Empowering Immigrants' Environmental Engagement: Intersectional Community Building in Richmond, B.C.

by
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Author’s Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

My thesis explores the dynamics between ecological challenges, spaces inhabited by immigrants, and cultural identity. Given Canada's current ambitious immigration policies, the project takes an empathetic stance, drawing from local ecological conditions to support immigrants' integration in Canada by proposing spatial conditions to foster social integration.

Ethnic Chinese immigration to Canada has been common since the country's establishment for diverse reasons including labour migration, family reunification, business immigration, and political tensions. Many have relocated to Metro Vancouver in British Columbia (B.C.), especially Richmond, where many cite their ethnic origin as China, Hong Kong, or Taiwan. There is a complex amalgamation of issues here. Segregation between immigrants and English-speaking locals is visible through the tension regarding Chinese-only signage in the city. The city is also prone to flooding. The city provides various environmental stewardship programs, yet they often rarely target immigrants. There is a stereotype that immigrants care less about environmental issues, given their priority of economic stability.[1] However, flooding can hinder financial stability. Hence, this thesis asks how architecture can facilitate environmental stewardship initiatives by engaging immigrants in the context of Richmond's immigrant-dominated demographic.

To address the research question, I analyze existing literature. However, limited materials provide insight into this niche and ever-changing subject encompassing social, political, and ecological considerations. Instead, scholars offer insights into various disaggregated aspects of the topic and highlight the importance of redefining the relationship between ethnic minority groups and environmental movements. Moreover, I explore Richmond's environmental and anti-racism initiatives, analyzing their successes and shortcomings. The goal is to understand the barriers to implementing community-building or environmental programs for Canada's immigrants.

This research will materialize in the latter part of the project in the form of a housing cooperative (co-op) design. In response to the critical reading of Richmond's existing initiatives and policies, I advocate for designing smaller interventions that are well-integrated with daily life in place of massive-scaled projects to address a community's intersectional issues. Moreover, I aim to address Richmond's intersectional environmental issues by designing a housing cooperative as a response to B.C.'s housing crisis, a critical issue in the province. The design process will involve site planning, context analysis, program analysis, and photographic analysis. Overall, the design aims to acknowledge the financial benefits of living with environmentalism, and the importance of collective participation to create a sustainable project over the long term.

Ultimately, as a child of immigrants from Hong Kong, this topic is not just a professional interest but a deeply personal one. This research aims to inform forthcoming design projects, enabling diverse immigrant groups to engage in a spectrum of environmental stewardship initiatives.

1 Eugenia Wang, "Sustainable Diversity" (David Suzuki Foundation, February 2015), https://davidsuzuki.org/wp-content/uploads/2017/09/sustainable-diversity-david-suzuki-foundation-multiculturalism-green-movement.pdf.

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Finally, thank you to my extended family, whose gatherings shaped my thesis' development. I am especially grateful for the Pau family. Thank you for helping me settle in when I first arrived, and for continuously welcoming me into your home every week. Most importantly, Mom and Dad, I dedicate this thesis to you, and all the hardships you faced as you arrived in Canada. Thank you for paving the way for me, I would not be here if you had not chosen to immigrate many years ago. Thank you for your love and support, especially throughout the past six years at UWSA. I've had many highs and lows - thank you for your unconditional support in all sorts of ways, shapes and forms throughout this experience. I'm so fortunate to have such loving parents who I can also call my friends.

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Chapter 1: Introduction

Personal Relation to the Topic[1]

I grew up in Hong Kong before relocating to the Greater Toronto Area in 2018. I am also a child of 'reverse immigrants,' as my parents immigrated to Canada in the 1990s, returned to Hong Kong several years later to be with their families, and have since relocated back to Canada. Thus, my parents and I had to adapt to Canadian culture, making this thesis regarding immigrants personally relevant. This research combines two local issues crucial to me - social integration and climate change.

Having witnessed many individuals leaving Hong Kong following the National Security Law and the Anti-Extradition Bill Movement, I often heard the sentiment that Canada is an inclusive country relative to Hongkongers' other migration destinations,[2] with immigrants here less likely to be faced with racial slurs. However, during the COVID-19 pandemic, anti-Asian racism became increasingly apparent. Journalists documented many of these incidents in mass media.[3] These events highlighted that, as a country, Canada still has a long way to go regarding inclusivity.

After spending a year living and working in Metro Vancouver, I am compelled to impact the local community positively. The local climate was particularly concerning, as I experienced a severe heatwave during the summer of 2021, with temperatures exceeding 40 degrees Celsius. Neither my office nor my relatives' homes, where I often visited for dinner gatherings, had air conditioning. The only way I could work in the sweltering heat was by having an electric fan within arm's reach, and my supervisor often let employees leave early due to the challenging conditions. This personal experience highlighted the adverse effects of British Columbia's (B.C.) climate change.

Ultimately, this design thesis aims to be empathetic, drawing on local ecological conditions to propose architectural solutions that create spatial conditions conducive to social integration.

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1 Racism and oppression are key themes addressed in this thesis. The goal of beginning with a personal narrative through counter storytelling is to reveal my experience and truth in relation to this research topic.

2 Including the United Kingdom and Australia

3 Zahra Premji, "3 Years into the COVID-19 Pandemic, Anti-Asian Hate Still Prevalent in Metro Vancouver: Advocates," *CBC News*, January 26, 2023, https://www.cbc.ca/news/canada/british-columbia/anti-asian-hate-in-metro-vancouver-2023-1.6725671.

Eve Edmonds, "Editor's Column: Coronavirus Causing Rash of Racism in Richmond," *Richmond News*, February 27, 2020, sec. Opinion, https://www.richmond-news.com/opinion/editors-column-coronavirus-causing-rash-of-racism-in-richmond-3117788.

Background of Ethnic Chinese Migration to Canada and the Context of Richmond

Immigration of Ethnic Chinese populations to Canada has been common since the country's establishment in the mid-nineteenth century.[4] This phenomenon falls under five phases:[5]

1. A preliminary stage from 1858 to 1884
2. A restricted-entry era from 1885 to 1923
3. An exclusion period from 1923 to 1947
4. A renewed but limited immigration phase from 1947 to 1967
5. A sustained and sizable immigration period from 1967 to the present

The first two phases involved labour migration.[6] The third phase involved racist policies in the United States and Canada to restrict Chinese individuals from entering, known as the Chinese Exclusion Act and the Chinese Immigration Act, respectively. The fourth phase—characterized by family reunification—began after the government rescinded the Chinese Immigration Act. An average of 2,000 immigrants arrived in Canada annually, with many being working-class immigrants.[7]

Consequently, this thesis focuses on the final phase of immigration, understanding its contemporary reasons and features. Most early immigrants in this phase were middle-class individuals from Hong Kong.[8] Later, Chinese business immigrants increased, complementing the existing working-class immigrants from the previous phase, as well as the middle-class immigrants. The 1990s marked the peak of the Canadian Business Immigration Program when they accounted for about 10 percent of all immigrants to Canada. Ethnic Chinese immigrants arriving after 1997 were predominantly from the People's Republic of China (PRC), while those migrating before 1997 were primarily from Hong Kong.[9] The increase in immigrants from Mainland China is a "combined result of the 1989 student democratic movement, military conflicts and tensions across the Taiwan Strait."[10] China's rapid economic growth also fostered an increase in its citizens' financial resources to emigrate. Subsequently, most immigrants during this period were well-educated middle-class individuals, causing the rise of "affluent and multilingual ethnoburbs" such as Richmond, B.C. and Markham, Ontario.[11]

The decline in migration from Hong Kong aligns with the 1997 handover of Hong Kong's sovereignty from Great Britain to the PRC, as individuals emigrated in anticipation of the political shift.[12] The

4 "Discover Canada - Canada's History," Government of Canada, October 26, 2015, https://www.canada.ca/en/immigration-refugees-citizenship/corporate/publications-manuals/discover-canada/read-online/canadas-history.html.

5 Lloyd L. Wong, *Trans-Pacific Mobilities: The Chinese and Canada* (Vancouver: UBC Press, 2017), 4, https://doi.org/10.59962/9780774833813.

6 Associated with the gold rush and the construction of the Canadian Pacific Railway

7 Wong, *Trans-Pacific Mobilities*, 5.

8 Wong, *Trans-Pacific Mobilities*, 5.

9 Wong, *Trans-Pacific Mobilities*, 5.

10 Wong, *Trans-Pacific Mobilities*, 85.

11 Wong, *Trans-Pacific Mobilities*, 86.

12 Wong, *Trans-Pacific Mobilities*, 7.

scale of immigration was substantial—Hong Kong provided Toronto with the most immigrants between 1993 and 97.[13] However, many returned to Hong Kong as the economy stabilized after the handover and the 1998 Financial Crisis.[14]

The number of migrants leaving Hong Kong has recently risen again following the 2014 and 2019 pro-democracy movements and subsequent National Security Law, with many choosing to move to Metro Vancouver in B.C.[15] Richmond is home to many immigrants; as of 2021, the ethnic origin of 56% of its population is China, Hong Kong or Taiwan.[16] Segregation between immigrants and locals who predominantly speak English is visible through the tension regarding Chinese-only signage in the city.[17] The ethnic population's traces are also evident in all corners of Richmond's urban fabric, including local Buddhist temples[18] and malls catering to an Asian clientele, such as Aberdeen Centre.[19]

Unlike other ethnoburbs, Richmond faces a unique combination of challenges. It is prone to flooding, averaging 1 metre above sea level.[20] In response, the city and community organizations have organized environmental awareness programs, yet they rarely target the immigrant population (See Chapter 3: Urban Scale Context.) There is a stereotype that immigrants care less about environmental issues, given their priority of economic stability. However, flood risk can be a barrier to financial stability, and many migrants are relocating to Canada due to its desirable landscape for children to grow up in.[21]

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13 "Chinese History in Toronto," City of Toronto (City of Toronto), Toronto, Ontario, Canada, accessed July 11, 2024, https://www.toronto.ca/city-government/accountability-operations-customer-service/access-city-information-or-records/city-of-toronto-archives/using-the-archives/research-by-topic/chinese-history-in-toronto/.

14 Kennedy Chi-pan Wong and Miu Chung Yan, "Leaving the Homeland Again for My Family's Future: Post-Return Migration Among Hong Kong Canadians," *Journal of International Migration and Integration* 24, no. 2 (April 6, 2022): 476, https://doi.org/10.1007/s12134-022-00955-0.

15 Kenneth Chan, "90% of Hong Kongers Immigrating to Canada Now Choosing Metro Vancouver | Urbanized," *DailyHive*, October 31, 2022, https://dailyhive.com/vancouver/hong-kong-immigration-canada-vancouver-pandemic.

16 Government of Canada, "Profile Table, Census Profile, 2021 Census of Population - Richmond, City (CY) [Census Subdivision], British Columbia," Statistics Canada, February 9, 2022, https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E.

17 The Canadian Press, "Richmond, B.C. Passes Policy on English Signs," *CTVNews*, September 12, 2017, sec. Canada, https://www.ctvnews.ca/canada/richmond-b-c-passes-policy-on-english-signs-1.3586524.

18 Wong, *Trans-Pacific Mobilities*, 59.

19 Jim Taggart, "Suburban Shift," *The Canadian Architect* 51, no. 8 (August 2006): 36.

20 "Flood Protection," City of Richmond, accessed July 11, 2024, https://www.richmond.ca/services/water-sewer-flood/dikes.htm.

21 Eugenia Wang, "Sustainable Diversity" (David Suzuki Foundation, February 2015), 15, https://davidsuzuki.org/wp-content/uploads/2017/09/sustainable-diversity-david-suzuki-foundation-multiculturalism-green-movement.pdf.

Research Question, Objectives and Significance of Research to the Broader Community

This thesis poses the question, how can architectural design in Richmond, B.C., facilitate environmental stewardship initiatives by engaging immigrants? Specifically, I aim to understand Richmond's strengths and challenges relevant to its immigrant-dominated demographic. The goal is to propose systems to facilitate sustainable living integrated with locals' lifestyles and educate ethnic groups—who comprise most of the local population—about environmentalism.

This research is critical to Richmond because flooding affects locals' livelihoods and lifestyles. These impacts have materialized through (1) the closure of infrastructure due to flooding, such as when a ramp in Richmond to Highway 99—a vital corridor connecting the province[22] to the United States—was temporarily shut down in December 2023.[23] Another way is (2) the pricey improvements of flood infrastructure when this money could serve the community in other ways. For example, in May 2024, the local government committed to spending 13 million CAD to upgrade the No.3 Road South Drainage Pump Station.[24] Lastly, (3) homes repeatedly flood during severe weather, leading to insurance companies raising premiums or even disqualifying homes from getting flood insurance.[25]

22 Highway 99 begins in Lillooet

23 Maria Rantanen, "Update: Shell Road South-Bound Ramp to Highway 99 Now Re-Opened," *Richmond News*, December 5, 2023, sec. Local News, https://www.richmond-news.com/local-news/shell-road-south-bound-ramp-to-highway-99-closed-due-to-flooding-7924718.

24 Vikki Hui, "Flood Protection: Richmond Gets $13M for Pump Station Upgrades," *Richmond News*, May 10, 2024, sec. Local News, https://www.richmond-news.com/local-news/flood-protection-richmond-gets-13m-for-pump-station-upgrades-8727699.

25 Kerry Gold, "Climate Change Is Having a Direct Impact on Home Insurance Rates," *The Globe and Mail*, September 16, 2023, https://www.theglobeandmail.com/real-estate/vancouver/article-climate-change-is-having-a-direct-impact-on-home-insurance-rates/.



Figure 1.01. Richmond's Location Relative to Vancouver. 2024. By author. Adapted from aerial photograph courtesy of Google Maps.

To address significant climate change events, an integrative approach is crucial;[26] it requires localized initiatives to foster autonomy amongst communities by encouraging knowledge gain. Climate change cannot be addressed solely through urban policy due to the uncertain nature of climate change. Instead, institutions and organizations from all sectors—including both the private and public—must participate in creating plans that can adapt quickly to a changing environment.[27] Urbanist Aseem Inam's "City as Flux" is a relevant concept, defined by cities' constant evolution. Therefore, in addition to being a three-dimensional material object, time should be critically considered as cities' fourth dimension.[28] This complex condition creates a crucial opportunity for "private, public and civil institutions and organizations on all levels" to collaborate.[29] Ultimately, this thesis aims to address the question of how the design of spaces can encourage locals to embrace a sustainable lifestyle and understand the relevant methods and consequences. The goal of this is to ultimately minimize environmental disasters.

This research also intends to benefit the broader Canadian community, given Canada's ambitious plan to welcome up to 500,000 immigrants annually until 2025.[30] It aims to inform forthcoming local design projects, enabling diverse immigrant groups to actively engage in a spectrum of environmental stewardship initiatives in the future.

In conclusion, this study explores the potential of designing spaces for new immigrants and locals to (1) build a strong sense of community, (2) engage with Richmond's environmental efforts through well-designed spaces, and (3) address B.C.'s housing affordability crisis through the exercise of designing a single residential building case study.

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26 Yosef Jabareen, "Planning the Resilient City: Concepts and Strategies for Coping with Climate Change and Environmental Risk," *Cities* 31 (2013): 224, https://doi.org/10.1016/j.cities.2012.05.004.

27 Jabareen, "Planning the Resilient City," 224.

28 Aseem Inam, *Designing Urban Transformation* (Oxford: Taylor & Francis Group, 2013), 60, http://ebookcentral.proquest.com/lib/waterloo/detail.action?docID=1498734.

29 Jabareen, "Planning the Resilient City," 224.

30 Refugees and Citizenship Canada Immigration, "Notice – Supplementary Information for the 2024-2026 Immigration Levels Plan," Government of Canada, November 1, 2023, https://www.canada.ca/en/immigration-refugees-citizenship/news/notices/supplementary-immigration-levels-2024-2026.html.

Mapping Exercises

The following maps explore how Richmond's demographics are distributed spatially across the city. The drawings are categorized into five groups, including (1) land use, (2) ethnic & immigrant communities, (3) housing, (4) Climate and the Environment, and (5) exploring broader correlations. The regions discussed below can be understood Eto local planning areas, as described in the following map:

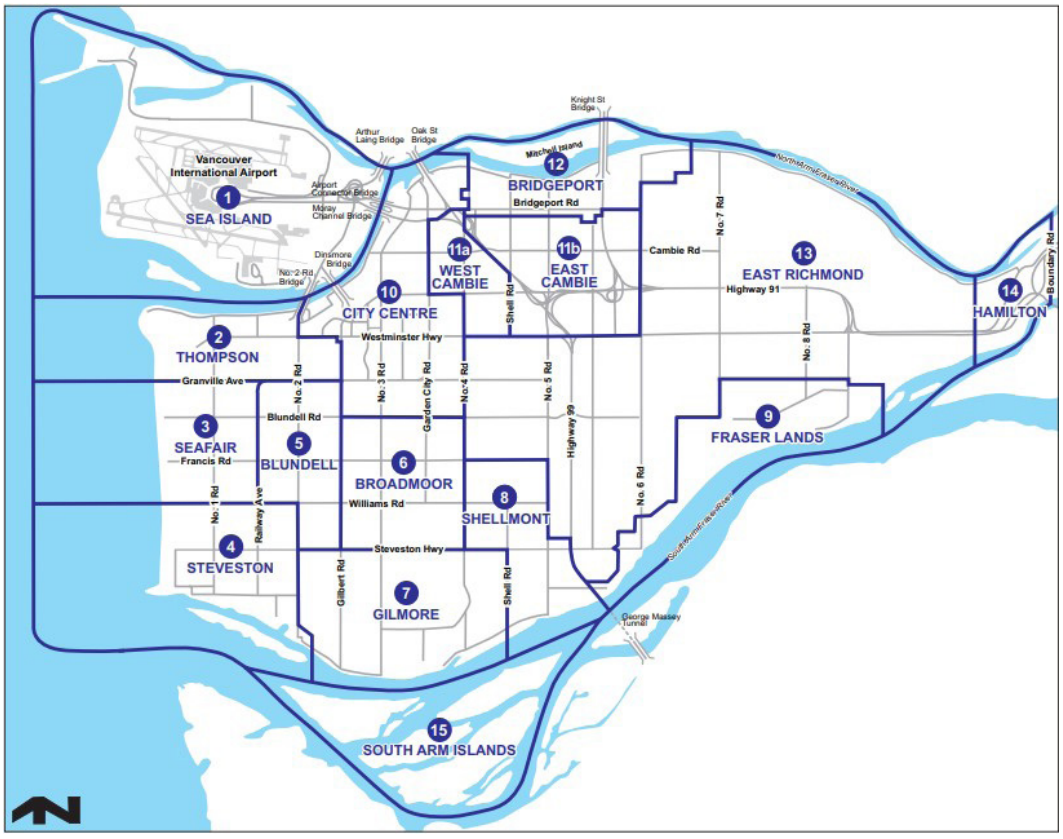


Figure 1.02. Richmond's Planning Areas Map. 2023. Courtesy of the City of Richmond, retrieved from "Population Hot Facts," (https://www.richmond.ca/__shared/assets/Population_Hot_Facts6248.pdf.)

Mapping Exercises: Land Use

East Richmond contains large agricultural lands, with ports and industrial lands bordering these areas. Notably, Vancouver International Airport is in the Sea Island planning area. The remaining lands are dominated by a mix of residential and retail buildings. In particular, single-detached housing is abundant, with retail buildings near the city's northern regions.

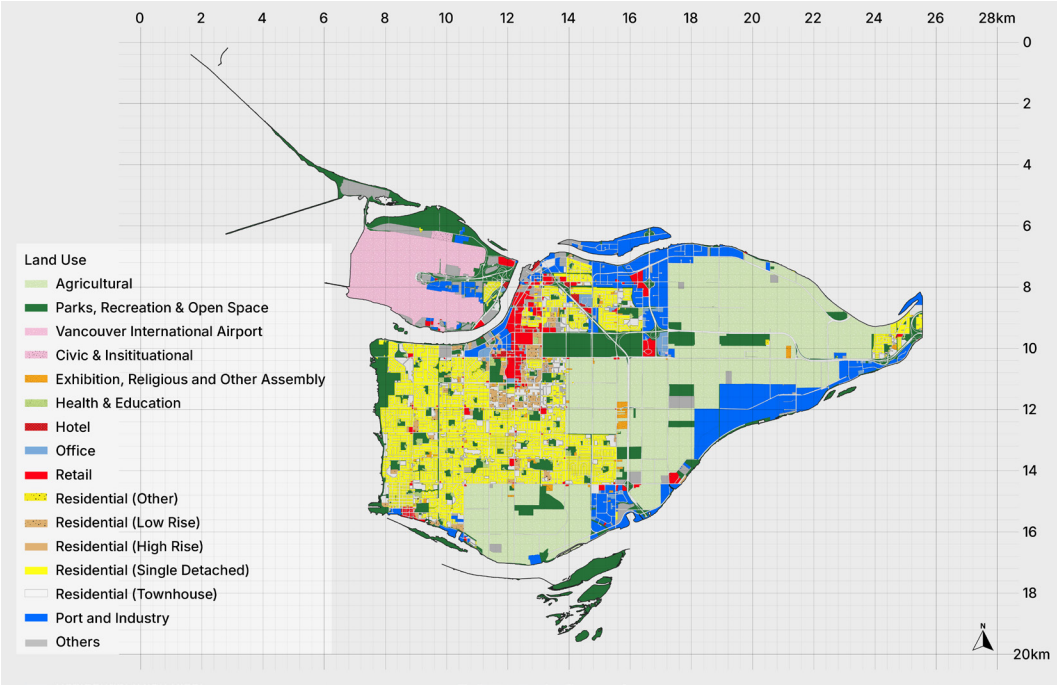


Figure 1.03. Land Use map in Richmond, B.C. (Colours Adapted from Richmond 2041 Land Use OCP.) 2024. By author. Adapted from GIS Data courtesy of Metro Vancouver (https://arcg.is/fimfP1.)

Mapping Exercises: Ethnic & Immigrant Communities

Richmond has an exceptionally high percentage of ethnic Chinese residents, including 56% who cite their origin as Hong Kong, China, or Taiwan. Immigrant populations are most concentrated in central Richmond; this pattern is visible in both generational and recent immigrants. However, a predominantly residential area known as Steveston, has a low percentage of the immigrant population relative to the rest of Richmond. The agricultural lands in East Richmond also have a low immigrant population, suggesting that non-immigrant groups are predominantly responsible for local agricultural work.

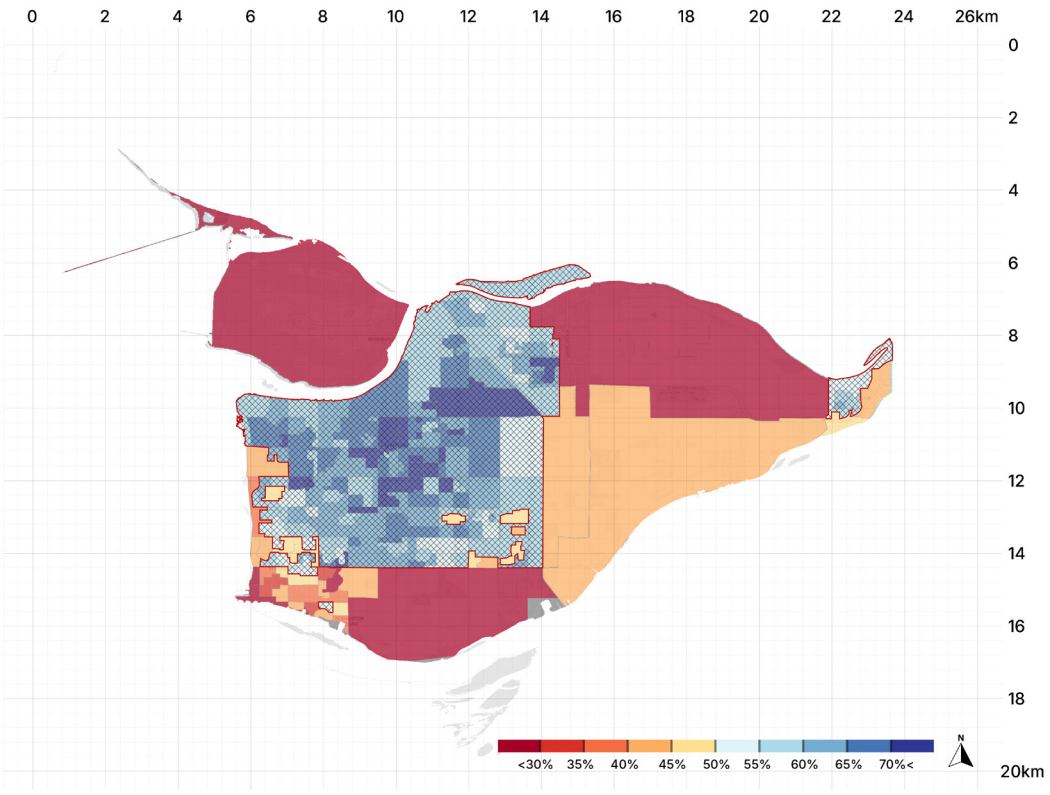


Figure 1.04. The Immigrant Population in Richmond, B.C. (Crosshatched Areas Represent Over 50% of the Population Being Immigrants.) 2024. By author. Adapted from GIS Data courtesy of Statistics Canada. Statistics from Statistics Canada 2021 Census retrieved via CensusMapper (https://censusmapper.ca/popup/about_census.)

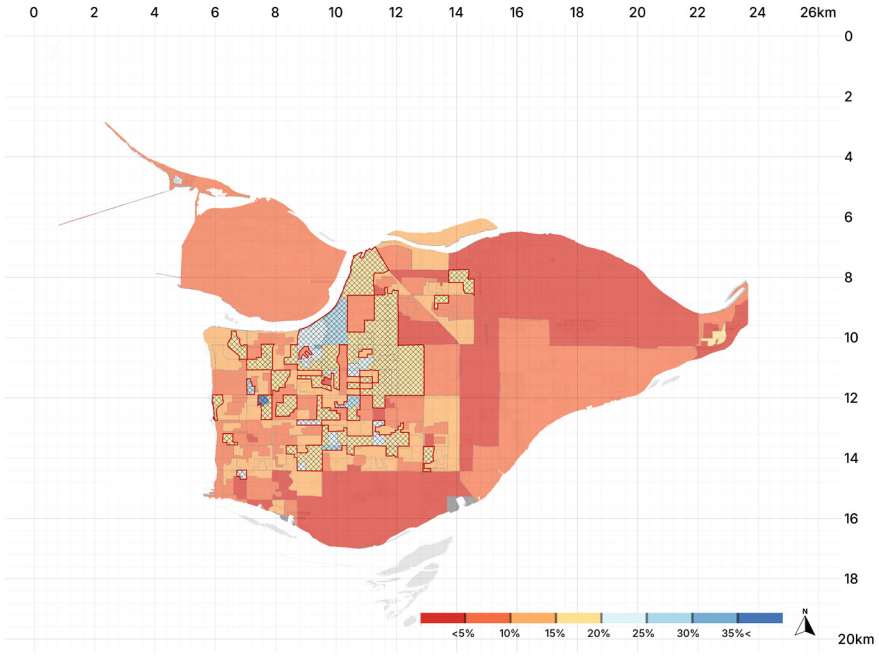


Figure 1.05. Recent (2011-2021) Immigrants in Richmond, B.C. (Crosshatched Areas Represent Over 15% of the Population Being Recent Immigrants.) 2024. By author. Adapted from GIS Data courtesy of Statistics Canada. Statistics from Statistics Canada 2021 Census retrieved via CensusMapper (https://censusmapper.ca/popup/about_census.)

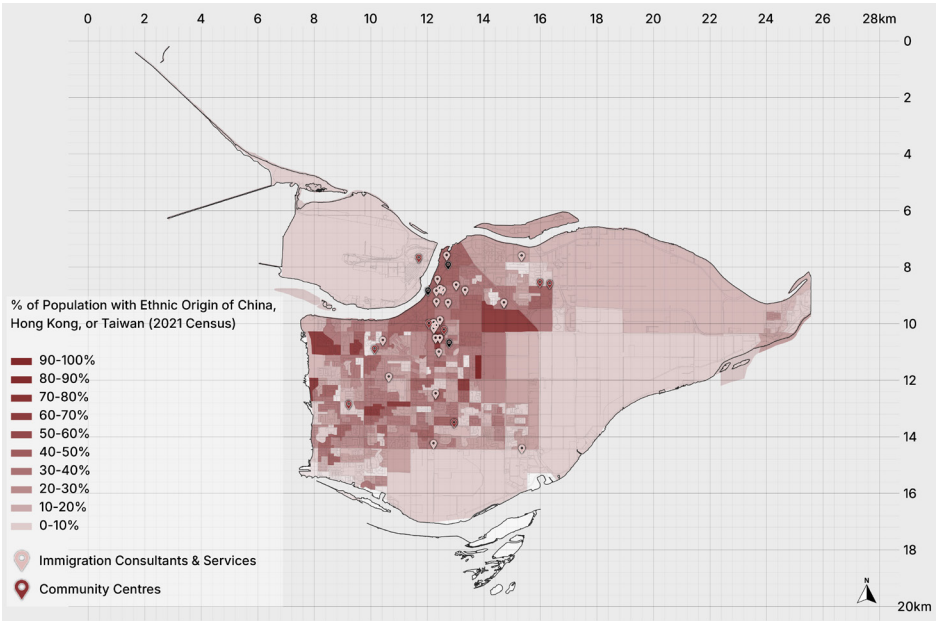


Figure 1.06. Population in Richmond with Ethnic Origin of China, Hong Kong or Taiwan. 2024. By author. Adapted from GIS Data courtesy of Statistics Canada. Information from Google Maps.

One observation in understanding Richmond's green infrastructure is that the two key greenways and trails run in the north-south direction. They run parallel to the key commercial and transit corridor along No. 3 Road. (See section below) Parks are abundant and scattered throughout the urban regions. However, there is ample green space towards central Richmond, between the core immigrant-occupied areas and the agricultural lands to the east. This vast green space is called the Garden City Lands. (See *The Garden City Lands Legacy Landscape Plan* in *Chapter* 3) Community gardens are also abundant but concentrated in central Richmond. They are operated by Urban Bounty.

Moreover, given that Richmond is prone to flooding, the city's Dike Master Plan outlines the ongoing process of upgrading flood prevention infrastructure.[31] It has been divided into five phases, and action will begin on the city's southern end, where there is a low immigrant population relative to the rest of Richmond. These systems may, therefore, inadvertently contribute to a lack of equity in urban strategies.

31 "Dike Master Plan," City of Richmond, accessed July 7, 2024, https://www.richmond.ca/services/water-sewer-flood/dikes/dikemasterplan.htm.

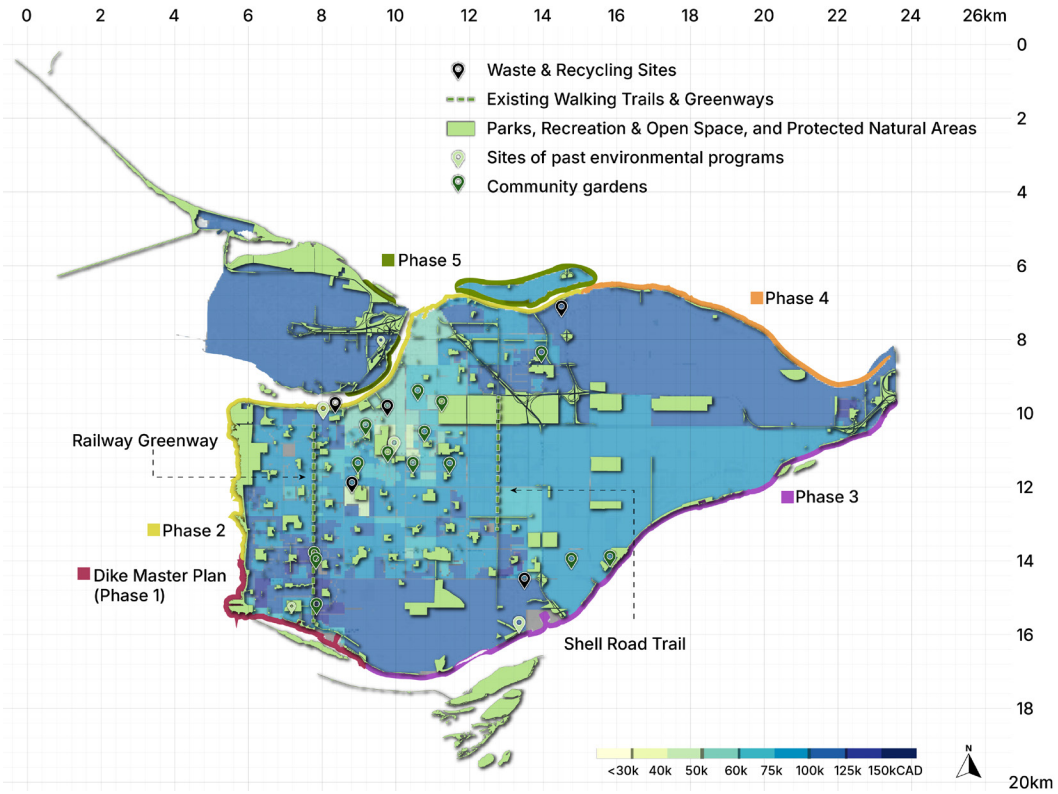


Figure 1.07. Green Amenities in Richmond, B.C. and Median Household Income. 2024. By Author. Adapted from GIS Data courtesy of Statistics Canada. Information from Google Maps and City of Richmond (https://www.richmond.ca/services/water-sewer-flood/dikes/dikemasterplan.htm.) Statistics from Statistics Canada 2021 Census retrieved via CensusMapper (https://censusmapper.ca/popup/about_census.)

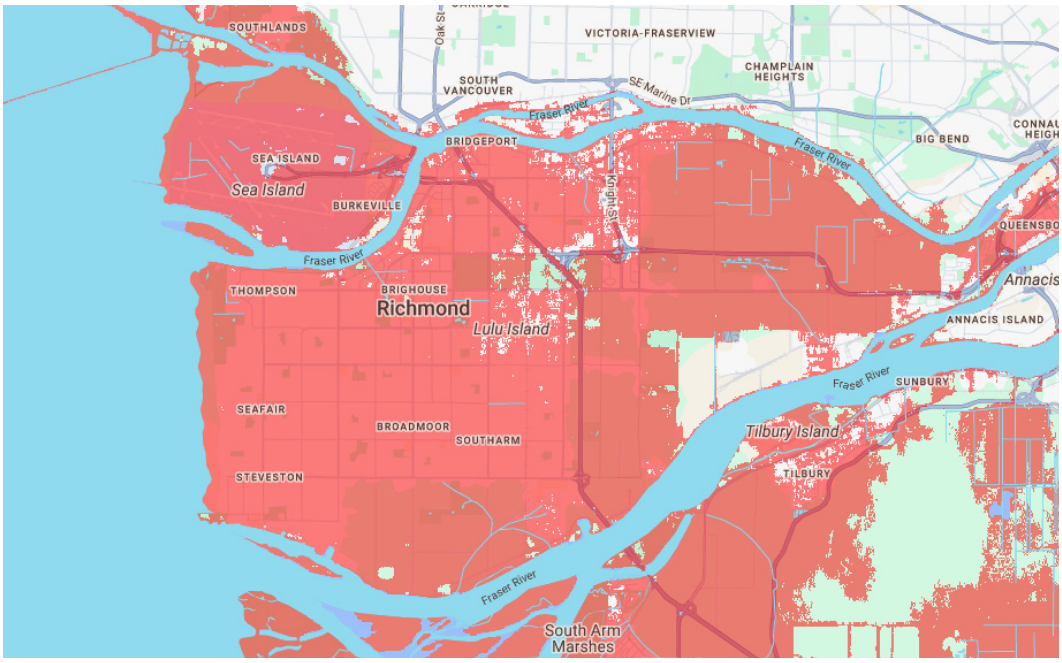


Figure 1.08. Land Projected to be Below Annual Flood Level in 2030. Retrieved August 27, 2024. Courtesy of Climate Central. (https://coastal.climatecentral.org/mapview/12/-123.0959/49.1723/e3f535d0063b429bbe84af013b2b28e023ef25f63b3fa0c48f3c640f49d989a6.)

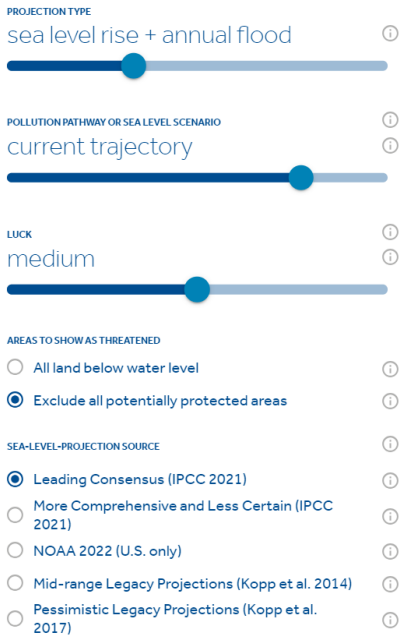


Figure 1.09. Screenshot of Settings and Assumptions for Figure 1.08. Retrieved August 27, 2024. Courtesy of Climate Central. (https://coastal.climatecentral.org/mapview/12/-123.0959/49.1723/e3f535d0063b429bbe84af013b2b28e023ef25f63b3fa0c48f3c640f49d989a6.)

Mapping Exercises: Housing

Richmond's housing is generally well maintained and suitable for living in, with a low percentage of homes needing significant repairs or being overcrowded. Interestingly, the City Centre planning area and the city's border—near Steveston and Gilmore—has a low percentage of multi-generational households. However, the spaces in between, including the planning areas of Shellmont and Blundell, have a higher percentage of multi-generational families. These neighbourhoods fall under the areas where over 50% of the population are immigrants. The regions bordering the agricultural lands in East Richmond also include more multi-generational housing. This pattern could indicate a correlation between multi-generational households and families that farm for a living.

However, Richmond's housing challenges are most visible in its affordability, especially near the City Centre planning area. Many residents spend over 30% of their income on shelter. Consequently, there is a high concentration of renter and roommate households in the heart of Richmond. This affordability issue suggests that Richmond may be facing a housing crisis, with a significant need for a greater supply of affordable housing. This topic will be further explored and addressed throughout this thesis.

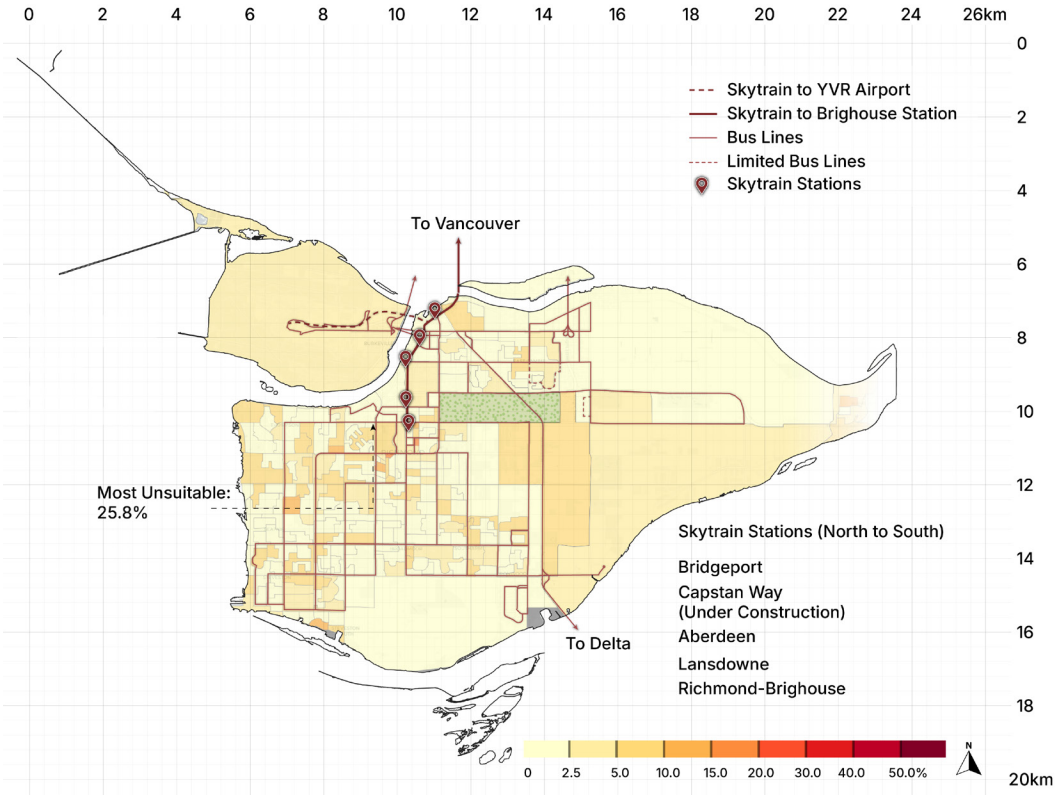


Figure 1.10. Housing In Need of Significant Repairs in Richmond, B.C. 2024. By author. Adapted from GIS Data courtesy of Statistics Canada. Information from Google Maps, Statistics from Statistics Canada 2021 Census retrieved via CensusMapper (https://censusmapper.ca/popup/about_census.)

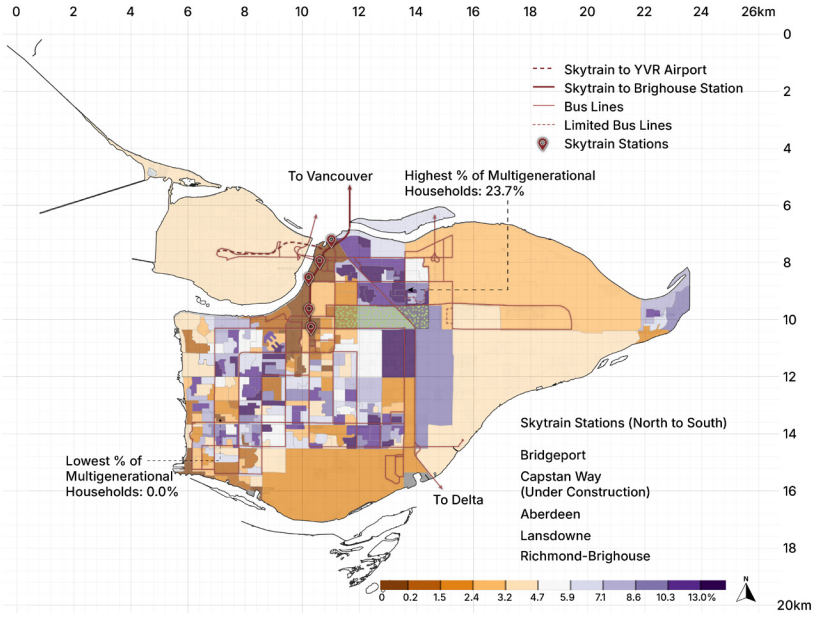


Figure 1.11. Multi-Generational Households in Richmond, B.C. 2024. By author. Adapted from GIS Data courtesy of Statistics Canada. Information from Google Maps, Statistics from Statistics Canada 2021 Census retrieved via CensusMapper (https://censusmapper.ca/popup/about_census.)

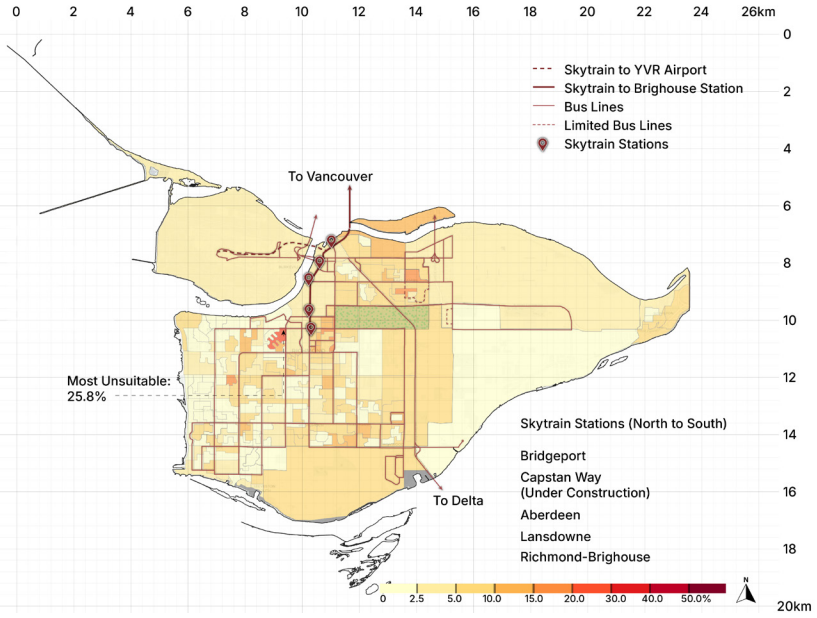


Figure 1.12. Unsuitable Housing in Richmond B.C. (Overcrowded According to the National Occupancy Standard.) 2024. By author. Adapted from GIS Data courtesy of Statistics Canada. Information from Google Maps, Statistics from Statistics Canada 2021 Census retrieved via CensusMapper (https://censusmapper.ca/popup/about_census.)

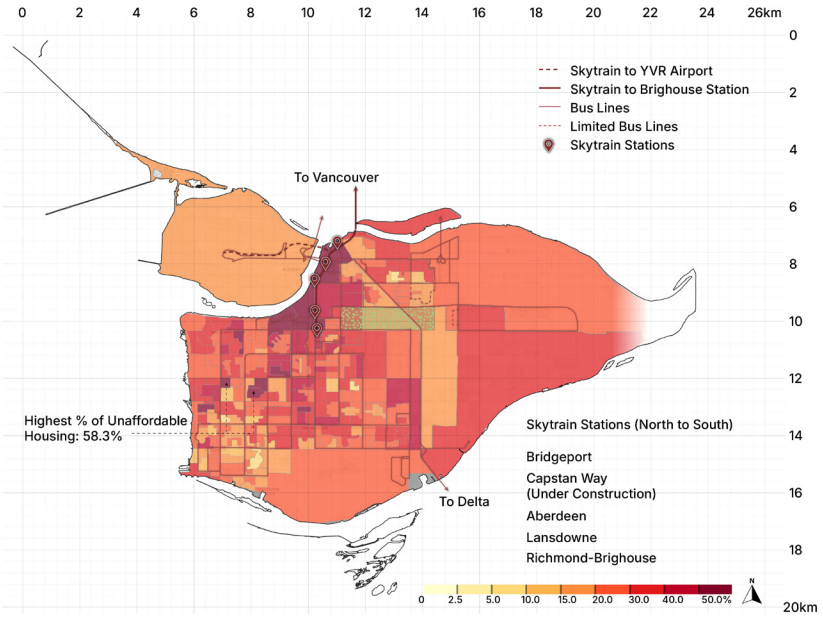


Figure 1.13. Unaffordable Housing in Richmond, B.C. (Population Spending Over 30% of Income on Shelter.) 2024. By author. Adapted from GIS Data courtesy of Statistics Canada. Information from Google Maps, Statistics from Statistics Canada 2021 Census retrieved via CensusMapper (https://censusmapper.ca/popup/about_census.)

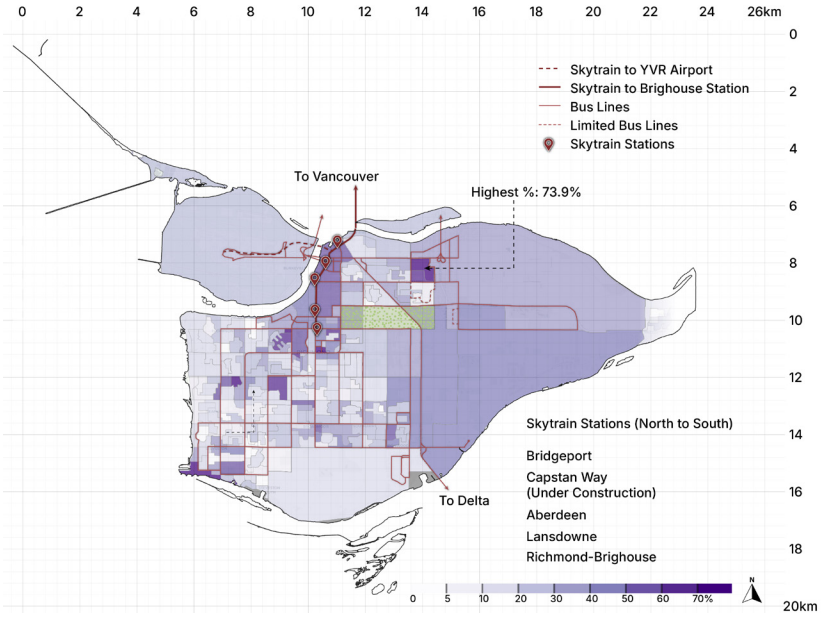


Figure 1.14. Renter Households in Richmond, B.C. 2024. By author. Adapted from GIS Data courtesy of Statistics Canada. Information from Google Maps, Statistics from Statistics Canada 2021 Census retrieved via CensusMapper (https://censusmapper.ca/popup/about_census.)

