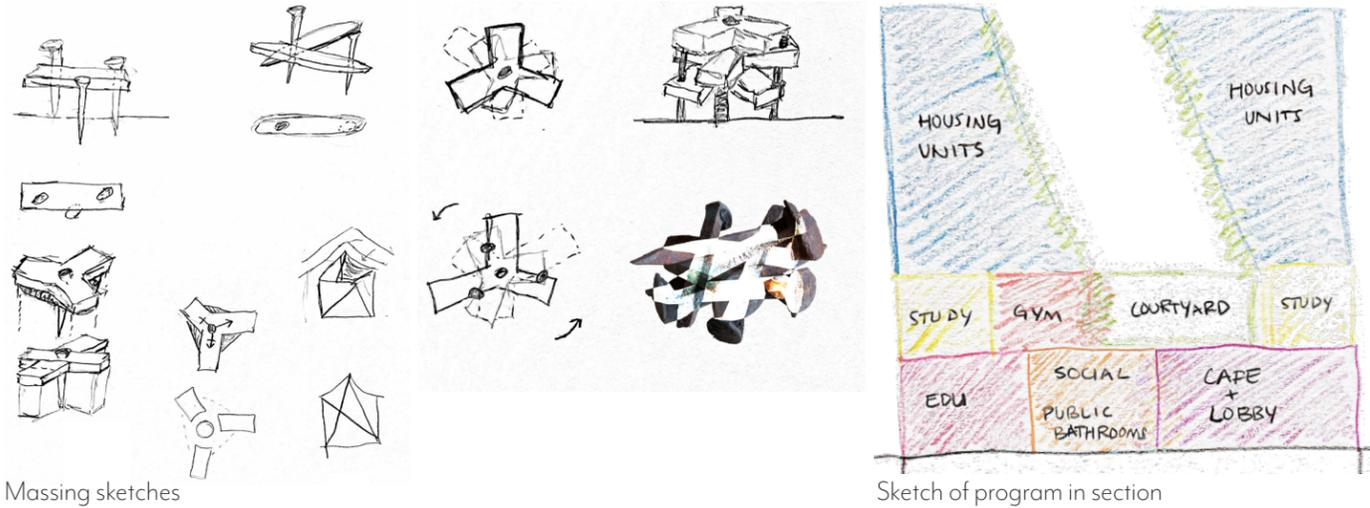


Fig. 52-59 Exterior views, floor plan, and site analysis diagrams



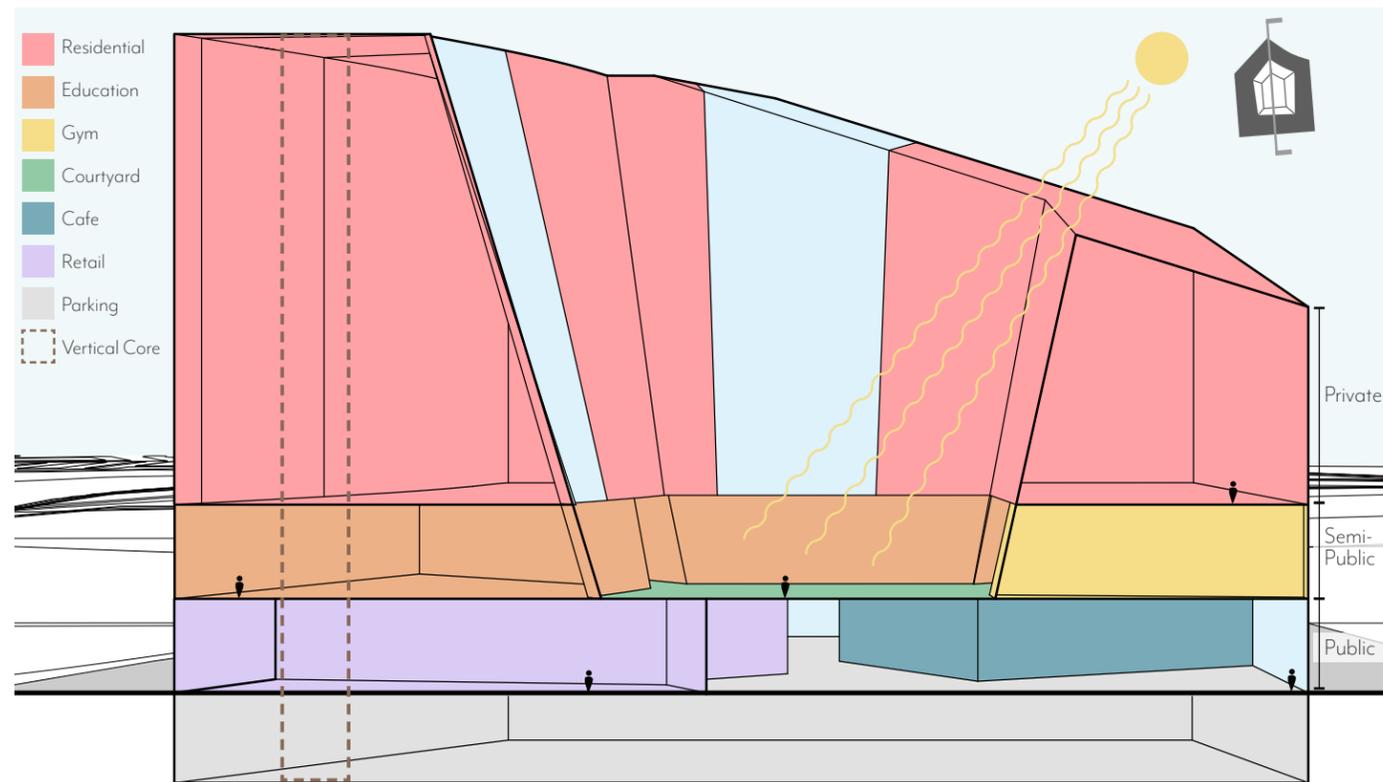
## Initial Program Ideas

Reflecting on the site and overarching topic of student housing, my first iterations of the building incorporated the concept of "anchoring" as a way to organize the form and program. The three-part arrangement places the public program elements at the bottom and slowly transitions to private at the top. The final design evolved from these ideas while reacting to the site conditions, broader context, and environmental factors.



Massing sketches

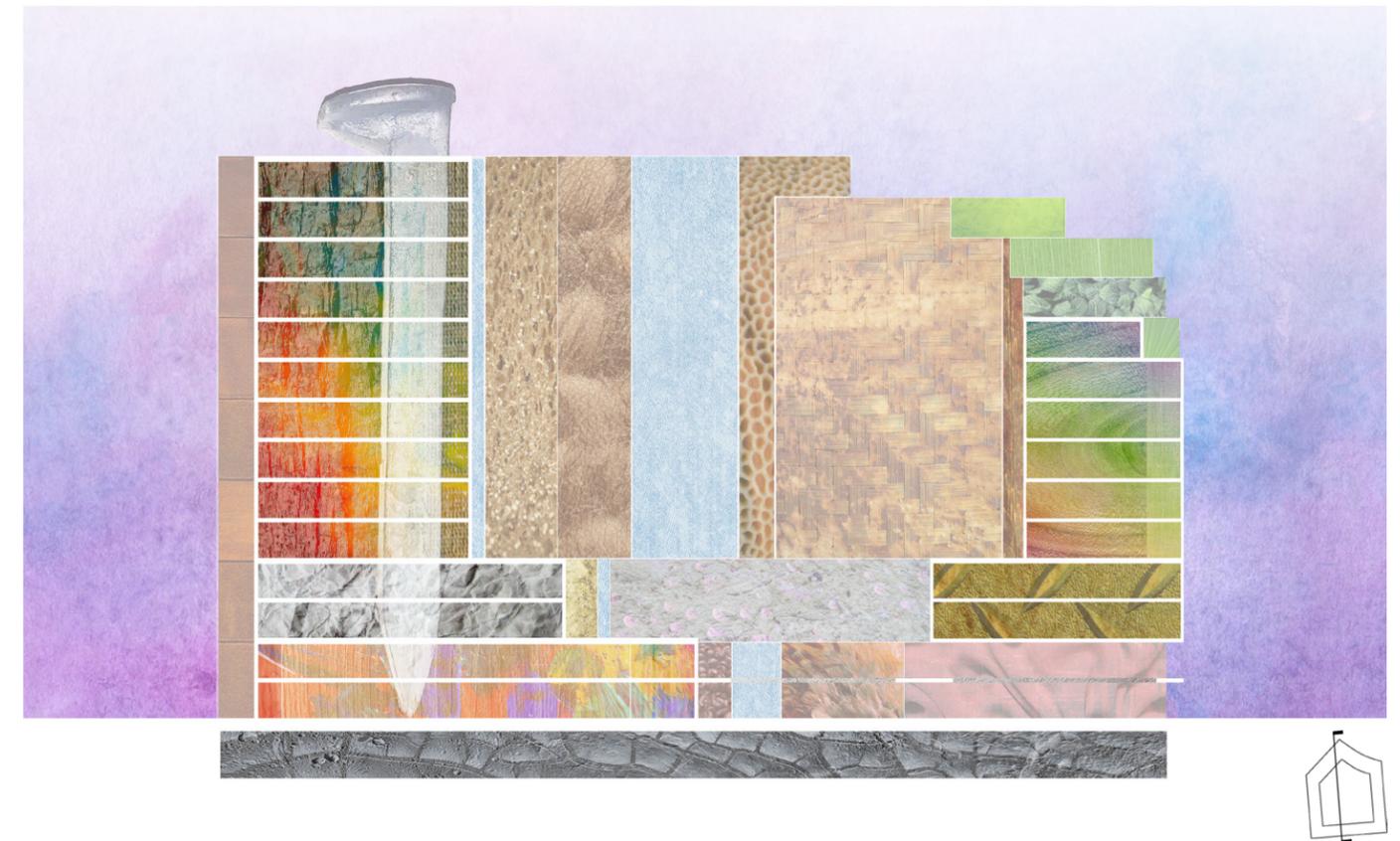
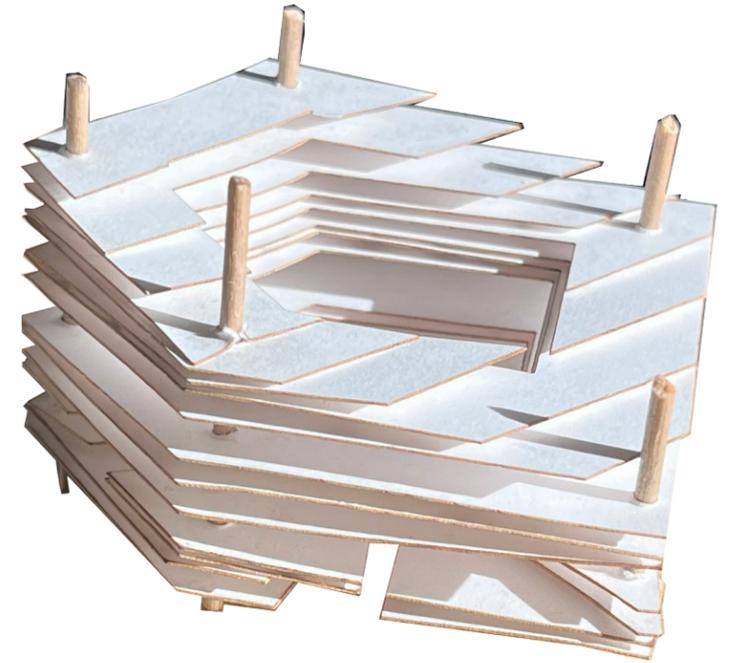
Sketch of program in section



Early program section diagram

## Study Model + Section

This study model (right) looks at how the floor plates terrace back at an angle as they go up. It was interesting to see that the five wooden dowels acted as "anchors" and would eventually become the location for the egress stairs. Because the building is so large, it needs multiple egress stairs for life safety purposes and the vertical circulation "anchors" the building down to the ground. An early version of the experiential section (below) shows the figurative "anchor" as the railroad spike, connecting the layers of the building. The section is cutting through the north study space, education spaces, and the residential lobby. The colors and textures illustrate how the spaces feel.



Early experiential section

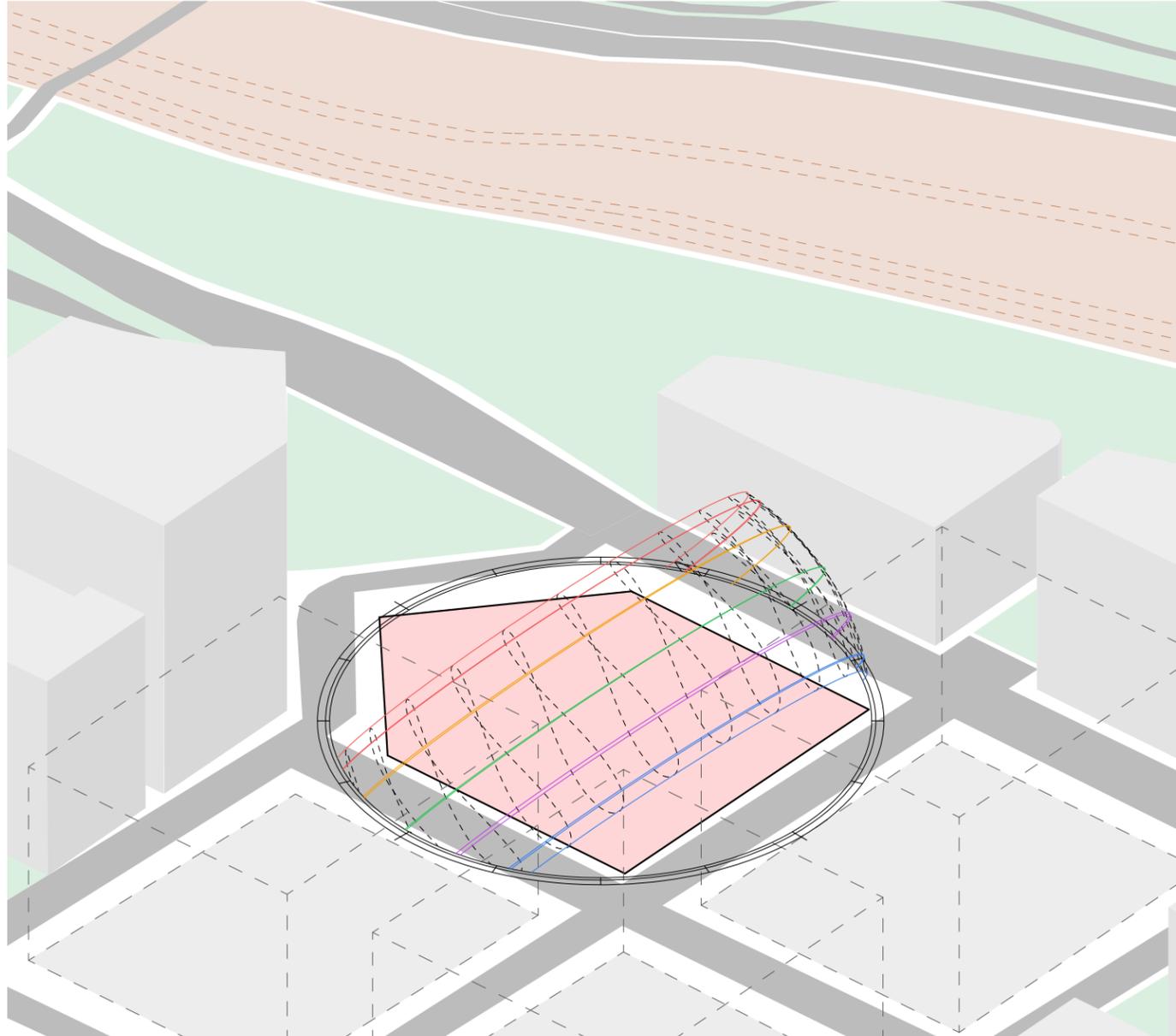


## Massing Sequence

Step 0: Sun path analysis.

