

Building Agriculture: An Architectural Investigation of a
New Urban Farm Type to Establish Food Sovereignty
In Regent Park, Toronto

by

Adam Petit

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APPROVED/APPROUVÉ

Thesis Examiners/Examineurs de thèse:

Prof. Ted Wilson
(Thesis Advisor / *Directeur/trice de thèse*)

Dr. Raili Lakanen
(Thesis Second Reader / *Directeur (trice) de these deuxième*)

Carol Phillips, OAA
(External Examiner/Examineur externe)

Approved for the Faculty of Graduate Studies
Approuvé pour la Faculté des études supérieures
Dr. David Lesbarrères
Monsieur David Lesbarrères
Dean, Faculty of Graduate Studies
Doyen, Faculté des études supérieures

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Abstract

1 in 8 households in Canada do not have adequate access to healthy and affordable food¹. Across the country this issue is even more prevalent in urban centers compared to rural areas². Considering that by 2050, it is estimated that 68% of the world's population will live in cities, more needs to be done in order to ensure proper production, distribution and disposal of food in and around cities as they continue to expand³. A strong interest in sustainability has brought this topic to light because food is something that connects everyone, and the food industry has significant health, social, and environmental impacts throughout communities around the world. Today, the food network is a global system, leaving behind past traditions of locally grown food, which supported local farmers, and the local economy. This has resulted in a disconnect between producers and consumers, and a lack of equity in the food system. As a result, the issue of food sovereignty is the driving factor behind this thesis proposal; and more specifically how the integration of architecture and agriculture can begin to establish food sovereignty in an urban environment through the introduction of an urban farm that can grow food all year round utilizing sustainable practices.

The thesis research will look at current issues with the food network, and examine urban agriculture case studies around the world, within Canada, and in the city of Toronto. Toronto was chosen as the urban context for the project because it is one of the most advanced cities globally in regards to urban agriculture initiatives, and the cold climate presents challenges that very few projects globally have dealt with. More specifically, the thesis will look at Regent Park in Toronto's East end, a neighbourhood that has undergone significant development over the past decade. Regent Park has a history of food sovereignty which began in the mid 1800's when the area was known as South Cabbagetown, due to the Irish immigrants who grew cabbages and other vegetables on their front lawns for food⁴.

The architectural solution proposed will be an urban farm that prioritizes education in association with other community led program; looking at the food system in a holistic way in order to establish a closed loop food system. The thesis aims to establish a solution that not only transforms the chosen site, but a solution that can begin to influence different areas by setting out principles that re-imagine how the city and others around the world can use design in order to better integrate food sovereignty within urban environments.

Acknowledgments

Throughout my architectural education at Laurentian university there have been many people who have helped me along the way towards the completion of my degree. This includes many of my professors that have been helpful and continuously expanded my knowledge in regards to architecture. Additionally, they have instilled a level of mindfulness for the environment while designing along with an appreciation for context and communities. I truly believe this is a unique aspect of the education I have received over 6 years and I am thankful for that.

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Adam Petit

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Chapter 1: Framing The Project & Toronto Case Studies

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Figure 1.0. Vegetables



Figure 1.1. Global Food

What is The Issue?

Currently in Canada 1 in 8 households do not have adequate access to healthy and affordable food⁵. Surprisingly, this issue is even more prevalent in urban centres than rural areas. Although Canada is a developed country, 8.7% of households in urban areas still face food inequality throughout the country on a daily basis⁶. Considering that by 2050 it is estimated 68% of the world's population will live in cities⁷, more needs to be done to ensure people within urban centers have access to affordable and nutritious food. For this to happen, cities must begin to re-imagine the production, distribution and disposal of food to accommodate everyone.

Thesis Question

How can architecture and agriculture be integrated in a **symbiotic** way in order to improve **food sovereignty** by establishing an **urban farm** that incorporates multiple programs within an **urban context**?

The first step to achieve this goal will be an examination of the current food network. The food network today is a global system, no longer relying on locally grown food which once supported local farmers and the local economy. The system has caused a disconnect between producers and consumers, as consumers are often not aware of where their food comes from, since foods are frequently flown across the world in order to meet demands. All of these issues have caused an inequitable food system which does not consider everyone. A more in-depth analysis of the current food system and how it came to be can be referred to in Appendix A.

Defining Key Terms

In order to fully understand the intentions of the thesis, a few key terms from the thesis question must be elaborated on: Food sovereignty, urban farm, urban context and symbiotic. These terms are essential for the framing of the project and are a significant part of the thesis methodology.

Food Security vs Sovereignty

Typically, with projects that focus on food, the discourse is concerned with food security. However, for this thesis proposal it is important to understand the difference between food security and food sovereignty. Food sovereignty will be the focus of the thesis rather than food security.

Food Security:

Food security is concerned with current food distribution systems and protecting them, so everyone has an equal opportunity to healthy and affordable food⁸.

Food Sovereignty:

Food sovereignty encourages community collaboration in order to ensure a democratic food system that receives input from citizens in order to foster equity and a sense of accountability⁹.

The 7 pillars of food sovereignty identified by Food Secure Canada are essential to the thesis in order to create a larger social impact¹⁰. The 7 pillars will drive the methodology, and help inform building program, ensuring a holistic approach to food sovereignty.

7 Pillars of Food Sovereignty



Focuses on Food for People:
People's need for food is at the centre of policy/program.



Localizes Food System:
Reduces distance between production and consumption of food.



Builds Knowledge & Skills:
Focuses on traditional knowledge, and food literacy.



Puts Control Locally:
Places control in the hands of local food providers.



Works With Nature:
Works towards improving ecosystems and biodiversity in order to increase resilience.



Values Food Providers:
Supports sustainable livelihoods, and those who produce food.



Food is Sacred:
Food is a human necessity and should not be made into a commodity.

Figure 1.2. 7 Pillars of Food Sovereignty. Image by Author

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What is Urban Agriculture?

In order to understand what an urban farm is within the context of the thesis it is first important to understand what urban agriculture is. Urban agriculture refers to the growing of plants for food and other uses, such as pollination, within or surrounding cities¹¹. This can include a variety of programs, some of which can be seen in figure 1.3. These programs can cater to a variety of social, economic, and environmental goals. Case studies have composed an integral part of understanding the possibilities and limitations of urban agriculture. More detailed studies of urban agriculture initiatives throughout the world as well as throughout Canada can be referred to in Appendix B.

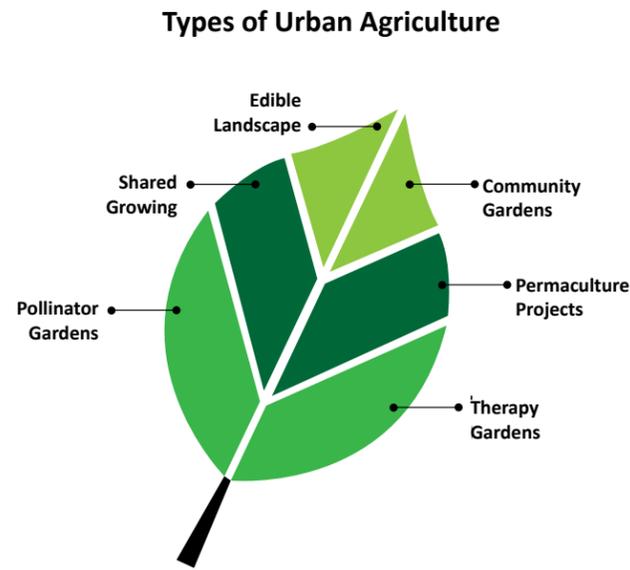
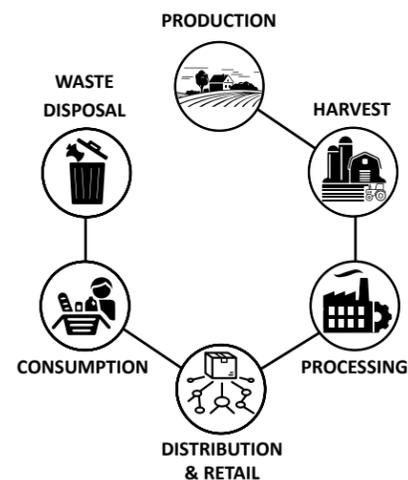


Figure 1.3. Types of Urban Agriculture. Image by Author

What is an Urban Farm?

An urban farm is the architectural solution for where urban agriculture takes place. The urban farm proposed within this thesis will emphasize the entire food system; not only looking at the production, processing and distribution of food, but also the disposal in order to establish a closed loop food system. This will be achieved by working with current organizations to ensure that the food grown and sold on site does not go to waste and is accessible to people who are most in need. Additionally, much of the food waste produced throughout the different phases of the urban farm can be re-purposed as compost. Figure 1.4. depicts the different operations that are part of an urban farm, comparing an open loop system that is typically employed versus a closed loop system the thesis will implement.

Urban Farm Process Open Loop



Urban Farm Process Closed Loop



Figure 1.4. Urban Farm Open vs. Closed Loop. Image by Author

How Can Architecture and Agriculture be Symbiotic?

Symbiotic is a term that describes a mutually beneficial relationship between different groups or systems¹². The project aims to establish a symbiotic relationship between architecture and agriculture by implementing a cradle to cradle approach, where outputs from certain building functions become inputs for others, in order to reduce resource demand. Strategies will include incorporating an anaerobic digester that will make use of the waste created throughout the urban farm, passive heating and cooling for the various growing spaces, and green roofs that collect rainwater for the vegetation throughout the site. Figure 1.5. begins to map out different elements that architecture or agriculture programs could utilize. Where the two intersect, there is potential for symbiosis.

Architecture & Agriculture

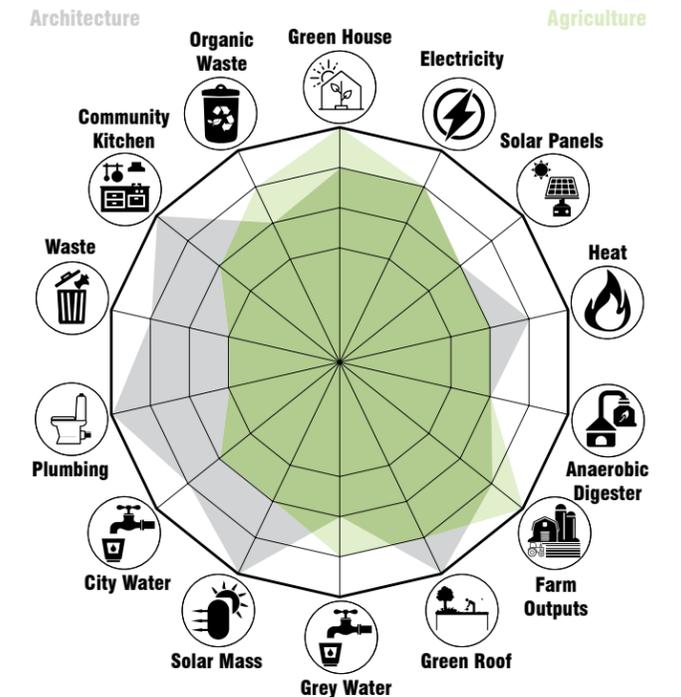


Figure 1.5. Symbiosis between architecture & agriculture. Image by Author

What is the Urban Context?

Urban context can be defined based on population density, concentration of infrastructure and a diverse set of income ranges as well as income driving activities¹³. The urban context for this thesis is the city of Toronto. Toronto was chosen because it is one of the most advanced cities globally when it comes to urban agriculture. Additionally, the cold climate poses significant challenges that many existing projects of this type have not faced. Case studies within the city of Toronto are a vital part of the thesis and form a basis for what an urban farm is and what types of programs can be incorporated in order to achieve a holistic design proposal.

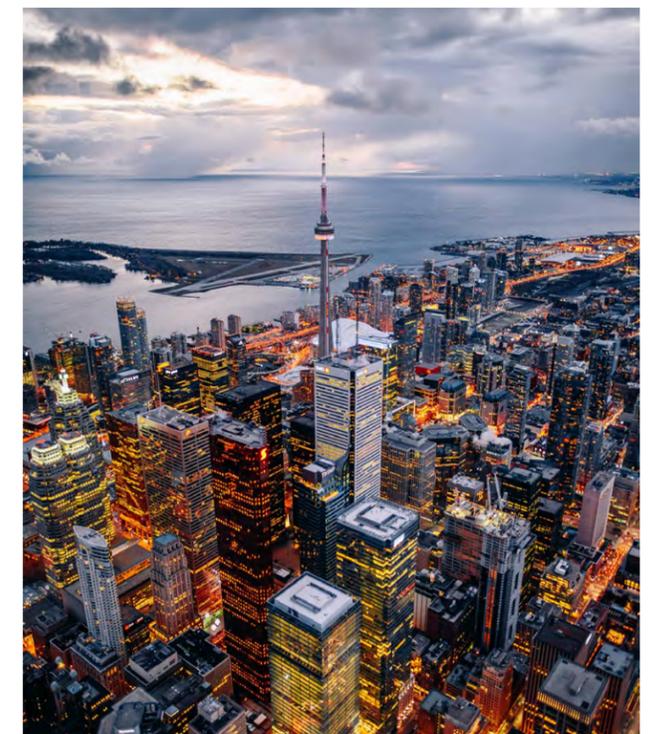


Figure 1.6. City of Toronto

11. Gocova, Anezka. "Urban Agriculture Garden Guide," n.d., 52.

12. Lexico Dictionaries | English. "Symbiotic | Definition of Symbiotic by Lexico." Accessed December 20, 2019. <https://www.lexico.com/en/definition/symbiotic>.
13. "Defining Urban Contexts." www.wvi.org. World Vision, November 17, 2012. [https://www.wvi.org/sites/default/files/Defining urban contexts 12.11.17.pdf](https://www.wvi.org/sites/default/files/Defining%20urban%20contexts%2012.11.17.pdf).



Figure 1.7. Case Study Criteria. Image by Author

Toronto Case Studies

To determine the various components and programs within an urban farm, visits and interviews (appendix C) of urban agriculture initiatives in the city were vital. Every project addresses important factors in regard to food sovereignty and operating an urban farm within the context of Toronto. The discussions provided strong anecdotal evidence for what to, and not to do when it comes to growing food within the

city. Additionally, these different organizations represent existing food infrastructure around the city which the proposed project can collaborate with to ensure a larger scale impact rather than a solution that only impacts the chosen site. Each case study was analyzed through the various benefits they provided, using seven criteria (see figure 1.7.) established by the book 'Farming the City: Food as a Tool for Today's Urbanisation'¹⁴.

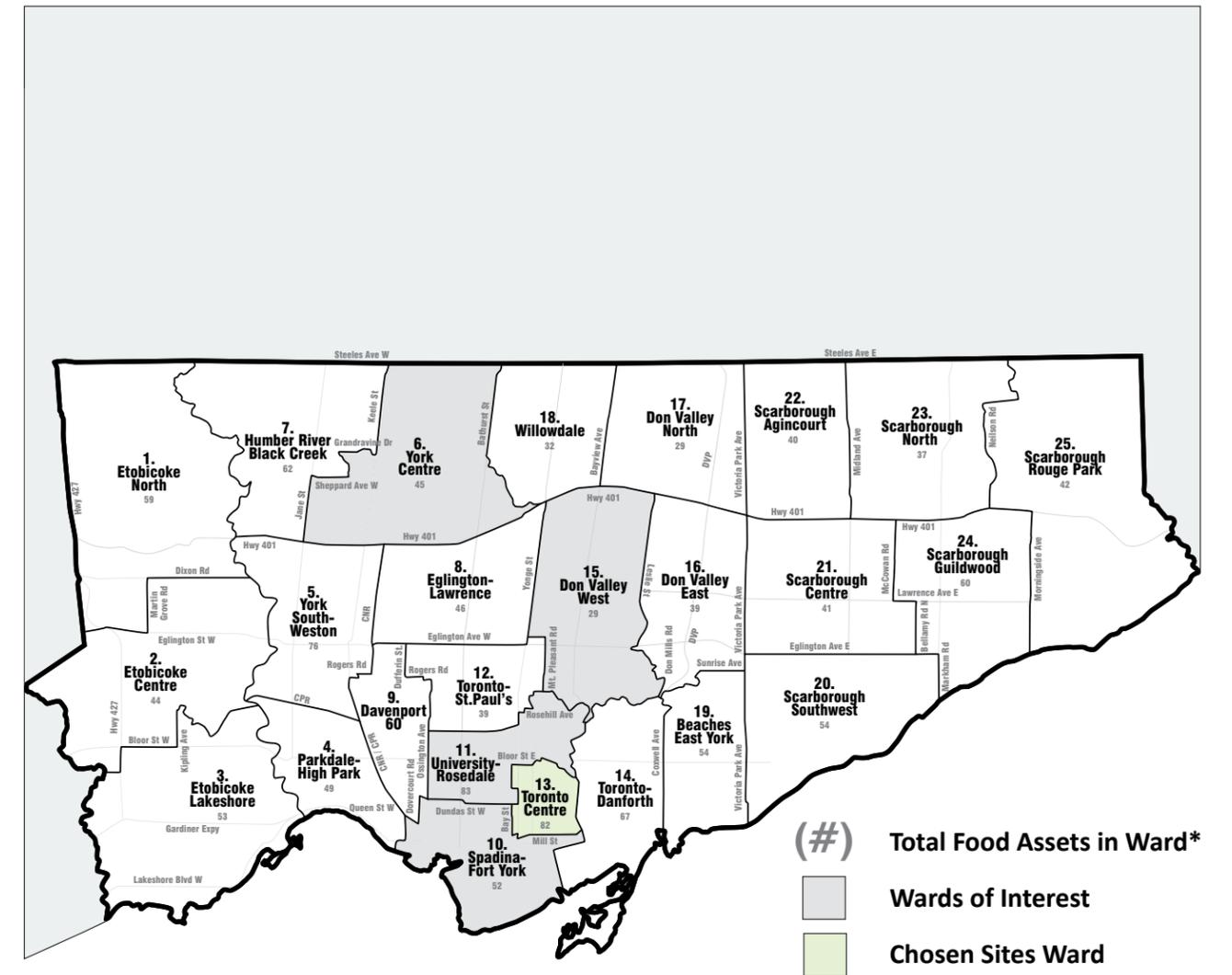


Figure 1.8. Map of Toronto. Image by Author

As part of analyzing the case studies within Toronto, the city was broken down into its 25 wards. The two sites considered for the project are Regent Park and the St. Lawrence Market, which are both located in Ward #13 'Toronto Centre'. Figure 1.8. illustrates the various wards within the city, including several wards of interest where some of the different case studies are located (most are within the main core of the

city). Additionally, the map identifies the total number of food assets in each ward¹⁵. Food assets can be understood as places where people can grow, buy, prepare, receive or learn about food. The case studies throughout the city form the thesis' framework for what an urban farm incorporates, and what type of programs an urban farm can facilitate.

14. Miazzo, Francesca, and Mark Minkjan. Farming the City: Food as a Tool for Today's Urbanisation. Amsterdam: Valiz, 2013.

15. Cabannes, Yves, and Cecilia Marocchino, eds. Integrating Food into Urban Planning. London: UCL Press, 2018. <http://www.jstor.org/stable/j.ctv513dv1>.



Figure 1.9. Evergreen Brick Works



Location: 550 Bayview Ave, Toronto, ON M4W 3X8

Ward: University - Rosedale

Programs: Urban Farm In & Out, Market, Community Kitchen, Nursery, Beekeeping, Seniors Classes, Urban Orchard, Education Centre, Social Space, Restaurant, Composting, SeedBank.

Evergreen Brick Works

Evergreen Brick Works opened in 2010, and has become a hub for sustainable practices that aim to create flourishing cities. They are an organization that utilizes urban agriculture as a tool to promote sustainability, cultural teachings, and education¹⁶. One unique aspect of their operation is their incorporation of indigenous food pathways as well as multi-generation and cultural teachings. They are a great example of how food can begin to connect people regardless of where they come from and shows the significant impact culture has on food, especially in a diverse city like Toronto. Evergreen Brick Works exemplifies how urban agriculture can play a larger role in re-imagining what cities could look like moving into the future.



Figure 1.10. The Bowery Project



Location: Multiple locations around Toronto

Ward: Spadina - Fort York

Programs: Urban Farm Outside, Education, Social Space, Public Park, Seed Bank, Composting.

The Bowery Project

The Bowery Project is a not for profit organization that establishes urban agriculture initiatives throughout the city of Toronto by making temporary use of vacant lots. The organization designs, builds and manages mobile urban farms using milk crates. They grow food for local restaurants and charities, while engaging the surrounding community through educational programming¹⁷. Due to the mobile nature of their growing crates, The Bowery Project runs urban farms that can be disassembled and relocated within hours. This allows for changes in location when the land is claimed for its subsequent uses. The mobility allows for a greater amount of freedom making the locations to introduce their agricultural acupuncture endless.



Figure 1.11. Toronto Botanical Gardens



Location: 777 Lawrence Ave, North York, ON M3C 1P2

Ward: Don Valley West

Programs: Urban Farm Outside, Education centre, Seed Bank, Rain Garden, Nursery, Beekeeping, Seniors Classes, Composting, Urban Orchard.

Toronto Botanical Gardens

Toronto Botanical Garden is a not for profit organization that offers themed gardens, with a range of indoor and outdoor programs for all ages including tours, nature day camps, and special events¹⁸. The gardens prioritize local ecologies and ensure that they do not just consider what people consume, but also carefully design their gardens to encourage pollinators. Toronto Botanical Gardens is a good case study since they offer a variety of programs, while using a non-traditional approach that is very concerned with local ecologies in order to encourage biodiversity. Their seed bank and beehives on site are just some ways they encourage biodiversity, and begin to introduce non-traditional as well as culturally significant foods to the community.



Figure 1.12. Fresh City Farms



Location: 70 Canuck Ave, Toronto, ON M3K 2C5

Ward: York Centre

Programs: Urban Farm Inside & Out, Urban Farm Incubator, Public Park, Nursery, Distribution.

Fresh City Farms

Fresh City Farms is a for profit business which delivers fresh food around the city through a subscription service using their website, and a brick and mortar store. Their subscription service makes it easy to purchase healthy locally grown food all year round. Their farm is in Downsview Park in the North end of the city where they organically grow on two acres and in a greenhouse. The farm operates as the production location for the business (production, storage, distribution)¹⁹. Fresh City Farms is a unique case study because they are one of the only examples within Toronto that is using urban agriculture strictly as a business. The farm provides an interesting model for how food grown within the city can be distributed not only to the immediate community but also areas throughout the city.

16. "About Evergreen | Evergreen." Accessed December 20, 2019. <https://www.evergreen.ca/about/>.
17. Bowery Project. "The Bowery Project: Our Vision." Accessed December 20, 2019. <https://www.boweryproject.ca/ourvision>.

18. Toronto Botanical Garden. "Toronto Botanical Gardens: About." Accessed December 20, 2019. <https://torontobotanicalgarden.ca/about-2/>.
19. Keech, Julianne. Fresh City Farms Interview, October 2019.



Figure 1.13. Second Harvest



Location: 1450 Lodestar Rd, North York, ON M3J 3C1

Ward: York Centre

Programs: Packaging & Distribution, Food Collection, Composting.

Second Harvest

Second Harvest is the largest food rescue organization in Canada and is a global leader in food recovery. They work across various stages of the food network from farm to retail in order to collect surplus food before it ends up in a landfill. The food they save, they redistribute to an extensive network of 1,080 social service organizations. The amount of food they rescue is staggering and amounts to roughly 43,000 meals a day redistributed to people in need across the country²⁰. By providing distribution, as well as education concerning food waste in Toronto and throughout Canada, Second Harvest is making a huge impact on the food network, ensuring a more closed loop system that greatly reduces how much edible food goes to landfills.



Figure 1.14. St. Lawrence Market. Photo by Author.



Location: 92 Front St E, Toronto, ON M5E 1C4

Ward: Toronto Centre

Programs: Farmers Market, Community Kitchen, Social Space.

St. Lawrence Market

The St. Lawrence Market is Toronto's oldest market, playing a significant role in the city since 1803²¹. The market was originally the distribution centre of the city, but after the opening of the Ontario Food Terminal, it is no longer the food distribution hub it once was. The market still represents the history of food within the city and is composed of three main buildings: The South market, the North market, and the St. Lawrence hall²². The market today has transitioned from a food hub to a local destination for tourists and the nearby community. Regardless, the Market stands as an icon for the history of food within the city, while showcasing a viable business that sells to the local community.



Figure 1.15. Regent Park Food Centre Photo by Author.



Location: 40 Oak St, Toronto, ON M5A 2C6

Ward: Toronto Centre

Programs: Urban Farm Inside & Out, Farmers Market, Residential, Community Kitchen, Seniors Classes, Education Centre, Social Space, Composting, Seed Bank.

Regent Park Food Centre

The CRC (Christian Resource Centre) is a multi-service organization that has served Regent Park for more than 50 years. The CRC aids low-income community members by helping them improve their lives in different ways. One way they accomplish this is by offering community meals four days a week, which feed almost 300 people in need each day. Most of the produce for these meals is grown at the nearly 250 community garden plots (10'x10 or 8'x8') run by the CRC throughout the community. The organization runs several community programs as well as housing support, drop-in food programs and cultural celebrations²³. The CRC is an amazing example of how food sovereignty programs can empower a local community while benefiting them with fresh, healthy and culturally significant food.



Figure 1.16. Regent Park Planters. Photo by Author.

20. "What We Do - Second Harvest." Accessed December 20, 2019. <https://secondharvest.ca/what-we-do/>.
 21. "St. Lawrence Market : History." Accessed October 10, 2019. <http://www.stlawrencemarket.com/history>.
 22. Ibid.

23. "TCRC » About CRC." Accessed December 20, 2019. <http://tcr.ca/who-we-are/our-roots-are-deep>.
 * The CRC identified that 8'x8' are often more productive because people tend to be more conscious and efficient when they have less room to plant, rather than larger lots that often become overgrown with weeds.

Components of an Urban Farm

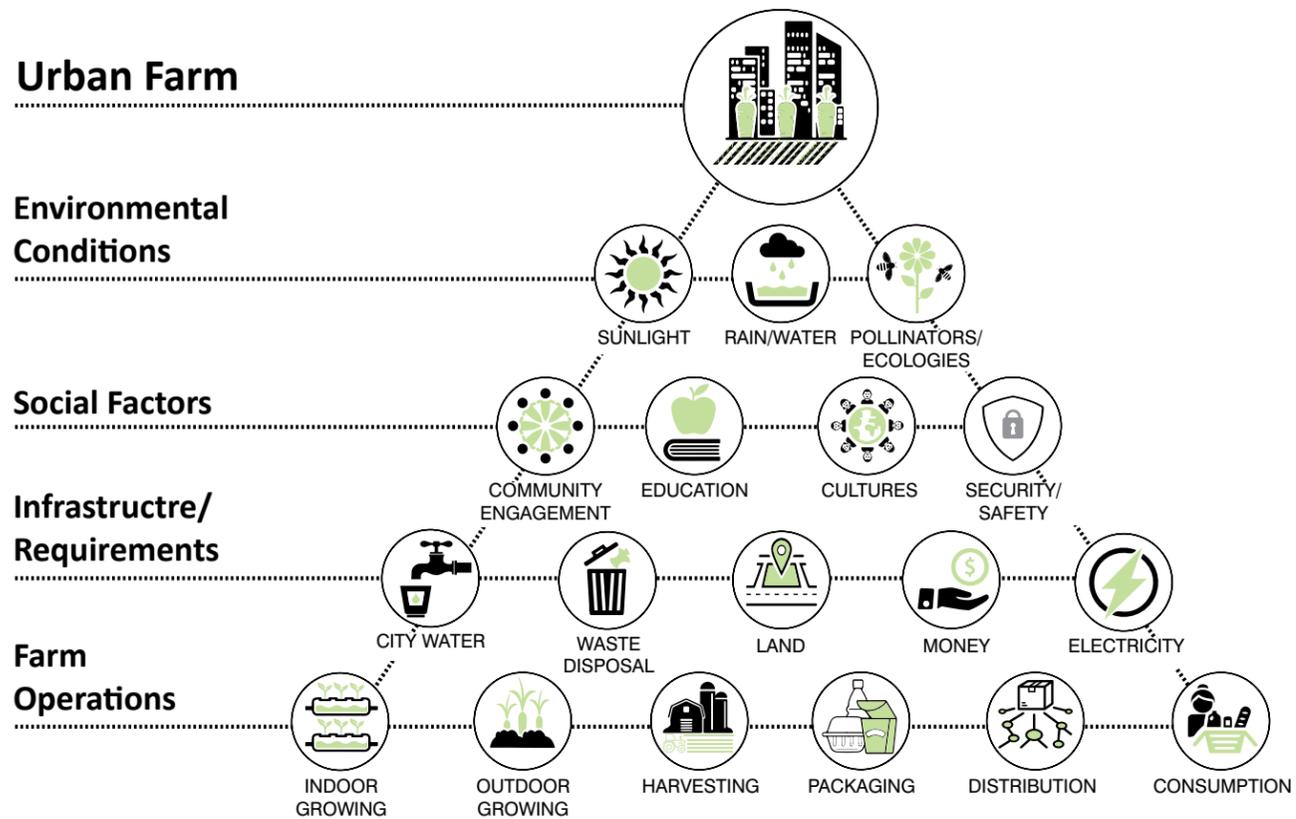


Figure 1.17. Components of an Urban Farm. Image by Author

Using the data collected from the different case studies throughout Toronto (along with the Canadian and global examples), four subcategories were generated, breaking down the different components of an urban farm. In order to better understand how an urban farm can prosper, it was important to know what has made existing initiatives within the city successful. The categories are: environmental conditions, social factors, infrastructure/requirements, and farm operations. Environmental conditions look at things such as sun and water which are the two most vital elements for growing food, and will be important for the resources strategies of the

building. Social factors incorporate things like education as well as community engagement and culture which are significant factors in improving food sovereignty throughout communities. Infrastructure and requirements speak to different things that are essential for starting an urban farm. Land for example is one of the biggest requirements for an urban farm, and one of the hardest to have, specifically due to the price of property within cities compared to rural areas. And finally farm operations address the different stages of the food network an urban farm facilitates, from production to waste management.



Figure 1.18. Fresh City Urban Farm. Image by Author



Chapter 2: Identifying a Site & Significance of Regent Park

Comparative Site Study

17-19

Regent Park

20-26

Sun Study

27-30



Figure 2.0. Site Study. Images by Author

Comparative Site Study

As part of determining a site for the urban farm, a comparative site analysis was conducted between the North End of the St. Lawrence Market and Regent Park at the corner of Parliament and Gerrard. In general, both sites show potential to be relevant to food sovereignty. The Market is a very historic site as a food market within the city, while Regent Park has a strong history of growing food within the community. Although the thesis will focus on one site specifically, it is important to state that the intention of the project is to begin establishing an urban farm typology that can determine common principles that would allow for several nodes of urban farms throughout the city. Therefore, the site that is chosen should not be considered the only place the project could take place, but rather as a place which is most indicative of the thesis values laid out in chapter 1, signifying a prototype for incorporating food production within urban environments.

As a means of comparing the two sites, site visits were conducted during the week of October 14th-18th 2019. A specific set of criteria was used in order to analyze the neighbourhood and site dynamics of the sites. As a result, five graphic maps were produced for each possible site showing: neighbourhood conditions, circulation and transportation around the site, senses and different stimuli around the site, site services and features, as well as different environmental conditions such as sun and wind exposure. This mapping exercise can be referred to in Appendix D.

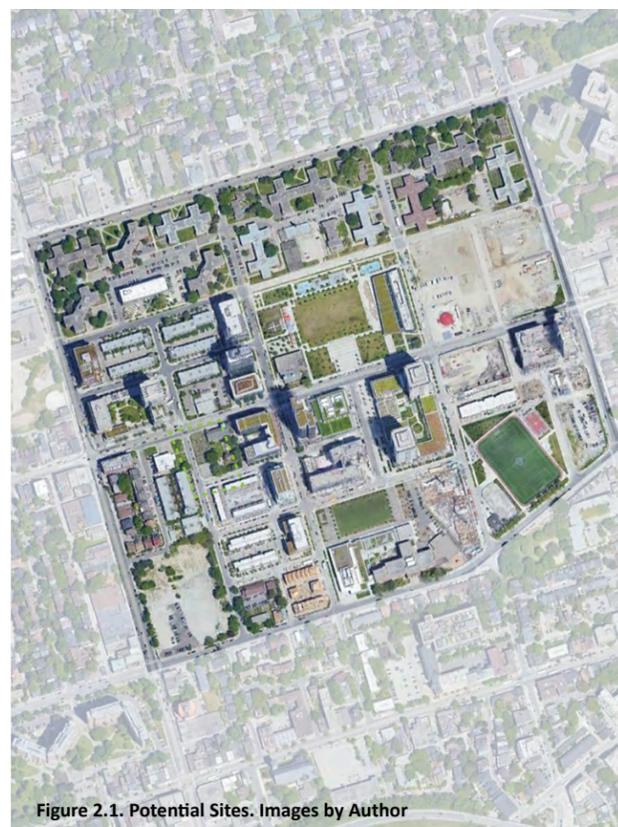


Figure 2.1. Potential Sites. Images by Author



Figure 2.2. St. Lawrence Market Site. Image by Author

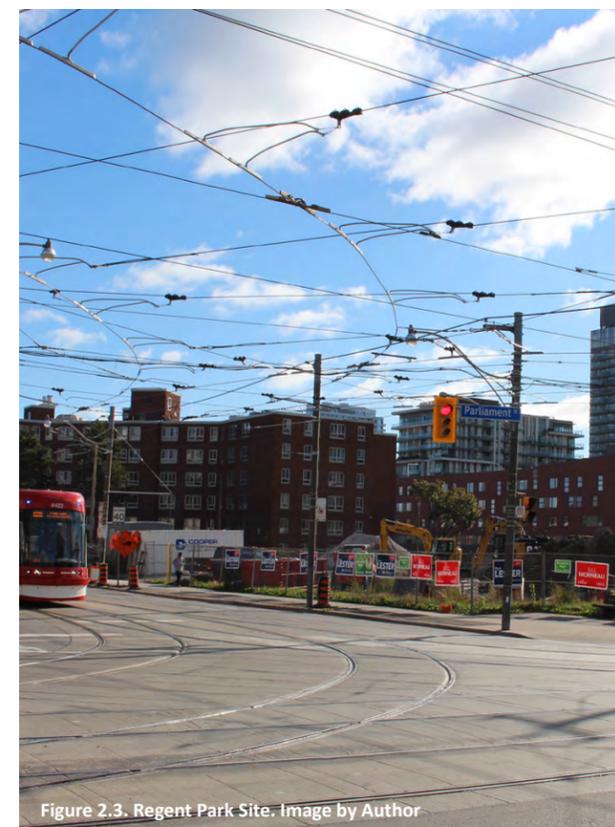


Figure 2.3. Regent Park Site. Image by Author

St. Lawrence Market

The St. Lawrence Market is Toronto's oldest market, and has played a significant role in regard to food within the city since its establishment in 1803. The market was once the food distribution hub of the city, before the introduction of the Ontario Food Terminal in the 1950s'. The Market site is historically significant and was previously the location of the Toronto's first city hall. Although the market is no longer a food distribution hub, it still plays an important role in the culture of Toronto's food scene. Today, it is one of Toronto most popular tourist destinations as thousands of people a day visit. The market is composed of three main buildings: the South market (Figure 2.2.), the North Market (the proposed site), as well as St. Lawrence Hall²⁴.

Regent Park

Regent Park is a neighbourhood in Toronto's East end and was home to Canada's largest community housing project²⁵. The project was once a success, but quickly failed as crime in the area began to rise due to a lack of access. The area has undergone significant changes over the last decade due to gentrification as part of the proposed revitalization which began in the early 2000s²⁶. The area is defined as Gerrard St. to the North, Parliament to the West, Shuter St. to the South, and River St. to the East. The neighbourhood is broken up into 2 main areas; North Regent Park (North of Dundas) and South Regent Park (South of Dundas). The proposed Site (Figure 2.3.) is part of North Regent Park, at the corner of Gerrard St. and Parliament St.

24. "St. Lawrence Market : History." Accessed October 10, 2019. <http://www.stlawrencemarket.com/history>.

25. August, Martine. "Challenging the Rhetoric of Stigmatization: The Benefits of Concentrated Poverty in Toronto's Regent Park." *Environment and Planning A: Economy and Space* 46, no. 6 (June 1, 2014): 1317-33. <https://doi.org/10.1068/a45635>.

26. *ibid.*



Figure 2.4. Back of St. Lawrence Market. Image by Author

St. Lawrence Market

The initial instinct of the thesis was that the St. Lawrence Market site would be more suitable for the architectural intervention because of its significance as a historic food site within the city. The opportunity to propose a structure on the North site which is currently under development presented the possibility of an urban farm which could juxtapose the new and old food hubs within the city. Additionally, this would allow for new prosperity to the market area, impacting as many people as possible since it is so well known within the city.

However, after visiting the St. Lawrence market site it was obvious that it has become more of a destination, rather than the true food hub that it once was. Overall, there was very little culture of urban agriculture in the area, as

well as very little need, since the area has developed into a higher income neighbourhood. Many of the vendors were not sourcing from local farmers directly or dealing with urban producers opting instead to take advantage of the Ontario food terminal.

Additionally, after conducting a short survey from people at the market, it showed that most of the people there were tourists and not people from the city. Most people who were from the city worked nearby and primarily stopped by for lunch rather than to buy their everyday food items. As a result, thinking about the site through the lens of food sovereignty, it no longer seemed like the location where the proposed project could create the greatest impact for the local community.

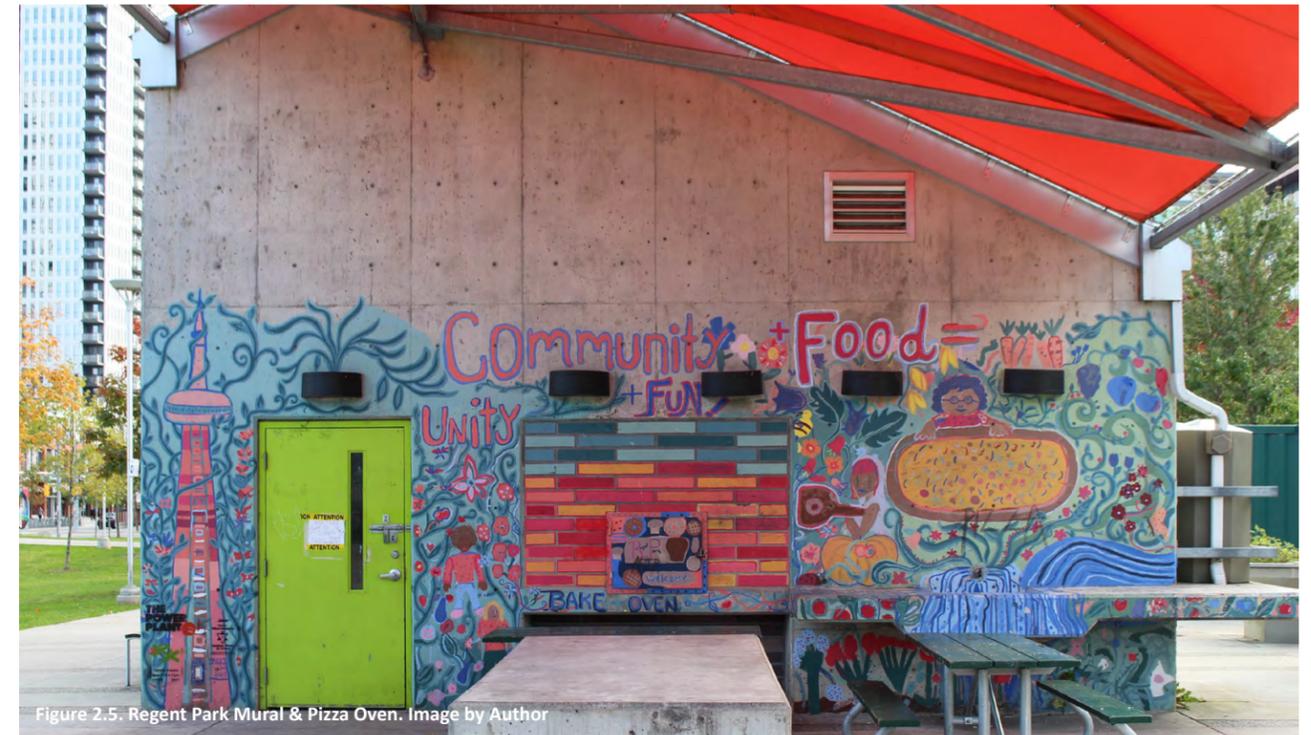


Figure 2.5. Regent Park Mural & Pizza Oven. Image by Author

Regent Park

Considering these different factors, the focus shifted to the Regent Park community. Walking around the Regent Park area it quickly became apparent how much they valued community gardens, and the ability to grow their own food. It seemed like every other street there was some sort of community garden plot where people were working. One experience which left a considerable impression was finding a mural (Figure 2.5.) next to one of the community gardens which encapsulated the area's excitement for food and community. The mural was on the side of a gardening supply building and incorporated a pizza oven, with the word "community, food, and unity" standing out. This seemed like the perfect community to introduce an urban farm because there was an apparent culture and enthusiasm for growing food.

After completing more research into the area this became even more evident. Regent Park has a rich history of growing food dating back to the 1850's when it was known as South Cabbagetown due to the immigrants who grew cabbages and other vegetables on their lawns²⁷. Since then it is an area that hosted one of Canada's largest community housing developments. The development ended up failing and the area is now undergoing its second revitalization in the last 70 years. Today, there are hundreds of community garden plots that are used to help feed low income people from the neighbourhood who are in need. Although each site provided unique opportunities, after analyzing them within the intentions of the project, Regent Park presented a greater urgency for a project that focused on food sovereignty.

27. "Brief History of Cabbagetown – Cabbagetown Preservation Association." Accessed December 20, 2019. <https://cabbagetownpa.ca/heritage/brief-history-of-cabbagetown/>.

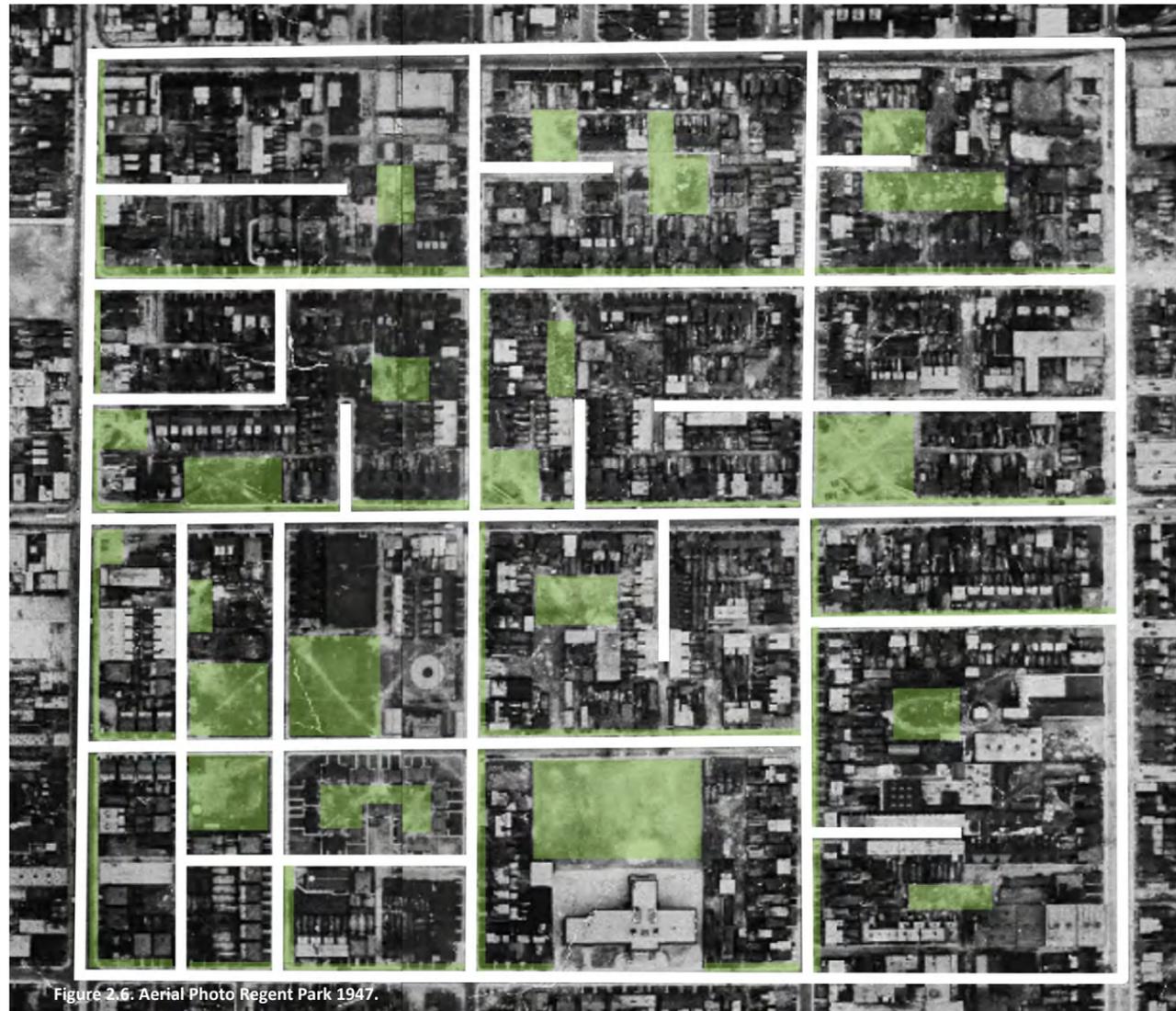


Figure 2.6. Aerial Photo Regent Park 1947.

Cabbagetown 1850-1949

Regent Park was chosen for the architectural intervention because it is an area with a strong history of food sovereignty over the last two centuries and presents an opportunity for a prototype proposal that re-imagines how Toronto could begin to integrate food within its urban fabric. The story of food sovereignty in Regent Park began in the mid 1800's, when the area was known as South Cabbagetown, due to the Irish immigrants who grew cabbage and

other vegetables on their lawns for food (Figure 2.7. & 2.8.)²⁸. The aerial photo during this time (Figure 2.6.) shows a dense layout of houses and alleys. People who faced the South West would often grow vegetables on their front lawn, while people to the North primarily grew in their backyard. The green areas highlighted on the images show where people may have grown food. However, for several reasons the area deteriorated, and in 1949 the City of Toronto tried to revitalize the area by introducing a social housing development²⁹.



Figure 2.7. Cabbagetown 1947, Dundas St. E.



Figure 2.8. Cabbagetown 1947, 178-180 River st.

28. *ibid.*
 29. August, Martine. "Challenging the Rhetoric of Stigmatization: The Benefits of Concentrated Poverty in Toronto's Regent Park." *Environment and Planning A: Economy and Space* 46, no. 6 (June 1, 2014): 1317-33. <https://doi.org/10.1068/a45635>.