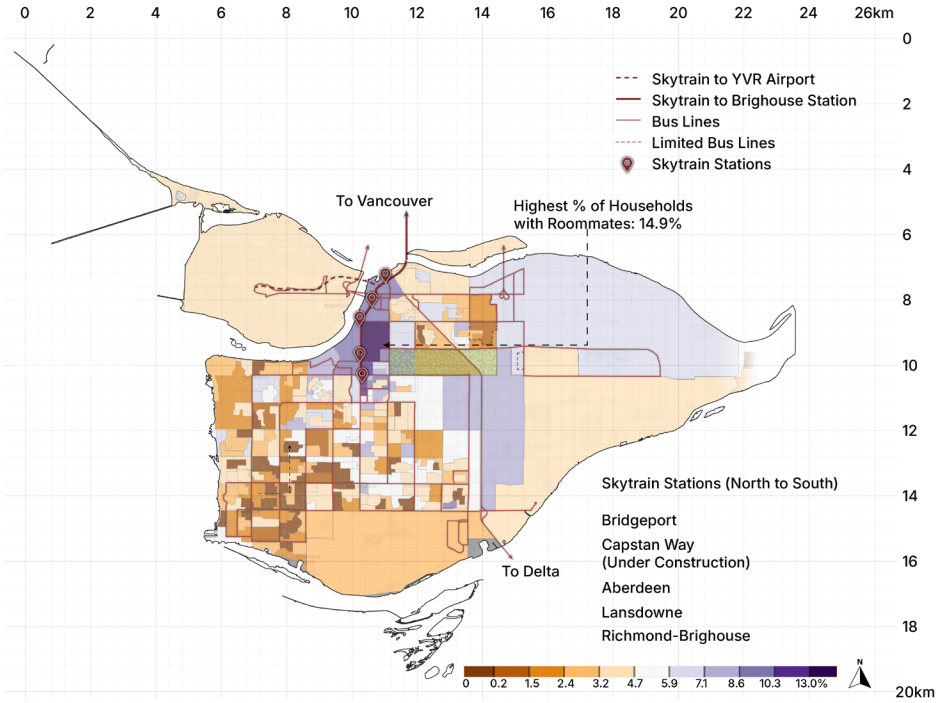


Figure 1.15. Roommate Households in Richmond, B.C. 2024. By author. Adapted from GIS Data courtesy of Statistics Canada. Information from Google Maps, Statistics from Statistics Canada 2021 Census retrieved via CensusMapper (https://censusmapper.ca/popup/about_census.)

Mapping exercises: Exploring Correlations between demographics and transit

The City Centre area also correlates with Richmond's transit infrastructure, as the SkyTrain system runs along No.3 Road, central to this region. Richmond is served by a combination of buses and the SkyTrain, Metro Vancouver's rapid transit system. The Skytrain's Canada Line connects downtown Vancouver to central Richmond. Public transit is crucial to the experience of marginalized groups, including immigrants, ethnic minorities, and low-income individuals. Thus, the results of this mapping exercise suggest that Richmond's SkyTrain is situated appropriately to suit marginalized populations congregating in central Richmond, especially individuals who commute between downtown Vancouver and Richmond.

The patterns from previous maps indicate that immigrant populations, lower income groups, and roommate and renter households tend to live near the City Centre planning area, which is highly unaffordable relative to residents' income. Household sizes also tend to be smaller. Yet, the region's lower average income suggests that marginalized community members may rely more heavily on the SkyTrain to commute regularly to other parts of metro Vancouver.

On the other hand, there is a lower concentration of multi-generational families and a slightly lower concentration of unsuitable units or those requiring repairs here. This pattern suggests that many housing units in the City Centre region are newer transit-oriented developments (TOD.)

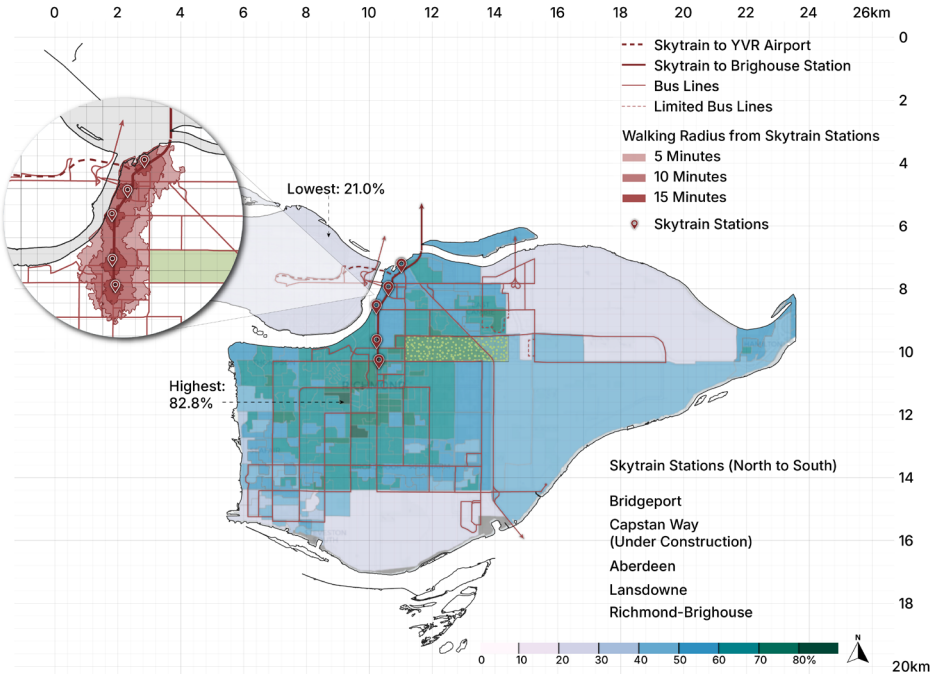


Figure 1.16. Immigrant Population Mapped Against Public Transit Networks. 2024. By author. Adapted from GIS Data courtesy of Statistics Canada. Information from Google Maps, Statistics from Statistics Canada 2021 Census retrieved via CensusMapper (https://censusmapper.ca/popup/about_census.) Walking radius traced from TravelTime (https://traveltime.com/docs/api/overview/introduction.)

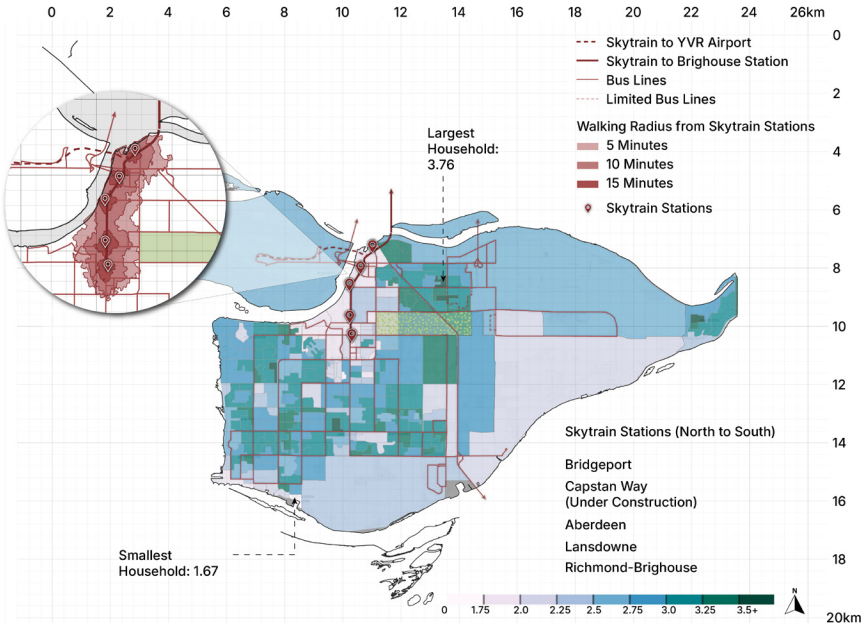


Figure 1.17. Average Household Size Mapped Against Public Transit Networks. 2024. By author. Adapted from GIS Data courtesy of Statistics Canada. Information from Google Maps, Statistics from Statistics Canada 2021 Census retrieved via CensusMapper (https://censusmapper.ca/popup/about_census.) Walking radius traced from TravelTime (https://traveltime.com/docs/api/overview/introduction.)

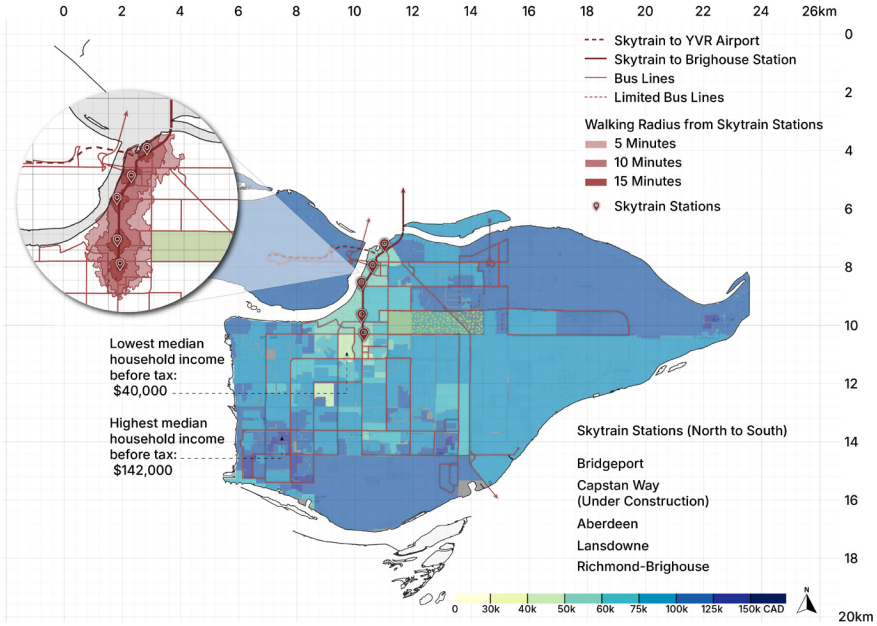


Figure 1.18. Total Household Income Mapped Against Public Transit Networks. 2024. By author. Adapted from GIS Data courtesy of Statistics Canada. Information from Google Maps, Statistics from Statistics Canada 2021 Census retrieved via CensusMapper (https://censusmapper.ca/popup/about_census.) Walking radius traced from TravelTime (https://traveltime.com/docs/api/overview/introduction.)

Mapping exercises: Conclusion

In conclusion, this exercise highlights three challenges and notable features in Richmond, including (1) housing affordability, (2) a lack of equity in environmental systems, and (3) a significant proportion of the population being immigrants. Many of these challenges have materialized near the City Centre planning region. Therefore, I intend to address these intersectional issues through an affordable housing project that facilitates environmentalism amongst Central Richmond's ethnic communities.

Defining Environmental Stewardship and Sustainability

Environmental stewardship and sustainability are both critical concepts. Environmental stewardship is defined as "actions taken by individuals, groups or networks of actors, with various motivations and levels of capacity, to protect, care for or responsibly use the environment in pursuit of environmental and/or social outcomes in diverse social-ecological contexts."[32] While it can take shape through various actions, this definition magnifies humans' role in protecting the environment. In this thesis, environmental stewardship should lead to productive and long-term efforts to sustain the environment rather than one-off initiatives.

Additionally, 'sustainability' in architectural design often refers to building materiality, construction, and high performance.[33] This is especially evident throughout the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) system. It provides an accessible framework for approaching environmentalism in architecture, especially given its easily comprehensible checklists. However, it minimizes the role of the human participation required to make a building sustainable over the long term. To avoid this deficiency, in this thesis, sustainable development must meet "the needs of the present without compromising the ability of the future generations to meet their needs" to fulfil the perspective that "our legacy should be one of hope, not destruction." [34]

In response to these definitions, how we approach environmentalism should shift from the 'one-size-fits-all' sustainability to instead focus on environmental stewardship that values human care and actions. This thesis aims to advocate for buildings that are sustainable in the long term, and thus, it is crucial to abandon perspectives towards environmentalism that minimize human participation.

Moreover, by highlighting these two definitions, this thesis emphasizes that the environment and finite natural resources are a collective responsibility of the people. These concepts may merely appear as environmental issues at first glance. However, they are equally social issues that are inherently intertwined with future planning initiatives concerning both environmental racism and immigrants. Planning for the future should be a collective responsibility—it is not the sole responsibility of decision-makers such as politicians, urban planners, landscape designers and architects. Community members also have the invaluable power to protect and utilize nature's resources reasonably.

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32 Nathan J. Bennett et al., "Environmental Stewardship: A Conceptual Review and Analytical Framework," *Environmental Management* 61, no. 4 (April 1, 2018): 597, https://doi.org/10.1007/s00267-017-0993-2.

33 Lance Hosey, "Toward a Humane Environment: Sustainable Design and Social Justice," in *Expanding Architecture: Design as Activism* (New York: Metropolis Books, 2008), 34.

34 Hosey, "Toward a Humane Environment: Sustainable Design and Social Justice," 34.

Ultimately, passive, environmental, and sustainable designs require activism in many ways. Not only can an active user operate passive systems that support sustainability, but they can also advocate for immigrant neighbourhoods and needs, preventing a system embedded in racism from reoccurring.

Thesis Sections & Methodologies

This introduction has predominantly utilized GIS mapping to uncover Richmond's various characteristics. In particular, the maps highlight a range of demographic patterns within the city that are quantified through Canada's census data. Additionally, following this introduction, this thesis will be separated into three chapters, including (1) a literature review, (2) an exploration of Richmond's urban scale context, and (3) an architectural scale proposal.

Literature Review

The literature review aims to understand socio-ecological issues and the role of marginalized communities intersectionally. I strive to uncover relationships between environmentalism and racism, specifically understanding East Asian communities' struggles with environmental injustice. I will achieve this by analyzing and critiquing texts that allow for an intersectional analysis between socio-ecological issues and marginalized communities through three approaches, grouped under the following categories:

1. The concepts of intersectionality and solutionism
2. Other marginalized groups' environmentalism and environmental justice challenges
3. Strategies to facilitate environmentalism for East Asian ethnic minorities
4. Strategies to design for environmentalism at an urban scale
5. Strategies to design for environmentalism at an architectural scale

While the urban fabric, socio-ecological issues and the role of marginalized communities may initially appear irrelevant to one other, the intention is to use an intersectional lens to uncover where the topics overlap, as they all collectively impact Richmond.

In addition to a critical analysis of existing theories, the methods used to achieve these objectives include a comparative analysis of two case studies to explore the role of community engagement. This analysis intends to learn from the successes and failures of each project to inform the architectural design process presented in the final chapter of this thesis.

An Exploration of Richmond's Urban Scale Context

The urban-scale chapter examines Richmond's environmental and anti-racism efforts, particularly in an urban context. I will utilize theories from the literature review to analyze the initiatives. The intention is to identify potential areas for improvements to increase alignment with local demographics. This chapter questions: what are examples of past initiatives, and what barriers may have hindered their successful implementation? Moreover, by understanding the findings of local community groups, I strive to seek a holistic answer rooted in local perspectives.

The primary method to achieve these objectives is a critical reading into local policies and proposals. A key aspect of the analysis involves a 2014 Garden City Lands Legacy Landscape Plan, in addition to various environmental and anti-racism initiatives promoted by the city.

Architectural Scale Proposal

Finally, the architectural-scale proposal responds to the conclusions gathered throughout the preceding chapters. By designing a tangible architectural example of how a high-rise co-op housing project can address inclusivity and climate change while providing a platform to educate local communities, the intention is to inform environmental efforts and architectural proposals in ethnic communities for years to come. This thesis intends to address Richmond's intersectional issues through this affordable housing project, given that the housing crisis deeply affects B.C.

While architectural design is the key method used to achieve these objectives in this chapter, this can be further categorized under (1) site planning, (2) context analysis, (3) program analysis, and (4) photographic analysis. The site planning involves documenting buildings of interest in the region, shortlisting potential sites, finalizing selection based on property data, and subsequently, understanding the site zoning that exists. The context analysis is executed by analyzing the site's geographic conditions through aerial and street-view photographs. The goal is to understand the massing and programming of these buildings and to design a building that cohesively aligns with the context's conditions. Overall, this context analysis informs a subsequent rezoning proposal based on the proposed site's adjacent buildings. The program analysis is informed by a precedent project by Haeccity Studio for Architects against Housing Alienation (AAHA). Their drawings are analyzed to understand what types of environmentalism-related practices may need to be accommodated in my project, and thus, what types of program areas are crucial. Finally, a photographic analysis informs this project's design concept and supplements the above program analysis. The analysis involves photographs of personal experiences and from a Hong Kong movie to develop a culturally relevant design concept. A key goal for the concept is to incorporate program areas pertaining to the cultural practices and needs of the intended occupants.

Chapter 2: Literature Review

Introduction

While existing environmental groups in Metro Vancouver,[1] have highlighted the importance of reframing the dialogue between ethnic minorities and environmental movements,[2] relevant initiatives—including recycling workshops and children's education programs—have rarely led to substantial long-term changes. Hence, this literature review focuses on texts that allow for an intersectional analysis between socio-ecological issues and marginalized communities through the three following approaches; this is important in clarifying why we should look at these seemingly separate issues in tandem:

1) Examine literature that looks broadly at racial discrimination.
2) Analyze texts outlining strategies against environmental injustices in marginalized or diasporic communities worldwide to inform how I design architecture to support Richmond.
3) Explore the relation between environmentalism and racism to understand East Asian communities' struggles with environmental injustice.

While these specific texts may initially appear irrelevant to architectural and urban design, Richmond, which has a large ethnic Chinese population, has a unique set of challenges associated with environmental stewardship. Thus, these initiatives' challenges and achievements may highlight specific considerations for my design.

Overall, sustainability is described as "Meeting the needs of the present without compromising future generations' ability to meet their needs."[3] (See Chapter 1: Introduction) This review additionally considers sustainability as an intersectional concept allowing us to address environmental injustices, impact climate change and foster a sense of community.[4] Ultimately, this study is relevant as climate change presently impacts the city of Richmond's spaces, survival, and population migration. As the effects of climate change continue to affect our planet, this literature review investigates how wealth, age, ethnic background, and environmental efforts or injustices overlap inform how designers can address climate change and sustainability.

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1 Including the David Suzuki Foundation

2 Wang, Eugenia. "Sustainable Diversity." David Suzuki Foundation, February 2015. https://davidsuzuki.org/wp-content/uploads/2017/09/sustainable-diversity-david-suzuki-foundation-multiculturalism-green-movement.pdf.

3 Lance Hosey, "Toward a Humane Environment: Sustainable Design and Social Justice," in *Expanding Architecture: Design as Activism* (New York: Metropolis Books, 2008), 34.

4 Leah Thomas, *The Intersectional Environmentalist: How to Dismantle Systems of Oppression to Protect People + Planet*, First edition. (New York: Voracious / Little, Brown and Company, 2022).

Background

Environmental design cannot be approached as an individual topic. Instead, it is deeply intertwined with social, economic and political issues; two key concepts that inform my thesis include 'intersectionality' and 'solutionism.'

Intersectionality, which is a core concept of this thesis that will be explored further below, is a key tenet of Critical Race Theory (CRT.) Thus, CRT also informs my research. It provides a framework for understanding how ethnic minorities have been pushed to the boundaries of society. CRT highlights the relationship between race and systems of power, specifically highlighting the presence of "white privilege," which is the social advantage associated with being part of the dominant race.[5] Additionally, there are six fundamental principles to CRT: 'Race is Socially Constructed,' 'Racism is ordinary, not aberrational,' 'Interest Convergence,' 'Differential Racialization,' 'Intersectionality,' and the 'Voice of Colour.'[6]

5 Richard Delgado, *Critical Race Theory: An Introduction*, Fourth edition., Critical America (New York: University Press, 2023).

6 Meg Matthias, "Critical Race Theory," Britannica, March 25, 2024, https://www.britannica.com/topic/critical-race-theory/Basic-tenets-of-critical-race-theory.

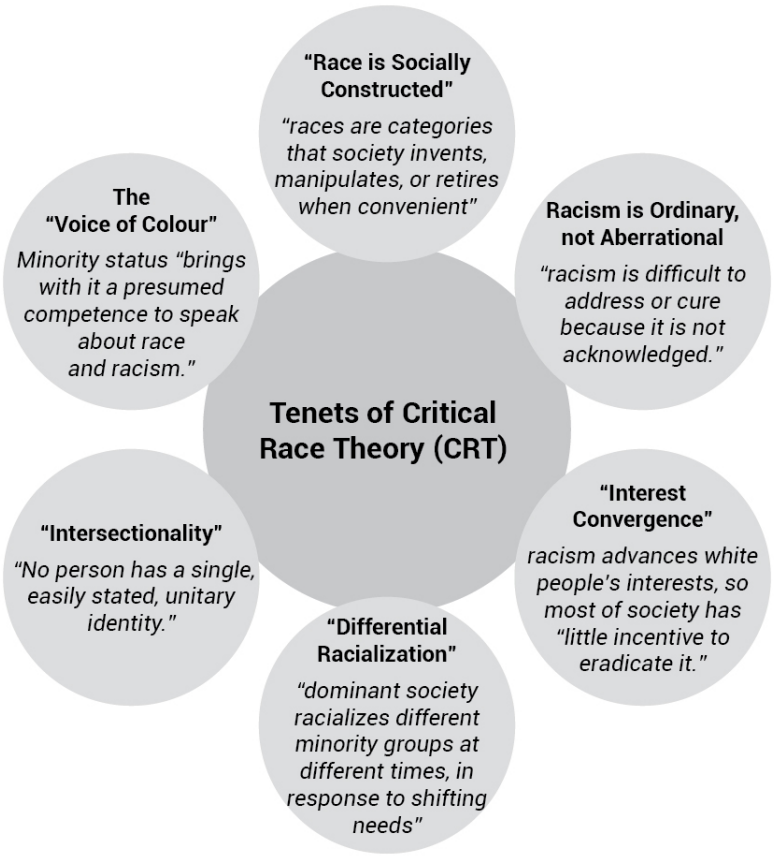


Figure 2.01. Tenets of Critical Race Theory. 2024. Information from Richard Delgado and Jean Stefancic, *Critical Race Theory: An Introduction*, 4th ed. (New York University Press, 2023), 8-11.

Critical Race Theory: An Introduction highlights that the research is based on the understanding of historical processes, examining the "foundations of the liberal order, including equality theory, legal reasoning, enlightenment rationalism, and neutral principles of constitutional law."[7] It was developed in the 1970s when scholars identified a need to address the increase in subtler forms of racism. 'Counter storytelling' encourages ethnic minorities to challenge mainstream preconceptions, narratives, and understandings of race and power by sharing their alternative everyday experiences associated with the topic to avoid inadvertently silencing these marginalized communities.

The Concepts of Intersectionality and Solutionism

Intersectionality—a tenet of CRT—and solutionism are inherently intertwined concepts and are fundamental to this research. The intention is to explore environmentalism and marginalized ethnic communities through an intersectional lens to avoid solutionism. According to the Center for Intersectional Justice, intersectionality refers to how systems of inequality "based on gender, race, ethnicity, sexual orientation, gender identity, disability, class and other forms of discrimination "intersect" to create unique dynamics and effects."[8] Specifically, different forms of inequality reinforce one another, and thus, it is critical to address them as connected issues.

Regarding environmentalism, "we cannot save the planet without uplifting the voices of its people — especially those most often unheard," as ethnic groups are often silenced throughout ecological movements and disproportionately affected by environmental injustices.[9] Environmentalist Leah Thomas describes a correlation between wealth and these examples of oppression, highlighting that people of colour and low-income communities receive less systemic protection against environmental disasters.

7 Delgado, *Critical Race Theory*.

8 "What Is Intersectionality," Center for Intersectional Justice, accessed April 8, 2024, https://www.intersectionaljustice.org/what-is-intersectionality.

9 Thomas, *The Intersectional Environmentalist*.

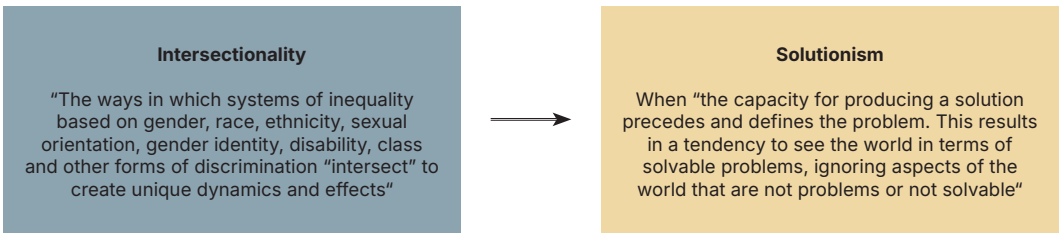


Figure 2.02. The Concepts of Intersectionality and Solutionism. 2024. By author. Information from the Center for Intersectional Justice (https://www.intersectionaljustice.org/what-is-intersectionality) and Rob Holmes, "Design with Change," in *Design with Nature Now*. (Lincoln Institute of Land Policy, 2019.)

In landscape design, 'solutionism' refers to when "the capacity for producing a solution precedes and defines the problems. This results in a tendency to see the world in terms of solvable problems, ignoring aspects of the world that are not problems or not solvable."[10] This implies responding to problems that can easily be addressed, ignoring a community's other issues that may be more urgent. It is vital to avoid solutionism as it undermines the ability of landscape designers. Through recursion, debate and elusion, they can often create innovative ways to address problems that effectively synthesize and adapt to conditions without apparent solutions.

A similar sentiment applies to architectural and urban designers; we live in a time when ineffective and damaging systems impede and hinder contemporary culture. To refrain from falling prey to solutionism, architectural and urban designers must work with intersectionality in mind, considering various facets of issues that a community is facing instead of fixating on an element that is easiest to address.

10 Rob Holmes, "Design with Change," in *Design with Nature Now* (Cambridge, Massachusetts: Lincoln Institute of Land Policy, published in association with the University of Pennsylvania Stuart Weitzman School of Design and The McHarg Center, 2019).

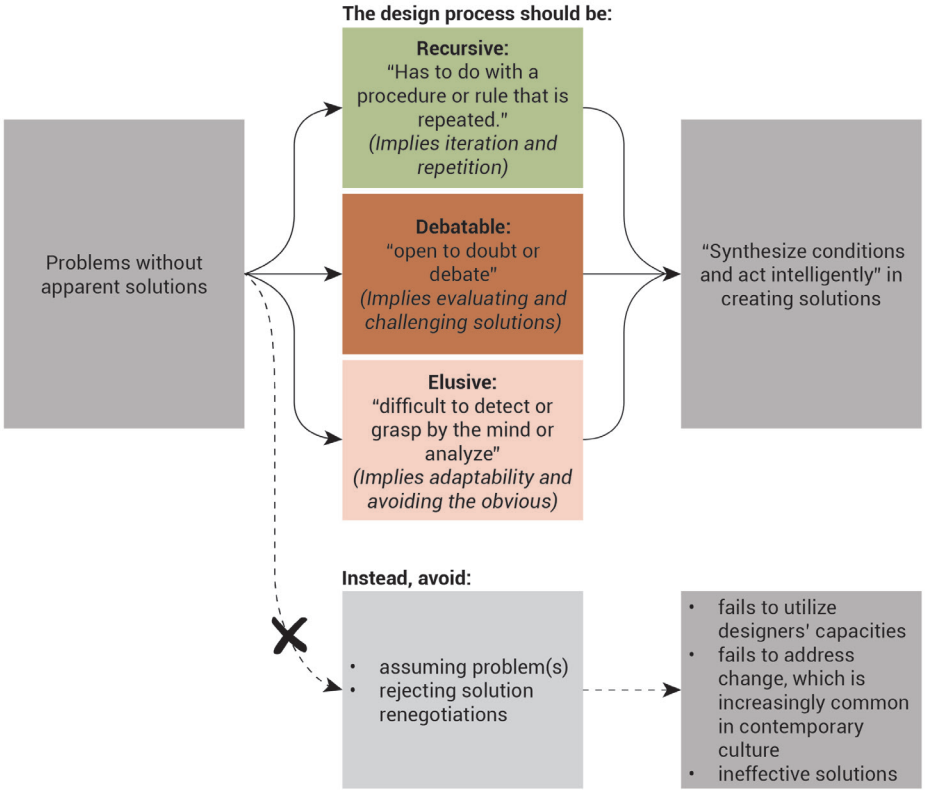


Figure 2.03. Finding Innovative Solutions to Intersectional Problems through Recursion, Debate and Elusion. 2024. By author. Information from Rob Holmes, "Design with Change," in *Design with Nature Now*. (Lincoln Institute of Land Policy, 2019.) Definitions from Vocabulary.com (https://www.vocabulary.com/dictionary/recursive, https://www.vocabulary.com/dictionary/debatable, https://www.vocabulary.com/dictionary/elusive.)

Environmentalism and Environmental Justice: Case Studies in Relation to Marginalized Groups

Environmentalist Leah Thomas highlights how environmental injustices severely impact ethnic groups.[11] Marginalized communities, including ethnic individuals, are often silenced throughout ecological movements and disproportionately affected by environmental injustices. Thomas describes a correlation between relative wealth and these examples of oppression, as people of colour and low-income communities receive less systemic protection against environmental disasters.

Similarly, scholar Rob Nixon discusses the concept of 'Slow Violence,' referencing an example where a previous president of the World Bank pushed to export waste materials to Africa, which encouraged offloading wealthier countries' toxins to the poorest continent globally.[12] Nixon stresses this phenomenon's invisibility, as environmental violence occurring slowly tends to be unnoticeable. Corporate media instead tends to focus on urgent problems that occur rapidly. Thus, to bring attention to the tragedies happening in marginalized communities, we must find new methods to "tell the slow-moving stories about the long dying."

In particular, Boston's Chinatown exemplifies Nixon's theories. Researchers have shown that the area has some of the highest levels of traffic-related air pollution (TRAP) in the Northeastern United States, and 51.8% of local households were deemed as 'very low income' in 2016.[13] Thus, TRAP profoundly impacts these community members' health. New planning strategies should focus on marginalized ethnic minorities. Community engagement can help minimize injustices; in Boston's Chinatown, these efforts materialized through design charettes, and community groups facilitated conversations about planning a stable and healthy Chinatown.

On the other hand, the East Village in Stratford, London, is an example of unsuccessful community engagement. Officials attempted to improve sustainability in this region which was facing significant environmental injustice. Stratford was similar to Richmond—prior to its revitalization associated with the 2012 Olympics—being home to marginalized communities. The neighbourhood is different in that its environmental issues are a direct result of man-made industrial and anthropogenic challenges. Richmond, instead, faces flooding which is a natural phenomenon. Stratford's industrial history resulted in land contamination—of mercury, cyanide, and lead—, waste dumping, and derelict industrial sites.[14] The 2012 London Olympics provided an ambitious opportunity to expedite regeneration initiatives. Despite ensuring that environmental remediation plans would come to fruition, the accelerated timeline prompted a lack of public engagement opportunities.[15]

Instead, those in power designated the East Village as a mixed-income neighbourhood, perhaps to

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11 Thomas, *The Intersectional Environmentalist*.

12 Rob Nixon, *Slow Violence and the Environmentalism of the Poor* (Cambridge, Mass: Harvard University Press, 2011).

13 Noelle C. Dimitri et al., "Advancing Environmental Justice in the Community Using Charrette: A Case Study in Boston Chinatown," *Environmental Justice* 16, no. 6 (December 2023): 461–72, https://doi.org/10.1089/env.2022.0001.

14 Bob Digby, "This Changing World: The London 2012 Olympics," *Geography* 93, no. 1 (2008): 40–47.

15 Andrew Smith, "'De-Risking' East London: Olympic Regeneration Planning 2000–2012," *European Planning Studies* 22, no. 9 (September 2, 2014): 1919–39, https://doi.org/10.1080/09654313.2013.812065.

address contemporary economic and political systems that cause unequal wealth and opportunity distribution. However, population data highlights that the community's residents are now predominantly white and young or middle-aged, "dominated by a professional-managerial salariat," the class most associated with gentrification.[16] Hence, the East Village's design failed to address local socio-economic contexts.

16 Piero Corcillo and Paul Watt, "Social Mixing or Mixophobia in Regenerating East London? 'Affordable Housing', Gentrification, Stigmatisation and the Post-Olympics East Village," *People, Place & Policy* 16, no. 3 (January 20, 2023): 236–54, https://doi.org/10.3351/ppp.2022.8325576466.

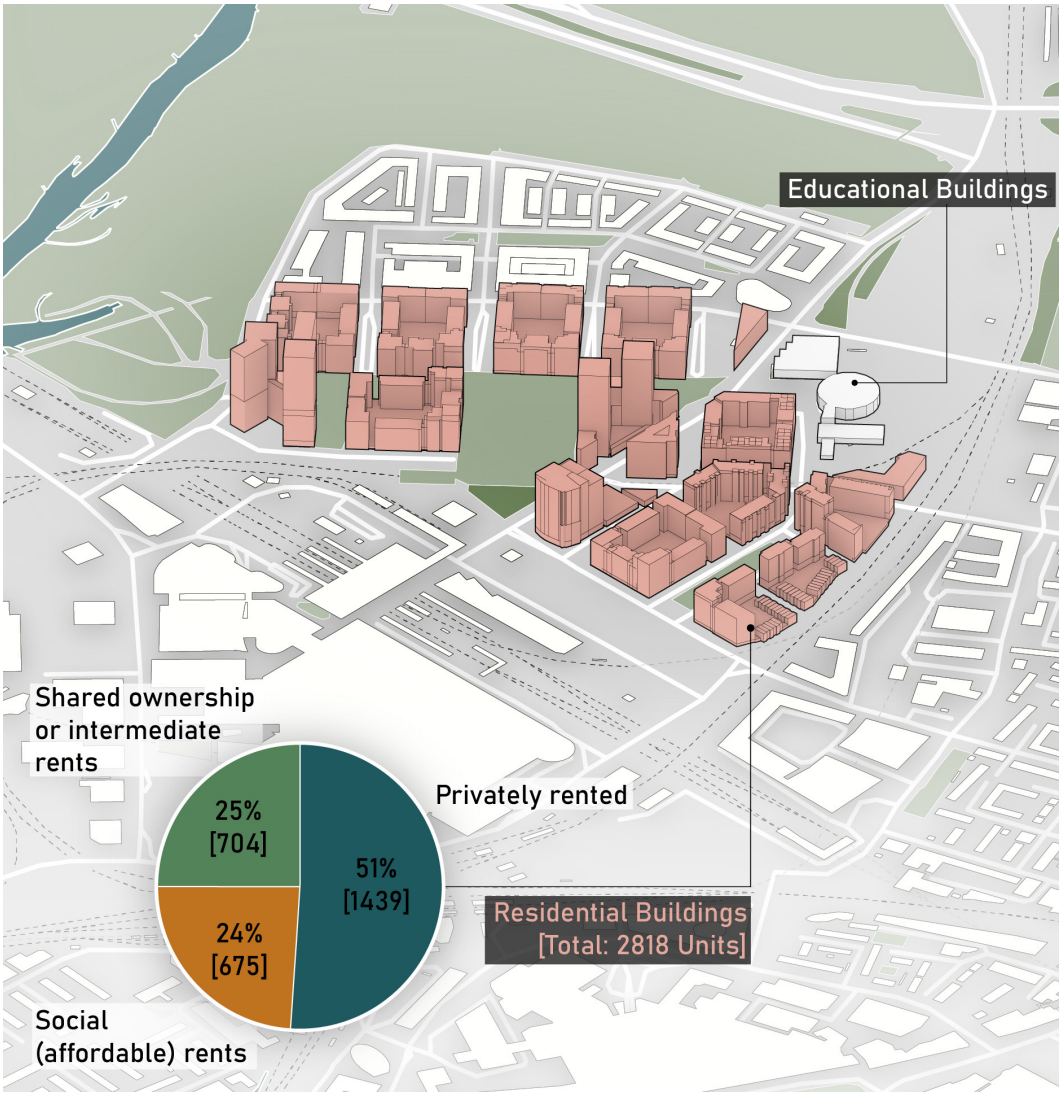


Figure 2.04. Unit Makeup at the East Village. 2024. By author. Adapted from GIS Data courtesy of OpenStreetMap®, available under the Open Database License (ODbL). GIS data retrieved via CADMapper (https://cadmapper.com/.) Information from Triathlon Homes (https://www.triathlonhomes.com/a-new-legacy-from-the-games-675-social-rented-homes-nominated-to-london-boroughs/.)

Ultimately, when designing with environmentalism in mind, projects require an intersectional focus where a community's social needs are considered in addition to their environmental goals. The contrasting approaches taken in Boston's Chinatown and Stratford's revitalization highlight the varying results of prioritizing community engagement versus using a top-down design strategy.

Environmentalism for East Asian Ethnic Minorities

It is crucial to explore race and environmentalism together, especially because of ongoing migration and globalization. As of 2021, 23% of Canada's population are immigrants.[17] Thus, to exclude these groups would prohibit genuinely transformative changes.

Based in Metro Vancouver, the David Suzuki Foundation explores the underlying stereotype that immigrants rarely care about the environment, given their financial priorities.[18] They emphasize the importance of reframing this stereotype; immigrants should have the option to care about ecological issues in addition to their other priorities. Ultimately, the existing literature highlights the importance of redefining the relationship between ethnic minority groups and environmental movements. One might infer that past initiatives' unsuccessful execution resulted from their misalignment with the local demographic's needs. (See Chapter 3: Urban Scale Context) However, this would need further analysis for a definite conclusion. Overall, Richmond's approaches to environmentalism should focus on cultural sensitivity. This can be achieved through grassroots strategies, and would likely be more effective than top-down approaches common in mainstream, white-dominated movements.

In particular, the University of British Columbia (UBC) Climate Justice Research Collaborative explores the struggles of de-centring white narratives and perspectives in the field of environmentalism[19] and alludes to why Richmond will not strongly benefit from top-down environmentalism. Racialized individuals often lack a sense of belonging within environmental movements, which are usually in English, which creates accessibility challenges for non-English speakers. Hence, racialized individuals often feel more welcomed in spaces designed specifically for Asians or BIPOC communities; these groups and individuals' engagement with environmentalism usually features informal strategies rather than formalized movements. Everyday acts of environmentalism often resulted from cultural or financial reasons, yet they would inadvertently benefit the environment, too.[20] Thus, a way to address environmental initiatives for ethnic minorities may be to magnify these informal, everyday actions instead of an authoritative strategy.

Similarly, the journal article, *Placing 'Sustainability' in Context: Narratives of Sustainable Consumption in Nanjing, China*—by various geography and planning scholars—highlights the notion

17 "Immigration and Ethnocultural Diversity Statistics," Statistics Canada, accessed April 8, 2024, https://www.statcan.gc.ca/en/subjects-start/immigration_and_ethnocultural_diversity.

18 Wang, "Sustainable Diversity."

19 Lynne Kim, Naomi Leung, and Jenica Pong, "Breaking Barriers to Climate Justice: Exploring Factors Limiting Participation of the Asian Diaspora in Metro Vancouver and Opportunities for Inclusive Engagement" (UBC Climate Hub Climate Justice Research Collaborative, April 2023).

20 Kim, Leung, and Pong, "Breaking Barriers to Climate Justice: Exploring Factors Limiting Participation of the Asian Diaspora in Metro Vancouver and Opportunities for Inclusive Engagement."

that Chinese people often perform acts of sustainability due to reasons beyond environmentalism.[21] In particular, authors specifically address the financial aspect of minimizing overconsumption, referring to this as "qinjian jieyue" (勤儉節約), encouraging individuals to adjust spending to their income and needs. The concept is rooted in the Confucian ideology that humans are stronger without desires (無欲則剛), discouraging acting upon one's impulses or spending to 'save face,' which loosely translates to maintaining one's dignity or image. Ultimately, minimizing consumption inadvertently benefits the environment. Thus, a low-waste lifestyle can be a valuable part of Richmond's grassroots environmental strategy.

Moreover, Zhan—an interdisciplinary academic specializing in sociology, political science and development studies—explores examples of overconsumption,[22] which often takes place to demonstrate care and love. Additionally, in this practice, there is a stigma relating to second-hand items. One interviewee's parents deemed their use of a second-hand item unhygienic and an indication that they were not taking care of themselves. Waste generation is subject to cultural norms and intertwined with social relations. Thus, to successfully address waste reduction, a wide range of cultural factors, attitudes and behaviours must be considered.

The examples examined by Liu and Zhan are well-aligned with the suggestions of academics Alana Boland and Jiangang Zhu, who specialize in planning and anthropology, respectively.[23] A grassroots strategy within a tight-knit community is more appropriate than an environmental movement that authorities impose on locals, as the Chinese are often wary of outsiders. Informal strategies also frequently lead to the emergence of unexpected actions and initiatives, highlighting innovative possibilities in environmentalism. Overall, a grassroots strategy aligns with the global trend of getting involved in sustainable development initiatives.

Designing for Environmentalism at an Urban Scale

We must rethink how we design our cities with a strengthened partnership with nature to create more equitable urban areas. Ecologist Patrick M. Lydon highlights that half of the human population resides in urban areas, which are expected to continue growing.[24] Our society has separated ecology from aspects of our daily lives rooted in urbanism, resulting in a "nearly complete failure of contemporary human culture to find ways of existing cooperatively as living beings within the larger living system we call Earth."[25] Lydon's critique emphasizes that, as cities continue to expand as expected, humans will become increasingly separated from natural systems. Instead, working with nature can encourage cities of ecological wellness as physically being in nature is the simple way to restore and rebuild our relationship with ecology. The result will be "healthier, more equitable

21 Chen Liu et al., "Placing 'sustainability' in Context: Narratives of Sustainable Consumption in Nanjing, China," *Social & Cultural Geography* 20, no. 9 (2019): 1307–24, https://doi.org/10.1080/14649365.2018.1454978.

22 Mallory Xinyu Zhan, "Waste in Zero-Waste Households: The Power of Materials and Norms in Everyday Consumption," *Worldwide Waste* 5, no. 1 (2022): 4–4, https://doi.org/10.5334/wwwj.85.

23 Alana Boland and Jiangang Zhu, "Public Participation in China's Green Communities: Mobilizing Memories and Structuring Incentives," *Geoforum* 43, no. 1 (January 1, 2012): 147–57, https://doi.org/10.1016/j.geoforum.2011.07.010.

24 Patrick M. Lydon, "Urban Ecology: Art and the Cultivation of Ecological Mindsets," in *The Routledge Handbook of Urban Ecology*, 2nd ed., vol. 1 (Routledge, 2021), 98–109, https://doi.org/10.4324/9780429506758-10.

25 Lydon, "Urban Ecology," 98.

places."[26] This highlights the importance of working in harmony with nature rather than attempting to control it. Through this approach, Lydon believes cities will become more effective, resilient and diverse spaces to live in.

One way to rethink our cities' design is by utilizing integrated green infrastructure to encourage frequent exposure to nature. Jane Houghton and Hazel Thomas suggest incorporating green infrastructure into daily life through integrated elements such as "tree-lined walking and cycling routes between home, school, workplaces, and shopping centers, providing such features as street trees, pocket parks, and green walls and roofs." These elements can effectively promote ecological restoration by improving flood resilience and water quality, urban cooling, air quality, and noise attenuation.[27] Houghton and Thomas' suggestions highlight the importance of having people visit green spaces more frequently. Their strategy mitigates the need for people to travel to be in contact with nature. Since integrated green infrastructure promotes more frequent and convenient contact with nature, our cities will be equipped to better address environmental injustices, which disproportionately affect marginalized groups who tend to visit green spaces less than average.

In addition, green infrastructure should be well-located and easily accessible to be fully utilized. In *The Death and Life of Great American Cities*, Jane Jacobs also highlights the importance of using green spaces.[28] Jacobs suggests that the worst parks are located in underutilized sites where people do not visit. Despite the widely known benefits of green spaces, designers must thoroughly consider their locations and designs for them to be fully utilized. Jacob's comment highlights how parks can bring negative impacts to a community if they are not used. Specifically, *A Pattern Language* highlights how designers can encourage the use of green spaces—if the green spaces are further than a three-minute walk away, "the distance overwhelms the need." [29] Green spaces should also be at least 150 feet wide and 60,000 square feet in area to provide valuable benefit. [30] Ultimately, it is necessary for green spaces to be abundant in both quantity and size. However, it may be a challenge to consider both aspects as cities unlikely have sufficient space for both frequent and extensive green sites.

Public green spaces should also cater to the diverse needs of different socioeconomic groups to encourage use. Larger public spaces allow different socio-economic groups to congregate separately.[31] For example, at Jacob Riis Beach, the various territories of the park—such as the bays and the back-beach areas—address different objectives. One example is when low-income newcomers who do not speak English often visit the beach in large groups, occupying the picnic areas where tables, shade and grills are available. Ultimately, a larger public space can address different demographic groups' needs and concerns that exist in a community. This helps to embrace diversity rather than promoting

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26 Lydon, "Urban Ecology," 109.

27 Jane Houghton and Hazel Thomas, "Urban Greenspaces: Understanding Patterns of Use and Greenspace Distribution in England to Inform Spatial Planning," in *The Routledge Handbook of Urban Ecology*, 2nd ed., vol. 1 (Routledge, 2021), 121, https://doi.org/10.4324/9780429506758-11.

28 Jane Jacobs, The Death and Life of Great American Cities (New York: Modern Library, 2011.)

29 Christopher Alexander, *A Pattern Language: Towns, Buildings, Construction* (New York, N.Y: OUP, 1977,) 305.

30 Alexander, *A Pattern Language.*

31 Setha M. Low, *Rethinking Urban Parks: Public Space & Cultural Diversity*, 1st ed. (Austin, TX: University of Texas Press, 2005).

segregation.[32]

In rethinking our cities' design from an environmental perspective, different-sized green spaces are required to support biodiversity and the health of the ecosystem. As part of his theories on urban ecology, landscape ecologist Richard T.T. Forman proposes a model—combining patches and corridors[33]—which can be used as the basis for creative proposals. A patch is "an area in the landscape that is beneficial for the species under consideration." Corridors are linear elements that "can connect patches and form spatial ecological networks."[34] In particular, Forman highlights that large patches of natural vegetation can "protect aquifers and interconnected stream networks, sustain viable populations of most interior species, provide core habitat and escape cover for most large home range vertebrates, and permit near natural disturbance regimes."[35] Alternatively, small patches "act as stepping stones for species movement" and are home to uncommon species.[36] Overall, Forman's model provides a clear example for how green spaces of various sizes are beneficial. While large patches provide crucial habitats and protection to natural resources, each of them cannot be connected without the presence of small patches and corridors. Thus, the size of green spaces or patches employed should reflect the needs of a specific site, as both large and small patches have their respective strengths in supporting biodiversity and the health of the ecosystem. Ultimately Forman's theories can lead us to understand that there is no singular strategy that will be able to address all community members. In approaching this design thesis, creating environments accommodating various needs, practices, and lifestyles is critical.

32 Low, *Rethinking Urban Parks*.

33 Richard T. T. Forman, "Spatial Patterns and Mosaics," in *Urban Ecology: Science of Cities* (Cambridge, United Kingdom ; Cambridge University Press, 2014), 31–64, https://doi.org/10.1017/CBO9781139030472.004.

34 Marc Antrop, "Landscape Mosaics and the Patch-Corridor-Matrix Model," in *The Routledge Handbook of Landscape Ecology* (Routledge, 2021,) 28.

35 Wenche E. Dramstad, *Landscape Ecology Principles in Landscape Architecture and Land-Use Planning* (Cambridge, Massachusetts: Harvard University Graduate School of Design, 1996,) 22.

36 Dramstad, *Landscape Ecology Principles in Landscape Architecture and Land-Use Planning*, 22.

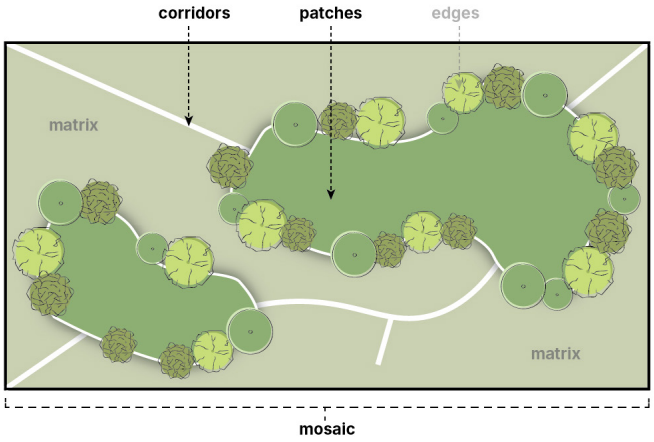


Figure 2.05. Diagram of a Mosaic Consisting of Patches, Corridors and Matrix. 2024. By author. Information from Marc Antrop, "Landscape mosaics and the patch-corridor-matrix model," in *The Routledge Handbook of Landscape Ecology*. (Routledge, 2021), 25-48.