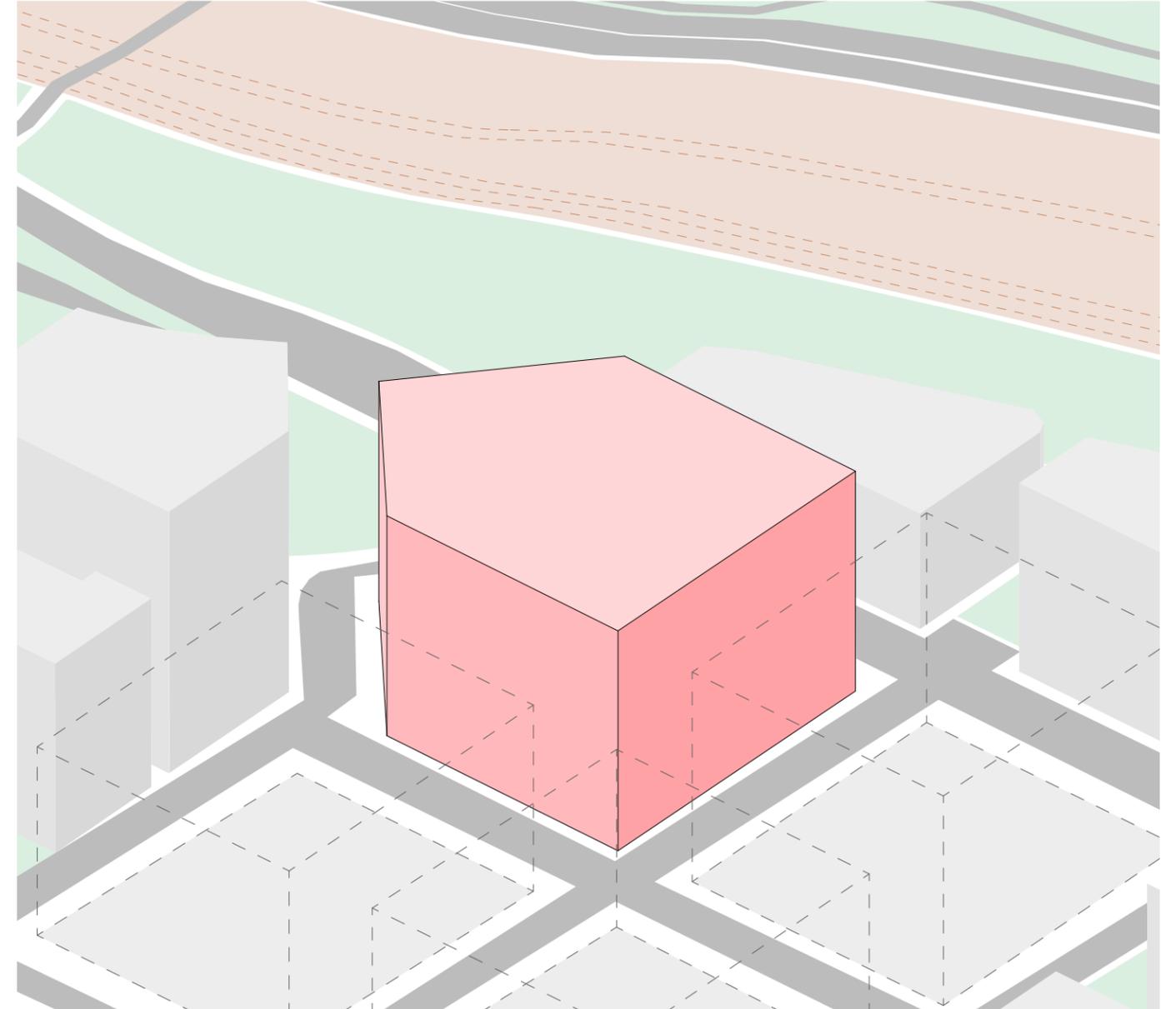
“House” shaped site affords:

- Opportunities for southern terraces with solar panels on the roof
- Removing true north-facing facade
- Facade can react to direct sunlight exposure + surrounding context to provide ideal natural lighting conditions and minimize solar heat gain and glare



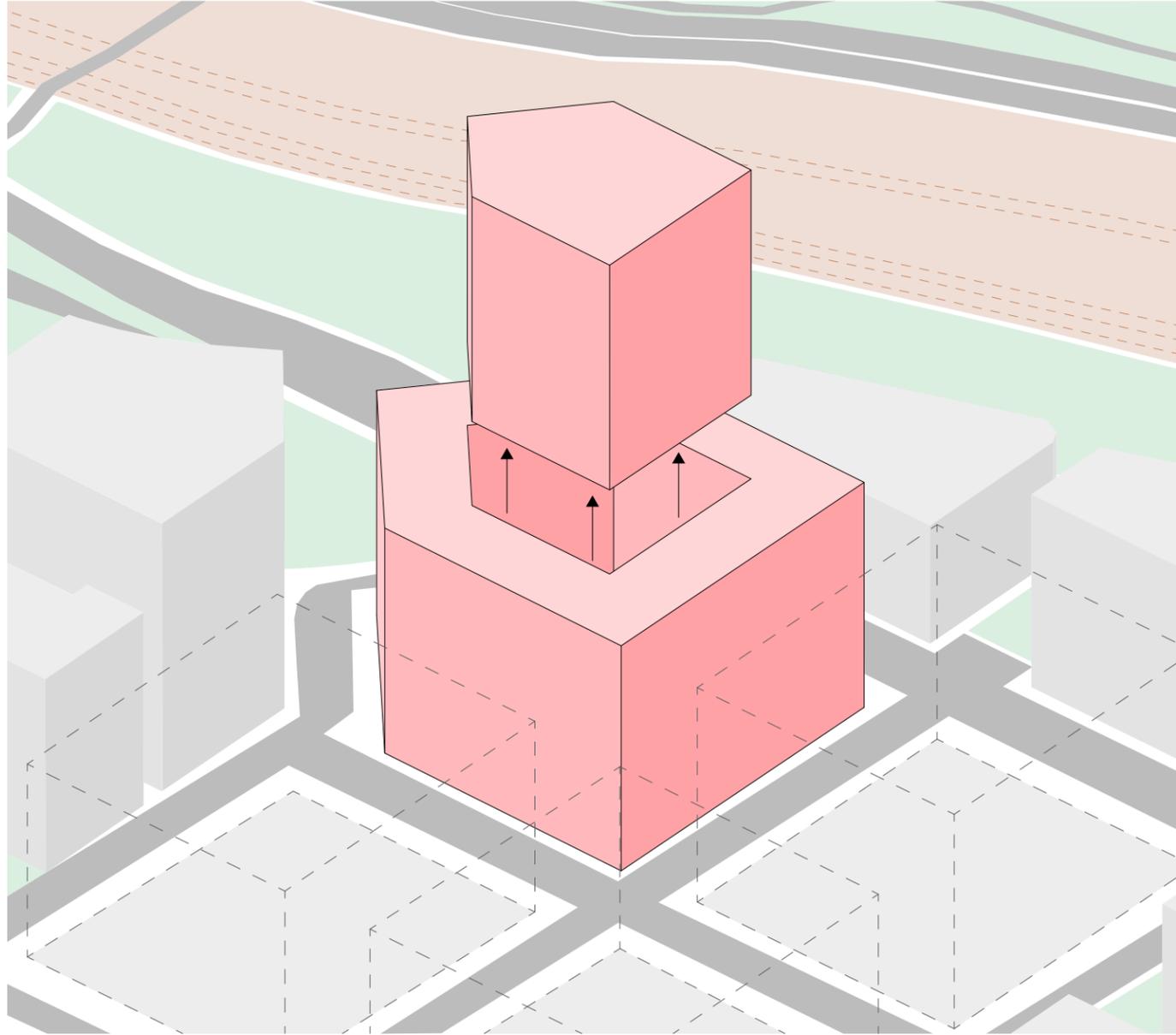
Step 1: A 220' tall block.

This is the maximum height zoned for this plot of land in accordance to the Potomac Yard Small Area Plan document. The buildings surrounding the site are roughly the same height.



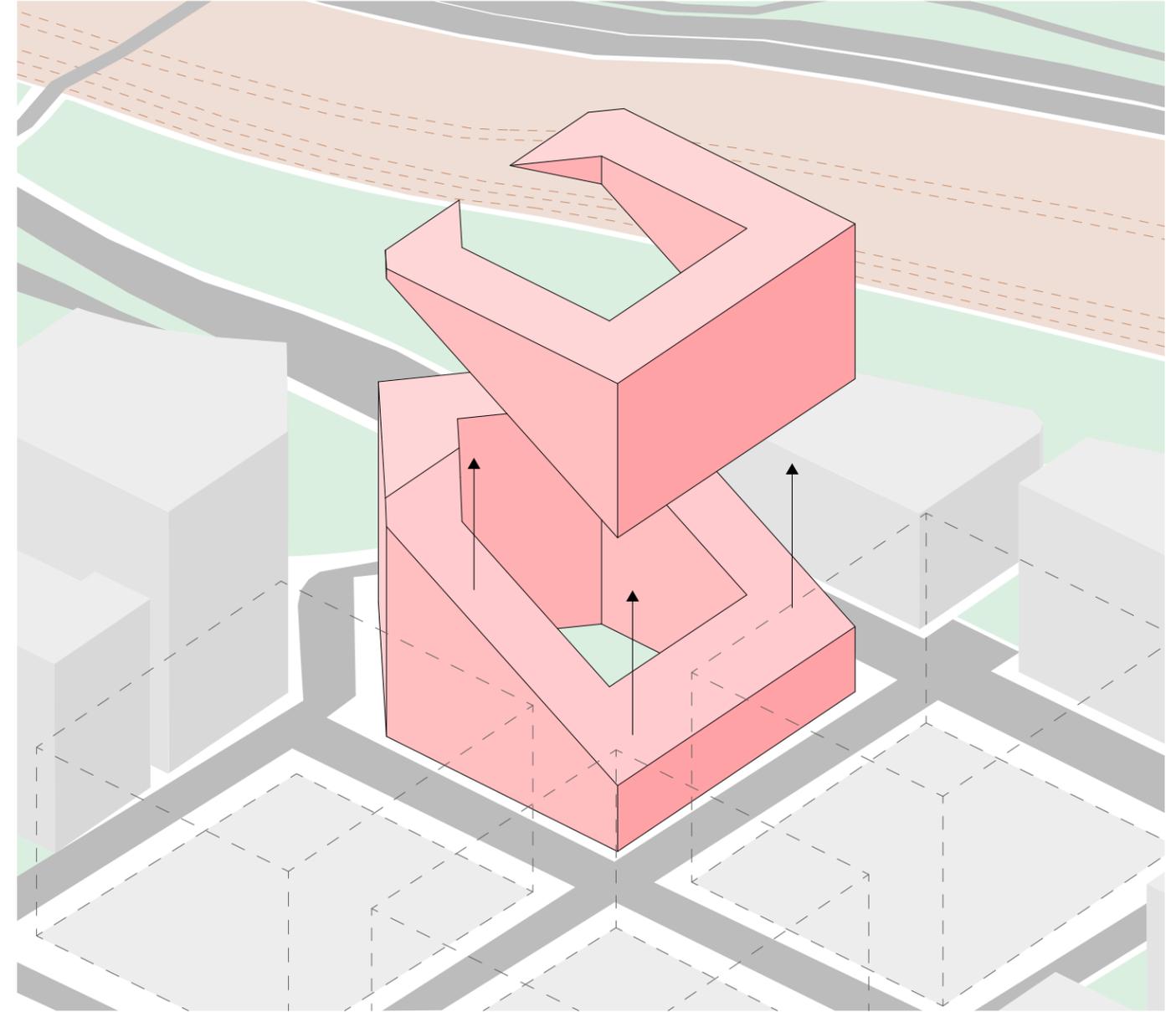
Step 2: Remove a piece from the center to create a courtyard.

The courtyard can allow the public and residents to gather around greenspace and enjoy the outdoors. It also serves as an access point to connect other buildings on the campus.



Step 3: Remove an angled piece from the top to allow more sunlight into the courtyard.

This maximizes sunlight exposure and makes the courtyard feel less suffocating and dark. This also generates opportunities for southern facing terraces.