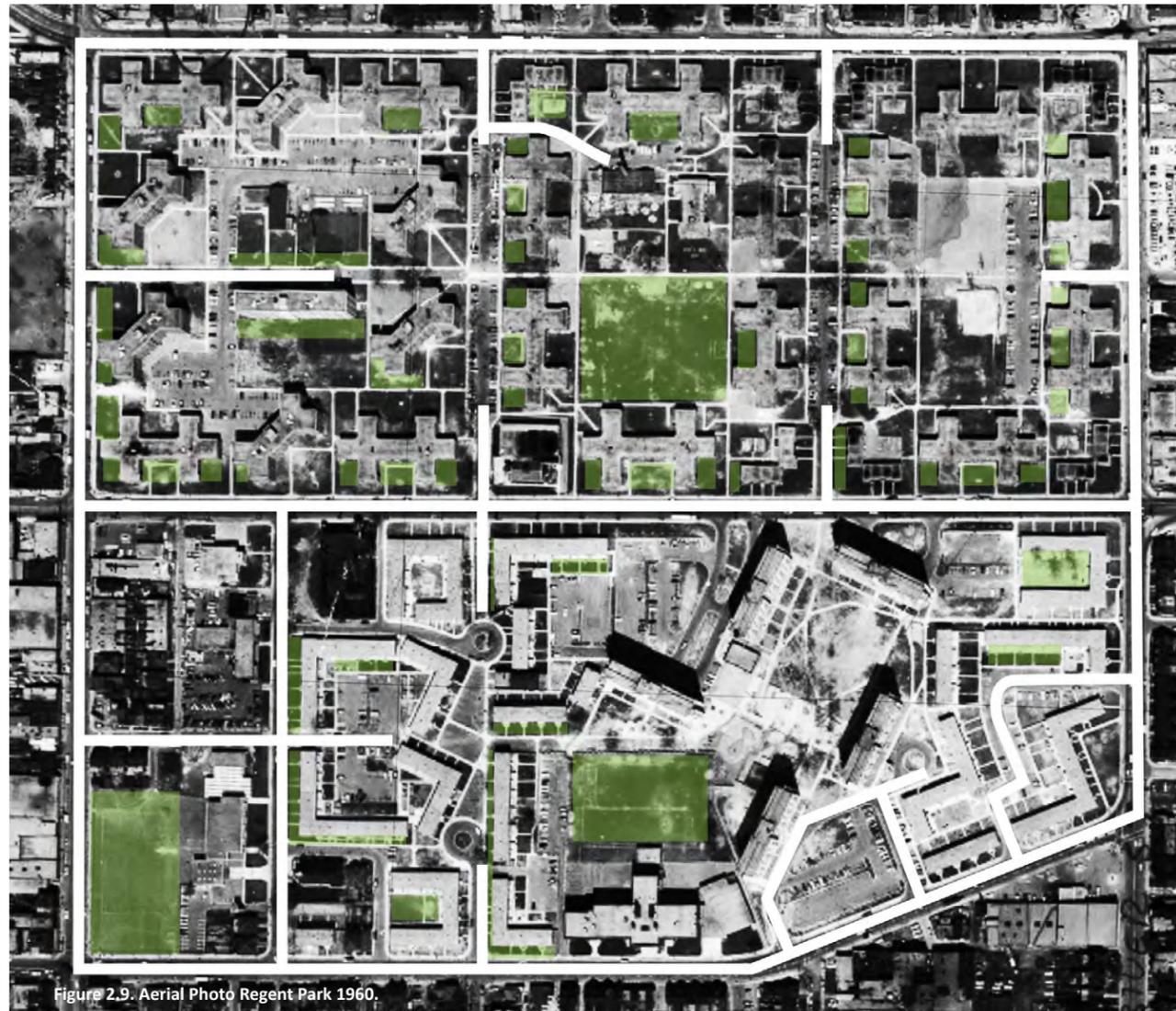


Figure 2.9. Aerial Photo Regent Park 1960.

Regent Park 1950 - 2002

Although the social housing development was successful for a while, a lack of through-streets as well as mixed use programming in the area caused crime to skyrocket³⁰. The aerial photo during this time (Figure 2.9.) shows residential super blocks isolated from the rest of the area due to a lack of streets into the neighbourhood other than Dundas St. which divided the development. The development was completed in two parts; the North development

introduced low-mid rise structures while the South development built high rise apartments. The areas highlighted in green show South/West facing properties on the ground level where food may have been grown. Although the plan for the development utilized the 'garden city' ideology, not that many actual gardens were part of the development³¹. Instead, the development eliminated a lot of the growing that took place along the streets that previously existed, and the towers as part of the South development made daylight more difficult to find at ground level.

30. *ibid.*
 31. Pages, Tneshia. "THE MYTH OF MASTER PLANNING: MORE THAN URBAN DESIGN: A COMPARATIVE ANALYSIS OF THE MASTER-PLANNED AFFORDABLE HOUSING DEVELOPMENTS STUYVESANT TOWN AND REGENT PARK." Master of Planning, University of Toronto, 2016. <https://digital.library.ryerson.ca/islandora/object/RULA%3A4942/datastream/OBJ/view>.



Figure 2.10. Regent Park South Development



Figure 2.11. Regent Park North Development

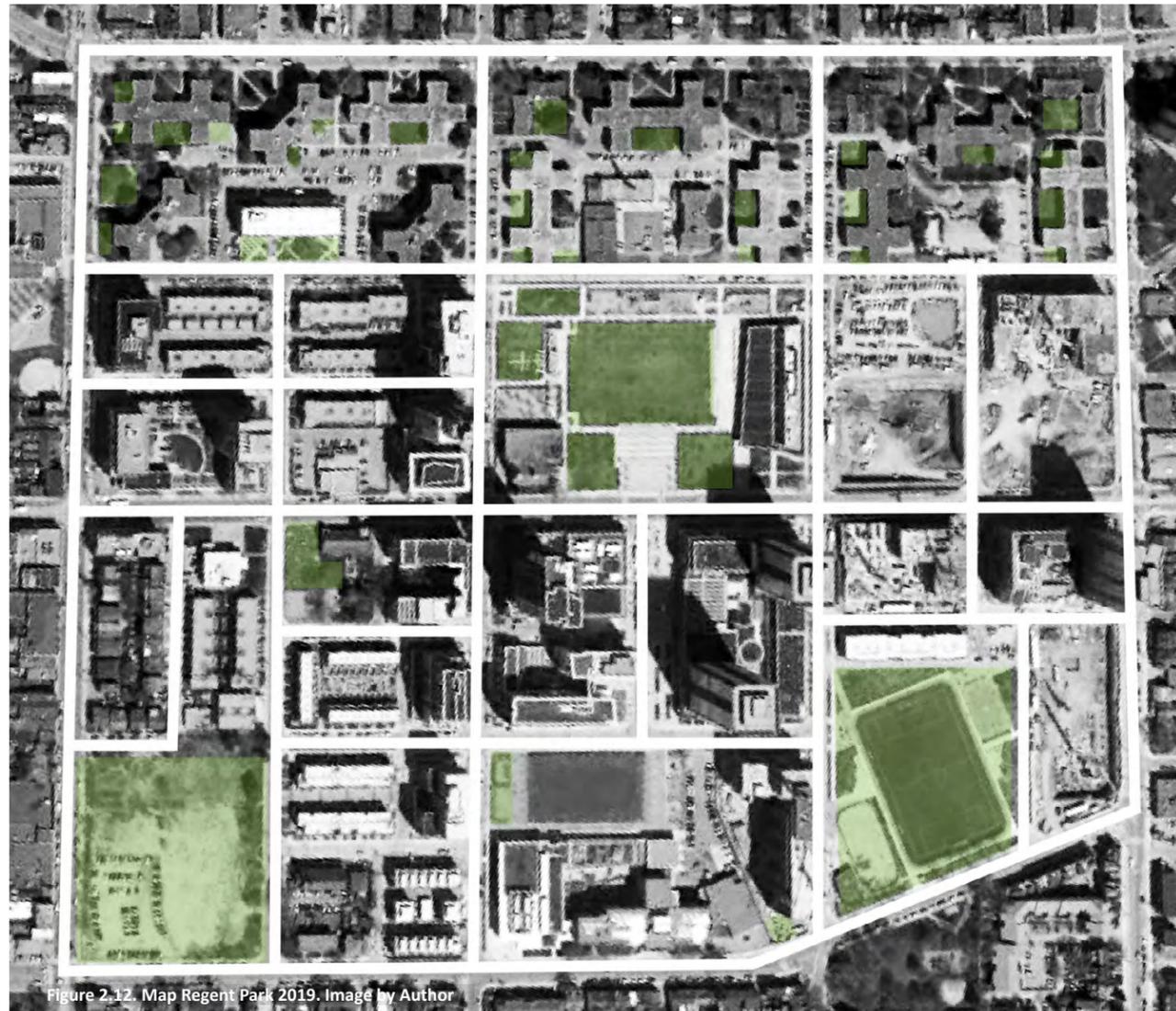


Figure 2.12. Map Regent Park 2019. Image by Author

Regent Park 2003-Present

Regent Park is now seen as a low income neighbourhood with a rich cultural mix, that has undergone significant changes over the last decade due to gentrification. However, the story of food sovereignty has persisted throughout, and still plays a significant role in the social and cultural dynamics of the neighbourhood. Today, Regent Park is home to almost 250 community garden plots, which support the local food centre (CRC) that feeds roughly 300 people who are in need throughout the community every day³².

This exemplifies how essential the ability to grow one's own food locally is to the residents, as well as how much a project that focuses on food sovereignty could benefit the community. Additionally, the growing of food through community gardens has emphasized the story of food sovereignty throughout the neighbourhood which was almost lost due to the social housing development. The areas highlighted in green show where different community gardens could take place on the ground, as well as the locations of existing gardens that are currently used to feed the community.

32. "TCRC » About CRC." Accessed December 20, 2019. <http://tcrc.ca/who-we-are/our-roots-are-deep>.



Figure 2.13. Community Garden St. Bartholomew's. Photo by Author



Figure 2.14. Community Garden Regent Park. Photo by Author

Sun Study

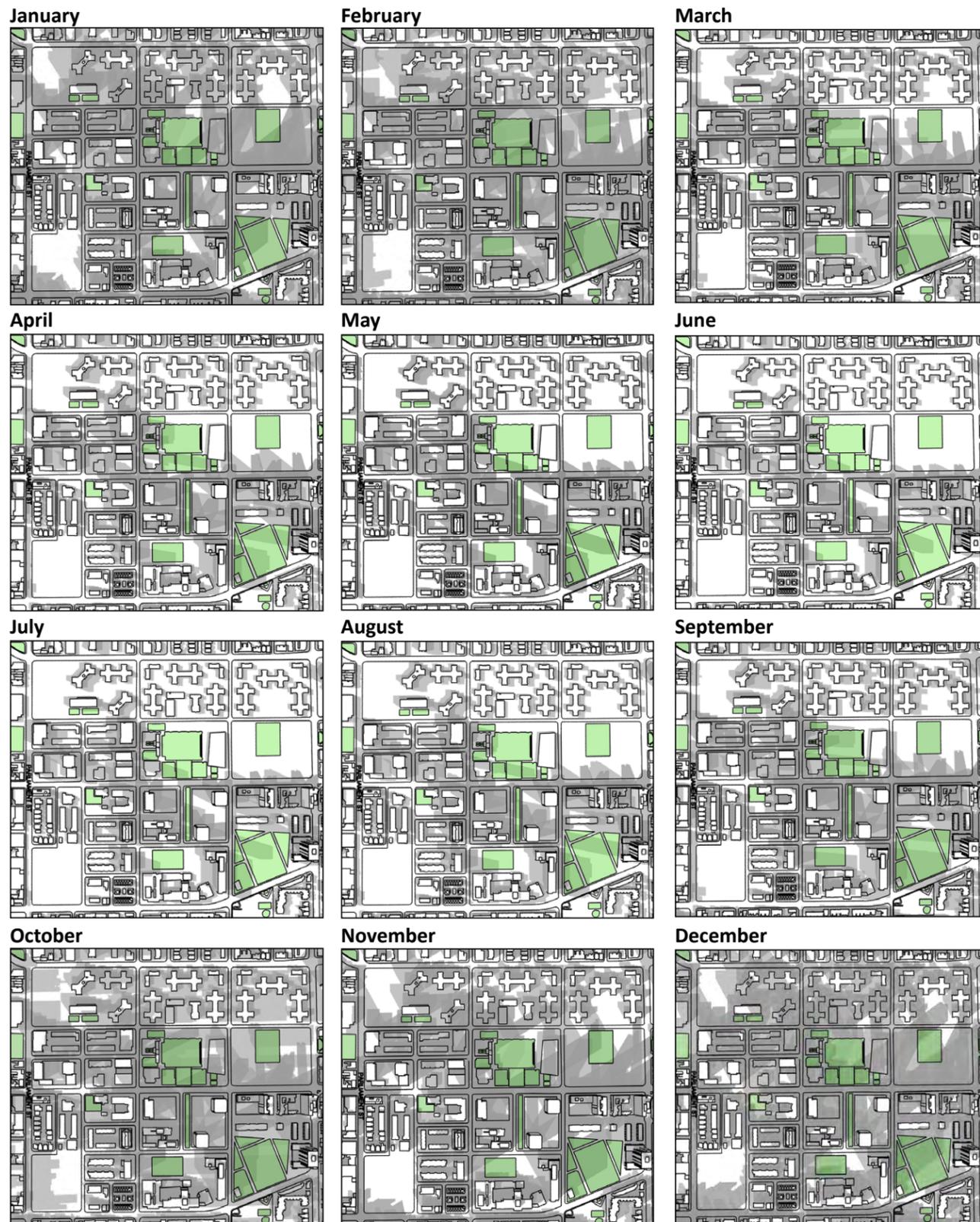


Figure 2.15. Sun Study Throughout the year 9am - 5pm. Images by Author

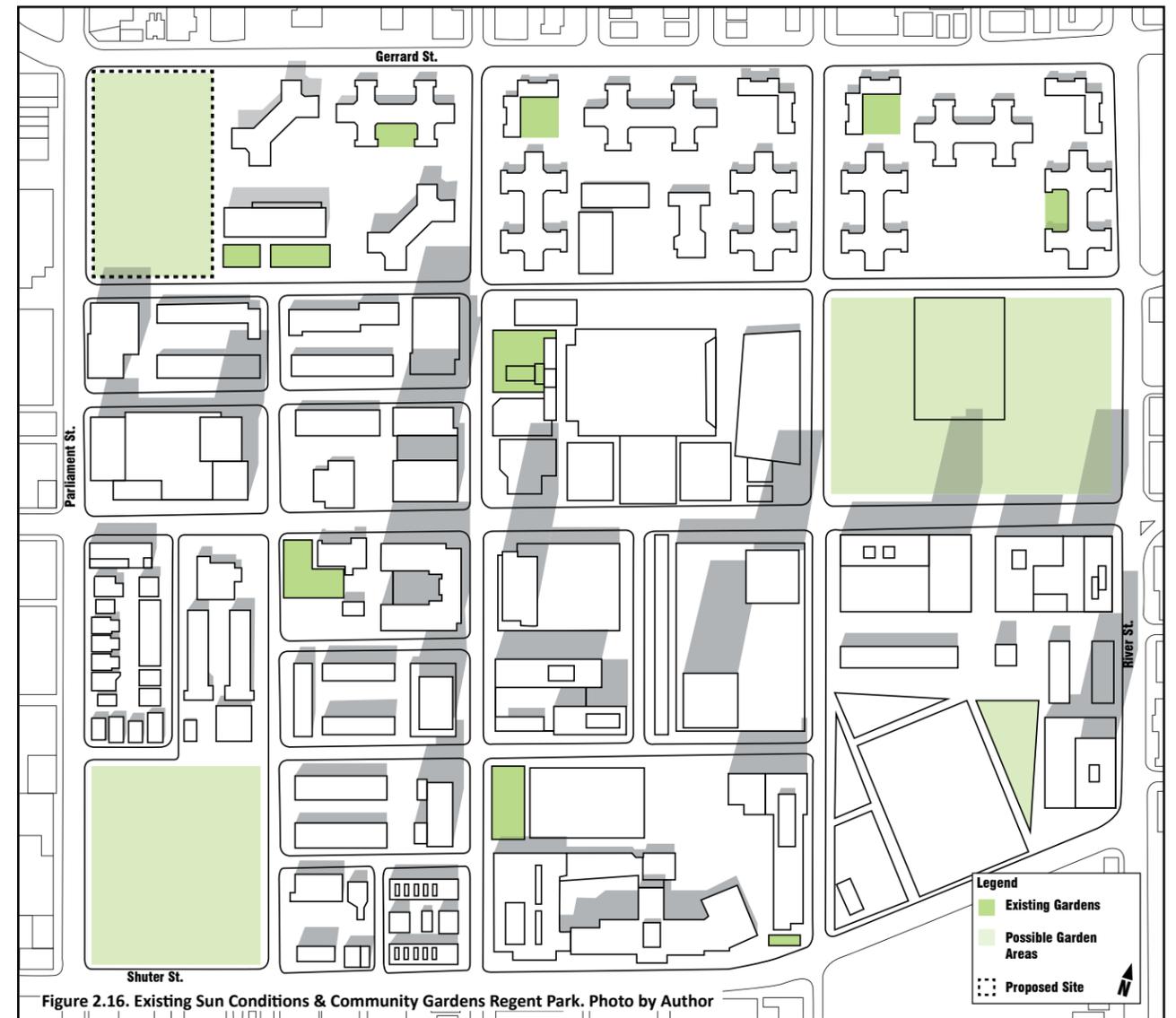
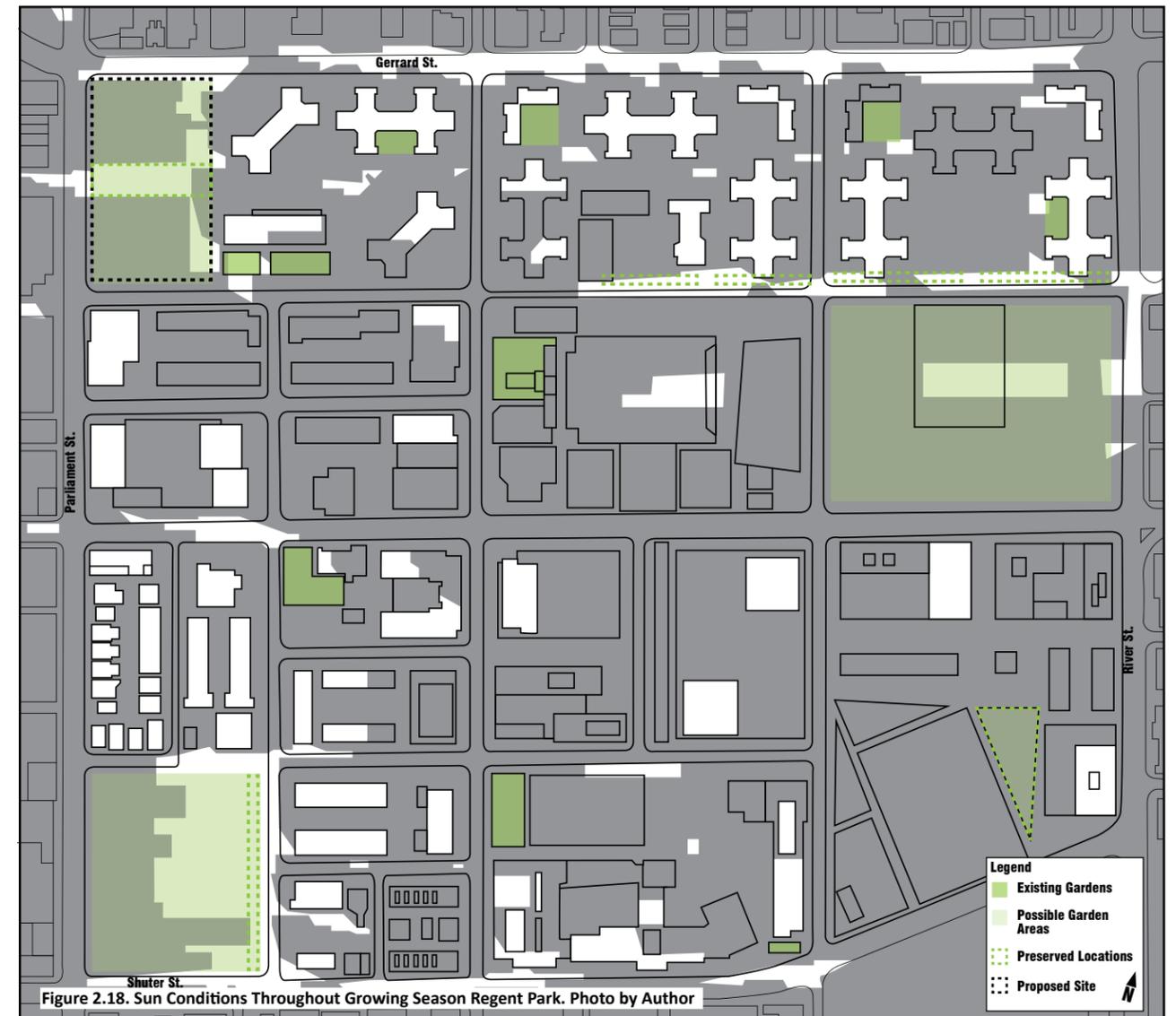
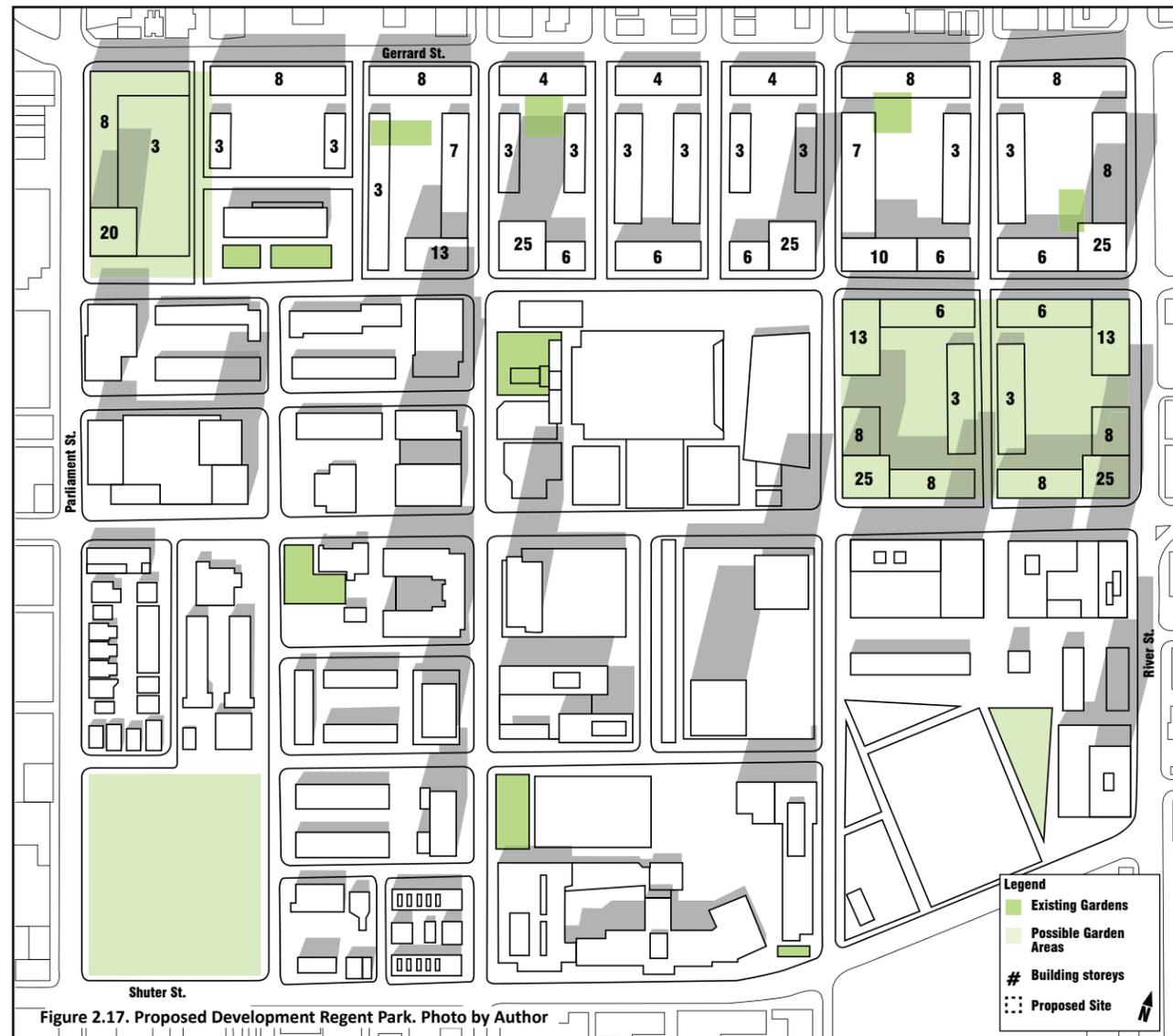


Figure 2.16. Existing Sun Conditions & Community Gardens Regent Park. Photo by Author

Although the community gardens currently ensure food sovereignty in Regent Park, the proposed revitalization has not given food sovereignty enough consideration and has begun to relocate several existing gardens. As a response to this, a sun study was completed showing the locations throughout Regent Park that get sunlight at ground level. After speaking to Ashrafi Ahmed who runs the gardens through the CRC, she identified that growing at ground level is something that is important to the community members since many of the relocated gardens

have been placed on rooftops, and some of the older people who participate in the growing are not comfortable working on high up roofs. Additionally, growing on the ground allows the gardens to be visibly and physically accessible to everyone. Therefore, it is important to reconsider the proposed design and instead work towards a design that prioritizes food sovereignty in Regent Park by preserving places to grow food on the ground. Figure 2.16. shows where all the existing community gardens are throughout Regent Park and areas where new gardens could be located.



The proposed development (Figure 2.17.) of Regent Park would greatly interfere with existing gardens while severely disrupting other locations that could be used for growing food in the future. With the intention of preserving vital land that receives sunlight throughout the growing season (May-October) some minor changes will need to be made to the proposed development. This would involve the relocation of residential towers to the North end of blocks, which are currently proposed along the South of the blocks. However, this would cause the

structures to shade the street and buildings on the North side of Gerrard. A more refined reconfiguring of the towers as well as the mid-rise structures will need to be completed in order to still achieve the cities envisioned density. This could include increasing some building heights while decreasing others in order to ensure the valuable Southern light is preserved. It is worth noting that Toronto's urban grid is not oriented directly North/South and has 16 - 17° angle West³³ which means most sites receive more afternoon/evening sun than morning sun.

Figure 2.18. overlays the existing areas that are shaded throughout Regent Park during the growing season (9 am - 5pm). The areas in white identify locations that get sun all day. Select areas have been identified based on these locations protecting places to grow food on the ground throughout Regent Park. This sun study was completed because sunlight is critical for growing food and locations that get enough sunlight for growing food need to be identified and preserved so that food sovereignty can persist throughout time. This methodology is

consistent with the 'Right to the City' movement which strives for democratic control over cities in order to do what is best for citizens rather than development being influenced by economic gain³⁴. By encouraging the reconfiguring and preservation of essential locations for growing food on the ground, the thesis is employing a multifaceted approach to food sovereignty; establishing multiple locations to grow food locally at ground level, while the primary site will host programs that help facilitate other aspects of food sovereignty using architectural design.

33. Oct 26, Talia Ricci - CBC News - Posted; 2019 5:00 AM ET | Last Updated: October 26, and 2019. "Toronto's 'Sunset to Be in Line with City Grid Saturday' | CBC News." CBC, October 26, 2019. <https://www.cbc.ca/news/canada/toronto/saturday-toronto-henge-1.5336123>.

34. Harvey, David. "THE RIGHT TO THE CITY," n.d., 16.

Chapter 3: Urban Farm Programs & Massing Studies

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Figure 3.0. Parliament and Gerrard Site Looking South East. Image by Author

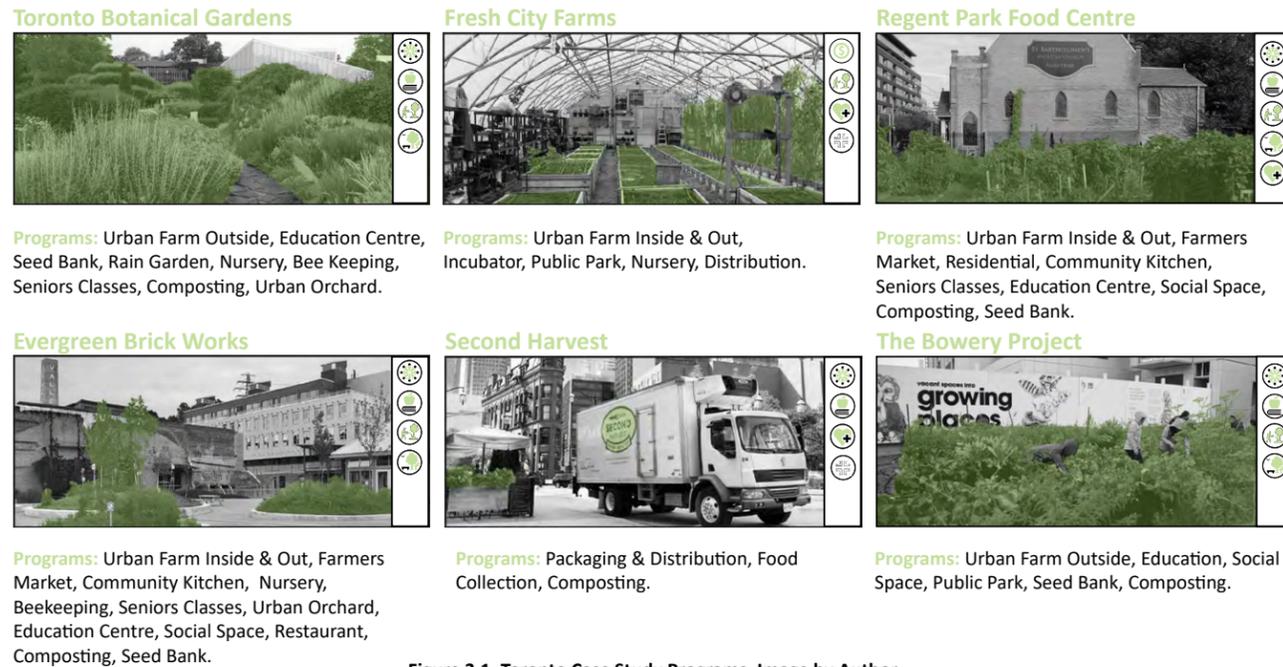
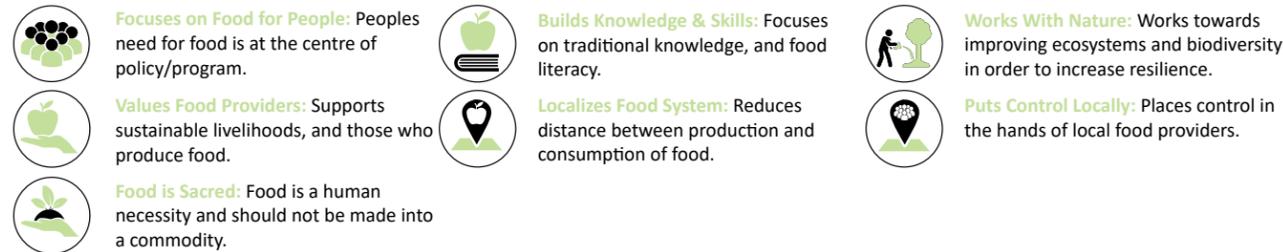


Figure 3.1. Toronto Case Study Programs. Image by Author

7 Pillars of Food Sovereignty



7 Community Benefits

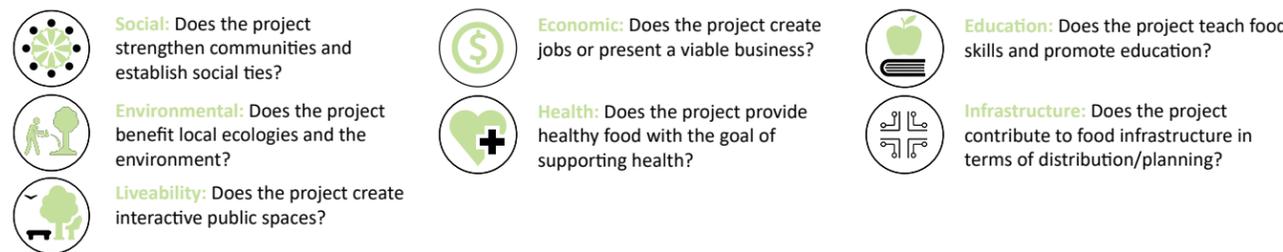


Figure 3.2. Program Criteria. Image by Author

The Toronto Case studies not only helped establish what a Toronto area urban farm entails, they also provided various programs that could be incorporated within the urban farm. In order to find a mix of programs that can address food sovereignty in a holistic way the 7 pillars of food sovereignty as well as the 7 community benefits established earlier were used in combination with different programs to establish a matrix. The matrix was then used to help determine an optimized program mix.

Program	7 Pillars of Food Sovereignty	Community Benefits	Total
Growing Centre			11
Urban Farm Incubator			8
Social Market			9
Farmers Market			9
Residential			3
Community Kitchen			7
Nursery			7
Bee Keeping			8
Seniors Classes			6
Rain Garden			2
Urban Orchard			8
Education Centre			9
Public Park			4
Social Space			4
Restaurant			9
Seed Bank			12
Packaging/Distribution			5
Composting			5

Figure 3.3. Program Matrix. Image by Author

The matrix was established assuming each pillar as well as the community benefits were equitable in terms of value to Regent Park. From there, each program that came from the various case studies was analyzed using these 14 factors. Each program was evaluated to see which of the different 14 factors they contributed towards, and a total tally was calculated showing the total value each program provided. After completing this, different program mixes were diagrammed in order to better understand their accumulative impact.

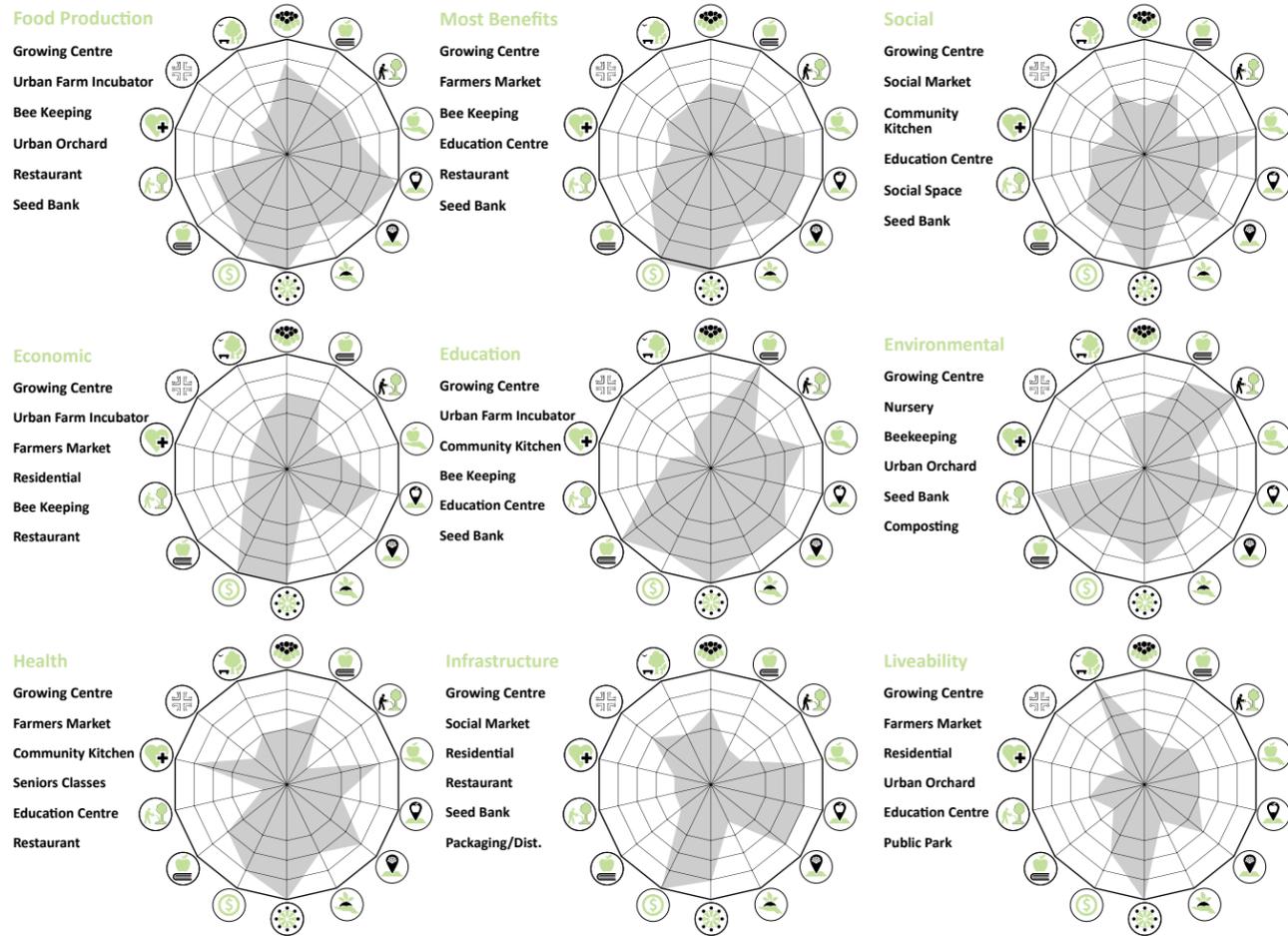


Figure 3.4. Potential Program Combinations. Image by Author

In order to determine combinations of programs that worked towards a specific impact, general titles were used to describe the overall mix and the impact they hoped to achieve; several focused on the 7 community benefits.

The first mix looked at ‘food production’, concentrating on programs that prioritize producing food such as an urban farm incubator, and an urban orchard. The next mix was ‘most benefits’ which looked at which programs totaled the highest overall scores within the matrix. The next was ‘social’ which looked at programs that fostered a social environment and gave back public space to the community.

The next three mixes examined were economic, education and environmental. Economic looked at programs that could generate revenue for the site. Education focused on teaching and programs that could improve food literacy skills, a vital aspect of establishing food sovereignty. Finally, environmental looked at the most environmentally conscious programs, and focused on creating healthy ecologies, and increasing biodiversity. The final three mixes prioritized health, infrastructure, and livability. While these mixes did address their primary objective, they were not holistic enough mixes, and several of the programs were also seen in the other combinations.



Figure 3.5. Three Best Program Combinations. Image by Author

From the nine different combinations, three stood out as a holistic approach. They were: Food Production, Most Benefits, and Education, which shared several programs. Specifically, bee keeping and a seed bank were programs that all three shared, since they scored very high on the matrix. However, after thinking through what these programs would require, and what existed at the CRC (seed bank) it became obvious that these were programs that could be incorporated as part of a larger building such as an education center. Additionally, after speaking with the CRC about what types of programs they would be interested in, they proposed a market they could run all year round. They also mentioned the ability to grow indoors during the winter, to help their meal service throughout the year. As a result the final mix of programs proposed are: A growing centre, an incubator, a market, an education centre, and an outdoor social space.

At this time, some general decisions have been made regarding the program layout on the site. The first is a central public space that gets sunlight throughout the growing season (identified through the sun study), linking the East and West sides of the site. The market that the CRC recommended will be placed at the North end of the site in order to maximize exposure to the street intersection, and within the public view. The proposed residential tower will be reimagined and relocated to the North East, allowing the cities desired density to still be accomplished, while permitting the Southern light that is needed for the growing spaces. Finally, the education centre and incubator will be located to the South of the site because they are programs that require minimal natural light, or exposure to the street. Additionally, this placement will also allow for a link between the proposed building and the CRC.

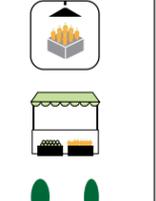
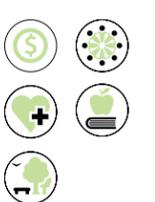
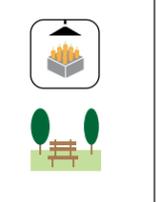
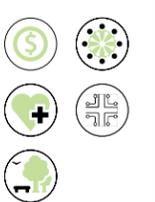
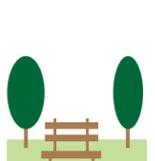
Program	7 Pillars of Food Sovereignty	Community Benefits	Connections	Requirements	Different Spaces	Qualitative Needs
 Growing Centre				Planter Boxes, Hanging Planters, Hydroponics, Waste Management (digester) Growing equipment, individual growing spaces, w/c, outdoor plots, water, light, ventilation, storage spaces for (planting medium, seeds, equipment), industrial sinks, prep space, culturally significant foods.	Hanging planter space, ground planters space, hydroponic growing space, seedling room, outdoor gardening plots, multiple storage rooms, waste room, planting medium room/prep space, equipment room, w/c, mechanical room, service elevator, buffer room, change room.	Some natural light some controlled light depending on growing type, open flexible spaces, good light penetration, controlled conditions, connection to outdoors, inside outside concept.
 Education Centre				Classrooms 4-6 (20-30 ppl), smaller offices/rooms, connection to farming spaces, labs (2) for growing, Lobby, sec., w/c, storage, equipment, wastemanagement, water, light, ventilation, bee keeping, green roof.	Classrooms, small offices, lab spaces, lobby, secretary space, w/c, storage, equipment room, wastemanagement area, mechanical room, bee keeping, green roof, small library.	Bright spaces, multifunctional spaces, connections to outdoors, high ceilings.
 Incubator				Flexible spaces, 6-8 individual growing spaces, storage, light, ventilation, water, mechanical, waste management, w/c, equipment, small offices.	Individual flexible growing rooms, storage spaces, mechanical spaces, shared equipment room, waste management shared with urban farm, small offices, w/c, buffer room, change room.	Natural light, flexible growing spaces, connection with exterior spaces, controlled conditions.
 Market				40-50 weekly vendors, 6-8 permanent vendors, flexible spaces, connection to exterior, open spaces, connection to food production, 1-2 industrial kitchens for food prep/classes, equipment, storage for vendors and food supplies (freezer) waste management (composter/digester), eating/sitting space, social space, w/c, lobby, small offices, green roof, culturally significant foods.	Space for vendors, Social Market, permanent location for 6-8 vendors, 1-2 industrial kitchens, small multipurpose rooms, equipment room, mechanical room, storage spaces for different rooms, industrial freezer, waste management, composting room, eating and sitting spaces, social space, w/c, lobby, small offices, green roof, truck dock 1-2 trucks.	High floor plates, potential for double heights, soft interior, lots of natural light, can transition indoor/outdoor spaces, approachable from the street.
 Social Space				Urban orchard, garden plots (min. 50), shade/sun, sitting/eating areas, ecological plantings, connections to buildings, permeable surface, hard surface.	Gardening plots, outdoor sitting spaces, storage shed for planting, planting medium area, urban orchard.	Sun and shade spaces, Blocked from wind, spaces that can connect to indoors, diversity of plantings.

Figure 3.8. Program Connections & Requirements Table. Image by Author

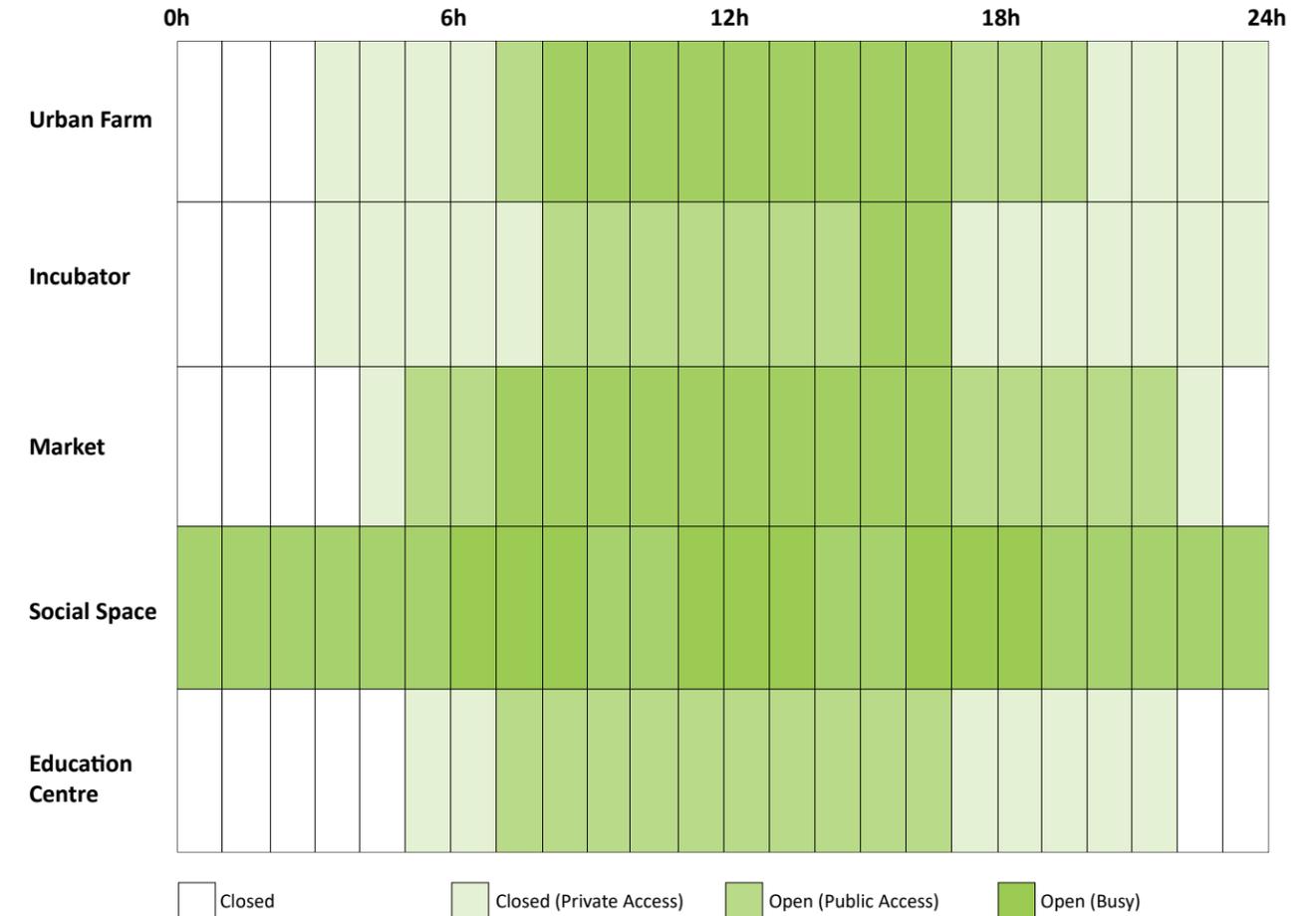


Figure 3.9. Program occupancy table. Image by Author

Now that the five primary programs for the site have been determined, they have been further broken down to show their specific requirements. Figure 3.8. looks at each program's connections to the 7 pillars as well as community benefits that were identified within the program matrix (Figure 3.3). The chart also begins to examine the connections between programs, different requirements, spaces and qualitative needs of each program. When looking at requirements for each program, it became apparent that certain spaces could be shared between programs such as storage spaces which did not need to be exclusive. Additionally, by examining qualitative needs of each program, certain architectural qualities began to be

exposed that will play an influential role later on in the design phase of the building. It was important to identify where each program can begin to integrate with others in order to create a sense of connection between programs, because they are all meant to work in collaboration to form the overall urban farm throughout the site.