Although the above methods provide valuable considerations in rethinking our cities' design with regard to environmentalism, they embody a critical lack of connection to marginalized groups and do not provide a perspective on how they each can be utilized to design for equity. This reflects a broader issue in literature where environmentalism and social equity are separated due to colonial and racist ideologies. Zakiyyah Iman Jackson[37]—an academic specializing in literature—highlights that one's strong relationship with nature and subsequent association with animals is linked to the dehumanization of black people. This association has historically been used as a racist tool of oppression. The introductory chapter discusses this discriminatory categorization of races and animals as a way to create hierarchies amongst the systems of the human world, and to gain control over the vast and overwhelming natural world. Overall, literature often inadvertently reinforces the idea of designing for environmentalism and equity being separate topics. The racist mentalities described above suggest why many literary materials that offer insight into designing for environmentalism fail to explore the role of marginalized communities. Yet, this is an issue because designing for marginalized populations requires an intersectional approach that acknowledges diverse needs and avoids one-size-fits-all solutions. Ultimately, literature by academics such as Forman may provide valuable frameworks to consider the natural environment, but these theories cannot be read alone without an understanding of relevant systems of racism.

Ultimately, scholars emphasize the importance of designing for environmentalism in an increasingly urban world, despite conflicting arguments regarding how to achieve this. Forman's landscape ecology principles can be applied to urban ecology in modern society, providing us with the framework to design successful ecological spaces and can be understood in parallel to designing to mitigate environmental racism. This does not mean a universal best strategy for developing green spaces exists. Instead, spaces should accommodate a community's unique combination of needs, providing convenient ways to interact with nature while supporting a diverse range of individual or cultural lifestyles.

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37 Zakiyyah Iman Jackson, *Becoming Human: Matter and Meaning in an Antiblack World*, Sexual Cultures (New York: University Press, 2020), 25.

Designing for Environmentalism at an Architectural Scale

It is imperative to rethink our spaces' design at different scales—including cities and buildings—from an environmental perspective to address ongoing urbanization and the ecology's separation from our daily lives.

Architect Peter Raisbeck highlights the critical and imminent need to incorporate sustainability in Architecture.[38] While there are ongoing discussions amongst architects about environmentalism, Raisbeck criticizes that they often default to the position and concept of 'the good Anthropocene'—Earth will continue to be a suitable living environment, despite the climate crisis—which fails to recognize the climate emergency' urgency. Architects should fear the critical crisis rather than approach its potential solutions in an abstract manner.

Additionally, environmentalist David Orr highlights architectural design is often considered as merely an art and science related to designing buildings, but argues that it should instead be considered amongst a larger context of ecological design,[39] due to the increasing human demand for buildings. Specifically, "humankind will build more buildings in the next fifty years than in the past 5,000." Thus, our current constructions will have a lasting impact on future generations. Historically, designers have modified environments to accommodate the built environment, but this may be the reason behind the correlation between increasing civilization, technological developments, and ecological damage.

Architect David Sim emphasizes the importance of creating spaces that encourage people to be closer to nature and spend more time outdoors.[40] Sim highlights multiple fine-grained architectural strategies for doing so, through in-unit elements such as a window box or balcony, shared amenities and systems, and building massing strategies. Overall, these methods can inform the design of spaces for marginalized communities as they encourage better health and well-being through a stronger connection to the outdoors. In particular, regarding design considerations within a residential building or unit, Sim emphasizes the importance of maximizing natural ventilation and daylighting, given the significant consumption of energy owing to lighting, cooling, heating and ventilation. This is tied to these three critical principles highlighted in the text:

1) Design smaller buildings to maximize exterior wall area and improve daylighting
2) Consider the hours of day when residents occupy spaces
3) Increase window openings for ventilation and daylighting

In their discussion, Sim refers to various successful European precedents. One is the classic Barcelona window, a vertical floor-to-ceiling opening featuring a narrow balcony. A more contemporary

38 Peter Raisbeck, *Architects, Sustainability and the Climate Emergency: A Political Ecology* (Bingley: Emerald Publishing Limited, 2023).

39 David Orr, "Architecture, Ecological Design, and Human Ecology," in *The Green Braid: Towards an Architecture of Ecology, Economy and Equity*, ed. Kim Tanzer and Rafael Longoria (London: Routledge, 2007), 15, https://doi.org/10.4324/9780203964880.

40 David Sim, "Living with Weather," in *Soft City: Building Density for Everyday Life* (Washington, DC, USA; Island Press, 2019).

example is Bo01 in Sweden, which successfully creates microclimates with effective ventilation, offering generous exterior spaces on the edges of the building in juxtaposition to intimate spaces on the interior.

While Sim's suggestions regarding designing for environmentalism offer valuable considerations for various projects worldwide, they feature a Eurocentric focus and are often not applicable to Canada's colder climate. For example, the National Building Code of Canada (NBC) and the British Columbia Building Code (BCBC) emphasize the need for well-insulated buildings. Specifically, *R22+ Effective Walls in Residential Construction in British Columbia* provides information on ways to achieve high thermal performance in low-and mid-rise residential buildings in B.C.[41] For example, windows have a critical impact on energy consumption as different types vary in thermal performance, with triple-glazed varieties performing more effectively than single- or double-glazed options.[42] Maximizing exterior wall area is counterintuitive to creating thermally-effective buildings. Yet, these principles are in conflict with strategies that maximize daylighting and ventilation which rely on incorporating windows and other openings into the building design. Thus, in Canada, designers must additionally consider the building envelope's performance.

In addition, there are other design challenges. Orr highlights the significance of radical creative thinking and carefully selecting an appropriate sustainable strategy when addressing complex environmental challenges.[43] However, sustainability in architecture is often measured using a checklist of best practices; they can be valuable in evaluating design decisions, but fail to promote exceptional strategies. An example is the LEED system (See *Defining Environmental Stewardship and Sustainability* in Chapter 1). Checklists ignore various social or demographic groups' habits in occupying space. Some criteria are irrelevant to marginalized users, such as those that raise project costs where building materials must conform to external verifications[44] or those encouraging the use of costly electric vehicles.[45] Therefore, promoting breakthroughs may require promoting an understanding that different types of buildings and users may benefit from alternative approaches to sustainability. This could help foster a perspective towards that strives for truly transformative change in the sustainable building industry rather than fulfilling one-size-fits-all checkboxes and a profit-focused housing market.

In developing radical design solutions, there are often cost limitations. For example, *Study of Technological Advancement and Challenges of Façade System for Sustainable Building: Current Design Practice* introduces readers to design innovations in modern façade systems, including

41 "R22+ Effective Walls in Residential Construction in British Columbia" (BC Housing, November 2017), https://vancouver.ca/files/cov/ig-r22-effective-walls-residential-construction.pdf.

42 Brittany Hanam and Dave Ricketts, "Thermal Importance of Windows," Construction Canada, April 1, 2012, https://www.constructioncanada.net/thermal-importance-of-windows/.

43 Orr, "Architecture, Ecological Design, and Human Ecology."

44 "Environmental Product Declarations," U.S. Green Building Council, accessed July 21, 2024, https://www.usgbc.org/credits/new-construction-core-and-shell-schools-new-construction-retail-new-construction-data-15?return=/credits/New%20Construction/v4.1.

45 "Electric Vehicles," U.S. Green Building Council, accessed July 21, 2024, https://www.usgbc.org/credits/new-construction-core-and-shell-retail-new-construction-data-centers-new-construction-1.

double skin and adaptive façades, and green wall systems.[46] However, a challenge with popularizing each is the higher initial investment in implementing these systems in a building. Thus, the authors synthesize that "to produce a sustainable building design, architects, engineers, and builders must consider a sustainable façade system that enables high energy efficiency, less cost, better occupant comfort, and fewer environmental impacts."[47]

Ultimately, Eurocentric environmental principles cannot be directly applied to a Canadian climate, but they are valuable references in providing a comprehensive approach to environmentalism that encompasses various passive strategies. They can provide a framework for Metro Vancouver's design projects, although Canadian designers may need to further combine with building technologies—such as low-E coated and triple-glazed windows—to ensure suitability for the local climate. This combined strategy could offer a more holistic approach to designing for environmentalism at an architectural scale. Moreover, improving marginalized users' everyday spaces—such as housing—for improved building performance and access to nature can benefit their mental health,[48] reduce energy costs and minimize the negative impacts of climate change—such as B.C.'s recent heat waves[49]—thereby increasing their quality of life.

Critique of Current Knowledge

Overall, the weaknesses of relevant literature can be broadly sorted into three categories. First, successful case studies highlighting grassroots approaches for ethnic minorities are lacking. While case studies explore environmental justice for marginalized groups and demonstrate that a top-down approach to community engagement is often inappropriate, there is a lack of successful existing case studies successfully utilizing alternative strategies. In this context, a grassroots approach entails being inclusive towards local residents by understanding their needs and preferences. This strategy could materialize through community engagement, practices integrated into their everyday actions, and community-led initiatives instead of top-down methods of engaging the community. However, there is ultimately a lack of successful examples to guide the advancement of this strategy in projects.

Secondly, literature often neglects how migration to North America affects East Asian minorities' environmental values. For example, overconsumption and the stigma against second-hand items are common Chinese ecological values. However, when individuals migrate to Canada from different countries such as China, environmental values may shift due to changing socio-economic factors and lifestyles; these potential shifts are not widely discussed. Cultural norms—which are highly dynamic—play a critical role in these environmental values. It is critical to understand how these

46 Dushan Fernando et al., "Study of Technological Advancement and Challenges of Façade System for Sustainable Building: Current Design Practice," *Sustainability (Basel, Switzerland)* 15, no. 19 (2023): 1-33, https://doi.org/10.3390/su151914319.

47 Fernando et al., "Study of Technological Advancement and Challenges of Façade System for Sustainable Building," 1.

48 Kirsten Weir, "Nurtured by Nature (American Psychological Association)," *Monitor on Psychology* 51, no. 3 (April 1, 2020): 50.

49 Brishti Basu, "B.C.'s Most Vulnerable Still Unprotected from Extreme Heat after 2022 Review, Advocate Says," *CBC News*, August 18, 2023, https://www.cbc.ca/news/canada/british-columbia/b-c-heat-dome-review-recommendations-1.6938700.

cultural nuances may shift over time to affect the considerations behind designing for ethnic or marginalized communities.

Finally, understanding how to design for environmentalism requires an intersectional reading of historical references, contemporary theories and region-specific limitations. Specifically, literature highlighting considerations at an urban scale, such as by Jacobs and Alexander, features design principles advocating for frequent green spaces throughout the city. However, contemporary theories, such as those outlined in *Rethinking Urban Parks* (2005)[50] or *Urban Ecology* (2014)[51] and *Landscape Ecology Principles*[52], underscore frameworks and design strategies that reflect more recent social values. Others also provide guidelines for designing in different climate conditions, like Canada's cold climate. No single article or book can comprehensively address the intersectional and complex nature of designing for environmentalism within marginalized communities. Design principles in older, well-established texts—such as by Jacobs and Alexander—may reflect outdated socio-economic factors and ways of life. Designers should implement foundational design principles from these texts using frameworks that respond to present-day needs and regional considerations.

Ultimately, the lack of successful case studies, the failure to address the impact of migration on immigrants' environmental values, and the need for an intersectional analysis of readings are existing shortcomings in this field of study. I must address this knowledge gap, as they will impact my research and design project. Overall, I aim to create an ethical framework for community engagement with diasporic groups to inform the housing design for various minority groups in Canada in the coming years. Canada faces an imminent need for this, as the country currently requires 170,000 new housing units to accommodate newcomers every three months[53]. Despite the rapidly increasing need for housing, designers should take sufficient time to thoroughly consider the potential future shifts in the population's needs. For example, there is presently a need for housing for asylum seekers, as evidenced by Quebec Premier François Legault's statement that the number of this demographic group is nearing a "breaking point."[54] However, within the scope of this thesis, I will first prioritize applying this framework to ethnic Chinese communities. Since each immigrant group's context is highly unique, this focused scope will allow me to learn how to thoroughly examine, understand and address cultural nuances through my framework.

Key Impact and Next Steps

Overall, the materials discussed indicate the need for a well-integrated strategy with people's daily lives. At an urban scale, there should be an abundance of easily accessible green spaces, at a scale suitable to the local context. There are also opportunities to strengthen connections to the outdoors

50 *Rethinking Urban Parks: Public Space & Cultural Diversity* by Setha M. Low

51 *Urban Ecology: Science of Cities* by Richard T.T. Forman

52 *Landscape ecology principles in landscape architecture and land-use planning* by Wenche E. Dramstad

53 Heather Wright, "Why Canada's Record Population Growth Is Helping – and Hurting – the Economy," *CTVNews*, March 27, 2024, sec. Canada, https://www.ctvnews.ca/canada/why-canada-s-record-population-growth-is-helping-and-hurting-the-economy-1.6825121.

54 The Canadian Press, "'Breaking Point': Quebec Premier Asks Trudeau to Slow Influx of Asylum Seekers," *CBC News*, January 18, 2024, https://www.cbc.ca/news/canada/montreal/legault-asks-trudeau-to-slow-influx-of-asylum-seekers-1.7087328.

at an architectural scale, though designers should balance this with regional climate considerations.

Additionally, considering communities' cultural backgrounds is vital in determining strategies to integrate environmentalism into individuals' daily lives. For example, an understanding that ethnic Chinese communities often inadvertently engage in environmentalism for financial reasons, and that top-down engagement strategies are often ineffective for marginalized communities, can provide insight into the prospective occupants' lifestyle.

With this understanding, I intend to design a housing co-op in my thesis, as housing is integral to people's daily lives. This form of design allows for meaningful engagement of Richmond's local community. With the larger site typically associated with this residential program, there are possibilities for designing well-integrated, thoughtful green spaces close to residents' homes.

Conclusion

In conclusion, this literature review uncovers that current materials tend to address various facets of this thesis topic separately. By exploring environmentalism through an intersectional lens and avoiding solutionism, I aim to understand potential barriers and considerations to working with ethnic minorities in British Columbia. The goal is for this information to prompt innovative design methods and frameworks that address Richmond's environmental issues while demonstrating the importance of understanding the community's lived experiences and culture. Moreover, case studies and existing knowledge regarding environmental justice highlight the importance of employing a grassroots strategy, and the importance of integrating green spaces into their everyday lives.

Ultimately, I hope the subsequent design strategies will encourage immigrants' sense of community and motivate engagement with Richmond's environmental efforts. Given Canada's ambitious immigration goals, this research aims to empower diverse immigrant groups to engage in future environmental stewardship initiatives.

Chapter 3: Urban Scale Context

Introduction

While existing literature alludes to the importance of innovative frameworks for addressing environmental issues through a cultural and intersectional lens, this has not materialized in Richmond's urban fabric. This chapter examines their environmental and anti-racism initiatives, particularly in an urban-scale context. Specifically, have past initiatives attained their targets, or what hindered their successful implementation? Additionally, by using Critical Race Theory (CRT) to analyze how Richmond currently fits within the context of environmental racism, I question whether the city's architecture and planning address environmental racism. Ultimately, this thesis aims to learn to address the city's changing needs and improve future projects' alignment with local demographics.

Past: Environmental Initiatives in Richmond, B.C.

Examples of Initiatives

Despite its flood risk, the City of Richmond offers its residents limited ways of participating in environmental improvement, which becomes apparent when seeking community workshops. The city promotes free workshops online, including 'Zero Heroes Home Edition,'[1] a partnership with DreamRider Productions,[2] an organization aiming to engage elementary school students in water conservation through theatre.[3] It inspires children to "explore our garbage predicament and work to change their families' waste habits." However, the city has not updated this website since at least 2021.

Another offering is the 'Green Ambassadors Program.' It aims to engage secondary school students meaningfully. However, it focuses on educating them about existing efforts rather than providing opportunities to create transformative change. Specifically, its goals focus on providing teamwork and leadership experiences, as well as personal growth and education to participants.[4]

Additionally, the city hosts repair fairs, including a recent "Clothing, Bike & Lawnmower Repair Fair" at South Arm Community Centre.[5] The website reinforces that only "one clothing item per session and one session per person" are permitted. South Arm Community Centre is also on the city's wealthier southern end—without direct SkyTrain access—where the median household income is higher than Richmond's median. This inadvertently reinforces that environmentalism does not prioritize marginalized communities. Since only being able to repair one clothing item may not make

1 "Free Community Workshops and Schedule," City of Richmond, accessed July 18, 2024, https://www.richmond.ca/services/recycling-garbage/community-outreach/workshops_schedule.htm.

2 Founded by the City of Vancouver in 1998 before becoming an independent organization in 2002.

3 "About Us," Planet Protector Academy, accessed July 18, 2024, https://planetprotectoracademy.com/about-us/.

4 "Richmond Green Ambassadors Program," City of Richmond, accessed July 18, 2024, https://www.richmond.ca/services/recycling-garbage/community-outreach/GreenAmbassadors.htm.

5 "Repair Fair," City of Richmond, accessed June 1, 2024, https://www.richmond.ca/services/recycling-garbage/community-outreach/repairfair.htm.

the journey worthwhile and prevent low-income groups from utilizing this event.

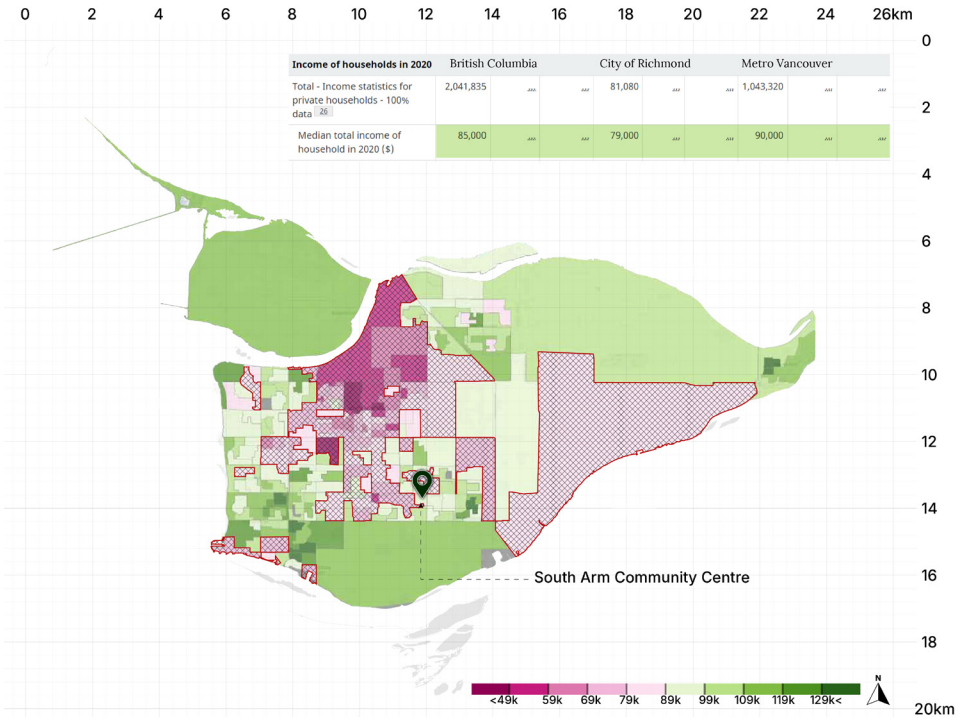


Figure 3.01. Richmond Median Income Map. 2024. By author. Adapted from GIS Data courtesy of Statistics Canada. Information from Statistics Canada 2021 Census, partially retrieved via CensusMapper (https://censusmapper.ca/popup/about_census.)

In addition, the ongoing Dike Master Plan outlines the process to upgrade the City's infrastructure in prevention of sea level rise and other climate change risks. It has been divided into five phases, and action will begin on the city's wealthier southern end.[6] The choice to prioritize this region therefore inadvertently strengthens systems rooted in environmental racism. (See *Mapping exercises: Climate and the Environment* in Chapter 1)

On the other hand, the sixteen community gardens across the city,[7] are more successful. The managing organization, Urban Bounty, was initially established in 2002.[8] The plots are well-utilized, fully occupied, and have over 760 members[9] and a waitlist. Their locations are well-aligned with the city's lower-income population (see figure 3.02.) However, even these gardens face occasional issues

6 "Dike Master Plan," City of Richmond, accessed July 7, 2024, https://www.richmond.ca/services/water-sewer-flood/dikes/dikemasterplan.htm.

7 Managed by Urban Bounty in partnership with the City of Richmond

8 Initially established by the Richmond Poverty Response Committee as the Food Security Task Force

9 "The Richmond Community Gardens Program," Urban Bounty, accessed July 18, 2024, https://www.urbanbounty.ca/programs/welcome-to-the-community-gardens/.

of abandoned plots.[10] While the Urban Bounty website shares a key shortcoming with many of the city's environmental initiatives—not having official foreign language translations. However, there is some evidence of acknowledging the Asian population, such as sharing a news article about choy (Asian greens) farming in their July newsletter.[11]

10 Valerie Leung, "What Happens to Weed-Filled Plots in Richmond Community Gardens?," *Richmond News*, September 7, 2023, https://www.richmond-news.com/in-the-community/what-happens-to-weed-filled-plots-in-richmond-community-gardens-7515074.

11 Urban Bounty, "July Newsletter From Urban Bounty," July 23, 2024, https://mailchi.mp/05e5ad221654/july-updates-2024.

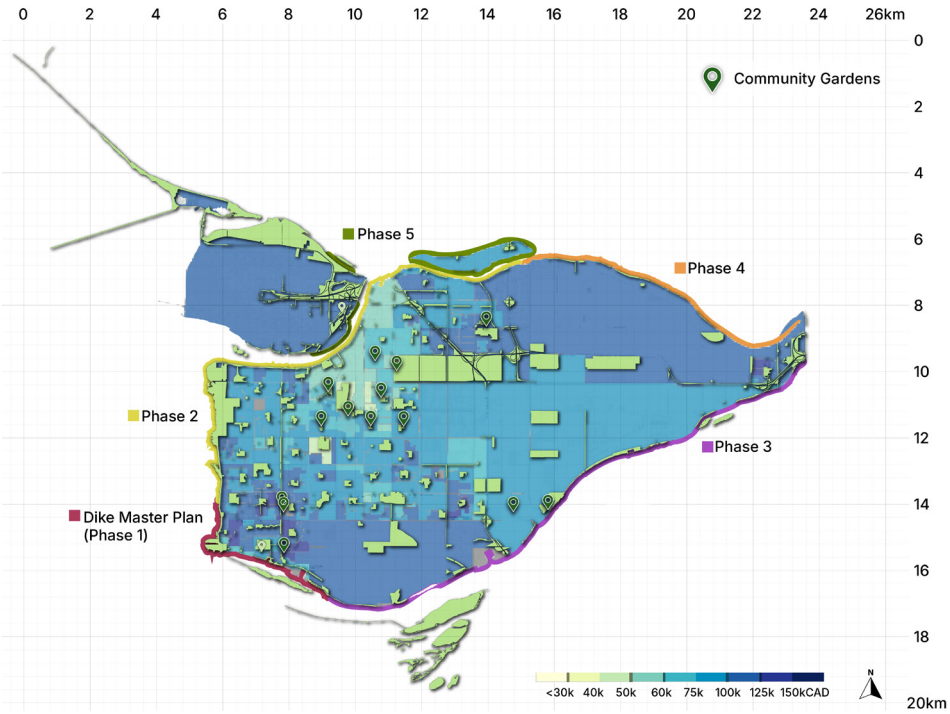


Figure 3.02. Phases of Richmond's Dike Master Plan Mapped Against Median Income. 2024. By author. Adapted from GIS Data courtesy of Statistics Canada. Information from the City of Richmond. (https://www.richmond.ca/services/water-sewer-flood/dikes/dikemasterplan.htm) and Statistics Canada 2021 Census retrieved via CensusMapper (https://censusmapper.ca/popup/about_census.)

Ultimately, most of these examples demonstrate attempts to create environmental opportunities, but they have neither addressed marginalized communities nor materialized into tangible change.

Barriers to Successful Implementation

Christina Lee of the Hua Foundation[12] highlighted barriers to implementing initiatives amongst members of the Asian Diaspora. Based in Vancouver's Chinatown, their mission is "to strengthen capacity among Asian diasporic youth, in solidarity with other communities, to challenge, change, and create systems for a more equitable and just future." Their work addresses an intersection between cultural heritage and social change.[13]

Specifically, ethnic minorities' environmental injustices relate to other issues, including information access, which encompasses considerations such as (1) language, (2) social media platforms, (3) jargon, (4) the target audience's age group, and (5) trust building.[14] Regarding language, many locals are non-English speakers. Richmond's proportion of the population speaking a non-official language as their mother tongue was the highest in Metro Vancouver.[15] In 2021, 22.7% and 23.3% spoke Mandarin and Cantonese as their mother tongue, respectively.[16] Thus, the city must promote begin to promote environmental initiatives in widely understood languages to engage locals.

Regarding social media platforms, Facebook, Pinterest and Twitter/X are Canada's three leading choices.[17] However, WhatsApp, Facebook and Instagram are the most popular in Hong Kong,[18] while YouTube, Facebook, and Instagram are Taiwan's top three.[19] Mainland China is entirely different; WeChat, douyin and QQ are the most popular.[20] Thus, social media platforms other than those typically used in Canada must be employed to reach ethnic Chinese immigrants effectively. This is difficult to achieve fully, because for example, Facebook is popular in Canada, Hong Kong and Taiwan but not in Mainland China.

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12 Director of the Hua Foundation's community capacity and strategic initiatives

13 "About," Hua Foundation, accessed July 18, 2024, https://huafoundation.org/about/.

14 Christina Lee, Zoom Call, March 4, 2024.

15 Alan Campbell, "59 per Cent of Richmondites Don't Speak English First," *Richmond News*, October 24, 2012, sec. Local News, https://www.richmond-news.com/local-news/59-per-cent-of-richmondites-dont-speak-english-first-2944750.

16 Statistics Canada Government of Canada, "Mother Tongue by Geography, 2021 Census," Statistics Canada, August 17, 2022, https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/dv-vd/language-langue/index-en.html.

17 Stacy Jo Dixon, "Leading Social Media Websites in Canada in February 2024, Based on Share of Visits," Statista, accessed July 18, 2024, https://www.statista.com/statistics/247737/top-social-media-sites-visit-share-canada/.

18 Lai Lin Thomala, "Hong Kong: Most Used Social Media Platforms 2023," Statista, June 13, 2024, https://www.statista.com/statistics/412500/hk-social-network-penetration/.

19 Lai Lin Thomala, "Popular Social Media Platforms among Internet Users in Taiwan as of May 2023," Statista, September 28, 2023, https://www.statista.com/statistics/966613/taiwan-social-media-use-by-platform/.

20 Lai Lin Thomala, "Monthly Usage of Major Social Media Platforms in China as of 3rd Quarter 2023," Statista, February 2024, https://www.statista.com/statistics/1296612/taiwan-social-media-users/.

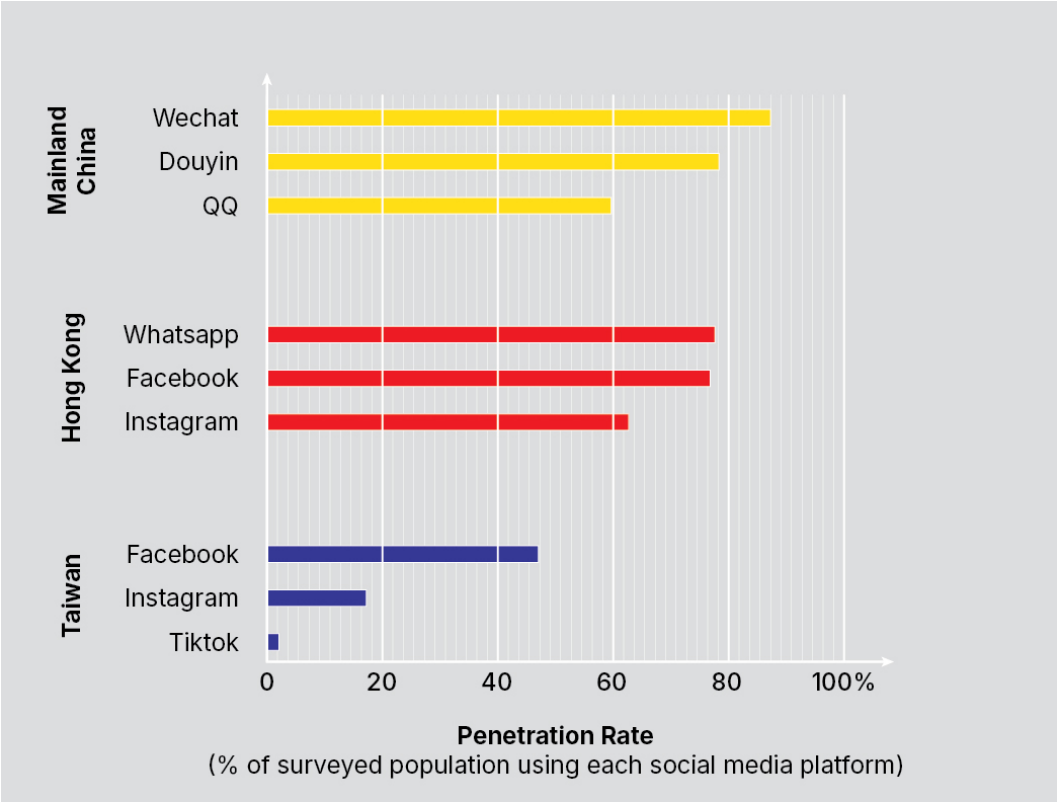


Figure 3.03. Graphs of China, Hong Kong and Taiwan's Top Social Media Platforms. 2024. By author. Adapted from Statista (https://www.statista.com/statistics/412500/hk-social-network-penetration/, https://www.statista.com/statistics/250546/leading-social-network-sites-in-china/, https://www.statista.com/statistics/966613/taiwan-social-media-use-by-platform/.)

However, there are concerns about data security for Chinese-affiliated apps.[21] Specifically, TikTok's Chinese parent company, ByteDance, monitored journalists' locations and IP addresses using TikTok in 2022, highlighting security concerns. However, both TikTok and ByteDance condemned this and the individuals involved.[22] TikTok has repeatedly denied the Chinese government having control over ByteDance. Nonetheless, the Canadian government has banned TikTok on government-issued mobile devices,[23] and a law in the United States will likely force ByteDance to sell TikTok by 2025.[24] Ultimately, promotions for immigrant-oriented initiatives must utilize nationally secure platforms.

21 Catharine Tunney, "Intelligence Chief Warns Canadians That China Can Use TikTok to Spy on Them," *CBC News*, May 17, 2024, https://www.cbc.ca/news/politics/csis-tikok-vigneault-1.7206000.

22 Emily Baker-White, "EXCLUSIVE: TikTok Spied On Forbes Journalists," *Forbes*, December 22, 2022, https://www.forbes.com/sites/emilybaker-white/2022/12/22/tiktok-tracks-forbes-journalists-bytedance/?sh=6aeebead7da5.

23 Treasury Board of Canada Secretariat, "Statement by Minister Fortier Announcing a Ban on the Use of TikTok on Government Mobile Devices," statements, Government of Canada, February 27, 2023, https://www.canada.ca/en/treasury-board-secretariat/news/2023/02/statement-by-minister-fortier-announcing-a-ban-on-the-use-of-tiktok-on-government-mobile-devices.html.

24 João da Silva, "TikTok Will Not Be Sold, Chinese Parent ByteDance Tells US," *BBC News,* April 26, 2024, https://www.bbc.com/news/articles/c289n8m4j190.

Regardless, this controversy facilitates racist anti-Chinese sentiments. In 2020, one in ten tweets by American politicians "about Asian Americans included racist or stigmatizing language."[25] National security-related restrictions can provide opportunities for individuals to make Sinophobic comments with stigmatizing language. Digital platforms affect how communities approach and disseminate information about topics, including environmental issues. Thus, to avoid reinforcing systems rooted in racism, carefully considering the use of social media is crucial.

Moreover, it is crucial to explain or omit jargon relevant to environmentalism that may be difficult for newcomers; they are typically not covered by formal learning resources like textbooks. Additionally, community programmes frequently target young second-generation immigrants who translate for parents lacking English fluency.[26] Consequently, children can be more connected to local services and act as an intermediary between policymakers and immigrant families. Existing environmental programmes[27] target children and have therefore begun to address this sentiment. Regarding trust-building, ethnic minorities frequently hesitate to share information due to distrusting the government. Recent issues—which often affect immigrants—have increased public doubt, including the strained healthcare system relating to the COVID-19 pandemic, and the long backlog in processing study permits and temporary visas.[28] Thus, Christina suggests taking a backseat or operational role in community programs, and instead leaving front-line roles to groups with locals' trust.

Scholars allude to the fact that grassroots strategies that utilize cultural patterns are likely more effective than formalized systems in addressing these barriers in relation to the target audience (see *Environmentalism for East Asian Ethnic Minorities* in Chapter 2.) Ethnic Chinese individuals often employ informal sustainability systems, which arise for financial rather than environmental reasons.

Ultimately, some initiatives are better aligned with the local demographic, such as when they target youth who are de facto translators for immigrant parents. However, certain weaknesses—such as the language of promotion and venue location—prevent other efforts from aligning with the local community's lifestyle. By addressing these shortcomings, the city can better address its unique demographic makeup. This discussion of communication channels is crucial to my architectural thesis which advocates for developing strategies that are well-aligned with individual lifestyles and cultural practices. This dilemma of social media highlights one type of cultural sensitivity pertaining to the challenges of environmentalism.

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25 Stop AAPI Hate, "The Return of 'Yellow Peril,'" October 21, 2020, https://stopaapihate.org/wp-content/uploads/2021/04/Stop-AAPI-Hate-Report-2020-Candidates-and-Anti-Asian-Rhetoric-201021.pdf.

26 Cecilia Huang, "As a Kid, I Was the Main Translator for My Immigrant Parents. It Wasn't Easy.," *Macleans.Ca*, June 7, 2023, https://macleans.ca/society/translating-immigrant-parents/.

27 Programs such as 'Zero Heroes Home Edition' workshop

28 Geoff Norquay, "Canada's Growing Problem with Trust in Government," *Policy Magazine*, November 30, 2022, https://www.policymagazine.ca/canadas-growing-problem-with-trust-in-government/.

Present: Community Organization & The City's Approach

The City's Current Approach to Anti-Racism and Anti-Oppression

Richmond's Anti-Racism webpage highlights the 2019–2029 Cultural Harmony Plan and three key initiatives, including:[29]

1. *Hate Has No Place*, which encourages reporting incidents of racism
2. *Richmond Community Protocol*, guiding effective and prompt reactions to racism
3. *Aspire | Build | Celebrate (ABC),* encouraging "intergenerational and intercultural dialogue on multiculturalism, diversity, and anti-racism through the arts."

Basic tenets of Critical Race Theory (CRT) serve as crucial frameworks for understanding Richmond's anti-racism and oppression achievements highlighted in their Cultural Harmony Plan updates. (See *Background* in Chapter 2) For example, 'intersectionality' highlights that individuals cannot be adequately identified by membership in a single group.[30] The Public Library has partnered with the Richmond Women's Resource Centre to deliver English classes to over 1,500 newcomer women to improve their English fluency while strengthening community connections.[31] In Chinese culture, women typically do domestic work at home,[32] while men work to support their families financially. By equipping women with fundamental linguistic skills, the program addresses intersectional inequalities between culture and gender.

In addition to initiatives in the Cultural Harmony Plan, the city's approach to controversies surrounding Chinese-only signage demonstrates 'social construction,' another basic tenet. While CRT often perceives white communities as the dominant group advantaged by interest convergence, Richmond is an example demonstrating power dynamics when a group other than the white race makes up the demographic majority, highlighting the dominant race merely as a social construct. There is a historical disconnect between Chinese and non-Chinese speakers; the city council once received a petition with over 1000 signatures to protest against Chinese signage.[33] Ultimately, social, economic and political factors impact language and race. This controversy would not arise amidst English-only signage, given that English is one of Canada's official languages. Since ethnic Chinese groups comprise the majority of the population in Richmond, the city opted for outreach with business owners instead of legal enforcement as their response.[34] This demonstrates consideration

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29 "Anti-Racism," City of Richmond, accessed July 18, 2024, https://www.richmond.ca/culture/social/inclusion/antiracism.htm.

30 Meg Matthias, "Basic Tenets of Critical Race Theory," Britannica, accessed July 18, 2024, https://www.britannica.com/topic/critical-race-theory/Basic-tenets-of-critical-race-theory.

31 Community Social Development Department, "2019-2029 Cultural Harmony Plan: 2022-2023 Update" (The City of Richmond, 2023), https://www.richmond.ca/__shared/assets/culturalharmonyplan2022-2023update72395.PDF.

32 Yalan Huang, "'Re-Feminization' of Dependent Women Migrants: Negotiating Gender Roles in the Chinese Digital Diaspora," *Asian Journal of Women's Studies* 26, no. 2 (2020): 159–83, https://doi.org/10.1080/12259276.2020.1747249.

33 Elaine Chau, "Richmond Chinese-Language Only Sign Controversy, a Sign of Cultural Tension," *CBC News*, March 12, 2015, https://www.cbc.ca/news/canada/british-columbia/richmond-chinese-language-only-sign-controversy-a-sign-of-cultural-tension-1.2991836.

34 The Canadian Press, "Richmond Opts for Outreach, Not Enforcement, over Chinese Language Signs," Maple Ridge-Pitt Meadows News, September 12, 2017, https://www.mapleridgenews.com/news/richmond-opts-for-outreach-not-

for the majority ethnic group through a strategy prioritizing harmony.

Ultimately, it is evident that the city's strategies focus on educating the local population and have basic connections to CRT. However, they can be improved by (1) strengthening the focus on an intersectional approach, (2) mirroring these values through policy and structural change, and (3) increase the alignment between the strategies and the local demographics. By integrating these improvements with housing, local architectural and urban design, these initiatives also have the potential to contribute to a built environment that reinforces anti-racist principles.

Power Structures Required to Make a Difference in Space

The city's anti-racism strategy lacks relevance to the design of spaces; as the Cultural Harmony Plan's initiative is ongoing, improvements can immediately begin with increased collaborations with the Planning & Development Department to develop an inclusive design strategy. The Cultural Harmony Plan already highlights collaborations with a 'steering committee' and key stakeholders from various organizations.[35] There are also alignments with other city strategies, such as the 2041 Official Community Plan and Social Development Strategy 2013–2022.

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enforcement-over-chinese-language-signs-2612053.

35 Including the Immigrant Services Society of BC and the Public Library.

The Garden City Lands Legacy Landscape Plan

The Garden City Lands (GCL) is an ample open space owned by the city since 2010.[36] It is a 55.2-hectare site under the Agricultural Land Reserve. Therefore, "Farming is encouraged and non-agricultural uses are controlled."[37] GCL will become a significant park with "urban agriculture, environmental preservation and interpretation, recreational and cultural uses." This is crucial to the city's vision to become a sustainable city,[38] specifically "the most appealing, livable and well-managed community in Canada."[39] The site provides a transition between agricultural and urban regions, and its location is accessible via transit, being a 12-minute walk from the nearest SkyTrain[40] station, Lansdowne.[41] Its design—endorsed by the City Council in 2014—came about in response to "science-based recommendations" and feedback from "hundreds" of residents "and the contribution of Kwantlen Polytechnic University (KPU) regarding agricultural production." The Park Development Plan separates the site into several areas.[42] The city also emphasizes GCL as a unique opportunity since it is the largest public open space within City Centre and the second largest in Richmond.[43]

36 The City of Richmond, "Garden City Lands Legacy Landscape Plan," May 2014, https://www.richmond.ca/__shared/assets/2014_Legacy_Landscape_Plan_-_May_201438760.PDF.

37 "Agricultural Land Reserve," Columbia Shuswap Regional District, accessed July 18, 2024, https://www.csrd.bc.ca/214/Agricultural-Land-Reserve.

38 The City of Richmond, "Garden City Lands Legacy Landscape Plan."

39 City of Richmond, "City Profile," accessed July 18, 2024, https://www.richmond.ca/culture/discover-richmond/profile.htm.

40 SkyTrain is Metro Vancouver's Light Rail System

41 "Google Maps," Google Maps, accessed August 12, 2024, https://www.google.com/maps.

42 Including the Agricultural Lands, Bog, Rise, Nodes, Dyke, and Perimeter Trails

43 The City of Richmond, "Garden City Lands Legacy Landscape Plan."



Figure 3.04. Location of the Garden City Lands. 2024. By author. Adapted from aerial photograph courtesy of Google Earth.

Garden City Lands: Current State of Implementation

Despite introducing the design in the Garden City Lands Legacy Landscape Plan (GCLLLP) in 2014, GCL's construction is incomplete. The latest update on the City's webpage states that they are refining the plan and proposed activities unrelated to on-site farming.[44] After approval is received, the public can access the entire site, and the proposed infrastructure will begin construction. In the meantime, the public can only access a 2.9km perimeter trail, and the government is focusing on agricultural projects such as community gardens and farm activities—including an organic farm—led by KPU.[45] Monthly tours of the farm are available until at least October 2024.[46] There are no further updates on the City's website beyond the list of planned activities for 2022,[47] which is only written in English. There is an automatic translation function, but technical terms and jargon are poorly translated.

Moreover, the Agricultural Land Commission (ALC) updated the proposal's status to "approved as proposed" in March 2023.[48] Therefore, public access to the site should now be allowed, but the website still states, "Please see signage on site and the project web page for updates," and no URL is provided to said web page. The design process seemingly lacks transparency, as updates are not easily available.

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44 "Garden City Lands," City of Richmond, accessed July 18, 2024, https://www.richmond.ca/parks-recreation/parks/design-construction/gardencitylands.htm.

45 Maria Rantanen, "Urban Farm in Richmond Offers Final Twilight Tour Highlighting Season Extension," *Richmond News*, October 5, 2023, sec. Local News, https://www.richmond-news.com/local-news/urban-farm-in-richmond-offers-final-twilight-tour-highlighting-season-extension-7647659.

46 "Twilight Tours," Kwantlen Polytechnic University, accessed July 18, 2024, https://www.kpu.ca/science/agriculture/twilight-tour.

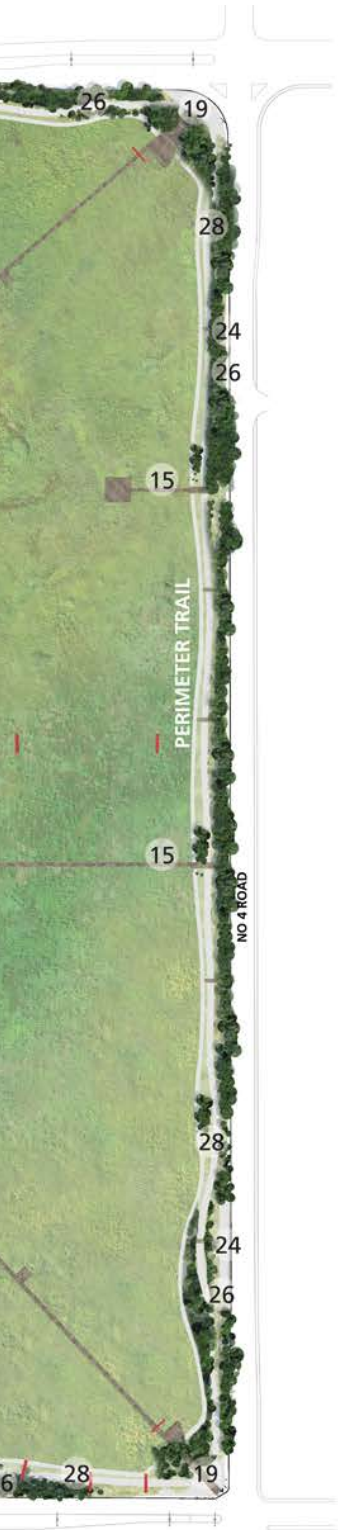
47 "Garden City Lands."

48 "Public Search," Provincial Agricultural Land Commission, accessed July 18, 2024, https://portal.alc.gov.bc.ca/public/application/58154.



Figure 3.05. Garden City Lands Updates. 2023. By author. Adapted from aerial photographs courtesy of Google Earth.


ALDERBRIDGE WAY
PERIMETER TRAIL
THE RISE
THE DYKE
FARM FIELDS
THE BOG
LANSDOWNE ROAD
THE COMMUNITY HUB & FARM CENTRE
THE SANCTUARY
GARDEN CITY ROAD
PERIMETER TRAIL
FARM FIELDS
THE FEN
PERIMETER TRAIL
WESTMINSTER HWY



LEGEND

THE AGRICULTURAL LANDS

1 Multi-Functional Building and Parking
2 Rainwater Storage for Agricultural Irrigation
3 Farm Drainage Ditch
4 Agricultural Event Field
5 Agricultural Fields
6 Orchard
7 Demonstration Orchard
8 Community Gardens
9 Hedgerows & Beetle Banks
10 Sliding High Tunnels
11 Farm Fields
12 Soil Amendment Trials

THE BOG

13 Bog Conservation Area
14 The Fen
15 Boardwalk with Rest Points

THE RISE

16 Meadow / Informal Recreation
17 Children's Play

THE NODES

18 Garden City Lands Main Entrance
19 Entry Nodes
20 Entry Alley
21 Viewing Platform
22 Crosswalk
23 Parking Lot with Accessible Stalls
24 Parallel Parking with Accessible Stalls

THE DYKE

25 Multi-use Path with Farm Access

THE PERIMETER TRAILS

26 Native Forest Plantings
27 Street Trees
28 Perimeter Trails - Separated Paths
29 Rain Garden

Scale 1:1000

Figure 3.06. The Garden City Lands Park Development Plan. 2014. Courtesy of the City of Richmond, retrieved from "GCL Park Development Plan," (https://www.richmond.ca/__shared/assets/GCL_Park_Development_Plan_-_PDF45126.pdf.)

As mentioned, the government emphasizes this opportunity to design such a large-scaled civic space in an urban context is rare. However, this begs the question of why this centralized strategy is not widely employed.

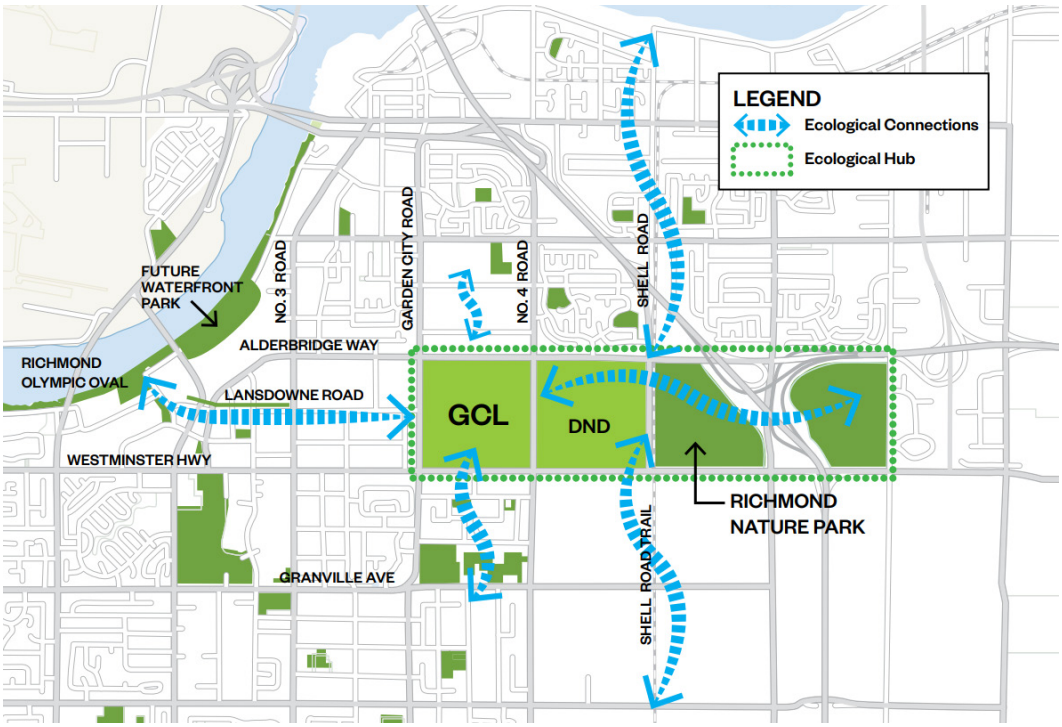


Figure 3.07. Ecological Hub/Connections Diagram from GCL LLP. 2014. Courtesy of the City of Richmond, retrieved from "Garden City Lands Legacy Landscape Plan," https://www.richmond.ca/__shared/assets/2014_Legacy_Landscape_Plan_-_May_201438760.PDF.

One challenge is inconvenience. While GCL is within walking distance of the SkyTrain, which theoretically increases its accessibility, GCL is not well-integrated amidst the daily paths of residents as Richmond's transit, residential and commercial areas are located to the massive site's west. Various literary works discuss this issue.[49] (See *Designing for Environmentalism at an Urban Scale* in Chapter 2) For example, Jacobs states, "People do not use city open space just because it is there and city planners and designers wish they would."[50] However, the community must utilize parks to reap their benefits; parks can otherwise cause adverse effects as dangerous places that locals avoid. This sense of danger can impact the community's safety. Instead, *A Pattern Language* highlights that

49 Including Jane Jacobs' *The Death and Life of Great American Cities* and Christopher Alexander's *A Pattern Language: Towns, Buildings, Construction.*

50 Jane Jacobs, *The Death and Life of Great American Cities* (New York: Random House, 1961,) 117.

green spaces should be within a three-minute walk[51] of one another[52] to address humans' need for green spaces to nourish themselves by going to walk, run, and play. Having many green spaces across the city instead of one large, centralized site can help to avoid underutilization.