## Visual + Conceptual Network on Site

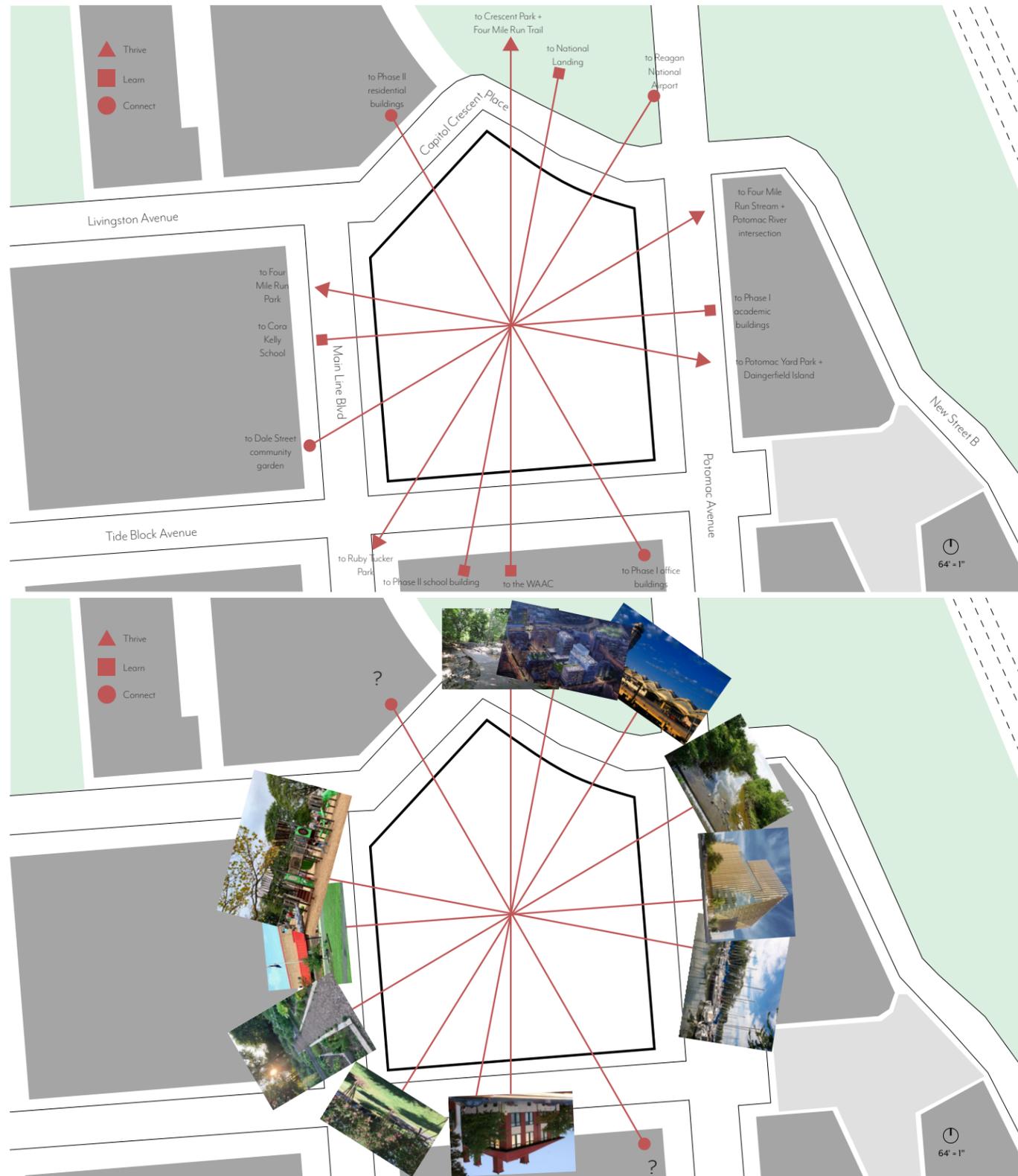
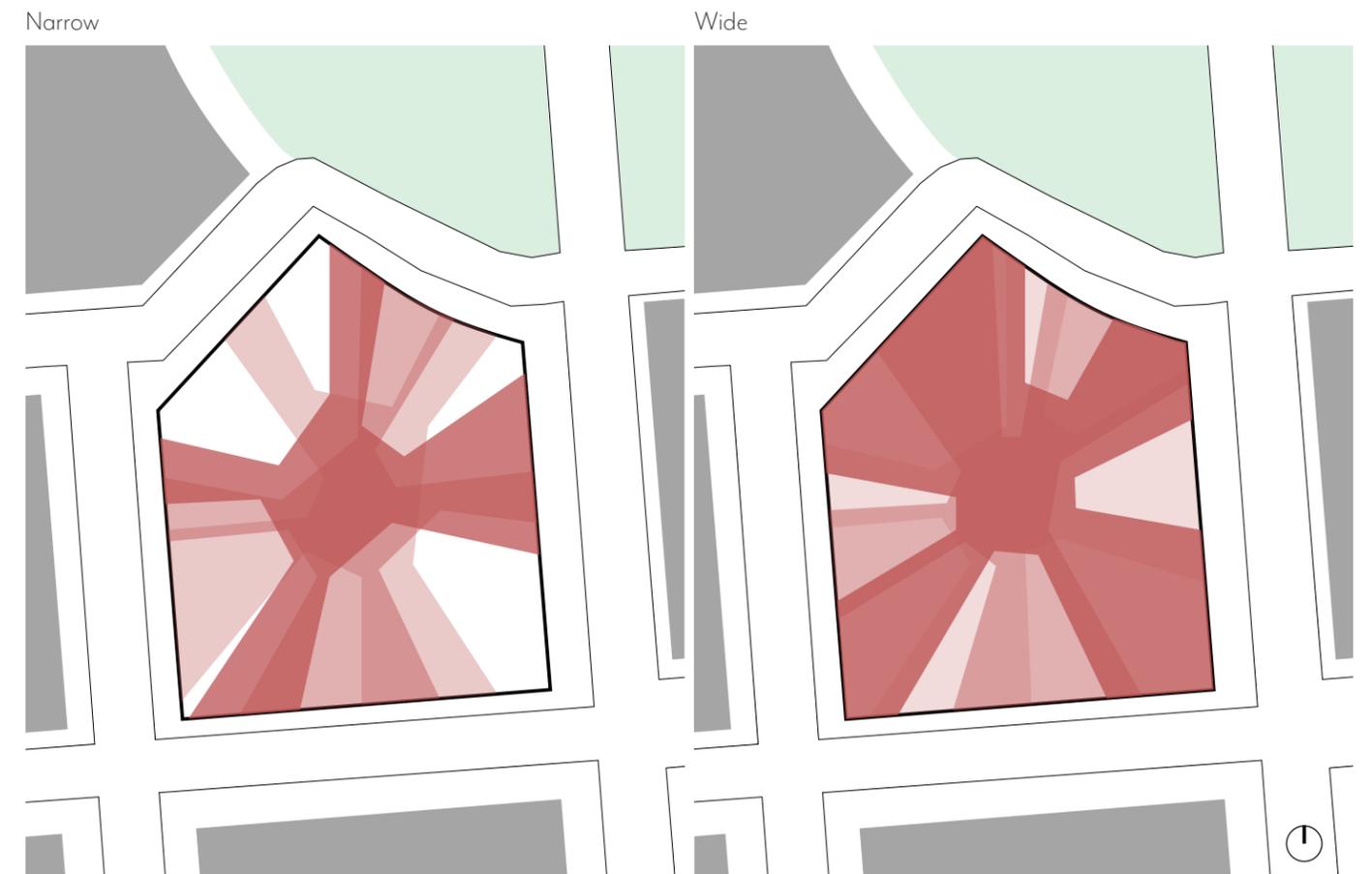


Fig. 60-70 Photographs of network connections

## Connections Iterations

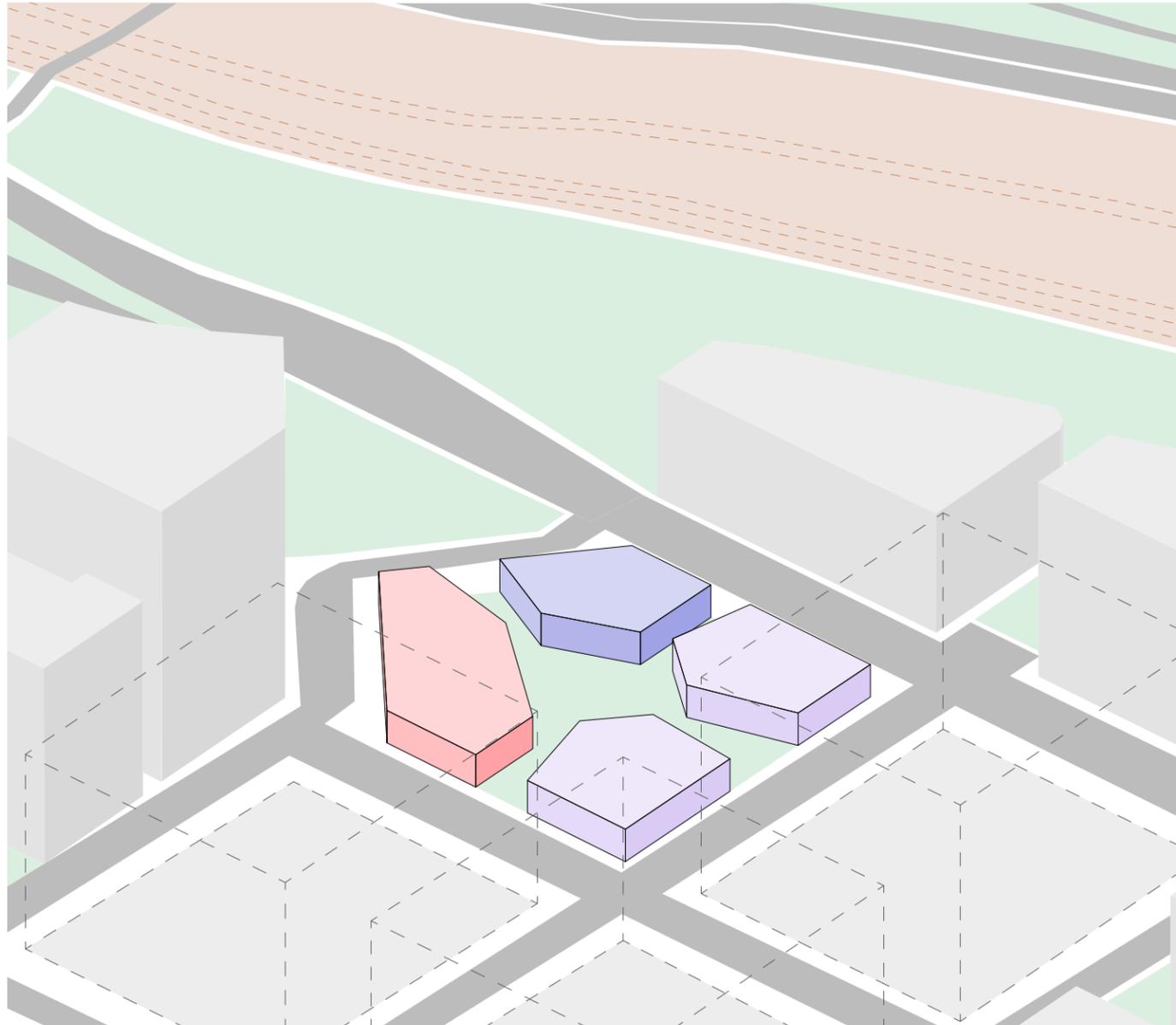
The first iteration shows narrower connections while the second iteration shows larger, denser connections. It shows the relationship of horizontal circulation to building. The dark red shows areas where people can cross the site. The lighter shades of red show moments of visual connection on the upper floors of the building. Layering them helps to identify moments of overlap where vertical circulation can be placed. Vertical circulation has to stack all the way up so that different parts of the building can still exit the building if there is a fire or emergency. With the first iteration, the pathways are not very wide, while the built area occupies more of the site. With the second iteration, the pathways are much wider, but the built area has a much smaller footprint. Finding the right combination of circulation to building is dependent on factors such as egress stairs, interior layouts, minimum requirements for programs, and sun path analysis. The push and pull between the concept and reality is key for remaining flexible while retaining structure.



## Program Diagram: Floor 1+2

### Tertiary:

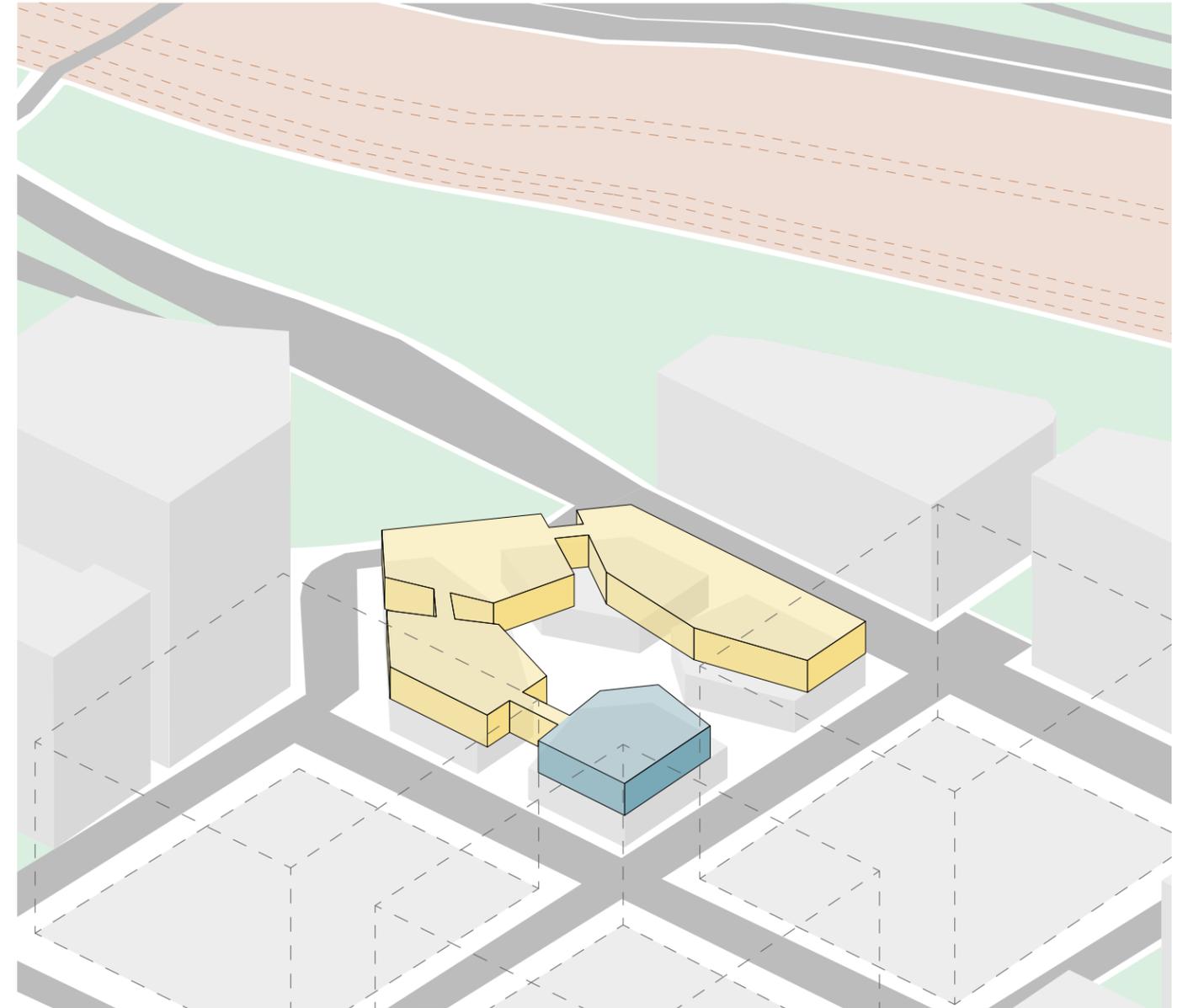
Cafe/Restaurant  
Gym  
Retail  
Parking