Connections between programs are essential because one of the primary objectives of the thesis is creating a symbiotic relationships throughout the site, with programs sharing resources in order to reduce the overall costs and environmental impact of the urban farm. Figure 3.9. begins to break down when each program would be occupied throughout the day; this was

significant in order to identify when the building would not be occupied. This was particularly relevant when looking at the market building. Since the farmers' market in Regent Park currently only runs on weekends, it was vital to consider how the building could be a community hub when the market is not running. As a result, the idea of a social market, two community kitchens and full-time food hall with six permanent vendors is being proposed. The idea behind the social market is that it would sell grocery (specifically produce) items at a reduced rate, benefiting many of the low-income residents throughout the community³⁵. Produce sold at the social market will primarily be food that was unable to be sold at the weekend market, as well as food that would otherwise go to waste throughout the city collected by organizations such as Second Harvest. This will reduce food waste on the site while providing the community a means of accessing healthy and affordable food.

Figure 3.10. breaks down the predicted occupancy of each program throughout the week, identifying when the site will be most busy. Figure 3.11. further dissects each program into individual spaces. This diagram begins to stack the initial program requirements in order to visualize the spatial needs of each space on the site, while further informing which programs have potential to share spaces with one another. This is just an initial proposal which classifies the different types of growing as either indoor or outdoor. A finer grain understanding of different growing types is essential to refine the spatial requirements of each program throughout the urban farm.

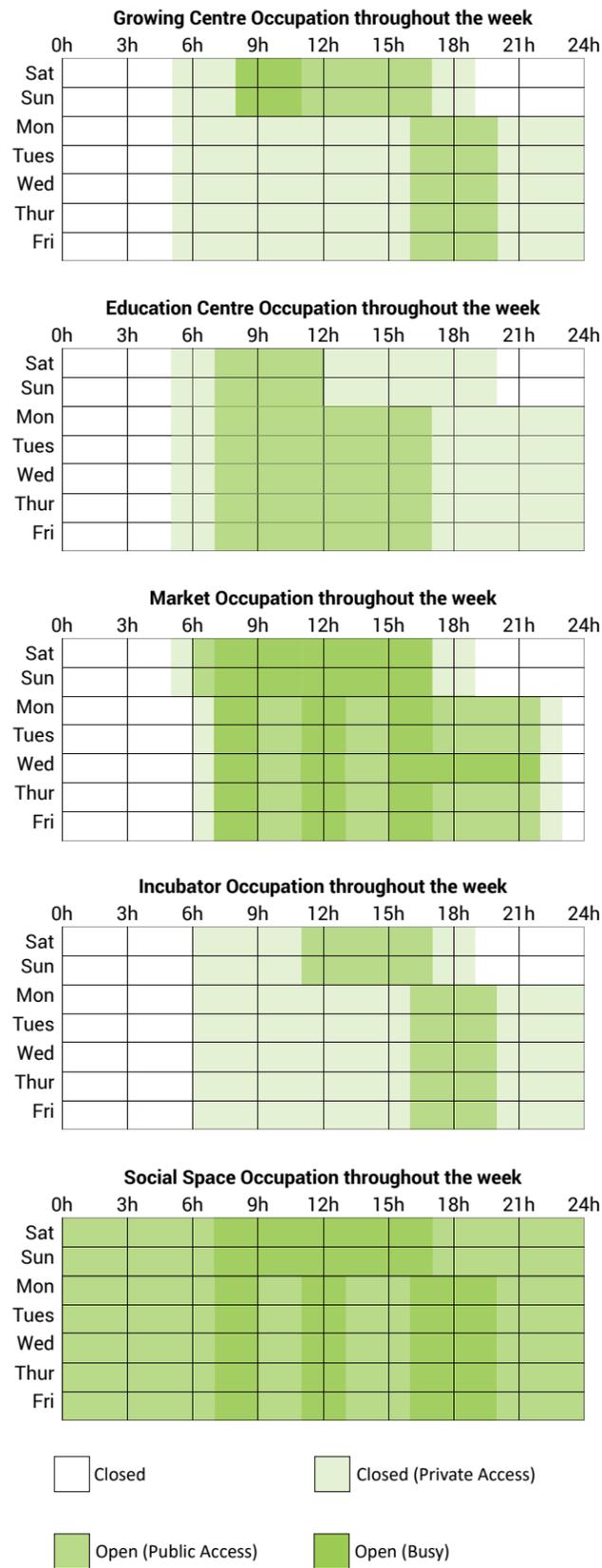


Figure 3.10. Program occupancy time tables throughout the week. Image by Author.

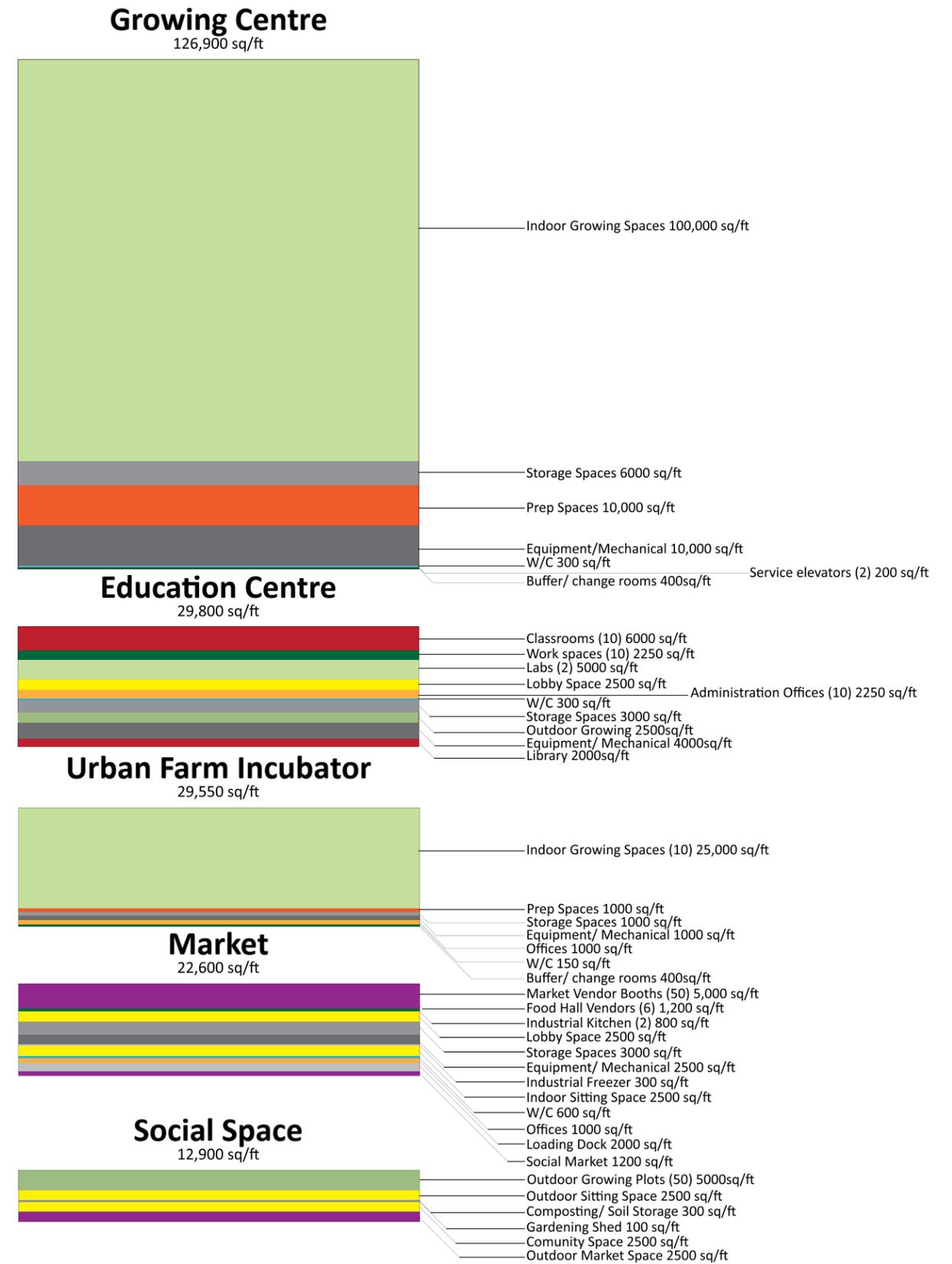


Figure 3.11. Initial Program Spatial Requirements. Image by Author.

35. Rayner, Jay. "The Rise of Social Supermarkets: It's Not about Selling Cheap Food, but Building Strong Communities." The Observer, May 19, 2019, sec. Society. <https://www.theguardian.com/society/2019/may/19/social-supermarkets-food-poverty-jay-rayner>.

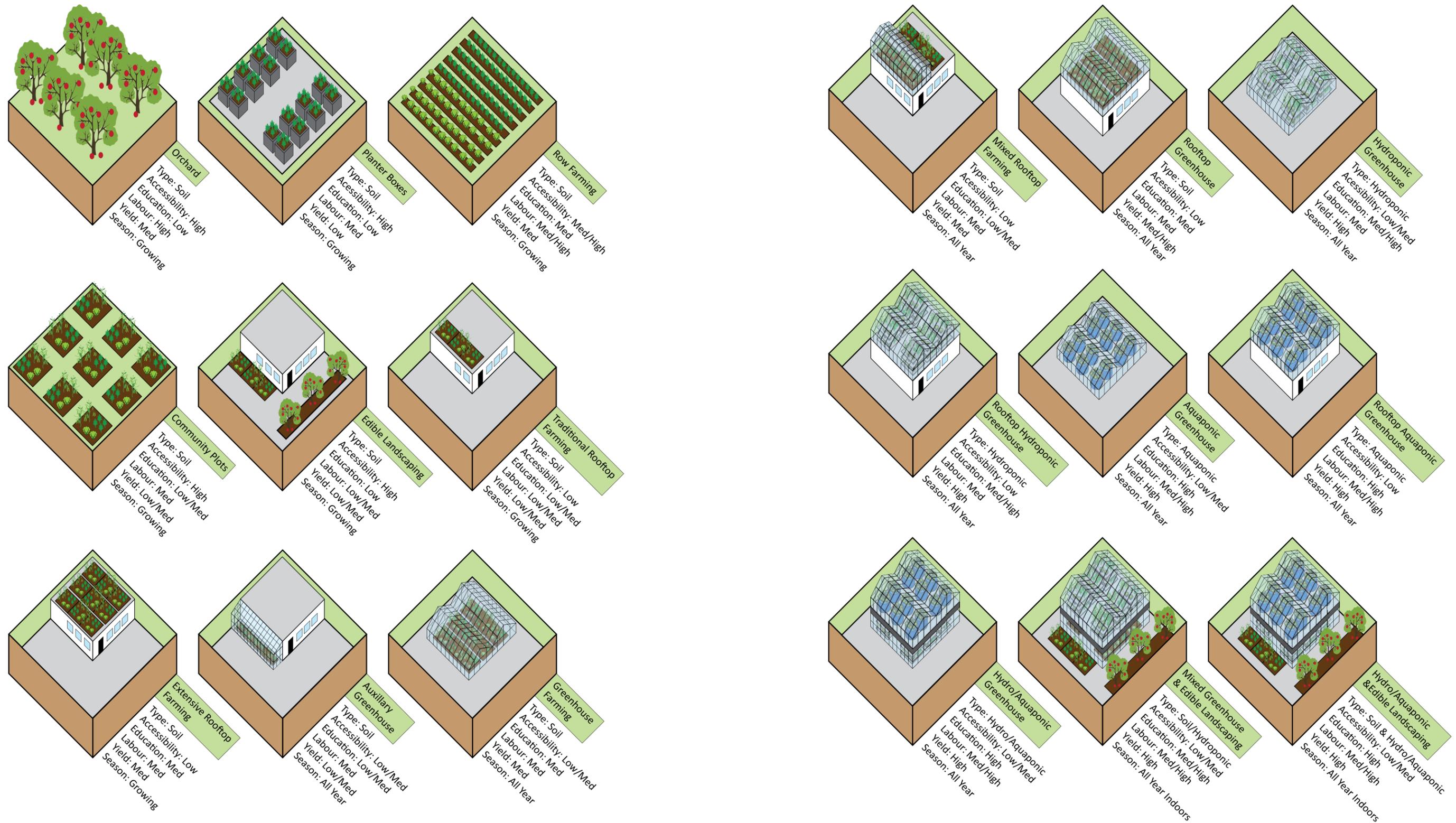


Figure 3.12. Different Farming Types. Image by Author

Farming Types

As a means of better understanding the different types of growing that could be part of the growing centre, 18 different types of farming were identified and classified using a specific set of criteria. The farming types were then analyzed looking at: The growing type (such as soil based

or hydroponic), the level of accessibility in regards to the public, the level of education needed to competently use that growing method, how much labour is involved, what level of production the method offers (yield), as well as what time of the year the type of farming can take place.



Figure 3.13. Farming Types Graph. Image by Author

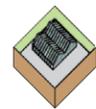
The different farming types were then plotted in order to better visualize the overall impact of each method. The graph analyzes soil based vs. building integrated farming, control vs. self-organized, high tech vs. low tech, and land intensive vs. land conscious farming methods. Considering that the

proposed building hopes to implement several different farming types, five different farming methods were identified which provide a variety of farming opportunities. This was done in order to engage the community across various growing skill levels, from basic to advanced level of growing skill.

Vegetable Consumption Vs. Required sq/ft to Meet Yield: Comparing Traditional and Hydroponic Growing Methods



Traditional Growing sq/ft required to provide average consumption per person/year



Hydroponic Growing sq/ft required to provide average consumption per person/year (5:1 Growing Potential)



Greatest Potential For Hydroponic Growing vs Traditional Growing

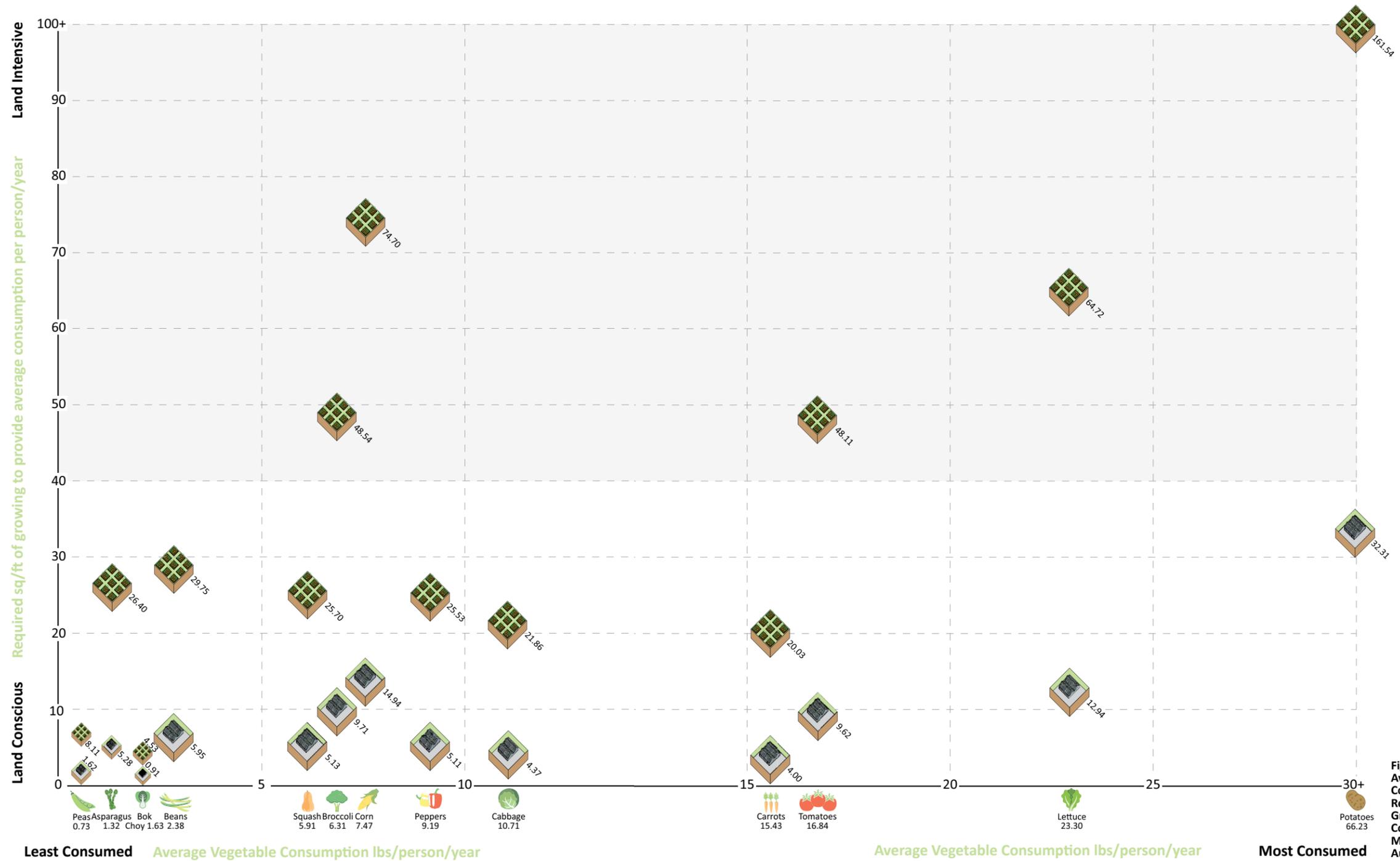


Figure 3.14. Average Vegetable Consumption, Required sq/ft for Growing and Yield Comparing Growing Methods. Image by Author

In addition to understanding the different types of growing taking place throughout the urban farm, it was essential to understand how much space different growing methods occupy depending on what is being grown. Figure 3.14. compares the average vegetable consumption of people within the city of Toronto (lbs/year) with the required sq/ft of growing required to meet the demand³⁶. The graph then compares the sq/ft needed using traditional growing vs. hydroponic growing. The vegetables that fall in the grey portion of the graph are the ones which would stand to benefit most in terms of space required by being grown hydroponically. Using traditional methods people require roughly 500

sq/ft to meet their vegetable consumption each year, compared to roughly 100 sq/ft hydroponically. The hydroponic square footage needed roughly correlates to a 10' x 10' box (similar to the outdoor community garden beds that are 10' x 10'). It is important to acknowledge this is not an exact formula since the graph does not consider fruits, other culturally significant vegetables, or that some 8'x8' lots actually grow food in a more efficient manner than the 10'x10' lots throughout the community. These numbers are just used for roughly estimating the overall production of the site and its relation to the space needed for growing using a mix of traditional and hydroponic growing methods.

36. MacRae, Rod, Eric Gallant, Sima Patel, Marc Michalak, Martin Bunch, and Stephanie Schaffner. "Could Toronto Provide 10% of Its Fresh Vegetable Requirements from within Its Own Boundaries? Matching Consumption Requirements with Growing Spaces." Journal of Agriculture, Food Systems, and Community Development, December 31, 2010, 105-27. <https://doi.org/10.5304/jafscd.2010.012.008>

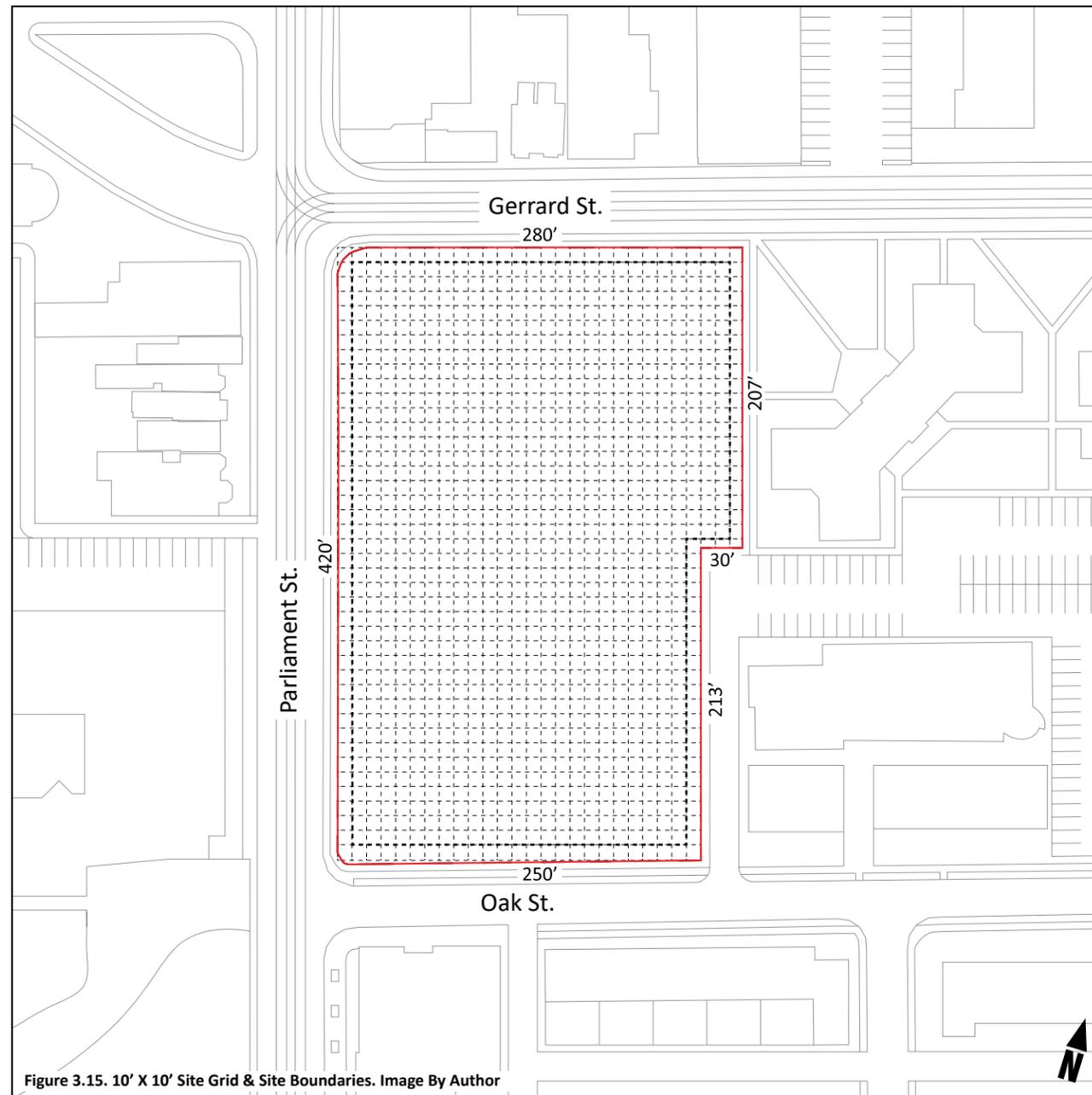


Figure 3.15. 10' X 10' Site Grid & Site Boundaries. Image By Author

The 10' x 10' plot using hydroponic growing methods begins to help inform the building massing, providing a standard unit which correlates roughly to the desired yield of one person's vegetable consumption each year. Additionally, many farmers markets are organized in a 10' x 10' grid for each vendor³⁷. As a result, it makes sense to use the 10'x10' plot as a standard dimension in order begin organizing the program

spaces on the site. This grid will also be quite useful later on in the project while designing a structural system and locating columns. Following this methodology, the site was subdivided into 10'x10' plots (see figure 3.15.). From there, a minimum set back of 10' was provided further narrowing down the workable site area for the buildings to be placed.

37. Francis, M., and L. Griffith. "The Meaning and Design of Farmers' Markets as Public Space: An Issue-Based Case Study." *Landscape Journal* 30, no. 2 (January 1, 2011): 261-79. <https://doi.org/10.3368/lj.30.2.261>.

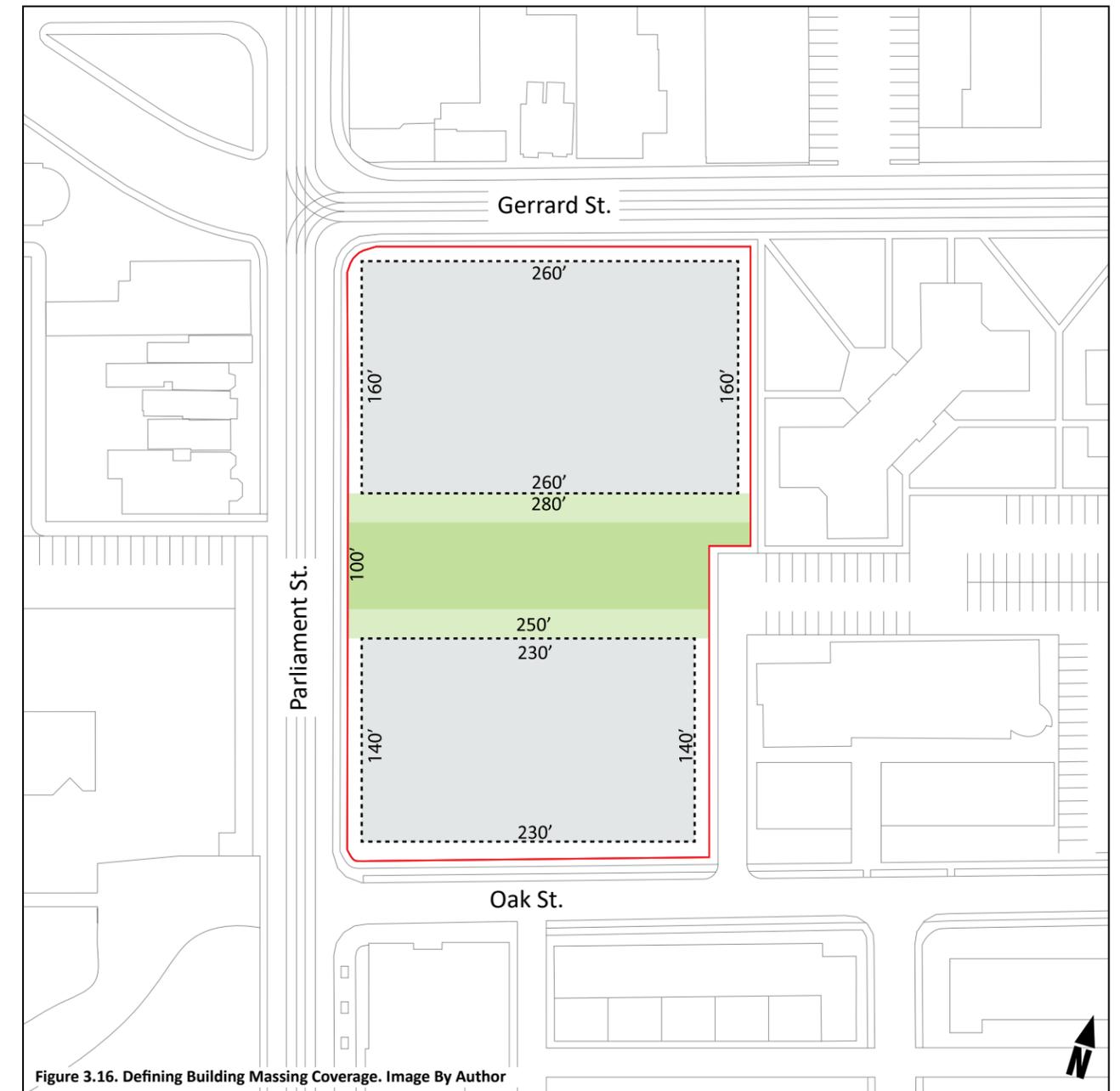


Figure 3.16. Defining Building Massing Coverage. Image By Author

The central social space that cuts through the site East to West was established (see Figure 3.16.) in order to further define the building footprints on the site. This area was based off of the previous Regent Park sun study, with the area in darker green highlighting the portion of the site that receives sunlight throughout the entire year. The area highlighted in lighter green is meant to act as a buffer zone between the

interior and exterior spaces allowing for interior spaces to open up to the outdoors during warmer months. Overall this space is a 100' wide strip which is meant to connect the two buildings by acting as a central congregation and social space while also connecting Parliament St. to the future developments East of the site. Therefore, the two building foot prints to begin the preliminary massing are 140' x 230' and 160' x 260'.

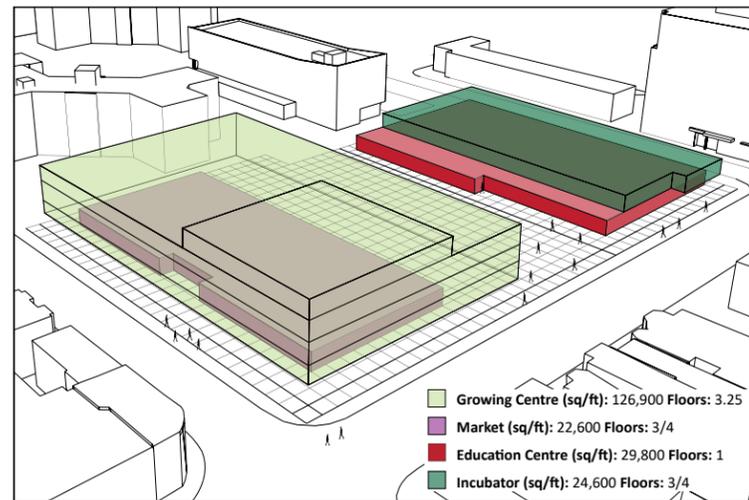


Figure 3.17. Proposed Mix 1 Massing. Image By Author.

Program Mix 1

Public Growing (sq/ft): 7,500 (75 - 10x10 Plots)
 Private Growing (sq/ft): 125,000
 Yield/Yr (Public+Private Growing): 1265 People

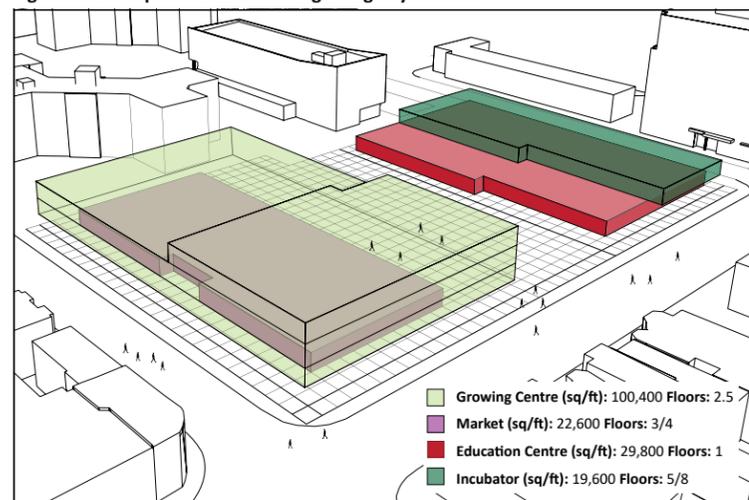
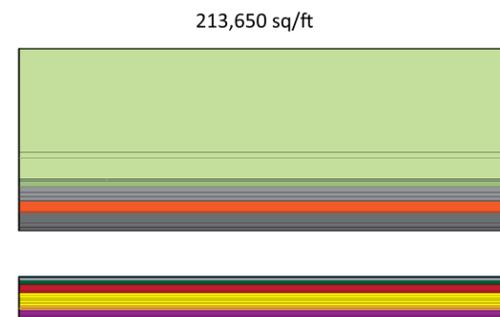


Figure 3.18. Proposed Mix 2 Massing. Image By Author.

Program Mix 2

Public Growing (sq/ft): 12,500 (125 - 10x10 Plots)
 Private Growing (sq/ft): 95,000
 Yield/Yr (Public+Private Growing): 975 People

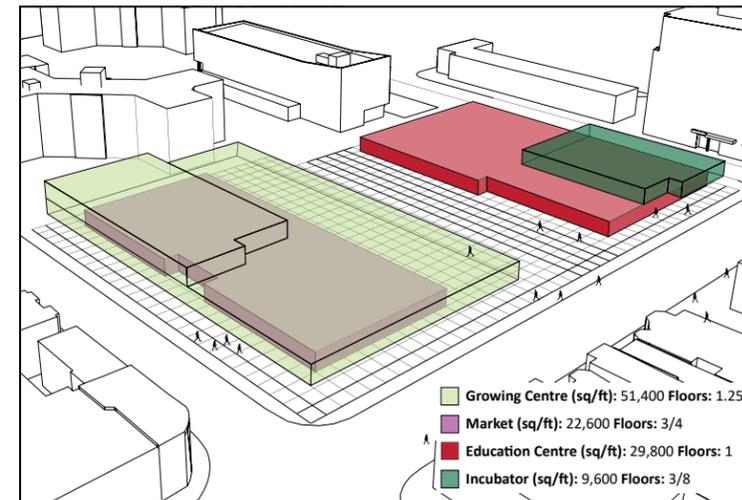
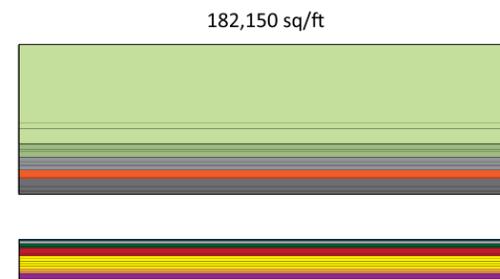


Figure 3.19. Proposed Mix 3 Massing. Image By Author.

Program Mix 3

Public Growing (sq/ft): 17,500 (175 - 10x10 Plots)
 Private Growing (sq/ft): 65,000
 Yield/Yr (Public+Private Growing): 685 People

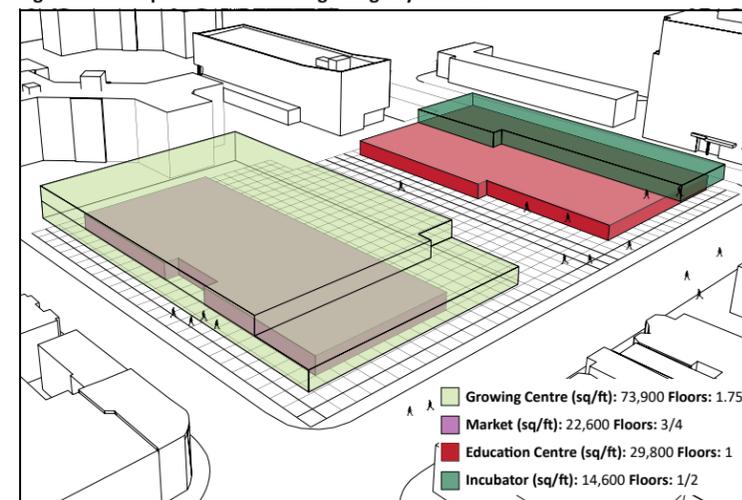
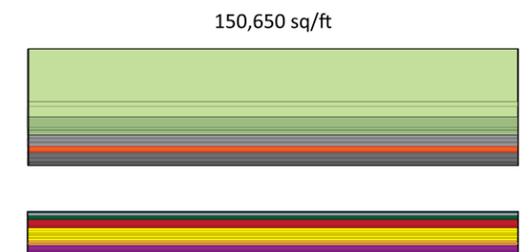
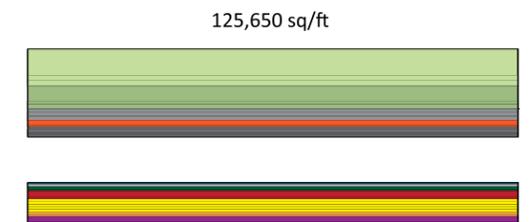


Figure 3.20. Proposed Mix 4 Massing. Image By Author.

Program Mix 4

Public Growing (sq/ft): 22,500 (225 - 10x10 Plots)
 Private Growing (sq/ft): 35,000
 Yield/Yr (Public+Private Growing): 395 People



Initial Massing

To begin massing on the site, the individual programs were broken down into two primary categories: growing operation and other programs, showing how much space is designated towards the production of food. The growing operation (including storage, prep, and mechanical spaces) was then subdivided into private vs. public growing. Private growing pertains to more advanced methods of growing, such as hydroponics, while public growing concerns soil-based farming. However, it is important to distinguish that private growing

does not imply that the public can't access these facilities, but rather there is some sort of financial stake as well as a certain level of education/skill required. Public growing implies that the community can utilize garden plots (indoor and out) sharing resources and equipment with the growing centre, and would only be asked to share a portion of their overall yield.

Using Figure 3.11. spatial requirements as a baseline, four variations of the program mix were proposed with varying degrees of public vs. private growing. Depending on the type of growing taking place, a yield estimate

was established based off of figure 3.14. This was done in order to help determine the total production of the site for the community. The mixes were then roughly massed on the site showing how many sq/ft and floors each individual program would need depending on the overall mix. In association with the massing on the site, a simple light analysis (Appendix E) was completed comparing the shadows cast by the building masses from 1 to 4 stories high in order to be conscious of how the number of floors impacts the solar access on/around the site. Program mix 1 and 2 prioritize private growing and as a result have the highest overall yields.

Although the high yield models are intriguing economically, they do not display the level of public engagement necessary for a project that is focusing on the people of Regent Park and the idea of food sovereignty. Mix 3 and 4 show a much greater balance between public and private growing spaces, although the overall yields are significantly less than mix 1 and 2, with much lower profile building masses. A program mix that has a private vs public ratio seen within mix 3 and 4 with the overall massing density of mix 1 and 2 seems to be optimal to ensure an adequate level of production while still engaging the Regent Park community and focusing on food sovereignty.

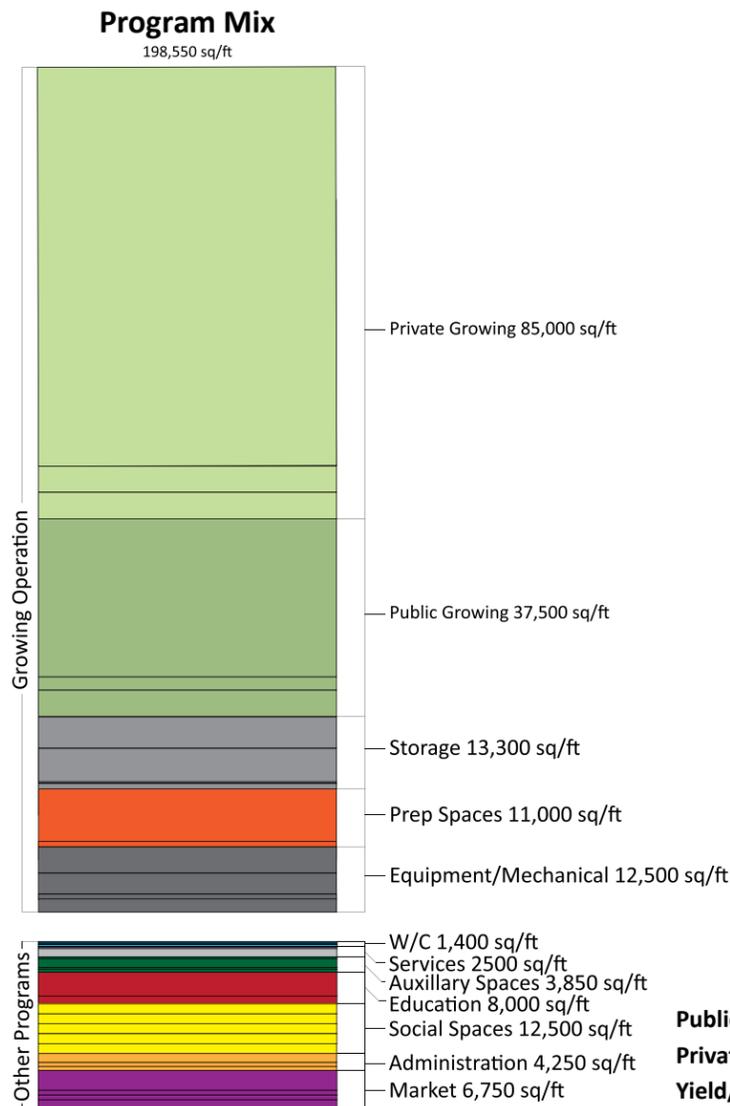


Figure 3.21. Program Spatial Diagram, Proposed Mix. Image By Author

Figure 3.21. represents the proposed program mix based off of the massing analysis. Overall, this mix address several different criteria that was of concern in earlier mixes, such as a higher ratio of public to private growing, while also having the overall production capacity of the larger scale massing proposals. The mix balances public and private growing spaces while providing opportunities through the education centre for community members to develop their growing knowledge and progress to more technological growing methods. This establishes an urban farm that is operated by community

members, encouraging people to engage at multiple stages of growing and have a level of sovereignty over the site while accommodating a level of production that would otherwise not be achievable without the resources and facilities on site. Figure 3.22. breaks down each individual program into finer grain spaces, which will begin to inform the more detailed floor plans once a massing form is established. This breakdown is still not final, and experimentation with the floor plans may lead to some spaces becoming larger or smaller depending on the final design proposal.

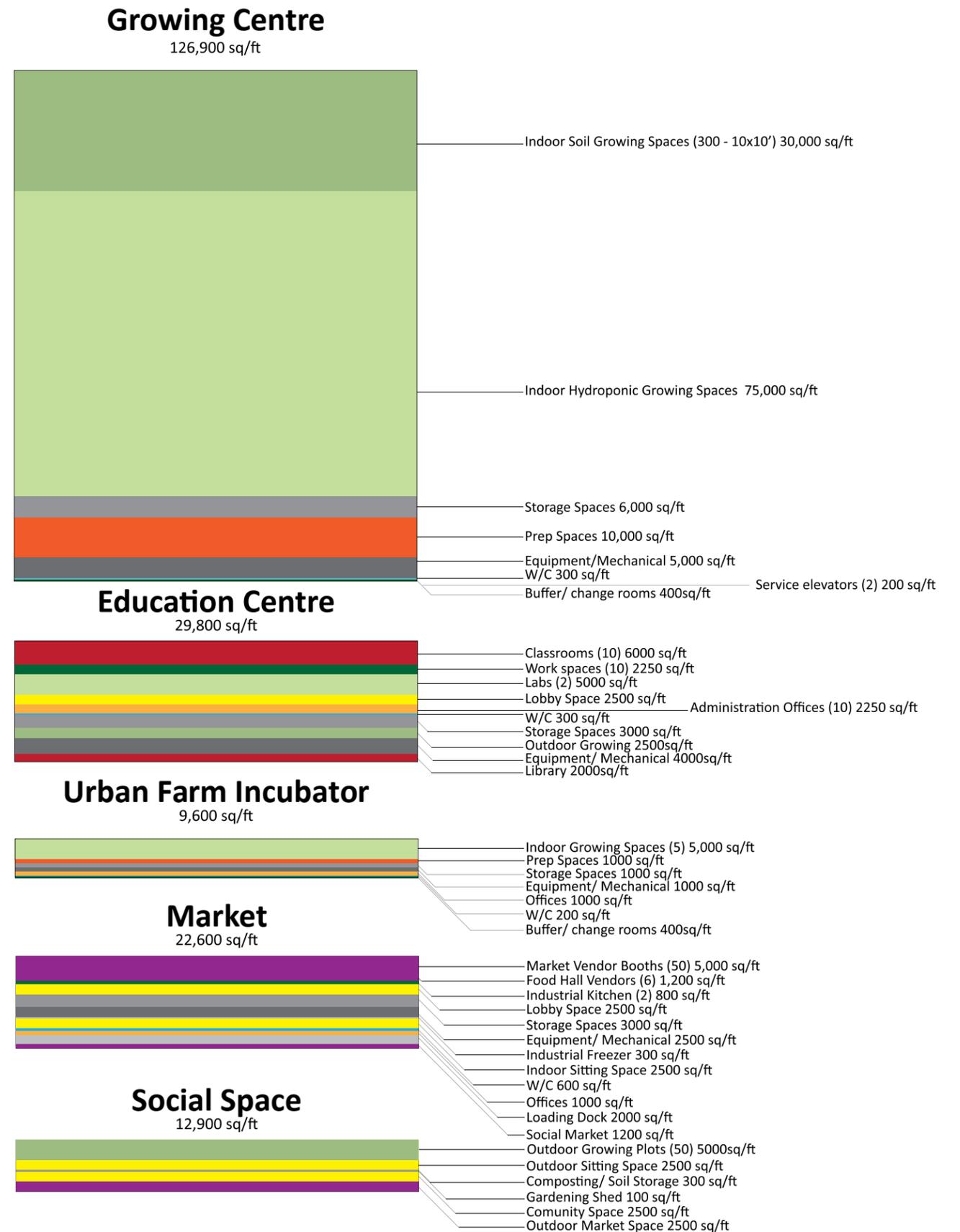


Figure 3.22. Proposed Mix Spatial Requirements of Programs. Image By Author

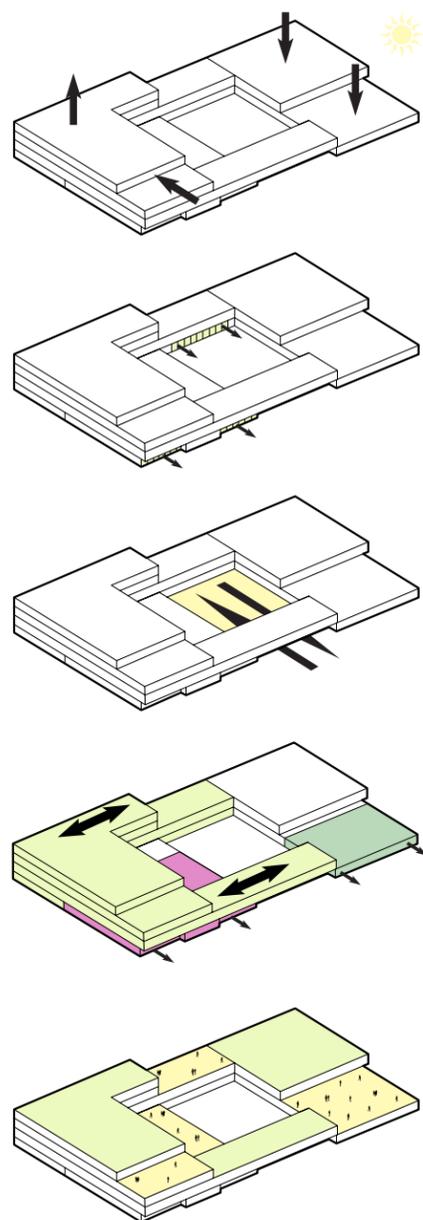


Figure 3.23. Massing Iteration 4 diagramming. Image By Author

Using the program spatial requirements seen in Figure 3.22, six massing iterations were conceptualized. A more in-depth analysis of each massing iteration as well as their overall intentions can be seen in Appendix E. Simple diagrams (figure 3.23. & 3.24.) were established to communicate the larger design moves that were implemented for each massing. The six criteria which began to influence the different

Light

Building mass lowest at Southwest corner of site and highest at Northeast to maximize sunlight within central space and increase southern facade solar gain.

Adaptability

Growing centre used to connect market and incubator. Incubator and market face towards the main street to increase public exposure/access.

Accessibility

Central social space primarily accessible from Parliament st. allowing easy access, while entrance is semi-protected by growing centre bridge at 2nd level.

Connectivity

Market and ground level growing feature operable curtain walls which open up during warmer months merging interior and exterior spaces and allowing passage from the East to the West end of the site.

Social Spaces

Various level rooftops allow for private and public spaces for sitting, eating and planting. Other rooftops used as rainwater collection green roofs.

variations were: Light, adaptability, accessibility, connectivity, and social spaces. These criteria were essential in order to promote the production of food on the site, while encouraging a level of accessibility and connectivity to the community. Connectivity (specifically visual) to the community is an essential strategy in order to encourage participation and a sense of ownership of the site for the residents.