GCL's development has continued for over ten years, likely catering to its large scale. However, this is associated with risks, including delaying public access to green space. The community's needs may shift between the project's planning and completion. Additionally, as mentioned, the site's design includes various zones. Certain areas may be neglected during this staggered construction, posing safety and maintenance issues. Finally, escalating costs may cause complications, leading to delays, or regions may not reach the intended vision due to budget limitations. Regarding budget limitations, considering that Richmond's median income is lower than B.C.'s average, this begs the question of whether or not this massive design strategy is appropriate within this city's context.

Suggestions for Future Proposals

GCLLLP's construction is ongoing, but there are things the city could do to better address local needs. Its shortcomings include (1) a somewhat inconvenient location, which risks underutilization and (2) an extended development period involving a staggered construction process. To address accessibility, the city can improve surrounding transit and pedestrian networks to better consider marginalized residents. Regarding the extended development process, the city can monitor project changes as development continues, making changes accordingly to ensure they address community needs. Ultimately, future proposals have the potential to transform the city into an inclusive and sustainable space, learning from the strengths and shortcomings of past environmental and anti-racism initiatives. They can design spaces inclusively through these strategies concluded from the above analysis:

1. Improving green spaces' accessibility and availability
2. Reconsidering the languages and platforms used to promote initiatives
3. Employing a grassroots approach that aligns with locals' lifestyles
4. Making updates regarding initiatives transparently
5. Continue engagement with local youth

Affordable Housing in B.C.

The housing crisis is one of B.C.'s key social issues. Hence, through the vessel of affordable housing, designers can relieve other intersectional problems that the local community faces (see Chapters 2 and 4.) For example, this could empower ethnic communities to confront environmental racism while adding their communal voice in these systemic issues. Since those excluded from environmentalism are marginalized individuals, it is likely that they face housing challenges too.

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51 Equivalent to 750ft.

52 Christopher Alexander, *A Pattern Language: Towns, Buildings, Construction* (New York, N.Y: OUP, 1977).

Housing in Metro Vancouver is extremely unaffordable. Housing prices in Vancouver within the last quarter of 2023 were higher than they had ever been, anywhere in Canada.[53] Specifically, an average Canadian requires over 63% of their income to own a home, but Vancouverites need 106%.

This crisis has been deeply impacted by financialization.[54] The Canadian Human Rights Commission defines financialization as "how housing is treated as a commodity" instead of a fundamental right. Investment firms and foreign investors purchasing real estate are both related to financialization.

Over one-third of properties in B.C. and 41.2% in Ontario are owned by investors. They purchase buildings before renovating units and increasing rent, particularly impacting residents of low-income neighbourhoods who are forced to move out in favour of "short-term high yield profits." These properties are often used for short-term rentals; the absence of regulation of this shift leads to the inadvertent cultural reshaping of low-income neighbourhoods.

The federal government has recognized the dire affordability impacts of foreign investors purchasing real estate in major Canadian cities. They responded by banning foreigners' and foreign commercial enterprises' non-recreational housing ownership in 2022.[55] In February 2024, they extended the act for two years.

While financialization is viewed as a negative trend, Richmond is an ethnoburb with a high ethnic Chinese population (See chapter 1: introduction.) So, how might these individuals perceive the idea of housing as a tool for investment? Mainland China's real estate sector drove economic growth in the late 20th century, especially following the removal of state-allocated housing in 1998.[56] The basis of this boom in the real estate market is Chinese residents who heavily invested in residential property. However, Zheng and Ho highlight that these transactions were often plagued with uncertainties, especially regarding the renewal of the land lease and contradicting laws. This is because the Chinese state owns urban lands and acts as the landlord, leasing lands at 70-year terms for residential purposes. However, properties on these state-owned lands are developed by private companies responsible for paying a premium or land conveyance fee. Despite the uncertainties mentioned above, the drastic real estate boom suggests that viewing buildings as an investment tool is the norm in Mainland China.[57]

Moreover, this housing crisis also deeply affects Richmond, as shown in Chapter 1's mapping exercises. Most households in Richmond make less than 86,000 CAD, the household income limit

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53 Angela Jung and Amy Judd, "Vancouver Is in a 'Full-Blown Crisis' for Housing Affordability: Report," *Global News*, April 3, 2024, https://globalnews.ca/news/10401449/vancouver-full-blown-crisis-housing-affordability-report/.

54 Martine August, "The Financialization of Housing in Canada" (Office of the Federal Housing Advocate, June 2022), https://publications.gc.ca/collections/collection_2023/ccdp-chrc/HR34-7-2022-eng.pdf.

55 Department of Finance, "Government Announces Two-Year Extension to Ban on Foreign Ownership of Canadian Housing," news releases, Government of Canada, February 4, 2024, https://www.canada.ca/en/department-finance/news/2024/02/government-announces-two-year-extension-to-ban-on-foreign-ownership-of-canadian-housing.html.

56 Ying Zheng and Peter Ho, "Unpacking the Paradox of 'Insecure' Housing Rights in China: Urban Residents' Perceptions on Institutional Credibility," *Cities* 97 (2020): 102485, https://doi.org/10.1016/j.cities.2019.102485.

57 Zheng and Ho, "Unpacking the Paradox of 'Insecure' Housing Rights in China."

marking eligibility for a three-bedroom apartment in affordable housing projects.[58] Specifically, the City Centre planning region—home to a more significant percentage of marginalized and ethnic communities (see mapping exercise in Chapter 1: Introduction)—is most severely affected by this trend. Households in this region have a median income of 77,000 CAD versus the city's average, 96,000CAD.[59]

Ultimately, affordable housing can be a vessel to address Richmond's intersectional issues, which entail social and environmental considerations, amongst many others.

Table 3.01. Vancouver's 2023 HILs.

1 Bedroom or less	2 Bedrooms	3 Bedrooms	4+ Bedrooms
58,000	72,000	86,000	107,500

Source: Adapted from BC Housing, '2023 Housing Income Limits (HILs),' https://www.bchousing.org/sites/default/files/media/documents/2023-Housing-Income-Limits-HILS-Effective-January-1-2023.pdf.

Table 3.02. Household Total Income Breakdown in 2020 of Private Households in Richmond.

Income Range (CAD)		No. of Households	% of Total	Cumulative %
Lower limit	Upper limit			
0	4999	2445	3.0	3.0
5000	9999	990	1.2	4.2
10000	19999	2810	3.5	7.7
20000	29999	6130	7.6	15.3
30000	39999	6475	8.0	23.3
40000	49999	5960	7.4	30.6
50000	59999	5590	6.9	37.5
60000	69999	5370	6.6	44.2
70000	79999	5190	6.4	50.6
80000	89999	4800	5.9	56.5
90000	99999	4370	5.4	61.9
100000	124999	8795	10.9	72.8
125000	149999	6540	8.1	80.8
150000	199999	7945	9.8	90.7
200000	N/A	7570	9.3	100.0
		80980	**100.0**	

Source: Adapted from the City of Richmond, 'Income Hot Facts,' https://www.richmond.ca/__shared/assets/Income_Hot_Facts6259.pdf.

58 "2023 Housing Income Limits (HILs)" (BC Housing, December 2022), https://www.bchousing.org/sites/default/files/media/documents/2023-Housing-Income-Limits-HILS-Effective-January-1-2023.pdf.

59 "Income Hot Facts" (City of Richmond, July 2023), https://www.richmond.ca/__shared/assets/Income_Hot_Facts6259.pdf.

Conclusion

In conclusion, Richmond's racism challenges include intersectional injustices due to its population dominated by ethnic Chinese individuals, while their environmental issues are often related to a lack of ecological initiatives addressing marginalized communities and materializing into tangible change.

Specifically, Richmond has introduced various efforts demonstrating its dedication to environmentalism and sustainability, including the ambitious GCL development. However, its large scale and lack of transparency have hindered its success. Residents have been deprived of this valuable green resource for at least a decade, during which construction has continued. The city could better allocate this significant effort and budget to smaller, well-designed spatial initiatives around the city that cater to local living patterns.

Environmental initiatives aimed at ethnic or marginalized communities must employ a grassroots strategy that builds upon their existing practices and habits. These strategies could be based on the vessel of affordable housing, and would help ensure that the initiatives are accessible, relevant and subsequently beneficial.

Chapter 4: Architectural Design Proposal

Introduction

The *Urban Scale Context* chapter highlights the need for Richmond to integrate environmentalism-related efforts with its spatial design. Massive-scaled projects tend to have significant potential drawbacks, and thus, this thesis advocates for designing smaller interventions to address environmentalism along with a city's intersectional issues. This thesis' architectural proposal will be a housing co-op design, as housing is an integral part of daily life. Specifically, the design aims to dispel the notion that immigrants don't care about the environment because of their financial priorities. Living with environmentalism in mind can have financial benefits.[1]

Housing Co-ops

I aim to address Richmond's intersectional environmental issues by designing a housing cooperative (co-op) because it can help to address B.C.'s housing crisis, a prominent social problem in the region (see Affordable Housing in B.C. in Chapter 3.) As an affordable housing project, my design targets Richmond's lower-income residents.

Co-ops are a non-profit, flexible type of housing that can take many architectural forms.[2] Most co-ops in Canada are rental properties—constructed under government-run programmes throughout the 1970s-80s—providing social housing and a strong sense of community for low-to-middle-income communities. Residents are members of the co-op legal association and can vote in any collective decisions, eliminating the need for an external landlord.

B.C.'s co-op housing supply may seem sufficient relative to the rest of the country, though this is not true. Just over 17% of Canada's Co-op housing[3] and less than 14% of the low-income population[4] is in the province.[5] However, B.C.'s—including Richmond's—costly private housing increases the need for affordable housing. 25% of the population spends over 50% of their income on rent and utilities, compared to 16% nationally[6] (See *Affordable Housing in B.C.* in Chapter 3.) As a result of the expensive private housing, there is a greater need for affordable co-op housing to alleviate households' financial strain and to avoid housing insecurity from becoming a dominant issue in the community.

Long waiting lists, land supply, and disrepair are all barriers that prevent affordable co-op housing

1 Eugenia Wang, "Sustainable Diversity" (David Suzuki Foundation, February 2015), https://davidsuzuki.org/wp-content/uploads/2017/09/sustainable-diversity-david-suzuki-foundation-multiculturalism-green-movement.pdf.

2 "About Co-Op Housing," CHF Canada, accessed July 7, 2024, https://chfcanada.coop/about-co-op-housing/.

3 "Facts and Figures," Co-operative Housing Federation of Canada, accessed July 10, 2024, https://chfcanada.coop/about-co-op-housing/facts-and-figures/.

4 According to the national LIM low-income status

5 Government of Canada, "2021 Census of Population," Statistics Canada, November 15, 2023, https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E.

6 Darrian Matassa-Fung, "25% of B.C. Renters Spend Half of Income on Housing: Report," *Global News*, accessed August 6, 2024, https://globalnews.ca/news/10577705/25-per-cent-bc-renters-spend-half-income-housing/.

from being the norm in Canada.[7] Co-ops that are accepting applications for their waiting list can have three-year waits for an interview. This period is even longer for those seeking a rent subsidy.[8] Moreover, non-profit developers[9] must offer competitive bids to purchase property to create new co-ops. However, land prices reflect the high housing demand. Architects for Housing Alienation (AAHA) argues that the barriers preventing "full potential collective ownership are systemic on multiple fronts."[10] Not only is funding required to bid for properties, but it is also required for expensive repairs. Most co-op housing in Canada was built over 35 years ago and require extensive repairs, which require funding through one of three methods:[11]

1. Residents' housing charges
2. Securing financing through banks if mortgages have been paid off
3. Requesting funding from the local government

The government can help alleviate this situation by funding expensive repairs and coordinating policies to improve land supply issues. These strategies would help to reduce the long waiting lists.

Why Are Features of Housing Co-ops Inherently Aligned With This Project?

As housing is a fundamental need and co-ops foster strong community values with a unique governance strategy, housing co-ops offer ethnic Chinese communities a comfortable way to learn about environmentalism. Immigrant communities can often be wary of outsiders, which also contributes to how co-ops can act as a convenient bridge to access sustainable and regenerative practices. Jane Jacobs highlights the need for strategies involving well-integrated green spaces, "People do not use city open space just because it is there and city planners and designers wish they would."[12] For example, this could involve pocket parks, integrated planters or community gardens designed in housing co-ops so residents do not have to visit other parts of the city to access green amenities. This can be achieved as residents vote to control their living environment and challenge existing initiatives that may inadvertently strengthen racist systems, a core part of a co-op's governance strategy. When combined with housing, environmental efforts become an ingrained part of daily life, crucial as people will only partake in environmentalism if it is convenient to their lifestyles. Moreover, by having the autonomy to dictate their living environment, residents can combat initiatives such as Richmond's flood infrastructure prioritizing neighbourhoods with lower ethnic populations (See Chapter 3.)

State of Housing Co-ops in Richmond, B.C.

Understanding the state of affordable housing in Richmond is essential to comprehend why housing co-ops are the most suitable vessel—rather than other affordable housing types—to address the intersectional issues explored in this thesis. The City of Richmond articulates three types of units in

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7 Tara Carman, "Co-Ops Allow People of All Incomes to Live Affordably in Cities. So Why Aren't We Building More?," *CBC News*, March 7, 2022, https://www.cbc.ca/news/canada/co-op-housing-affordability-1.6374412.

8 Carman, "Co-Ops Allow People of All Incomes to Live Affordably in Cities. So Why Aren't We Building More?"

9 Such as the B.C. Community Land Trust

10 "We Demand Collective Ownership," Architects Against Housing Alienation, accessed July 7, 2024, https://aaha.ca/en/demand/collective-ownership.

11 Carman, "Co-Ops Allow People of All Incomes to Live Affordably in Cities. So Why Aren't We Building More?"

12 Jane Jacobs, *The Death and Life of Great American Cities* (New York: Random House, 1961,) 117.

its Affordable Housing Guide.[13] These include (1) non-market housing, (2) housing co-ops, and (3) low-end market rentals (LEMR.)[14] Non-market and LEMR units both offer housing at lower than private market rents, although LEMR units are typically integrated with private developers' projects.[15] Ultimately, neither housing type has a governance strategy like co-ops' and does not necessarily focus on community values.

Considering Richmond saw a 91% increase in homeless individuals between 2020 and 2023, increasing the affordable housing supply would undoubtedly benefit the community.[16] Climate issues exacerbate this crisis, as shelters have turned away homeless individuals amidst extreme weather, unable to accommodate the rising numbers. For example, in November 2021, Union Gospel Mission[17] rejected over 19 people in a single night when there was extreme rainfall.[18] Housing co-ops can alleviate the housing crisis as they provide an affordable type of housing, and their community-orient values can facilitate a culture of resource-sharing, which also provides financial benefits for its residents.

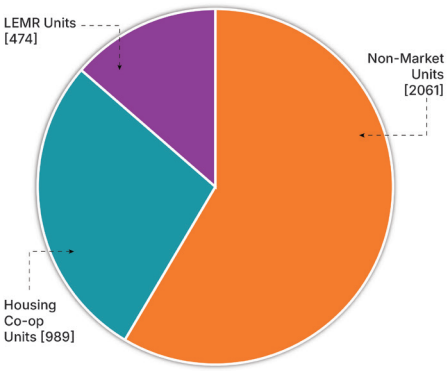


Figure 4.01. Affordable Housing Units in Richmond. 2024. By author. Information from the City of Richmond," Affordable Housing Guide," https://www.richmond.ca/__shared/assets/affordablehousingguide66343.pdf.

13 In addition to rent supplement programs.

14 "Affordable Housing Guide" (City of Richmond, June 2024), https://www.richmond.ca/__shared/assets/affordablehousingguide66343.pdf.

15 Rather than being a stand-alone building

16 "2023 Homeless Count in Greater Vancouver" (Homelessness Services Association of BC, October 2023), https://www.richmond.ca/__shared/assets/homelesscount70604.pdf.

17 A shelter with 92 beds

18 Baneet Braich, "Extreme Weather Creating Unprecedented Demand and Challenges for Shelters in B.C.," *CBC News*, November 27, 2021, https://www.cbc.ca/news/canada/british-columbia/shelters-overrun-following-flooding-1.6263838.

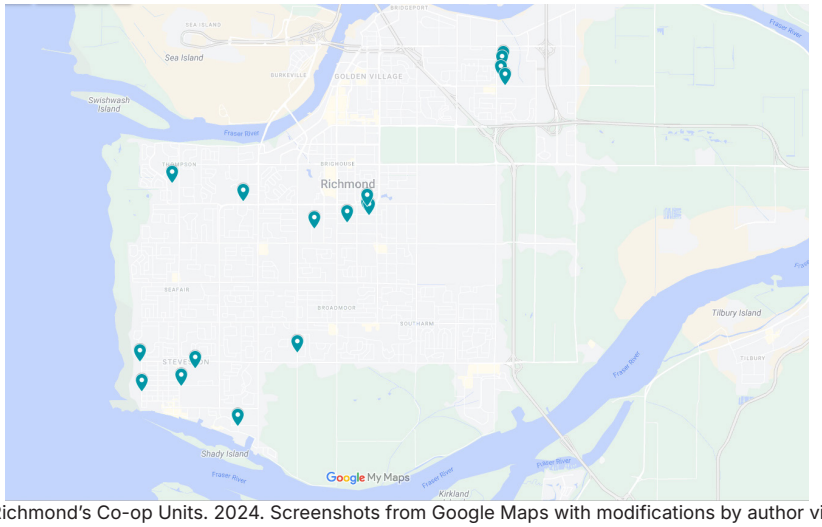


Figure 4.02. Richmond's Co-op Units. 2024. Screenshots from Google Maps with modifications by author via Google My Maps.

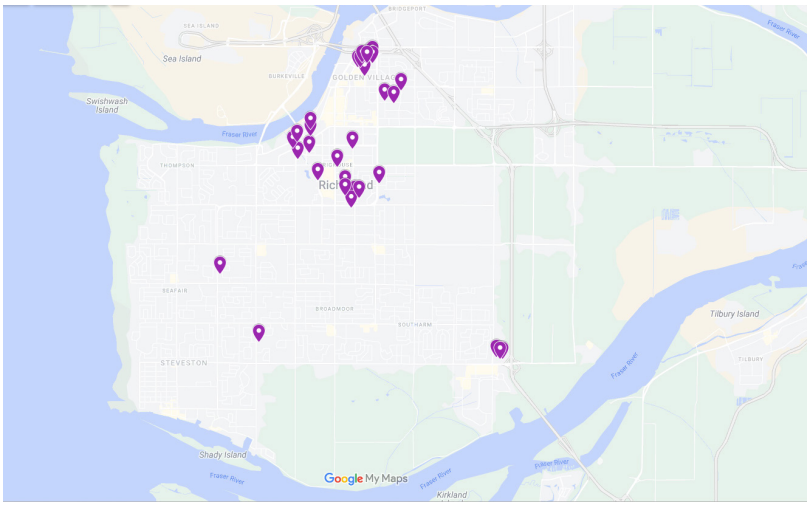


Figure 4.03. Richmond's LEMR Units. 2024. Screenshots from Google Maps with modifications by author via Google My Maps.

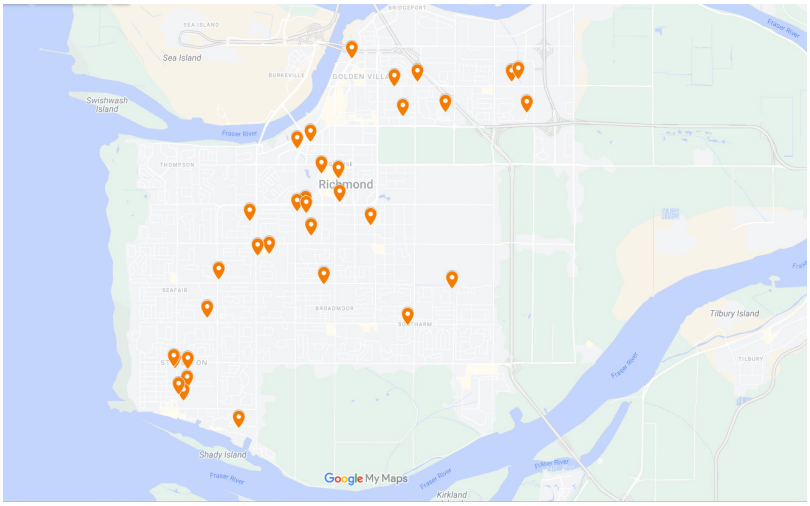


Figure 4.04. Richmond's Non-Market Units. 2024. Screenshots from Google Maps with modifications by author via Google My Maps.

In considering what type of affordable units the city should aim to increase, one must understand what units exist in Richmond. Currently, most affordable housing units are non-market units. Given the benefits of their unique governance strategy and community values, the government should allocate more resources to developing housing co-op units instead. They are the second-most common type of affordable housing type in Richmond, at 989 units.[19] By comparison, there are just over 92,000 co-op units throughout Canada.[20] Therefore, this thesis aims to address housing affordability issues in Richmond through the design of a housing co-op.

19 "Affordable Housing Guide" (City of Richmond, June 2024), https://www.richmond.ca/__shared/assets/affordablehousingguide66343.pdf.

20 Carman, "Co-Ops Allow People of All Incomes to Live Affordably in Cities. So Why Aren't We Building More?"

Table 4.01. Number of individuals experiencing homelessness in Richmond (2005-2023.)

2005	2008	2011	2014	2017	2020	2023
35	56	49	38	70	85	162

Source: Adapted from Homelessness Services Association of BC, '2023 Homeless Count in Greater Vancouver' prepared for the Greater Vancouver Reaching Home Community Entity, https://hsa-bc.ca/_Library/2023_HC/2023_Homeless_Count_for_Greater_Vancouver.pdf.

Table 4.02. Existing Co-op Housing in Richmond.

Name & Address	Total # of Units	Housing Type	Bedroom Type	Eligible Tenants
Benryk Mews Housing Co-op, 8631 Bennett Road	60	Townhouse	2, 3, & 4	Families
Blueberry Vale Housing Co-op, 8640 Bennett Road	60	Townhouse/ Apartment	1, 2, 3, & 4	Seniors, Families, Persons with disabilities
Delta Green Housing Co-op, 12060 Bath Road	72	Townhouse	2, 3, & 4	Seniors, Families, Persons with disabilities
Garry Point Housing Co-op, 1 1631 7th Avenue	64	Townhouse/ Apartment	1, 2, 3, & 4	Seniors, Families
Granville Gardens Housing Co-op, 6800 Lynas Lane	94	Townhouse/ Apartment	1, 2, 3, & 4	Seniors, Families, Persons with disabilities
Greenland Housing Co-op, 12055 Greenland Drive	62	Townhouse	2, 3, & 4	Families
Heron Court Housing Co-op, 3640 No. 5 Road	40	Townhouse	2, 3, & 4	Families
Klahanie Co-op, 4340 Steveston Highway	70	Townhouse	2, 3, & 4	N/A
Maya Housing Cooperative,10771 Gilbert Road	40	Townhouse	2, 3, & 4	Families
Meadow Walk Housing Co-op, 7460 Moffatt Road	63	Townhouse/ Apartment	1, 2, & 3	Seniors, Families, Persons with disabilities
Richmond Heights Housing Co-op, 12411 Trites Road	67	Townhouse	1, 2, 3, & 4	Seniors, Families, Persons with disabilities
River Mist Co-op, 8520 Granville Avenue	44	Townhouse/ Apartment	1, 2, 3, & 4	Families
River's End Housing Co-op, 4080 Garry Street	54	Townhouse/ Apartment	1, 2, 3, & 4	Seniors, Families
Robert Owen Housing Co-op, 12211 Cambie Road	50	Apartment	2, 3, & 4	Families
Sundune Housing Co-op, 8191 General Currie Road	28	Townhouse	2, 3, & 4	Families
Sunset Point Housing Co-op, 2960 Steveston Highway	48	Townhouse	2, 3, & 4	Families
Terra Nova Housing Co-operative, 6600 Barnard Drive	73	Townhouse	2, 3, & 4	Families
	989			

Source: Adapted from the City of Richmond, 'Affordable Housing Guide,' https://www.richmond.ca/__shared/assets/affordablehousingguide66343.pdf.

The CO-CO-MO Framework

Haeccity Architecture's Precedent & Relevance to My Research

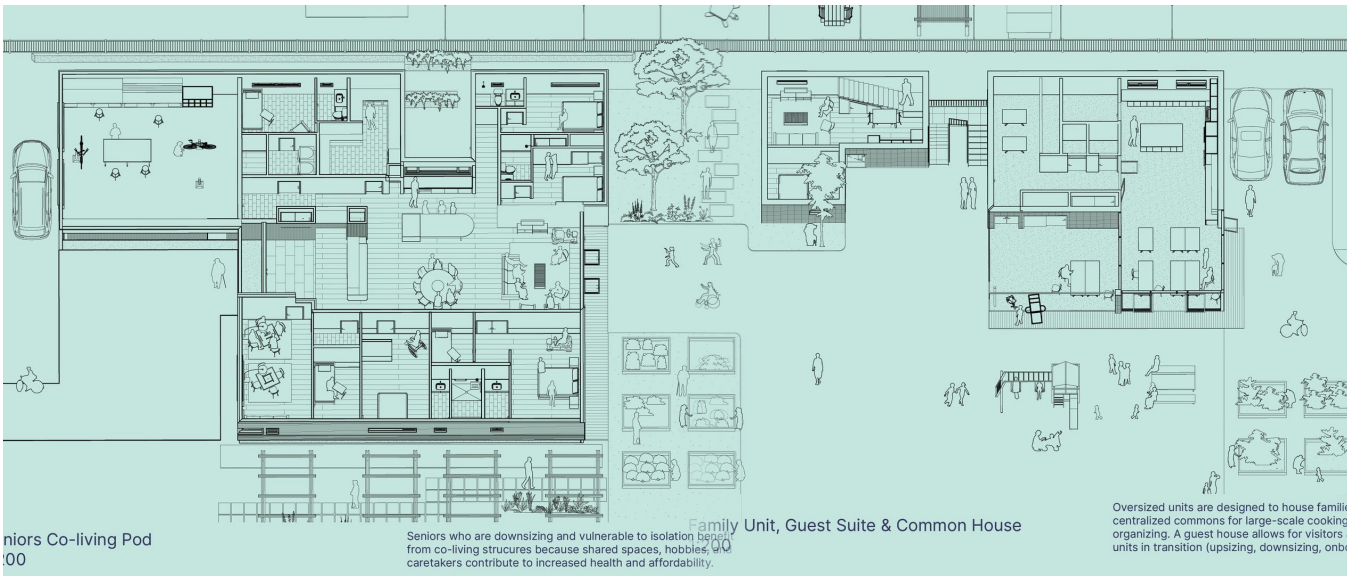
One specific project has informed the framework of my co-op design based on a demand for "non-alienated housing." Architects Against Housing Alienation (AAHA) collaborated with Vancouver's Haeccity Architecture on project *CO-CO-MO*—demanding collective ownership—in Richmond's City Centre near the Garden City Lands.[21] Haeccity Architecture highlights Richmond's ethnoburb status, dominated by "single-family houses on large lots" and "car-oriented urbanism." This site is "leftover from Richmond's agrarian past, a large lot with double street frontage in a largely developed area." The project focuses on social connection and collective action and is a "new typology of grassroots social housing structured around collective design, collective management and collective ownership." It aims to de-commodify and de-financialize housing to combat top-down frameworks found in traditional social housing.[22] Personas for hypothetical occupants were developed based on interviews, local demographics, and observation to inform the design.[23]

Ultimately, *CO-CO-MO's* framework informs this design project. The following section will address how the framework can be adapted to understand Richmond's socio-ecological issues through an intersectional lens.

21 "Venice Architecture Biennale 2023," Haeccity Studio Architecture, accessed July 7, 2024, https://www.haeccity.com/wlog/cocomo.

22 "Venice Architecture Biennale 2023."

23 "We Demand Collective Ownership."



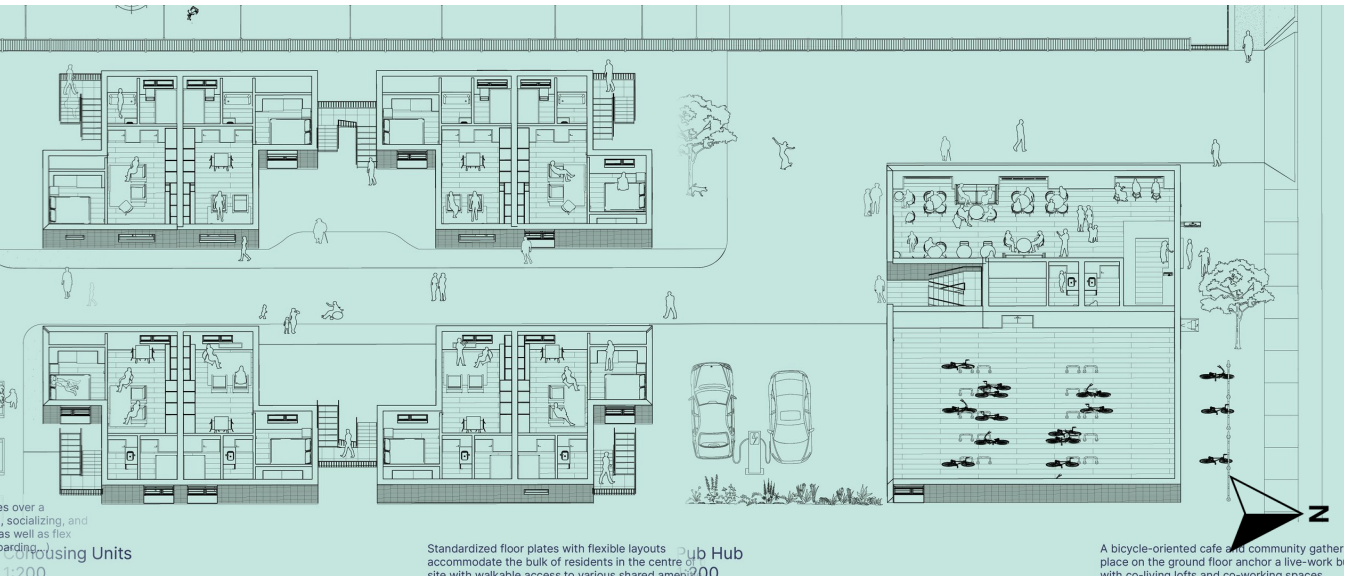
(1) Seniors Co-living Pod

Seniors who are downsizing and vulnerable to isolation benefit from **co-living structures** because **shared spaces, hobbies and caretakers** contribute to increased health and affordability.

(2) Family Unit, Guest Suite & Common House

Oversized units are designed to house families over a centralized commons for large scale cooking, socializing and organizing. A **guest house** allows for visitors as well as flex units in transition (upsizing, downsizing, onboarding...)

Figure 4.05. Plans of Haeccity's Project in Richmond. 2023. Separate images combined by author. Courtesy of Haeccity Studio Architecture (https://www



(3) Cohousing Units

Flexible layouts accomodate the bulk of residents in the centre of the site with walkable access to various shared amenities. **Cohousing** implies shared units/ apartments.

(4) Pub Hub with live-work building

A bicycle-oriented cafe and community gathering place on the ground floor anchor a live-work building with **co-living lofts and co-working spaces**.

.haeccity.com/wlog/cocomo.)

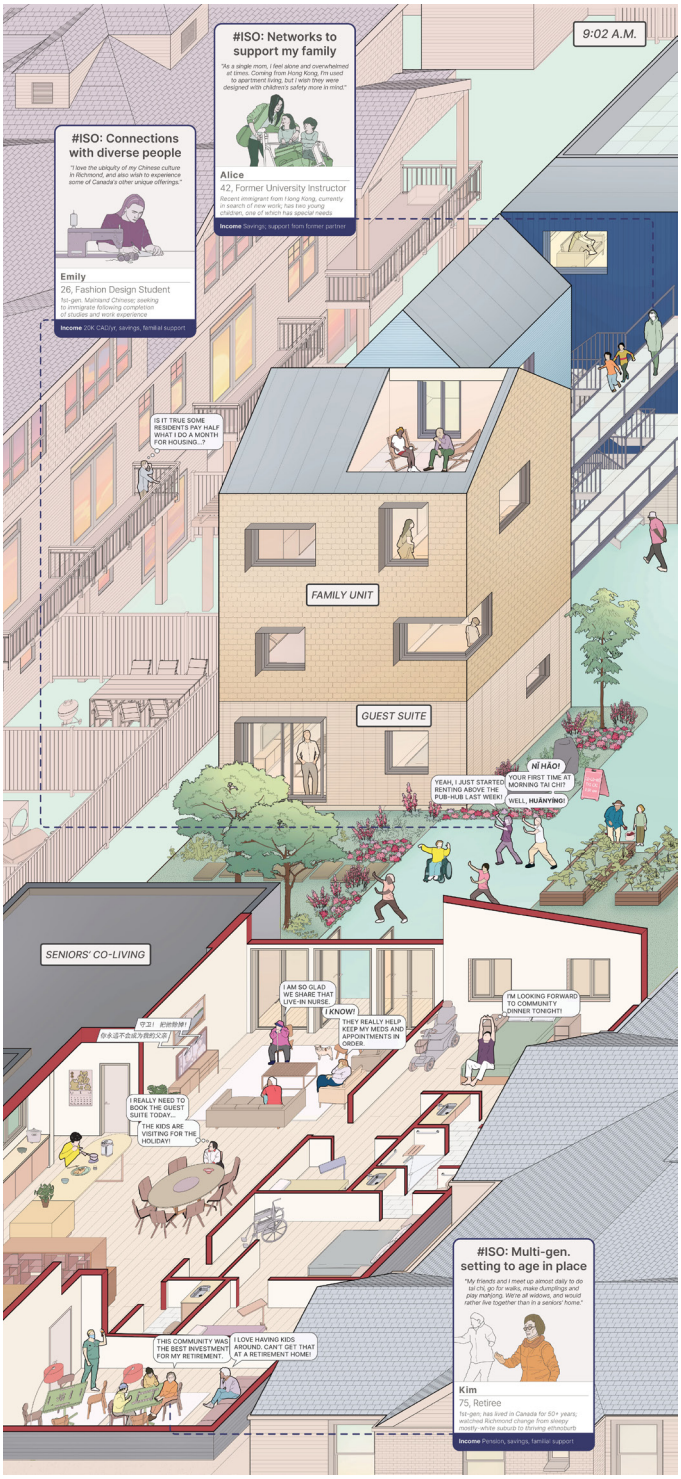


Figure 4.06. CO-CO-MO Project Axonometric (1). 2023. Courtesy of Haeccity Studio Architecture, retrieved from https://www.haeccity.com/wlog/cocomo.

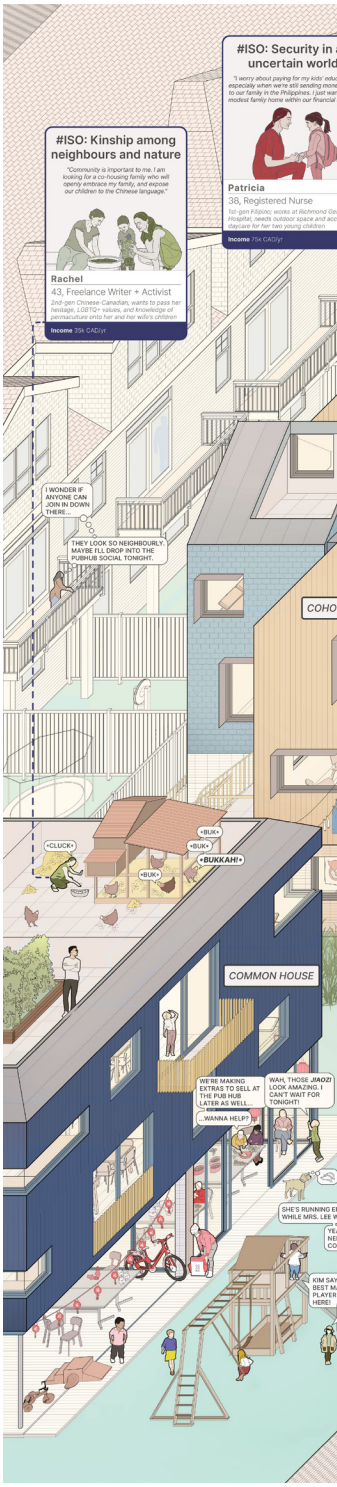


Figure 4.07. CO-CO-MO Project Axono Studio Architecture, retrieved from http



ometric (2). 2023. Courtesy of Haeccity
ps://www.haeccity.com/wlog/cocomo.

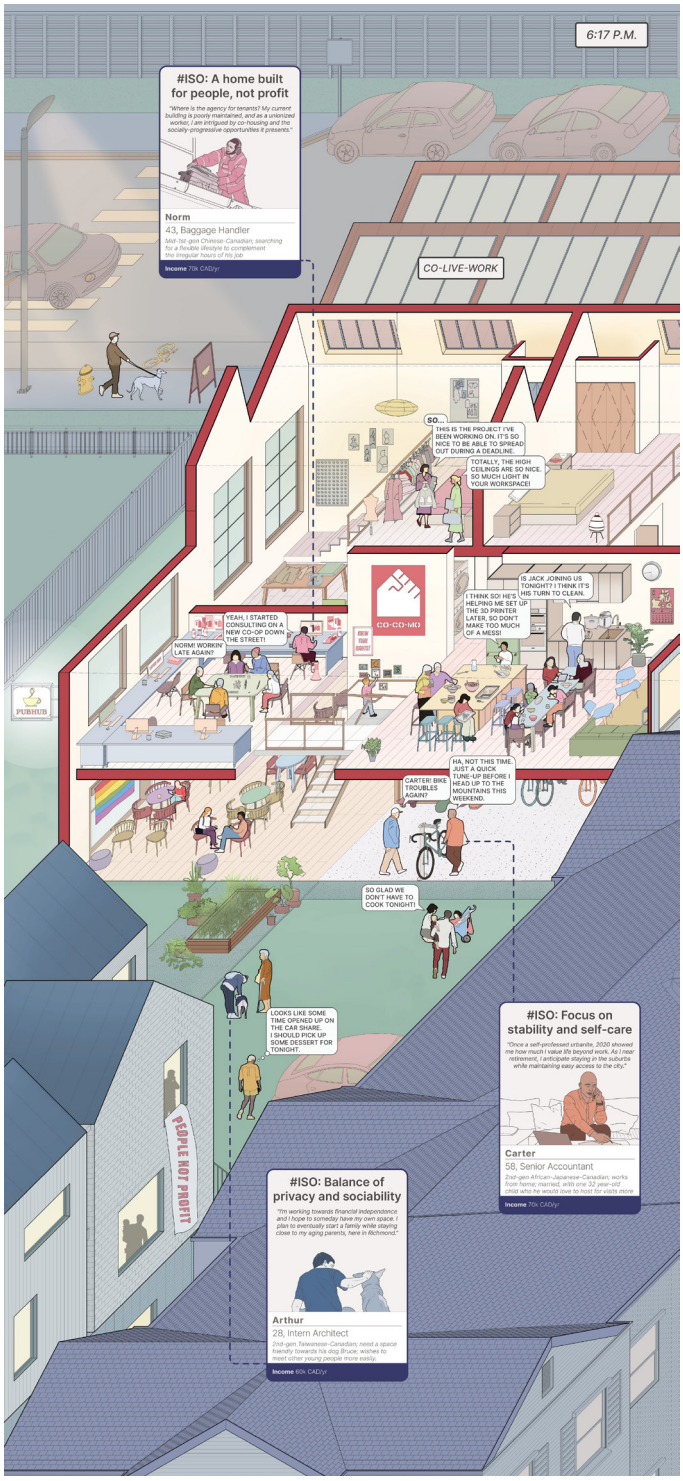
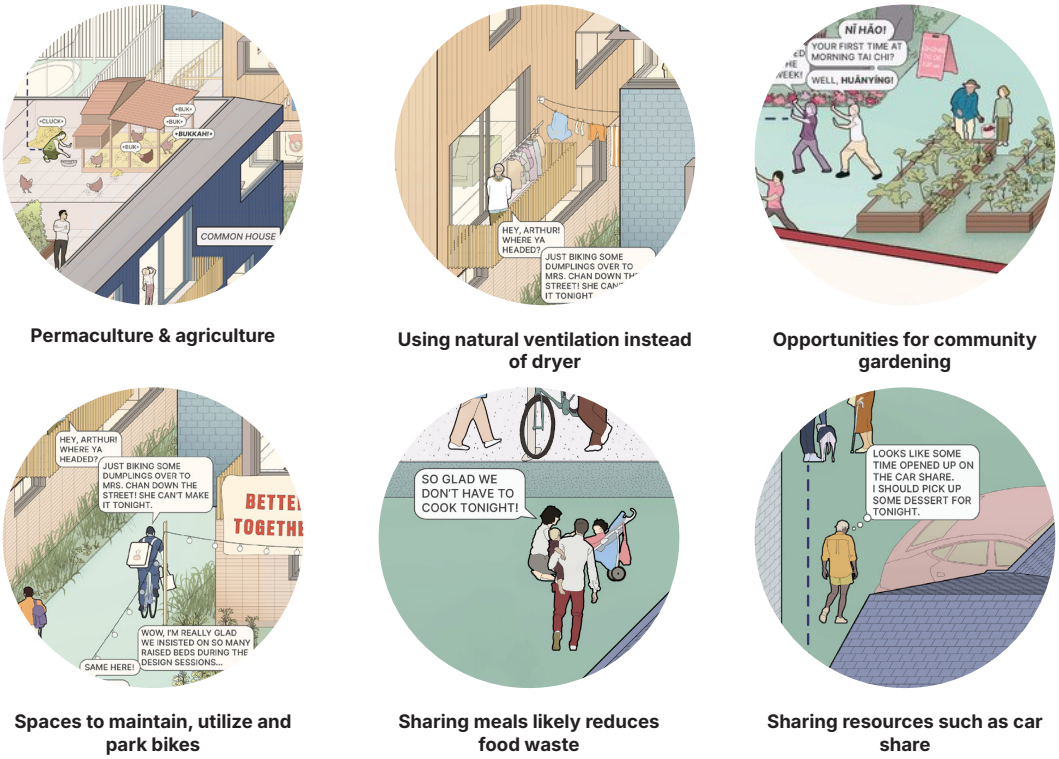


Figure 4.08. CO-CO-MO Project Axonometric (3). 2023. Courtesy of Haeccity Studio Architecture, retrieved from https://www.haeccity.com/wlog/cocomo.

CO-CO-MO is relevant to this thesis for two key reasons. Firstly, the case study project is located in the City Centre, an integral region to this research. Thus, the geographical conditions and socio-environmental issues impacting *CO-CO-MO* and my design overlap. Moreover, although environmentalism is not the only focus of *CO-CO-MO*, Haeccity Architecture's drawings demonstrate how hypothetical characters inhabit space and inadvertently highlight sustainable moments. They illustrate how ethnic minorities' daily actions—performed for cultural or financial reasons—can often benefit the environment.

These moments support Boland and Zhu's suggestion of favouring grassroots environmental strategies instead of top-down ones. They are rooted in minimizing overconsumption (see *Environmentalism for East Asian Ethnic Minorities* in *Chapter 2.)* They demonstrate Liu et al.'s discussion of the "qinjian jieyue" principle, encouraging individuals to spend according to their income and needs.



Permaculture & agriculture

Using natural ventilation instead of dryer

Opportunities for community gardening

Spaces to maintain, utilize and park bikes

Sharing meals likely reduces food waste

Sharing resources such as car share

Figure 4.09. Moments of Sustainability in CO-CO-MO Drawings. 2023. Separate images compiled by author. Courtesy of Haeccity Studio, retrieved from https://www.haeccity.com/wlog/cocomo.

CO-CO-MO's framework involves a (1) co-op tenure, (2) co-housing delivery, and (3) co-living community. While the co-op tenure infers a style of housing governance discussed above, co-living and co-housing can foster sustainable living habits and encourage learning about environmentalism.

Co-housing entails self-contained units, with facilities shared between households. However, co-living is where private spaces are typically limited to the bathroom, bedroom, and potentially a kitchenette. Common spaces "are shared with other residents; these may include a kitchen, living room(s), shared baths and a flexible area where meals and other social gatherings may occur." Thus, the critical difference is that residents have more private space in the co-living model. Ultimately, this means co-op housing can include co-housing or co-living spaces. In the context of CO-CO-MO, the differentiation between co-living and co-housing allows the space to facilitate social interaction at different levels, thereby catering to residents' personal preferences and habits. This ideology is well-aligned with this design thesis, which advocates for environmental strategies that are well-integrated with individuals' daily lives and cultural practices.

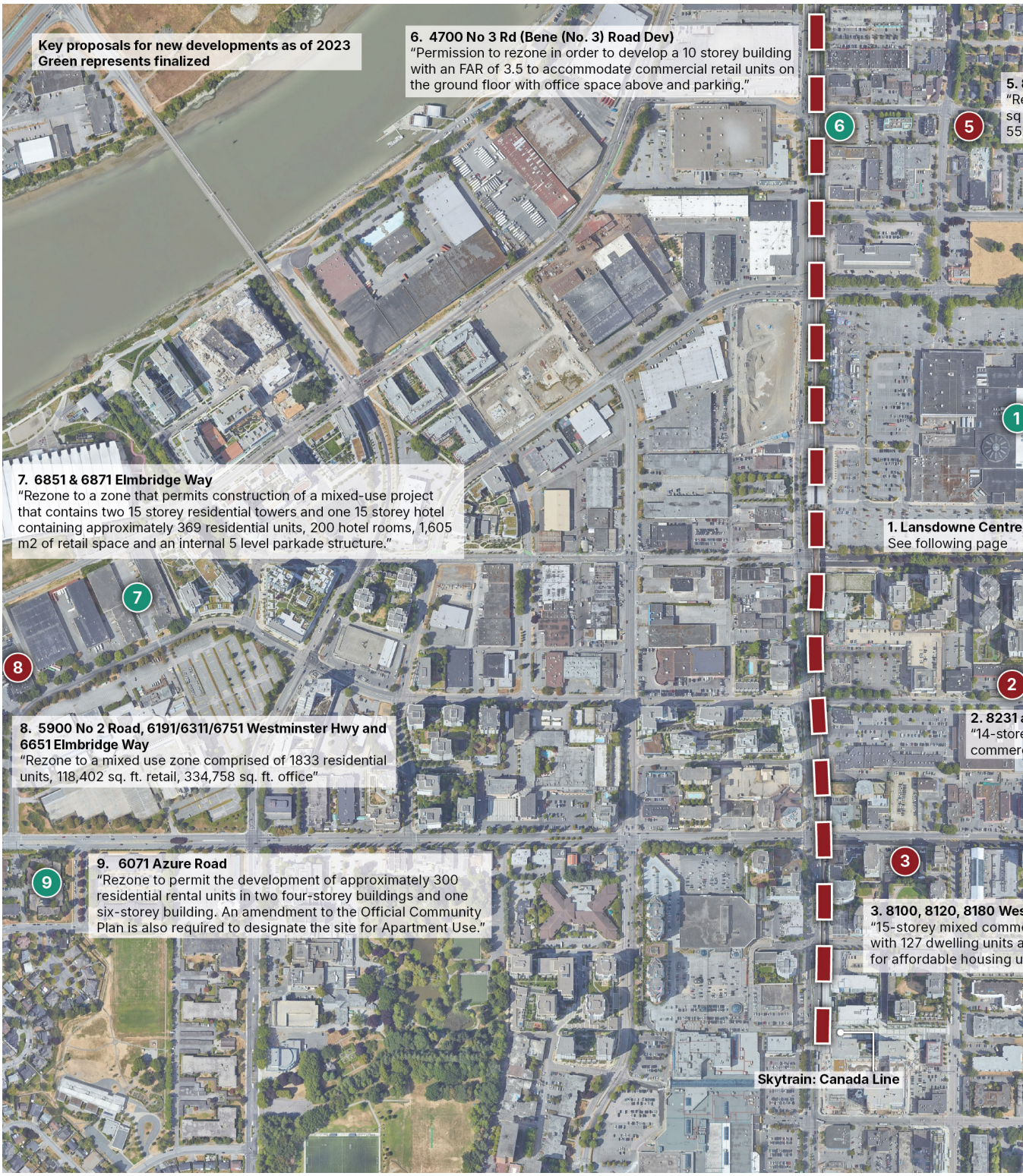

Key proposals for new developments as of 2023
Green represents finalized
6. 4700 No 3 Rd (Bene (No. 3) Road Dev)
"Permission to rezone in order to develop a 10 storey building with an FAR of 3.5 to accommodate commercial retail units on the ground floor with office space above and parking."
7. 6851 & 6871 Elmbridge Way
"Rezone to a zone that permits construction of a mixed-use project that contains two 15 storey residential towers and one 15 storey hotel containing approximately 369 residential units, 200 hotel rooms, 1,605 m2 of retail space and an internal 5 level parkade structure."
1. Lansdowne Centre
See following page
8. 5900 No 2 Road, 6191/6311/6751 Westminster Hwy and 6651 Elmbridge Way
"Rezone to a mixed use zone comprised of 1833 residential units, 118,402 sq. ft. retail, 334,758 sq. ft. office"
9. 6071 Azure Road
"Rezone to permit the development of approximately 300 residential rental units in two four-storey buildings and one six-storey building. An amendment to the Official Community Plan is also required to designate the site for Apartment Use."
Skytrain: Canada Line



Figure 4.10. Key Proposals for New Developments as of 2023 (Green Represents Finalized.) 2024. By author. Adapted from aerial photograph courtesy of Google Earth. Information from the City of Richmond, retrieved via "2023 Development Applications in Process," https://www.richmond.ca/__shared/assets/2023Devapp66199.pdf.