## Program Diagram: Floor 3+4

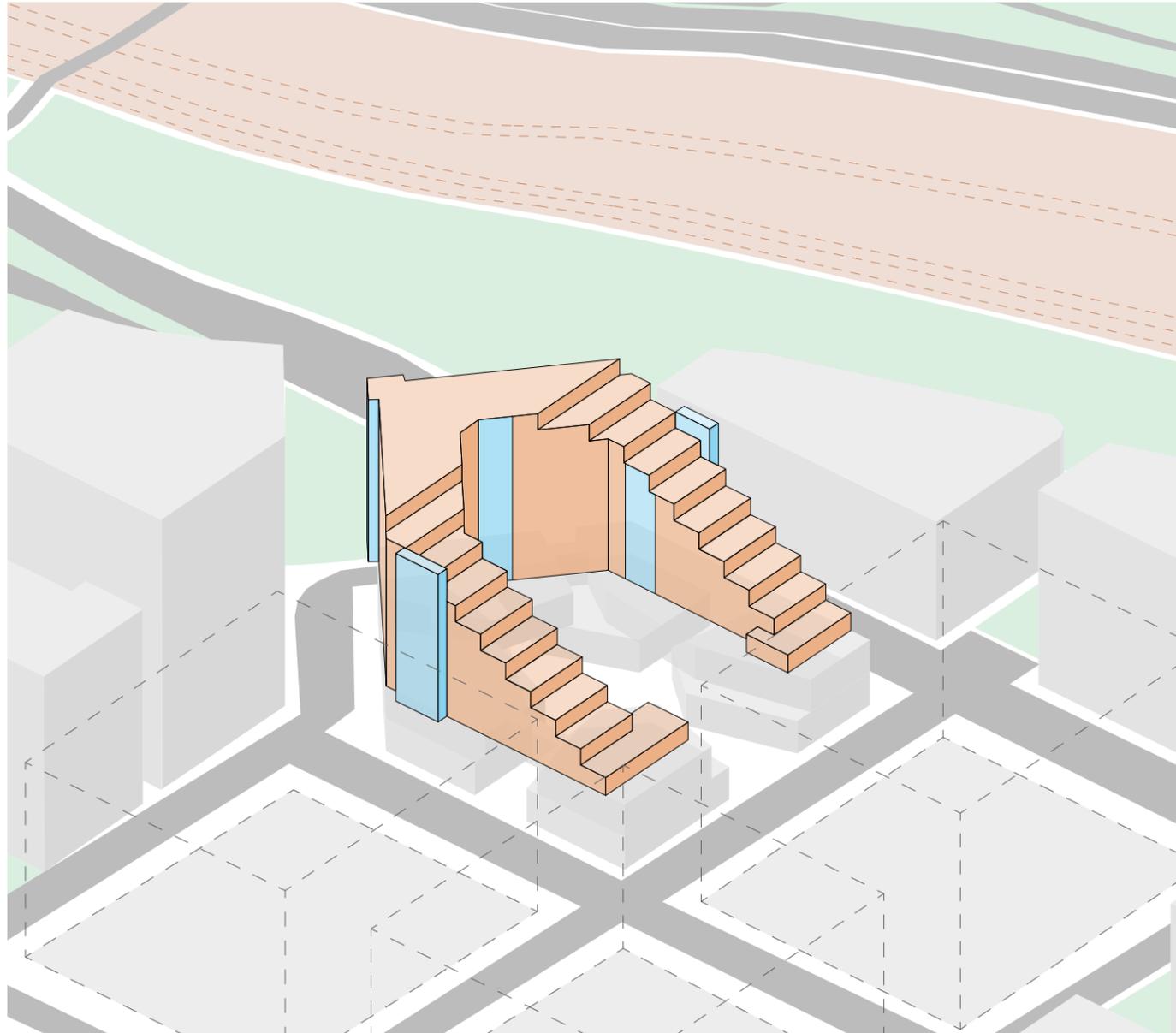
### Secondary:

Social Areas  
Indoor  
Outdoor  
Education Spaces  
Auditorium



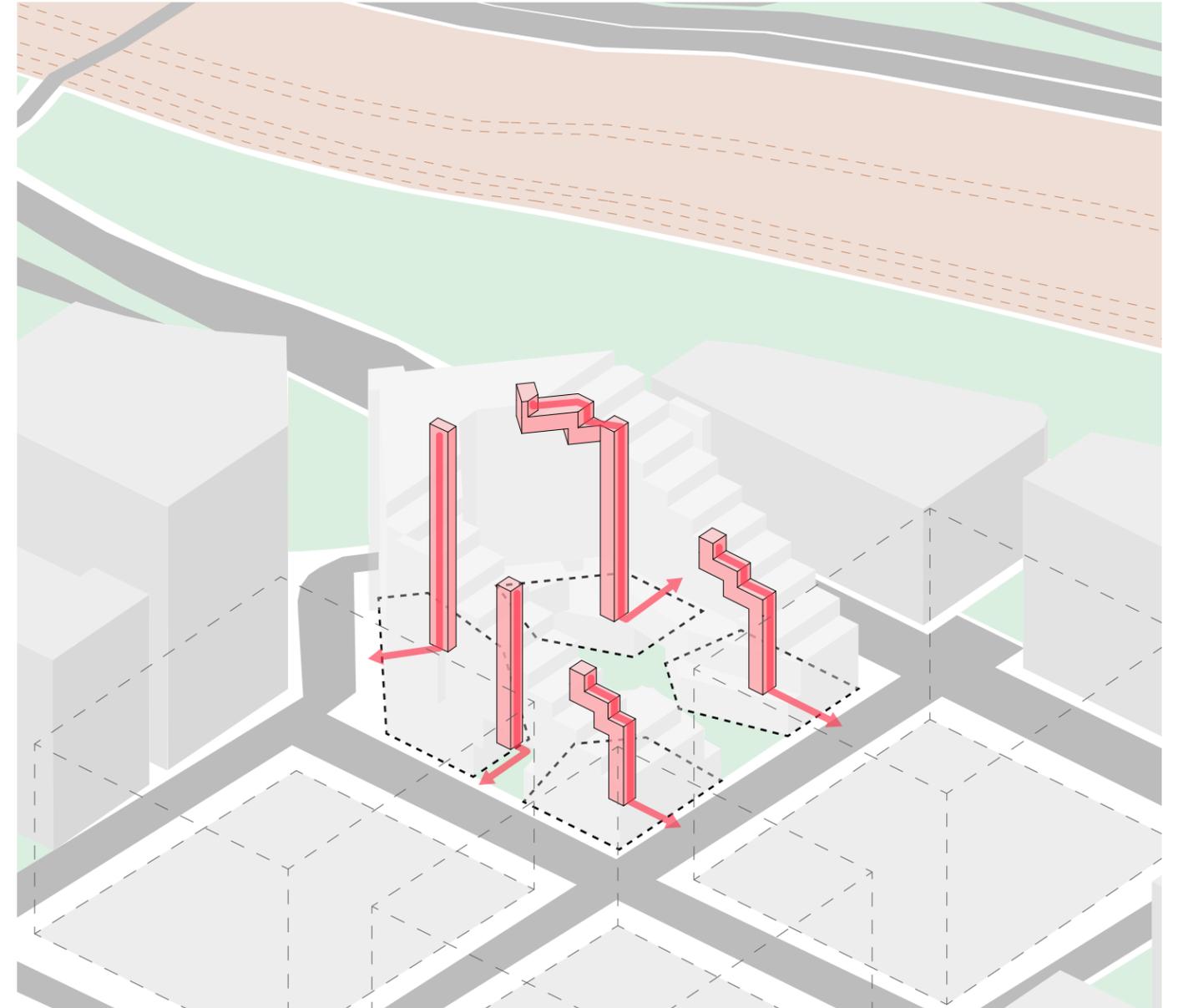
## Program Diagram: Floors 5-14

<b>Tertiary:</b>	Service Areas	Bathrooms	
Housing Units	Laundry	Communal	
1 bedroom	Storage	Single-User	
2 bedroom	Study Spaces		
3 bedroom	Open Private		



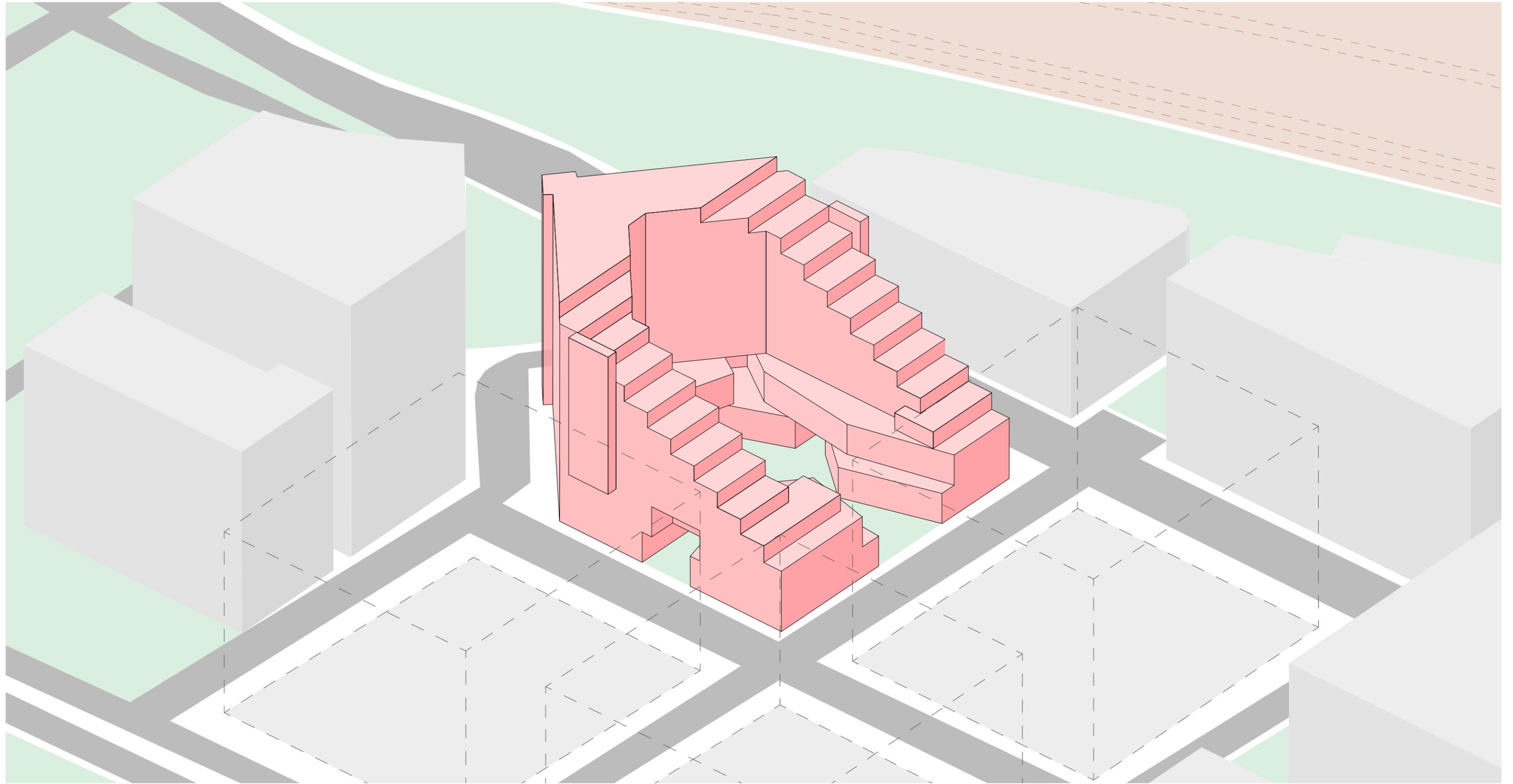
## Egress

The egress stairs are an important part of the building. Due to the stepped terraces, each floor becomes smaller and smaller as it goes up leaving dead end corridors. To address this, some of the egress stairs step back with form of the building to make sure that any unit is within 50 feet of an egress stair. The egress stairs are separate from the communicating stairs as they are fully enclosed and are only for emergency situations. The communicating stairs are meant for students to access other floors more easily and to function as a social space; they are not enclosed.



## Massing Sequence Completed

Step 4: The angled roof is translated into a stepped terrace roof and the outlets are reintroduced to create different levels of privacy.



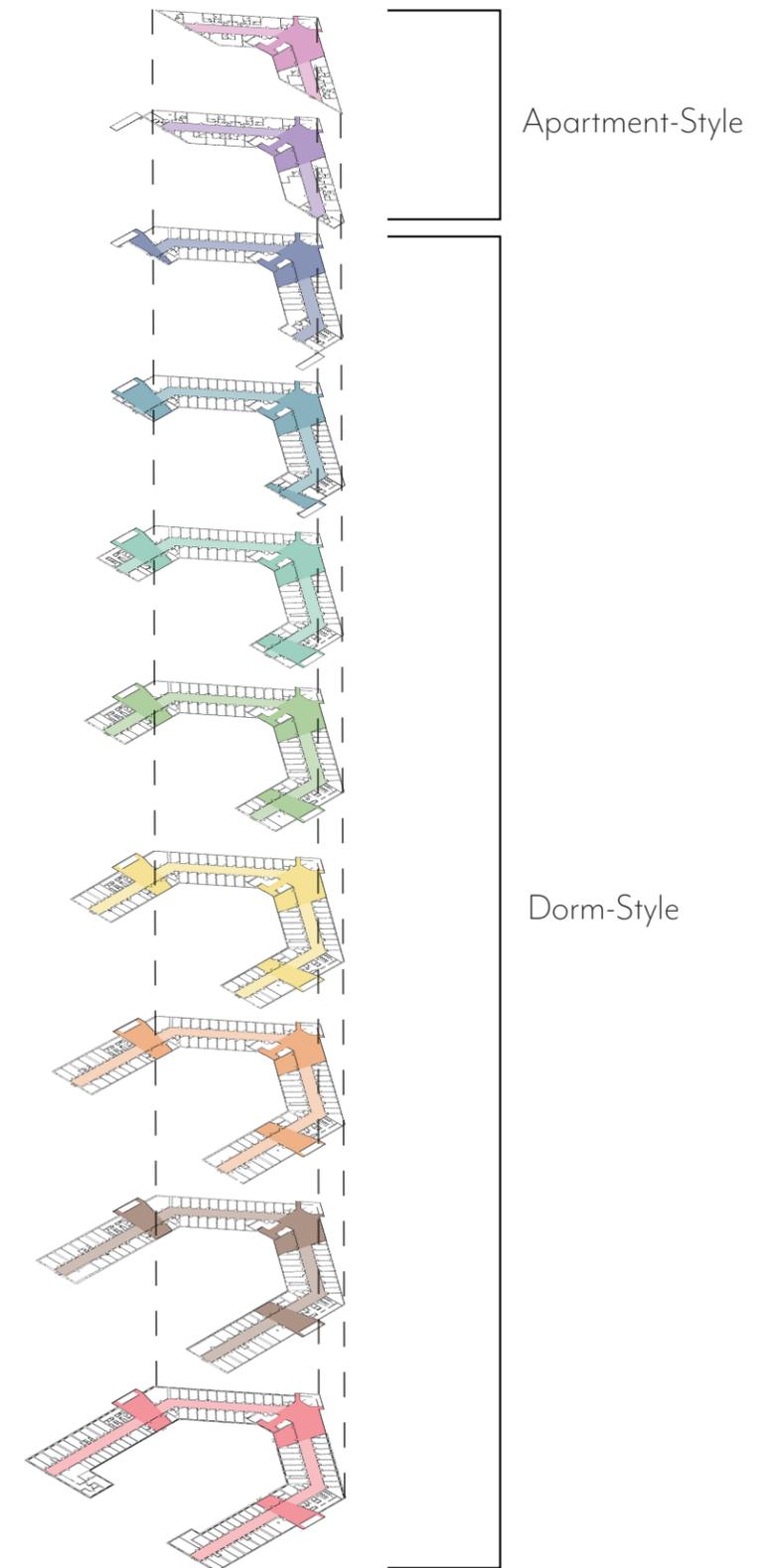
# Design Proposal: Residential Plans

"It is almost universally understood that women, people with disabilities, and sexual and gender minorities face significant social and economic disadvantages when compared with able-bodied, cisgender, heterosexual men. What is still not fully understood and accepted among many urban planning and design practitioners is exactly how existing conditions in the built environment — and the lack of diversity in the voices shaping it — facilitates, feeds into, and perpetuates these inequities."