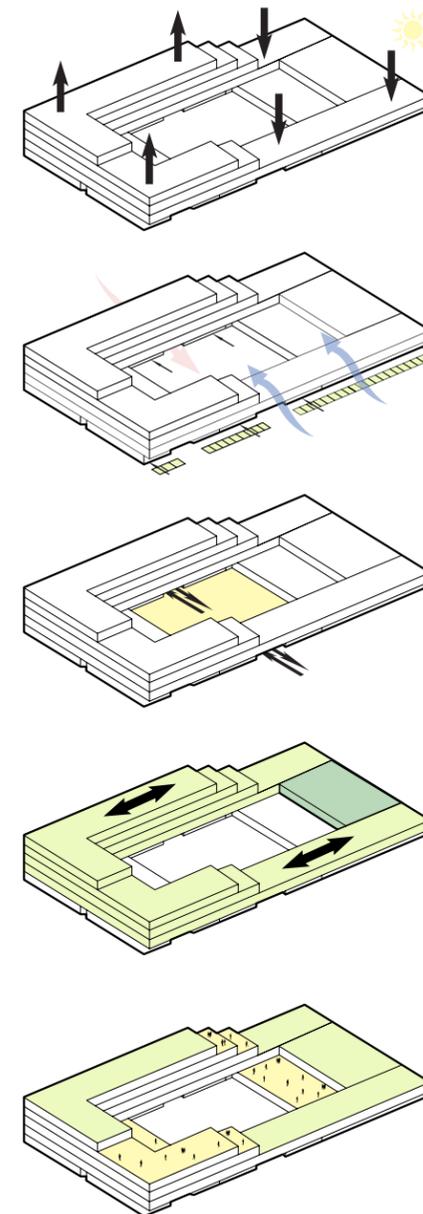


Figure 3.24. Massing Iteration 6 diagramming. Image By Author

By creating easy access and opening up to the streets, the site establishes community social spaces that can be used by anyone, whether they are growing food, or just coming to visit the market. Additionally, thought was put towards how the building could adapt depending on the time of year to accommodate different types of growing methods and different levels of growing knowledge. Cascading rooftops seen in both

Light

Building mass higher to North of site and lower to South to maximize sunlight in central space throughout the day, while increasing the southern facades solar gain.

Adaptability

Building pushed back from street to increase public activity and introduce community garden plots. Operable curtain wall used to block winter wind while opening up during warmer months.

Accessibility

Strong connection with street while connecting East and West ends of site through central social space. Operable curtain walls containing planting spaces.

Connectivity

Main building masses connected through growing centre bridge. Allow access to growing centre from education centre or market.

Social Spaces

Cascading rooftops allow for places for sitting, eating and planting. Other rooftops not accessible to public used as rainwater collection green roofs.

designs allow for different growing depending on the unique rooftop conditions (East vs West exposure for example). From the six possible massing types, Massing 4 and Massing 6 were further refined, looking at how the individual programs could begin to be laid out as finer grain rooms in plan as well as section. These designs are a part of the iterative design process which will influence the final design proposal.

Initial Design: Massing 4

The design for massing iteration 4 focuses on access to sunlight establishing different social areas through the cascading of rooftops (lower profile southern mass) connected by the growing centre. This approach establishes more accessible public space while creating different rooftop experiences depending on light exposure. Additionally, the design focuses on the transition between interior and exterior spaces incorporating operable curtain walls that can open during warmer weather. The central social space is easily accessible from Parliament while the indoor growing spaces at grade allow the community to grow on the ground throughout the whole year. Additionally, the intention of the social space was providing more dynamic and occupiable elements such as social stairs and sloped planted surfaces which could host native plant species, encouraging pollinators on the site.



Figure 3.25. Massing Iteration 4 Plans. Image By Author

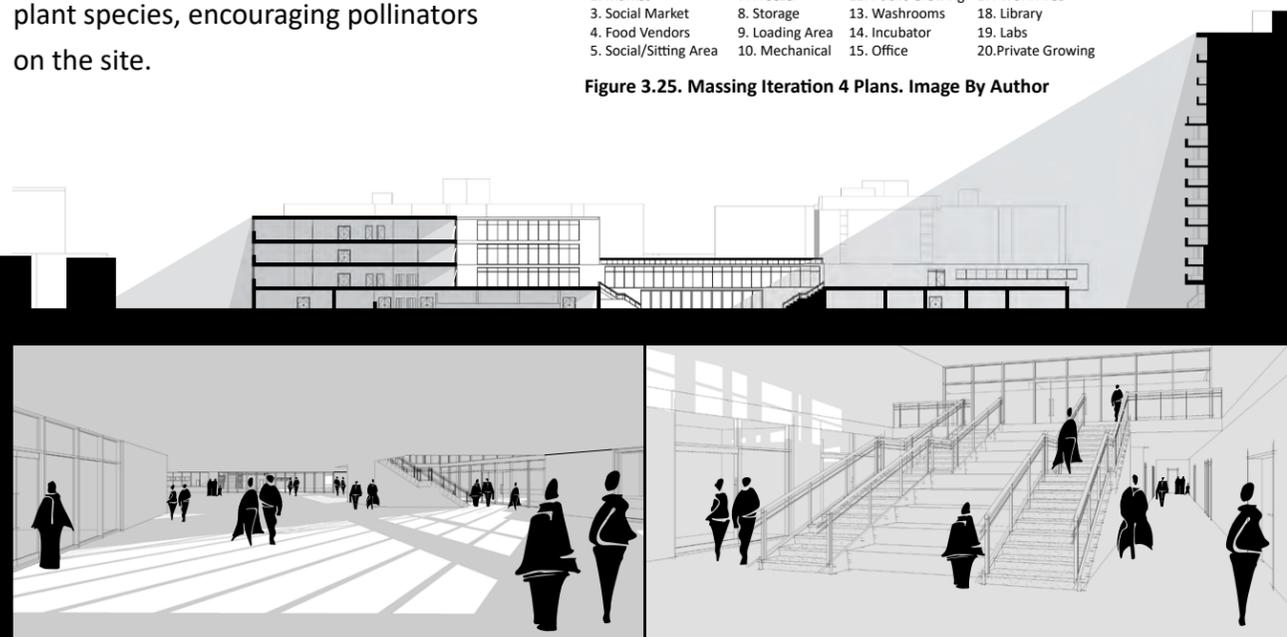


Figure 3.26. Massing Iteration 4 Section and Interior Vignettes. Image By Author

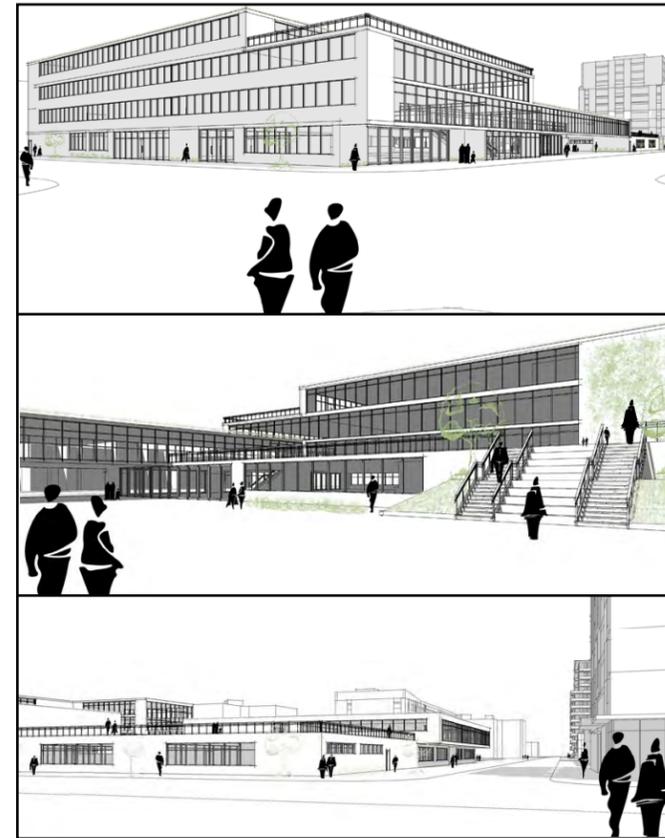


Figure 3.27. Massing Iteration 4 Exterior Vignettes. Image By Author

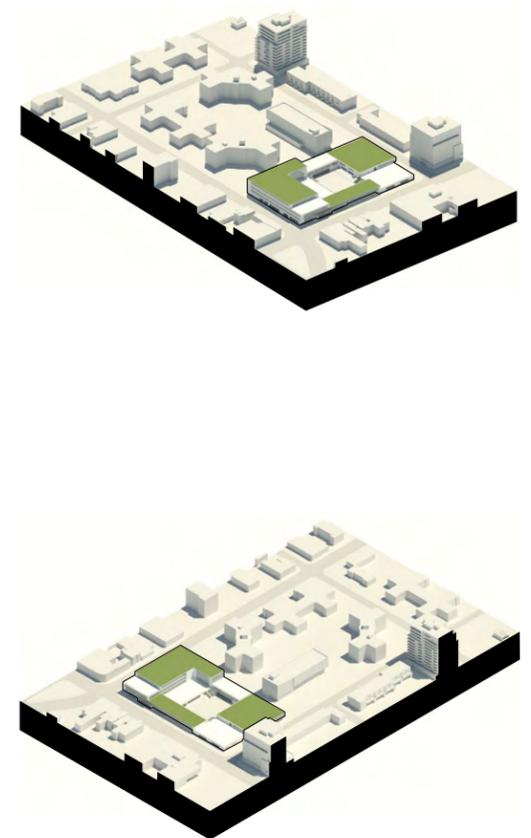


Figure 3.28. Massing Iteration 4 3D Views. Image By Author

Design Considerations

Although this design meets most of the criteria set out through the massing, the overall composition of spaces could be further refined in order to increase flexibility. This can be seen in the education centre where the main lobby and study spaces are quite condensed. One solution to this could be relocating the business incubator, so that all of the education centre spaces are on one level, this would better communicate the separation between entirely public and private spaces throughout. It will be important to continue thinking about how visual connections can begin to blend and reduce the sense of boundaries between public space and more private growing spaces. Additionally, the market design is fairly unresolved, and would

benefit from a more open and flexible plan. This is a result of the social market and community kitchens facing towards Gerrard St., while the main entrance of the market opens to Parliament St. These programs could stand to be better integrated within the public spaces, once again blending the public/private elements within the building.

Another consideration moving forward, is the depth of the growing centre floor plates, since shallower floor plates would allow for deeper penetration of natural light into interior spaces (see figure 3.26.). Finally, at this stage the facade composition is generic with curtain walls as the primary method of accessing sunlight. More thought could have been given towards window placement and facade composition.

Initial Design Massing 6

While similar to massing 4 this design gives back more public space to the community, while better integrating growing spaces with other programs. One way the design provided more community space was by pushing the building facade along Parliament back in order to introduce community garden plots along the street. Additionally, shallower floor plates as part of the growing centre (see figure 3.30.) allow for deeper light penetration while also creating larger social rooftops, which are publicly accessible from the market building. Another notable difference is the treatment of interior spaces, as most of the social programs of the market are pushed towards Parliament to encourage people passing by to stop inside, while the growing centre is more prominent at grade establishing better visual connectivity. Finally, the interior spaces utilize transparent walls rather than opaque ones once again to encourage a visible connectivity throughout the building.

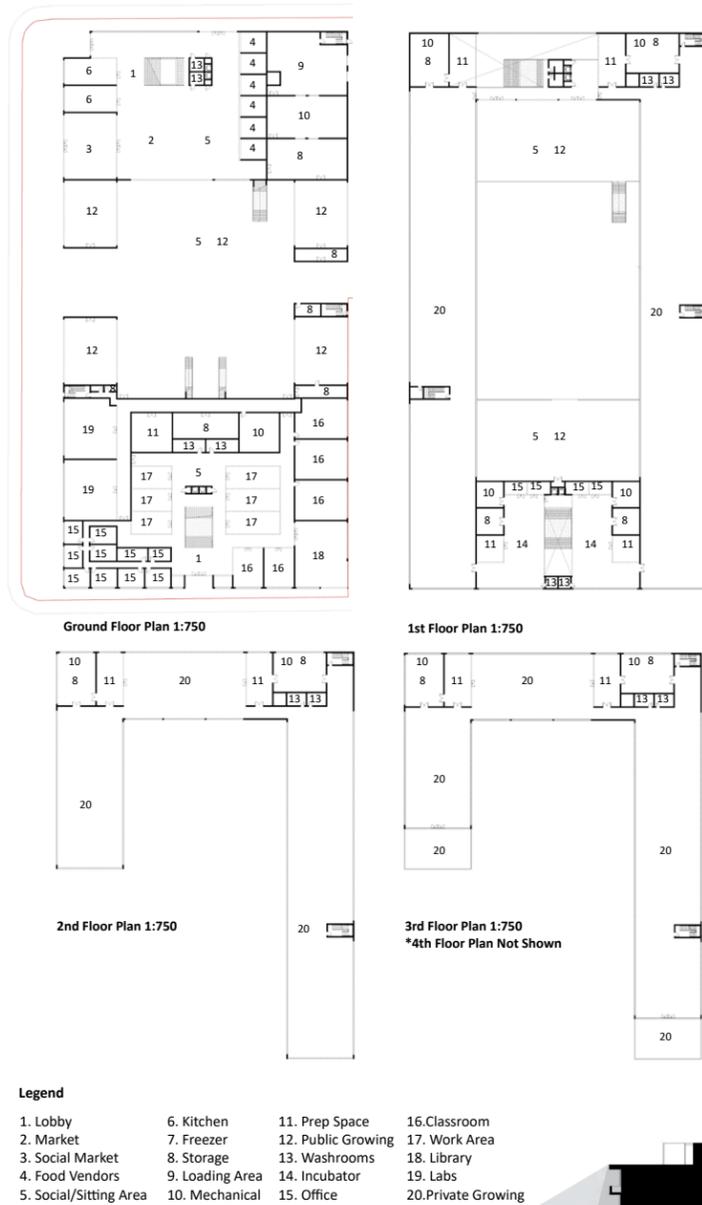


Figure 3.29. Massing Iteration 6 Plans. Image By Author



Figure 3.30. Massing Iteration 6 Section and Interior Vignettes. Image By Author

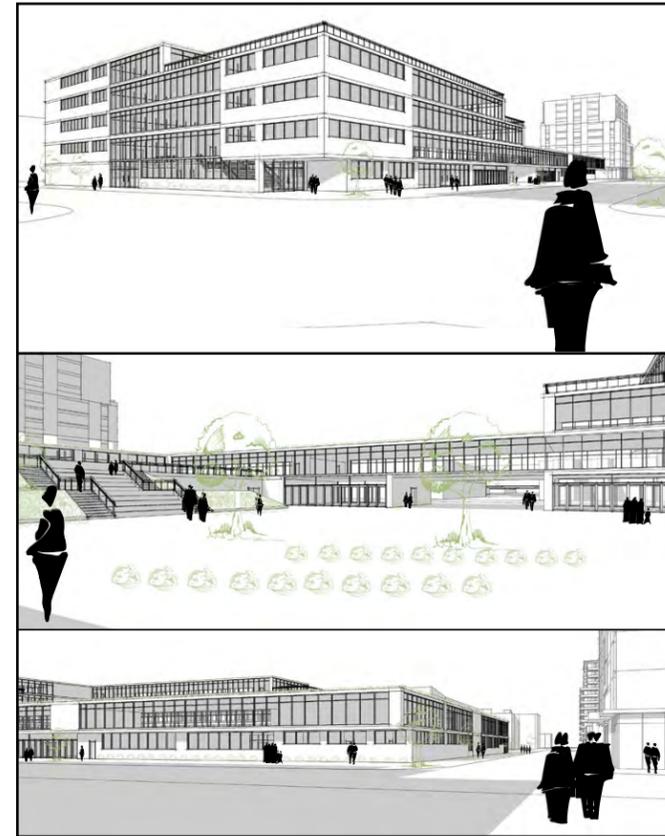


Figure 3.31. Massing Iteration 6 Exterior Vignettes. Image By Author

Design Considerations

Although this design takes advantage of shallower floor plates in order to give back more community space, the drawback is the need for an additional level to maintain the same area designated towards the growing centre. Additionally, one element not discussed throughout the design, is water. Considering water is essential for growing food, there is an opportunity to better showcase and celebrate water throughout the site. This could include things like small reveals of water traveling down the facade and throughout the site from the rainwater collection greenroofs to the ground. There are also opportunities for water scape features which change the complexion of the

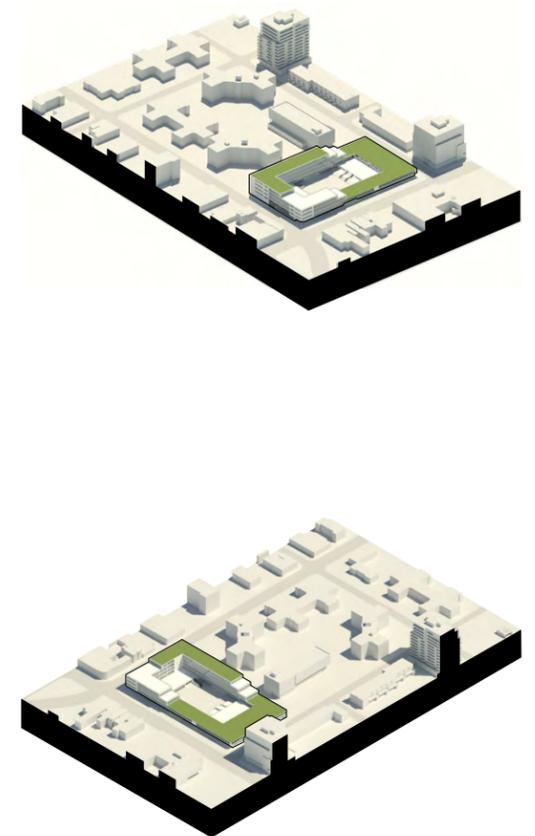


Figure 3.32. Massing Iteration 6 3D Views. Image By Author

central social space depending on the season and amount of precipitation the site receives. The idea of water also connects with the buildings goal of forming symbiosis on the site, taking advantage of natural resources that are available. The celebration of water could further push the idea of seasonality, while also thinking about how the facade could adapt depending on what time of year it is. This would result in a design that adapts to its environment, while being flexible no matter the weather. In order to help achieve this, an analysis will be carried out in order to establish specific growing conditions which can be aided by the architecture throughout the site while being adaptable to the needs of the building users.

Plant Growing Profiles



Figure 3.33. Plant profile chart. Image By Author

Light Sunlight is vital for growing. A plant's requirements dictates where it would best grow on the site.	Full 6-8hrs Partial 4-6hrs Light 2-4hrs Shade <2hrs
Growing How each plant grows informs the architecture throughout the building.	Ground Planter Climbing Hanging Micro greens
Season When each plant grows is important to understand seasonality of the site and passive strategies.	Spring Summer Fall Winter
Temp/Size Knowing what temperature to plant and how large a plant gets helps dictate the architectural solution.	Planting Temp. Plant Size

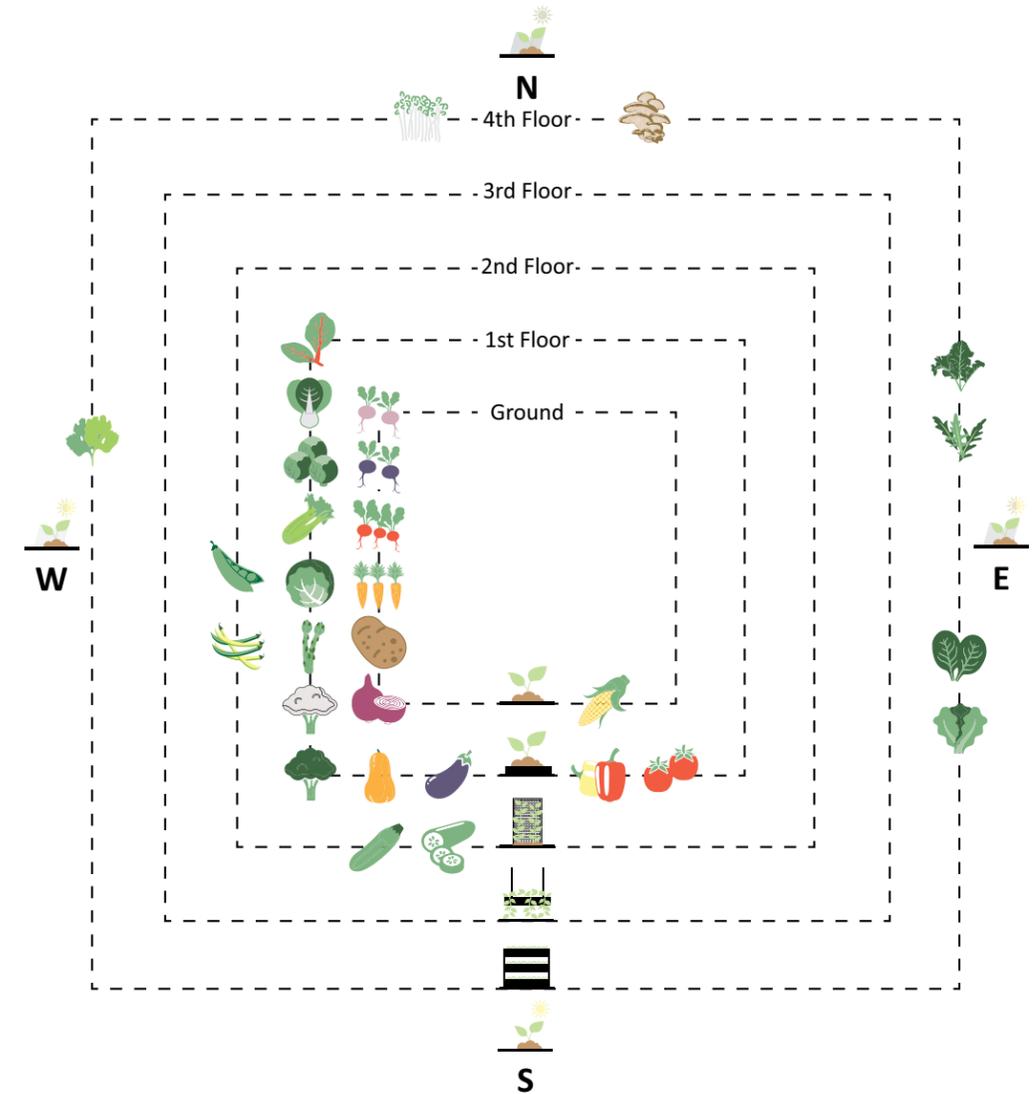


Figure 3.34. Spatial planning of vegetation based off of plant profile growing conditions. Image By Author

In order to better design the architecture to respond to the specific growing conditions that different vegetation requires, profiles were established (Figure 3.33.)³⁸. The profiles break down specific light conditions, growing methods, seasonality, temperature the plants can go outdoors, as well as how large each plant will grow. Some of these are similar to the vegetables seen in Figure 3.14., while others have been added which were identified by Ashrafi Ahmed of the CRC as culturally significant to the residents of Regent Park. These include: coriander/cilantro,

radish, cucumber, zucchini, spinach, and kale. Utilizing the growing profiles, Figure 3.34. begins to map out where each plant could grow on the site prioritizing lighting conditions, while considering which level of the building would be most suitable for each growing method. Although this is a diagrammatic process it begins to clearly define where the majority of growing should take place in order for the plants to thrive. The next step will be mapping out the plants on the actual building design so that specific architectural solutions to the planting can be proposed.

38. Almanac, Old Farmer's. "Growing Guides." Old Farmer's Almanac. Accessed March 29, 2020. <https://www.almanac.com/gardening/growing-guides>.

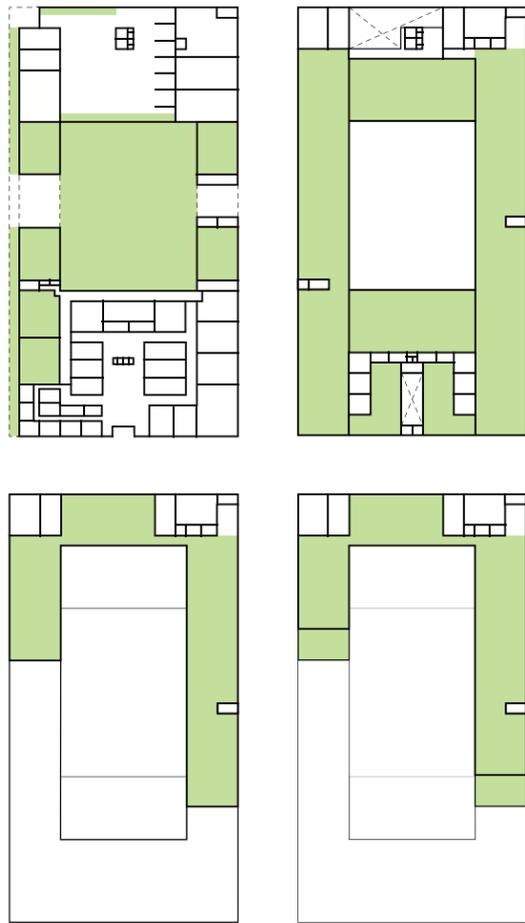


Figure 3.35. Massing 6 Growing Spaces Plans. Image By Author

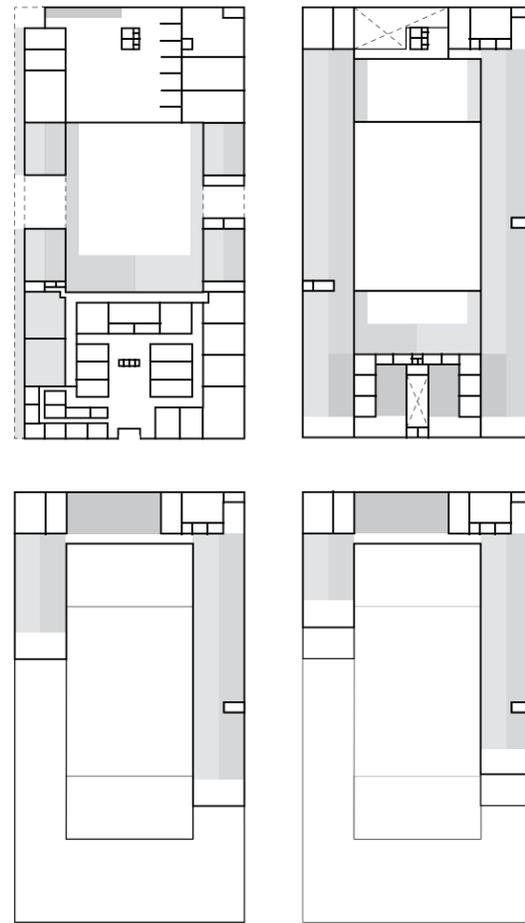


Figure 3.36. Massing 6 Light Conditions Plans. Image By Author

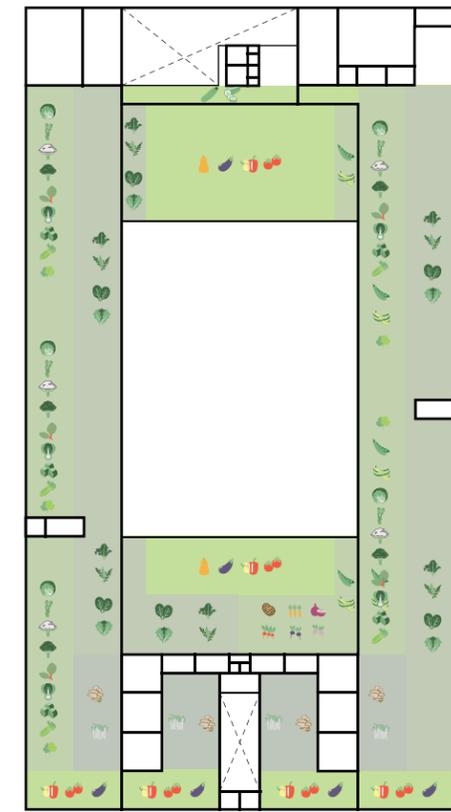
Designing For Growth

In order to establish the specific locations for growing, all of the areas which will be designated for growing throughout the building were identified (Massing 6). Figure 3.35. begins to highlight the current growing spaces, while Figure 3.36. maps out lighting conditions throughout these growing areas. Southern exposure is considered full sun, Western exposure partial sun, Eastern exposure light sun, and Northern exposure as shade. Although the amount of light between Western and Eastern exposure are typically similar, the slight angle of Toronto's street grid results in Western exposure receiving more light on the site³⁹. Figure 3.37. begins to

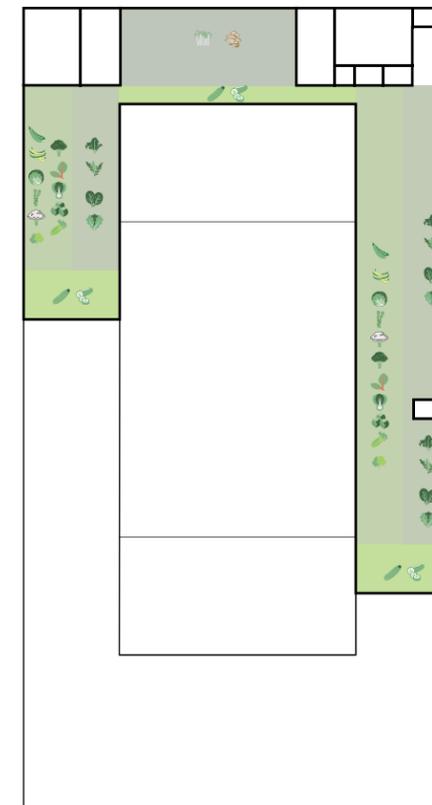
overlay the growing spaces and light conditions to propose planting locations organized by growing method for vegetation throughout the site. It is important to note that these are suggested locations for planting based off of natural light, but many of the plants that grow with East or West exposure are interchangeable, and the people maintaining the site would determine the optimal location through experience. Additionally, hydroponic growing does not require natural light and benefits from controlled lighting. Some strategies for growing on the site will include planter boxes, community plots, planted balconies, as well as green facade elements which will allow for the users of the building to adapt the system to their needs.



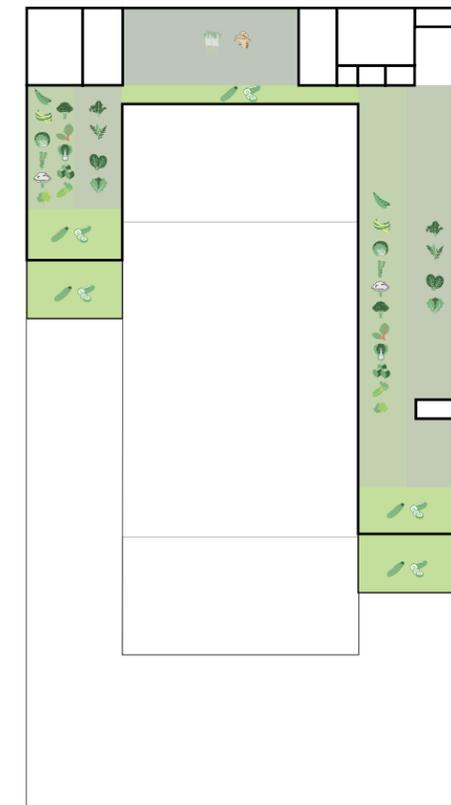
Ground Floor



First Floor



Second Floor



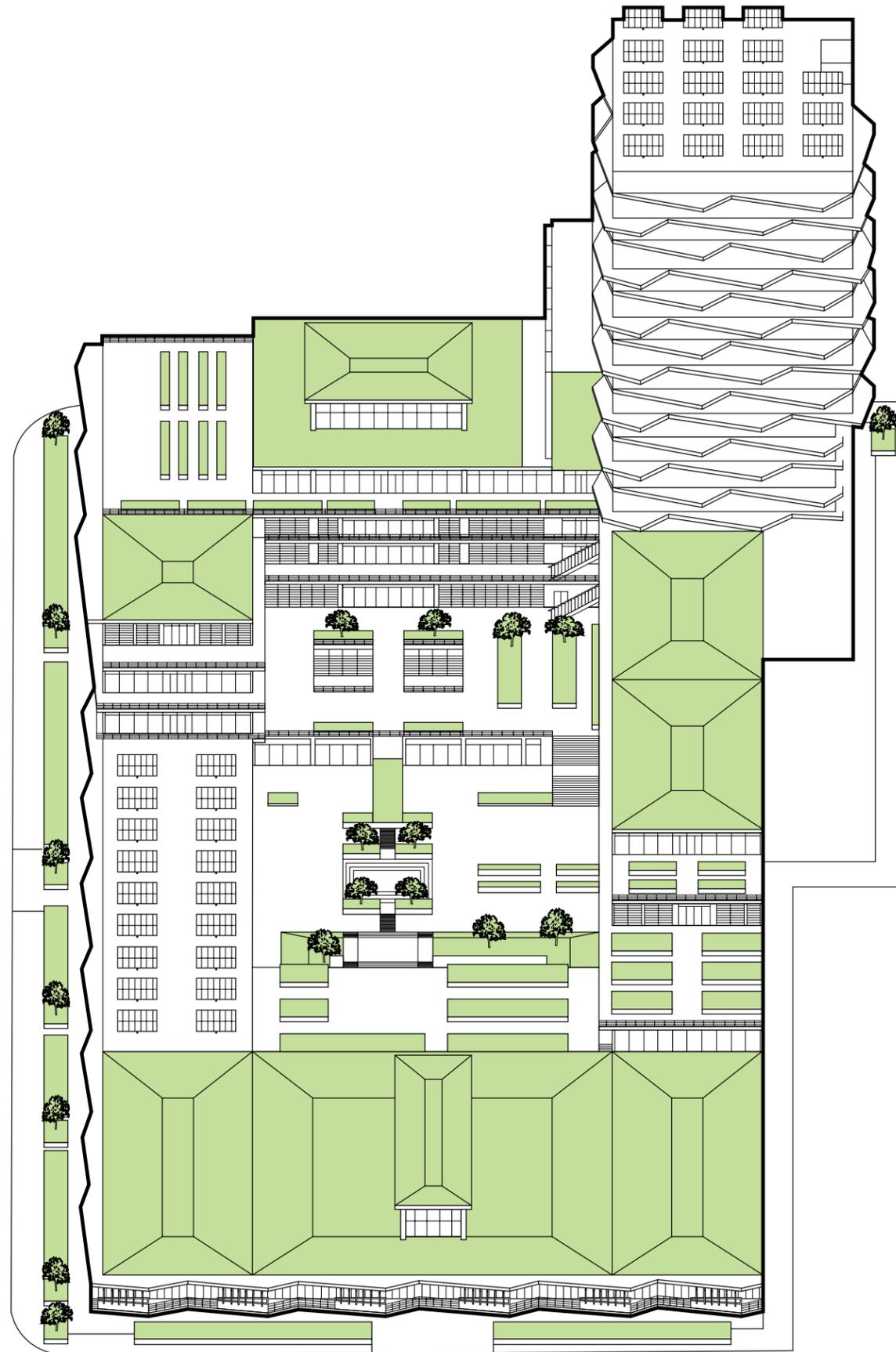
Third Floor



Figure 3.37. Massing 6 Proposed Planting Locations. Image By Author

39. Oct 26, Talia Ricci - CBC News - Posted: 2019 5:00 AM ET | Last Updated: October 26, and 2019. "Toronto's 'Sunset to Be in Line with City Grid Saturday | CBC News." CBC, October 26, 2019. <https://www.cbc.ca/news/canada/toronto/saturday-toronto-henge-1.5336123>.

Chapter 4: Final Design



Design Concepts

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Plans/Sections

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Resources Strategy

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Planting Module

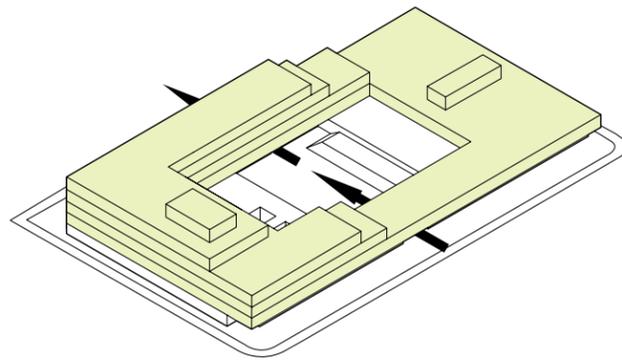
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Facade Adaptability

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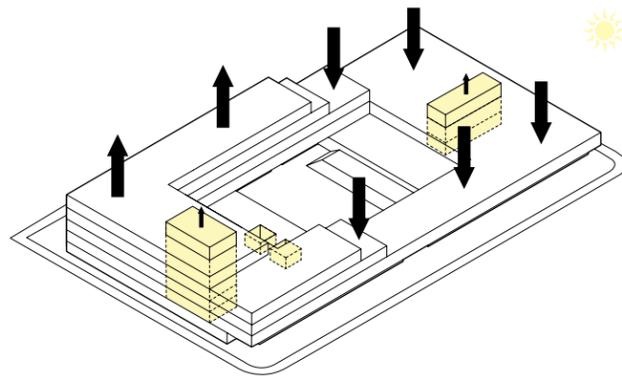
Figure 4.0. Full Site Perspective Drawing. Image By Author.

Design Concepts



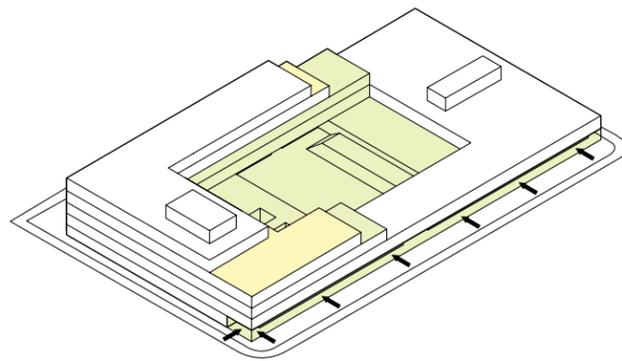
Accessibility/Connectivity

A central axis for pedestrian flow has been established between Parliament st. to the West and the existing development including the CRC to the East. Public access through the market building from Gerrard st. as well as direct access off of Parliament encourage people to pass through the space. Growing spaces throughout the site connect the various programs, while a balcony system allows for complete public access up to level 4 on the exterior of the building and level 2 on the interior.



Light

Similar to previous iterations the final design prioritizes lighting conditions throughout the site. In order to best accommodate light within the central social space the building mass was lowered to the Southwest and raised to the Northeast. Additionally, several voids were introduced into the mass to bring natural light into the core of the structure. The main voids within the market and education centre were capped with a monitor, enclosing the spaces, allowing plants to be grown within them all year round.



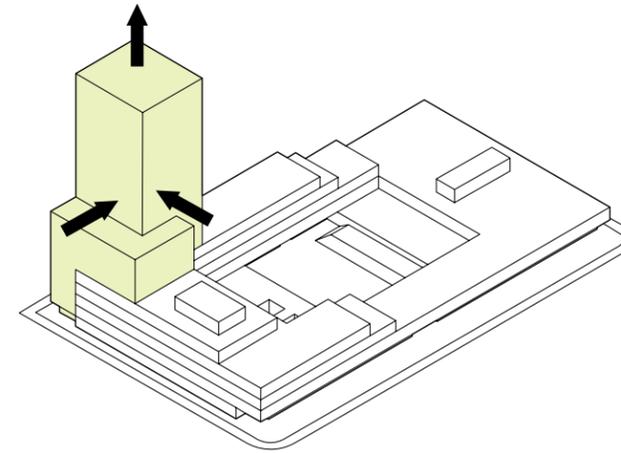
Social Spaces

The building facade to the West along Parliament has been set back to accommodate community garden plots along the street, connecting back to the heritage of the area when it was once Cabbagetown, while creating a larger public realm along the street. Cascading rooftops throughout the site establish various public spaces (green) where the community has different opportunities to grow food, while more private growing (yellow) rooftops are limited to the top level of the building.

Figure 4.1. Final Design Concept Diagrams Images By Author

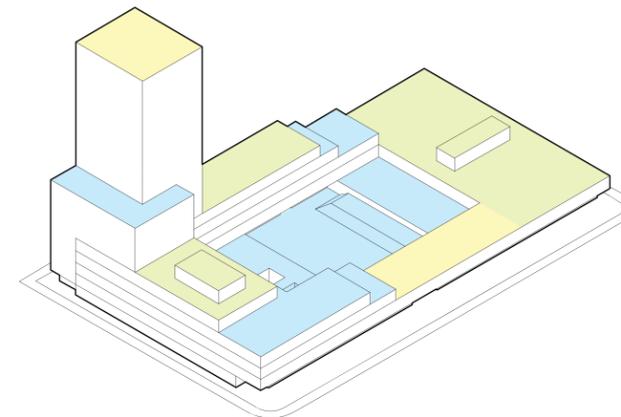
The final design proposal is an accumulation of the initial design goals set out in Chapter 1, which have been further refined through the massing and program exploration in Chapter 3. Several key concepts which have been referenced earlier on form the basis for the

major design intentions of the final design. As a result, the six primary design concepts seen in figure 7.1 were established in order to inform the final design proposal. Although these concepts are site specific, they are design intentions which can be modified in order to suit other



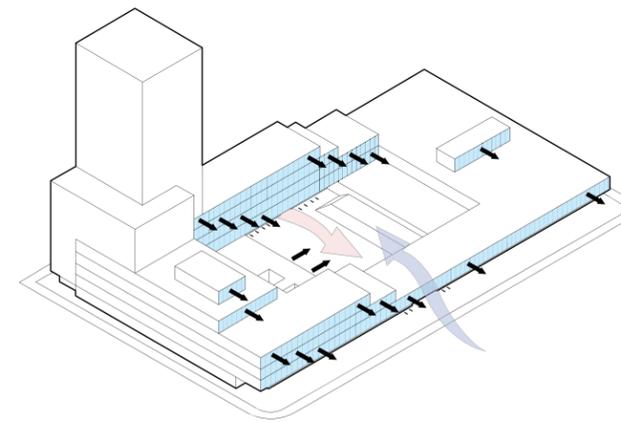
Residential

The residential component of the building first identified through the solar study of Regent Park has been massed to the Northwest corner of the site. In total the structure reaches a height of 20 storeys, achieving the cities envisioned height. The building was limited to a slimmer profile in order to reduce the shadow cast on the other side of Gerrard. Additionally, the base of the tower reaches a height of only 9 storeys, ensuring access to sunlight along the other side of the street during the summer.



Resources

To grow food there are two essential resources that are needed, light and water. Natural lighting is used to reduce the need for electrical lighting, while additional requirements are supplemented by two solar arrays (yellow) on the site. Collecting and utilizing water that falls on the site is equally important, and several rain water collection green roofs (green) as well as hard surfaces (blue) have been applied throughout the site in order to directly collect or passively redirect water to where it is needed.



Adaptability

Adaptability has been prioritized in order to encourage the production of food throughout the entire year. Strategies include a planted facade and movable vertical fins which allow the occupants of the building to adapt the structure to specific seasonal and lighting conditions. Additionally, the structure adapts to seasons by opening up during warmer weather, while light monitors take advantage of stack effect in order to moderate the buildings temperature throughout the year.

sites and are generally appropriate for a project of this type. The six concepts were all chosen specifically within the context of Regent Park and with the goal of food sovereignty in mind. This includes different educational opportunities throughout the site as well as specifically

design planting elements which offer different growing possibilities for the public to interact with in order to further the growing possibilities throughout the community and promote the idea of sovereignty by providing a sense of ownership over the site.

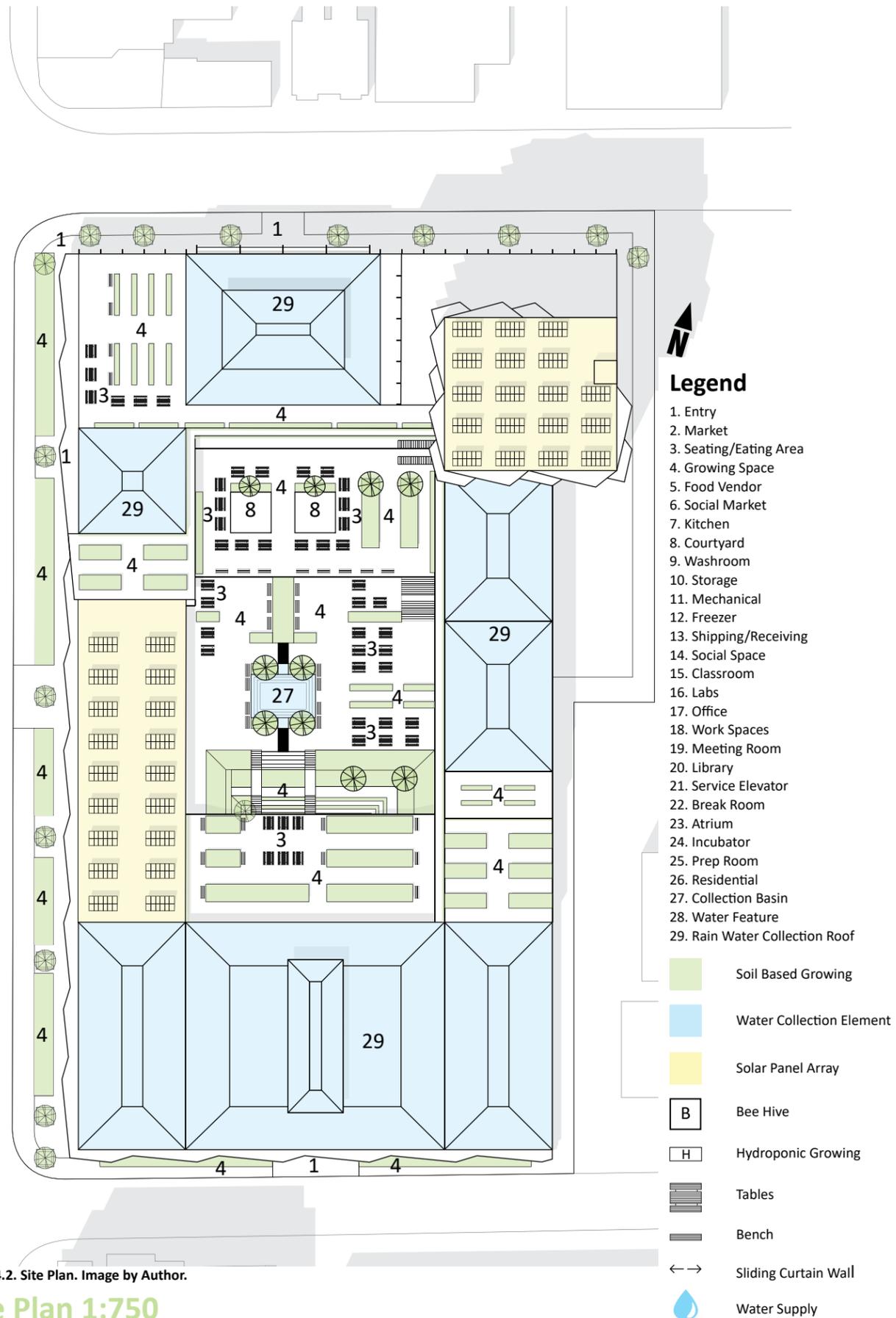


Figure 4.2. Site Plan. Image by Author.