Strategy Comparison the Lansdowne Centre Redevelopment

Figure 4.10 above spotlights proposed and approved developments.[24] Of these examples, the Lansdowne Centre Redevelopment is the most prominent project. Lansdowne Centre opened in 1977[25] and has since become catered towards Chinese communities. Its anchor tenant is the T&T Supermarket, which sells Asian groceries.[26]

However, the massive ongoing redevelopment needs more affordable rental units to support the community. With a staggering site area of 50 acres,[27] the site will become home to 24 mid-rise towers, retail, entertainment, office space, residential units, a community amenity building, and a public park and civic plaza.[28] There will be 4,300 housing units, including LEMR units.[29] Phase 1A of construction has begun and will include around 13.5% affordable rentals.[30] Considering the B.C.'s expensive private market housing and over 15.9% of Richmond's population were categorized as low-income in 2020,[31] the proportion of affordable rental units in the Lansdowne Redevelopment project is arguably insufficient.

Lansdowne Centre is a massive project, which can indicate a series of operational and construction issues (See *Critique of GCL* in Chapter 3,) including setbacks in construction, which delay when residents can reap the benefits of these ambitious architectural projects. Moreover, having LEMR units amidst private-sector housing involves the social mixing of different income groups, which may lead to greater segregation.[32] Thus, my smaller-scaled design aims to create housing only to serve low—to middle-income communities where the residents' cultures are more relatable.

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24 As of 2023

25 Matthew Hoekstra, "Flashback Friday: Woodward's $1.49 Day All but a Distant Memory," *Richmond News*, December 5, 2015, sec. In the Community, https://www.richmond-news.com/in-the-community/flashback-friday-woodwards-149-day-all-but-a-distant-memory-3022889.

26 "Directory," Lansdowne Centre, accessed July 7, 2024, https://lansdowne-centre.com/directory/.

27 The total floor area of this development will reach six million square feet.

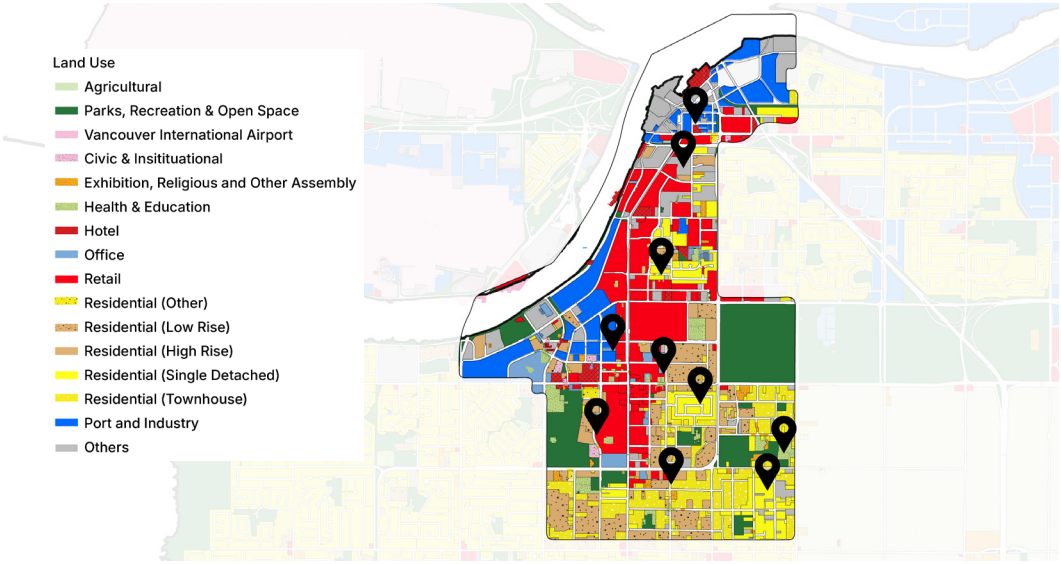
28 Kenneth Chan, "Lansdowne Centre Closing in 2025 for Redevelopment into 24 Towers (RENDERINGS)," February 28, 2018, https://dailyhive.com/vancouver/lansdowne-centre-lansdowne-district-richmond-redevelopment-2025.

29 Vikki Hui, "Richmond under Construction: What Is That Structure in the Lansdowne Parking Lot?," *Richmond News*, March 22, 2024, sec. Local News, https://www.richmond-news.com/local-news/richmond-under-construction-what-is-that-structure-in-the-lansdowne-parking-lot-8490305.

30 141 units

31 Government of Canada, "2021 Census of Population," Statistics Canada, November 15, 2023, https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E.

32 Iain Lindsay, "Social Mixing: A Life of Fear," *Urbanities* 2, no. 2 (November 2012), https://www.anthrojournal-urbanities.com/wp-content/uploads/2015/11/Iain-Lindsay-Social-Mixing-1.pdf.





1. 5731 Minoru Blvd



2. 67-68 Lechow St



3. 8320 Brownell Rd



4. 8351 Spires Rd



5. 8860 Beckwith Rd



6. 9740 Alberta Rd



7. Concord Gardens South Estates_3311 Ketcheson Road



8. The Palms - 7080 St Albans Road



9. Units at Lexington Square_5500 Cooney Rd



10. Units at Minoru Garden Apartments_6451 Minoru Blvd

Figure 4.11. Building Documentation Exercise. 2024. By author. Adapted from GIS Data courtesy of Metro Vancouver (https://arcg.is/fimfP1.) Building screenshots courtesy of Google Maps.

Site Selection

Building Documentation Exercise for the City Centre Region

The design proposal will be located in the City Centre planning area, which is home to a higher concentration of ethnic communities (See *Mapping exercises: Ethnic & Immigrant Communities* in Chapter 1.) Land uses here also differ from those in the remainder of Richmond, typically dominated by single-family dwellings and agricultural lands.

Relative to the rest of Richmond, there are many commercial properties here, aligned with the Canada Line SkyTrain, which predominantly runs along No.3 Road.[33] As discussed in Chapter 1,[34] public transit is crucial to the experience of marginalized groups, as attracts commercial developments and community amenities, while conveniently connecting Richmond's residents to different parts of Metro Vancouver. Moreover, Richmond's SkyTrain is situated appropriately to serve marginalized populations. The SkyTrain Canada line[35] opened on August 17th, 2009. Four stations are located along No. 3 Road, including—from North to South—Bridgeport, Aberdeen, Lansdowne and Richmond-Brighouse (See Figure 4.12.) Capstan station is being constructed between Bridgeport and Aberdeen stations and is scheduled to be opened in Mid-2024.[36] Bridgeport station connects the stations on No.3 Road to the Vancouver International Airport (Figure 4.13.) Other significant developments nearby include a 4-billion CAD waterfront redevelopment, which was approved in late May 2024.[37]

33 Chan, "Lansdowne Centre Closing in 2025 for Redevelopment into 24 Towers (RENDERINGS.)"

34 In *Mapping exercises: Exploring Correlations between demographics and transit* in Chapter 1

35 The Skytrain's Canada Line serves Richmond

36 "Capstan Station," TransLink, accessed July 7, 2024, https://www.translink.ca/plans-and-projects/projects/rapid-transit-projects/capstan-station.

37 Yasmin Gandham, "City Council Greenlights Major Redevelopment of Richmond Night Market Site," *CTVNews*, May 29, 2024, sec. Vancouver, https://bc.ctvnews.ca/city-council-greenlights-major-redevelopment-of-richmond-night-market-site-1.6906215.

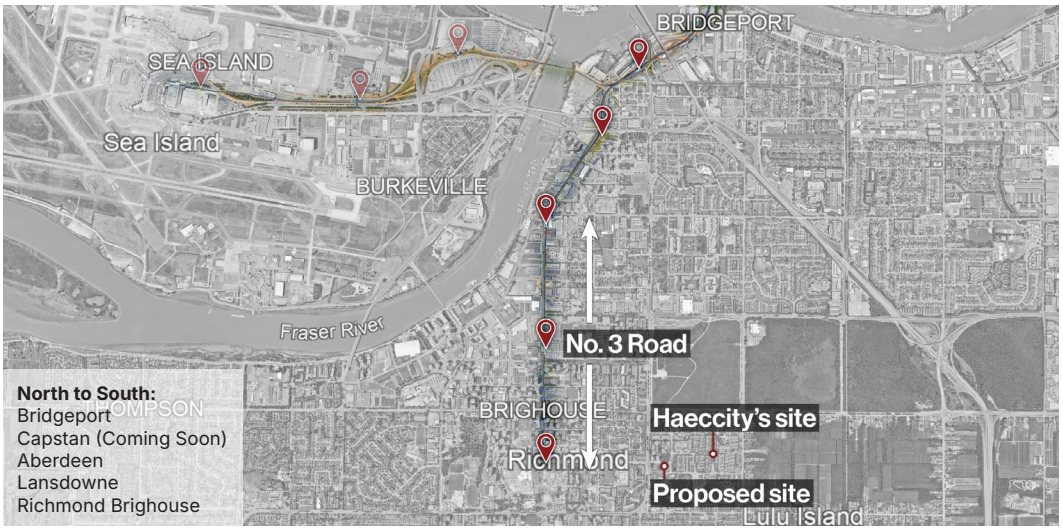


Figure 4.12. Richmond's Transit System. 2024. By author. Adapted from aerial photograph courtesy of Google Maps. Information from TransLink (https://www.translink.ca/schedules-and-maps/transit-system-maps.)

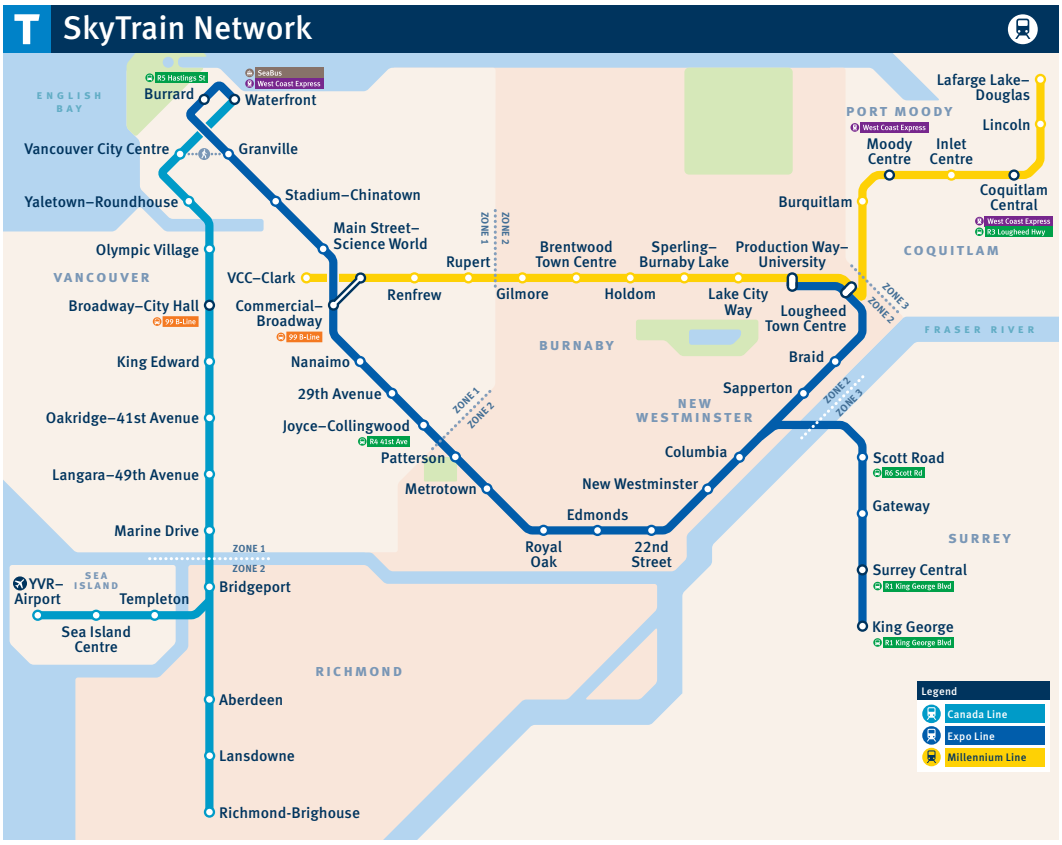
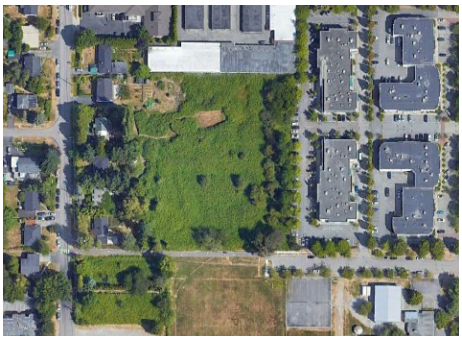


Figure 4.13. Skytrain System Map. Effective January 1, 2024. Courtesy of TransLink (https://www.translink.ca/schedules-and-maps/transit-system-maps.)

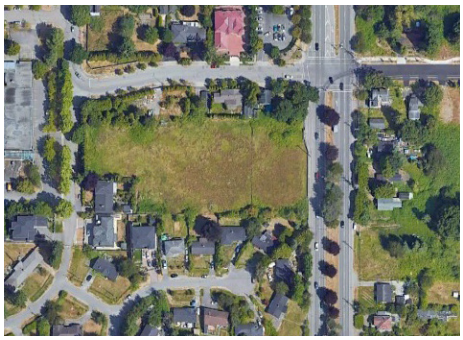
Shortlisted Sites and Final Site Selection

I identified vacant sites in the City Centre planning area without confirmed development plans, then narrowed down the options to sites 5 and 6, which were closest in size to Haeccity Architecture's site at 3,500 square meters. The intention is to better utilize the *CO-CO-MO* framework and considerations in this design project.

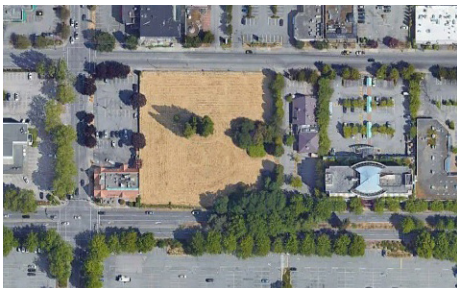
The *CO-CO-MO* site is narrow and linear in shape. Hence, I decided to move forward with site 5 (9200-9260 Cook Road) to explore different site conditions and understand how the framework can be spatially applied to alternate conditions. The intention is for the largest property on site (9233 Cook Road) to serve as the site for the proposed building, while the smaller secondary sites on the northeastern corner (9200 and 9260 Cook Road) to become a pocket park to serve the local community.



Potential Site 1
Address: 4166, 4180, 4340 Brown Rd
Site Area: 8,094m^2



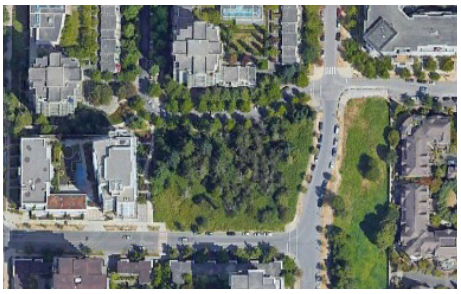
Potential Site 2
Address: 8660-8780 Odlin Cr, 4331 Garden City Rd
Site Area: 12,645m^2



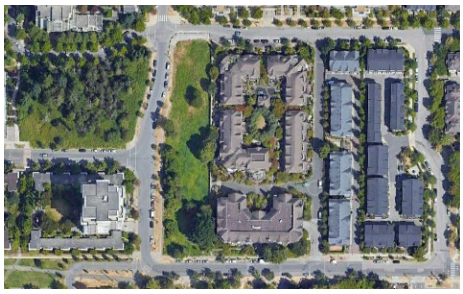
Potential Site 3
Address: 8220-8280 Alexandra Rd
Site Area: 8,694 m^2



Potential Site 4
Address: 8680 Alexandra Rd
Site Area: 6,480 m^2



Potential Site 5
Address: 9200-9260 Cook Rd
Site Area: 4,399 m^2



Potential Site 6
Address: 9271 Alberta Rd
Site Area: 3,929 m^2

Figure 4.14. Preliminary Sites. 2024. By author. Adapted from aerial photographs courtesy of Google Earth. Information from Richmond Interactive Map (https://maps.richmond.ca/rim/.)



Figure 4.15. 9200-9260 Cook Road. 2024. By author. Adapted from aerial photograph courtesy of Google Earth. Information from Richmond Interactive Map (https://maps.richmond.ca/rim/.)

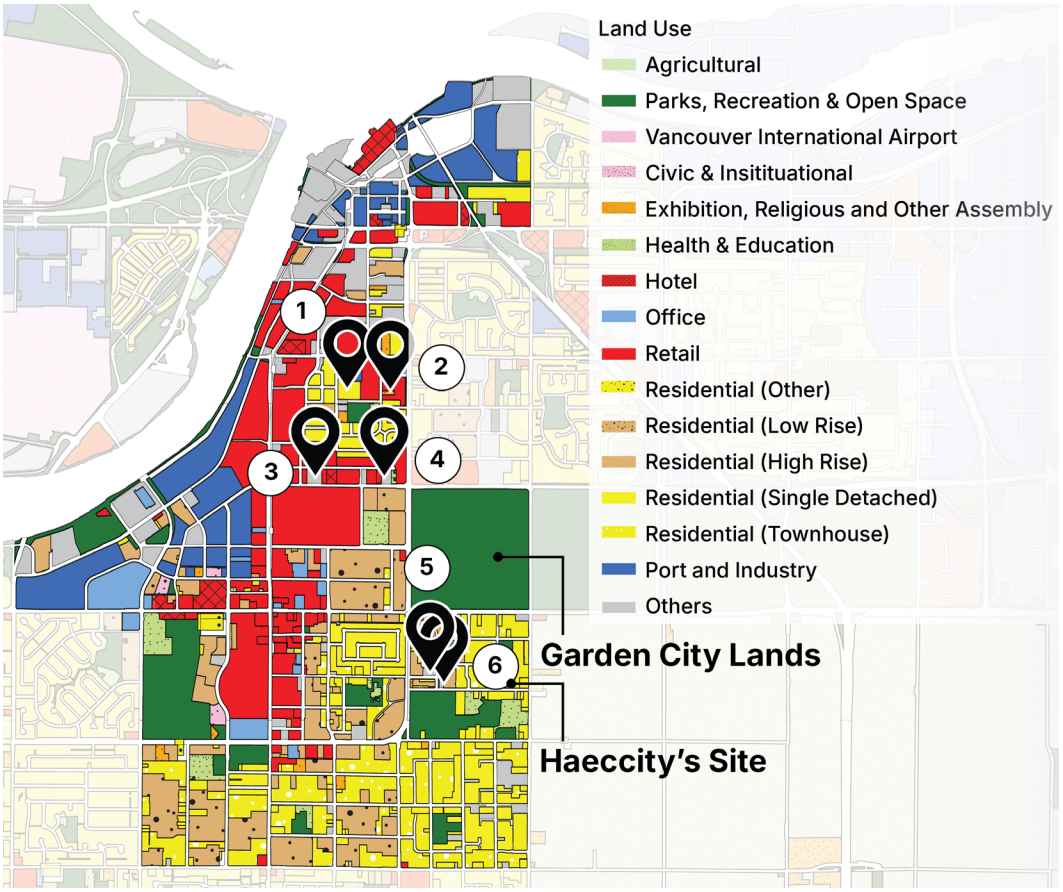


Figure 4.16. Map of Shortlisted Sites. 2024. By author. Adapted from GIS Data courtesy of Metro Vancouver (https://arcg.is/fimfP1.) Information from City of Richmond (https://archives.richmond.ca/archives/maps/map-search.aspx) and Google Maps.

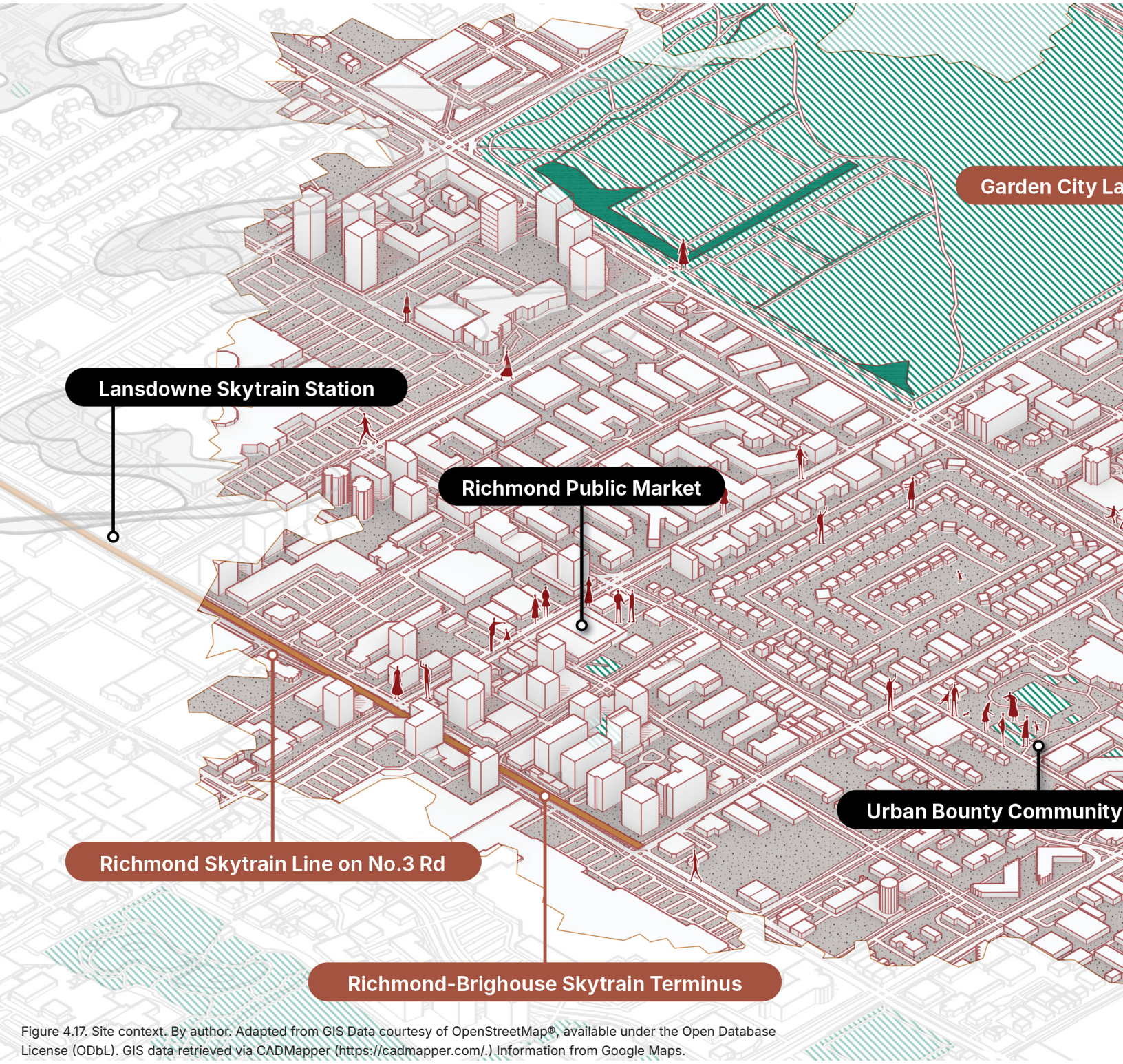
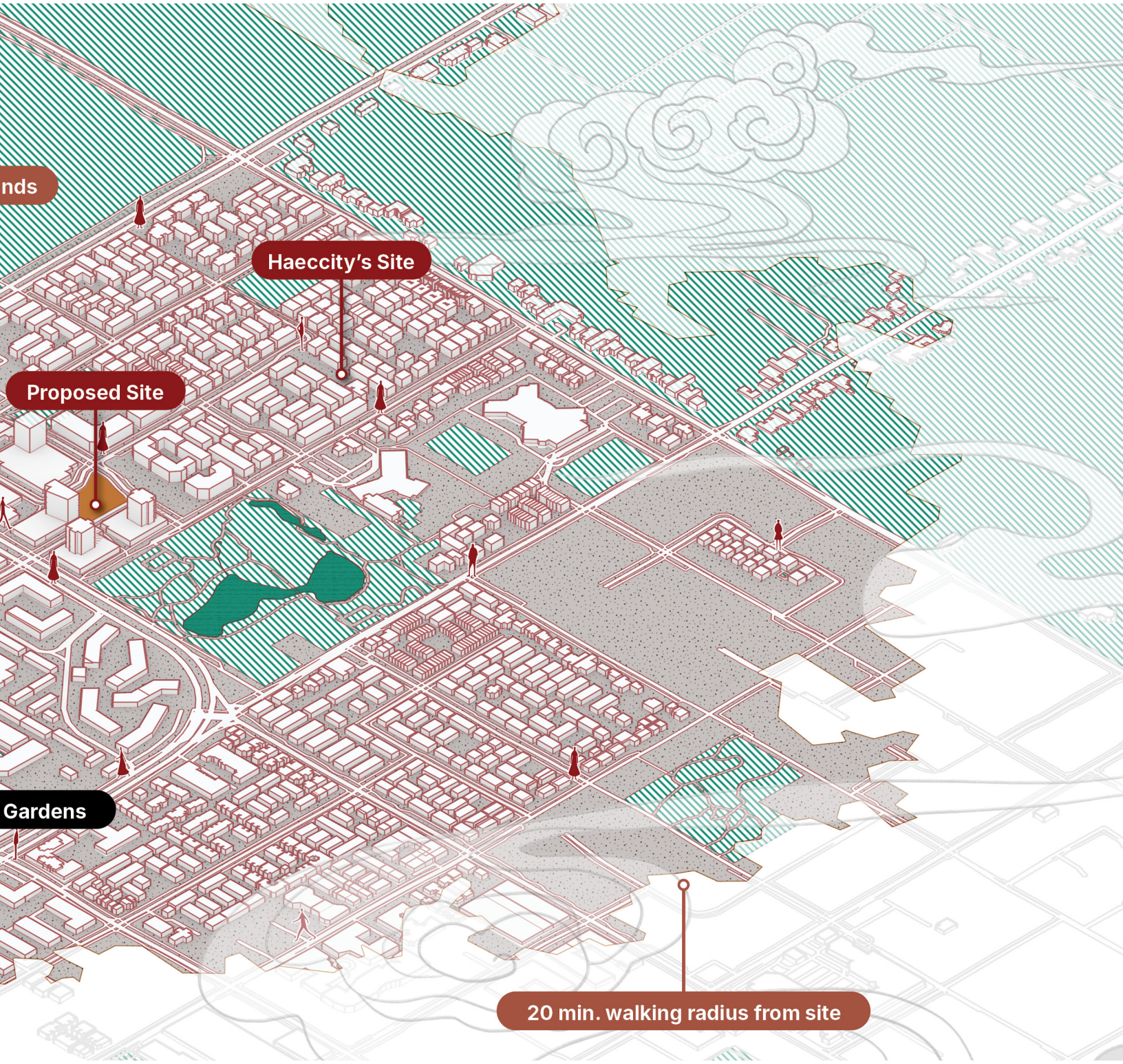


Figure 4.17. Site context. By author. Adapted from GIS Data courtesy of OpenStreetMap®, available under the Open Database License (ODbL). GIS data retrieved via CADMapper (https://cadmapper.com/.) Information from Google Maps.


nds
Haeccity's Site
Proposed Site
Gardens
20 min. walking radius from site

Site Analysis

Various community amenities are within a 20-minute walking radius of the site (9200-9260 Cook Road), including the Garden City Lands, three community gardens under Urban Bounty's network, the Richmond-Brighouse SkyTrain station, and the Richmond Public Market.

The site is adjacent to high-rise residential buildings on the north, west, and south. Most of these 14-to-16 storey buildings consist of ground-level residential units. However, *Garden City—Residences on a Park* on the southwest (see Figure 4.18 below) has a preschool on the ground floor, highlighting an opportunity to create a public corner.

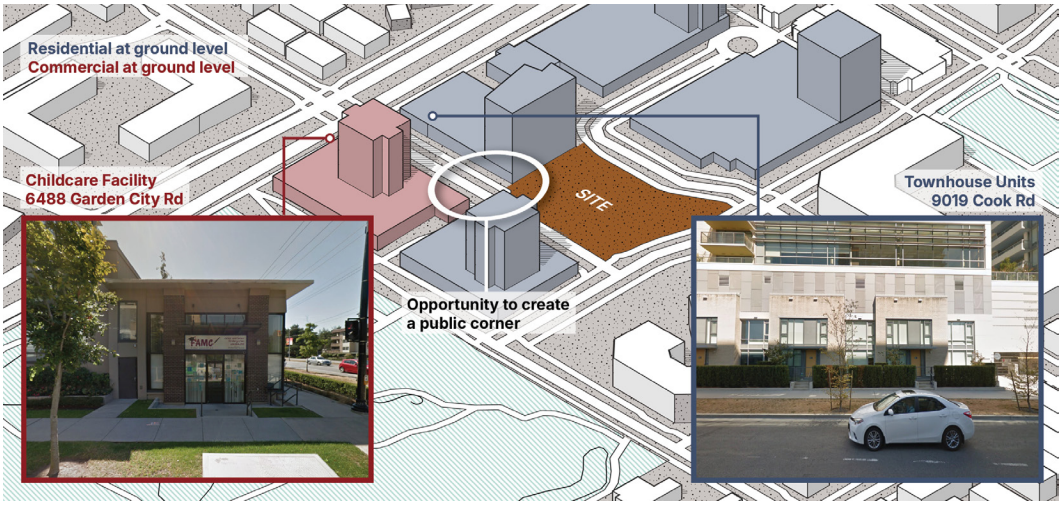


Figure 4.18. Context of Surrounding Buildings. 2024. By author. Adapted from GIS Data courtesy of OpenStreetMap®, available under the Open Database License (ODbL). GIS data retrieved via CADMapper (https://cadmapper.com/.) Information from Google Maps, screenshots courtesy of Google Maps.

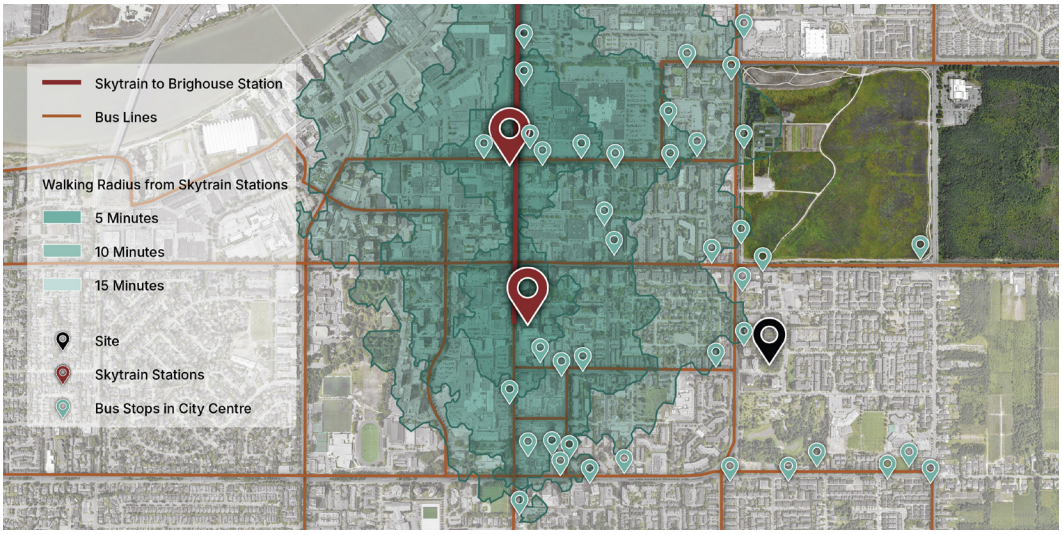


Figure 4.19. Transit Diagram. 2024. By author. Adapted from aerial photograph courtesy of Google Earth. Information from Google Maps. Walking radius traced from TravelTime. (https://traveltime.com/docs/api/overview/introduction.)

On foot, the site is over 15 minutes from Richmond-Brighouse, the nearest SkyTrain station. However, several bus stations are nearby, with the closest one on Garden City Road. A site entrance towards the west would be more convenient, as transit options are predominantly west of the proposed site.

A series of low-rise constructions, predominantly consisting of townhouses and an empty site on the opposite side of Katsura Street, are located east of the site. Consideration should be given to this area to avoid a drastic and abrupt height change. Moreover, the Garden City Community Park and Arboretum is an ample green space south of the proposed site. There is an opportunity to design moments on the building's south side to prioritize this view, especially given the importance of green space to facilitating urbanism (see Chapter 2: Literature Review.)



Figure 4.20. Site Context Diagrams. 2024. By author. Adapted from aerial photograph courtesy of Google Earth and screenshots courtesy of Google Maps.

Finally, passive design is a crucial consideration, especially given B.C.'s severe heat waves with temperatures over 40 degrees Celsius in recent years.[38] ventilation can be an effective cooling strategy in summer. Figure 4.21 below highlights the dominant wind direction—between east and west—in Vancouver from June to September.

38 Kathy Michaels, "B.C. Weather: Temperature Soars Past 40 C in 5 Cities amid Heat Wave | Globalnews.Ca," *Global News*, accessed July 7, 2024, https://globalnews.ca/news/9899535/bc-heat-wave-5-cities-eclipse-40-c/.

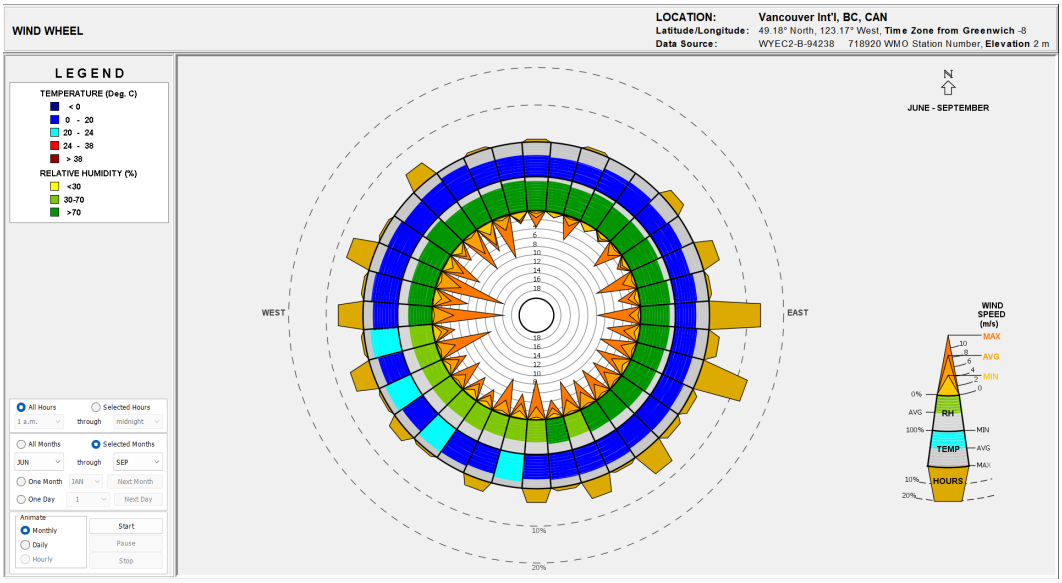


Figure 4.21. Vancouver Wind Rose (June to Sept.) Exported August 2024. Output from Climate Consultant 6.0, developed by the UCLA Energy Design Tools Group. Copyright © 2016 The Regents of the University of California. All Rights Reserved. Climate data retrieved from EnergyPlus (https://energyplus.net/weather.)

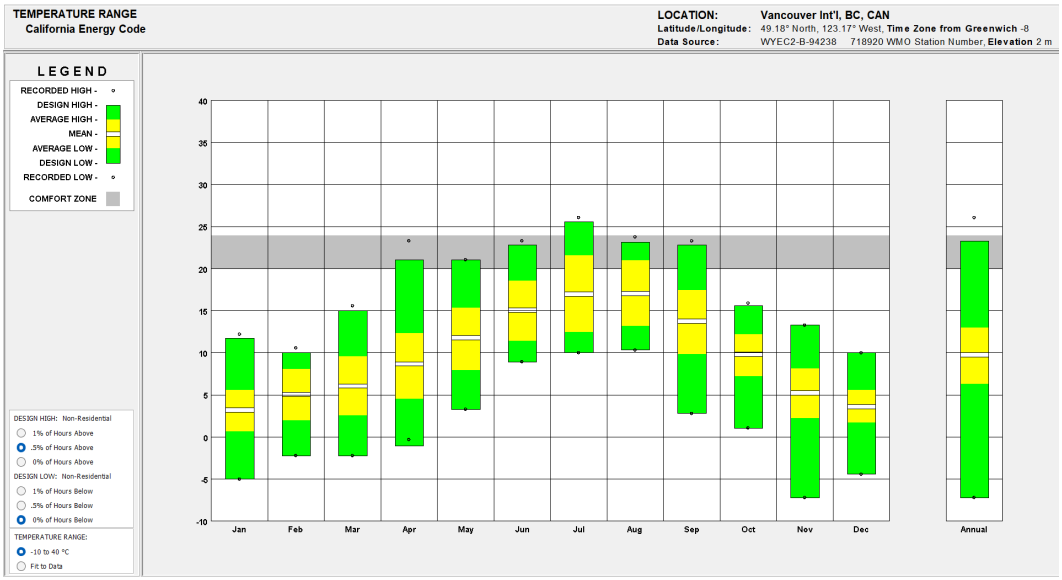


Figure 4.22. Average temperatures in Vancouver. Exported August 2024. Output from Climate Consultant 6.0, developed by the UCLA Energy Design Tools Group. Copyright © 2016 The Regents of the University of California. All Rights Reserved. Climate data retrieved from EnergyPlus (https://energyplus.net/weather.)

Rezoning Proposal

My design proposal assumes a successful rezoning application to the ZHR9[39] category to allow a maximum building height of 47.0 m geodetic. Currently, the site is classified under the RSM/XL category (Small-Scale Multi-Unit Housing[40]); this has changed from the RS1/F (Single Detached) category earlier in 2024. Overall, this site is designated for small residential projects. However, the surrounding buildings are all high-rises at 14 to 16 storeys tall. While Co-ops typically used to be much smaller (Figure 4.24,) the building scale must be much bigger in this land economy to address land scarcity and the high housing demand. This is evident through B.C.'s recent shift towards high-rise constructions. Examples include ongoing Vancouver-based projects such as Sen̓áḵw—which will provide over 6000 rental units[41] across 11 towers[42]—and the Oakridge Centre Redevelopment, which will provide over 3300 new homes.[43] This shift is also visible in Richmond (Figure 4.25). Thus, considering the local context, designing a high-rise building would be more appropriate for this site.

39 High Rise Apartment – North McLennan (City Centre)

40 With a maximum height of 9 meters

41 "Vision," Sen̓áḵw, accessed October 6, 2024, https://senakw.com/vision.

42 "Design," Sen̓áḵw, accessed October 6, 2024, https://senakw.com/design.

43 "Oakridge," Henriquez Partners Architects, accessed October 6, 2024, https://henriquezpartners.com/projects/oakridge/.

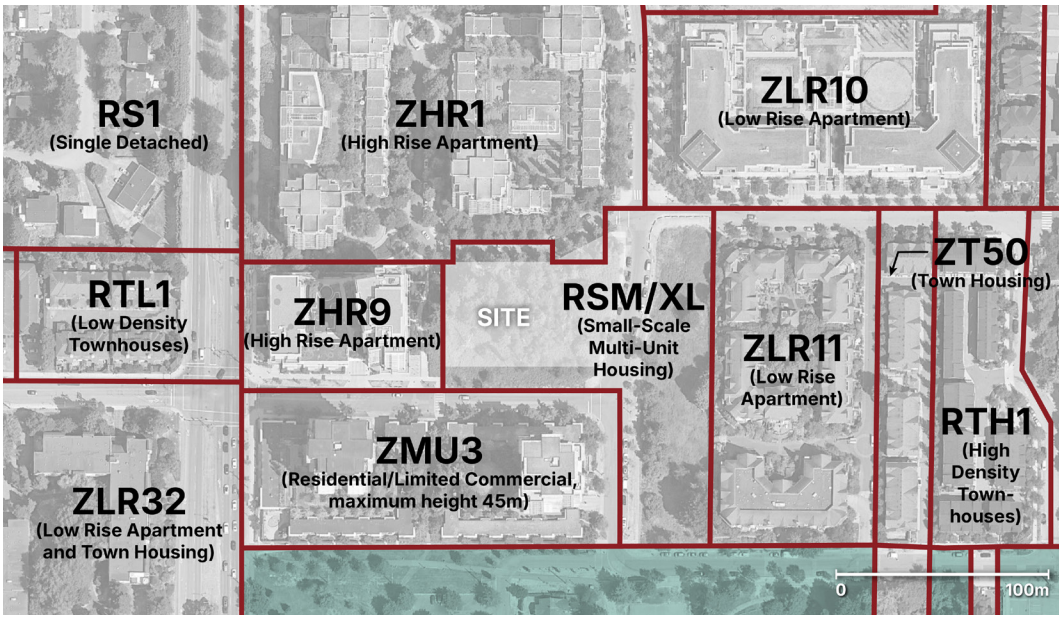


Figure 4.23. Zoning of Site and Context Building. 2024. By author. Adapted from aerial photograph courtesy of Google Earth. Information from Richmond Interactive Map (RIM) https://maps.richmond.ca/rim/.



Figure 4.24. Blueberry Vale Housing Co-Operative (Top) and Robert Owen Housing Co-Operative (Bottom). Screenshots compiled in 2024. Screenshots courtesy of Google Maps.



Luxe Lansdowne
12 to 15-storey buildings
Image shows construction progress in May 2024

The Paramount
15-storey buildings
Image shows construction progress in January 2021

Figure 4.25. Recent High-Rise Constructions In Richmond. 2024. By Author. Adapted from GIS Data courtesy of OpenStreetMap®, available under the Open Database License (ODbL). GIS data retrieved via CADMapper (https://cadmapper.com/.) Screenshots courtesy of Google Maps. Information from Vancouver New Condos (https://www.vancouvernewcondos.com/properties/luxe-lansdowne-richmond/ and https://www.vancouvernewcondos.com/properties/the-paramount-in-richmond/.)

The Design Concept

Initial Concept and Program

The literature review and urban-scale chapters highlight the importance of finding convenient ways to participate in environmentalism rooted in locals' existing lifestyles. Thus, a crucial part of the concept is finding something the wider community can relate to.

Food is a collective language that allows humans to feel a sense of home and an aspect of culture that immigrants can transport between different countries. Communal dining, as shown in the CO-CO-MO axonometric drawings, is also an inadvertent moment of sustainability as it helps to minimize food waste. Thus, communal dining inspired this design's concept and will materialize through three layers of features:



Figure 4.26. Concept Diagram - How the Concept of Dining and Food Materializes Spatially. 2024. By author. Adapted from photographs by author and screenshot of Community Garden courtesy of Google Maps.

1. An opportunity for locals to grow vegetables on site, including choy (Asian greens)
2. A weekly produce market on-site, inspired by Hong Kong and Mainland China's wet markets
3. Communal dining areas inspired by Chinese family meals

The first feature provides residents with fresh foods and the autonomy to grow vegetables of their own liking. On the other hand, the second feature allows local growers to make money through their crops. While Urban Bounty currently prohibits its gardeners from selling their crops grown at the community gardens, this thesis advocates for a policy amendment to provide gardeners with a new financial opportunity, while providing the local community with fresh produce.[44] Nonetheless, there are abundant gardening opportunities within this project's design, with an intention for crops from these spaces to be sold on site. This feature is sustainable, as wet markets often use less plastic packaging and have a lower carbon footprint than supermarkets. The benefit of the third feature is minimizing food waste while consolidating cooking efforts amongst the co-op's residents.

44 "Richmond Community Gardens Rules and Agreements 2024" (Urban Bounty, 2024), https://www.urbanbounty.ca/wp-content/uploads/2023/12/Rules-and-Agreements-2024-Version.pdf.

produce market

ers, Lower environmental ackaging, Fresh produce

3. Communal Dining area

Minimize food waste, Consolidates cooking efforts

ets in HK/China



Cultural practice of dining together



In particular, the communal dining feature will be designed in layers, inspired by two different examples. The first example is families bringing food, tables, and chairs to public streets to dine in the 20th century. Each family and household still has the privacy of their own table, yet households informally share dishes. I refer to this habit through the movie *Echoes of the Rainbow*, set in the 1960s British Hong Kong.[45] The second example is the typical 'family dinner,' often held to celebrate

45 The_FilmPost, "Breaking Down the Symbols in Echoes of the Rainbow," *Medium* (blog), January 9, 2022, https://thefilmpost.medium.com/breaking-down-the-symbols-in-echoes-of-the-rainbow-f0297b020ce0.

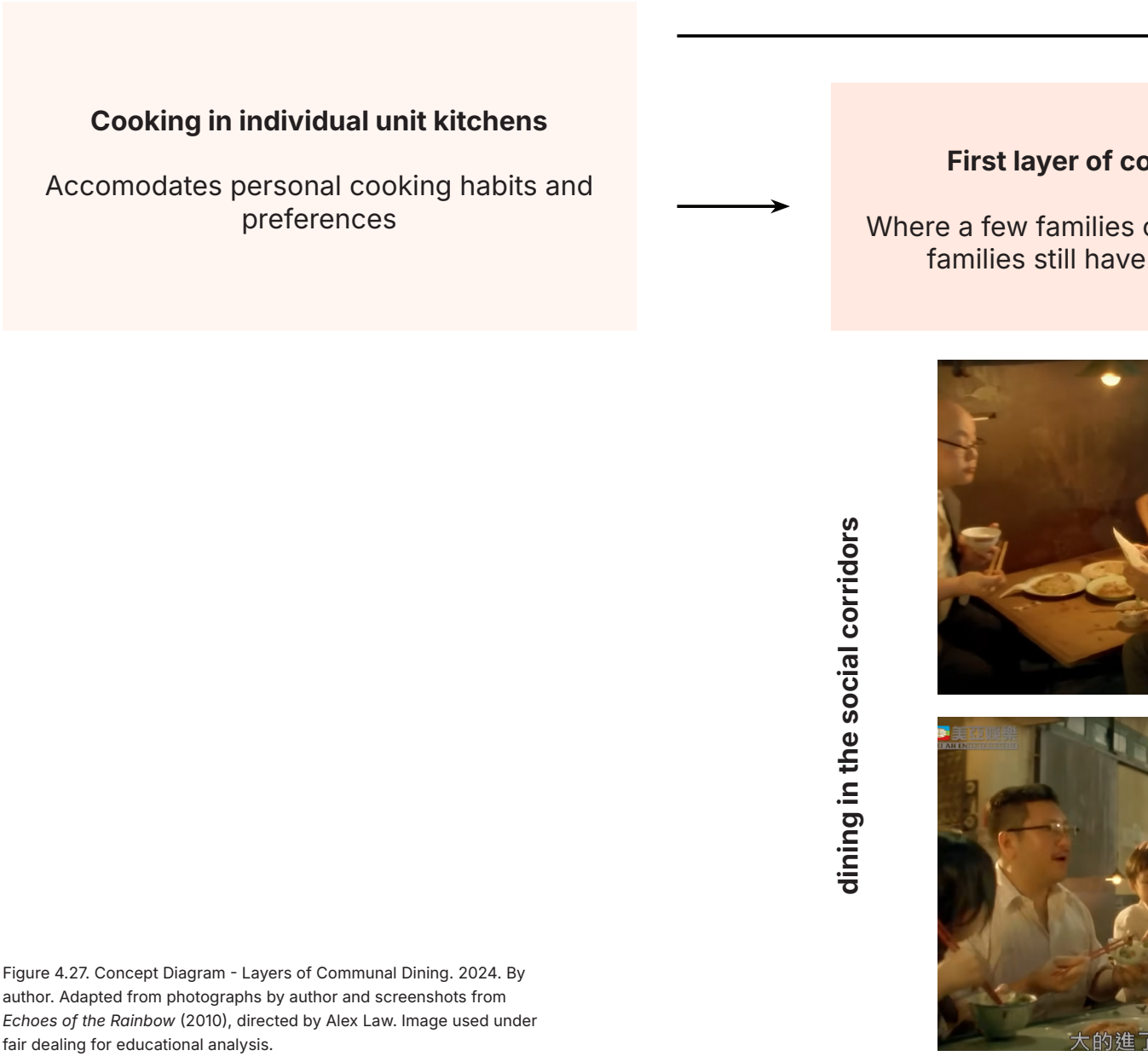


Figure 4.27. Concept Diagram - Layers of Communal Dining. 2024. By author. Adapted from photographs by author and screenshots from *Echoes of the Rainbow* (2010), directed by Alex Law. Image used under fair dealing for educational analysis.

specific festivals, including mid-autumn, winter solstice and lunar new year. This involves members of different households coming together to share a meal at the same table. These meals can sometimes incorporate elements of a potluck and are spatially facilitated by large tables and lazy susans.

ommunal dining

congregate (individual
their own tables)





Second layer of communal dining

A multipurpose community space that can facilitate communal dining/potluck for the whole building (mixing of families)

extended family dinners





The Features of a Family Dinner

The following exercise is broadly inspired by the idea of a 'punctum,' which refers to a single aspect of a photograph;[46] in particular, Wilson describes it as an "emotionally bruising, affective" detail "that breaks through the field of signification (stadium) to prick or wound the viewer."[47] Using floorplans and photographs, I analyzed my family dinner experiences that provided a sense of togetherness, identifying moments I had not previously registered. Key takeaways from this exercise informed my project's design.