- *The World Bank, Handbook for Gender-Inclusive Urban Planning and Design*

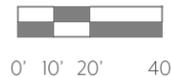
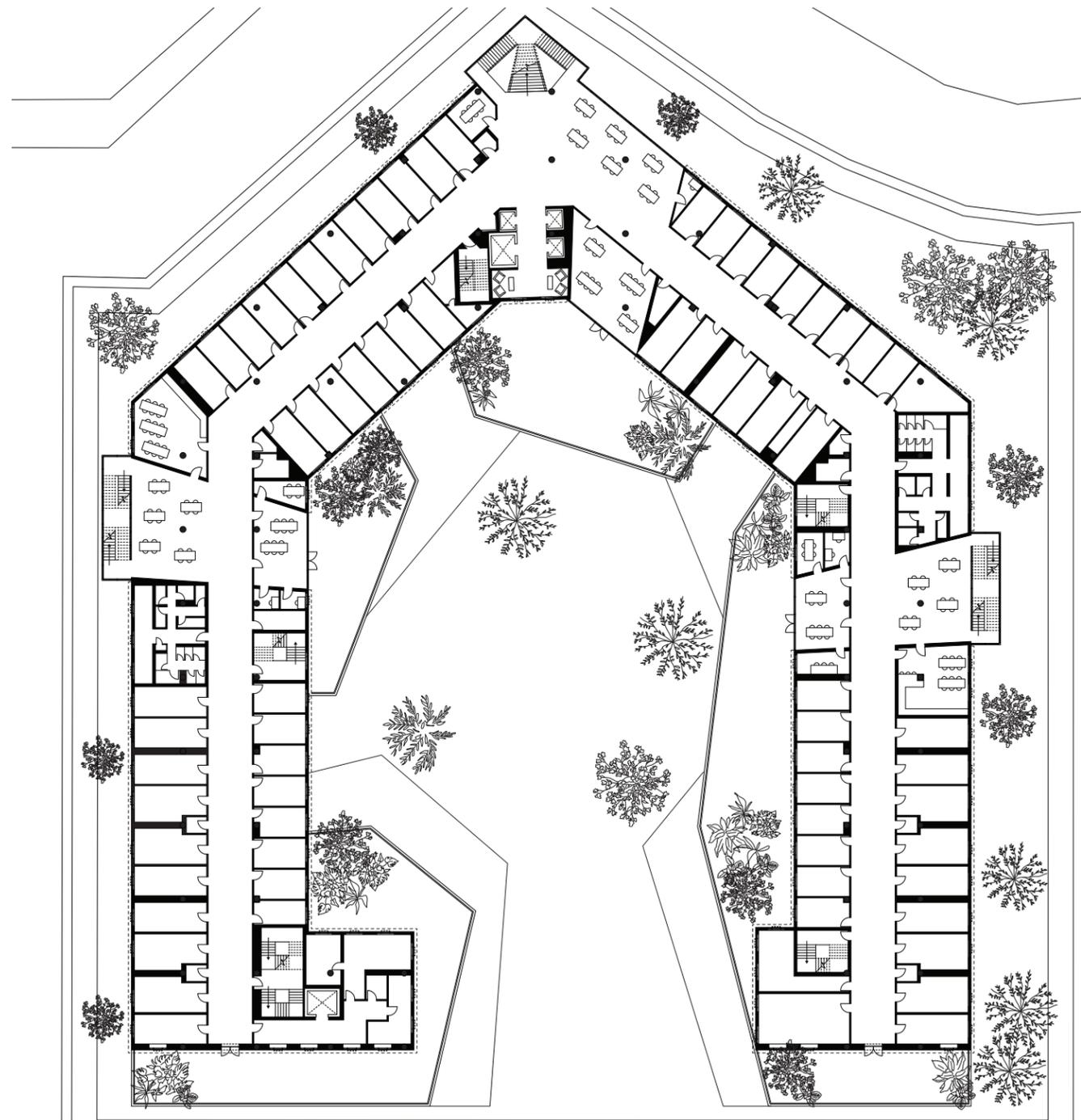
## Residential Floors

The rainbow colors of each floor reflect the inclusivity and diversity present in this student housing building. Each floor contains a primary color and then hints of colors from the floor above and below it. The colors serve to create individual identity for each floor and act as a way finding tool. The lower eight floors contain typical dorm-style units and the top two floors contain apartment-style units. Apartment-style units are reserved for students who live with families, elderly people, or children. They can also accommodate visiting faculty and other university guests.



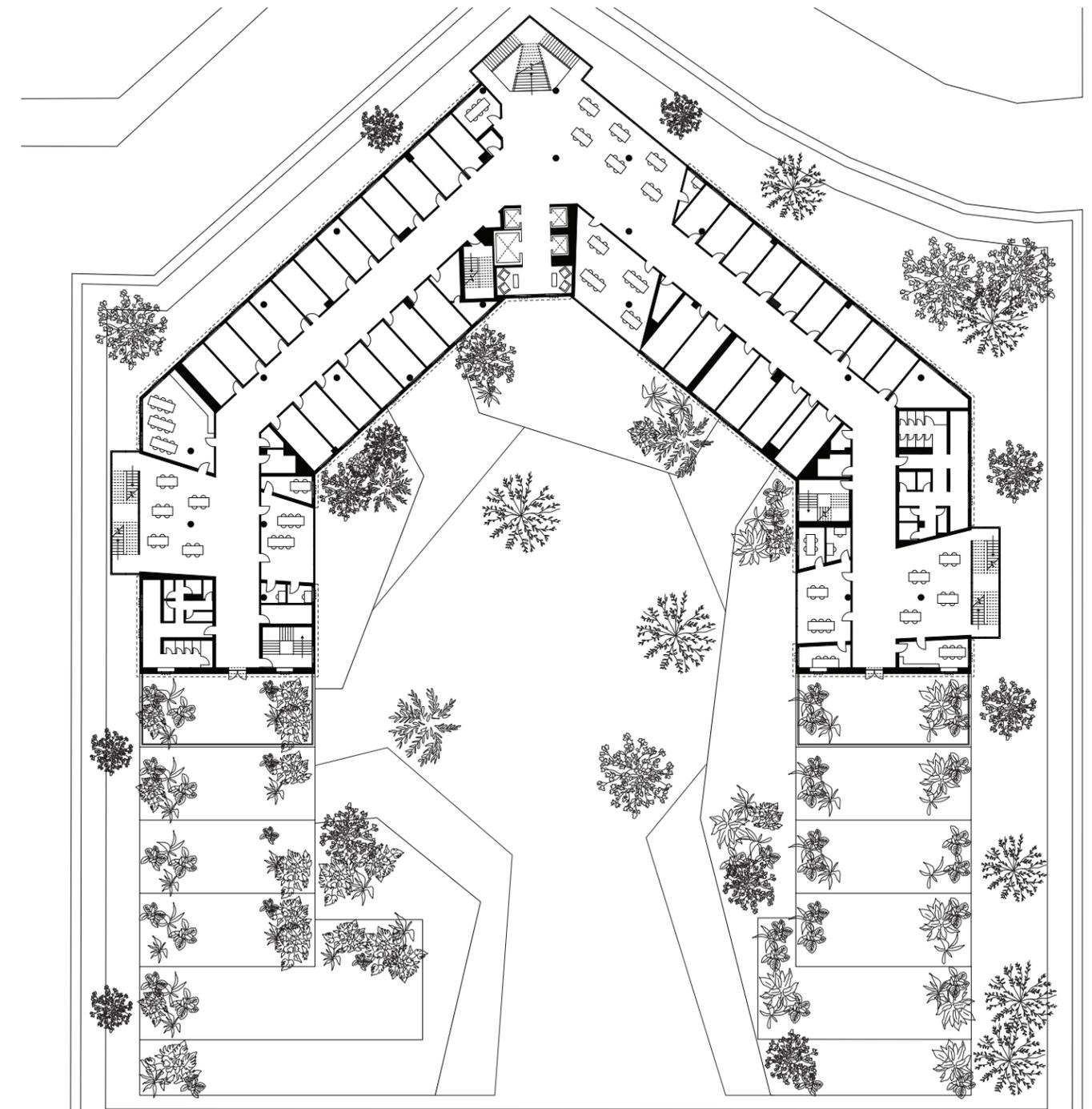
## 5th Floor

The 5th floor contains the most dorm-style units. Each floor above steps back 25' from the southern side, producing space for the terraces.



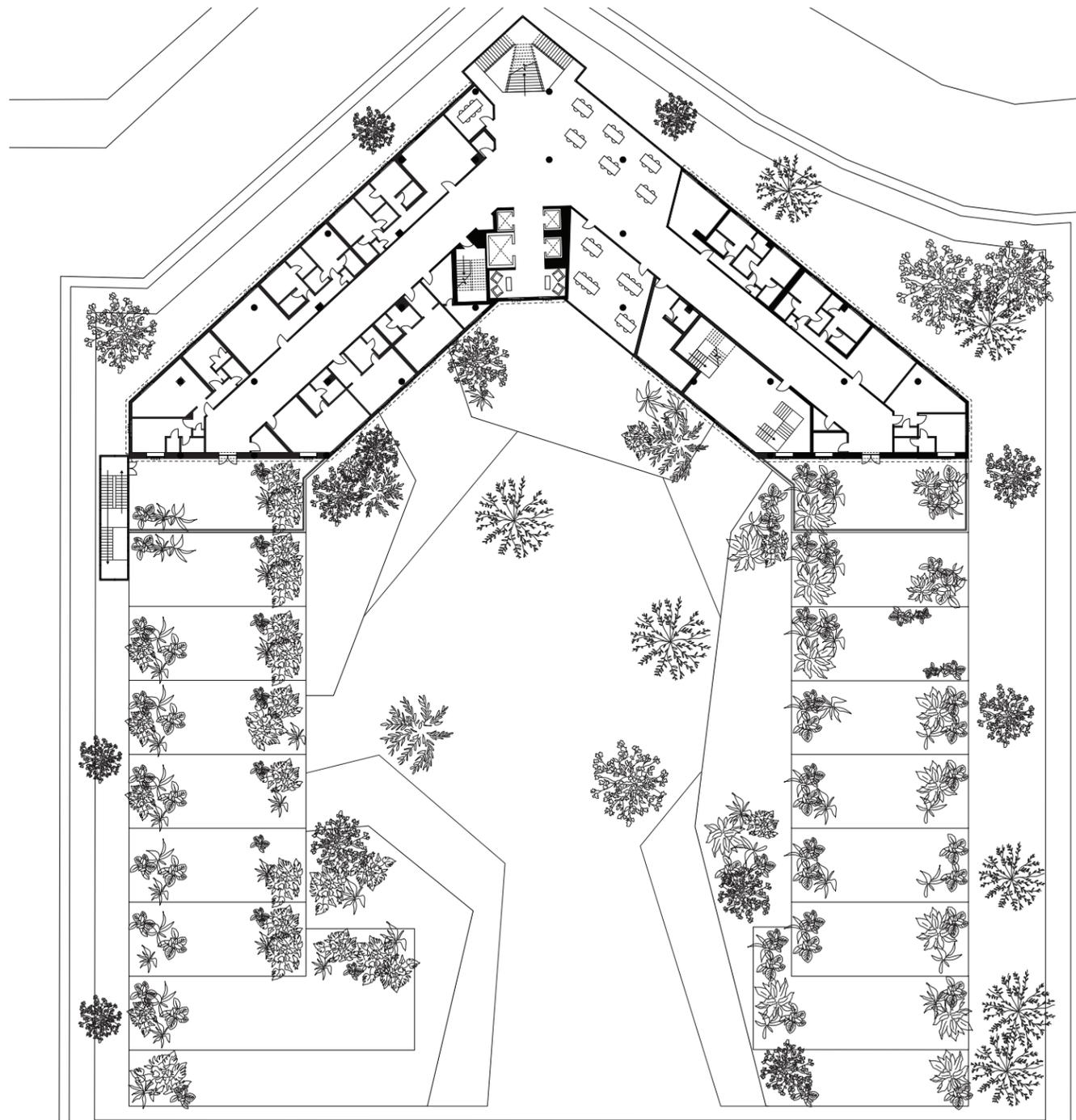
## 10th Floor

On the 10th floor, you can see the floor plate has stepped back 125' from the 5th floor.



## 13th Floor

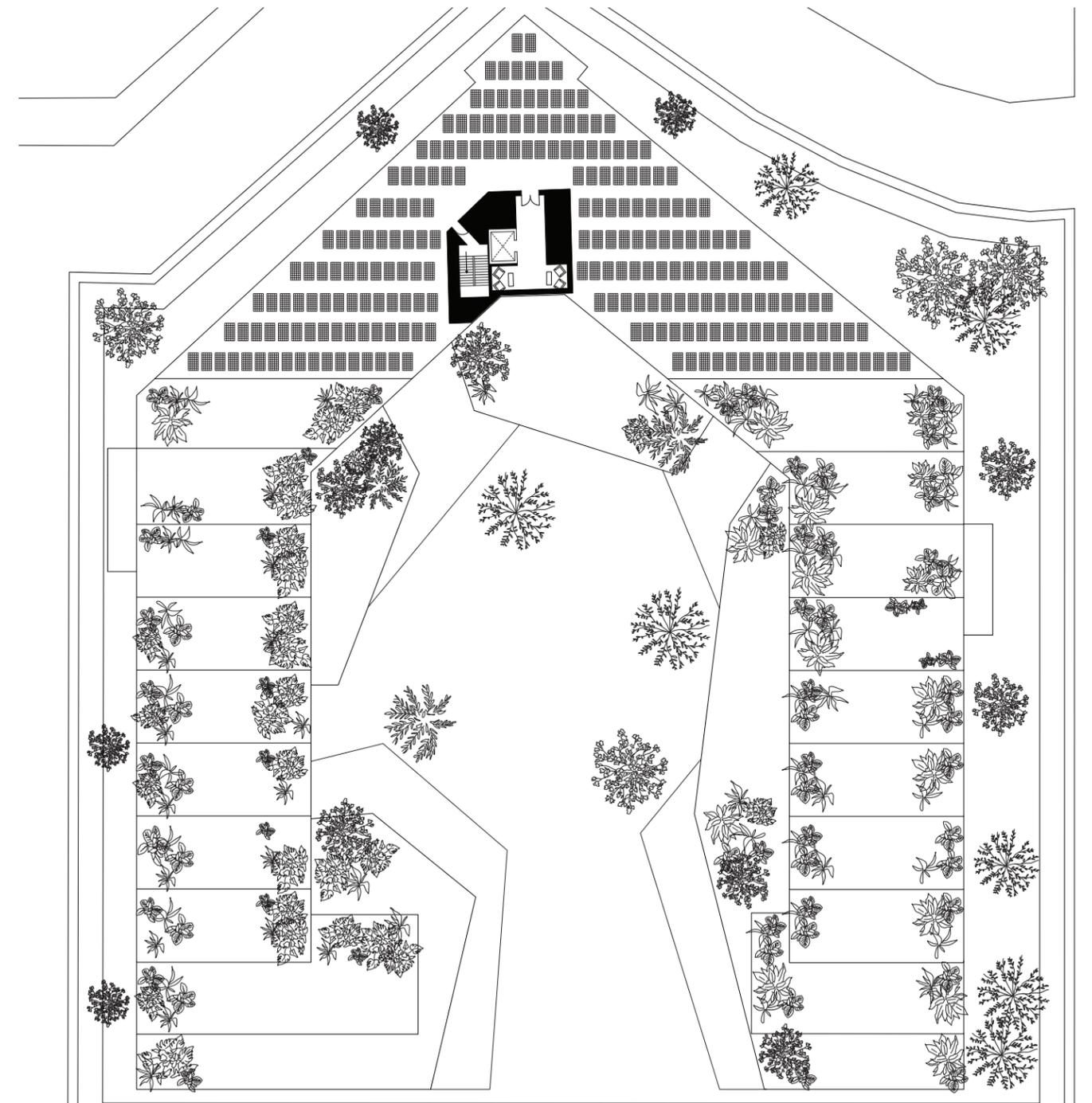
The 13th floor is the first apartment style floor.