Site Plan 1:750



Figure 4.3. Community Garden Beds Along Parliament St. Facing North. Image by Author.



Figure 4.4. Community Garden Beds Along Parliament St. Facing South. Image by Author.

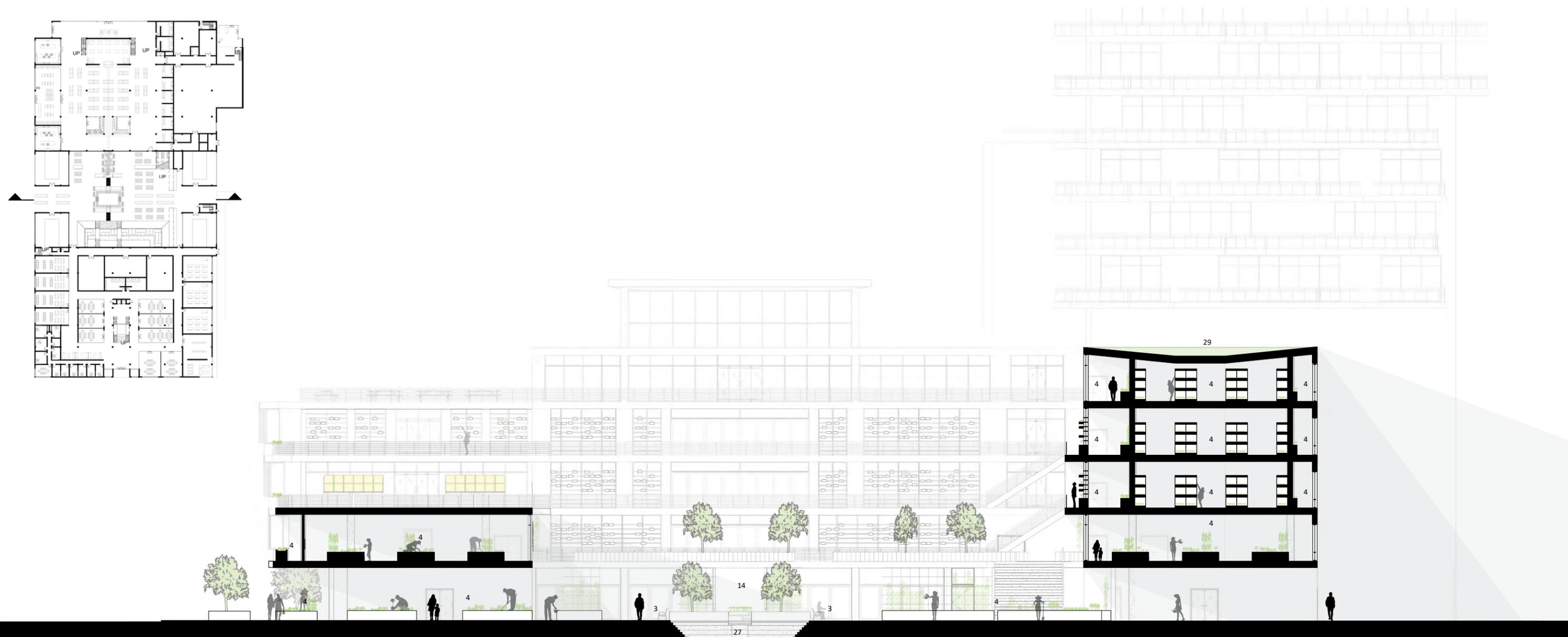


Figure 4.5. Site Section East/West. Image by Author.

Section Facing North 1:250

Legend

- | | |
|------------------------|--------------------------------|
| 1. Entry | 16. Labs |
| 2. Market | 17. Office |
| 3. Seating/Eating Area | 18. Work Spaces |
| 4. Growing Space | 19. Meeting Room |
| 5. Food Vendor | 20. Library |
| 6. Social Market | 21. Service Elevator |
| 7. Kitchen | 22. Break Room |
| 8. Courtyard | 23. Atrium |
| 9. Washroom | 24. Incubator |
| 10. Storage | 25. Prep Room |
| 11. Mechanical | 26. Residential |
| 12. Freezer | 27. Collection Basin |
| 13. Shipping/Receiving | 28. Water Feature |
| 14. Social Space | 29. Rain Water Collection Roof |
| 15. Classroom | |

The site plan (Figure 4.2.) begins to show the overall composition of the site with a central social space with most of the building mass around the periphery. One of the main objectives of the design was easy access from Parliament st. to the central social space while connecting the East and West ends of the site. Additionally, a conscious decision was made to push the building facade along Parliament back in order to incorporate two rows of community garden

beds. This was intended to give back the street to the community while encouraging growing of food along the street like the area previously experienced when it was known as Cabbagetown. Fruit trees establish a more approachable scale, while increasing the overall food production of the site. All of this begins to establish a unique experience along the street for people who pass by or through the site (Figure 4.3. & 4.4.). Figure 4.5. shows a section through the site East/West

showing the straight connection at ground level covered by a 2nd story bridge. The section begins to depict the growing activity along the street and how it transitions into the central social space. The 2nd story community growing plots are also visible providing contrast to the hydroponic growing from levels 3-5 as the growing operation evolves from the more public realm at ground level to more private spaces within the upper levels of the building.



Figure 4.6. First Floor Plan. Image by Author.

First Floor Plan 1:750

The first floor (figure 4.6.) hosts the market to the North, and education centre to the South. This level has four growing spaces which open and close depending on weather, to allow growing on the ground to take place all year round. The market building hosts two community kitchens, a social market and six permanent vendors. The central space within

the market showcases the central atrium (figure 4.7.) and water feature which brings natural light into the core of the structure while being open to the 2nd level. Two courtyard spaces to the South are intended to blend interior and exterior conditions. On the weekend the space transitions from a food hall into a farmers market (figure 4.8.) where people are encouraged to sell

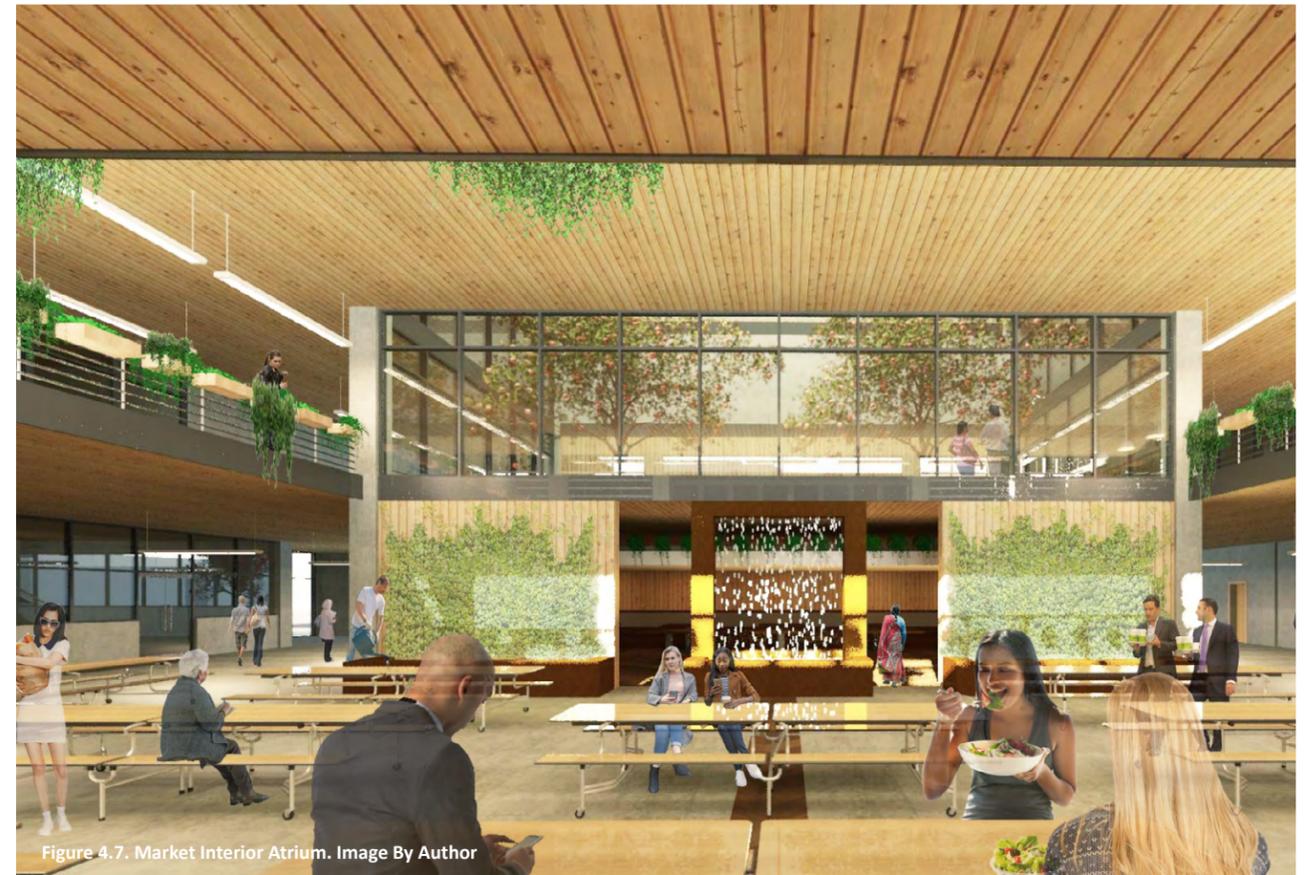


Figure 4.7. Market Interior Atrium. Image By Author



Figure 4.8. Weekend Farmers Market. Image By Author



Figure 4.9. Second Floor Plan. Image by Author.

Second Floor Plan 1:750

food they grow on the site. During the warmer months the market opens into the exterior of the building providing additional space for sitting and eating. The education centre has flexible spaces for community engaged learning⁴⁰, as well as labs for hydroponic growing. The main entry space has a large monitor above which brings in natural

light to the social spaces, and provides additional growing area using an elevated growing system (figure 4.10). The space establishes a visual connection to the growing operations (incubator) on the 2nd floor (figure 4.9). This strategy is intended to inspire interaction between the public and private growing operations while

40. "What Is Community-Engaged Learning? | Student Life." Accessed April 1, 2020. <https://www.studentlife.utoronto.ca/ccp/community-engaged-learning>.

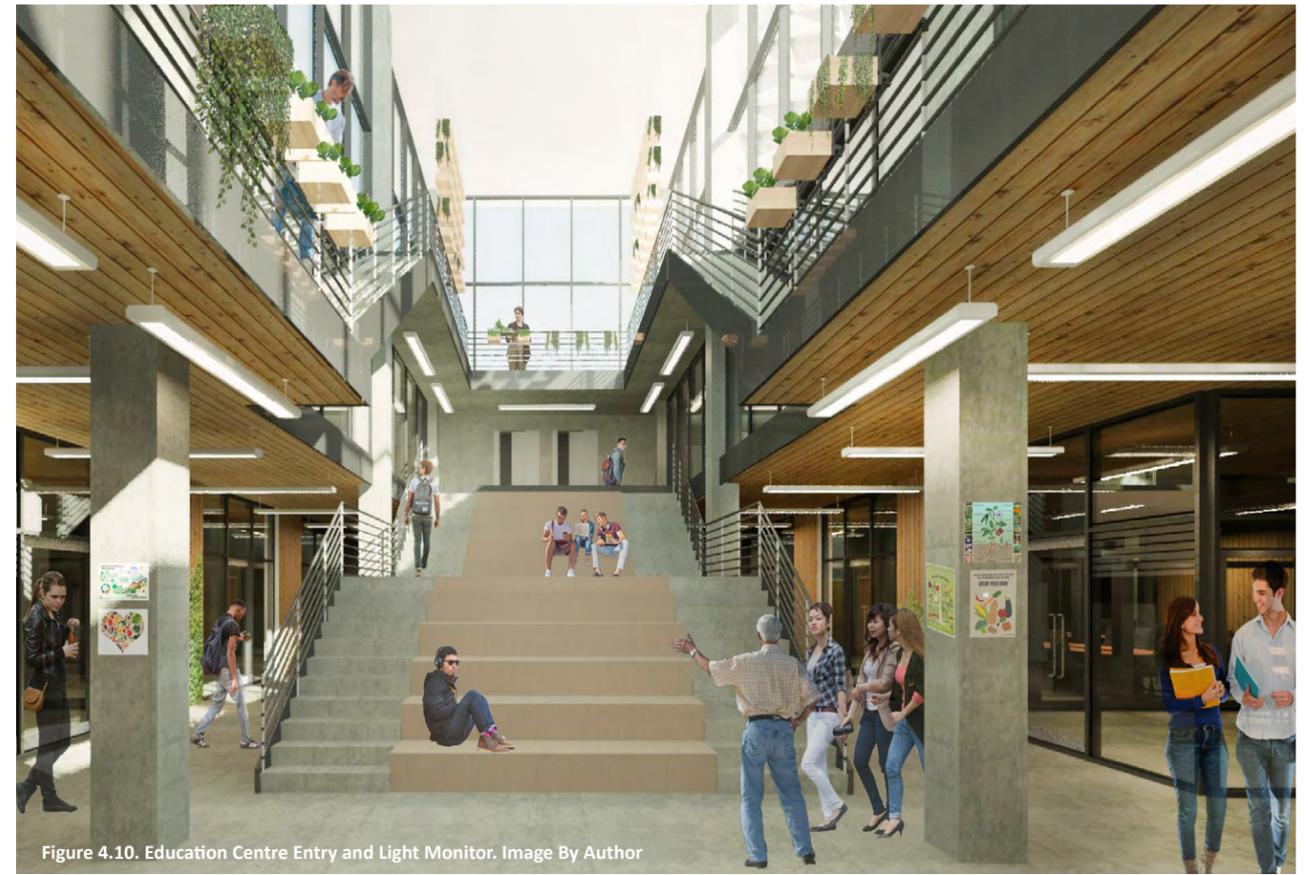


Figure 4.10. Education Centre Entry and Light Monitor. Image By Author



Figure 4.11. Second Level Community Growing Beds. Image by Author.

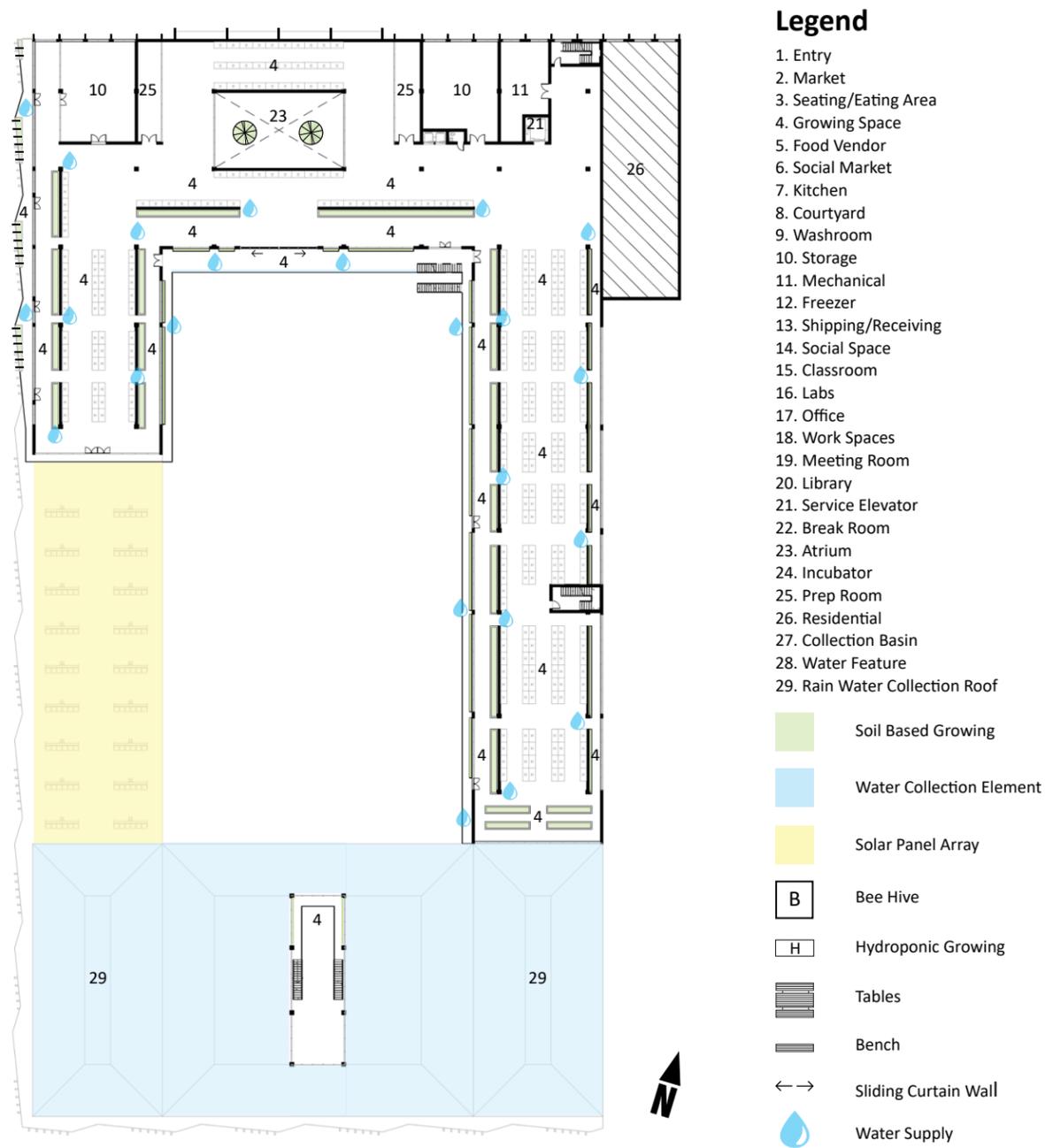


Figure 4.12. Third Floor Plan. Image by Author.

Third Floor Plan 1:750

promoting the opportunities for the public to expand their growing skills, through hands on education. The 2nd floor also hosts community garden beds (figure 4.11.). Lighting in the space would take advantage of natural light when possible, while passive learning strategies such as plant profile tags would help the community

understand optimal conditions and cultural significance of plants. Additionally, the 2nd floor hosts the enclosed atrium space and two large rooftops which host community planters as well as sitting and socializing spaces for different events. The 3rd floor (figure 4.12.) is accessible to the general public through an exterior balcony

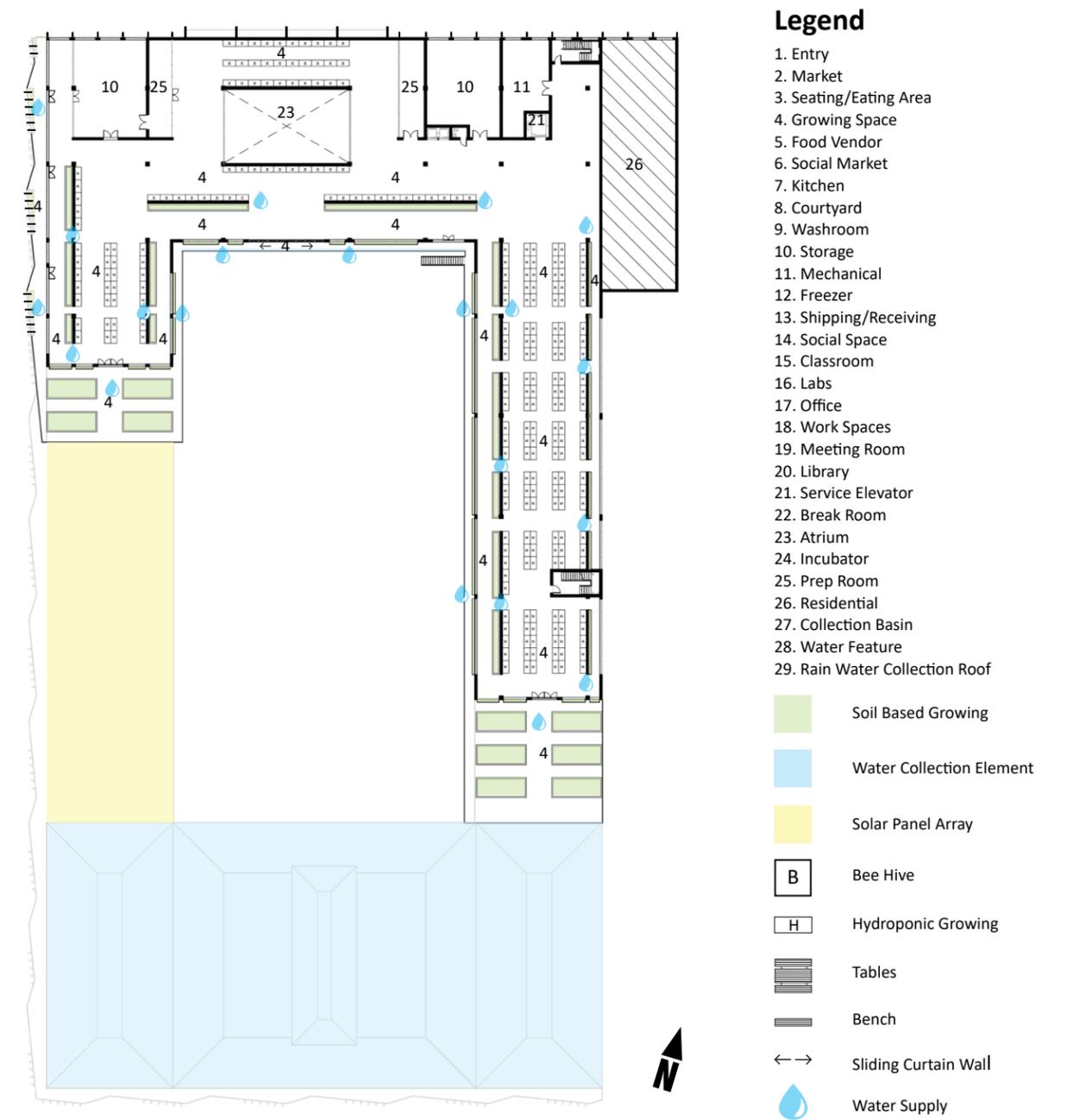


Figure 4.13. Fourth Floor Plan. Image by Author.

Fourth Floor Plan 1:750

system which goes up to level 4 of the building. This level is also the first floor which hosts hydroponic growing. The general intent of the layout was to have an inner core of hydroponic growing which utilizes controlled lighting while the outer layer of each floor plate would host soil based growing which takes advantage of

natural light. This is because hydroponics often thrive under more controlled lighting conditions, resulting in higher yields⁴¹. The 3rd floor also hosts the monitor growing space above the education centre which will allow plants that require more sunlight such as tomatoes or peppers to grow within a controlled environment

41. Cockrall-King, Jennifer. Food and the City: Urban Agriculture and the New Food Revolution. Amherst, NY: Prometheus, 2012.

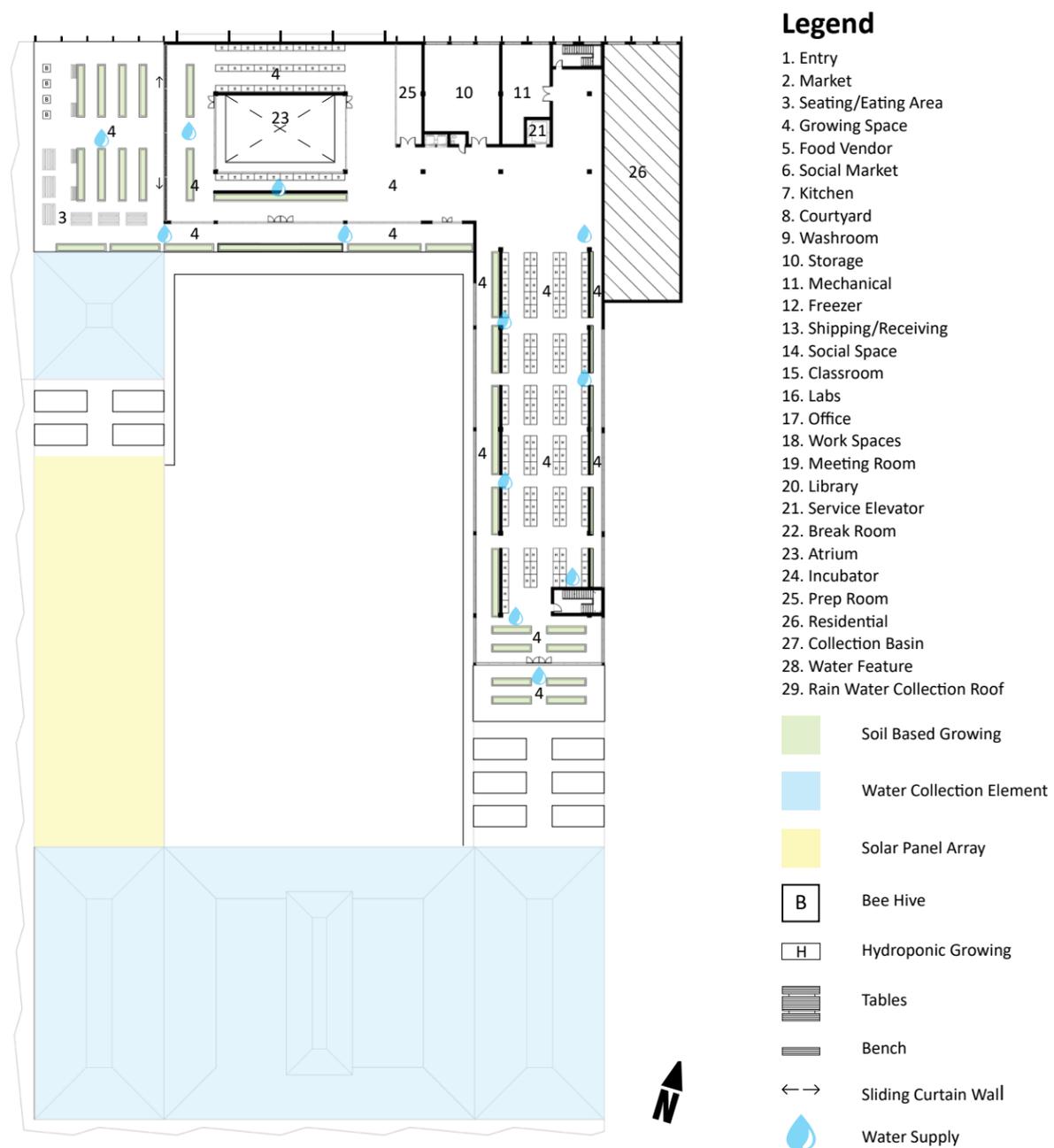


Figure 4.14. Fifth Floor Plan. Image by Author.

Fifth Floor Plan 1:750

during colder months. The 4th floor has a very similar layout to floor 3, however since the level cascades up the 4th floor hosts two growing rooftops which would each promote different types of growing due to the type of light they receive (morning vs afternoon sun). Similarly, the 5th floor follows the layout of the previous

two levels but features a private rooftop space intended to host soil planters as well as four bee hives. The roof is ideal for receiving afternoon sunlight, but due to the hives it is restricted from the general public. Overall, the floor plans focus on flexible spaces that blend interior and exterior growing conditions throughout the year.



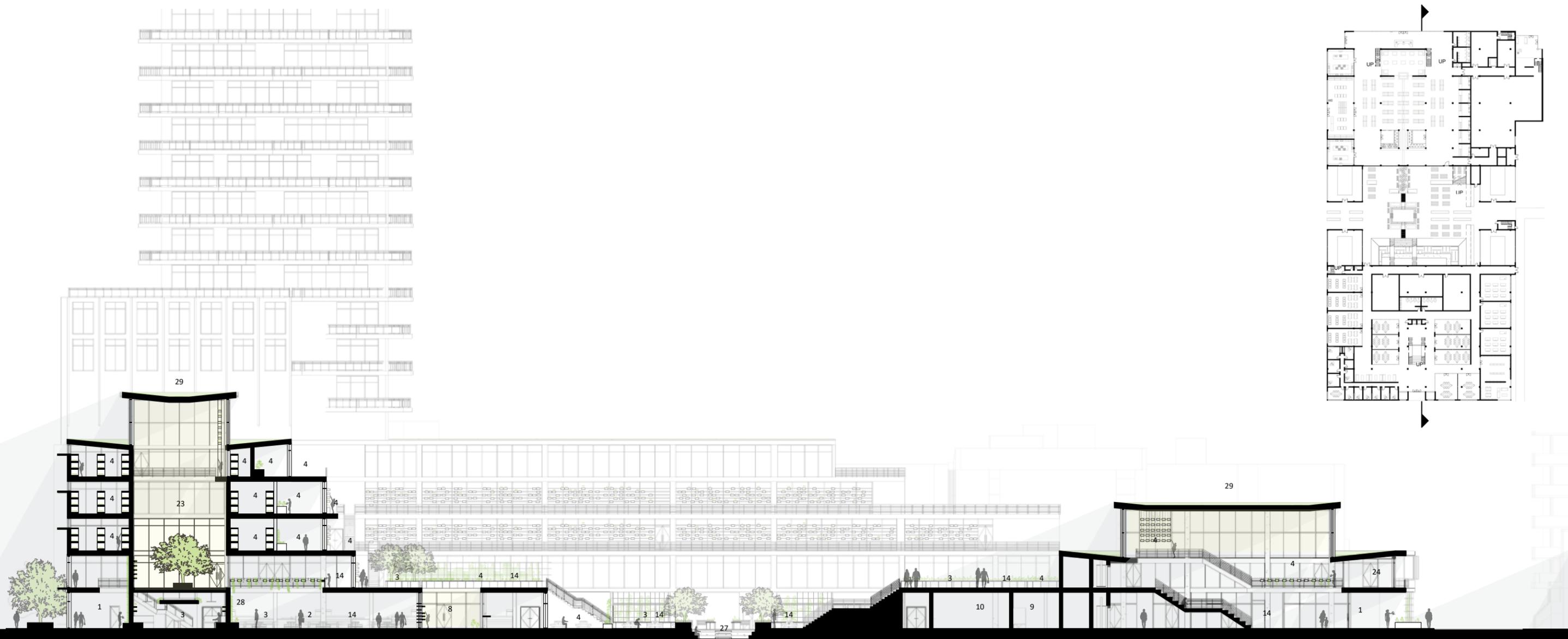


Figure 4.17. Full Site Section. Image by Author.

Site Section Facing East 1:750

Legend

- | | |
|------------------------|--------------------------------|
| 1. Entry | 16. Labs |
| 2. Market | 17. Office |
| 3. Seating/Eating Area | 18. Work Spaces |
| 4. Growing Space | 19. Meeting Room |
| 5. Food Vendor | 20. Library |
| 6. Social Market | 21. Service Elevator |
| 7. Kitchen | 22. Break Room |
| 8. Courtyard | 23. Atrium |
| 9. Washroom | 24. Incubator |
| 10. Storage | 25. Prep Room |
| 11. Mechanical | 26. Residential |
| 12. Freezer | 27. Collection Basin |
| 13. Shipping/Receiving | 28. Water Feature |
| 14. Social Space | 29. Rain Water Collection Roof |
| 15. Classroom | |

Looking through the building in a full length section (figure 4.17) two things stand out. The first is the two main monitor spaces at either end of the site which bring natural light into the core of each structure. These spaces don't only provide natural light into the structures, but also provide additional growing spaces, and establish a strong visual connection between different levels of the buildings. Additionally, the larger atrium within the market building provides a more intimate and quite courtyard experience.

The second thing that can be seen is the cascading of rooftops as well as the lower profile Southern mass (right) compared to the North end of the site. This was a strategy determined early on within the design phase influenced by the solar study of Regent Park. The lower profile to the South allows for natural daylight to always be accessible within the central social space on the site even during the winter, ensuring a more comfortable experience for the public within this space all year round.

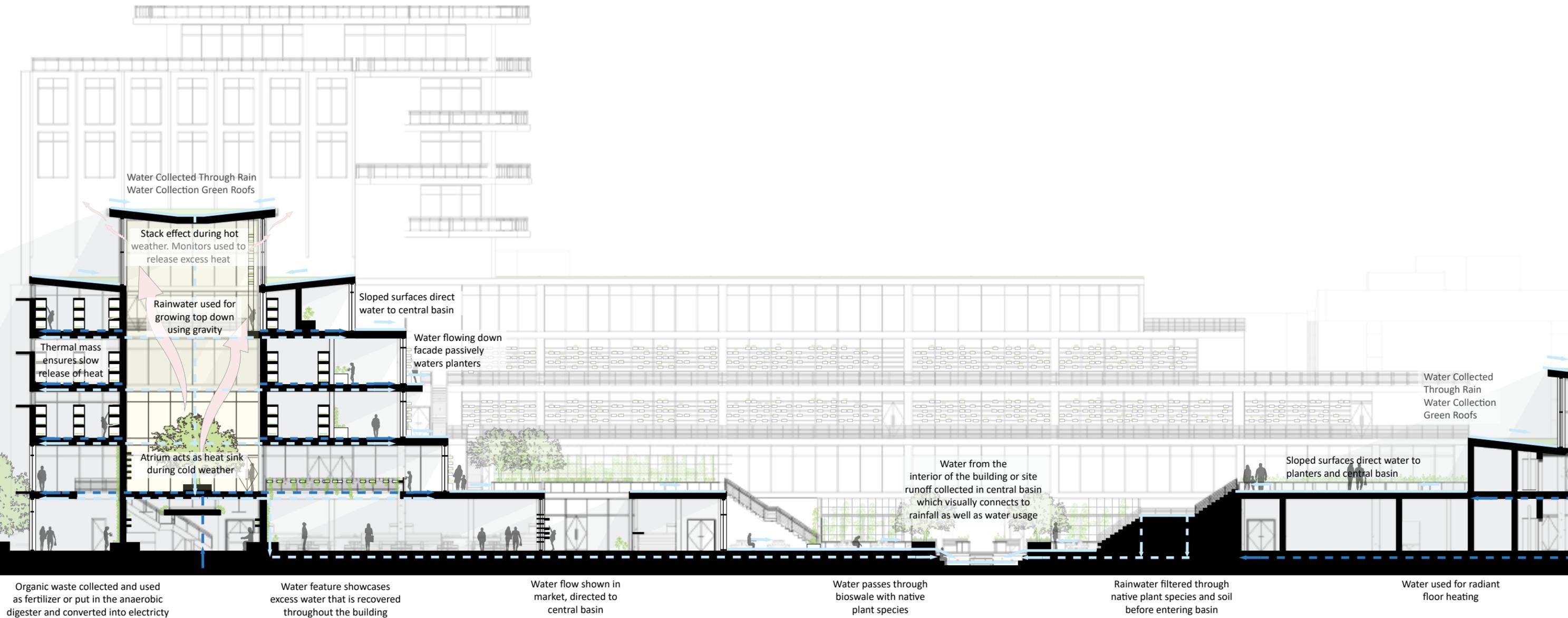


Figure 4.18. Resource Strategy Section. Image by Author.

Resource Section Facing East 1:500

Legend

- Surface Rain Water
- - - Collected Rain Water
- - - Municipal Water
- Direction of Flow
- ↗ Heat Transfer
- Natural Light

Several design strategies were integrated aligning with the initial goal of a symbiotic building. The strategies involve the utilization of organic waste, light, water and natural ventilation in order to reduce the resource demand of the building. Any organic waste produced through the food related programs will be re-purposed as compost for planters or put in the anaerobic digester where it will be converted into electrical energy. Additionally, solar panels above the West section of the building as well as on top of the

residential tower will produce electrical energy. The southern facing wall within the atrium utilizes thermal mass to slowly release heat while the atrium encourages stack effect, allowing excess heat to be released through the monitor. This strategy advocates for natural ventilation during the summer taking advantage of wind from the East. This includes operable windows at the top of the atriums and the facades, as well as fully operable curtain walls, encouraging cross ventilation throughout the structure. By breaking

up the structure with shallow floor plates the building can open up and breathe during warmer months, while having a higher level of control over how each space is ventilated.

Municipal water will be used as part of a geoexchange system to use radiant in floor heating throughout the structure. Other water will come from rain water collection green roofs (figure 4.19.) which will collect and direct water using a gravity fed system to the planting areas

Monitor/Green Roof Detail 1:20

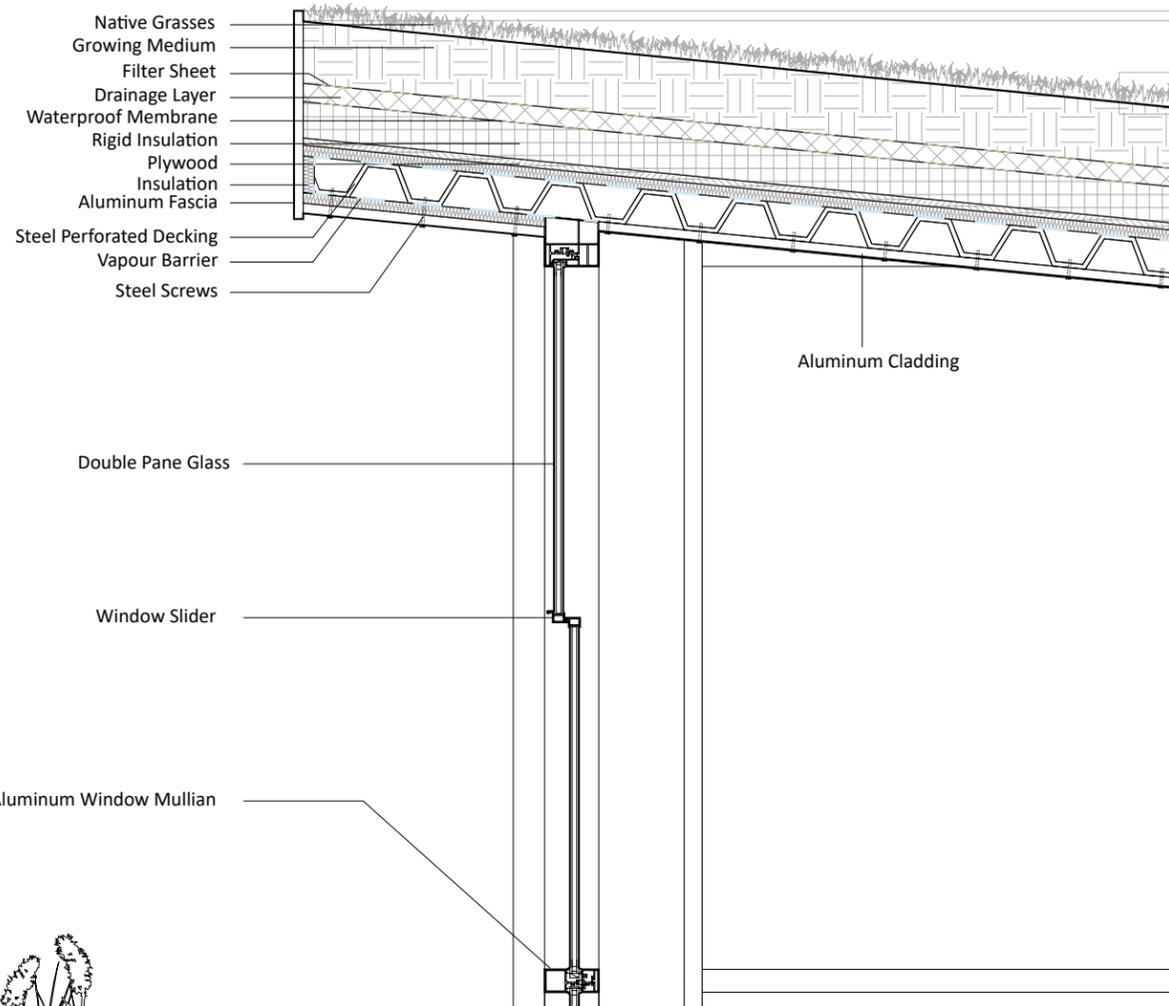


Figure 4.19. Roof Monitor Detail. Image by Author.

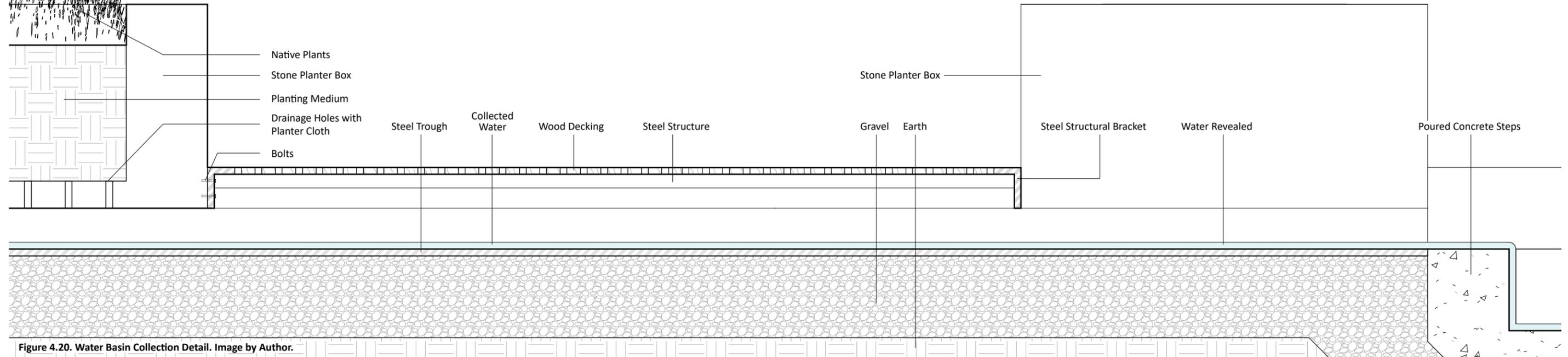


Figure 4.20. Water Basin Collection Detail. Image by Author.

throughout the site. As the rain water works itself through the building from top to bottom it is used by the various programs until it eventually reaches the atrium space where the water feature visibly showcases the flow of water to the exterior of the structure. This is intended to establish a visual connection between the occupants of the building and the water that is collected throughout the site. The water feature celebrates the recycling of water and the importance water plays in the growing of food.

Once the water reaches the ground level it travels under the market floor (identified by a wood grain pattern, see figure 4.8) and is brought to the exterior of the building traveling under a planter box with native plant species and under a wood slat walkway which offers a small reveal of the traveling water to the people walking above (figure 4.20). The water following a shallow slope eventually runs into the collection basin at the centre of the outdoor social space. The path of

the water establishes a clear axis throughout the structure promoting a sense of movement for the occupants of the building towards the central space outside. Additionally, balcony surfaces will have slight slopes in order to influence the water to naturally collect and fall to the lower levels, passively watering the planted facades. Any excess water will then be directed towards the central water collection basin.

The basin tells an important story throughout the site due to how it evolves depending on the season and the weather. When the weather is dry the basin will be empty and the stepping profile presents additional sitting and social space for the community. However, during periods of heavy rain the basin will fill up transforming the area into a reflection/water retention space, once again visually connecting people using the site to the seasonality of the building as well as the water that is recycled throughout the site.

Water Collection/Basin Detail 1:15

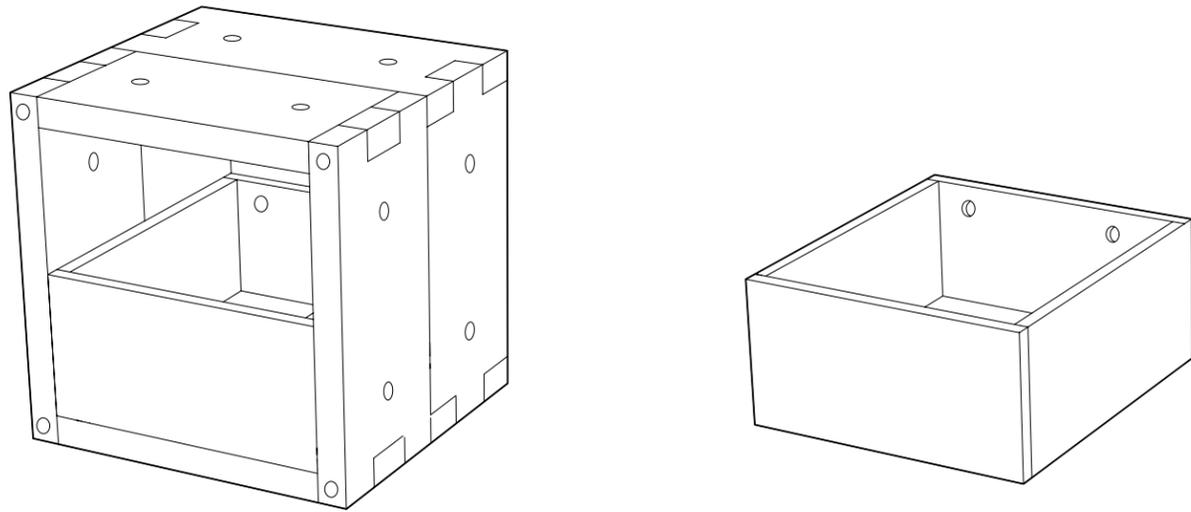


Figure 4.21. Modular Planter Box Structure (right) Tray (Left). Image By Author

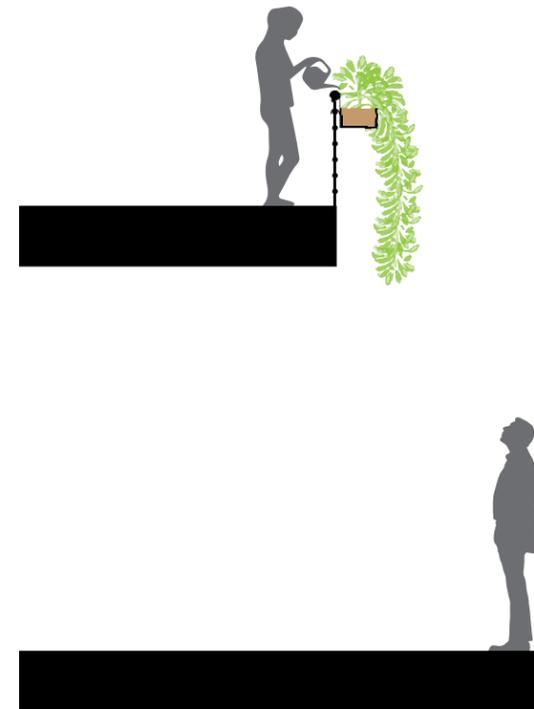
Planting Module

The community garden plots in Regent Park area signify how important a community focused approach to growing of food is to its residents. However, gardens being displaced onto rooftops as the area continues to grow has forced many residents to resort to growing on balconies. This has resulted in a deviation to a more private growing experience, eliminating the culture and camaraderie the community gardens currently provide. The planting module conceptualized through the *Fabrication 2* and *Material Culture* courses begins to blend these two experiences by developing a system that allows the approach to growing (private vs. public) to be left up to the user.

The design introduces a modular planter system which allows the community members to easily transport their plants between the public and private sphere. Using The Bowery Project case study which uses milk crates as a mobile growing system⁴², the planter structure will be a

1' cube unit. This size allows the units to easily work within the 10' x 10' building grid, while providing a system which is mobile, allowing for greater flexibility and customization for the user. Trays (6" x 1' x 1') will then fit into the main structure. The structure will be able to aggregate in multiple directions, utilizing a simple dowel connection. The trays will encourage users to modify their own planter system, while easily transporting them between their own property (private) and the shared community planting areas (public) on the project site. Additionally, the system will allow for uses other than just planters such as animal (bird/bee) habitats, encouraging biodiversity in an urban environment.