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46 Roland Barthes, *Camera Lucida: Reflections on Photography*, 1st American ed. (New York: Hill and Wang, 1981.)

47 Harry Robert Wilson, "The Theatricality of the Punctum: Re-Viewing Camera Lucida," *Performance Philosophy* 3, no. 1 (June 25, 2017): 266, https://doi.org/10.21476/PP.2017.31126.



Figure 4.28. Contributions from Different Family Members (Example shows a combination of home-cooked and store-bought foods.) 2024. By author.



Figure 4.29. Example of How Circular Massing Encourages a Collective Focal Point (Example shows family members looking at the same point.) 2024. Photograph courtesy of Louisa Lee.



Figure 4.30. Example of How Family Members Serve/Help Each Other at the Dining Table (Example shows family member reaching over with chopsticks to help portion out the steamed fish.) 2024. By author.

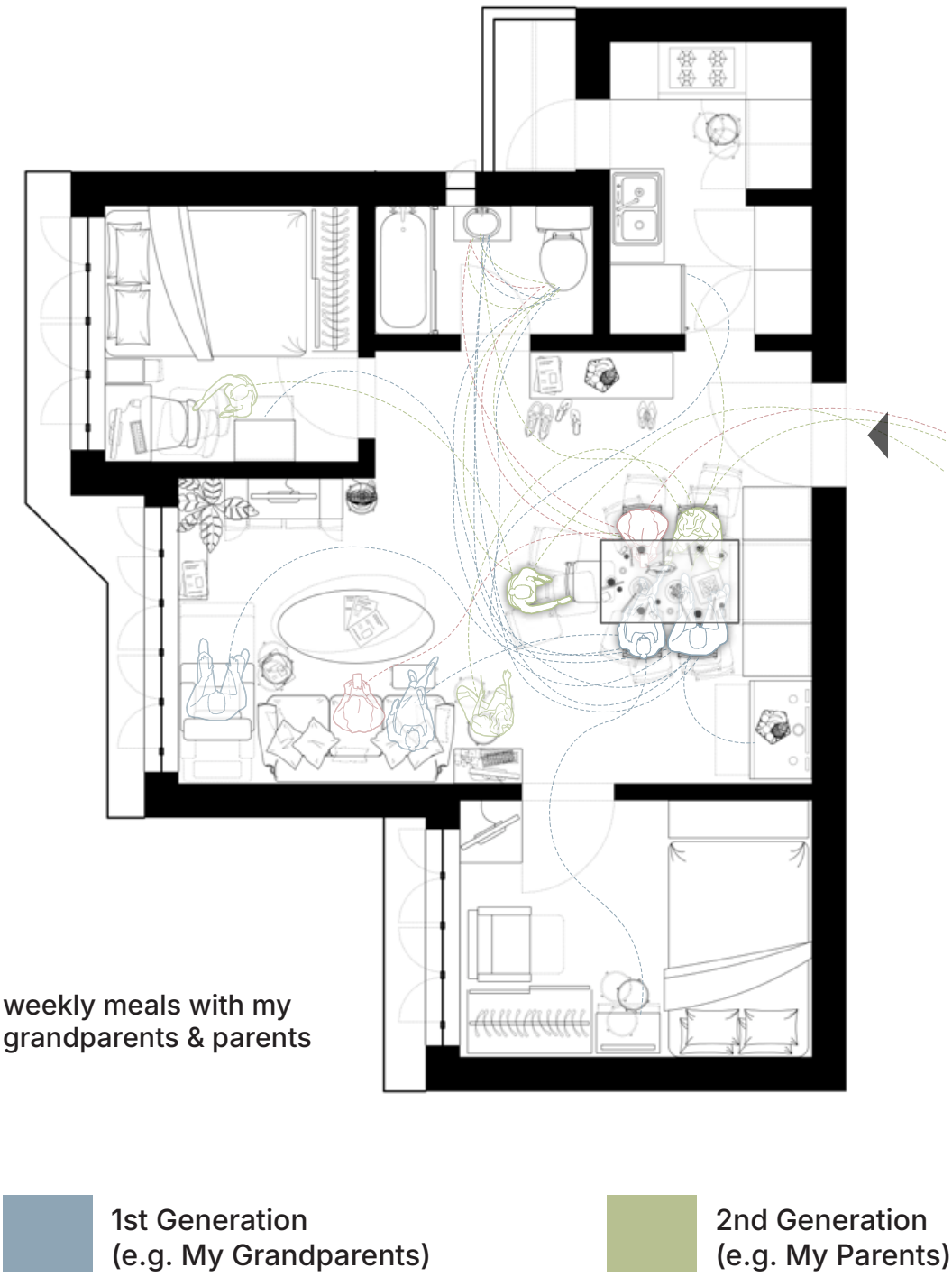
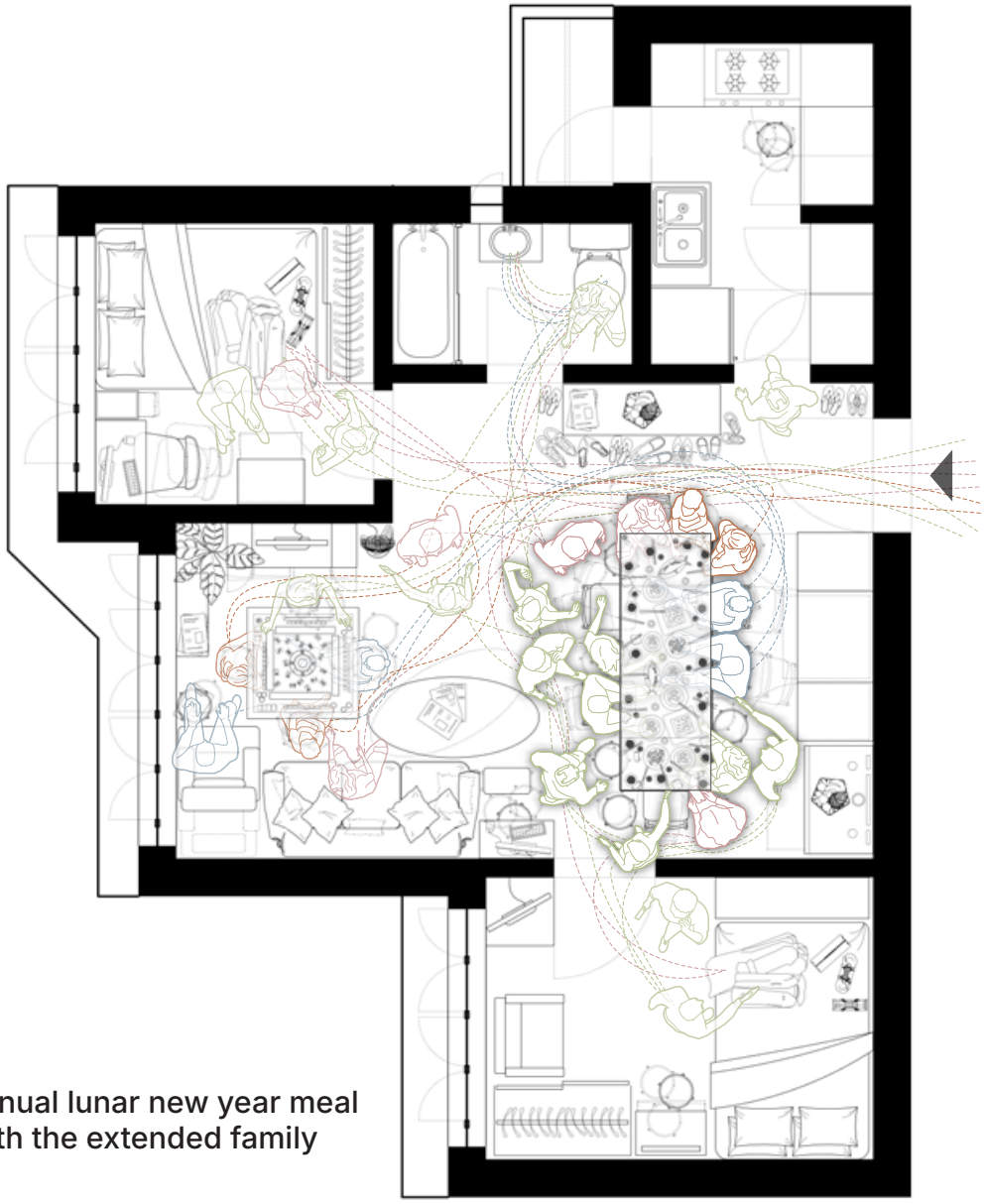


Figure 4.31. Finding Moments Through Reconstructed Floorplans of My Grandparents' Apartment: Understanding Differences in Spatial Circulation Under Different Dining Conditions. 2024. By author.



annual lunar new year meal
with the extended family

3rd Generation
(e.g. My Cousins and I)

4th Generation
(e.g . My Cousins' Children)

Design Drawings

The Massing & Materiality

The proposed massing includes circular areas—inspired by the collective conversations that circular dining tables facilitate at family dinners—removed from the podium to create outdoor amenity spaces. This collective interaction also inspired the courtyard, which provides visibility between units, facilitating stronger social connections between residents. The stairs jog in on the 8th floor to support the tapered courtyard. From an architectural standpoint, the building's design juxtaposes a regular, cube-like massing with multifaceted, crystal-like glazing. Moreover, the podiums are designed in response to the local context and building forms. Surrounding buildings predominantly consist of podiums, where residential townhouse units are often situated (see *Site Analysis* section above.)

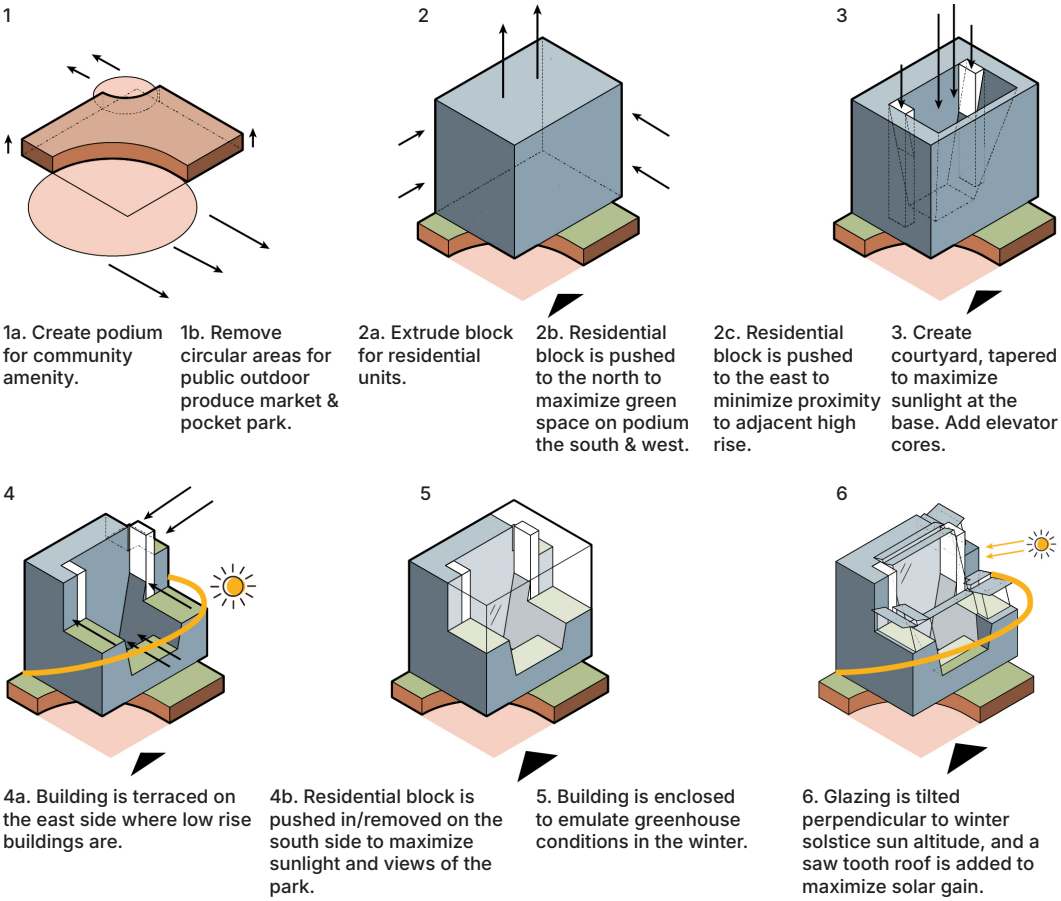


Figure 4.32. Building Massing Diagram. 2024. By author.

Hong Kong's 1970s courtyard apartment buildings are a relevant case study. Designed for safety benefits, residents often left doors open to allow neighbours to watch over their children. This visibility was made possible by the continuous corridor around the large courtyard.[48] The expansive line of vision within the building's courtyard massing shares parallels with the experience of eating at a large circular table with family.

48 馮俊鍵, 香港築印 (非凡出版, 2020.)

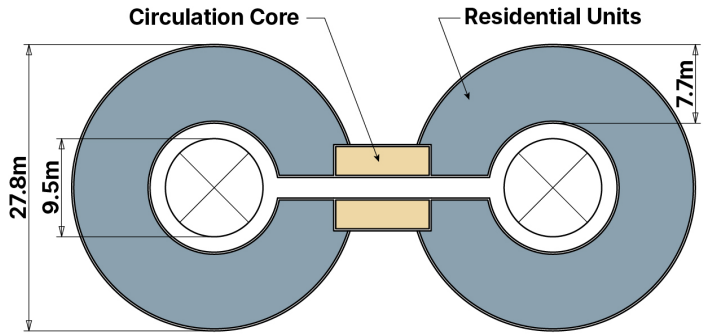


Figure 4.33. Parti Floorplan Diagram of Hong Kong's Lai Tak Tsuen with Approximate Dimensions. 2024. By author. Adapted from tracings of aerial photographs courtesy of Google Maps.

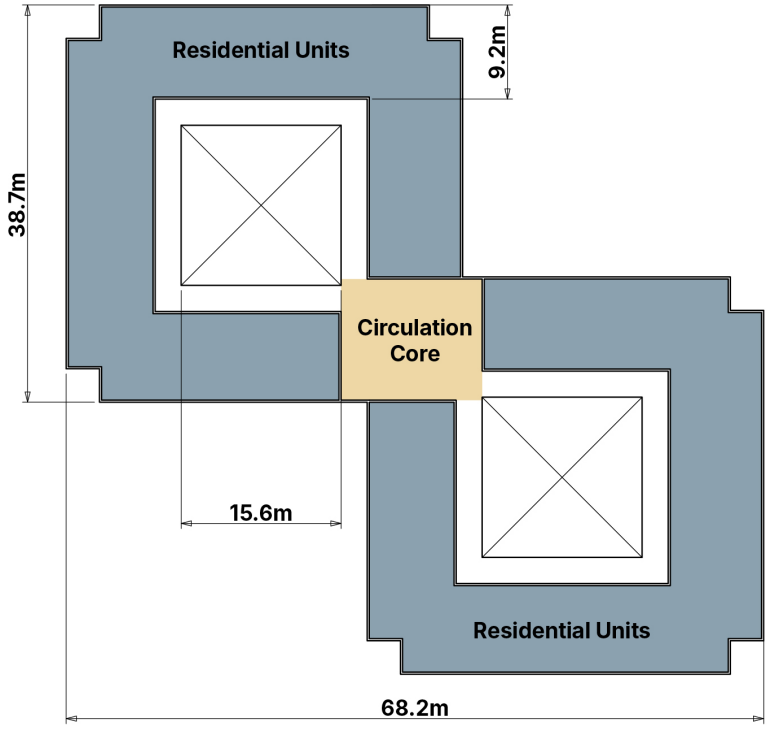


Figure 4.34. Parti Floorplan Diagram of Hong Kong's Oi Man Estate with Approximate Dimensions. 2024. By author Adapted from tracings of aerial photographs courtesy of Google Maps.

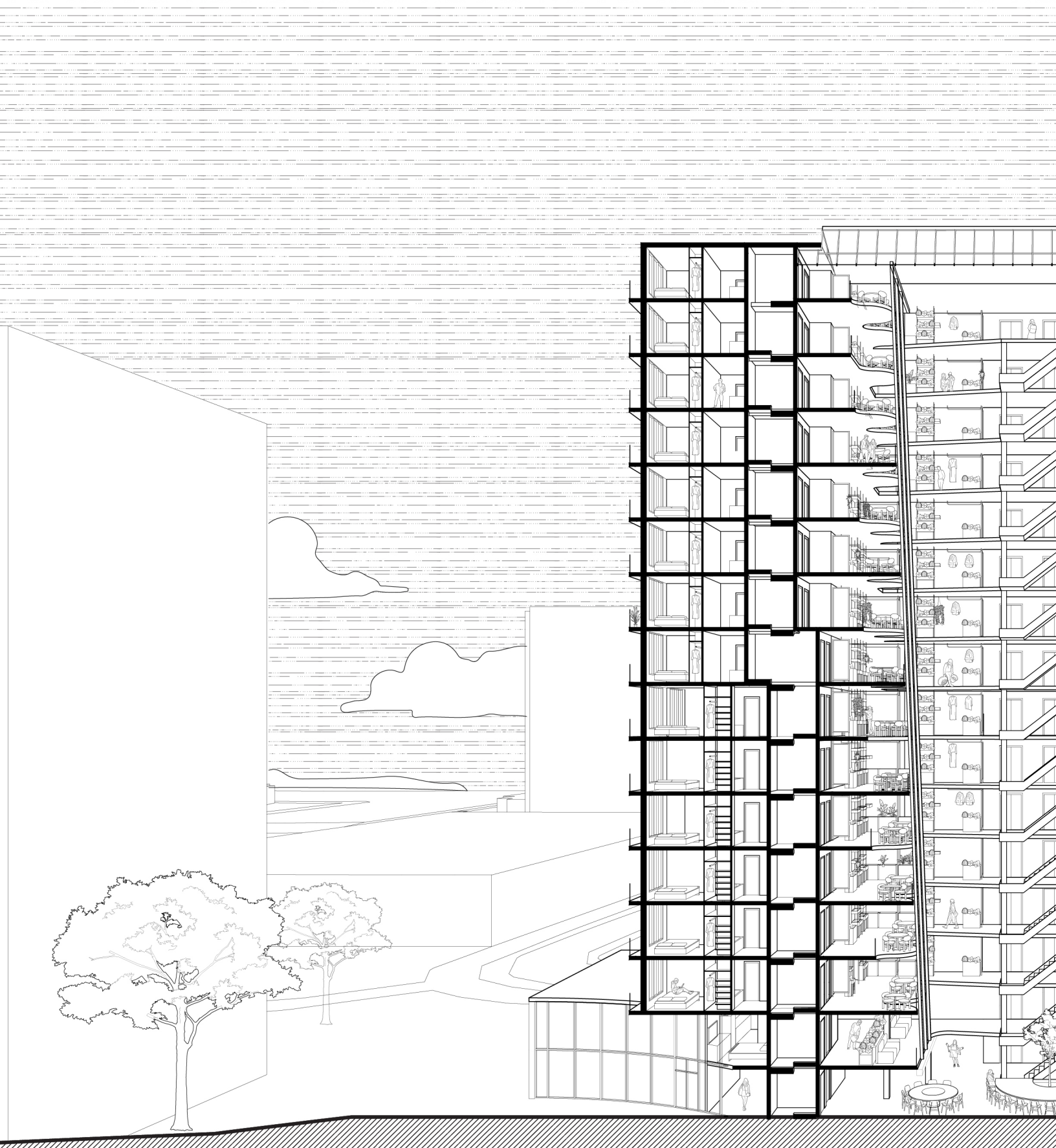


Figure 4.35. Building Section Illustrating the Stairs Jogging In. 2024. By author.



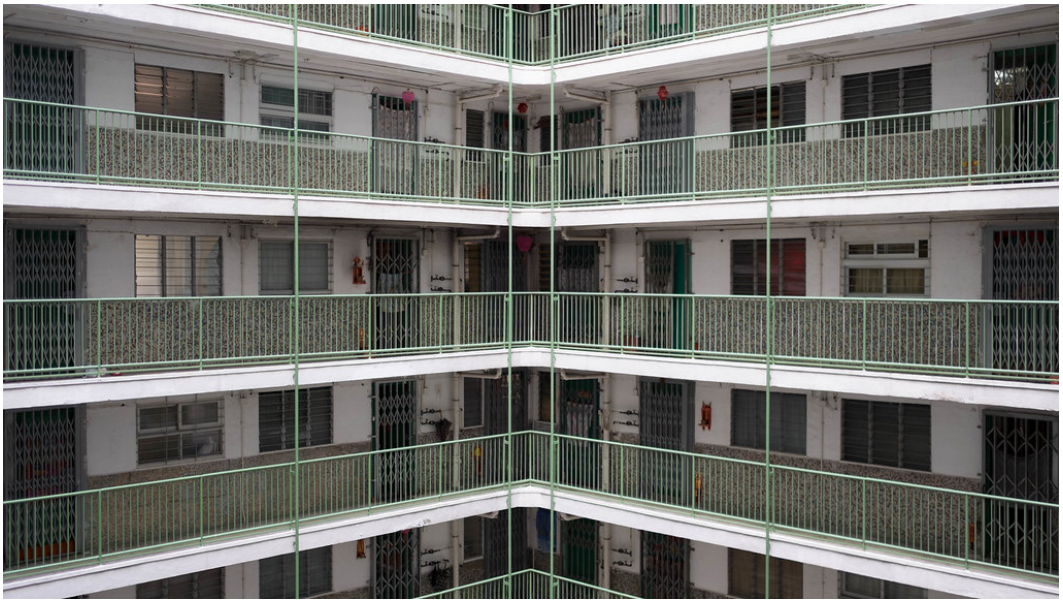


Figure 4.36. Corridor of Oi Man Estate in Hong Kong. 2014. “Oi Man Estate Apartments” by randomwire is licensed under CC BY-NC-SA 2.0. https://www.flickr.com/photos/61683005@N00/15522036345.



Figure 4.37. Corridor of Lai Tak Tsuen in Hong Kong. 2017. “勵德邨” by kevinho86 is licensed under CC BY-NC-SA 2.0. https://www.flickr.com/photos/95790832@N05/37021327365.

Beijing's Siheyuan (四合院) is another relevant case study. The building is designed to be oriented north-south, so the inner courtyard receives ventilation benefits in the summer. This means that the room located on the north—but opening up towards the south—is ideal for daylighting and ventilation.[49] Therefore, this is usually the bedroom given to the most senior members of the family, such as the grandparents, highlighting how buildings' environmental design can be intertwined with existing social hierarchies.[50] Overall, the courtyard is a culturally significant element with different social connotations for various ethnic Chinese groups.

49 王梓欣, "四合院," Hong Kong Baptist University, accessed July 7, 2024, https://digital.lib.hkbu.edu.hk/history/relic-view.php?id=68.

50 王梓欣, "四合院."

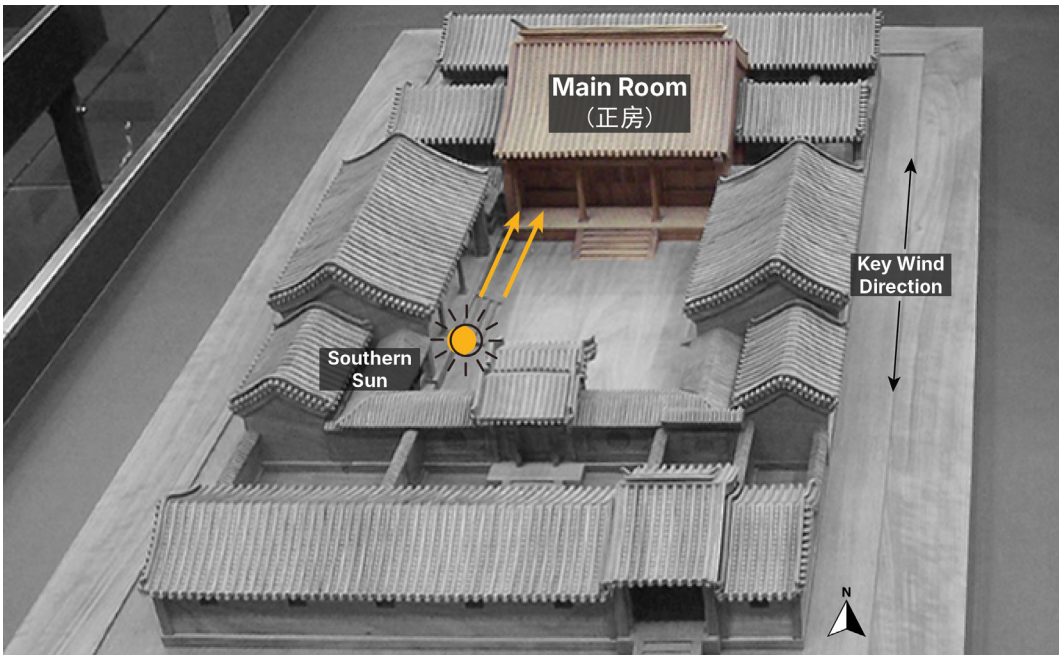


Figure 4.38. Siheyuan Social Considerations. 2005. Adapted from "File:Siheyuan model.jpg" by Pubuhan, licensed under CC BY-SA 3.0. https://commons.wikimedia.org/wiki/File:Siheyuan_model.jpg#/media/File:Siheyuan_model.jpg.

The building's glazed enclosure focuses on an expansive central courtyard, while the secondary gardening terraces on the east and west are double-height spaces. It is a mass timber structure—a decision responding to Canada's abundant lumber resources—following a 6x6m structural grid, which drives its architectural language. In this design case study, I utilize a two-way beam system, which is advantageous for space planning, as there is no dominant beam direction.[51] Moreover, the building's position is predominantly determined by site context. The initial intention was to avoid aligning the building to the site's east side where a series of low-rise buildings are located, to avoid introducing an abrupt and drastic change in height. Furthermore, the east and west sides of the building are aligned with adjacent buildings' towers, as shown in Figure 4.38.

51 J. David Bowick, "Mass Timber Primer," *Canadian Architect* (blog), November 13, 2019, https://www.canadianarchitect.com/mass-timber-primer/.

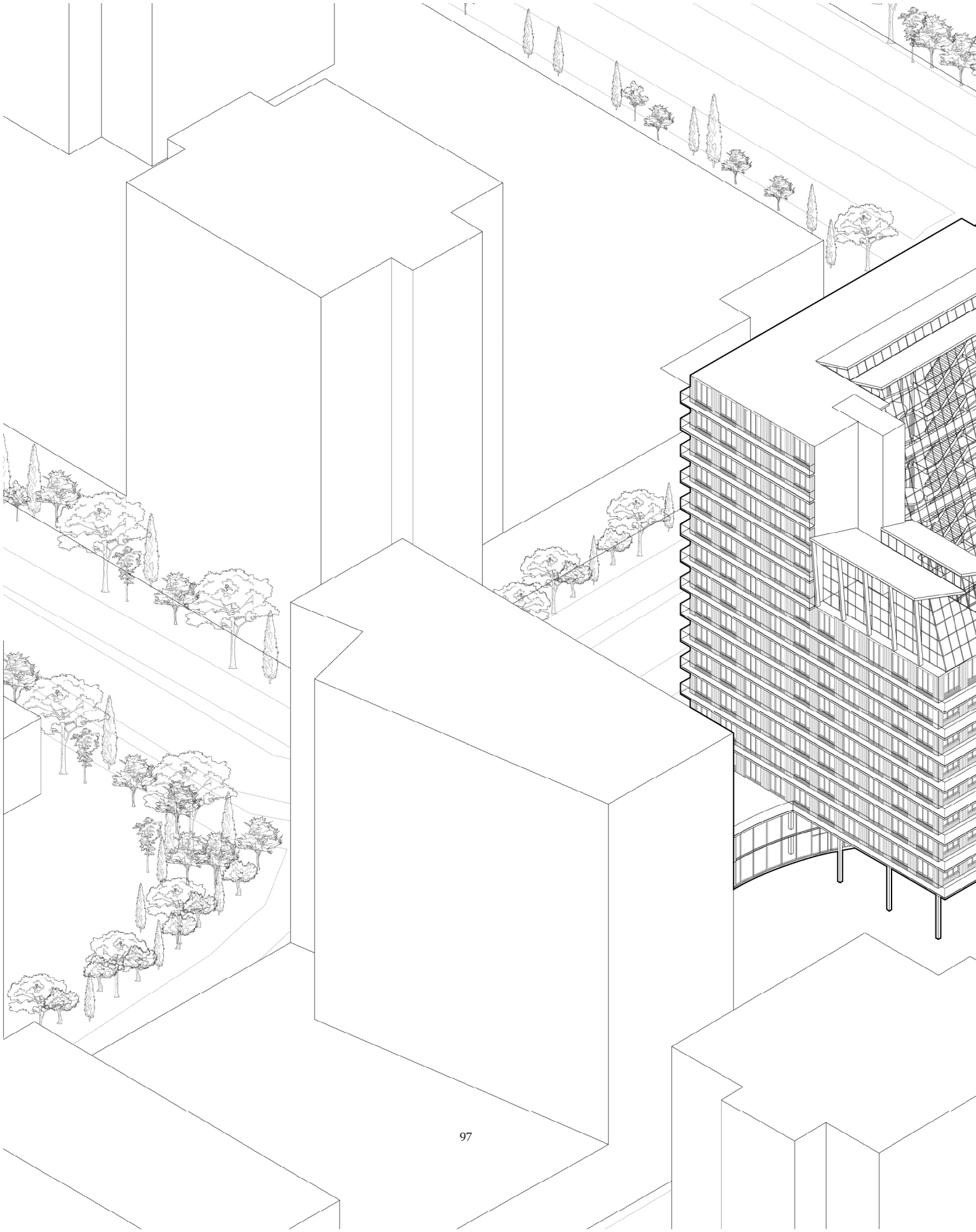
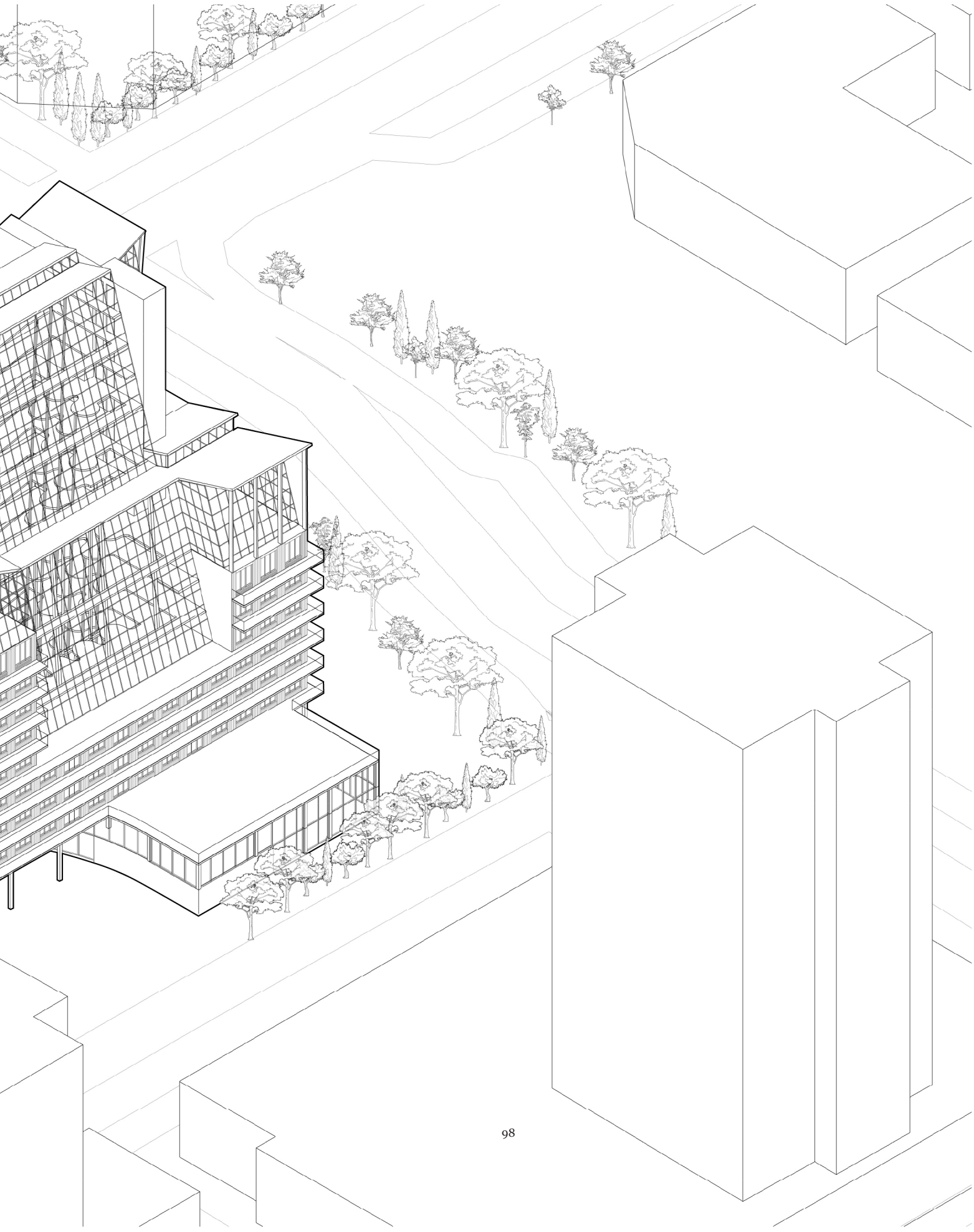


Figure 4.39. Building Axonometric. 2024. By author.



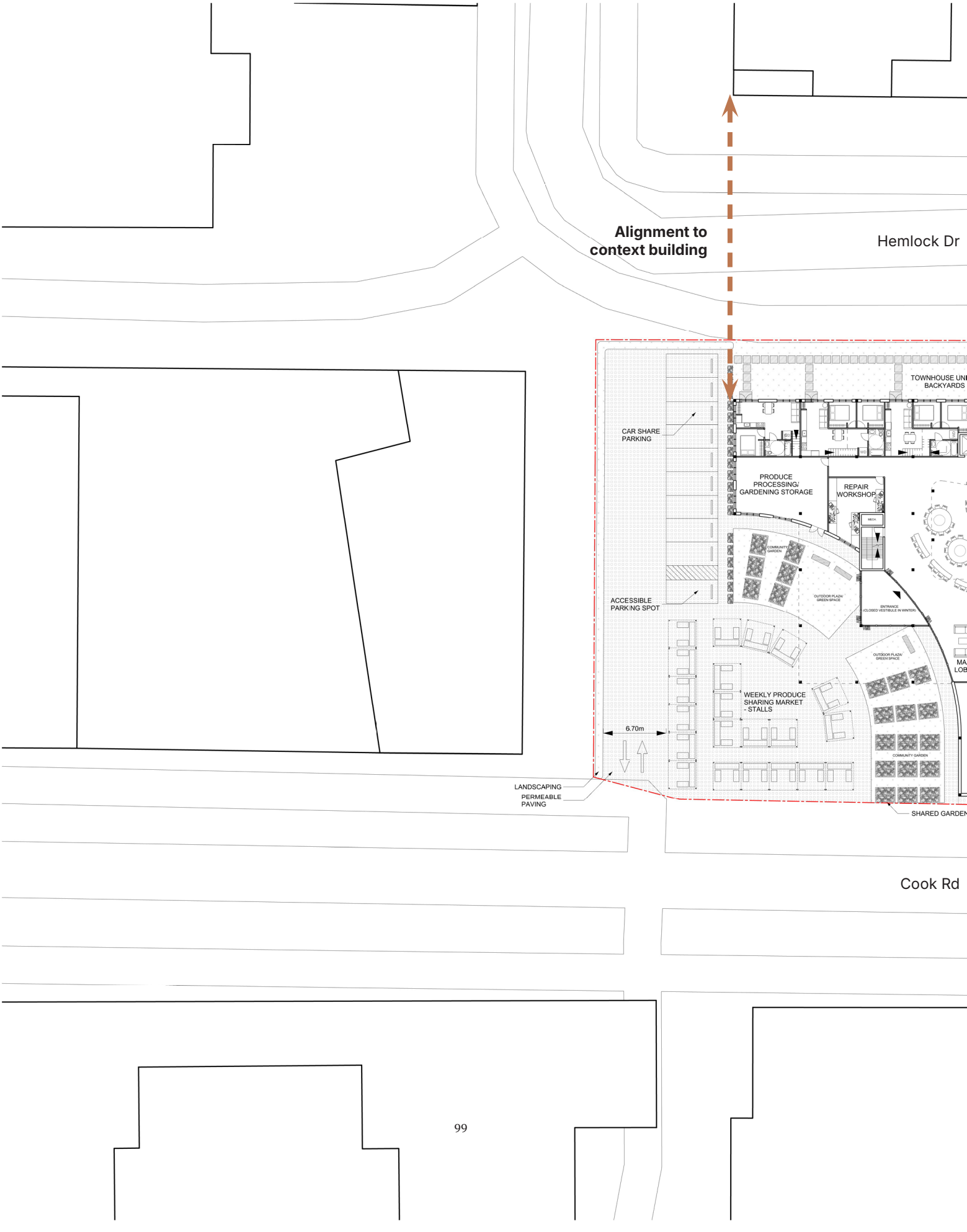
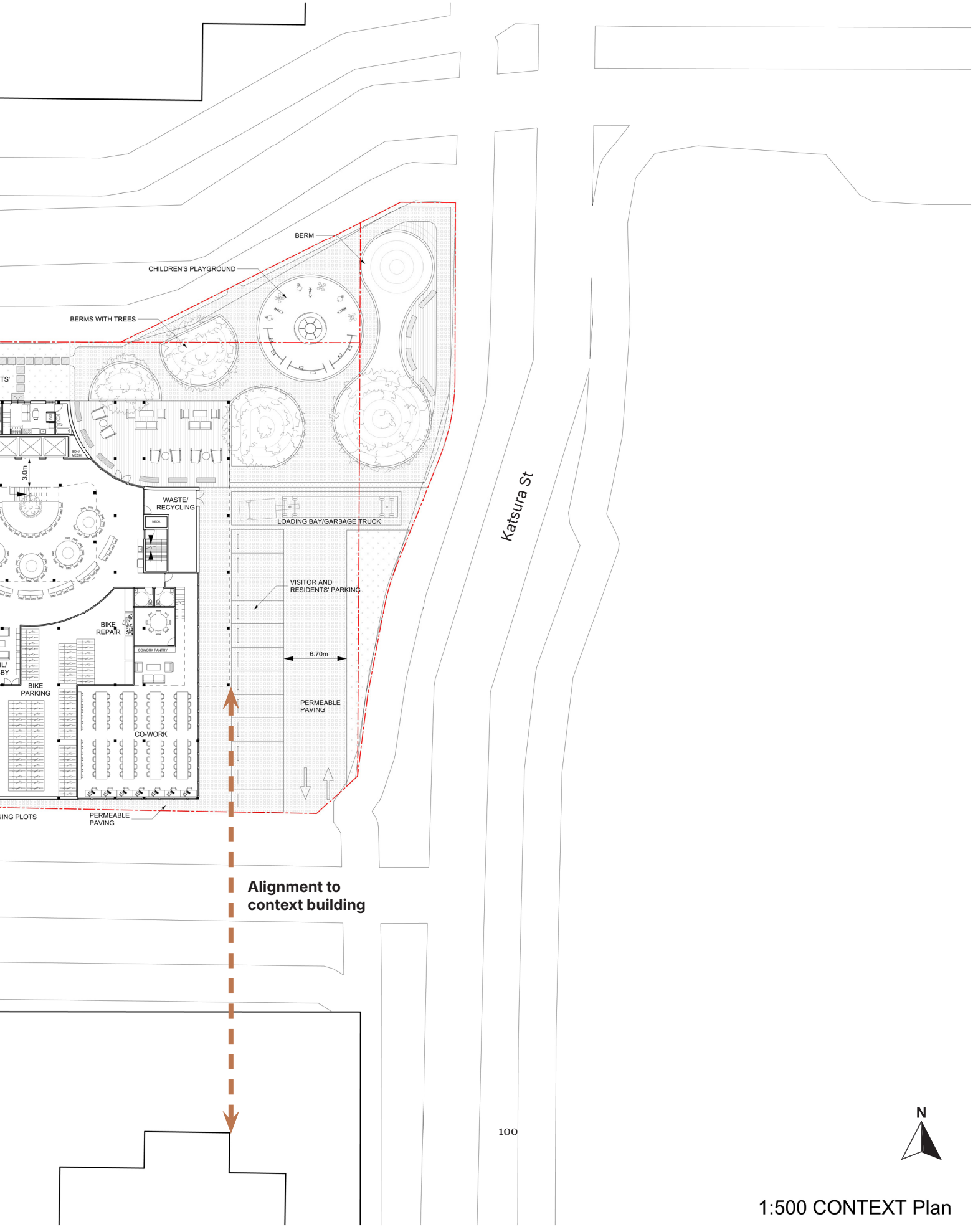


Figure 4.40. 1:500 Site Diagram and Context Plan. 2024. By author.



1:500 CONTEXT Plan

Residential Layout and Logic

The plans follow a 'social core' logic. At a building scale, communal programs are adjacent to the central courtyard. Spaces become more private as occupants move outwards and into their units. This provides an opportunity to consider the corridor as a semi-private and public space.

The semi-private corridor provides opportunities for residents to execute moments of sustainability, such as air drying their clothes in an exterior space, without having to do so on their public-facing balconies adjacent to traffic pollution. The public corridor provides an opportunity for communal dining inspired by Hong Kong in the 1960s, as described in the *Initial Concept and Program* section and demonstrated in the Hong Kong movie *Echoes of the Rainbow*. The intention of the circular dining platforms located throughout the corridor is that they not only allow residents to interact with their neighbours on the same floors, but their staggered placement also facilitates visibility and interactions between adjacent levels.

Planters separate the semi-private and public corridor, offering an additional gardening opportunity and spaces to share plant clippings and seeds. This encourages residents to know what their neighbours are planting as they navigate the corridor spaces. Moreover, planters adjacent to the units' front doors extend to the ceiling for increased privacy.

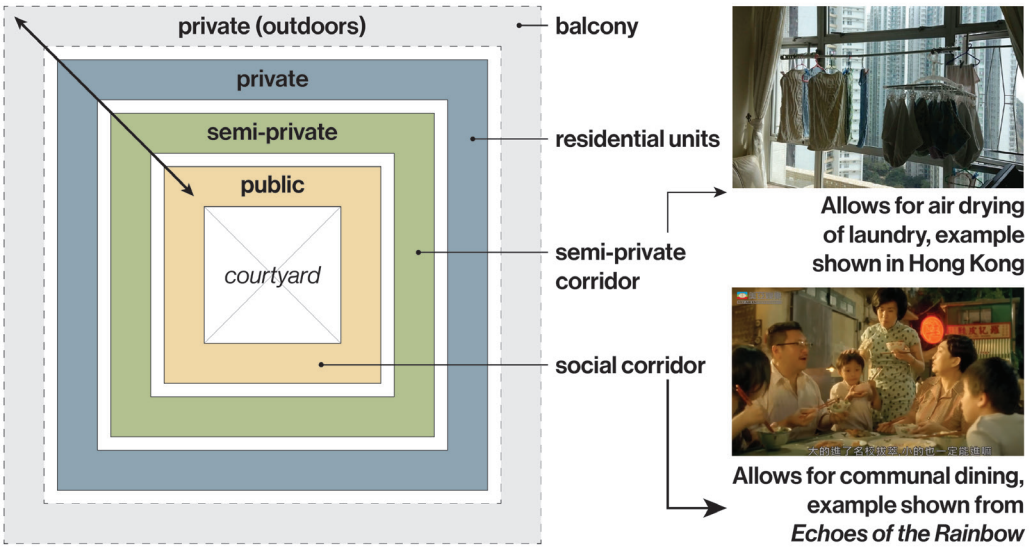


Figure 4.41. Floorplan Parti Diagram. 2024. By author. Adapted from photograph courtesy of Ricky Cheng and screenshots from *Echoes of the Rainbow* (2010), directed by Alex Law. Image used under fair dealing for educational analysis.



Figure 4.42. Semi-Private Corridor Render. 2024. By author.

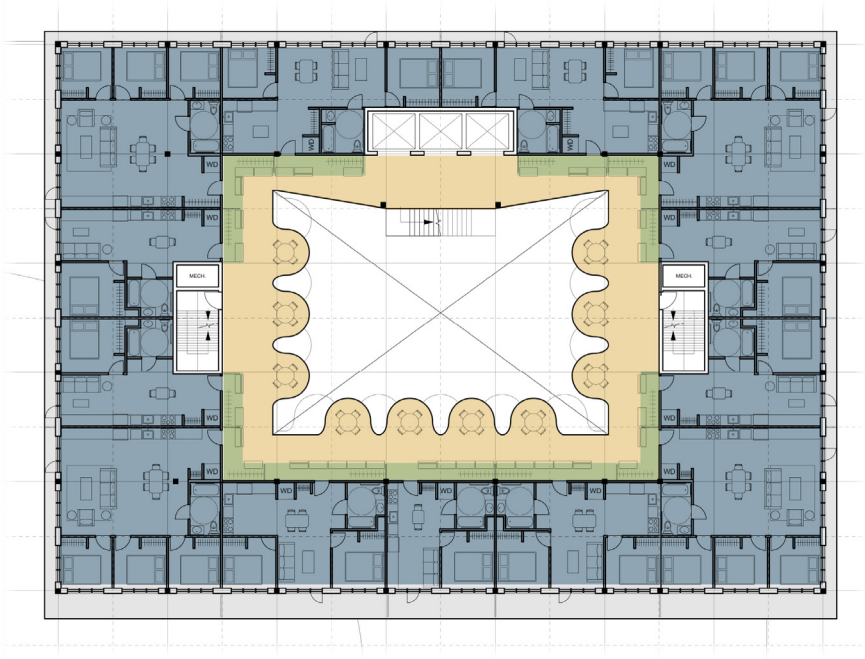


Figure 4.43. Floorplan Parti Diagram (Plan). 2024. By author.



Figure 4.44. Social Corridor Render. 2024. By author.





Figure 4.45. Residential Unit Diagram. 2024. By author.



Figure 4.46. Residential Unit Render. 2024. By author.

The ‘social core’ concept materializes within a unit through its circulation. The living and dining rooms become the core spaces residents must pass through to reach their bedrooms, as seen in Figures 4.43 and 4.44. This benefits communication,[52] strengthening the community-oriented aspect

52 Friederike Schneider and Oliver Heckmann, *Floor Plan Manual, Housing*, 4th rev. and expanded ed. (Basel: Birkhäuser, 2011.)

of this project. By minimizing corridors, areas that residents enjoy are maximized, which is critical as floor area is typically limited in affordable housing. Specifically, BC Housing specifies maximum 'Net Unit Areas' for affordable dwelling units.[53]

Table 4.03. Maximum Net Unit Areas defined by BC Housing.

Bedroom	Net Unit Area (Sq. Meters)
Studio	33
1	49
2	67
3	86
4	112

Source: Adapted from BC Housing, 'Design Guidelines and Construction Standards,' https://www.bchousing.org/sites/default/files/media/documents/BCH-Design-Guidelines-Construction-Standards.pdf.

Table 4.04: Current Unit Count. By author.