0' 10' 20' 40'

## Roof Plan

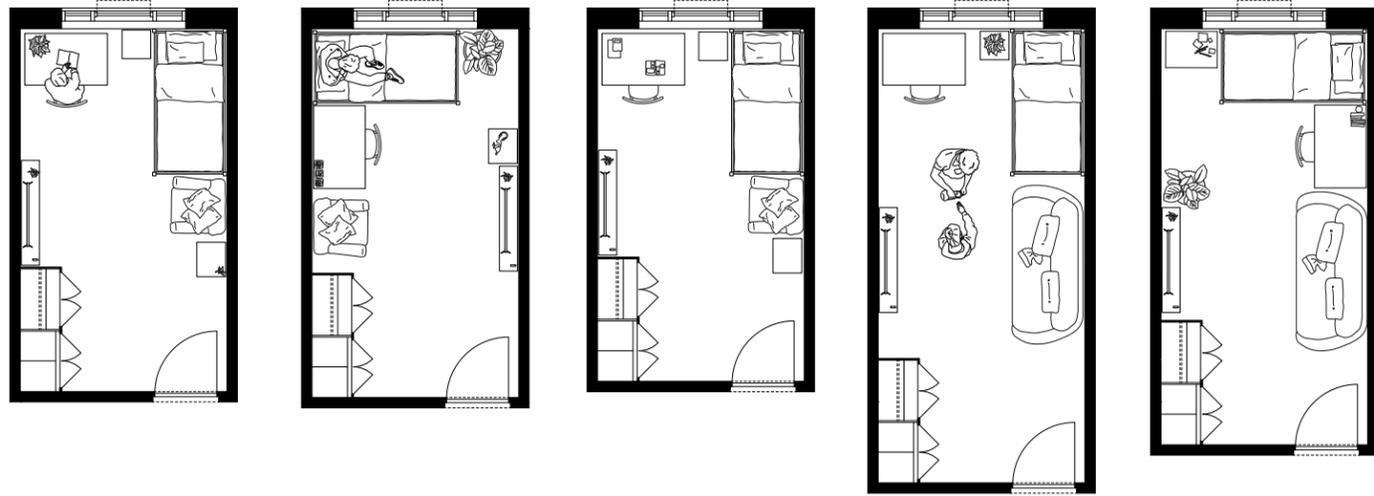
The roof houses a vestibule for roof access and solar panels. The solar panels can power 100 dorms.



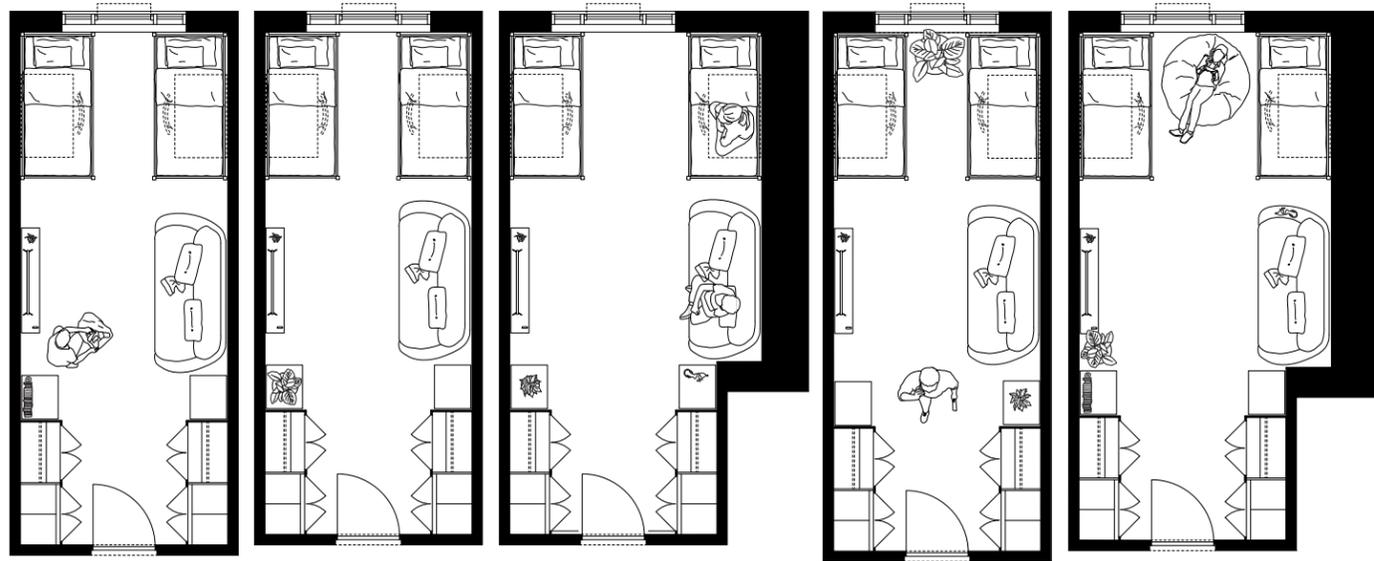
0' 10' 20' 40'

# Dorm Catalogs

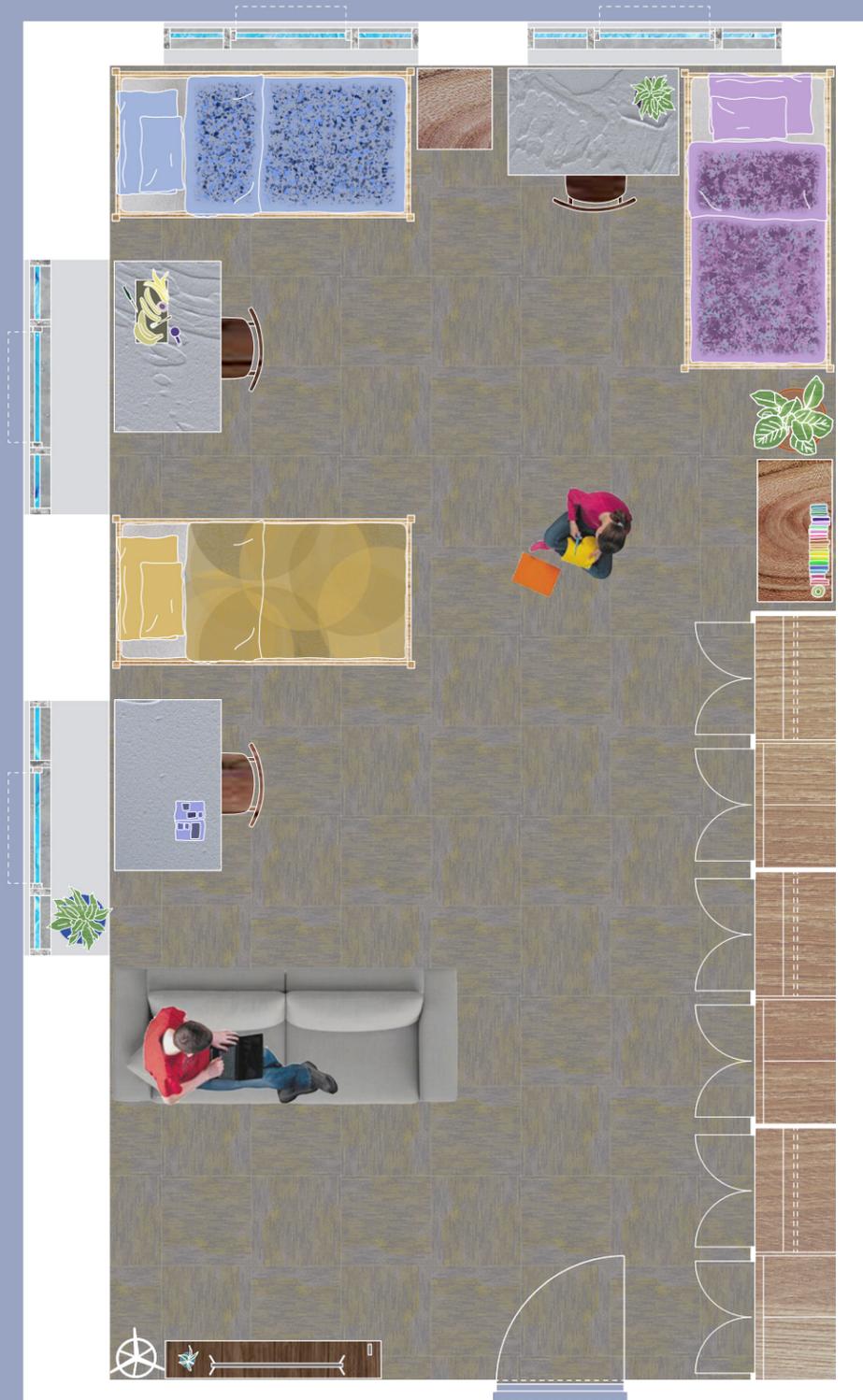
The single room dorms come with a bed, desk, chair, and built-in closet. The awning windows open out 6" as a safety precaution.



The double room dorms come with two beds, desks, chairs, and built-in closets. The awning windows here are operable as well.



# Triple Room



There is only one triple room in the whole building. This experiential plan shows the materiality of the interiors. The built-in closets are aligned against one wall to leave more room for the students. The open plan enables students to customize the space however they want. The carpet has hints of the color that is associated with that floor. The eighth floor is the yellow floor, so the carpet has bits of yellow throughout while keeping the gray to remain more neutral. The neutral palette allows students to make the space their own by bringing in colors and textures that they want to have in their dorms. For example, the students can express their personalities and aesthetic choices through the color of their bedding.

## Dorm Room: 9th Floor

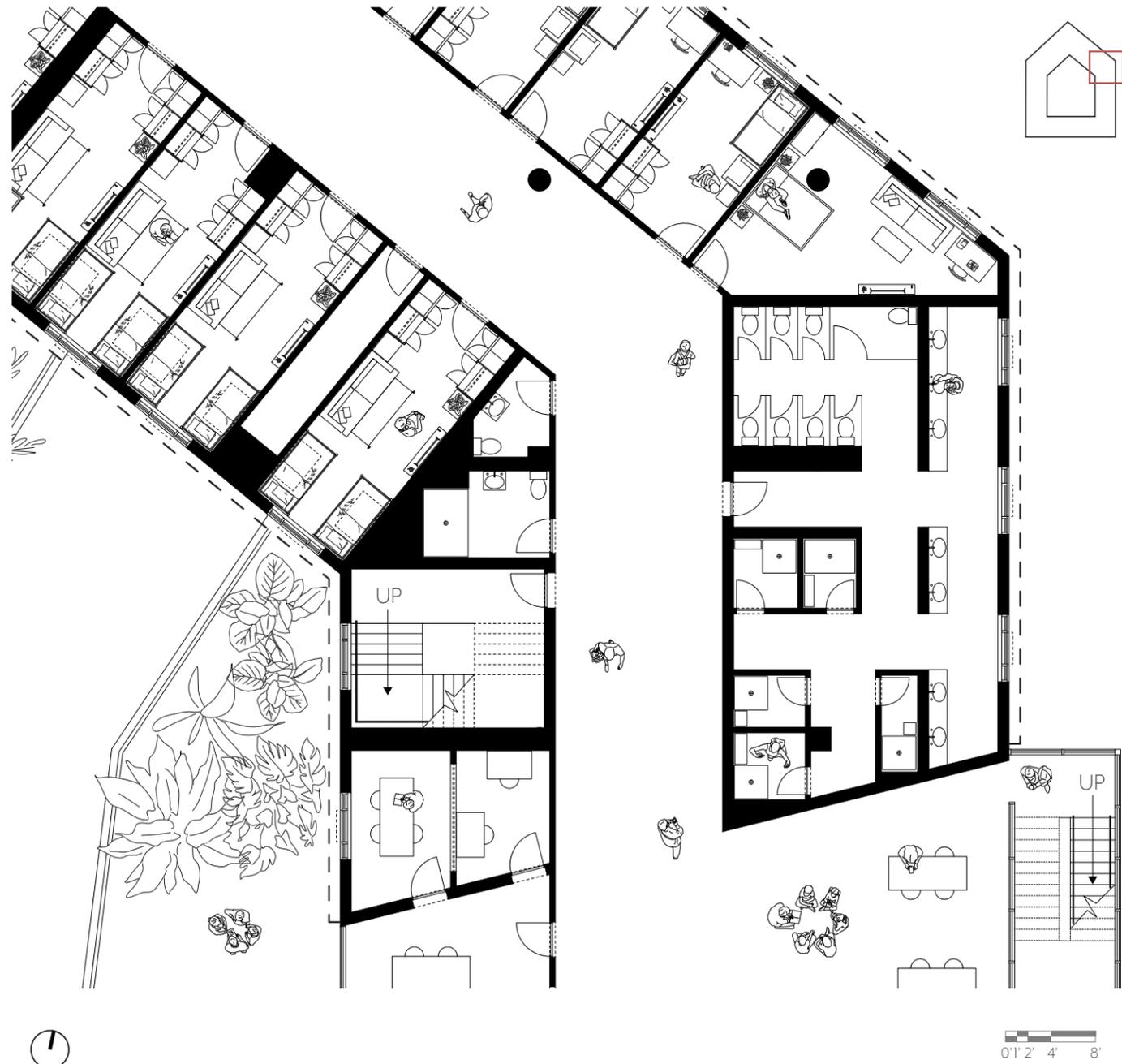
Tanvi is my little sibling and they are 20 years old. They identify as non-binary and use they/she pronouns. They go to school at the new Virginia Tech Innovation Campus! Throughout the project we will see them and their friends around the building and the site. We will also see a typical day in their life as a student living at Ourhouse.

Tanvi needs to wake up, they are late for class! The dorm rooms are very flexible so students can make the space their own. Tanvi has some fun band posters up on the walls because they love punk rock. They also play the cello for the VT orchestra club. The tall punch windows make the rooms feel more spacious while allowing light in. All the windows in the dorms have an operable awning window portion. Carpet squares allow for easy clean up and add a bit of color to the room.



## Partial Plan: 8th Floor

This floor contains dorm-style units. The northeast corner of the building contains single rooms, double rooms, single-user restrooms, a communal bathroom, egress stairs, study spaces, an outdoor terrace, and a communicating stair.