The mobile system will promote different applications throughout the site, encouraging the user to dictate how it is used. Six primary applications were designed throughout the site for the module allowing for the community members to engage and populate the site.



Railing - Hanging & Herbs

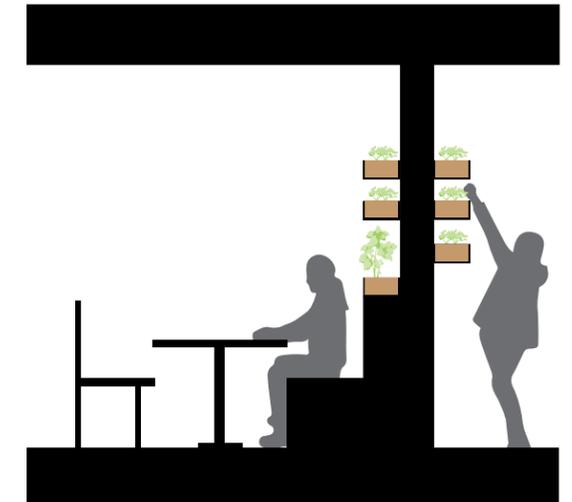
Figure 4.22. Railing Planter Application. Image By Author



Mobile Wall - Herbs & Micro-greens

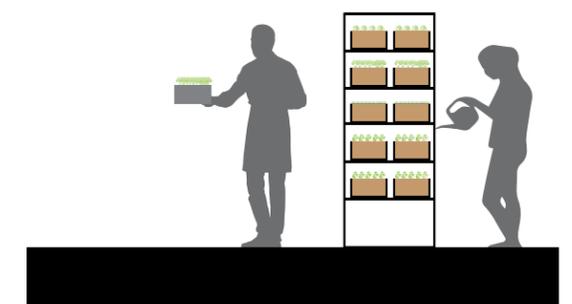
Figure 4.24. Mobile Wall Planter Application. Image By Author

Each variation of the system makes use of the tray with the addition of simple hardware that allows it to be adapted for the desired use. The dowel connections make for a simple yet effective connection point for this hardware to secure the trays, such as a metal bracket which modifies the tray so it can hang off of railings (figure 4.22.). The main structure can be used in many applications such as temporary walls during the



Interior Walls - Herbs & Micro Greens

Figure 4.23. Interior Wall Planter Application. Image By Author

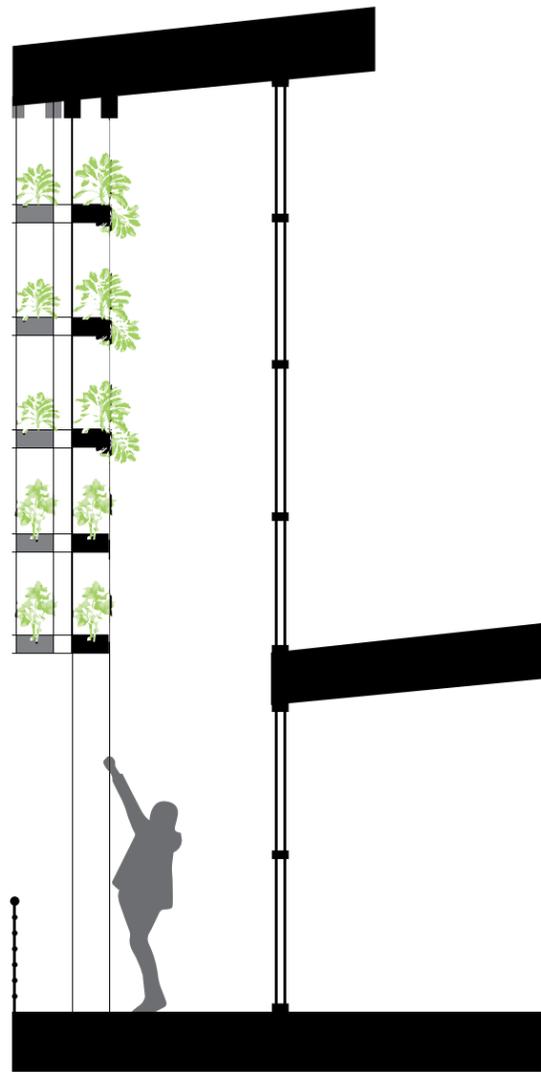


Planter Tray - Sprouts & Micro-greens

Figure 4.25. Planter Tray Application. Image By Author

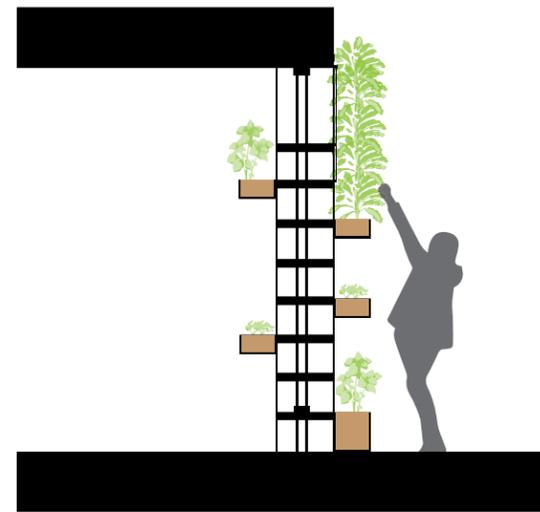
summer market (figure 4.24.), dividing spaces while having the flexibility to be adapted on a regular basis depending on the function taking place. Other applications will utilize a simple track system which allows for the trays to be slotted in and secured. This can be seen in the interior wall variation (Figure 4.23.) which would be located throughout the market building to grow herbs and micro-greens. The intention is that the trays

42. Bowery Project. "The Bowery Project: Our Vision." Accessed December 20, 2019. <https://www.boweryproject.ca/ourvision>.



Hanging Pulley System - Dictated by User
Figure 4.26. Pully System Planter Application. Image By Author

will also allow for flexibility throughout the year, with people needing indoor growing conditions during winter to grow micro-greens or start seedlings (figure 4.25.) or even grow larger plants that require large amount of sun (figure 4.26.). When it is warm enough the tray can be brought outside as part of the exterior facade system (figure 4.27). Once the plant has reached maturity it can be detached and harvested inside, leaving a void which can then be occupied by someone



Interactive Facade - Dictated by User
Figure 4.27. Facade Planter Application. Image By Author

else. The facade application is the most significant way the module is applied because it allows the community to directly impact the interior and exterior composition of the architecture itself, adding a level of sovereignty while showcasing the buildings adaptability over the course of the year. In turn, the system establishes a community mural of plants which is constantly evolving depending on weather conditions and the needs of the community.

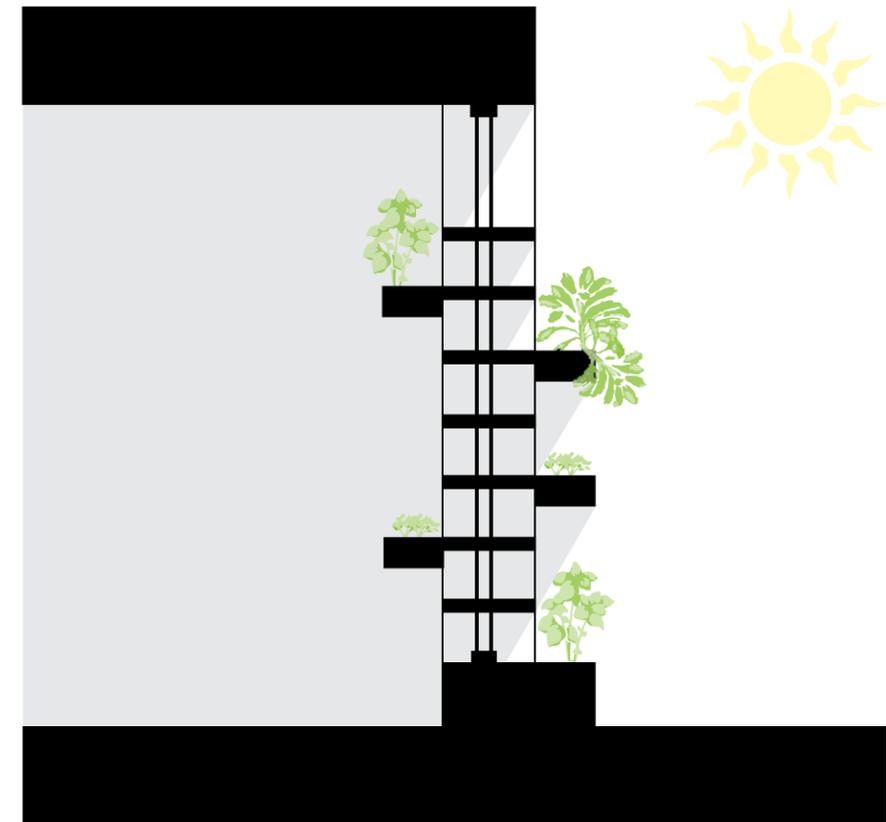


Figure 4.28. Planted Facade Summer. Image By Author

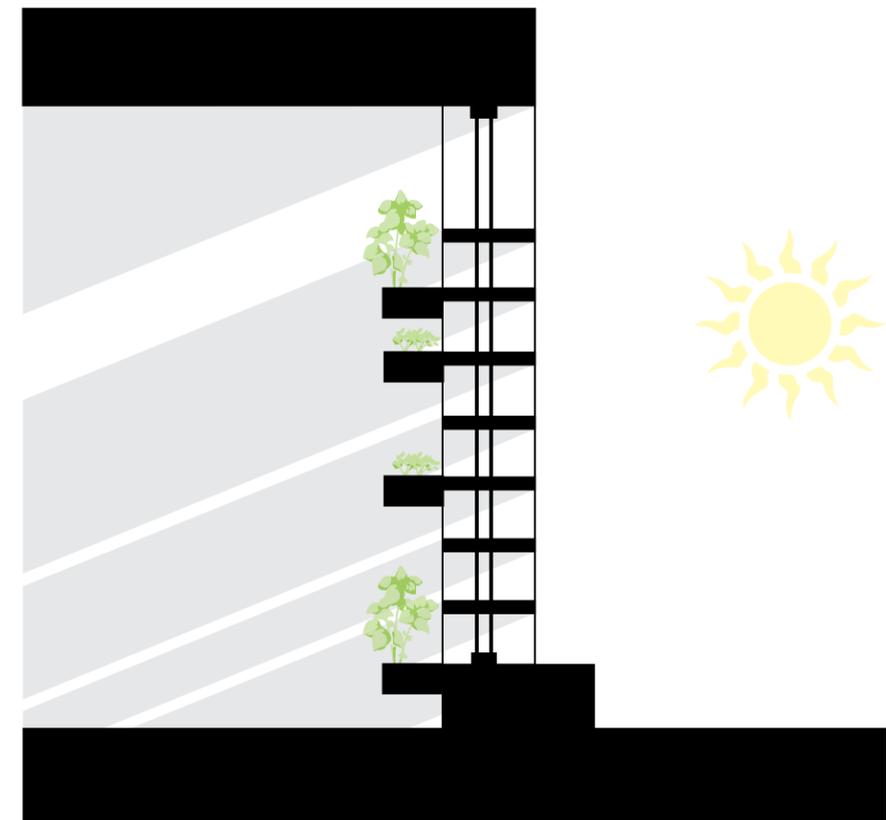


Figure 4.29. Planted Facade Winter. Image By Author



Figure 4.30. Exterior Module Planted Facade Facing South. Image by Author.

Planted Facade Summer

During the summer most of the plants attached to the facade system will be on the exterior of the building (figure 4.30). The plants themselves will be used to passively shade the building, while the depth of the shelves which the planter trays are secured to double as light shelves, ensuring minimal solar gain, instead redirecting ambient light into the interior of the building. The system permits securing cables which would allow small climbing plants to be placed on the facade, while larger climbers would use a deeper fixed planter at the base of the facade. The users would have to plant the facade vertically in a similar way as they do horizontally being conscious of which plants shade others. As the site develops, the residents would develop a best practice for locations of different plants.

Planted Facade Winter

During winter all the plants would need to be brought inside in order to still produce all year round. The system allows for an easy transition from the exterior to the interior of the structure. While the pulley system (figure 4.26) would potentially allow larger plants to still grow, the facade system during the winter would primarily be used for seedlings and micro-greens. This is because plants secured to the interior of the system would mostly be getting ambient light. The system during the winter would also ensure deeper penetration of ambient as well as direct light due to the shallow depth of the light shelves. This is important as part of the buildings overall passive strategies, by permitting solar gain during the winter in order to reduce heating requirements for the building.

Planted Facade Detail 1:20

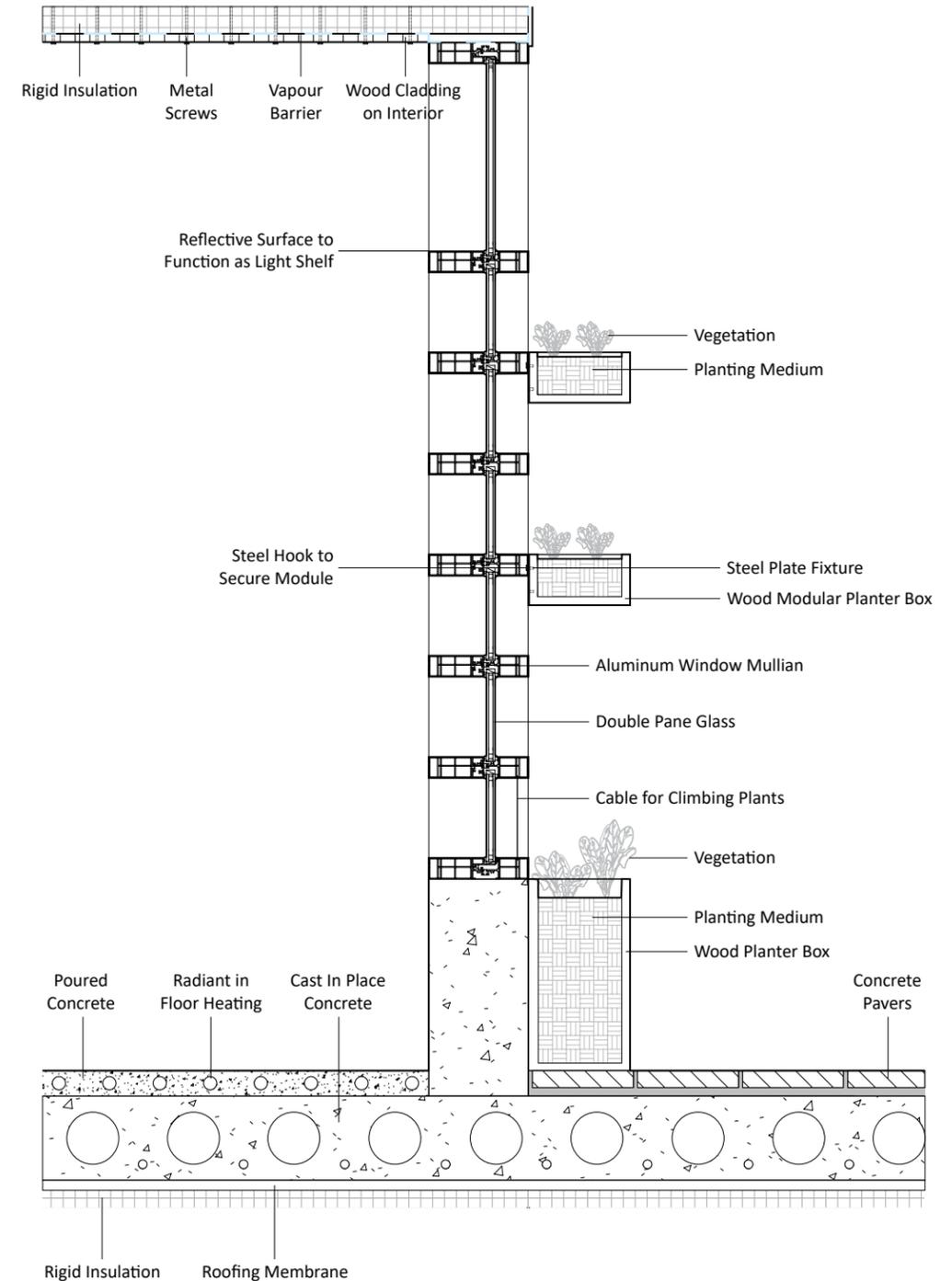


Figure 4.31. Module Planted Facade Detail. Image by Author.



Figure 4.32. Exterior View from Corner of Parliament & Gerrard Looking South East . Image by Author.

Adaptable Vertical Fins

In addition to the adaptability of the planted facade, the Western facade of the building along Parliament st. provides versatility depending on the users needs. The facade features exterior rotatable vertical fins which establish a more dynamic facade along the street (figure 4.32) while serving a functional purpose. The fins are made out of brushed aluminum (figure 4.33) implementing a semi-reflective surface which can be used in order to modulate natural light within the interior of the structure. The fins are attached to planter boxes at a slight angle in order to receive as much sunlight from the South and West as possible. The intention of

the fins is that the community members growing throughout the site can have a high level of control over lighting conditions depending on the season. The fins can be fixed at certain angles to permit indirect ambient light when the sun is to the South or direct light from the West into the growing spaces. Alternatively, the fins can close in order to reduce the amount of natural light, instead opting for a higher level of mechanical lighting. The fins and other adaptable design strategies allow for a greater amount of flexibility for the users, giving them a greater level of control, ownership, and in turn sovereignty over how their food is grown throughout the site.

Vertical Fin Detail 1:20

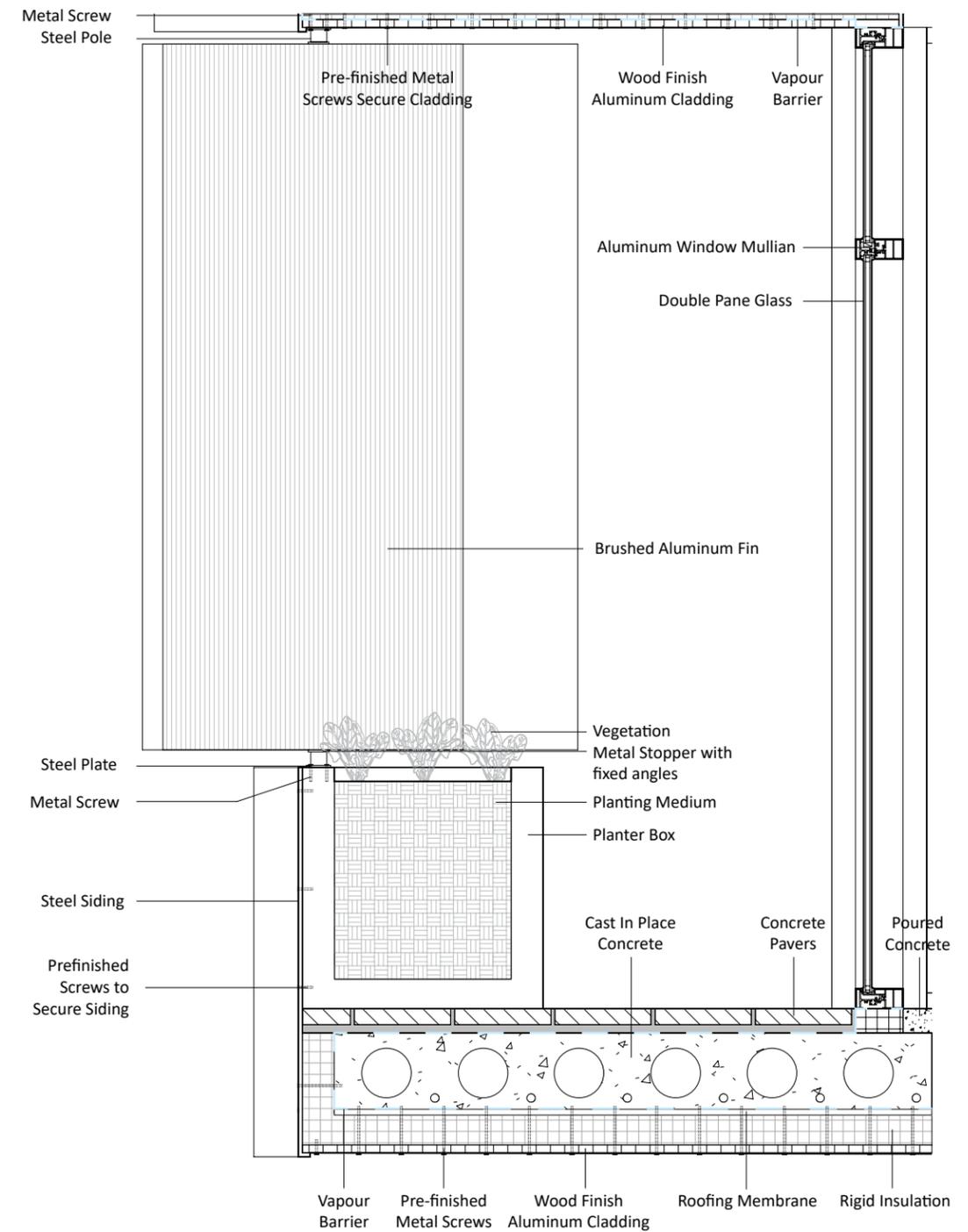


Figure 4.33. Vertical Fin Facade Detail. Image by Author.

Chapter 5: Principles for Growth & Conclusion

Principles of Growth

95-97

Conclusion

98



Figure 5.0. Regent Park Community Mural. Image by Author.



Figure 5.1. Growth.

Principles for Growth

As stated earlier on within the thesis document, the intention of the project was to present a prototype example of how urban agriculture can be symbiotic with architecture in order to establish food sovereignty within urban contexts. Therefore, the proposed design presents only one possibility for how this can be achieved based off of rigorous research and case studies specifically within the city of Toronto and the community of Regent Park. Although the conditions within Regent Park are unique due to its rich history of growing food dating back to the 1850's, the main principles which were

established throughout the project can be abstracted so that other urban farms which follow a similar typology can be introduced throughout Toronto and cities around the world. As a result, six "principles for growth" were determined providing a framework based off of lessons learned throughout the thesis project so that food can begin to be better integrated within urban fabrics. By utilizing these principles to help inform future developments, cities will begin to generate a more equitable and resilient food network, while establishing a higher level of food sovereignty throughout communities.

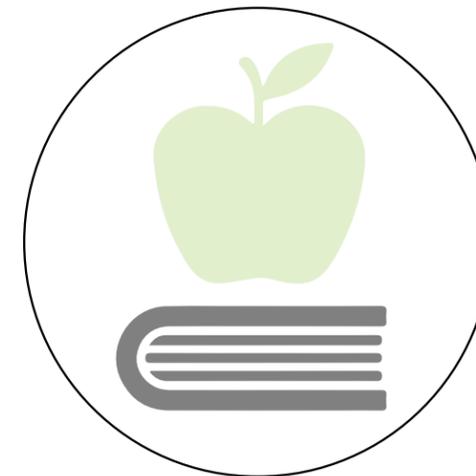
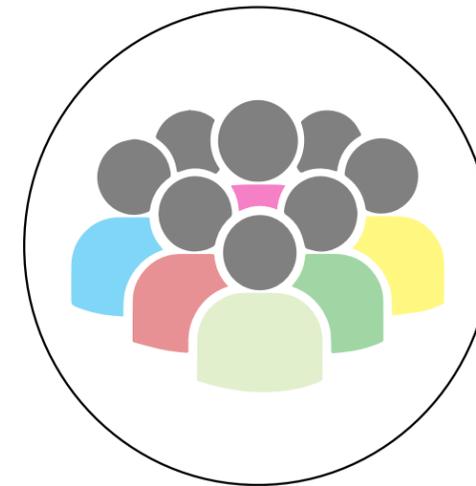
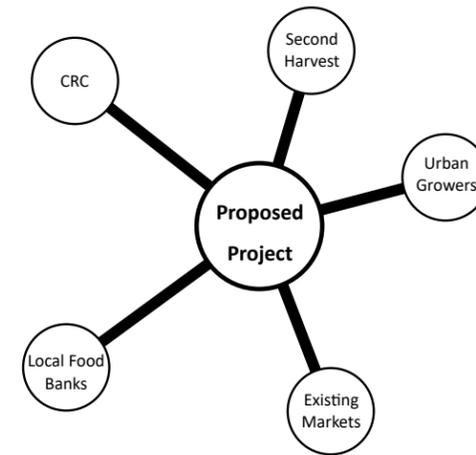


Figure 5.2. Principles of Growth. Images by Author.

Work With Established Food Network

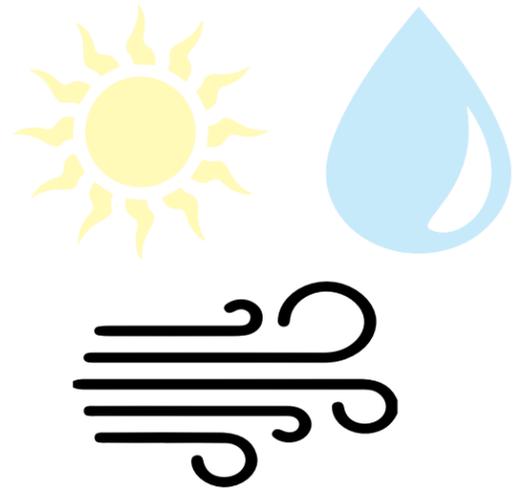
One of the most significant aspects of establishing an urban farm focused on food sovereignty is that it can not be seen in isolation. This means that the project must work with existing food infrastructure within its context to create the largest impact possible. This includes organizations such as local food centres, emergency food programs, food recovery programs, and other urban growers throughout communities. The project should be seen as a node within a much larger network that works in conjunction with different agencies towards the common goal of food sovereignty to assist those most in need throughout cities.

Community Engagement / Culture

For a project focused on food sovereignty to be successful, it is essential that the community has a definitive interest as well as culture for growing food. This is because for food sovereignty to persist it is vital that the community members are the people who care for and organize the day to day operations of the urban farm. Although Regent Park has its own distinct history of growing food the design of any future project should be catered to the specific communities unique culture with the community being engaged at every level of the project.

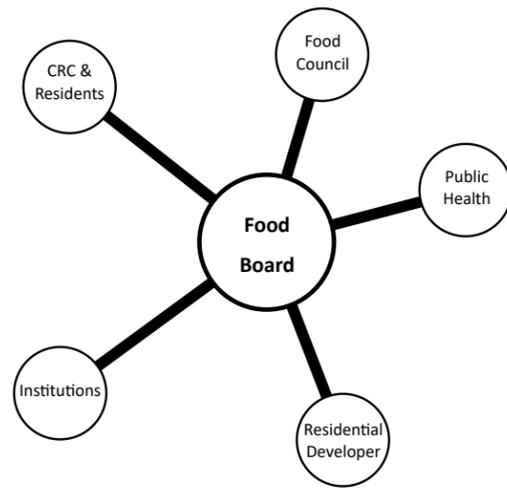
Education Leads to Opportunity

Education is a pillar of food sovereignty and plays a significant role in community engagement. The Regent Park project offers different opportunities for people to expand their food literacy and growing skills; whether they are a beginner or experienced grower. Projects that focus on growing food should prioritize community engaged learning where the people within the community pass on their own traditional knowledge using a hands on learning approach in order to form a greater connection and appreciation to the food being grown. It is important to offer different educational opportunities throughout projects so that people are truly in control of what they learn, where they learn and how they learn.



Value Natural Resources

This principle focuses on the large amount of resources necessary for running an urban farm. This includes utilizing natural ventilation as well as the two resources that are most vital in order to grow food: water and light. Using natural lighting and solar energy for electricity in association with water capturing/recycling systems, and natural ventilation will allow for a project that is adaptable and self sustaining instead of solely relying on existing city infrastructure. Natural resources that are available must be valued and utilized in order to reduce the overall waste as well as resource demand of a site.



Collaborative Governance

The principle of collaborative governance looks at how a large urban farm project could begin to be actualized. Collaborative governance speaks to public policy decision making which engages different agencies across sectors working towards a common goal⁴³. This could include many different food and health related organizations. However, for the project to truly establish food sovereignty it is essential that community members and their local food organization have a voice throughout the whole process, since they will be the people occupying and running the day to day operations of the building.

Designing Food Sovereignty

This principle is focused on how architecture can be designed in a way that allows for people occupying an urban farm to have control over the various day to day operations. In order for this to be achieved it is important to understand the needs of the community while not over designing spaces. By providing a design that can be adapted easily, seasonally or on a day to day basis, design in turn can begin to foster possibilities that help establish food sovereignty. Allowing for flexibility and adaptability are vital to allow people to choose and modify a system to suit their needs and have control over how their food is produced.

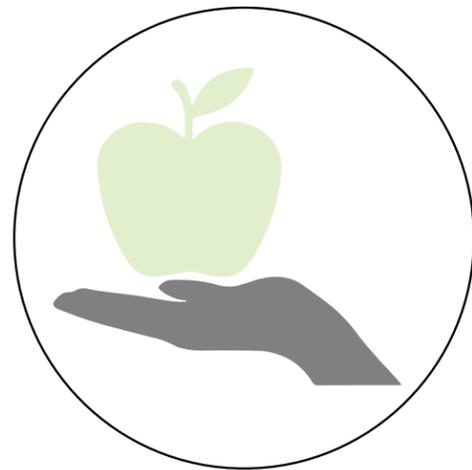


Figure 5.3. Principles of Growth 2. Images by Author.

43. Clark, Jill. (2019). Collaborative governance: The case of local food action planning.



Figure 5.4. CRC Community.

Conclusion

As cities continue to expand, occupying depleted farm land, the issue of food sovereignty will quickly come to the forefront. This thesis began with the question, “ How can architecture and agriculture be integrated in a symbiotic way in order to improve food sovereignty by establishing an urban farm that incorporates multiple programs within an urban context?”, and throughout an eight month investigation the answer has become more clear. The 7 pillars of food sovereignty established early on in the project in association with community case studies cultivated the creation of a new urban farm typology which can begin to inspire what could be possible in regards to the production, distribution, and disposal of food within the city of Toronto and in cities around the world.

A design proposal that incorporates multiple programs, values resources and responds to its environment, proves that a symbiosis can be established between

architecture and agriculture. However, there is no doubt that the most significant component of establishing food sovereignty within cities is the people throughout communities. Designing for flexibility with these people in mind, allows for adaptability which encourages communities to take greater control over their food system.

Regent Park is an area with a rich history and strong culture for growing their own food, but represents only one of many communities that understands the importance of food sovereignty. Although the design proposal is specific to the Regent Park area, many lessons can be learned in order to begin integrating food production within urban environments. By utilizing the 6 principles of growth in conjunction with strong community consultation and collaboration cities can begin to foster food sovereignty and in turn establish a more equitable, resilient, and sustainable food system moving into the future.

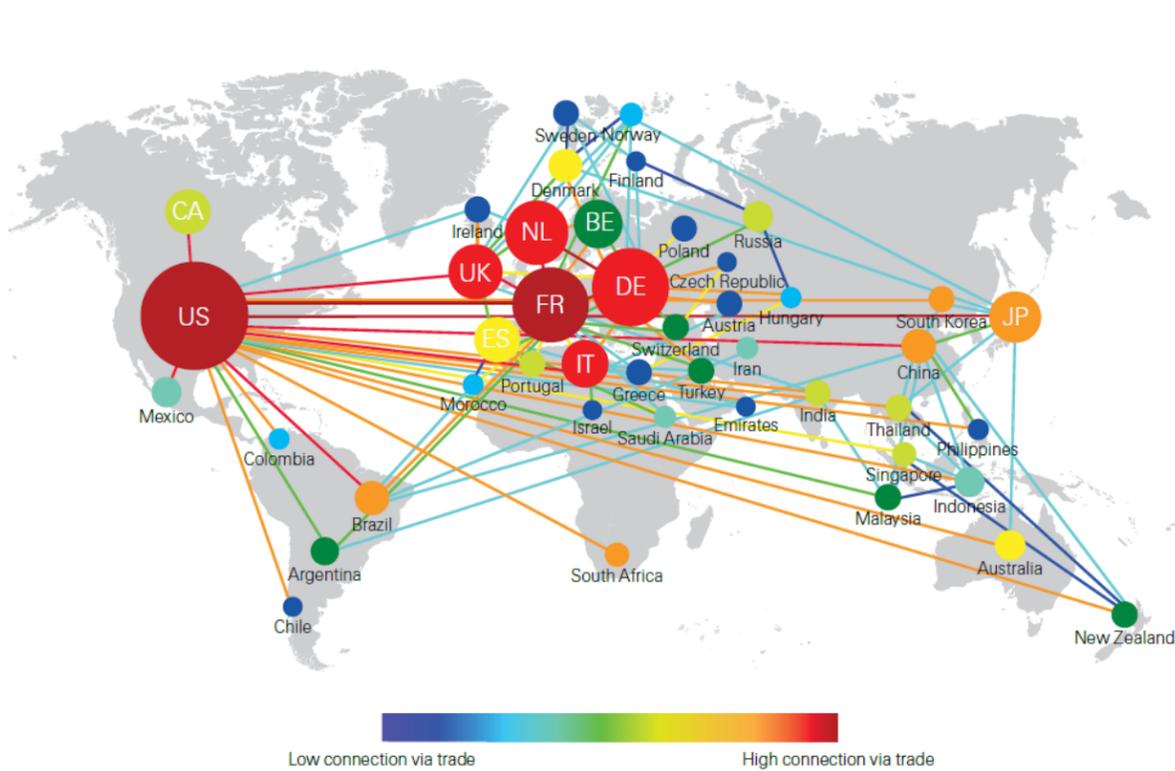


Figure A.1. Global Food Network



Figure A.2. Eat Local

How Did We Get Here?

The food network today is a global enterprise that relies on the transporting of food across continents. However, this was not always the case, and the industrialized food system we see today only began at the turn of the 20th century when developed countries like the United States and Canada realized that industrialization could be applied to the production of food⁴⁴.

This started the rise of industrial agriculture, and in turn, industrialized food. This method of production became even more prominent when food manufacturers began to use only a few select ingredients in order to make countless different products that could be packaged with a shelf life that was previously

not possible. Production of food became so efficient, that scarcity was soon replaced by over-production. Retailers quickly began lowering the price of items, so that they could get people to buy up the surplus. This all led to the introduction of the modern supermarket, which capitalized on a self-service model combined with cheap industrialized products in order to supply the mass consumption of food we see across the world today⁴⁵. Very few countries today have self-sufficient food systems (see Figure A.1.) and the reliance on importing and exporting food has left many food systems vulnerable to collapse unless they are able to improve their resiliency by reintroducing locally grown food.

The Start of the Local Food Movement

As a response to the distance created between producer and consumer due to the global food network, the local food movement is something that has become more prominent over the past two decades. The movement encourages eating locally grown foods to be more sustainable while supporting the local economy and making food networks more resilient⁴⁶.

In June 2001, the Leopold Center for Sustainable Agriculture at Iowa State University released a groundbreaking report about the production and distribution of food within the United States. Titled “Food, Fuel, and Freeways”. The report claimed, “most consumers do not understand today’s highly complex global

food system. Much of the food production and processing occurs far away from where they live and buy groceries.”⁴⁷. This was quite disturbing to some, since a global food network was not something people were worried about. Additionally, the realization that a dramatic increase in the use of fossil fuels was a result of a global food system made some reconsider their choices⁴⁸. This led to the report’s claim that the average grocery store food item was traveling astronomical distances in order to reach people’s plates. The report compiled some very compelling research and provided the local food movement with some essential talking points that are still relevant today.

44. Cockrall-King, Jennifer. Food and the City: Urban Agriculture and the New Food Revolution. Amherst, NY: Prometheus, 2012.

45. *ibid.*

46. ResearchGate. “[PDF] The Transition Movement and Food Sovereignty: From Local Resilience to Global Engagement in Food System Transformation.” Accessed December 10, 2019. https://www.researchgate.net/publication/275449506_The_Transition_Movement_and_Food_Sovereignty_From_Local_Resilience_to_Global_Engagement_in_Food_System_Transformation.

47. Pirog, Rich S., Timothy Van Pelt, Kamyar Enshayan, and Ellen P. Cook. “Food, Fuel, and Freeways: An Iowa Perspective on How Far Food Travels, Fuel Usage, and Greenhouse Gas Emissions,” 2001.

48. Cockrall-King, Jennifer. Food and the City: Urban Agriculture and the New Food Revolution. Amherst, NY: Prometheus, 2012.



Figure A.3. Food Miles

1500 Mile Diet

The shocking revelations of “Food, Fuel, and Freeways” in regards to the distance food was traveling led to the creation of the term ‘food miles’⁴⁹. The report exposed the fact that food miles were a harsh reality of the global food network which had environmental and economic costs related to the production, processing, and distribution of food that were rarely considered in the price of a food item⁵⁰.

The research completed comprehensive studies on the use of energy in the food network, prioritizing the transportation and distribution sector. By comparing the distance food traveled from a farm to consumer in a traditional supermarket model to distances in

a localized system, the report found that the industrialized food network accounted for 16-17% of the country’s energy consumption (11% for transportation alone)⁵¹. Finally, the study made its most concrete claim in regard to the industrialized food system: the average grocery store item traveled over 1,500 miles from farm to consumer. Although this number was shocking to many people, the industry has not changed much since, and the food miles items currently travel are impossible to calculate due to the privatization of food production systems⁵². Although it has not influenced the change it may have been hoping for, the report established a strong argument in favor of local food systems.

49. *ibid.*
 50. Pirog, Rich S., Timothy Van Pelt, Kamyar Enshayan, and Ellen P. Cook. “Food, Fuel, and Freeways: An Iowa Perspective on How Far Food Travels, Fuel Usage, and Greenhouse Gas Emissions,” 2001.
 51. *ibid.*
 52. *ibid.*



Figure A.4. Monoculture

Easier Access Means Less Options

A system which transports food around the world may seem like it gives consumers more choices, but in reality it has destroyed diversity within the food industry. The United Nation’s Food and Agriculture Organization estimates that 75% of the biodiversity of foods has been lost due to industrialized agriculture, while others claim that number is closer to 90%⁵³. A system that should be making more foods from around the world available has instead resulted in a reduction in food diversity. How can that be possible? This is because diversity does not coincide with mechanization. The industrial food system prioritizes consistency, and as a result diversity is left by the wayside. However, without biodiversity the global food system is extremely vulnerable.

Author Jennifer Cockrall-King summarizes this point well stating,

“Strip a system of redundancy, and you increase its efficiency; but you also reduce its adaptability and resilience. Centralize to take advantage of economies of scale, and you create an easy target to disrupt the whole of a system. Strip a food system of diversity and you get the Great Potato Famine.”⁵⁴

Considering the vulnerability food systems around the world face, it is essential for local food to be reintroduced into the global network in order to increase diversity and return resiliency to food systems moving into the future.

53. Millstone, Erik, Marion Nestle, and Tim Lang. *The Atlas of Food: Who Eats What, Where, and Why*, 2014. <http://www.credoreference.com/book/ucpressfood>.
 54. Cockrall-King, Jennifer. *Food and the City: Urban Agriculture and the New Food Revolution*. Amherst, NY: Prometheus, 2012.



Figure B.1. Agriculture in Havana.

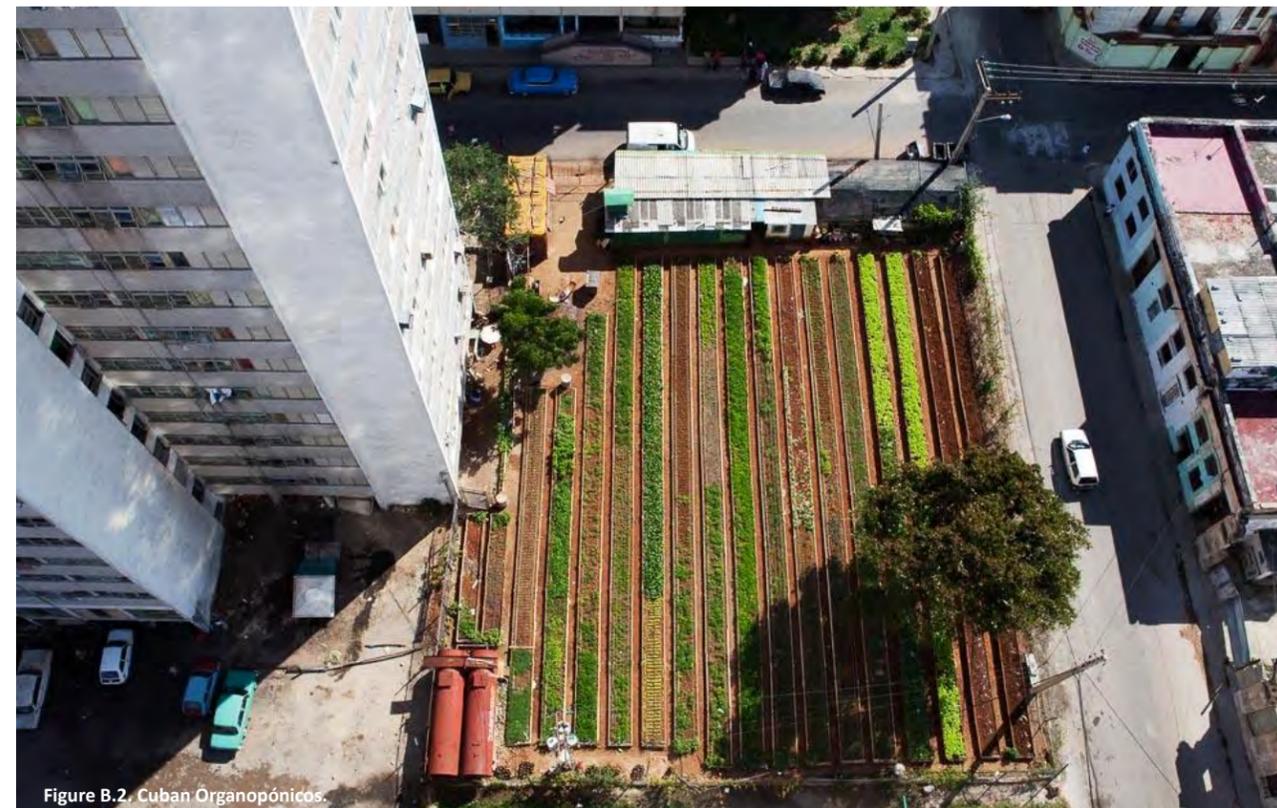


Figure B.2. Cuban Organopónicos.

Cuba

What would happen if a country's borders were closed, cutting them off from all food imports? What about if there was no longer any fuel to run tractors, seeders, and sprayers? No industrial fertilizers, pesticides, or herbicides to use on fields? To top it off, what if no other country was willing to trade, dramatically altering the globally interconnected food system of an entire nation? This was the situation the country of Cuba found itself in. However, this disaster acted as a catalyst for what can happen when a country gets behind an urban agriculture movement.

Between the late 1950s and 1980s, although it was a communist country, Cuba followed the same path of many capitalist

nations globally⁵⁵. It fully embraced the benefits of industrial agriculture at a large scale. Monoculture farming (largely sugarcane) and intensive livestock farming were predominate throughout the country. By the mid 1980's, bulk shipping terminals exported up to 75,000 tons of sugar a day, accounting for 74% of the total value of Cuba's exports at the time⁵⁶. The Castro government was fully invested in high yield, industrial farming.

This became a significant issue once the communist countries across Europe started to fail in the 1980s; Cuba no longer had allied countries who would purchase their sugar. Losing most of its trade was devastating, considering it relied on importing two-thirds of its food supply, all its fuel, and 80% of its farming equipment⁵⁷. The United

States saw this as an opportunity to end Cuba's communist regime, enforcing strict sanctions on trade with Cuba. Cuba became completely isolated from other countries, which started concerns of mass starvation. As a result, Castro declared a national emergency, food rationing was implemented, and the Cuban government began to focus its attention on re-imagining the Cuban food system. Scientists began to create biopesticides and started to uncover the potential of crop rotation. National seed sharing programs were established, and soil experts would assist any farmer who needed help. In order to not rely on the import of fuel, Cubans turned vacant lots in every city into organopónicos (urban farms with small shops attached). These began to lay the foundation for a huge urban agriculture initiative that became the foundation of the country's

new urban food system. By the early 2000's, Havana was growing 90% of its fresh produce in organopónicos directly in or close to the capital⁵⁸. Organopónicos, due to a direct connection between consumer and farmer are now as common as convenience or grocery stores in North America. There are nearly 200 in the city of Havana alone, supporting an urban population of two million people⁵⁹. The urban nature of the food production and direct retail component of the Cuban system has made grocery stores largely irrelevant. Cuba has now emerged as a global leader in ecologically sound, extremely efficient, local food systems, which prioritize nutritional needs over profits. The Cuban model of a deindustrialized food system has proven to be a more sustainable and secure way to feed cities moving into the future⁶⁰.

55. Cockrall-King, Jennifer. *Food and the City: Urban Agriculture and the New Food Revolution*. Amherst, NY: Prometheus, 2012.

56. Johnson, D. Gale. *Review of Review of Sustainable Agriculture and Resistance: Transforming Food Production in Cuba*, Fernando Funes, Luis García, Martín Bourque, Nilda Pérez, Peter Rosset, by Fernando Funes, Luis García, Martín Bourque, Nilda Pérez, and Peter Rosset. *Economic Development and Cultural Change* 51, no. 4 (2003): 1023–25. <https://doi.org/10.1086/375358>.

57. Funes et al., *Sustainable Agriculture and Resistance*, p. 5.

58. Cockrall-King, Jennifer. *Food and the City: Urban Agriculture and the New Food Revolution*. Amherst, NY: Prometheus, 2012.

59. *ibid.*

60. *ibid.*



Figure B.3. Community Farm Detroit

United States

Although the United States has countless urban agriculture initiatives throughout the country, the focus of these case studies will be on two metropolitan cities that are in close proximity to the Canadian border: Detroit and Chicago.

Detroit

Detroit was settled in the 18th century and was arranged as a series of narrow strips of farmland along the riverfront in order to maximize the number of farmers that could have access. They were called “ribbon farms,” and many street names in the city have kept the names of the original farms⁶¹. Despite its legacy as motor city, Detroit is now in disarray, and its situation of vacant lots and home foreclosures has left the city desperate for solutions. Detroit is now at the point where any idea for urban renewal is being considered. As a result it has garnered interest from urban agriculture groups interested

in social justice community gardens as well as more business focused groups. An increase in poverty and decrease in population, as a result of the failed automotive industry has caused food to be too expensive or not properly accessible to a large portion of residents in the city. Urban gardening has become an essential tool to combat issues such as food literacy, and lack of access, specifically in low-income areas.

The introduction of grassroots movements as well as social and civic programs have caused urban agriculture to take off in Detroit. Vacant land is one thing the city has in abundance; over 103 square kilometers of vacant land in the city, which presents a great potential for food production⁶². One nonprofit organization, Urban Farming, has created nearly 500 urban gardens, where all the produce they grow is free for the community⁶³. The Greening of Detroit, another organization, supports over 200 school, family, and community gardens, while continuing to see

a growth in urban agriculture projects each year⁶⁴. Although these are just a few examples of the growing interest of urban agriculture in Detroit, they show how investment in urban agriculture has begun to revitalize and provide opportunities to underprivileged communities in the city.