Floors	Studio	1 bed	2 bed	3 bed	4 bed	Total
1 and 2			1		3	**4**
2	1			1		**2**
3	2	3	4	4		**13**
4		5	4	4		**13**
5		5	4	4		**13**
6		4	2	4		**10**
7		4	2	4		**10**
8		4	2	4		**10**
9		4	2	4		**10**
10	1	1	2	2		**6**
11	1	1	2	2		**6**
12	1	1	2	2		**6**
13	1	1	2	2		**6**
14		1	2	1		**4**
15		1	2	1		**4**
16		1	2	1		**4**
Total	**7**	**36**	**35**	**40**	**3**	**121**
Current	**5.8%**	**29.8%**	**28.9%**	**33.1%**	**2.5%**	**100%**
Target	*7.0%*	*24.9%*	*28.0%*	*34.1%*	*6.0%*	
Difference	*1.2%*	*-4.8%*	*-0.9%*	*1.0%*	*3.5%*	

53 "Design Guidelines and Construction Standards" (BC Housing, May 2019), https://www.bchousing.org/publications/BCH-Design-Guidelines-Construction-Standards.pdf.

For the unit makeup in this project, I analyzed Richmond's co-op housing projects—7% are studios, 24.9% are 1-bedroom units, 28% are 2-bedroom units, 34.1% are 3-bedroom units, and 6% are 4-bedroom units.[54] This percentage is reflected in my design with a maximum 5% deviation. This varied combination of unit sizes addresses different low-income community needs. For example, singles and seniors typically require studio and one-bedroom homes, while lone-parent families usually need 2+ bedroom homes.[55]

Ground Floor Communal Amenity

In my ground-floor design, a communal dining space is the core, where circular tables juxtapose rectilinear rooms. Other amenities and spaces to support sustainability are closer to the exterior of the building, including bicycle repair and parking, co-working spaces, and more.

This reflects family dinners; the dining table is often the core, while secondary interactions—such as mahjong games and informal conversations—occur in other corners of the space.

54 "Affordable Housing Guide."

55 "Housing Needs Report" (City of Richmond, 2021), https://www.richmond.ca/__shared/assets/housingneeds59652.pdf.

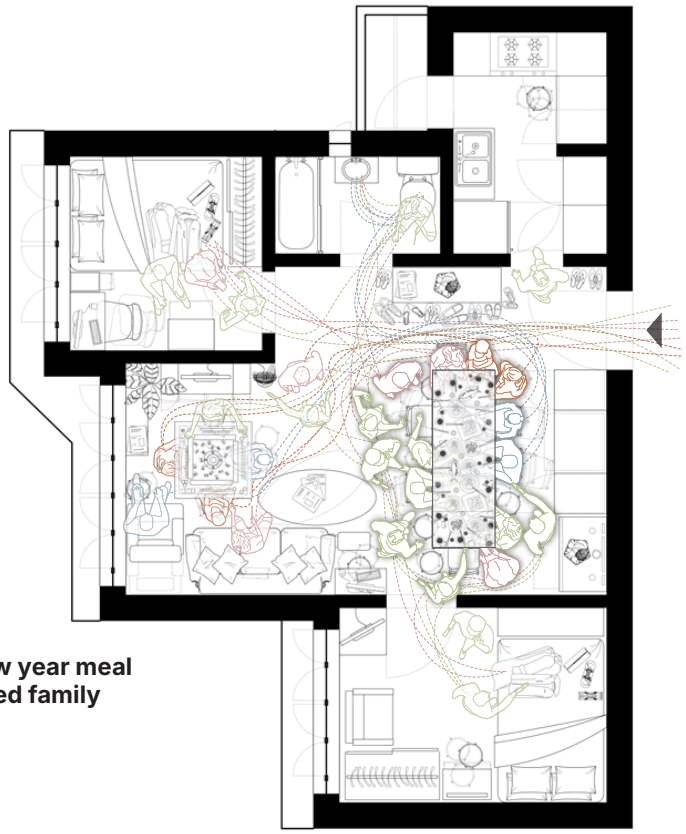


Figure 4.47. Finding Moments Through Reconstructed Floorplans of My Grandparents' Apartment. 2024. By author.

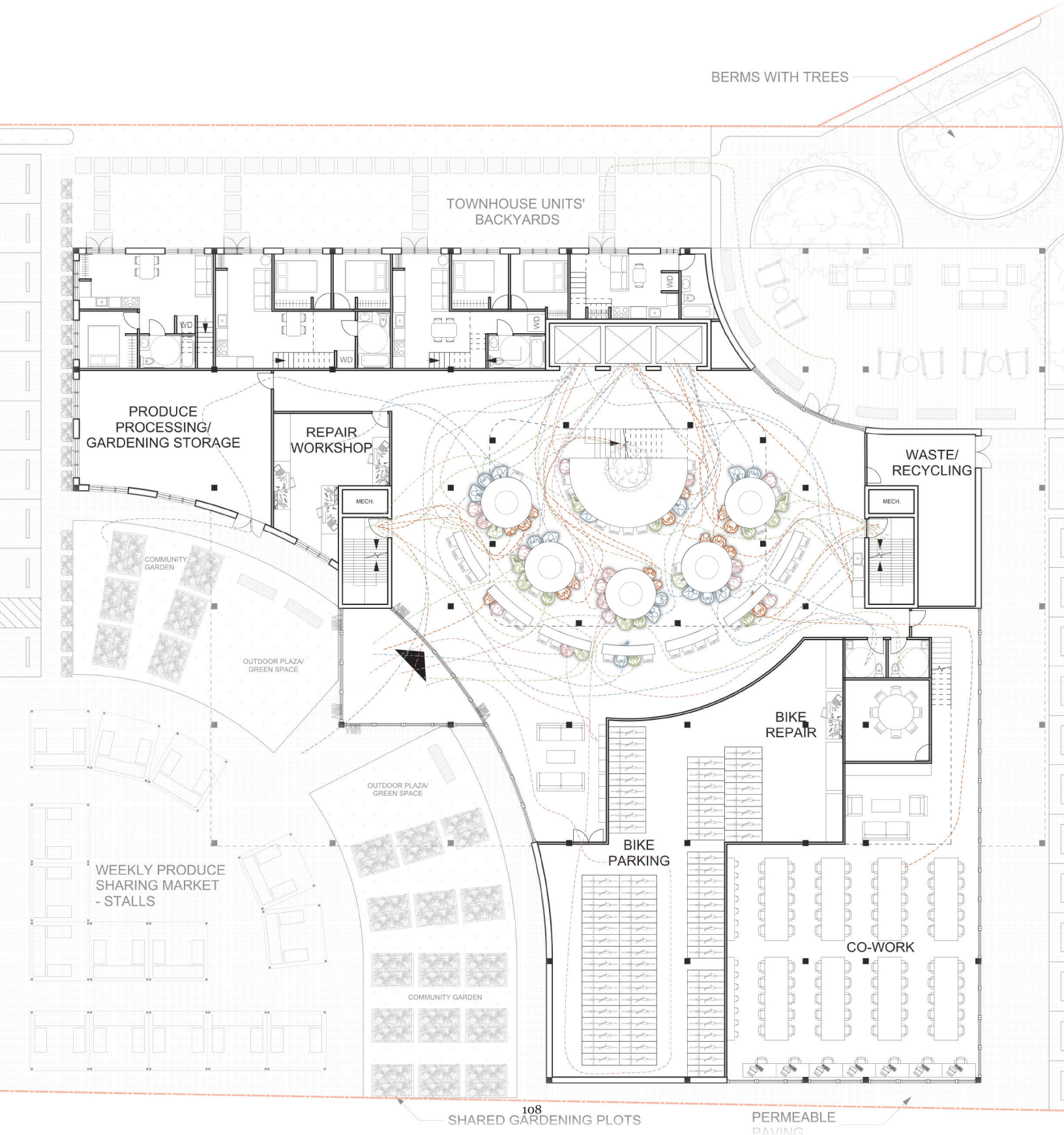


Figure 4.48. Plan of Ground Floor Communal Space (Different colours at each table represent residents from different households). 2024. By author.



Figure 4.49. Ground Floor Communal Space Render. 2024. By author.



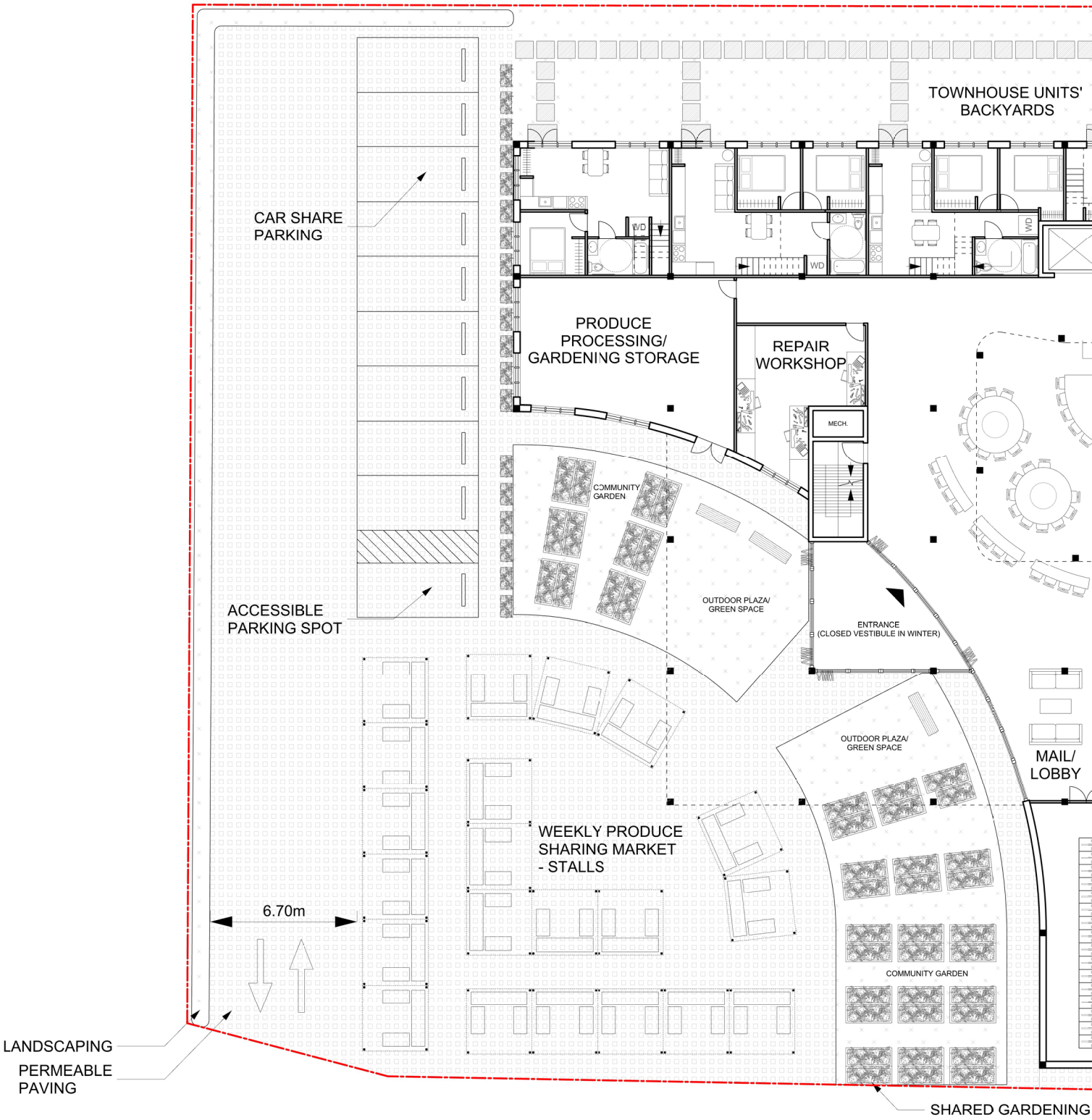


Figure 4.50. Ground Floor Plan. 2024. By author.

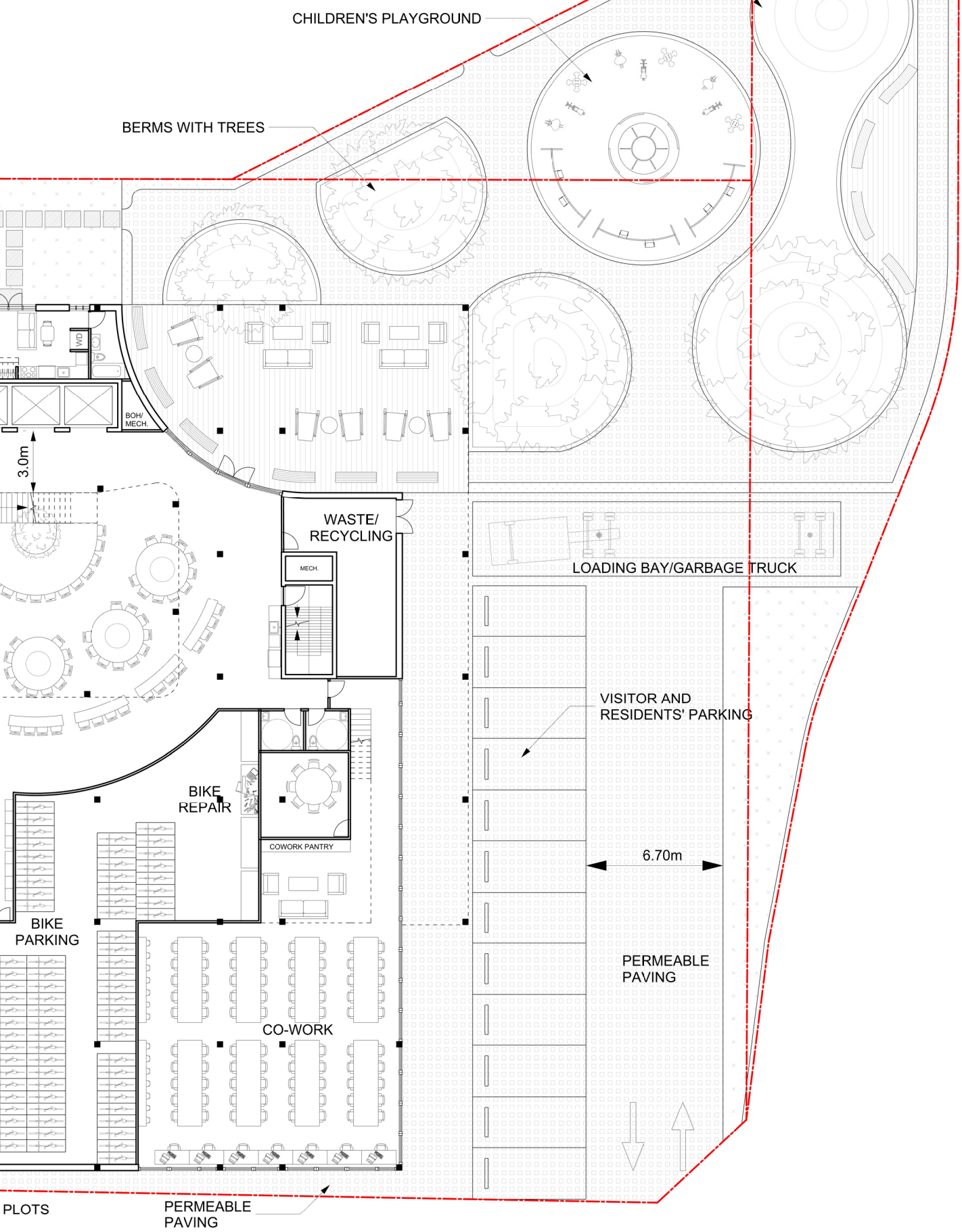

CHILDREN'S PLAYGROUND
BERMS WITH TREES
WD
BOH/
MECH.
3.0m
WASTE/
RECYCLING
MECH.
LOADING BAY/GARBAGE TRUCK
VISITOR AND
RESIDENTS' PARKING
BIKE
REPAIR
COWORK PANTRY
6.70m
BIKE
PARKING
PERMEABLE
PAVING
CO-WORK
PLOTS
PERMEABLE
PAVING



Figure 4.51. Exterior Rendering of Gardening Spaces, Market and Main Entrance. 2024. By author.

Passive Design Features

Defining Environmental Stewardship and Sustainability in Chapter 1 highlights that an active user is required to operate passive systems to support sustainability. Thus, the passive strategies focus on creating accessible systems to facilitate users' participation. For example, the building's terracing is south-oriented to maximize daylighting in gardening spaces, enhanced by the glass enclosure mimicking a greenhouse. The glass is also angled perpendicular to the sun's altitude on winter solstice to minimize reflections and maximize solar gain. Given that December is the coldest month in Richmond,[56] the intention is to facilitate the space's passive heating. Given that this is an affordable housing project, this design avoids using a costly flat glass roof, instead maximizing south light penetration using a series of saw-tooth roofs. Moreover, the balconies are deepest on the south side to provide residential units with adequate sun shading in the summer.

Additionally, the glazing at the top of the building is operable and accessible by designed walkways, facilitating the stack effect in the East-West direction. This supports ventilation in the dominant wind direction throughout the summer, as analyzed in the *Site Analysis* section above.

56 "Canadian Climate Normals 1991-2020 Data," Government of Canada, June 27, 2024, https://climate.weather.gc.ca/climate_normals/results_1991_2020_e.html?searchType=stnProv&lstProvince=BC&txtCentralLatMin=0&txtCentralLatSec=0&txtCentralLongMin=0&txtCentralLongSec=0&stnID=360000000&dispBack=0.

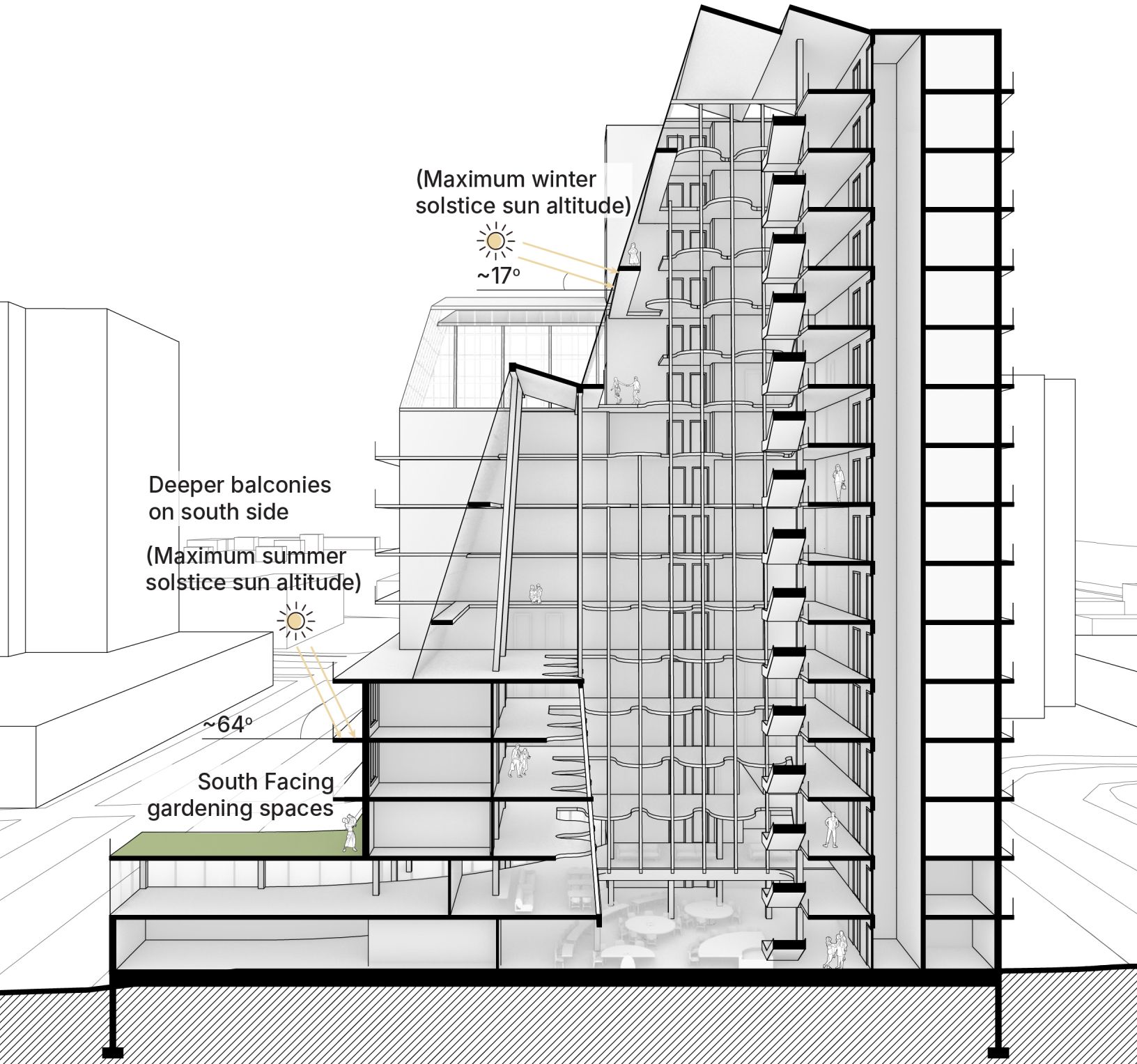


Figure 4.52. Building Section Highlighting South-Facing Gardening Spaces. 2024. By author.
Information retrieved from SunCalc (https://www.suncalc.org/.)

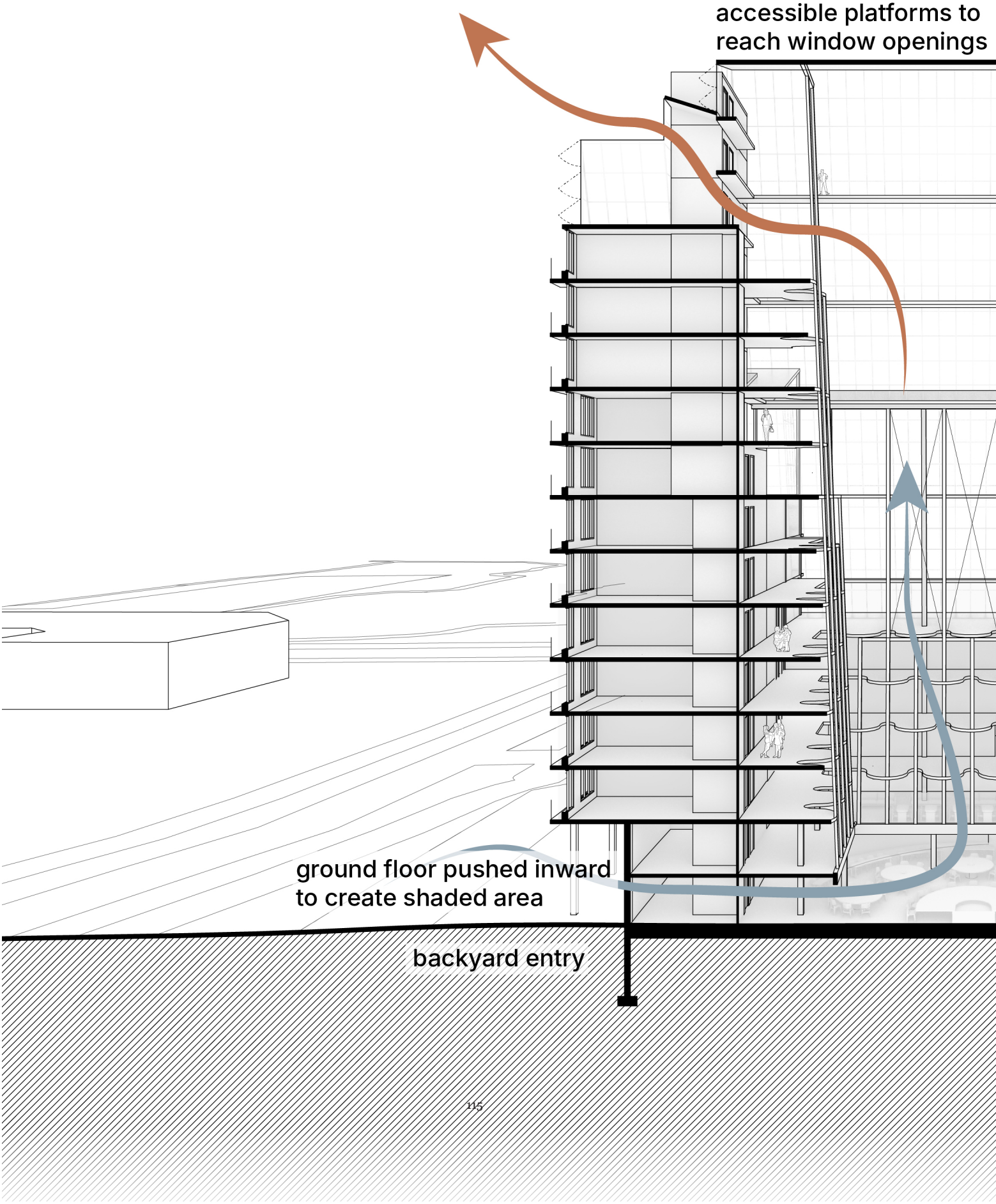
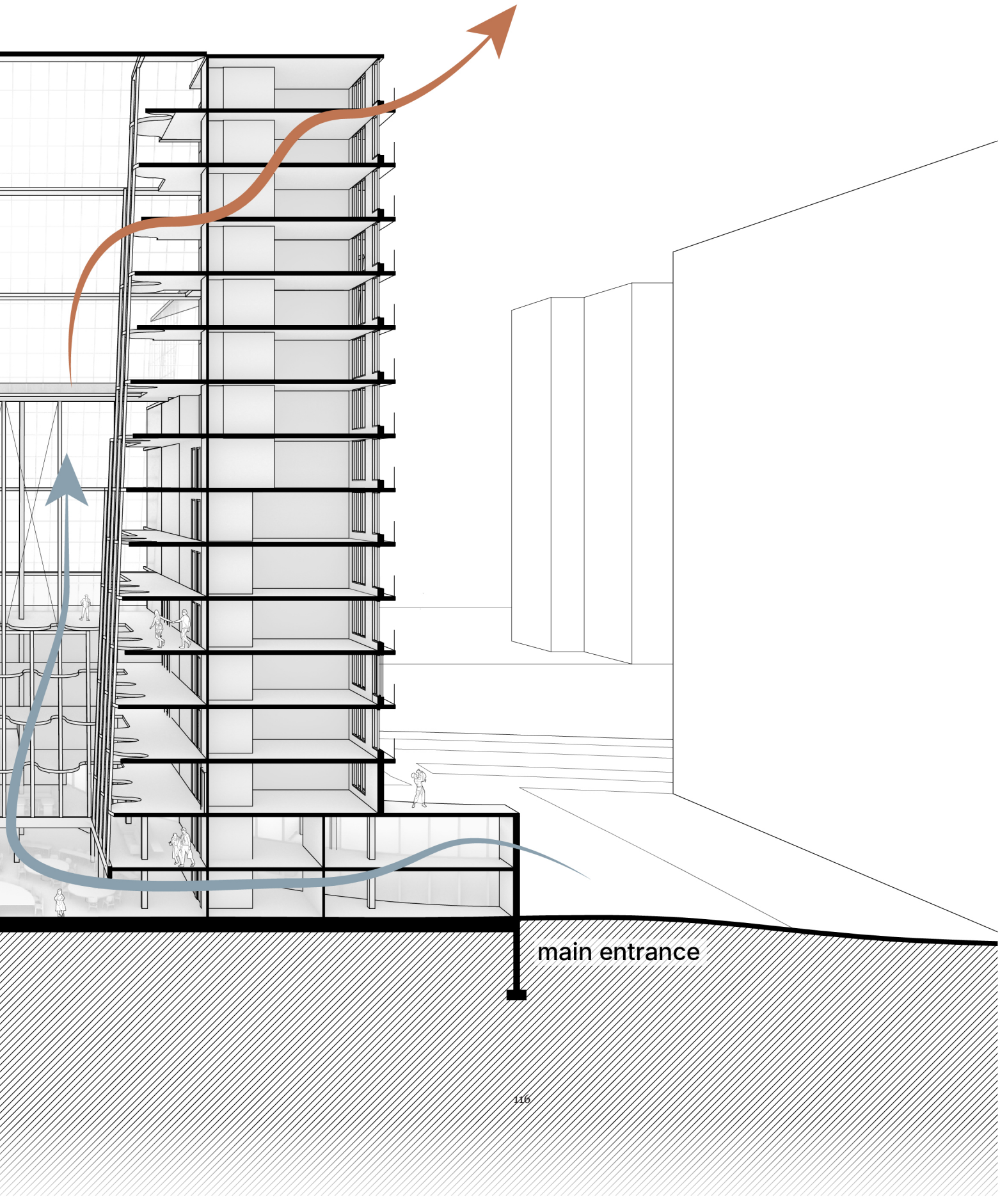


Figure 4.53. Building Section Highlighting Intended Stack Effect & Platforms to Reach Operable Window Openings. 2024. By author.


main entrance

Conclusion

Reflection

In conclusion, this thesis underscores the importance of collective human participation in creating a truly sustainable project. As emphasized in the *Introduction* chapter, the environment and finite natural resources are a collective responsibility of the people, as relevant concerns are ultimately social issues intertwined with planning initiatives. This makes environmentalism and our planet a collective responsibility rather than the sole responsibility of decision-makers. Thus, to facilitate human participation in making a building sustainable, we must understand people's cultural practices and lifestyles. While this thesis's limited time and scope led me to understand these practices through personal experiences and secondary research, real-life design projects should aim to gather meaningful input from community members. Ultimately, this project's design has emphasized the role of the collective through its residential plan layout, design of the ground floor amenities, and user-friendly passive design. Considering the importance of intersectionality, the aim of participating in sustainable practice together is not only to promote environmental awareness but also to bring people together throughout this process to construct stronger community bonds that are essential for Canada's newcomers.

Although this design thesis focuses on Richmond, an ethnoburb with many Mainland Chinese, Hong Kong and Taiwanese immigrants, its lessons can inform design processes in different ethnic communities nationally. In particular, this project has highlighted a range of considerations during the design process:

1. What intersectional issues exist in the community?
2. What opportunities currently exist in the community to partake in environmentalism? What barriers hinder their success?
3. What existing sociocultural practices can serve as a vessel for proposed environmental efforts?
4. Do community members already engage in acts of sustainability? If so, what are they, and what are the motivations behind these actions?
5. How do community members approach community and large group settings?
6. What vernacular or cultural architectural precedents can drive the design's form?
7. What spaces can facilitate the building occupant's interaction with passive design features?

Ultimately, this design thesis takes an empathetic perspective rooted in the challenges of migrating to and settling into a new country. The design draws upon local ecological conditions to propose architecture that creates spatial conditions conducive to social integration.

Challenges

This investigation highlights the various limitations of urban planning and architecture on facilitating environmentalism. Policies are constantly evolving based on the community's changing needs. For instance, encouraging public transit use and minimizing driving are well-aligned with sustainable

means of living. However, local by-laws currently dictate a minimum number of parking spaces required for each building type. Given that Vancouver has recently shifted towards removing these designated minimums,[57] and parts of Richmond[58] have been designated as TOD areas with reduced parking minimums,[59] this thesis' project is designed assuming that my site will follow suit. Thus, this emphasizes that we cannot rely on urban and architectural design alone to address environmentalism. Co-ordination from a diverse range of sectors is required to create truly transformative change. Ultimately, these needs underscore the importance of looking at this issue from an intersectional lens.

Moreover, a post-occupancy analysis would provide further insight into whether aspects of this design operate as effectively as intended. This may include the stack effect that is part of the passive design strategy, or which communal spaces are underutilized by residents and could be replaced with other more relevant features.

In addition, this project could benefit from more robust community engagement, which could entail learning from relevant case studies such as Boston's Chinatown (*see Environmentalism and Environmental Justice: Case Studies in Relation to Marginalized Groups* in Chapter 2) by offering design charrettes and focus group discussions with Richmond's locals. The intention of further community engagement is to gain a deeper understanding of locals' needs and wants, as well as to reveal perspectives rooted in lived experiences that may not be initially obvious based on secondary research.

Ultimately, this initiative would benefit from an in-depth analysis of these challenges, which are beyond the timeline and scope of this thesis. By addressing these points, the intention is to design a more inclusive project that is genuinely well-suited to the community's everchanging needs.

Future Discussion

Beyond this project's current timeline, various potential methods exist to mobilize the knowledge presented in this thesis document. As an extension of the more robust community engagement proposed in the previous section, one way to improve alignment with community needs would be to introduce a co-design project into this initiative. Although, co-design may be perceived as synonymous with reducing an architect's influence, architecture that does not involve the community could also be perceived as a vanity project.[60]

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57 Ian Holliday and Abigail Turner, "Vancouver Council Votes to Eliminate Minimum Parking Requirements City-Wide," *CTV News*, June 27, 2024, sec. Vancouver, https://bc.ctvnews.ca/vancouver-council-votes-to-eliminate-minimum-parking-requirements-city-wide-1.6942802.

58 Not including my proposed site.

59 "Transit Oriented Development Areas," British Columbia (Province of British Columbia, June 27, 2024), https://www2.gov.bc.ca/gov/content/housing-tenancy/local-governments-and-housing/housing-initiatives/transit-oriented-development-areas.

60 Kyle Buchanan and Sarah Ahmed, "Co-Design Tools: Regenerating Communities," in *Collective Action!: The Power of Collaboration and Co-Design in Architecture*, by Rob Fiehn and Mellis Haward, Design Studio; Volume 6 (London: RIBA Publishing, 2023), 12-21, https://doi.org/10.4324/9781003394945.

In addition, to maximize positive effects for locals, applying for policy change at the city and provincial level is crucial. For example, the previous section highlights the parking minimum as an example of an assumption made in this thesis design. Thus, the next step within this initiative would be applying for a reduction or removal of the parking minimums to truly advocate for the use of public transportation.

In conclusion, any future development of this project must thoroughly consider the community's needs in different aspects, not simply within the limited bounds of environmentalism. Intersectionality is crucial to this project, city planning, and design, but it is especially pertinent to marginalized communities. Ultimately, to emphasize the importance of this research, I echo environmentalist Leah Thomas' sentiment regarding environmentalism, "we cannot save the planet without uplifting the voices of its people — especially those most often unheard."[61]

61 Leah Thomas, *The Intersectional Environmentalist: How to Dismantle Systems of Oppression to Protect People + Planet*, First edition. (New York: Voracious / Little, Brown and Company, 2022), 3.

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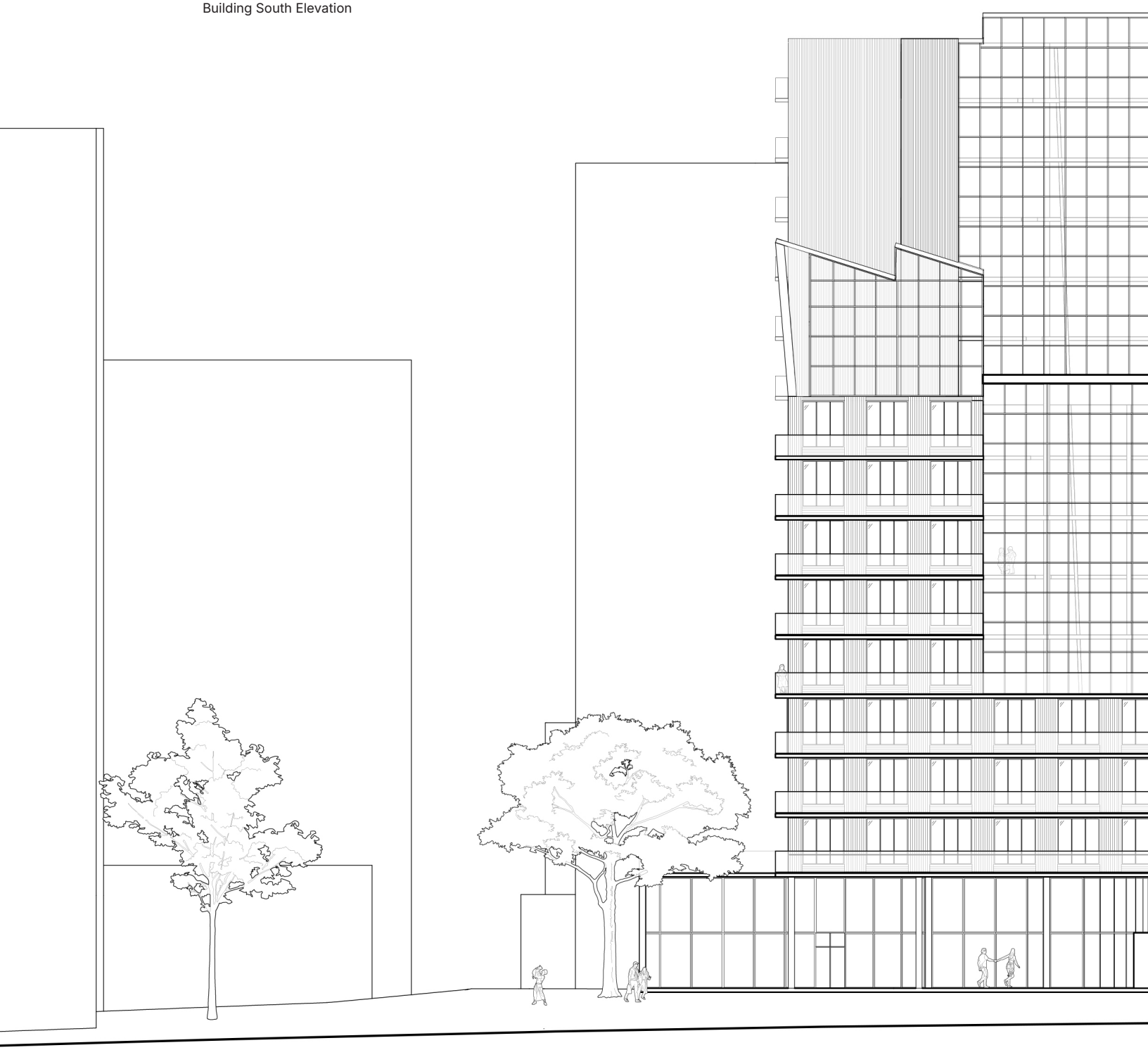
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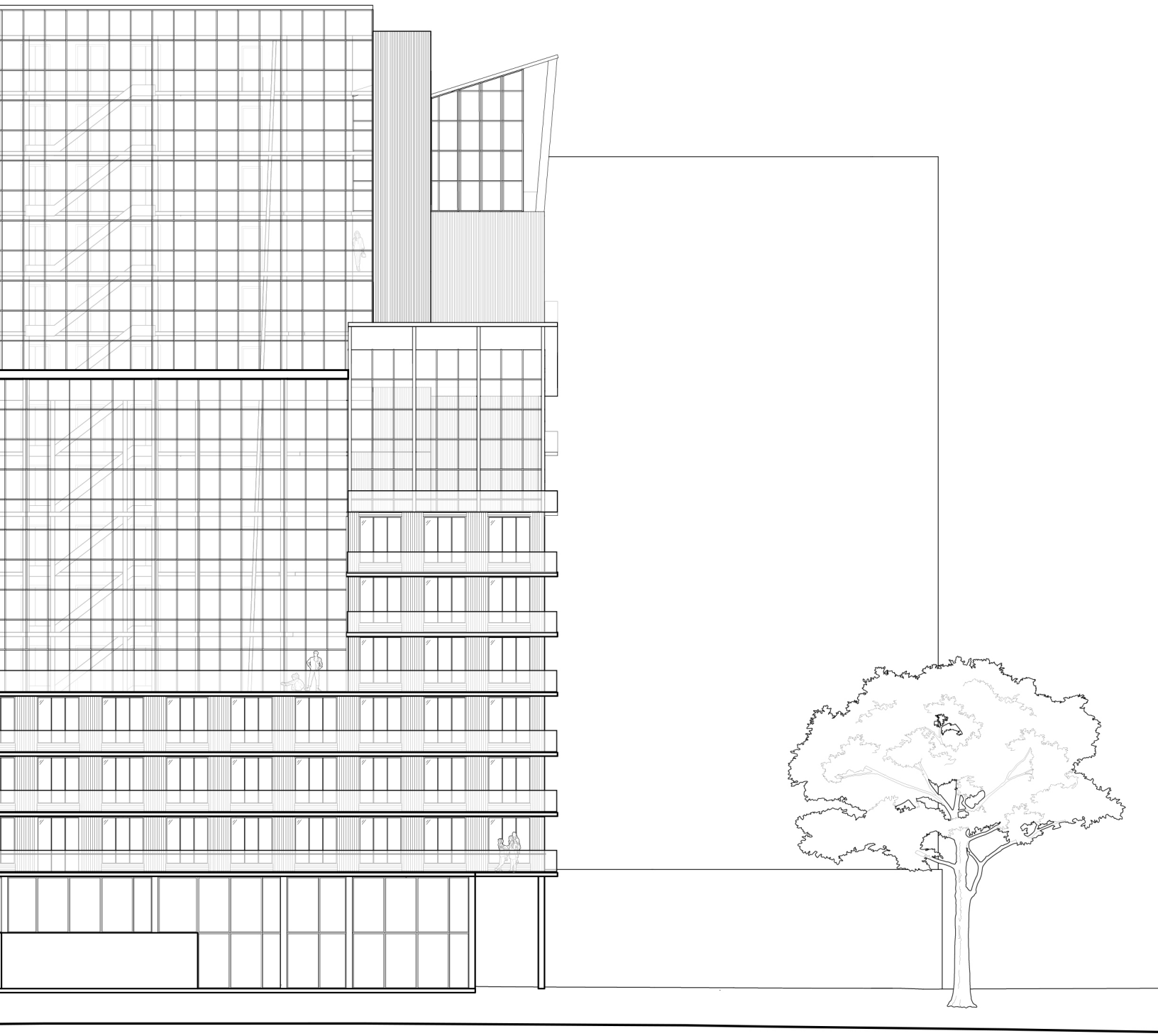
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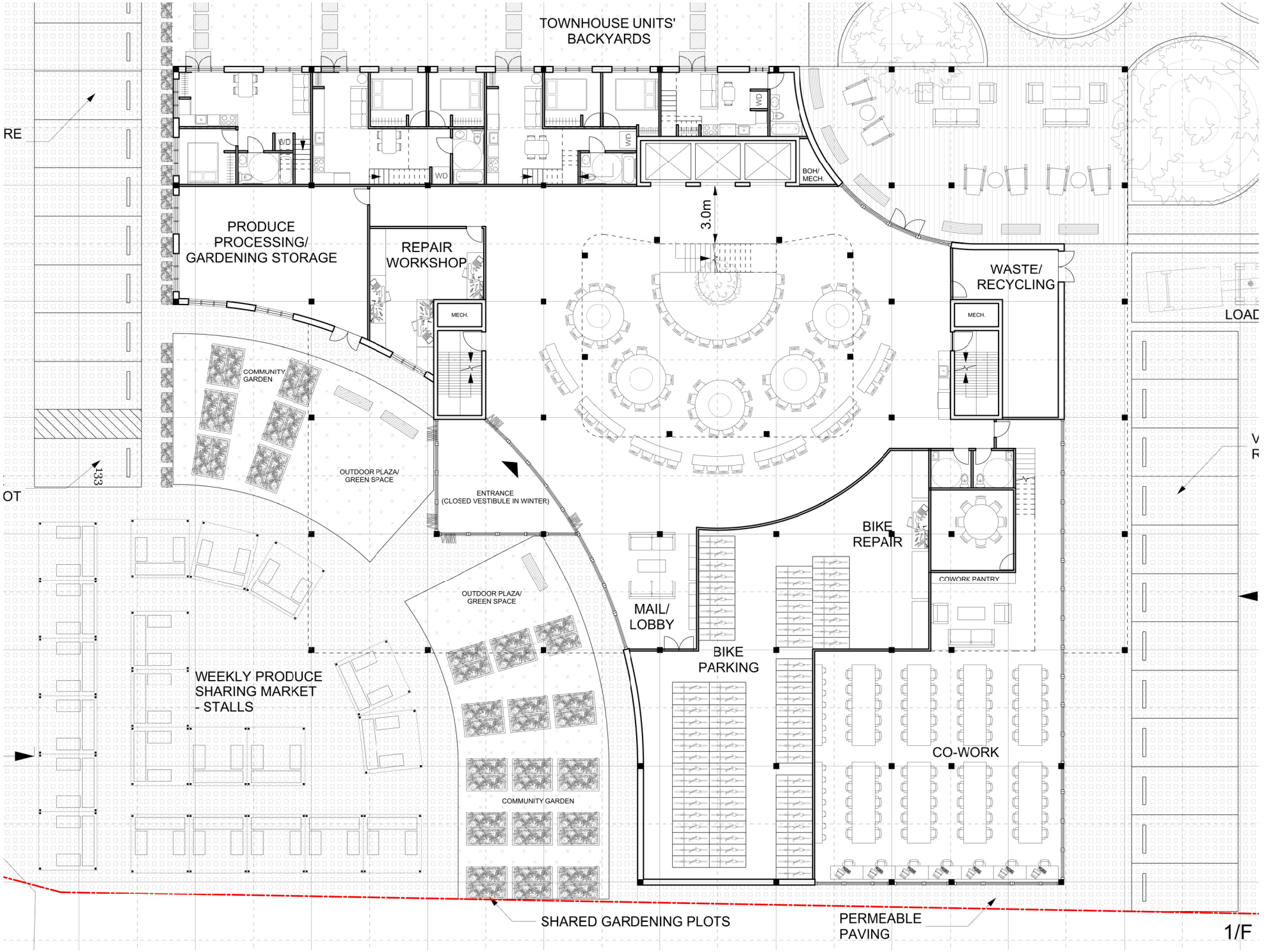
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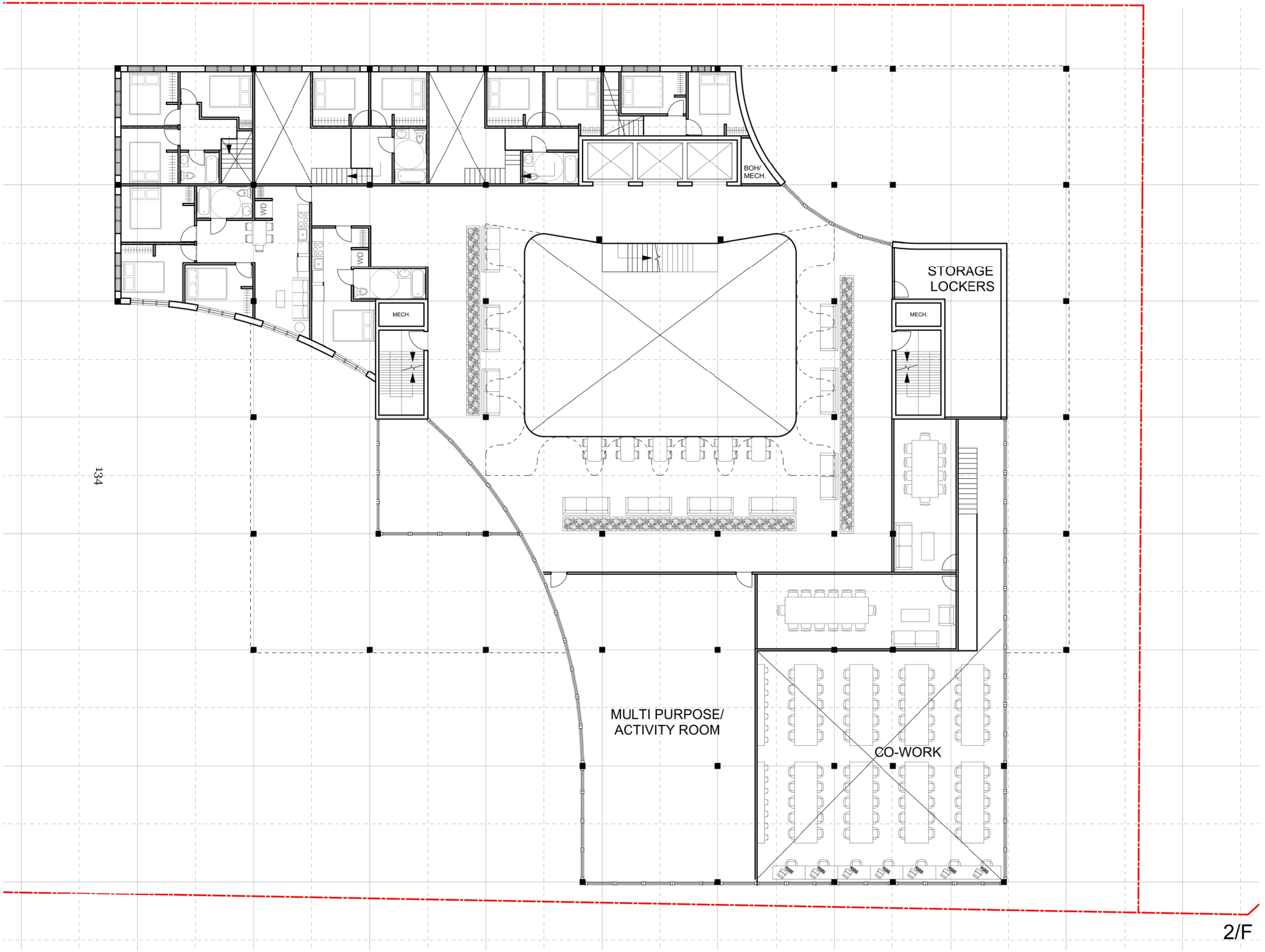
Appendix: Other Architectural Drawings