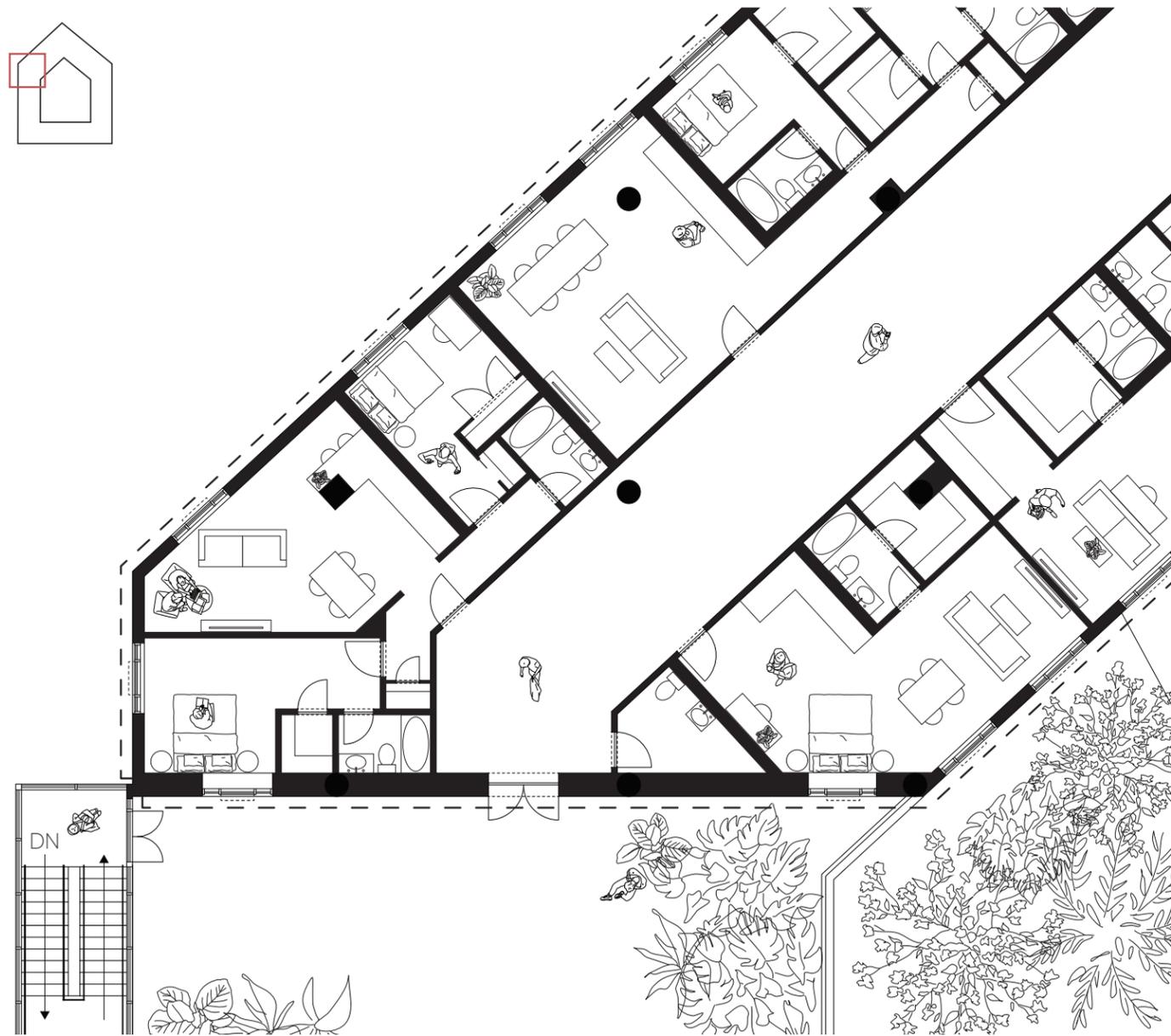


## Floor Materiality: 8th Floor



## Partial Plan: 13th Floor

This floor contains apartment-style units. There are studio, one bedroom, and two bedroom units. The apartments come with a kitchen, living/dining room, bedroom(s), bathroom(s), coat closet(s), and closet(s). Some of the apartments have space for in-unit laundry, but there are laundry rooms on every floor as well as a few single-user restrooms for guests to use. The northwest corner of the building has access to the west communicating stair which goes down to the other residential floors.



## Floor Materiality: 13th Floor



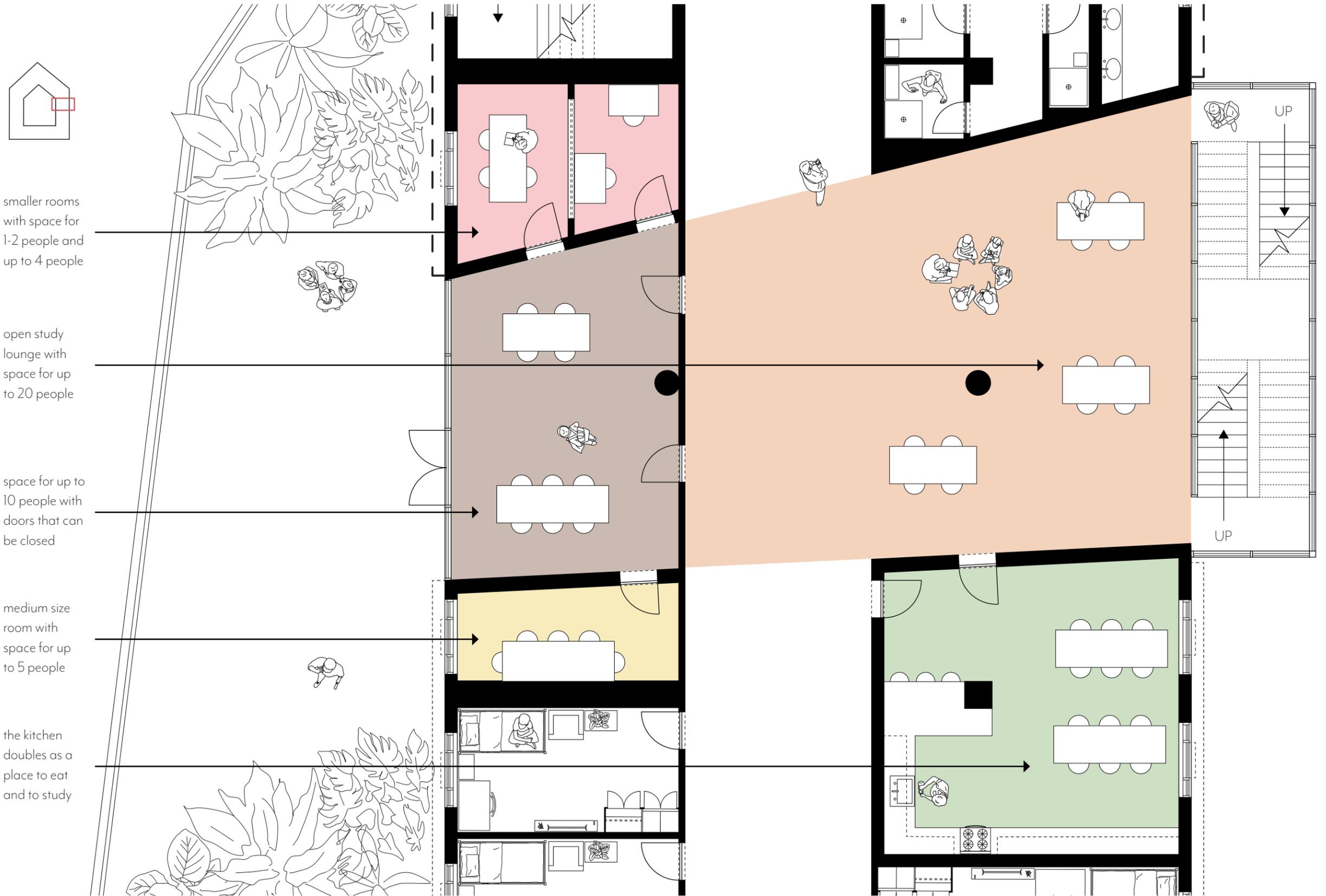
## Bathroom: 11th Floor

This communal bathroom features an accent wall to match the sink fixtures, large mirrors, free tampons, and a hand dryer. Tanvi is starting their day by taking their caddy to the bathroom so they can brush their teeth and wash their face. The windows facing the mirrors allow for a unique moment of simultaneously looking inward and outward. The eleventh floor is associated with the color indigo.



# Study Areas

The study areas, which are highlighted in different colors, allow for students to study however they feel comfortable. Whether it's on their own or with a large group, there are plenty of different types of study spaces to choose from. Flexibility and quantity of study areas is largely devoid in many student housing buildings today.



## Study Lounge: 7th Floor

The east study lounge faces Potomac Avenue and the river further out. Tanvi and their friend Zoe are using one of the tables to do their homework for sociology class. They enjoy working around a lot of people like to say hi to their friends as they walk past. The communicating stair allows students to quickly travel to another floor to study with their friends or classmates who may live on different floors. The open plan of the east facing portion allows flexibility for all types of users. The large feature wall serves as a wayfinding tool but is also part of the larger rainbow that can be seen throughout the building. The seventh floor is associated with the color orange.





# Concrete Layer

The base facade consists of concrete with punch windows and curtain wall and the outer layer consists of the perforated metal screen.

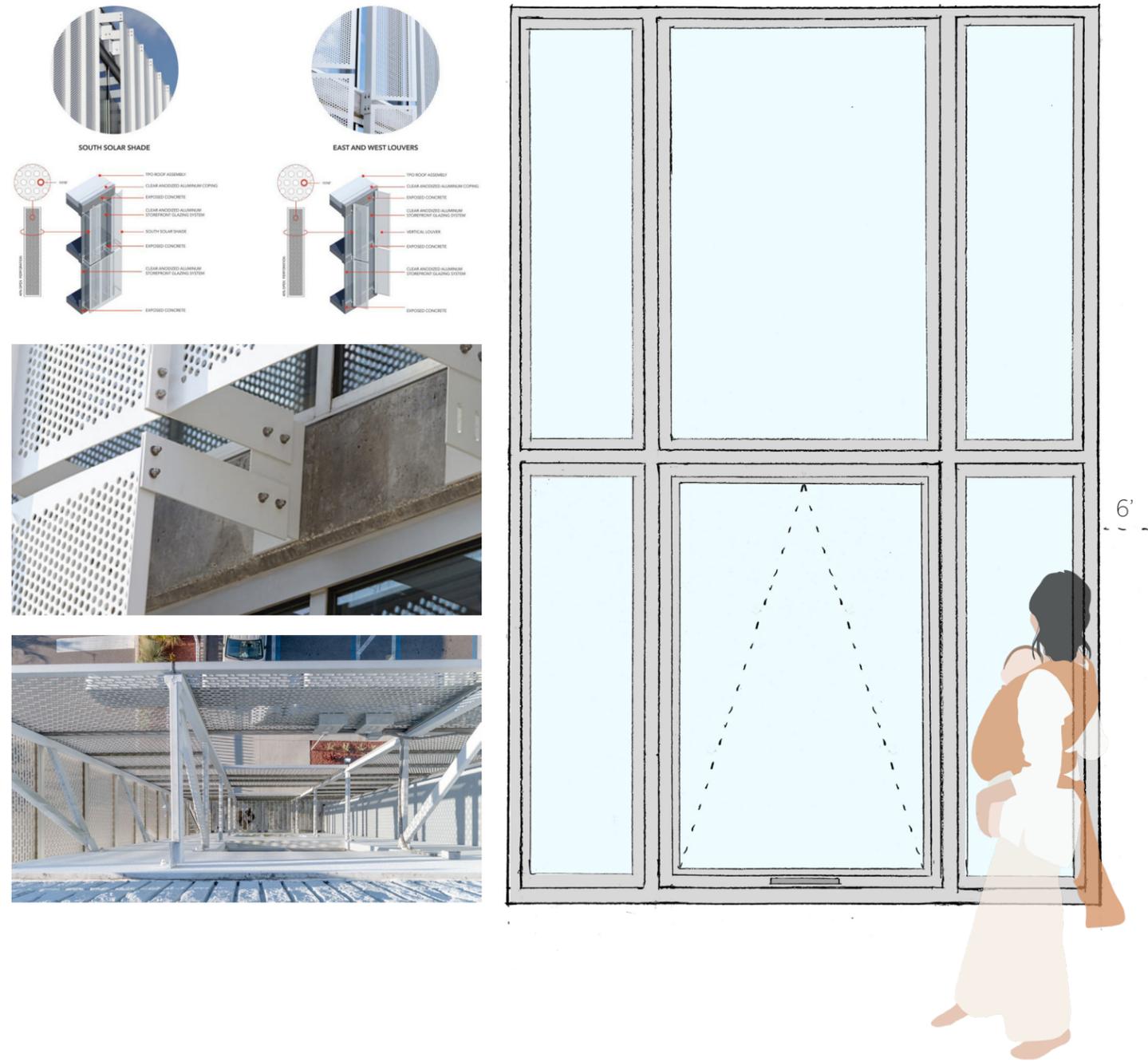


Fig. 71-73 Examples of perforated metal screens attaching to a concrete facade

Elevation of punch window with operable awning window portion

# Facade Precedents

The 2en1 Student Halls in Aubervilliers, France have white perforated metal panels with cut out openings for the windows. The white and red portions of the facade reference the type of program inside. There are one and two bedroom units that have operable windows.