Chicago

Although Chicago has not undergone the same collapse of its economy as Detroit, it is still a city with social and cultural tensions due to a lack of equity specifically for the communities in the South side of the city. Chicago is home to many urban agriculture initiatives, and community gardens that are sprinkled throughout the city. Chicago has become relatively unique in its approach to urban agriculture because it has begun to implement vertical farming initiatives.

The most notable example is ‘The Plant’, a former meatpacking plant, that now acts as a shell for a vertical farm. The retrofit has left the interior dark with little natural light. However, the owner states electrical lighting is a requirement for this type of operation. Electrical lighting also allows for better control of when and where plants are receiving light, which when done properly can begin to increase plant yield⁶⁵. The electrical demand is offset by an anaerobic digester installed within the building that turns organic waste into electrical energy, allowing the plant to be self-sustaining. Additionally, the building shares space with a kombucha tea producer, who transfers excess carbon dioxide to the planting area in order to expedite plant growth. The use of aquaponic systems which utilize fish waste in order to provide nitrates to the plants is one



Figure B.4. The Plant Chicago

further example of how the plant has successfully implemented a symbiotic system which sees potential where others may see waste. This multi-program building is a fabulous example of what is possible for an urban vertical farm, and how a closed loop system can be established in order to reduce resource demand.

The Plant sells its food to premium restaurants, produce wholesalers, and even the Chicago Public School System. The school system now sets aside 20% of its school lunch budget for local foods, which increases the viability of the plant, knowing there is no shortage of demand for local fresh food⁶⁶. Part of what has allowed the plant to be so successful is the relative lack of barriers the city has put forward in terms of zoning, allowing a progressive building to grow into something very successful. The Plant is a great example of how it is vital to have community as well as government support in order to run and operate an urban agriculture project of this scale.

61. *ibid.*62. *ibid.*63. Taja Sevelle's Urban Farming program, based in Detroit, has started farms on unused land and grows free vegetables and produce for the community surrounding the farm, <http://www.urbanfarming.org>.64. The Greening of Detroit. "Greeningofdetroit.Com." Accessed December 20, 2019. <https://www.greeningofdetroit.com>.65. Cockrall-King, Jennifer. *Food and the City: Urban Agriculture and the New Food Revolution*. Amherst, NY: Prometheus, 2012.66. *ibid.*



Figure B.5. Greenhouse vegetation, Netherlands.

Netherlands

For centuries, agriculture has been vital in the economic, societal and environmental aspects of the Netherlands. Farms have dominated the landscape, as farmers have cleared forests to establish fields, laid out gardens, and cultivated the land for agricultural applications. Prior to 1950, the country was focused on small scale mixed farms, with a variety of produce as well as livestock. Most of the arable land plots were quite small and mostly used to feed the animals on the farm. Any other production was traded at markets or consumed by the farmers themselves. At this time a significant portion of the Dutch population earned their livelihood from agriculture; with approximately 2.8 million people working in the agriculture industry in 1900⁶⁷. After the Second World War, agriculture in the Netherlands and around the world was in a state of transformation due to industrialization.

The intensification and modernization of Dutch agriculture began around 1960. During this time, Dutch agriculture changed from a diverse mixed farming system, into a specialized intensive farming system with high capital costs and high labour demand. The new system was intended to maximize the production of pigs, cows and poultry. From 1960 to 1980 the agriculture industry grew rapidly and was paralleled by a growth in labour productivity⁶⁸. This was primarily due to changes in technology, which were stimulated by policy of the Dutch government in regards to agriculture and later by the agricultural policies of the EU.

Today, the agriculture sector within the Netherlands is not as prominent as it once was, however it still represents their most significant sector and is a net exporter; agriculture accounts for about two thirds of the land use in the Netherlands. This is approximately 1,930,000



Figure B.6. Transformation Of Farming In The Netherlands

hectares of cultivated land: 53% grassland, 42% arable land, 3% is cultivated for vegetables and fruit, while 2% is used for flowers, ornamentals and seeds⁶⁹.

Although the Dutch model has been very successful, urban agriculture has begun to gain momentum within the country in order to stay at the forefront of the industry. The Dutch Minister of Agriculture has shown enthusiasm towards the concept of urban farming⁷⁰, and believes urban farms can play a significant role in reconnecting people with their food. As a result, they do not view urban farms as a way to improve access to fresh food. Instead, they believe urban farms have the potential to act,

“as a bridge between city dwellers who are increasingly ignorant about food production and professional farmers, who increasingly feel misunderstood”⁷¹

Gezonde Gronden (Healthy Soil) in The Hague is an urban agriculture initiative, who’s goal is to provide citizens in the area with food produced in their own region⁷². They are also involved in organizing courses for people to learn about more sustainable food production methods that don’t use chemicals and utilize a closed water and nutrient cycle.

Urban agriculture in the Netherlands represents a fundamental shift from rural to urban environment. Urbanization is no longer seen as a threat to farmers, but rather an opportunity. Although farmers close to or within cities may have smaller plots, the advantages provided by a direct connection to the consumer, volunteer labour, and urban markets have made urban agriculture a more viable option moving forward. Urban agriculture in the Netherlands presents an interesting model for how cities can reimagine the integration of food in order to be more resilient.

67. Heide, C. & Silvis, Huib & Heijman, Wim. (2011). Agriculture In The Netherlands: Its Recent Past, Current State And Perspectives. APSTRACT: Applied Studies in Agribusiness and Commerce. 05. 10.19041/Abstract/2011/1-2/3.

68. *ibid.*

69. *ibid.*

70. Schans, Jan Willem. (2010). Urban Agriculture in the Netherlands. Urban Agriculture Magazine. 24. 40-42.

71. *ibid.*

72. *ibid.*



Figure B.7. Sole Food Street Farms Container Gardening.

Vancouver

Vancouver is Canada's most Western metropolitan city and is one of the rare Canadian cities that is able to grow food all year round. This is because Vancouver has a very temperate climate, and in general receives very little snow compared to other major cities across the country. Vancouver is well known across Canada as a city of social activism and environmentalism, dating back to the inception of Canada's environmental movement back in the 1970s⁷³. As a result, it is fitting that Vancouver is a very advanced city when it comes to urban agriculture.

In 2009, the City published a document called "Vancouver 2020—A Bright Green Future", which was a report that stated the city's commitment to supporting locally grown food and urban agriculture initiatives. The report included an edible landscaping policy that required all city

facilities to incorporate a minimum of 25% edible landscaping, such as green roofs⁷⁴. The hope was that through collaboration of food organizations in the city such as urban farms, small scale food producers, cafés, and community food educators, the city would be able to establish a thriving local food system.

This initiated a significant movement towards locally produced food and urban farms within the city. Although the city has thousands of community garden plots, no initiative is more well known than Sole Food Street Farms in Vancouver's downtown East end. Sole Food Street Farms is a system of four urban farms across five acres of reclaimed land incorporating community gardens, container gardens and even an urban orchard. They produce more than 25 tons of fresh produce every year, and donate up to \$20,000 of produce per year to community kitchens throughout

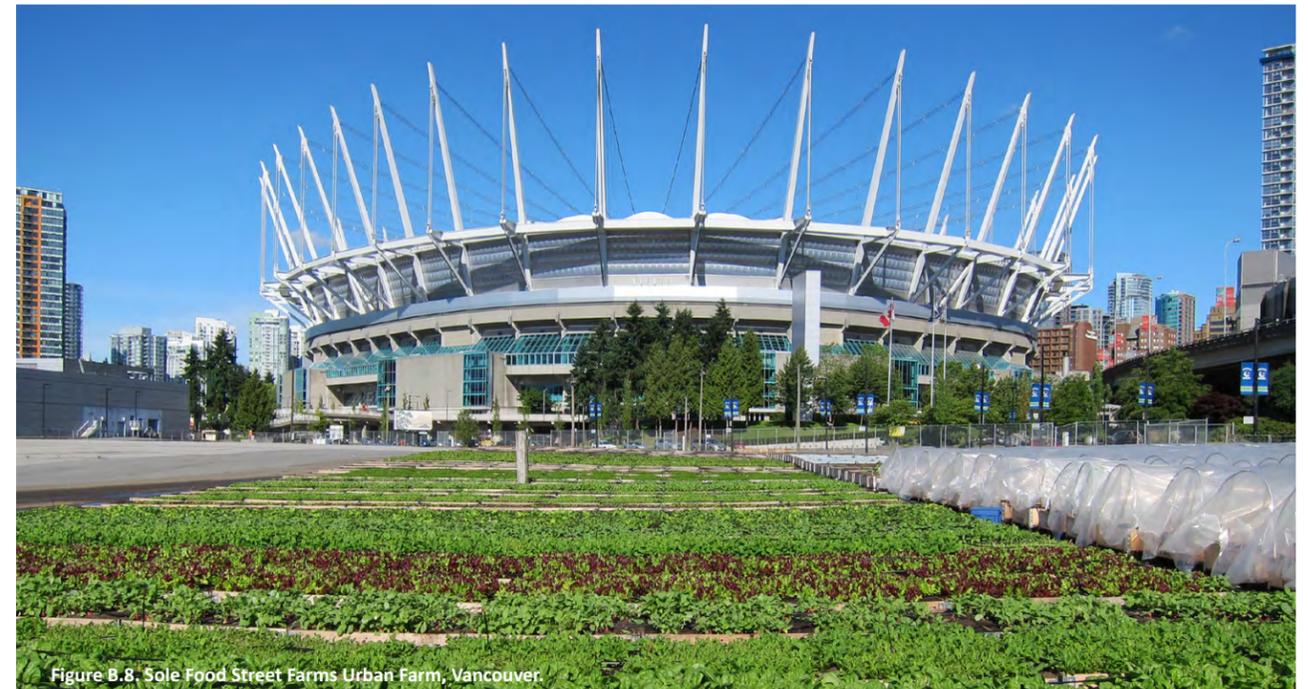


Figure B.8. Sole Food Street Farms Urban Farm, Vancouver.

the city⁷⁵. The food they grow supplies more than thirty restaurants, is sold at five Vancouver farmers' markets, and is used in their community supported agriculture program⁷⁶. As part of their community support agriculture program the farm employs 25 people within the community, many of whom are underprivileged, homeless, or have had issues with addiction. This aspect of their organization is essential to their vision as they are committed to building stronger communities and believe that the farm is as much about the farmers they establish relationships with as it is the food they produce. By establishing the farm in a less than desirable neighbourhood within a city that is otherwise quite pristine, Sole Food Street Farms believes they are providing value to the community. Michael Ableman, farmer and author of the book "Street Farm: Growing Food, Jobs, and Hope on the Urban Frontier" eloquently explains why urban farms are becoming valuable to cities.

"Urban farming is increasingly capturing the public imagination. Fruits, vegetables, even grains, dairy products, and meats are being produced on derelict land, parking lots, street corners, and rooftops—spaces that have slipped through the cracks of the high-value real estate markets of many cities."⁷⁷

By making use of land that would otherwise be seen as undesirable, urban farming has the potential to revitalize and provide value to these areas. The Sole Food Street Farm is a great initiative in regards to a project that not only provides the city with economic value, but more importantly encourages social activism by engaging a local community. By hiring underprivileged people from the communities around their farms, they can accomplish much more than just growing food, and are making a social, cultural, and environmental impact.

73. Cockrill-King, Jennifer. *Food and the City: Urban Agriculture and the New Food Revolution*. Amherst, NY: Prometheus, 2012.

74. Vancouver, City of. "Greenest City: A Renewable City." Accessed December 20, 2019. <https://vancouver.ca/green-vancouver.aspx>.

75. Ableman, Michael. *Street Farm: Growing Food, Jobs, and Hope on the Urban Frontier*. White River Junction, Vermont: Chelsea Green, 2016.

76. *ibid.*

77. *ibid.*



Figure B.9. Justin Trudeau Visits Lufa Farms.

Montreal

Montreal is another major city within Canada which has begun to fully embrace the various benefits provided by urban farming. Montreal, located in the province of Quebec, is known across Canada as a city with a rich culture and thriving food scene. However, compared to the extremely temperate weather in Vancouver, Montreal's weather is much more in line with the rest of the country, meaning the growing season is limited due to the harsh winters. As a result, Montreal has been at the forefront of indoor growing across the country.

Lufa Farms

The most well known indoor agriculture company within Montreal is Lufa Farms. Lufa Farms is a progressive technology based company that is working towards establishing a local food system. Additionally, they are responsible for the world's first commercial rooftop greenhouse,

and as a company believe that rooftop farming is the future of food production in urban areas. Their farms are extremely efficient and feature a high yield model. By using a hydroponic system, they claim they would only need to convert the rooftops of 19 average sized shopping centres in order to grow enough vegetables for the entire city of Montreal⁷⁸. Due to the added control provided by the use of a hydroponic system, the farms are able to save significant amounts of water, control the risk of pests, consume little energy, produce very little waste, all while taking up a fraction of the land traditional farming would require in order to achieve the same yield.

Lufa built it's first farm in 2010 and since then has completed two other commercial farms, while one is expected to be completed by 2020. Today, their facilities include 138,000 square feet of growing space which produces enough produce to supply 10,000 families every week throughout



Figure B.10. The Edible Campus, McGill.

the year with fresh locally grown produce, through their subscription based service. The service delivers the produce baskets to people's door using a fleet of electric vehicles in order to adhere with the environmentally conscious model of the company⁷⁹. Lufa Farms is an extremely interesting example of how a company can begin to implement urban agriculture at a commercial scale while still focusing on growing local food and being environmentally conscious.

The Edible Campus

Although the winters in Montreal can be quite cold, there are still several urban agriculture initiatives throughout the city in the warmer months. One of the more interesting projects that has been completed in the last several years is 'The Edible Campus'. Completed in 2007, the Edible Campus which involved volunteers and researchers in association with the McGill University School of Architecture, works

towards producing a productive landscape⁸⁰. The project was located at a prominent corner on the university's campus in downtown Montreal. The project was a 1,000 square foot container garden that involved the local community in order to establish edible community spaces. The project demonstrated how it was possible to integrate productive planting beds within urban spaces without compromising aesthetics or functionality⁸¹. The project was a huge success and was applauded for it's exploration of strategies that could be used to increase food production within cities while improving the spatial qualities of underutilized spaces.

Montreal is a very progressive city when it comes to urban agriculture initiatives. The projects discussed are just two of many, but show how urban agriculture can provide economic, social, and environmental benefits while establishing a local food system.

78. <https://montreal.lufa.com>. "About Lufa Farms." Accessed December 20, 2019. <https://montreal.lufa.com/en/about>.

79. *ibid.*
80. Minimum Cost Housing Group. "Setting up the Edible Campus." Accessed December 20, 2019. <https://www.mcgill.ca/mchg/blog/setting-edible-campus/wwwmcgillcamchgblogssetting-edible-campus>.
81. *ibid.*

Evergreen Brick Works



Figure C.1. Evergreen Brick Works Building.

Urban Agriculture Questionnaire

This interview was conducted with Isaac Crosby through email. Some answers have been modified for reading clarity.

1: What inspired you to get involved with urban agriculture? Why is urban agriculture important to you?

I have been doing urban agriculture for as long as I can remember, I started my life out on a farm and then we moved to the city when I was 3 and I remember planting tomatoes, peppers and pumpkins at our new place in the city. Urban Agriculture is important to me because it helps us to take back our food source and to control it to a degree.

2: How does your organization approach food security? (Cultural, social, economic, educational, or other)

We approach food security by running workshops on growing your own food in the city. We incorporate Indigenous food pathways as well as gardening techniques from around the world. Additionally, we encourage inter-generational and cross-cultural teachings.

3: What types of vegetation do you produce? Is it grown all year round? If not when is it grown?

I grow various produce: corn, potatoes, peppers, amaranth. I grow a lot of food on-site. I do grow all year round due to having a greenhouse on-site.

4: How do you approach the distribution of your agriculture? Where do you distribute?

We use the produce in youth programs that focus on growing food and cooking programs. We also have a partnership with the cafe on-site, and I also give it to the volunteers.

5: What are different food programs your organization runs? Why do you think they are important?

We run various Indigenous food programs on-site that help reconnect Indigenous youth to their ancestral foods. This is very important as it helps showcase traditional foods of our Indigenous peoples and it allows others to experience it.

7: What are the greatest challenges you see running urban agriculture and food security programs?

My greatest challenge is that there are still individuals who think it's a hobby and don't take food security seriously.

The Bowery Project



Figure C.2. The Bowery Project Mobile Planting.

Urban Agriculture Questionnaire

This interview was conducted with Deena DelZotto at The Bowery Project location outside of Sidewalk labs. Some answers have been modified for reading clarity.

1: What inspired you to get involved with urban agriculture? Why is urban agriculture important to you?

I was originally interested in the concept of farming concrete. I started with the Stop Greenhouse in Toronto and was primarily interested in growing food because it impacts all levels of people. I think it is significant to educate people regarding how food is grown.

2: How does your organization approach food security? (Cultural, social, economic, educational, or other)

We are not a high yield operation, but we typically provide fresh herbs and some vegetables to nearby food centres or restaurants. Food is culturally important, but I also believe education is very important, and teaching people how to grow things. The Bowery project grows in milk crates as a way of establishing a mobile agriculture system, which is kind of unique compared to other organizations.

3: What types of vegetation do you produce? Is it grown all year round? When is it grown?

We primarily grow vegetables and green herbs, and we also incorporate pollinator flowers and indigenous plants in order to help the overall ecology of a site. We participated at 6 different

sites across Toronto. We typically grow between May and October each year.

4: How do you approach the distribution of your agriculture? Where do you distribute?

We typically sell our yield to nearby restaurants depending on our location or donate to local food organizations. Again, we do not produce a lot because we are growing in small containers, but we do what we can.

5: What are different food programs your organization runs? Why do you think they are important?

We run various educational programs, including a co-op program for elementary and high school students. We have also gone through Canada's summer student program. Additionally, we will set up school programs to teach different skills to the kids, depending on the needs of the site. Recently, we worked with a native women research centre, and worked with some of the people there and in the end our yield went to their centre.

6: How do you engage the community? What is involved in your community outreach?

Primarily through teaching kids how to grow and maintain plants. It allows them to understand where their food comes from. This includes running different coop programs where kids can learn to grow food themselves and understand where their food comes from.

7: What are the greatest challenges you see running urban agriculture and food security programs?

Considering that we are growing out of milk crates we have roughly 1 square foot of growing medium. That limits our plant growth. Additionally, we grow outside so pest as well as environmental conditions can greatly impact how successful each plant is.

Toronto Botanical Gardens



Figure C.3. Toronto Botanical Gardens Building

Urban Agriculture Questionnaire

The interview was conducted with Paul Zammit and Mark Stewart at The Toronto Botanical Gardens. Some answers have been modified for reading clarity.

1: What inspired you to get involved with urban agriculture? Why is urban agriculture important to you?

M: I believe people are too disconnected in regards to where their food comes from, I once had a friend ask me how to grow a tomato tree.

P: I agree I think people are disconnected from their food. I grew up always growing my own food. I developed a passion for growing and I think it is very important to connect the producer and consumer of food.

2: How does your organization approach food security? (Cultural, social, economic, educational, or other)

We primarily approach it in an educational manner. Teaching people where their food comes from and giving them a chance to get their hands dirty. We also run different programs like our seed library to promote urban agriculture and biodiversity.

3: What types of vegetation do you produce? Is it grown all year round? If not when is it grown?

We grow herbs but also vegetables such as squash and cucumbers. An important thing for us is not just growing to feed humans, but we also plant things like fennel and dill to feed the pollinators. We don't grow all year round because

we only grow outside right now, however we do consider using plants like redbud for animals to eat off in the winter.

4: How do you approach the distribution of your agriculture? Where do you distribute?

We used to grow some non-traditional vegetables that were more culturally significant, however food banks didn't know what to do with them so we have started to grow more traditional vegetables to provide small quantities to the food bank we work with.

5: What are different food programs your organization runs? Why do you think they are important?

We run a variety of programs, some of which we have already talked about. We used to run a farmers market, however that has been put on hold. We typically raise funds too support other programs. We have a seed library where people can bring in or buy seeds in order to expand the diversity of plants we grow.

6: How do you engage the community? What is involved in your community outreach?

We engage the community through programs we run but we also conduct food related lecture series and will participate in public speaking events in order to reach out to the community. We run you pick days where people come in and pick vegetables that they planted earlier in the year. This is often

grandparents and their grandchildren, which we find is pretty common, learning between generations.

7: What are the greatest challenges you see running urban agriculture and food security programs?

Ground hogs. They were very bad recently and ate a lot of our plants. We also have issues with people stealing fruits or vegetables because we are not restricted from the public. Space and funds is also an issue as a non for profit, though we do have plans to potentially expand in with Edwards Gardens. Finally, the maintenance of plots is a big issue.

Fresh City Farms



Figure C.4. Fresh City Farms Green House. Photo by Author

Urban Agriculture Questionnaire

The interview was conducted with Julianne Keech the Farm manager and her assistant Jeremy at the Fresh City farm in Downsview Park. Some answers have been modified for reading clarity.

1: What inspired you to get involved with urban agriculture? Why is urban agriculture important to you?

Ju: I've had a passion for organic farming for a while, once I understood the positive impacts on the climate versus traditional agriculture. I think we need to create a direct connection between producers and consumers.

J: Being able to make the world a better place. I was interested in order to mitigate environmental damage. I think it is important to reconnect

people to their food. And there is something empowering about growing food.

2: How does your organization approach food security? (Cultural, social, economic, educational, or other)

Fresh City is a business, with a website and app that allows people a direct connection to where their food is being grown. We are focused on localizing the food system and providing fresh food to people across the city.

3: What types of vegetation do you produce? Is it grown all year round? If not when is it grown?

We have a 2 acre farm as well as a greenhouse, we rent from Downsview Park, and grow seasonal vegetables. We use a high production model in order to maximize yield and

will grow all year round. We typically grow things such as tomatoes in the summer, micro greens and sprouts in the winter, and then we will grow seedlings in the spring time.

4: How do you approach the distribution of your agriculture? Where do you distribute?

We are actually not directly involved with the distribution. Fresh City takes the food from the farm and it is brought to our warehouse at Samor Road in North York who deal with distribution. From there, the food is delivered to people's homes across the city through our website or app. We also have a brick and mortar store at Ossington and Queen.

5: What are different food programs your organization runs? Why do you think they are important?

Something called you-pick days, where people can pick their own produce each week during the summer. We also run an organic gardening course which is typically run during the spring.

6: How do you engage the community? What is involved in your community outreach?

We provide a direct connection to a farm. We are right by the road and are accessible to the public. We also set out a portion of our farm to provide roughly 40 smaller plots to people interested in starting their own urban farms. It is a small business incubator that

helps fund our farm while we share infrastructure and tools.

7: What are the greatest challenges you see running urban agriculture and food security programs?

Land access and prices of land in the city is a huge challenge. Labour is even more expensive in the city which makes it harder to stay viable.

Second Harvest



Figure C.5. Second Harvest Toronto.

Urban Agriculture Questionnaire

The interview was conducted with Jenelle Regnier-Davies over email. Some answers have been modified for reading clarity.

1: What inspired you to get involved with rescuing food? Why is it important to you?

I was attracted to Second Harvest because of the work they are doing in the community; more on the food security side than the food rescue side. The organization works with over 250+ social service and non-profits in the community that run food and meal programs. My background is food security, geography and food policy.

2: How does your organization approach food security? (Cultural, social, economic, educational, or other)?

Food security is a very indirect aspect of the work we do. We work to support other

organizations that are running food and meal programs. For many of those organizations food programming is only one of many services they provide. In general, what we do is offer free food to those organizations, and they in turn gain a food budget savings, which allows them to direct resources where they are needed. Even though we work with food, we cannot claim that we directly have an impact on food insecurity, because the facets that create food insecurity are systemic and deeply embedded into society. Unfortunately, you cannot create food security simply with the provision of food!

3: What types of produce do you take? Do you get this food from farms and restaurants or other places?

We see everything come through our warehouse, there is no one specific type of produce or product that we work with. We work with many partners along the supply chain, including farmers across Canada, local food distribution companies, and retailers. The range is

pretty huge! The food we get from those partners is distributed through our direct delivery program (on trucks on the road 7 days a week). In the last 2 years, we launched an online platform called FoodRescue.ca. It allows businesses to donate directly to social service organizations through online communications. I think there are around 600 partners across Ontario using that system, which is pretty cool.

4: How do you approach the distribution of the food you receive? Where do you distribute?

Every day, our warehouse fills with food, and every morning we empty it and the food is distributed across the city.

5: Are there any food related programs your organization runs? Why do you think they are important?

Yes, all of our partners run food or meal programs. Food has increased in price even in the last year, making it difficult for social service organizations to afford food that nourishes people. Individuals are also struggling to afford living in this city, since food cost and housing are increasing all the time. I see food as a right and believe that no one should be without access. These programs mean life or death for some people. Though food and meal programs cannot address the shocking levels of food insecurity experienced in our City, people would be worse off without these programs. What really needs to change is social policy.

6: How do you engage the community? What is involved in your community outreach?

Until recently, we put the majority of our energy in supporting our partner agencies with food delivery and training/education. More recently we have been offering education pieces to the general public. We launched a national research project last January looking at the massive problem of food waste across the country.

7: What are the greatest challenges you face running a food rescue and food security program?

The delivery of food can be a challenge because the food we receive is perishable and has a very short shelf-life. It must be directed to a user within a day, so they can get the most of the food. With packaged items, the general public sees best before dates as an expiry date, and often will not take food past or near the BBD, further contributing to food waste.

8: Is there some food you receive that is not able to be rescued? What happens to the food that can not be consumed?

Sometimes we do receive food that is not fit for human consumption. We donate some to a farm that makes pig feed out of food waste. Otherwise we have to send some food to an off-site City run composting program or to landfill. Our internal food waste is at an all time low of 3% currently. However, we do know that there is a lot of food sorting that also happens in the community. We are launching a food waste audit in the spring to gain a better understanding of what the percentage of food waste actually is.

ST. LAWRENCE MARKET

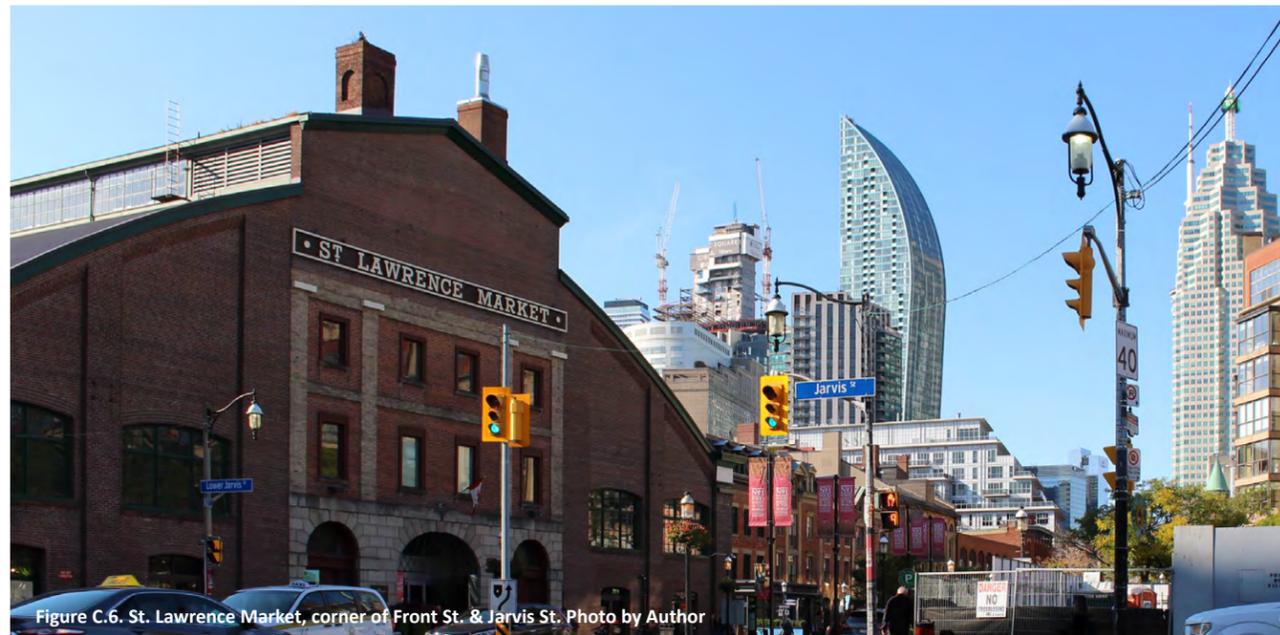


Figure C.6. St. Lawrence Market, corner of Front St. & Jarvis St. Photo by Author

St. Lawrence Market Questionnaire

The interview was conducted with Samantha Wiles at the St. Lawrence Market. Answers have been modified for reading clarity.

1: The market was once the central food hub for the city of Toronto. Was there any consideration in bringing back the market as a central hub for distribution of food?

Considering that the market is owned by the city and vendors actually just rent spaces, there is little interest in making the market what it once was. Many of the retailers will work with the food terminal because it is more convenient. However, many of the meat retailers will work with local farmers.

2: Does the market run any programs around the city in order to promote food security?

Since the market is owned by the city it is engaged through boards, the food policy council, we have cooking classes on site, farm talks, and a weekly market. We will also work with certain shelters after events where we will donate uneaten food.

3: Does the market run any classes in order to engage the community in terms of food literacy?

Like I just mentioned we run cooking classes and are involved in different programs throughout the city as part of the food policy council. We will also conduct farm visits where we take people from the market to a local farm.

4: How does the market deal with product that can no longer be sold? Is this left up to the vendors or does the market utilize city programs in order to minimize food waste?

The waste created is left up to the individual vendors to deal with. I know some vendors as well as the market work with Second Harvest, and we were actually one of their first pickup hubs. We used to run a night at the market in association with Second Harvest in order to raise funds.

5: I notice when conducting research at the market most of the visitors are tourists or people who work nearby. Do you have any reports or research on what type of people visit the market and where they are coming from throughout the city?

Our research shows roughly 30% of the visitors are tourists while 70% are locals (authors note: first hand data collected from my visit is that over 50% of visitors that day were tourists). Most of the people we see coming to the market are within 2-5km. We see a steep drop off of visitors coming from over 5km.

6: The Saturday market provides a venue for local producers to sell their products. Has there been any interest in allowing for this market to take place more than once a week?

The market is run on Saturdays, with about 40 farmers and we run an antique market on

Sundays. There is some interest in another day but, many of the farmers find it difficult coming to the city multiple times a week. However, the Saturday market is our busiest time as we will see roughly 10,000 visitors. We typically organize the market in 3 categories: farmers, processor, and resellers. The farmers also have terms they need to meet. In the Summer they are required to bring 70% of produce they grew themselves, and in the winter they are only required to bring 30% and the rest typically comes from the food terminal.

7: Has there ever been interest in promoting urban agriculture on the market site?

There has been interest in a learning kitchen with us growing vegetables on the terraces, which would incorporate an urban agriculture class, but its not a priority.

Regent Park Food Centre (CRC)



Figure C.7. Regent Park Community Food Mural. Photo by Author

Urban Agriculture Questionnaire

The interview was conducted with Ashrafi Ahmed at the CRC building at 40 Oak st. in Regent Park. Some answers have been modified for reading clarity.

1: What inspired you to get involved with urban agriculture? Why is urban agriculture important to you?

I came to Canada as an immigrant and grew up in the city. I originally started working in the Regent park community health centre. I think it is important to connect people with food. However, I don't look at it as just growing food, a lot of women in our community feel isolated, so gardening becomes an important part of their culture so we try to establish a community hub.

2: How does your organization approach food security? (Cultural, social, economic, educational, or other)

We primarily approach it culturally, but also educationally. It is important that people are getting a hands on learning experience. We run a variety of programs throughout the year to not only educate people in regards to growing, preserving and cooking food but also the cultural significance food plays in the community.

3: What types of vegetation do you produce? Is it grown all year round? If not when is it grown?

We grow a variety of vegetables and greens. Many are different cultural foods, we have a large Vietnamese as well as Bangladeshi community in the area who like to grow cultural vegetables. We primarily grow in the summer using no fertilizers, instead we use compost trying to create zero waste. Since the community gardens are owned by different families some grow seasonal vegetables but others will just grow what they like. We also grow sprouts and micro-greens indoors on the second floor during the winter.

4: How do you approach the distribution of your agriculture? Where do you distribute?

The harvest from the different plots is used towards the kitchen at the CRC. Monday + Friday we serve breakfast and lunch, Tuesday + Thursday we serve lunch, Wednesday we run our community kitchen program. We serve 200 people daily for free, so we require large yields, while smaller yields go towards the community kitchen.

5: What are different food programs your organization runs? Why do you think they are important?

We run various programs and they are almost entirely decided by what the community wants. We like working with the different cultural groups, and assigning a community member to act as a leader so that a lot of the time they are governing them self. As a result, we have several different garden plots that grow culturally significant food and then we will run workshops where these different cultural groups meet and share their knowledge in order to understand different cultures. Additionally, we have school programs, where kids will learn how to grow their own food and take it home to their backyard. We run cooking workshops, a health and nutrition workshop as well as a seed library workshop where people can get seeds to vegetables they may not typically have. We also run workshops for non traditional vegetables, a compost program where our growers learn how to create their own compost, a bee workshop, worm sharing programs as well as various other hands on workshops. We are always open to new programs as long as there is enough interest.

6: How do you engage the community? What is involved in your community outreach?

We have different community gardens as well as 243 individual plots that are either 8'x8' or 10'x10'. Even still there are 40-50 people on the waiting list to get their own plot. Additionally, we run a market in the summer where residents can purchase a table for \$10 and sell their yield to the local community. We also run a movie night in the summer, and use our community stone oven and have our annual taste of Regent park festival where we celebrate different cultural foods. We will also organize field trips to local farms each year where residents will pick their own produce and learn farming techniques.

7: What are the greatest challenges you see running urban agriculture and food security programs?

The Language barrier is an issue because there are so many different cultures, that is why we assign leaders. Also some residents are not interested in sharing their yield so there is a balance we need to create in order to establish a sense of community for everyone's benefit.

8: Is there anything else you want to explain with how your organization approaches urban agriculture and food security?

It is important to mention CRC is not just involved in food but also housing for people in need. We have 86 units in the building, giving a temporary place for people to live while we work with different housing agencies who help find these people places to live.

Neighbourhood: St. Lawrence Market

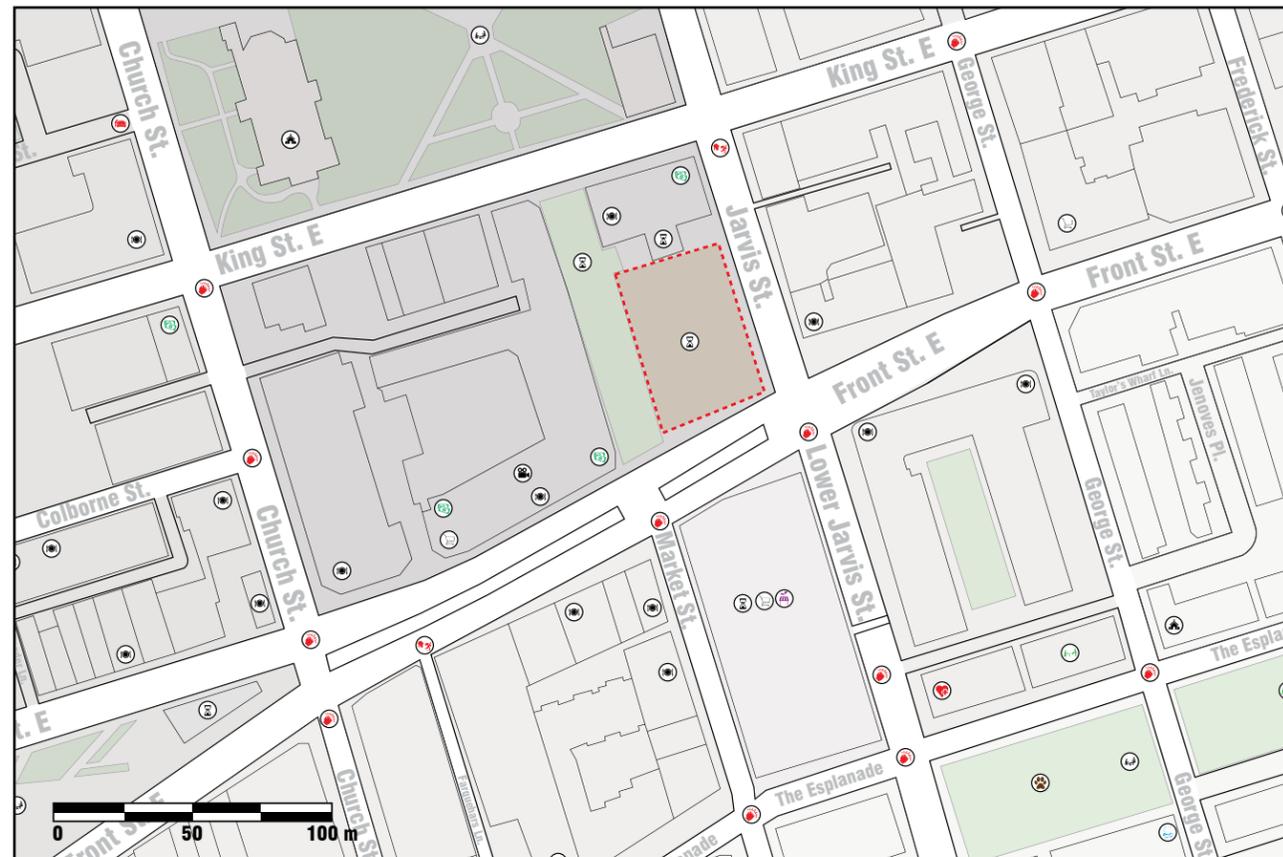


Figure D.1. Neighbourhood Map, St. Lawrence. Image by Author

- Restaurants:** There are a few nearby restaurants.
 - Community Gardens:** There are several community gardens throughout the site and neighbourhood.
 - Food Retail:** There are several nearby food retailers.
 - Market**
 - School Food Program**
 - Emergency Food Services**
 - Reported Assaults**
 - Reported Break and Enter**
 - Reported Car theft**
 - Medical:** There is one pharmacy within walking distance.
 - Bank**
 - Park**
 - Dog Park**
 - Church**
 - Historical Site**
 - Theatre**
 - Site**
- Neighbourhood Household Income:**
- \$50 - \$70,000
 - \$70 - \$90,000
 - \$90 - \$115,000
 - \$115 - \$135,000

Circulation: St. Lawrence Market

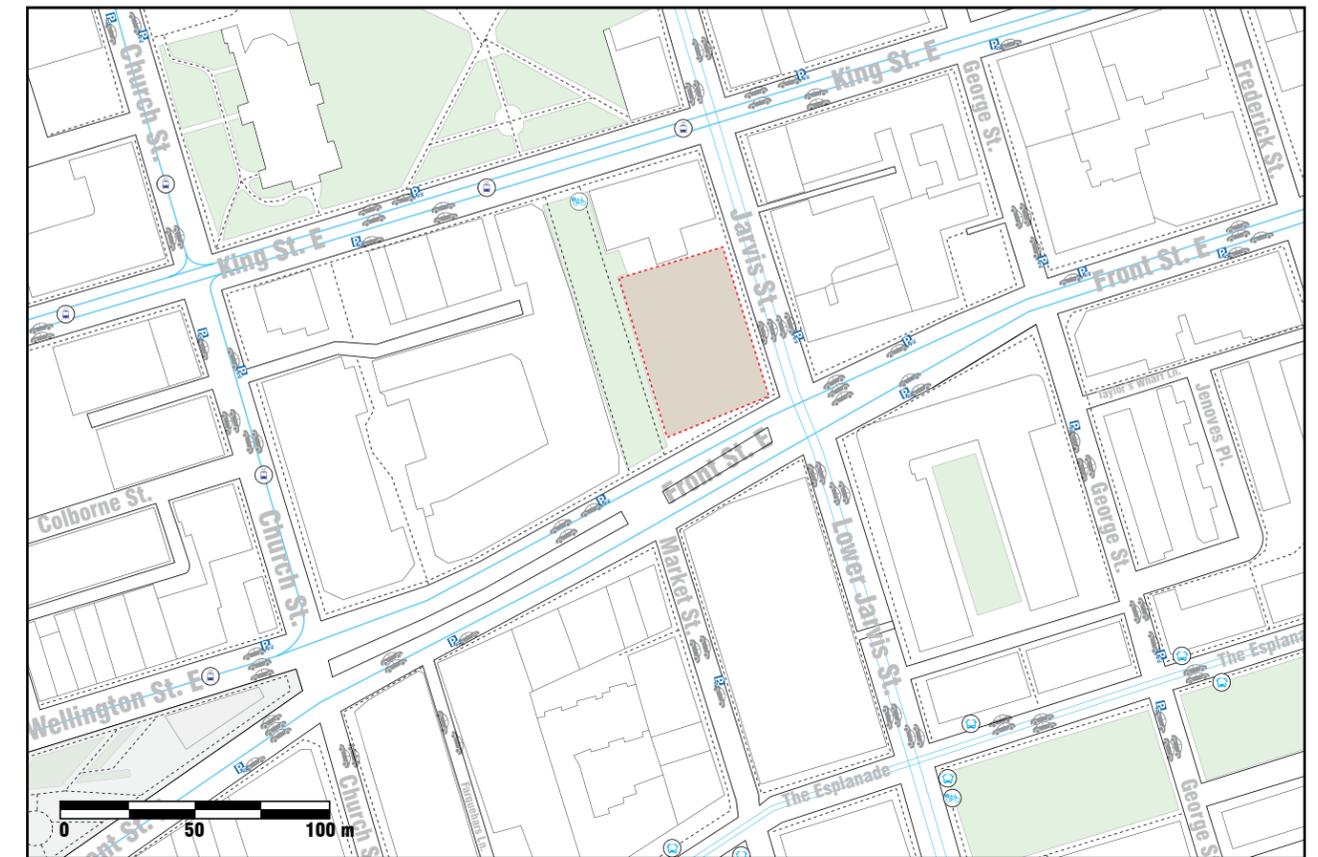


Figure D.2 Circulation Map, St. Lawrence. Image by Author

- Bus Stop:** There are several nearby bus stops.
- Street Car:** The street car runs along King, Church and Wellington St.
- Bus/ Street Car Route:** Convenient location for bus and street car transportation.
- Lane & Direction of Traffic:** Most streets are two way 4 lane traffic, with parts of Front St. being 6 lanes.
- Street Parking:** There are several street parking locations near the site.
- Parking:** Several parking lots but most are occupied for the market and apartment residents, parking will be required.
- Bike Rental**
- Pedestrian Walking Paths:** Several walking paths, a significant one is the parklet that connects Front and King St. to the West of the site.
- Site**

Senses: St. Lawrence Market

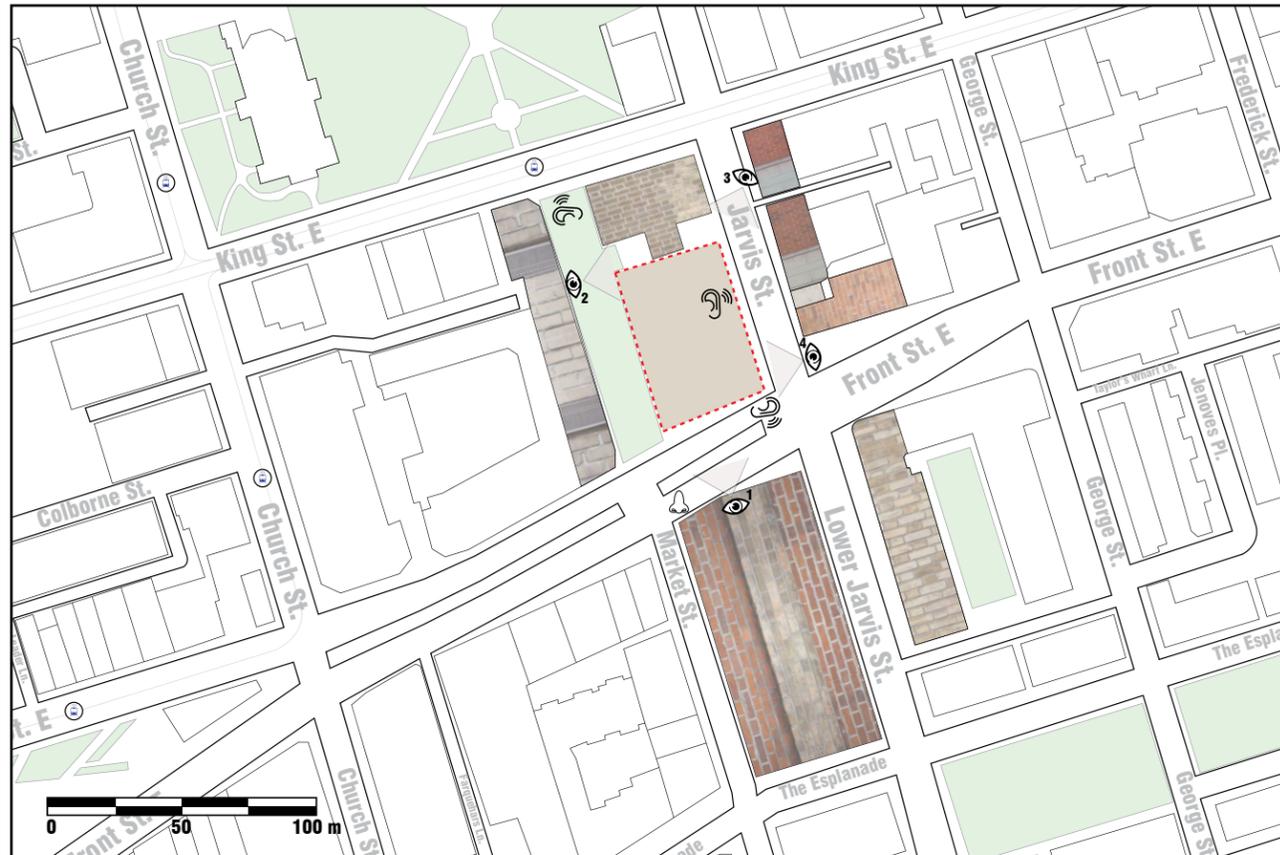


Figure D.3. Senses Map, St. Lawrence. Image by Author

-  **Smells:** The nearby St. Lawrence market vendors create an appetizing aroma.
-  **Sights:** These significant views towards the site provide context to the site plan and can be referenced on pg.42.
-  **Street Car Lines:** The street car lines above the road are very apparent but don't significantly impact site lines.
-  **Sounds:** Most of the sound around the site is due to traffic and the street cars.
-  **Textures:** Buildings around the site are represented with what their dominant building material is, in order to establish a material palette that is cohesive with nearby buildings.
-  **Site**