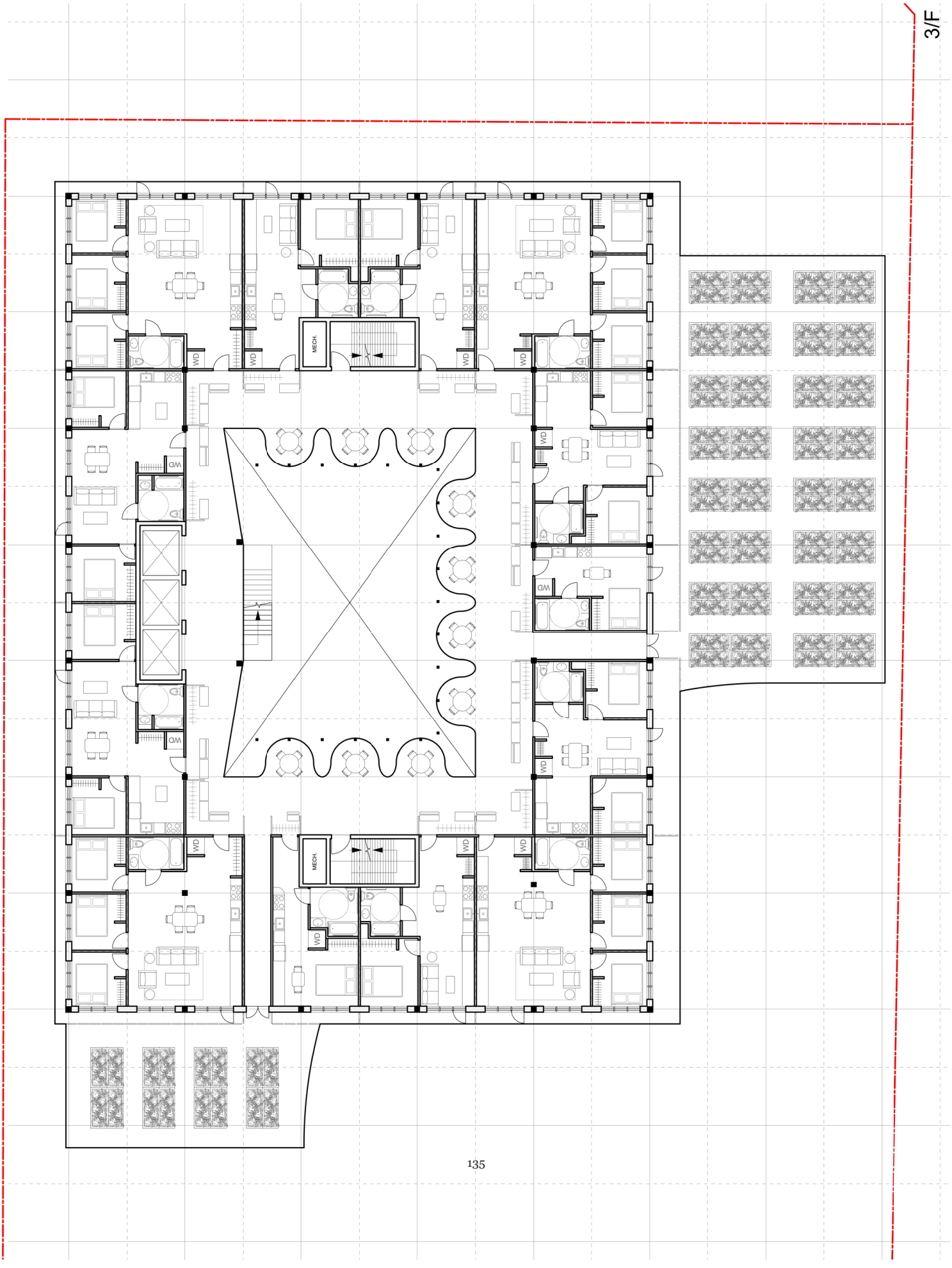
Building South Elevation



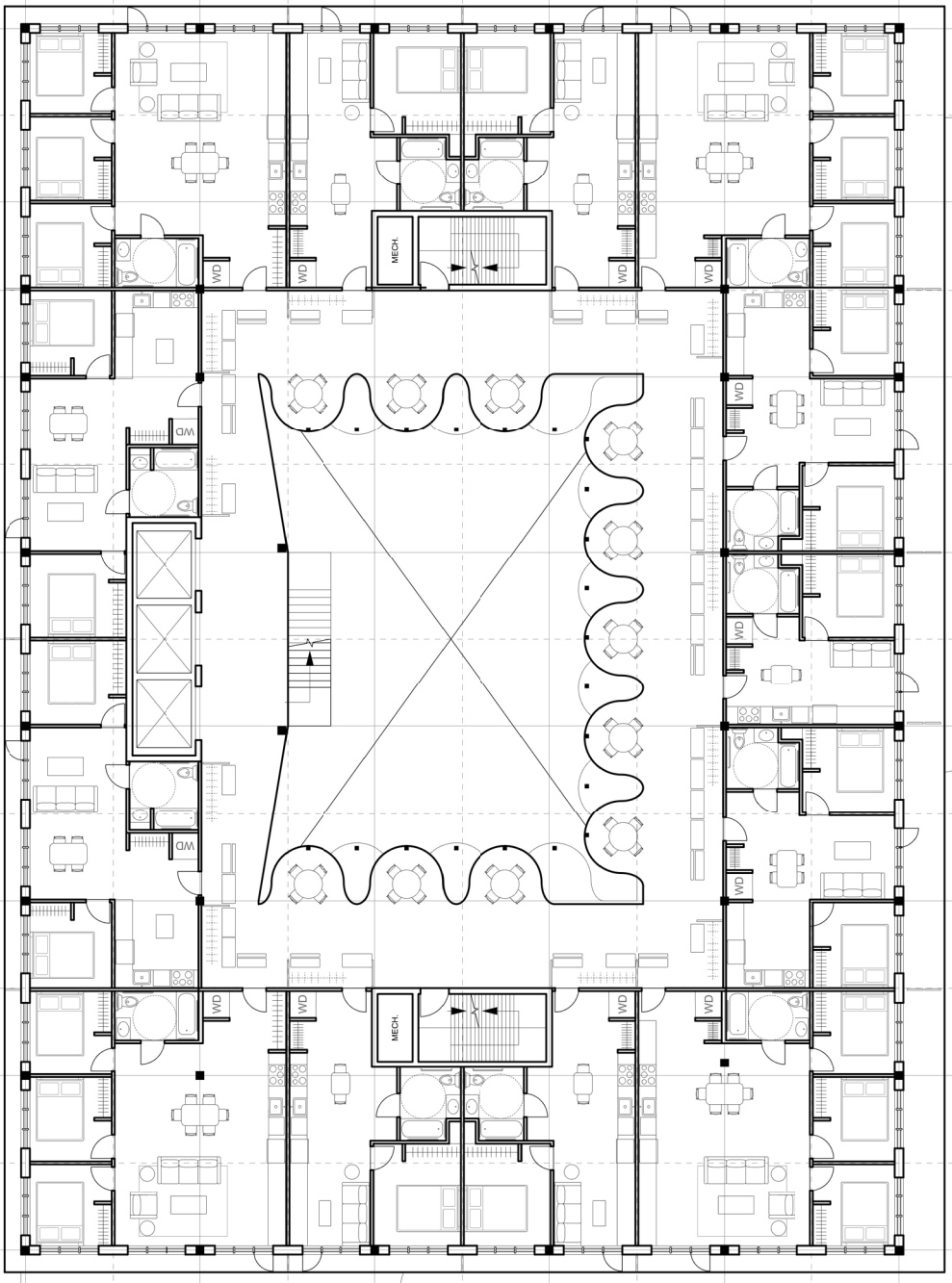



TOWNHOUSE UNITS' BACKYARDS
WD
WD
WD
WD
BOH/ MECH.
3.0m
PRODUCE PROCESSING/ GARDENING STORAGE
REPAIR WORKSHOP
MECH.
WASTE/ RECYCLING
MECH.
COMMUNITY GARDEN
OUTDOOR PLAZA/ GREEN SPACE
ENTRANCE (CLOSED VESTIBULE IN WINTER)
BIKE REPAIR
COWORK PANTRY
OUTDOOR PLAZA/ GREEN SPACE
MAIL/ LOBBY
BIKE PARKING
WEEKLY PRODUCE SHARING MARKET - STALLS
CO-WORK
COMMUNITY GARDEN
SHARED GARDENING PLOTS
PERMEABLE PAVING
1/F
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OT
133
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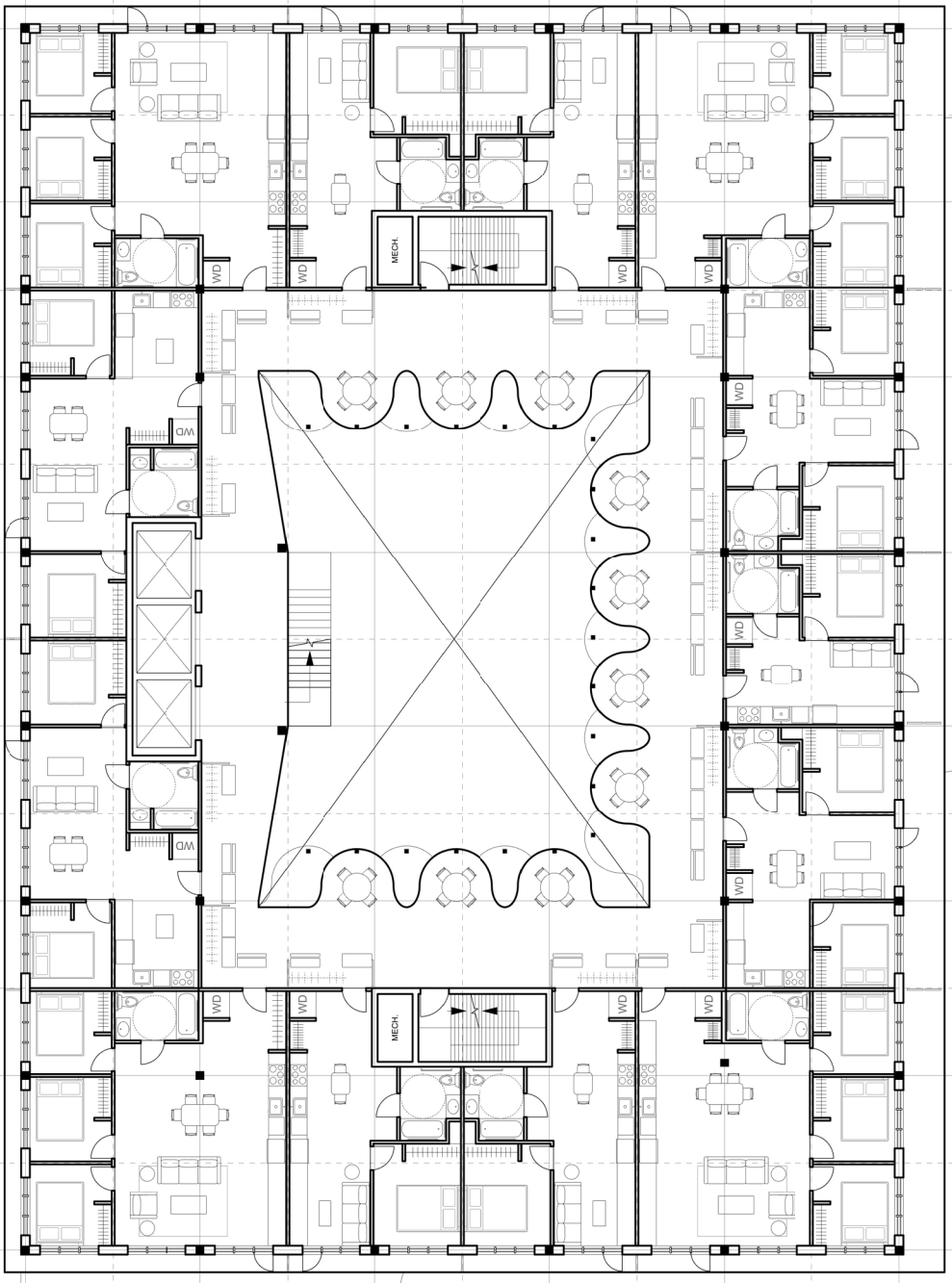

BOH/
MECH.
W/D
W/D
MECH.
STORAGE
LOCKERS
MECH.
MULTI PURPOSE/
ACTIVITY ROOM
CO-WORK
134
2/F


3/F
MECH.
MECH.
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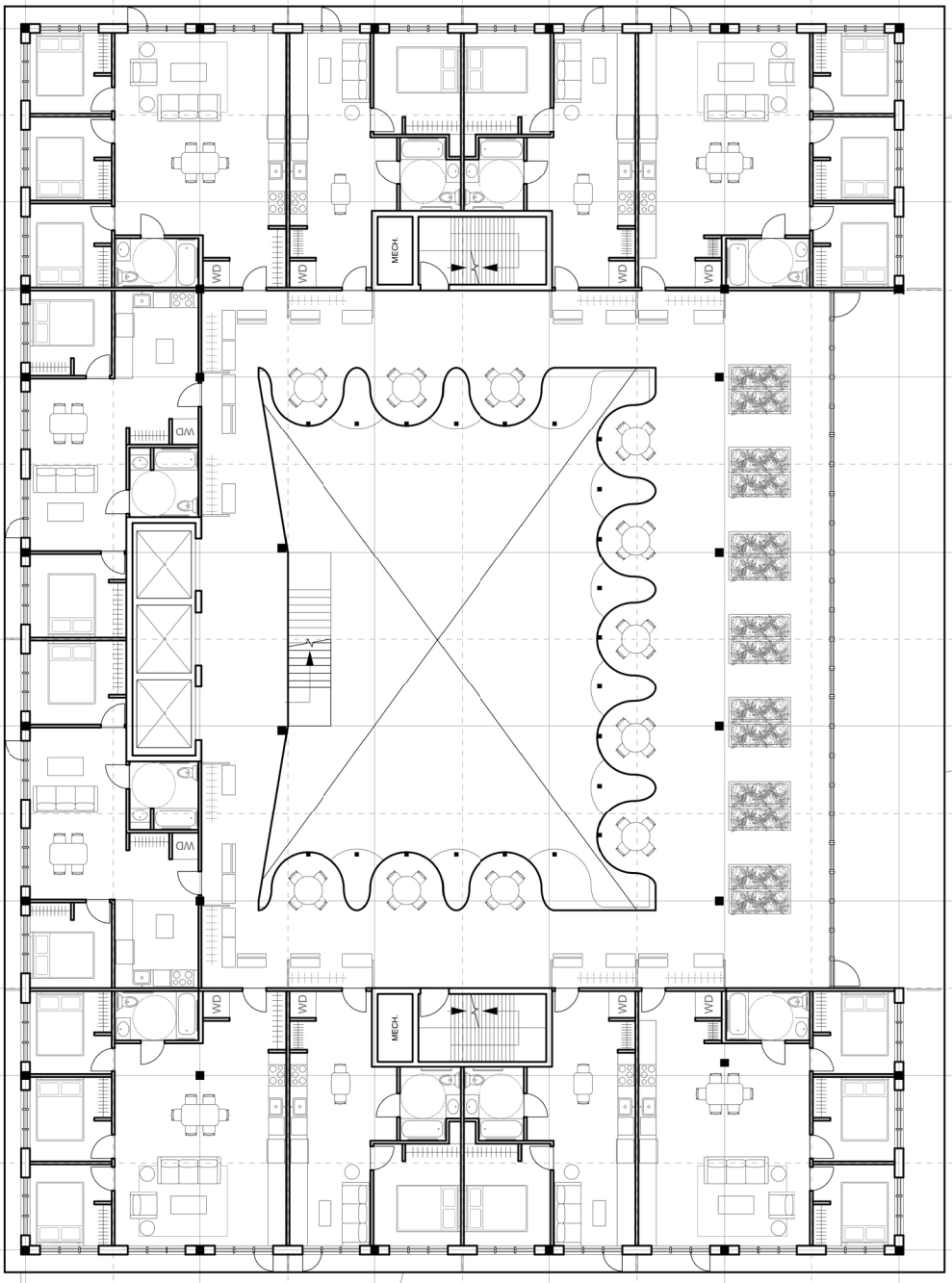
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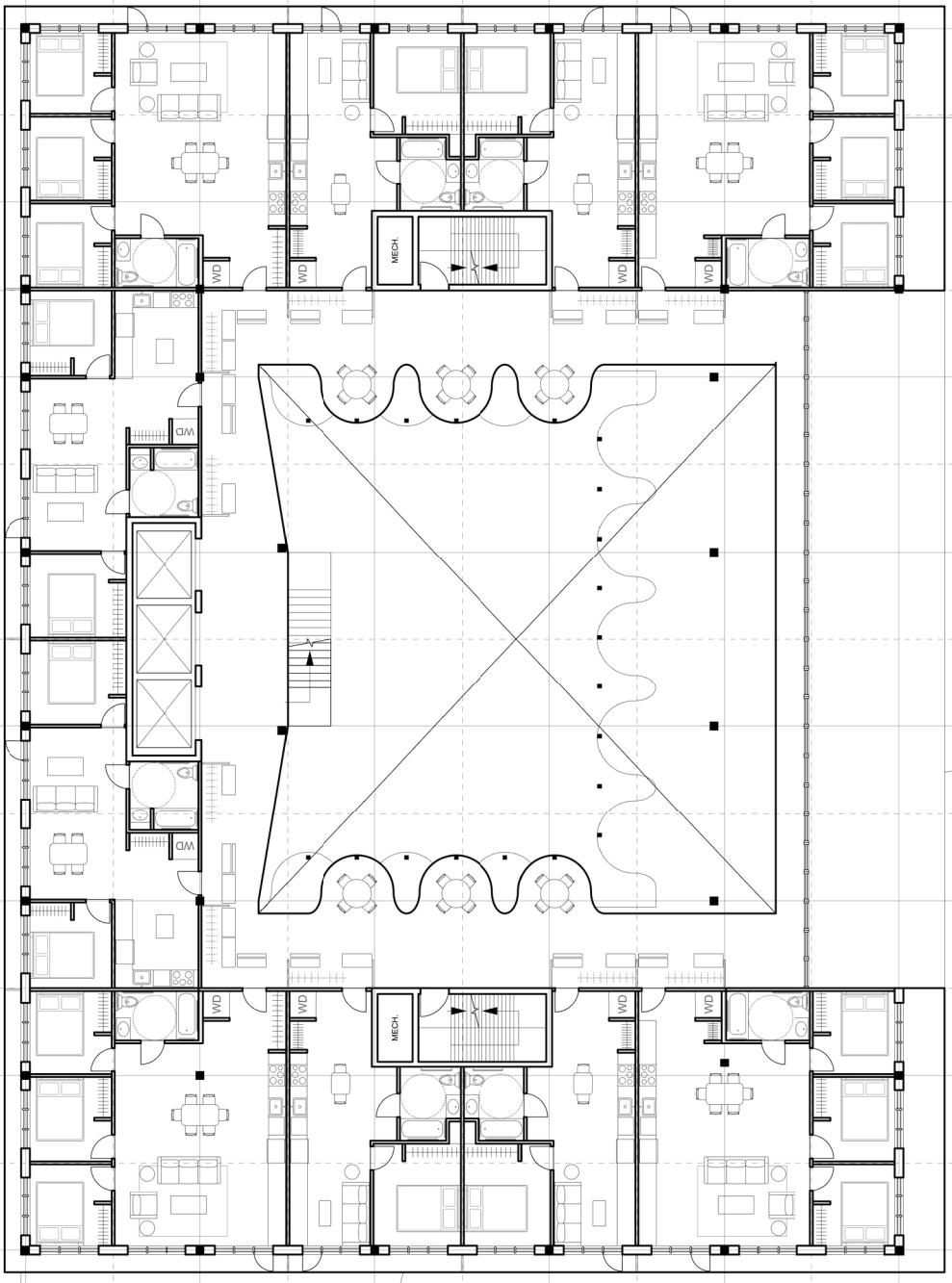
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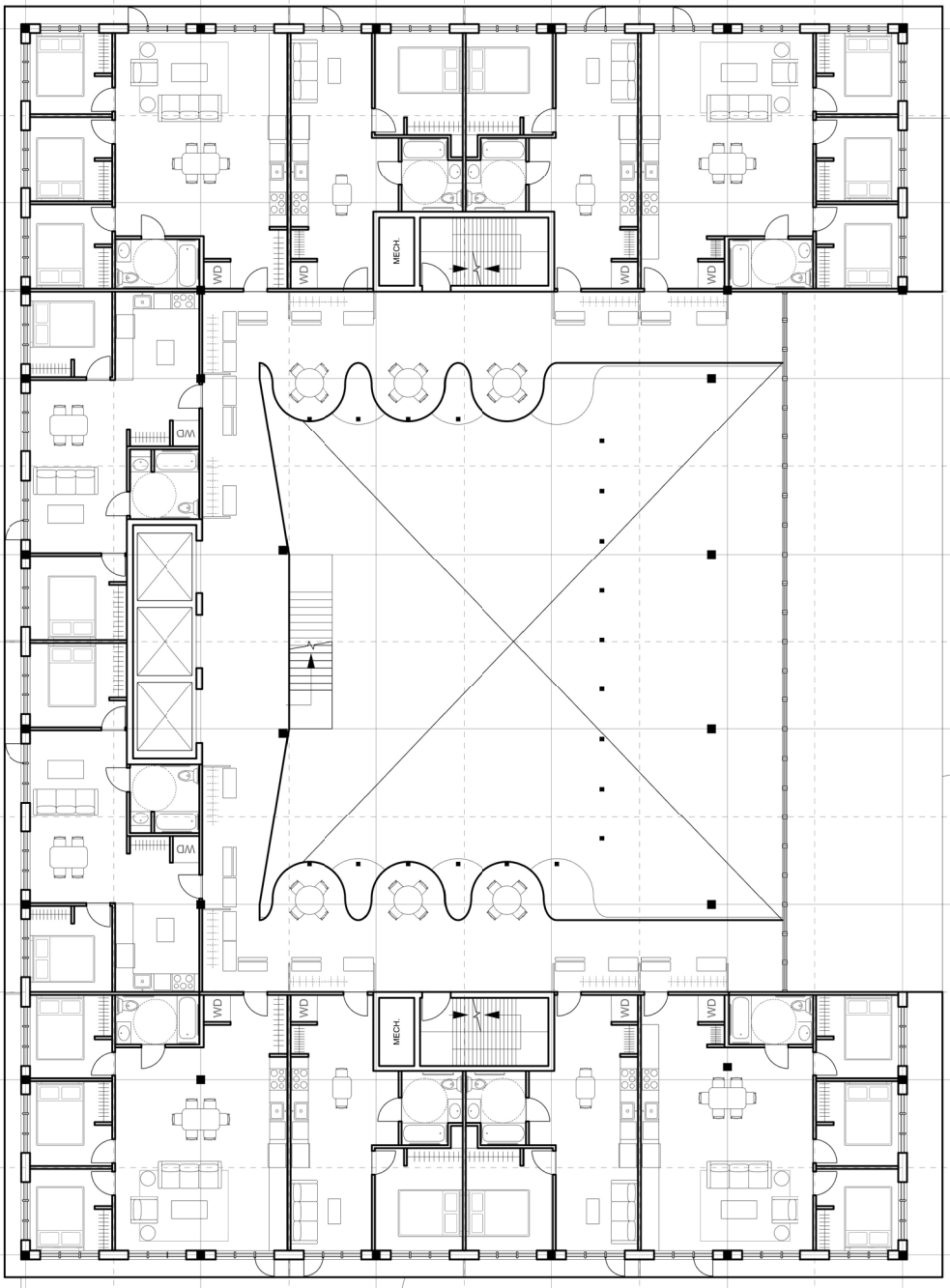


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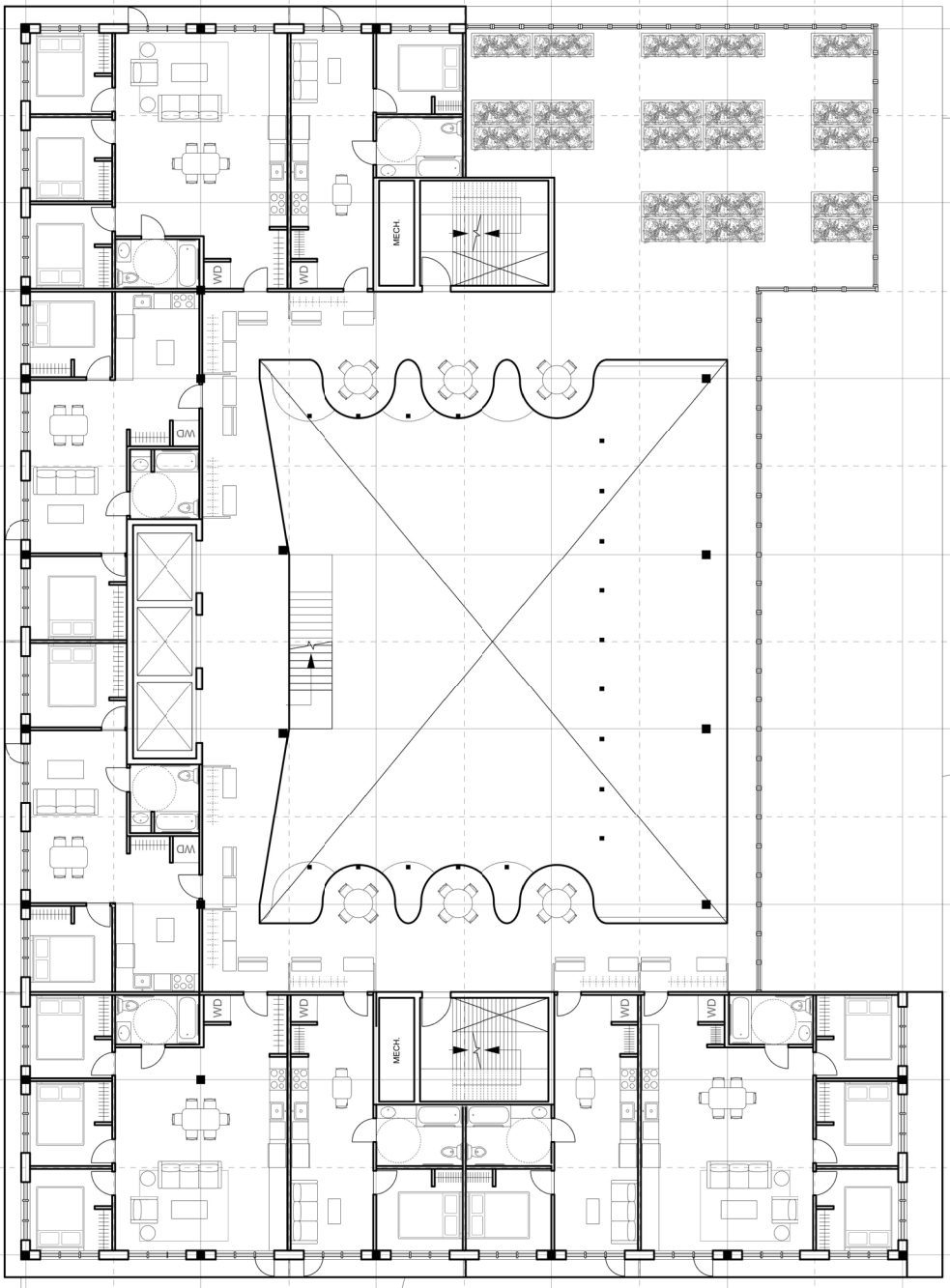
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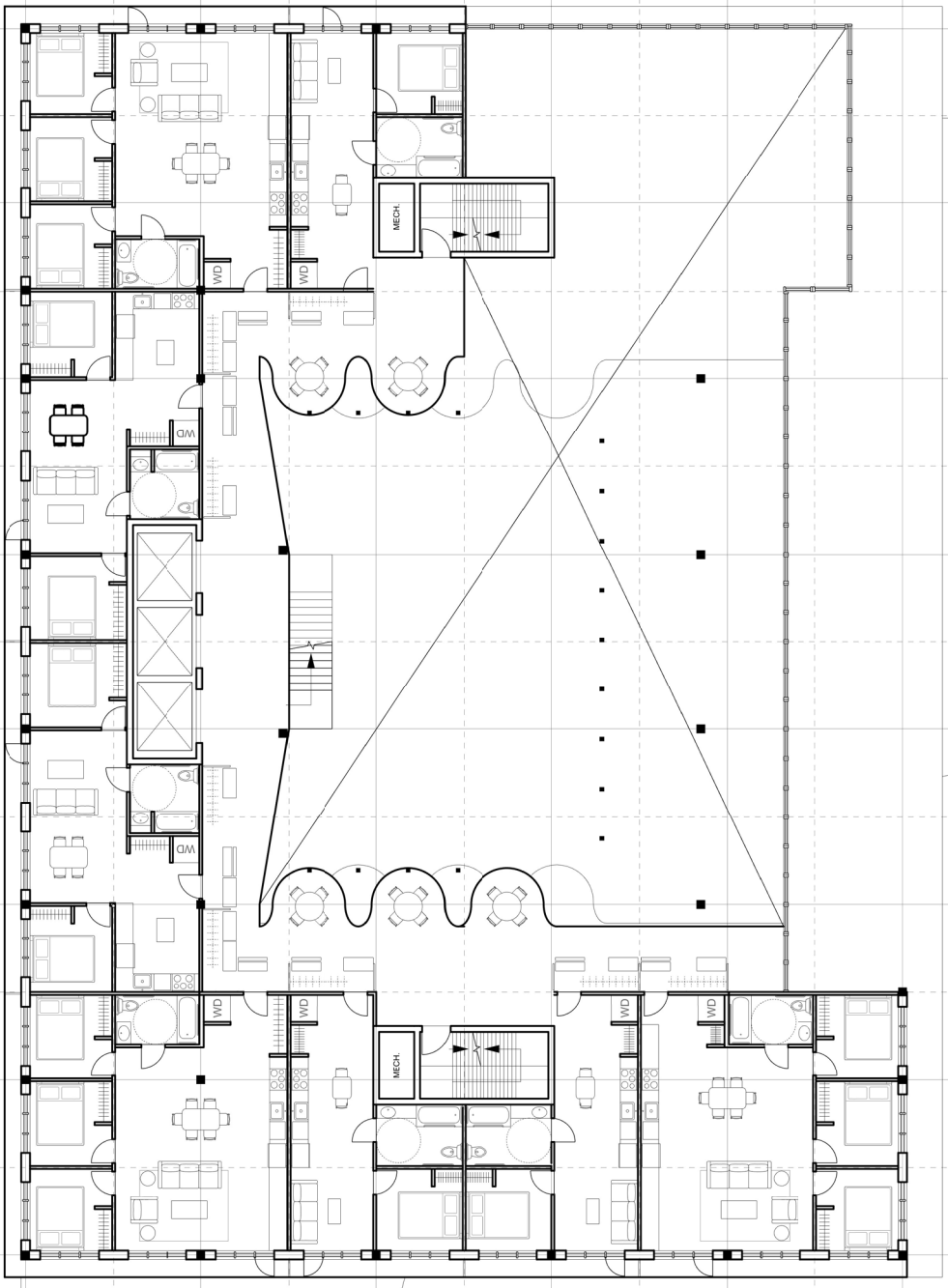




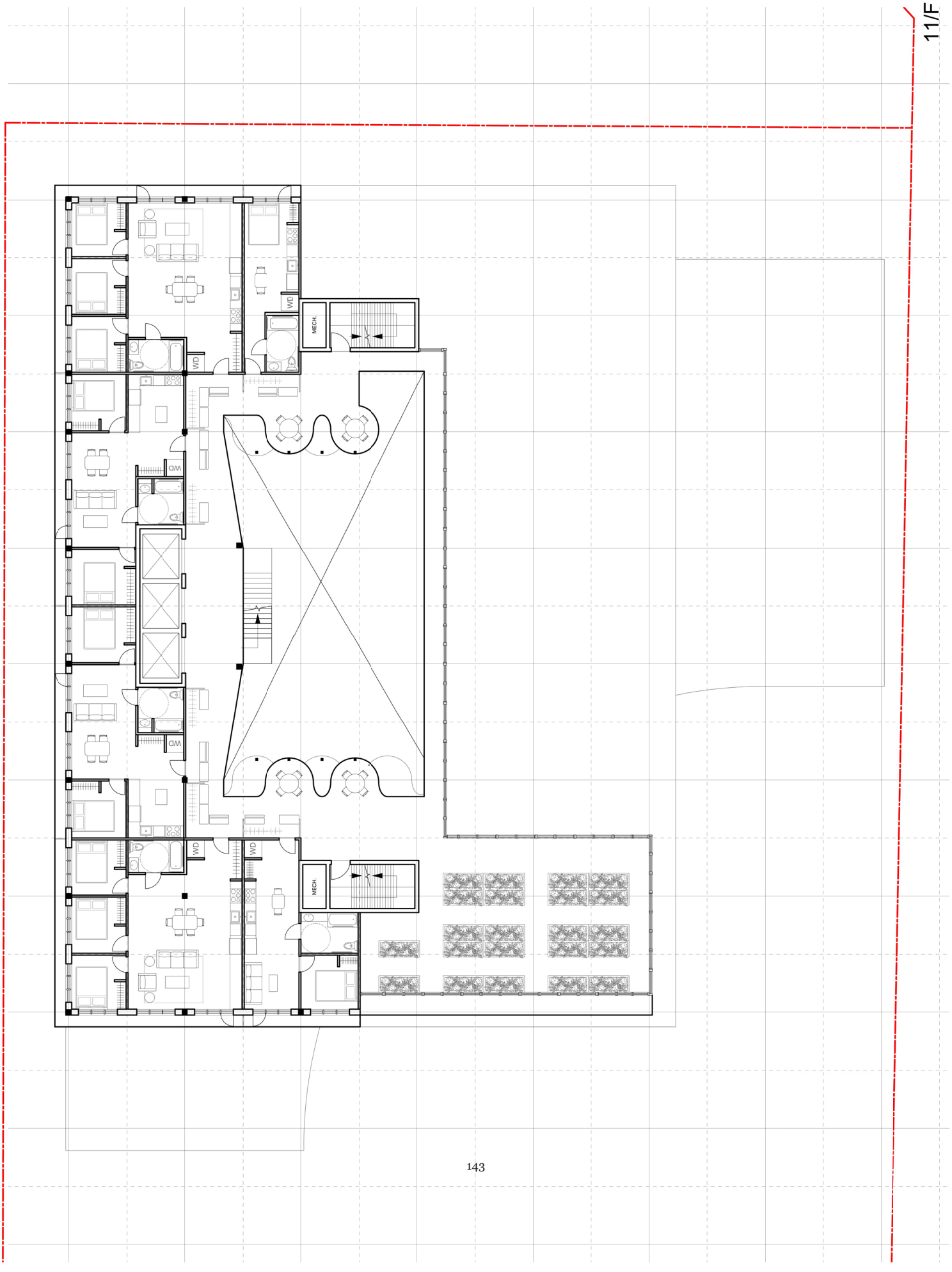
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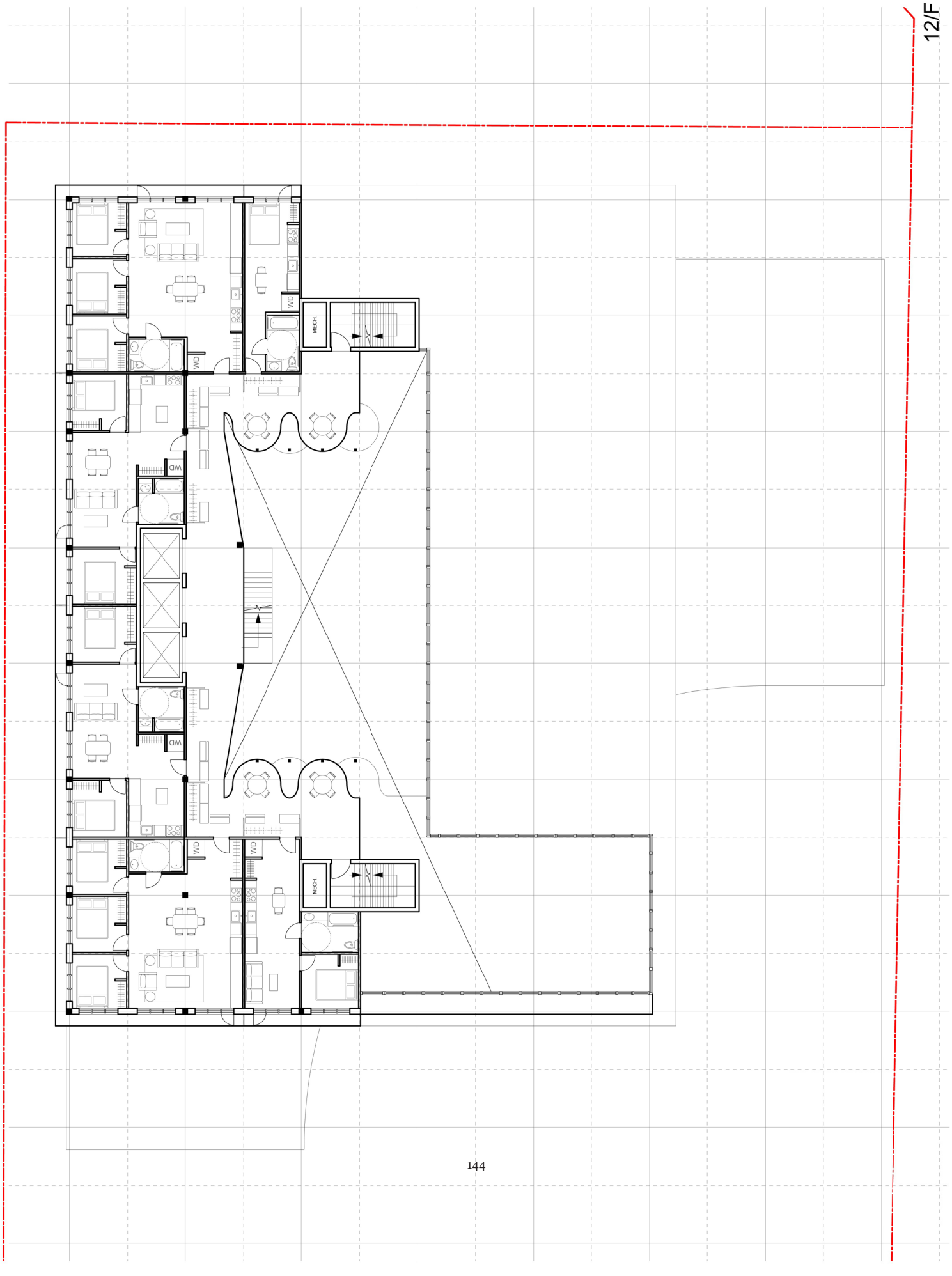
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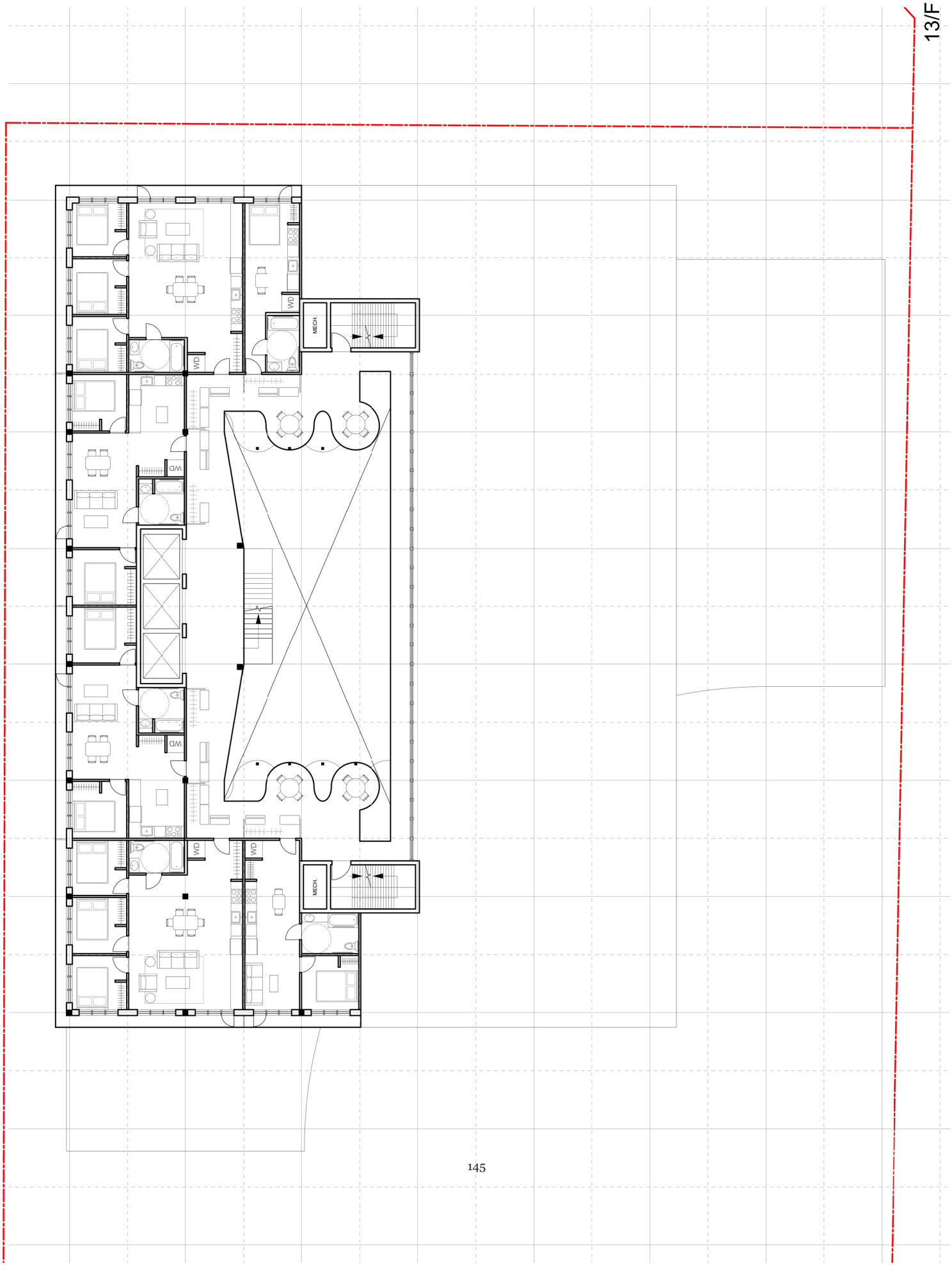




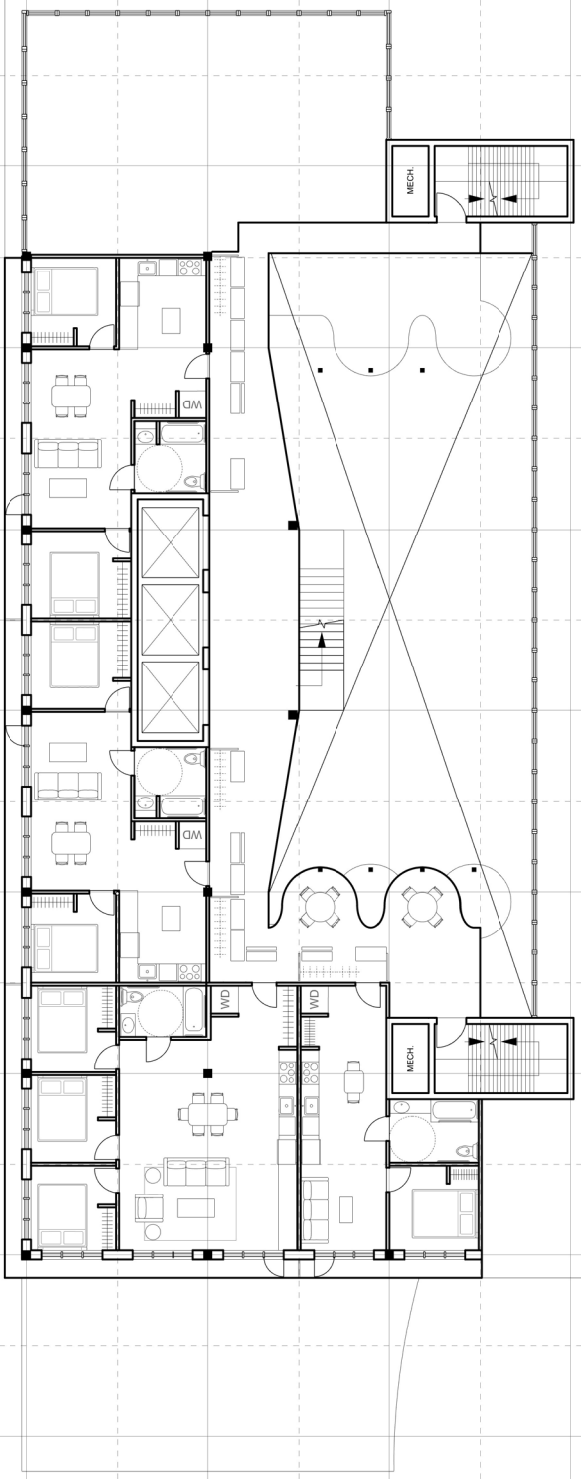
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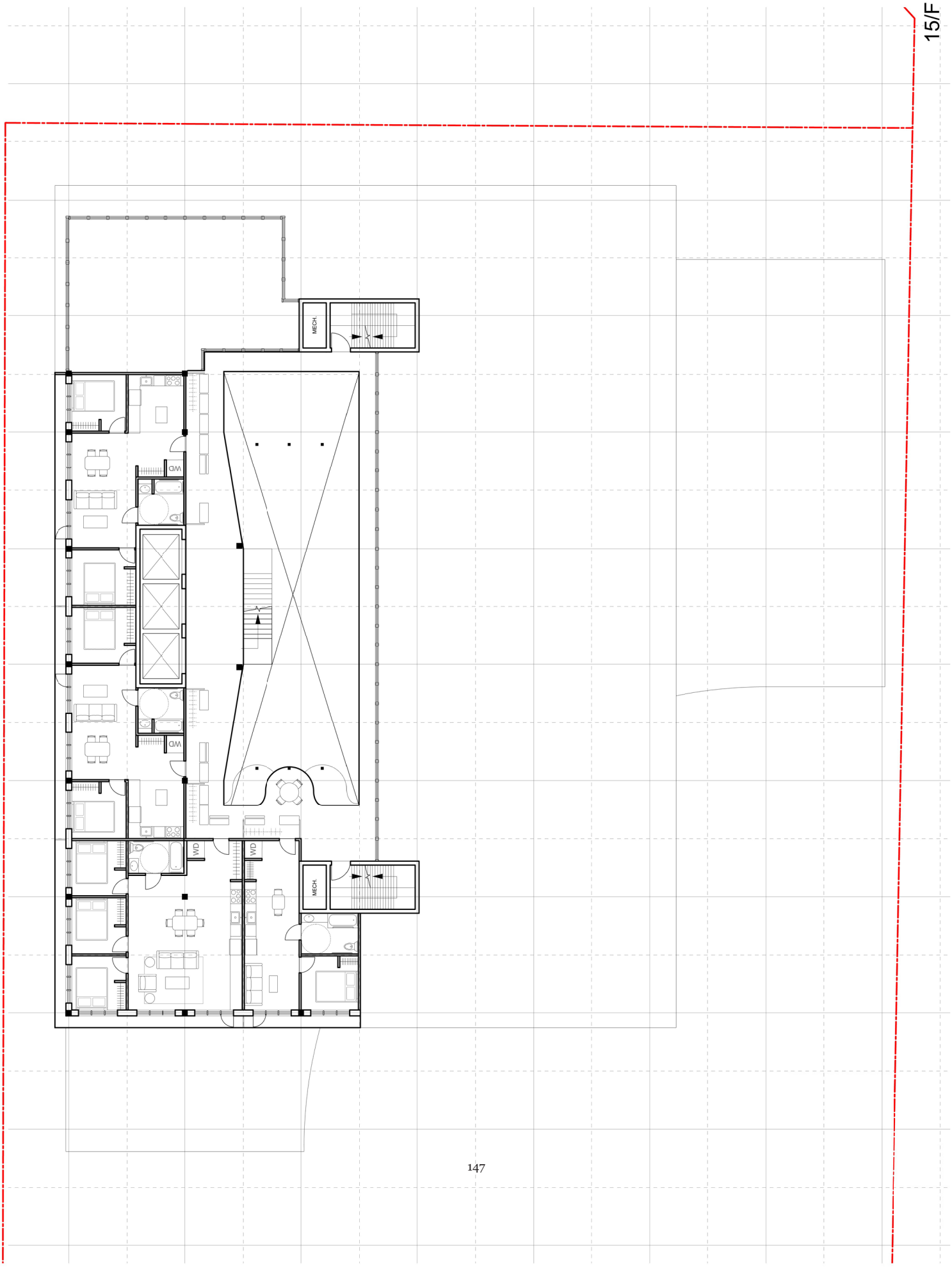

11/F
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