Fig. 74-78 Exterior views and floor plans, courtesy of BFV Architects

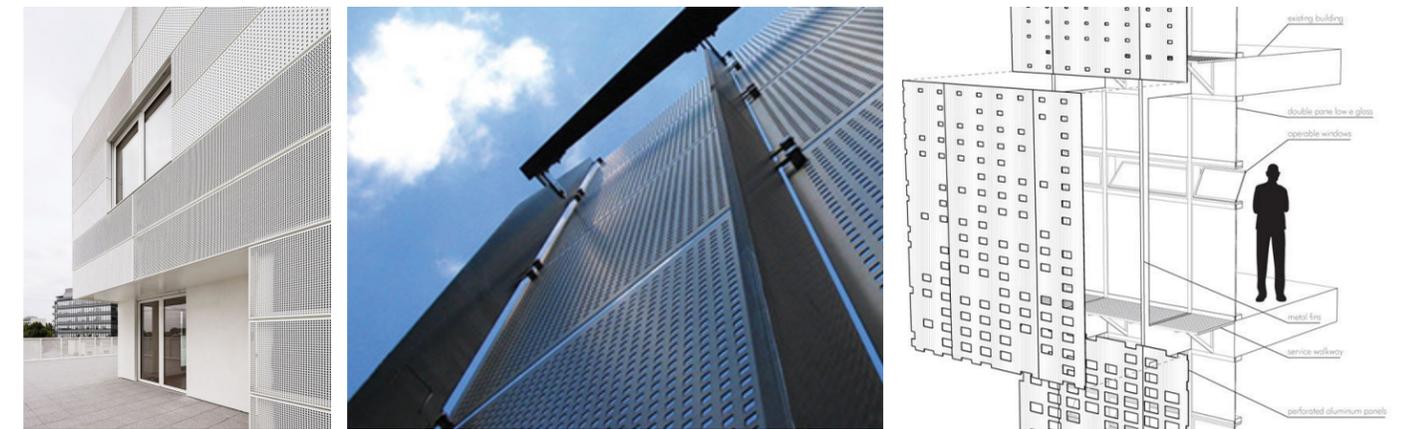
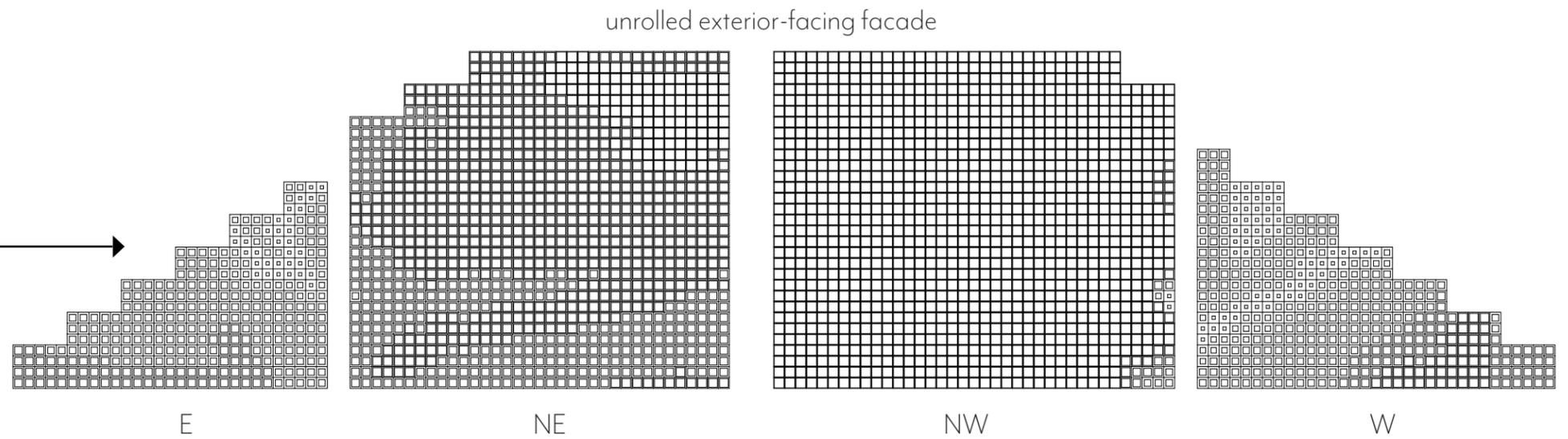
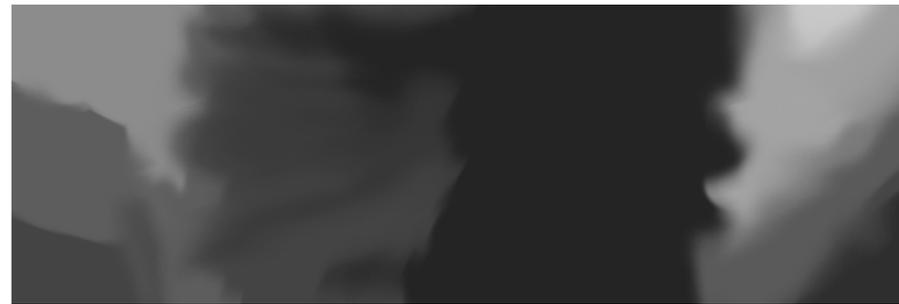
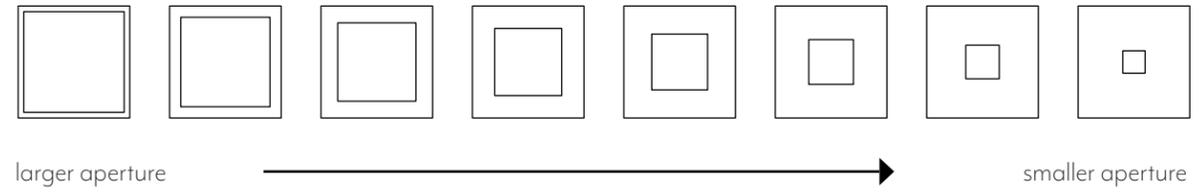
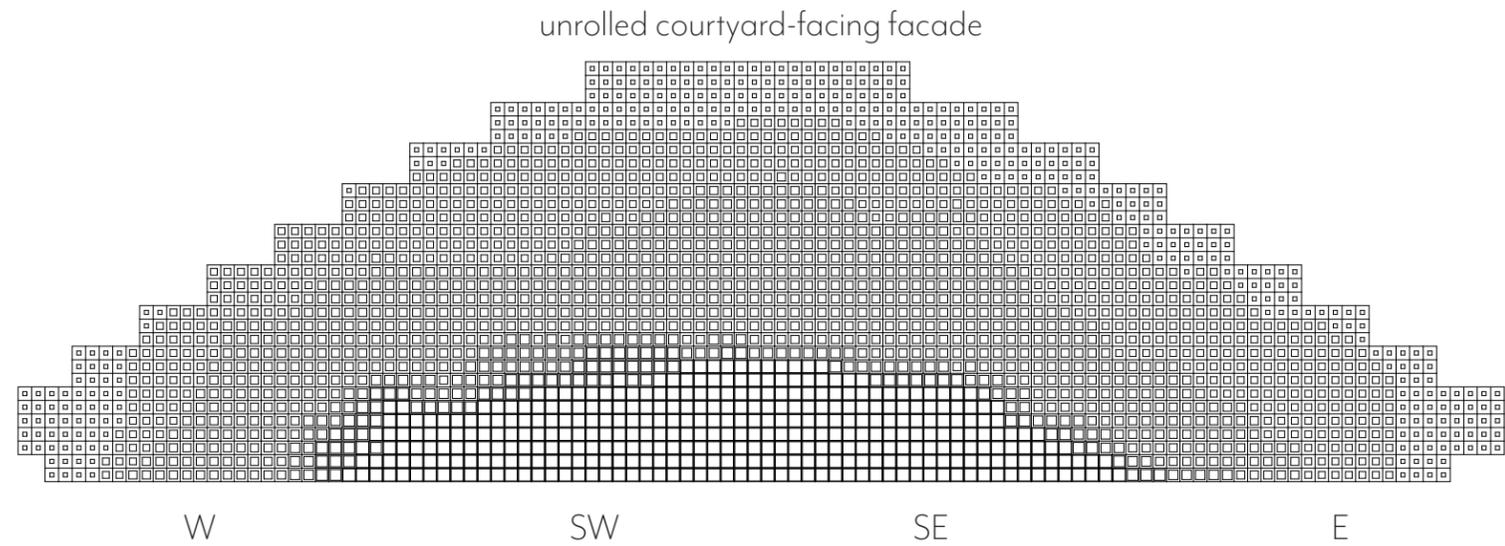
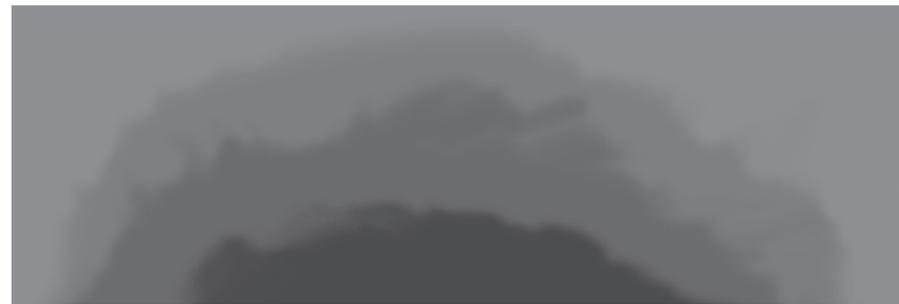
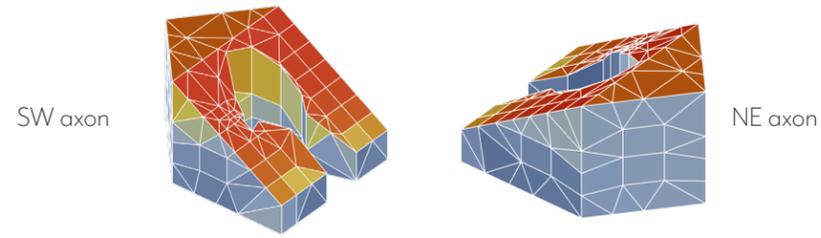


Fig. 79-81 An assortment of examples of white perforated aluminum panels with apertures of varying sizes



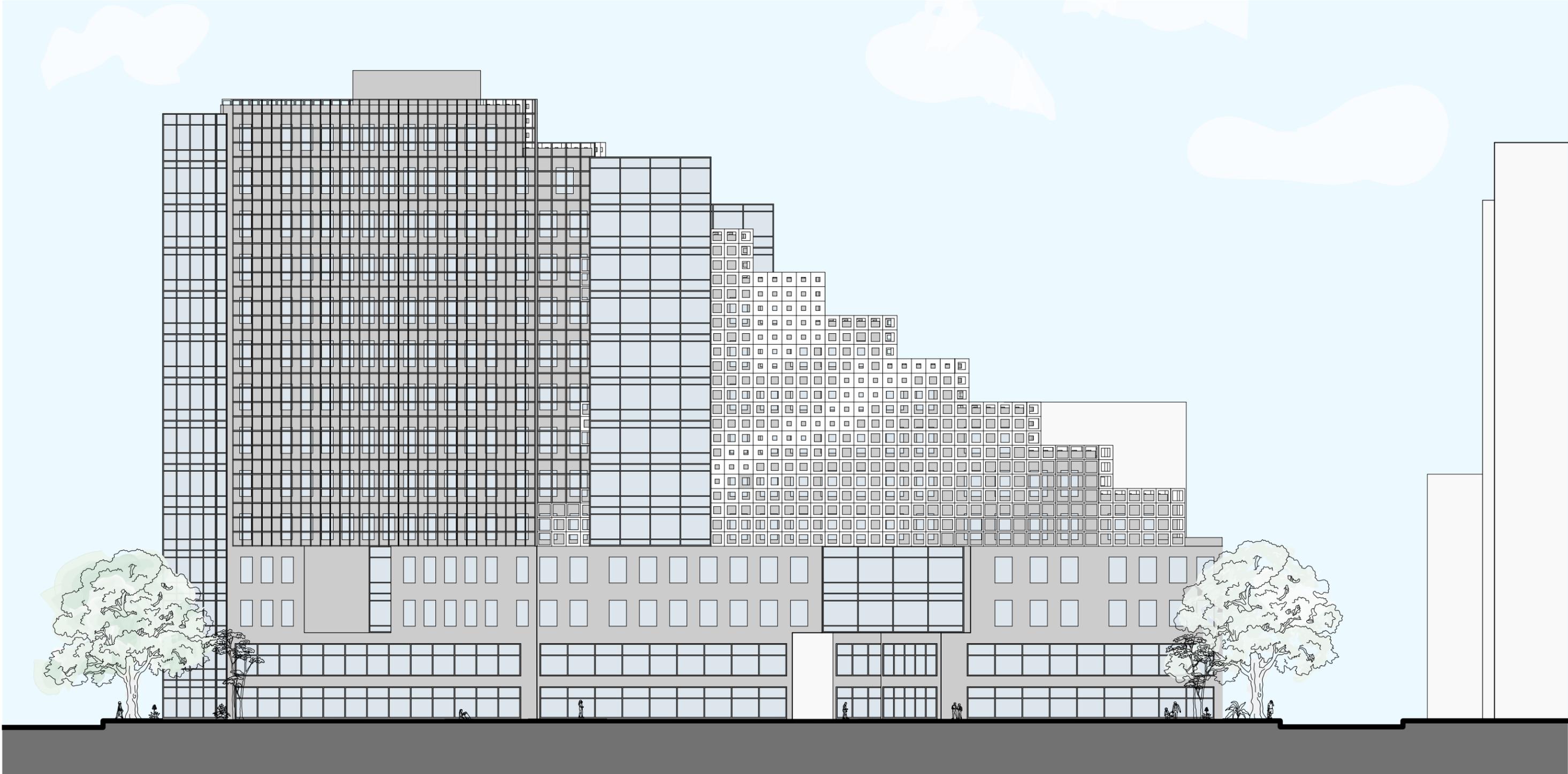
# Facade Logic

The facade panels are 5'x5'. Information from direct sunlight analysis in grasshopper informs the placement of the different panels on the facade based on areas getting the most and least amounts of direct sunlight. A grayscale image was extracted from the colored image so grasshopper can read the values and apply the correct panel in the correct place.



# Elevation

The west elevation shows how the concrete facade interacts with the aluminum facade. The curtain wall acts as moments of reveal to show the social spaces inside.



# Experiential Section

Cutting through northern study area and education spaces, looking east.



## Walking to Class

Tanvi walks to the new innovation campus building to attend their class about Renaissance art and architecture. They are currently majoring in Art History.



## Cornhole on the Terrace

Tanvi and Zoe go outside to hang out after class.





## Image Credits

Fig. 1 Yanni, C. (2019, September 6). "How college dorms evolved to fit America's gender and racial politics". Smithsonian.com. <https://www.smithsonianmag.com/history/why-living-college-dorms-american-rite-passage-180973050/>

Fig. 2 Yanni, C. (2019, September 6). "How college dorms evolved to fit America's gender and racial politics". Smithsonian.com. <https://www.smithsonianmag.com/history/why-living-college-dorms-american-rite-passage-180973050/>

Fig. 3 Floor plan diagrams from Georgia Tech Housing website. <https://housing.gatech.edu/explore-our-residence-halls>

Fig. 4 <https://archdesign.caus.vt.edu/students/waac-housing/>

Fig. 5 <https://housing.vt.edu/experience/YourResidenceHall/HallListing/TheGallery.html>

Fig. 6 <https://housing.vt.edu/experience/YourResidenceHall/HallListing/TheGallery.html>

Fig. 7 <https://housing.vt.edu/experience/YourResidenceHall/HallListing/TheGallery.html>

Fig. 8 <https://housing.vt.edu/experience/YourResidenceHall/HallListing/TheGallery.html>

Fig. 9 <https://trans-resources.org.uiowa.edu/gender-inclusive-restroom-map-campus>

Fig. 10 <https://www.otis.edu/residence-life/gender-inclusive-housing>

Fig. 11 <http://reslife.umd.edu/housing/mixedgenderinclusive/>

Fig. 12. Kelham, H. (2020). "Gender & Privilege". <https://www.hopekelham.com/gender-privilege>

Fig. 13. Quito, A. (2022, April 6). "UNSTALLED: Inclusive bathroom design". Architect. [https://www.architectmagazine.com/design/buildings/unstalled-inclusive-bathroom-design\\_o](https://www.architectmagazine.com/design/buildings/unstalled-inclusive-bathroom-design_o)

Fig. 14 <https://work.ac/work/risd/>

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Fig. 19 [http://www.slate.com/articles/arts/the\\_gay\\_bar/2011/06/10-gay-bars-that-changed-history.html#](http://www.slate.com/articles/arts/the_gay_bar/2011/06/10-gay-bars-that-changed-history.html#), photograph from the San Francisco Public Library Photo Collection

Fig. 20 [http://www.slate.com/articles/arts/the\\_gay\\_bar/2011/06/10-gay-bars-that-changed-history.html#](http://www.slate.com/articles/arts/the_gay_bar/2011/06/10-gay-bars-that-changed-history.html#), from the *CREDIT: New York World-Telegram* and the *Sun Newspaper* Photograph Collection via Library of Congress

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Fig. 29 Photograph from the National Photo Company collection at the Library of Congress

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Fig. 32 Bhavsar, A. (2022). Diagram created by the author with the use of a customizable map program by Aaron Cheng. [http://www.chengfolio.com/google\\_map\\_customizer](http://www.chengfolio.com/google_map_customizer)

Fig. 33 Photograph from the City of Alexandria Government website

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