Views: St. Lawrence Market



Figure D.4. View 1 St. Lawrence. Image by Author

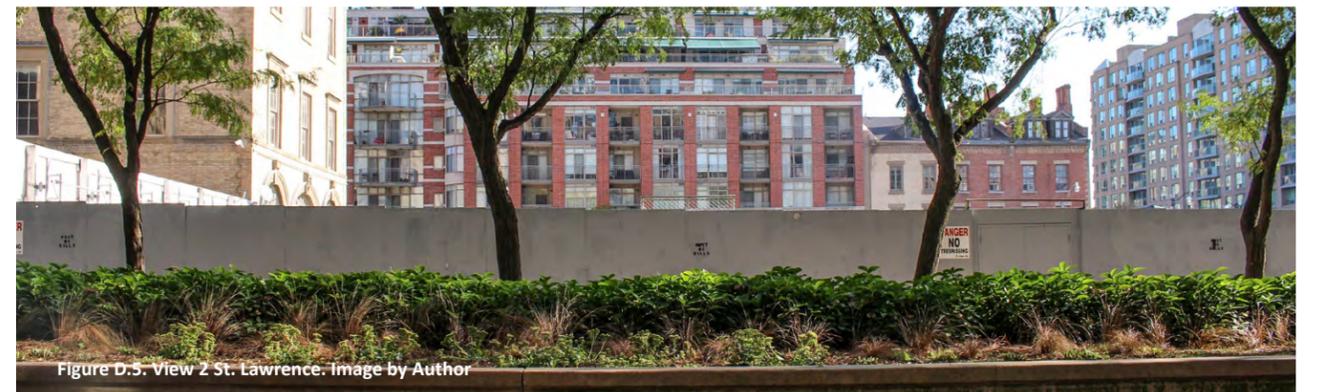


Figure D.5. View 2 St. Lawrence. Image by Author



Figure D.6. View 3 St. Lawrence. Image by Author



Figure D.7. View 4 St. Lawrence. Image by Author

Site Services: St. Lawrence Market

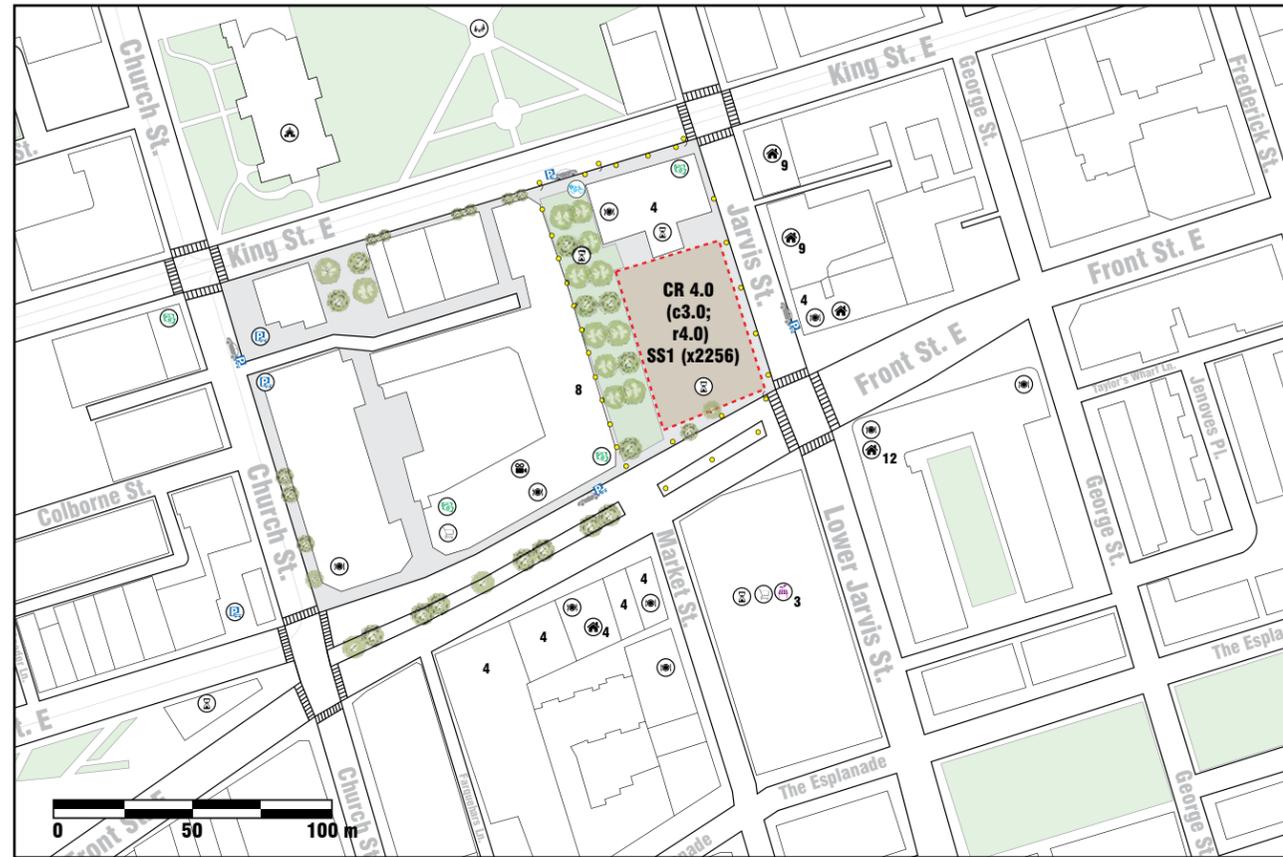


Figure D.8. Site Services Map, St. Lawrence. Image by Author

- | | |
|--|--|
| <ul style="list-style-type: none"> Restaurants: There are several restaurants around the site. Bike Rentals: There is one bike rental location at the North West corner of the site. Parking: Public parking is around the site, but most is used for the market. Additional parking is required. Street Parking: There are several streets in close proximity to the site that allow street parking. Residential: There are several residential apartments in the neighbourhood around the site. Food Retail: There are a few food retail suppliers in the neighbourhood though the primary one is the St. Lawrence market. | <ul style="list-style-type: none"> Bank Theatre Park: St. James park is directly North of the site. Church Historical Site: The St. Lawrence Market area has several historically significant buildings. Market: The St. Lawrence market. Lighting Cross Walk # Number of stories of nearby buildings H Fire hydrant P Postal Site |
|--|--|

Environment: St. Lawrence Market

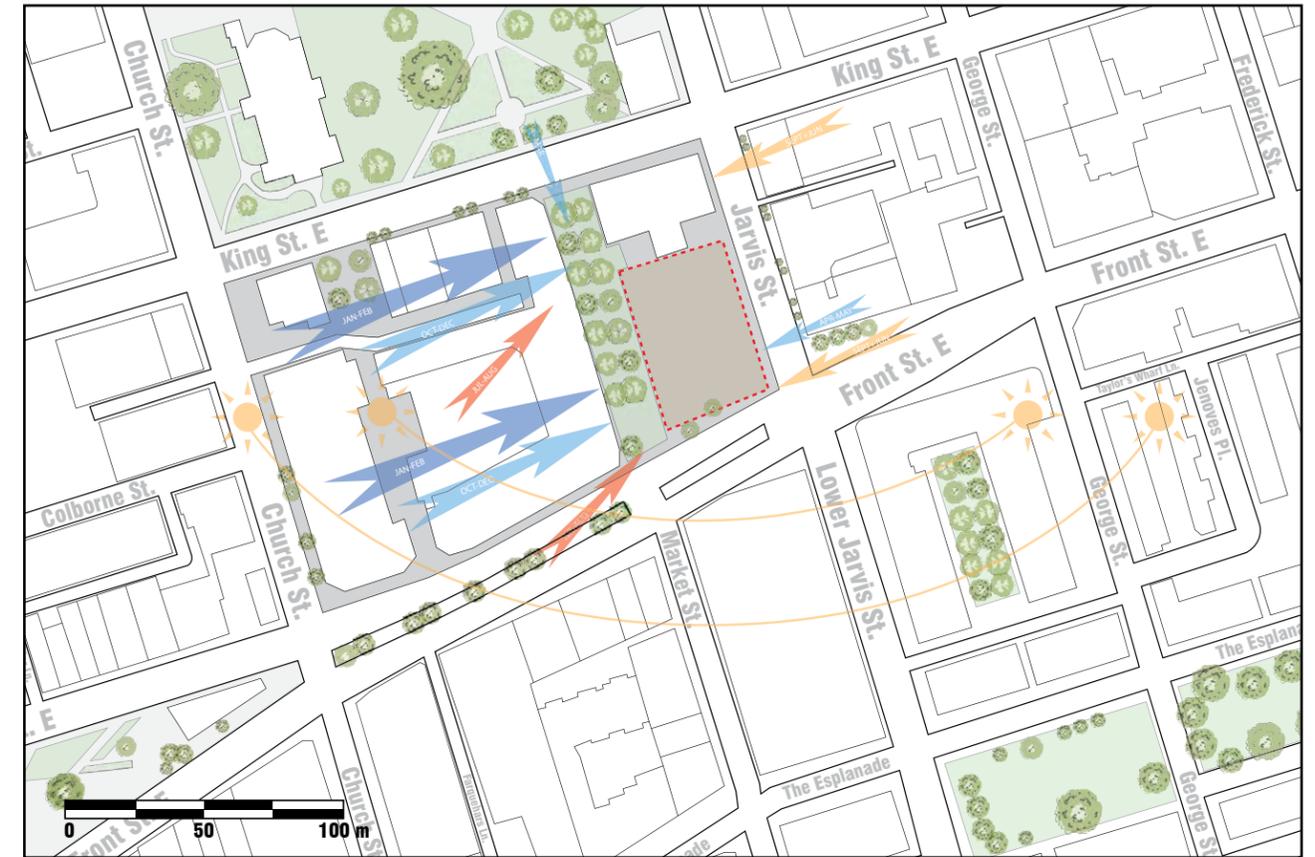


Figure D.9. Environmental Conditions Map, St. Lawrence. Image by Author

- Sun:** The two arcs show the sun's path in the summer vs. the winter. It is important to note that in the winter there are a few shadows that cross the site due to buildings nearby.
- Wind:** The arrows show the direction of the wind while the colour of the arrow is related to the temperature at that time. The size of the arrow is correlated to the amount of wind from that direction depending on the time of year.
- Trees**
- Green Space/ Permeable Surface**
- Asphalt/ Non-Permeable Surface**
- Site**

Neighbourhood: Regent Park

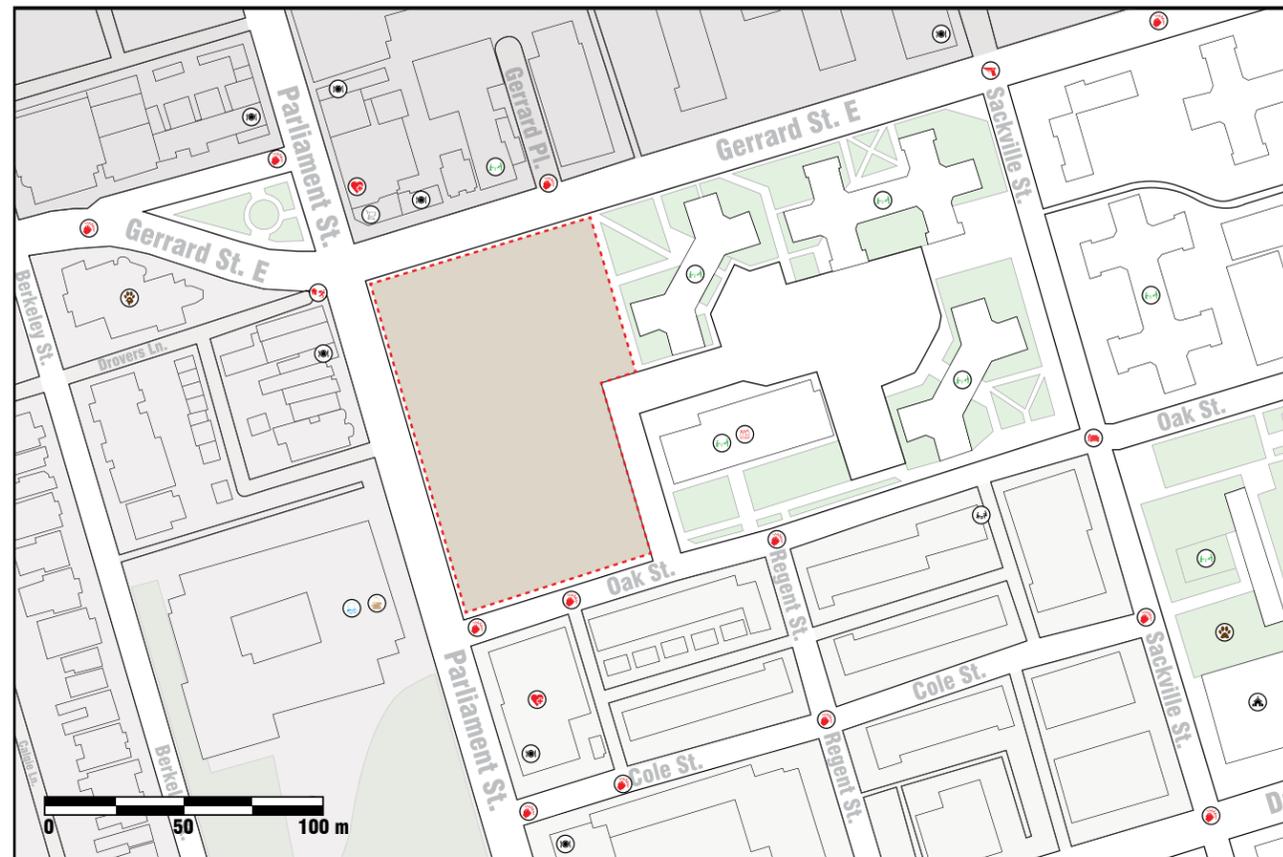


Figure D.10 Neighbourhood Map, Regent Park. Image by Author

- Restaurants:** There are a few small restaurants nearby.
 - Community Gardens:** There are several community gardens throughout the site and Regent Park neighbourhood.
 - Food Retail:** There are a few nearby food retailers, while another is located just south of the map limits.
 - School Food Program:** Student meal program at school across the street.
 - Emergency Food Services:** Emergency food service at the CRC.
 - Reported Assaults**
 - Reported Shooting**
 - Reported Break and Enter**
 - Reported Car theft**
 - School:** There is one elementary school near the site located on the other side of Parliament.
 - Medical:** There are two clinics and pharmacies within walking distance of the site.
 - Bank**
 - Park**
 - Dog Park**
 - Veterinarian**
 - Church**
 - Site**
- Neighbourhood Household Income:**
- 0 - \$50,000
 - \$50 - \$70,000
 - \$70 - \$90,000
 - \$90 - \$115,000

Circulation: Regent Park

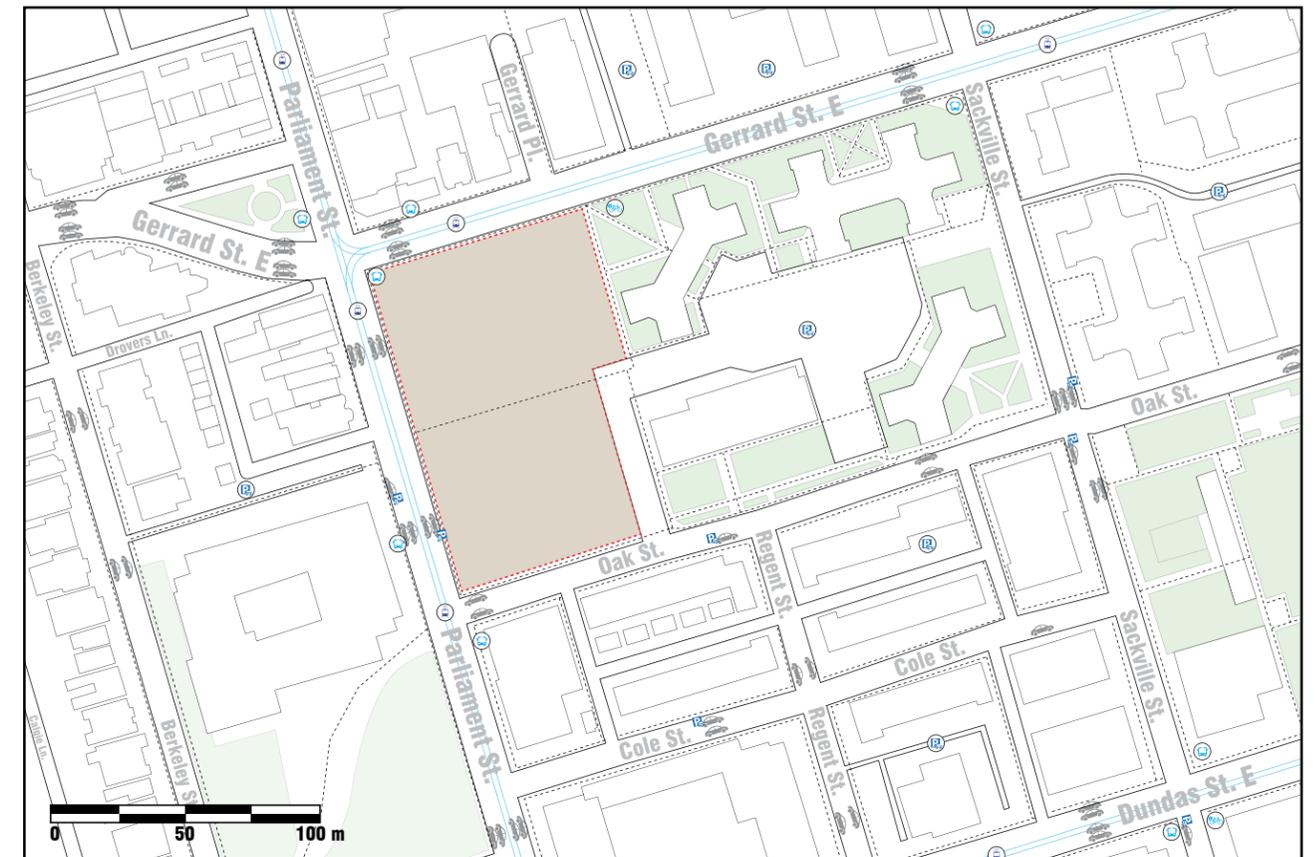


Figure D.11. Circulation Map, Regent Park. Image by Author

- Bus Stop:** There are several nearby bus stops.
- Street Car:** Street car runs along Parliament and Gerrard St.
- Bus/ Street Car Route:** Convenient location for bus and street car transportation.
- Lane & Direction of Traffic:** Most streets are two way single lane traffic while Parliament and Gerrard have two way with 4 lanes of traffic.
- Street Parking:** There are several street parking locations near the site.
- Parking:** There are several parking lots but most are occupied for apartment residents, parking will be required.
- Bike Rental**
- Pedestrian Walking Paths:** Former walking paths through the site allow for straight access to other housing units, shortcuts are prevalent.
- Site**

Senses: Regent Park

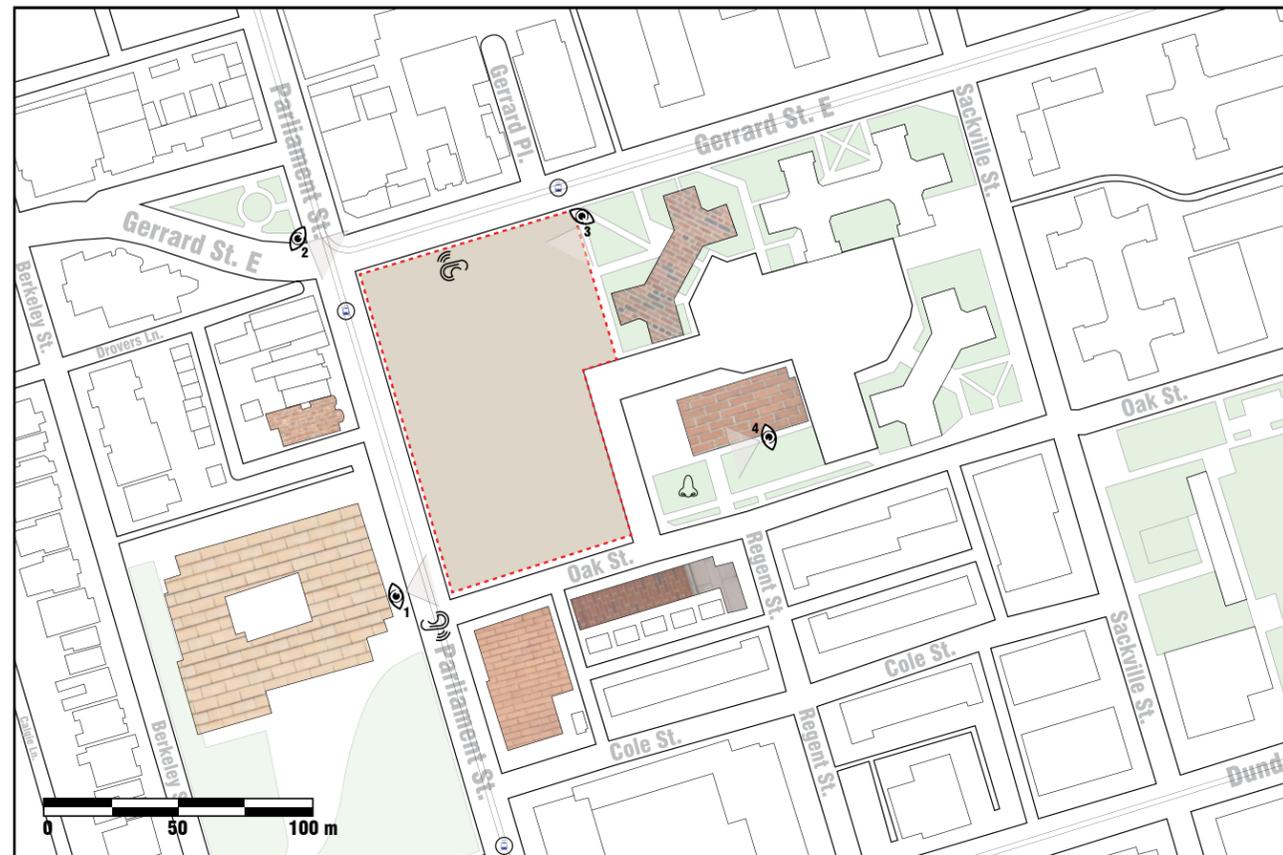


Figure D.12. Senses Map, Regent Park. Image by Author

-  **Smells:** The nearby garden in front of the CRC produces a flowery smell in the growing season.
-  **Sights:** These significant views towards the site provide context to the site plan and can be referenced on pg.48.
-  **Street Car Lines:** The street car power lines above the road interfere with clear site lines.
-  **Sounds:** Most of the sound around the site is due to traffic and the street cars, as well as the school to the West of the site.
-  **Textures:** Buildings around the site are represented with what their dominant building material is, in order to establish a material palette that appears cohesive with nearby buildings.
-  **Site**



Figure D.13. View 1 Regent Park. Image by Author



Figure D.14. View 2 Regent Park. Image by Author

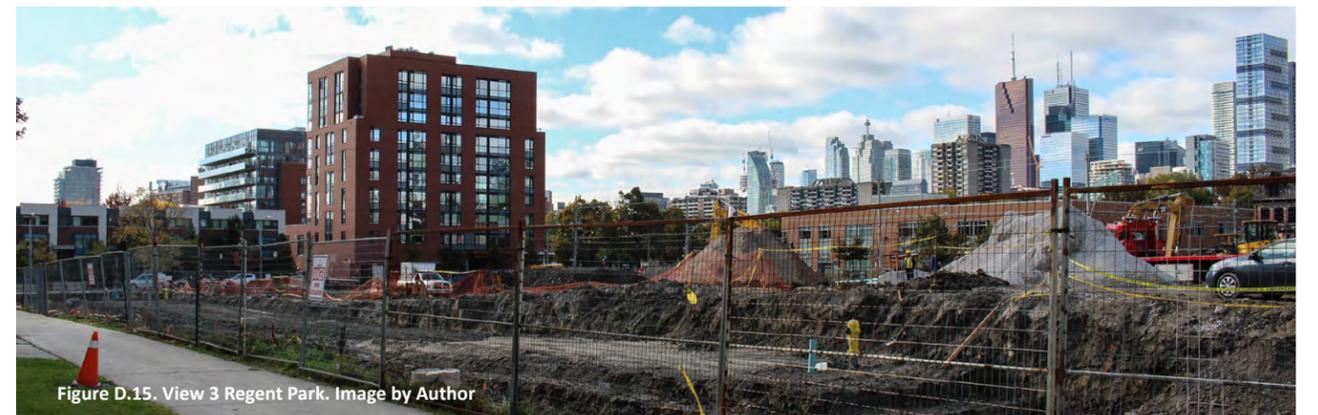


Figure D.15. View 3 Regent Park. Image by Author



Figure D.16. View 4 Regent Park. Image by Author

Site Services: Regent Park

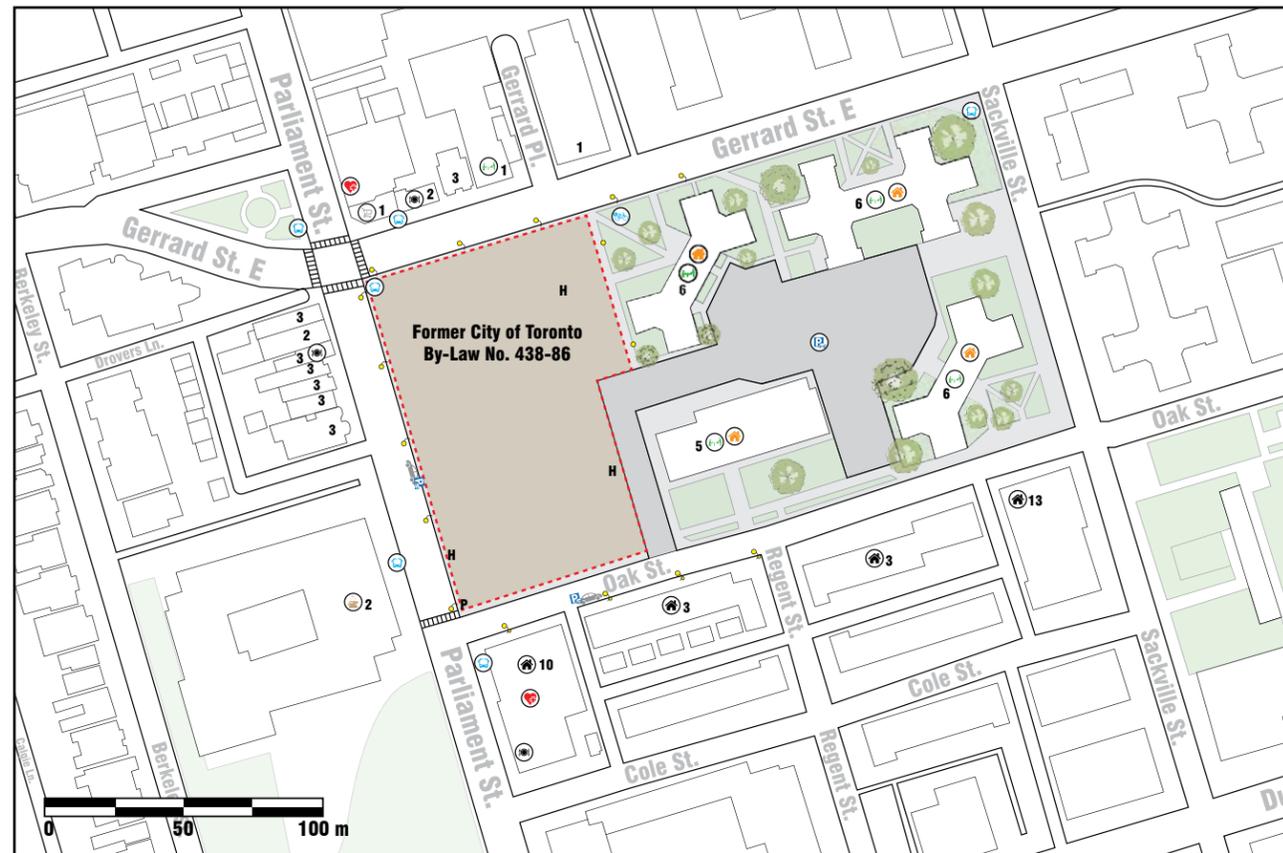


Figure D.17. Site Services Map, Regent Park. Image by Author

- Bus Stops:** There are several bus stops along Parliament and Gerrard.
- Restaurants:** There are a few restaurants.
- Community Gardens:** There are many community gardens throughout the site.
- Bike Rentals:** There is one bike rental location at the North East corner of the site.
- School**
- Parking:** Public parking is around the site, but most is used for apartment residents. Additional parking will be required.
- Street Parking:** There are several streets in close proximity to the site that allow street parking.
- Residential:** There are several residential apartments in the neighbourhood.
- Social Housing:** There are social housing buildings beside the proposed site, many are proposed to be demolished.
- Medical:** There are two clinics and pharmacies within walking distance of the site.
- Food Retail:** There is one nearby food retailer, while another is located just south of the map limits.
- Lighting:** There are street lights but very little lighting around the site. Lighting will need to improve to improve safety.
- Cross Walk**
- # Number of stories of nearby buildings**
- H Fire hydrant**
- P Postal**
- Site**

Environment: Regent Park



Figure D.18. Environmental Conditions Map, Regent Park. Image by Author

- Sun:** The two arcs show the sun's path in the summer vs. the winter. It is important to note that in the winter there are a few shadows that cross the site due to buildings nearby.
- Wind:** The arrows show the direction of the wind while the colour of the arrow is related to the temperature at that time. The size of the arrow is correlated to the amount of wind from that direction depending on the time of year.
- Trees**
- Green Space/ Permeable Surface**
- Asphalt/ Non-Permeable Surface**
- Site**

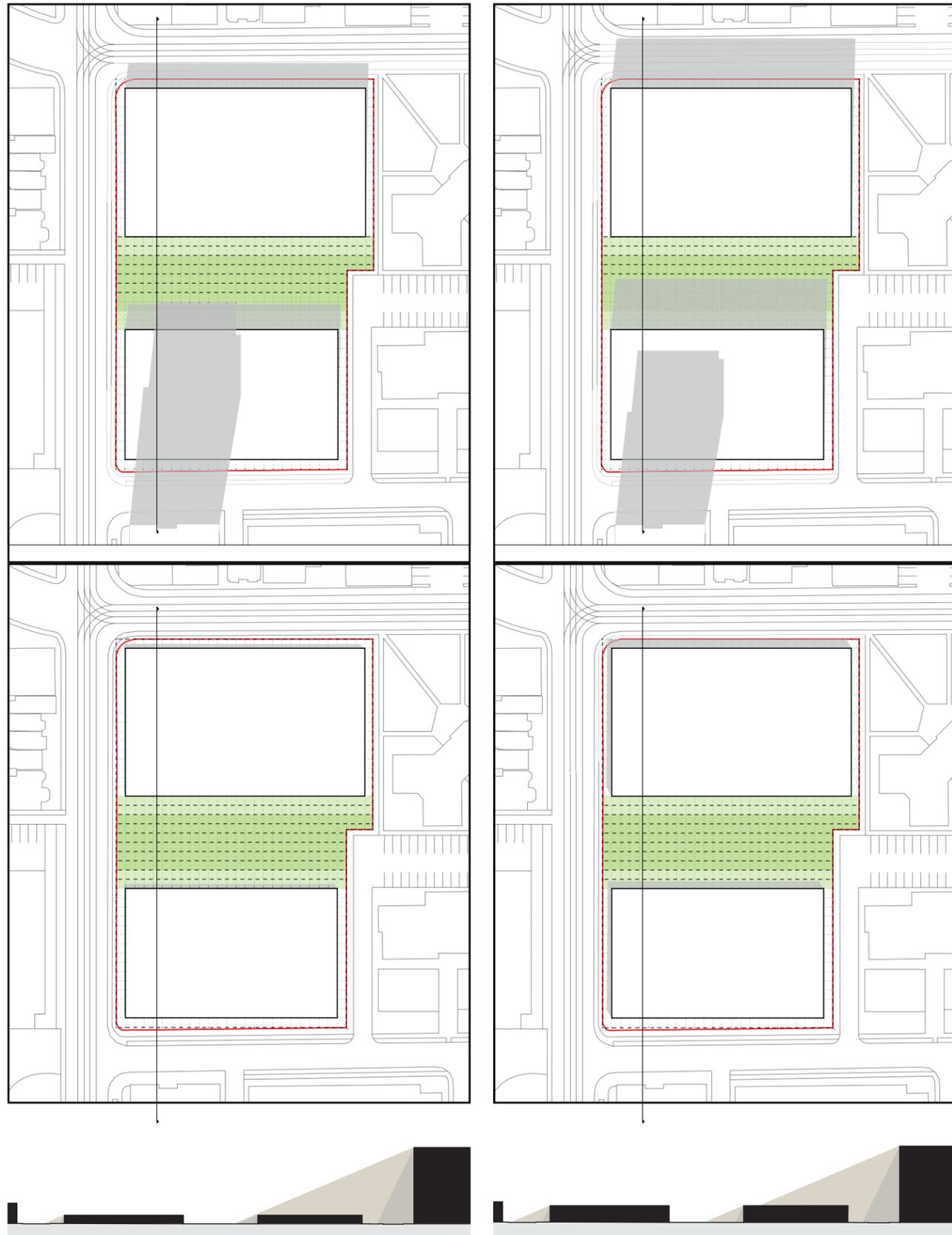


Figure E.1. 1 Storey Solar Analysis, Summer & Winter Solstice. Image By Author

Figure E.2. 2 Storey Solar Analysis, Summer & Winter Solstice. Image By Author

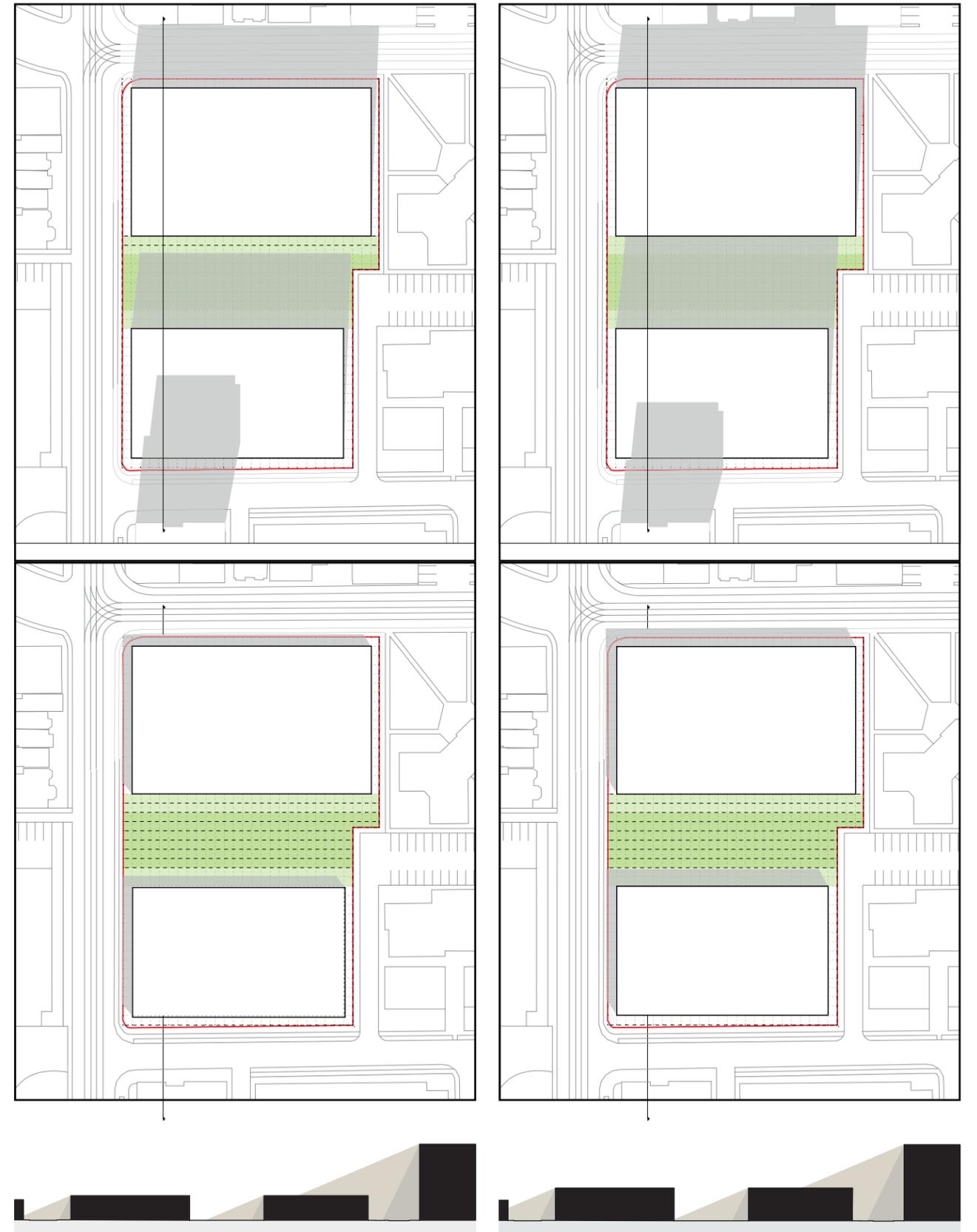
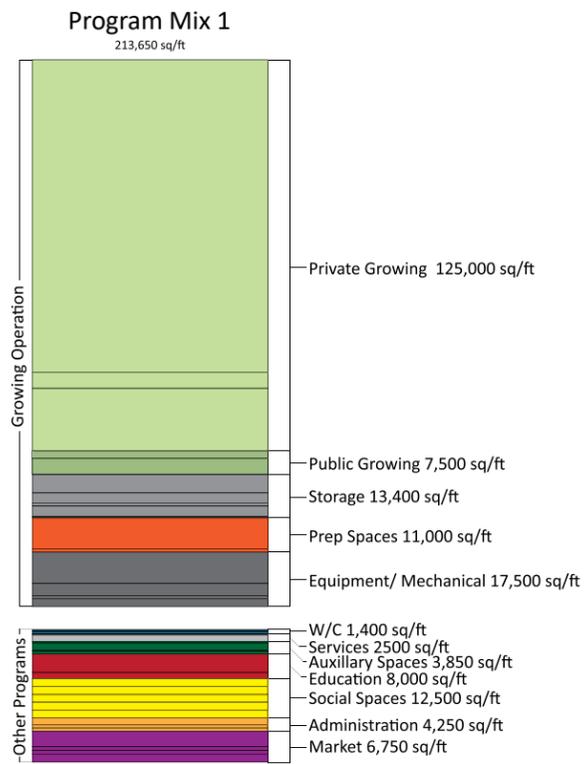


Figure E.3. 3 Storey Solar Analysis, Summer & Winter Solstice. Image By Author

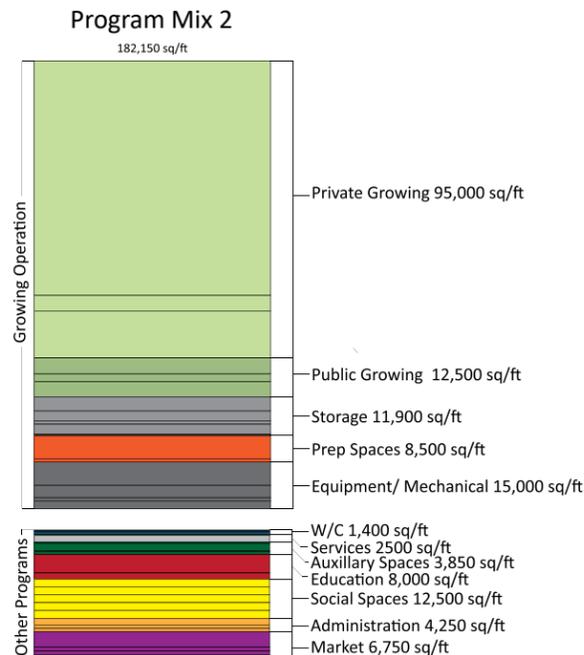
Figure E.4. 4 Storey Solar Analysis, Summer & Winter Solstice. Image By Author

Growing Operation Program Mixes



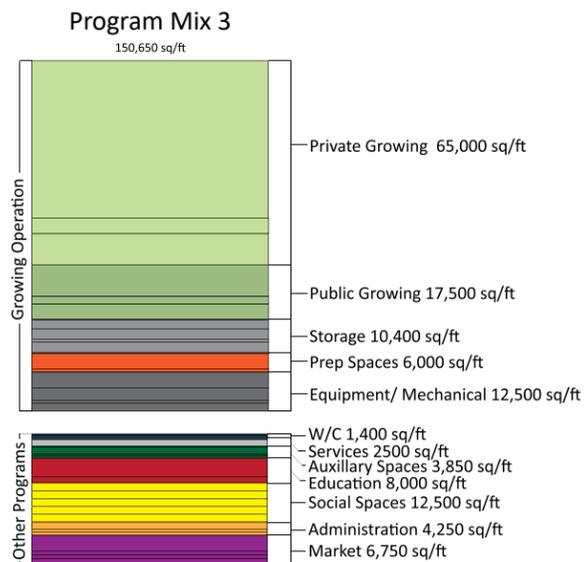
Public Growing (sq/ft): 7,500 (75 - 10x10 Plots)
Private Growing (sq/ft): 125,000
Yield/Yr (Public+Private Growing): 1265 People

Figure E.5. Program Spatial Diagram, Mix 1. Image By Author



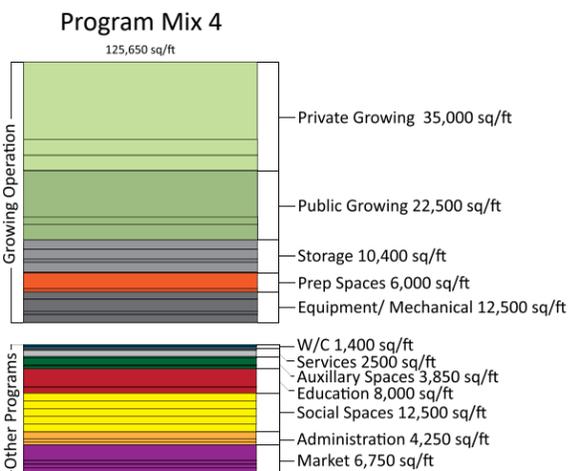
Public Growing (sq/ft): 12,500 (125 - 10x10 Plots)
Private Growing (sq/ft): 95,000
Yield/Yr (Public+Private Growing): 975 People

Figure E.6. Program Spatial Diagram, Mix 2. Image By Author



Public Growing (sq/ft): 17,500 (175 - 10x10 Plots)
Private Growing (sq/ft): 65,000
Yield/Yr (Public+Private Growing): 685 People

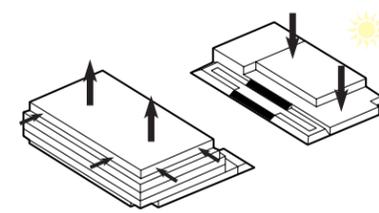
Figure E.7. Program Spatial Diagram, Mix 3. Image By Author



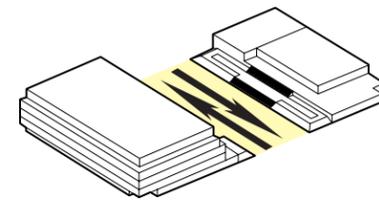
Public Growing (sq/ft): 22,500 (225 - 10x10 Plots)
Private Growing (sq/ft): 35,000
Yield/Yr (Public+Private Growing): 395 People

Figure E.8. Program Spatial Diagram, Mix 4. Image By Author

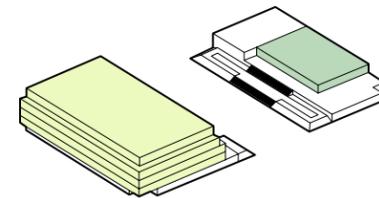
Design Concept Massing 1



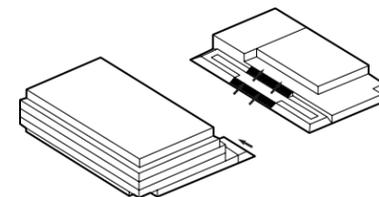
Lower profile southern mass allows natural light into central social space all year round. Northern mass elevated increasing southern facade exposure.



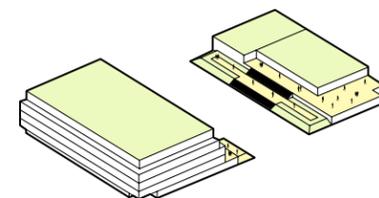
Open access to the street to ensure strong connection with street while connecting East and West ends of site through central social space.



Growing related programs (growing centre and incubator) separated between two masses.



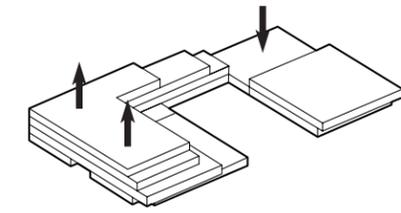
Social stairs along south building utilized while market is running and to access second level social/sitting spaces.



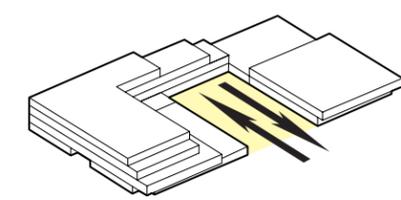
Rooftops used to collect rainwater for irrigation on site, while second level roofs used as additional social spaces supporting the central space.

Figure E.9. Massing 1 Drawings. Image By Author

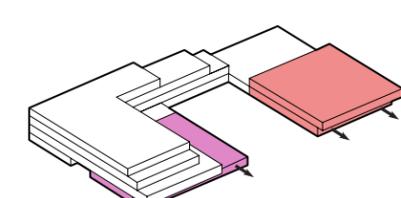
Design Concept Massing 2



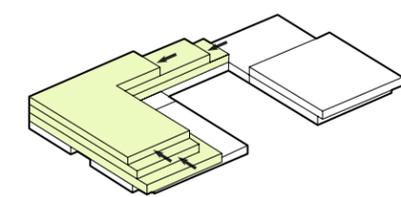
South building mass lowered to allow access of morning sun into central space. Northern mass elevated to receive sunlight throughout the day.



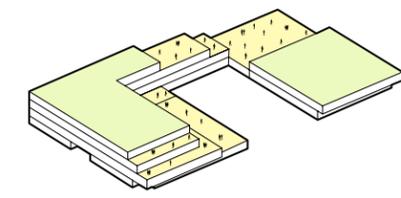
Central social space open to Parliament street to allow easy access for the public.



Market and education centre open towards the street to increase exposure to public and increase awareness/accessibility.



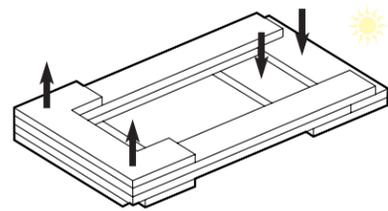
Growing centre bridges programs from North to South side of the site. Cascading used to establish outdoor spaces that receive adequate sunlight for growing.



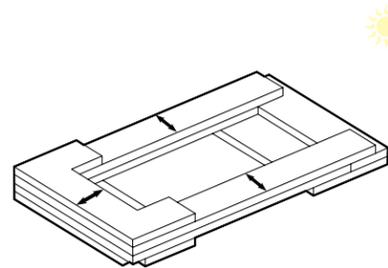
Multiple level rooftops used for growing centre as well as social spaces for the public that receive sunlight. Green roofs used to collect rainwater.

Figure E.10. Massing 2 Drawings. Image By Author

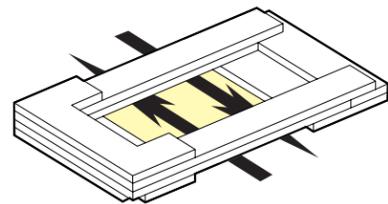
Design Concept Massing 3



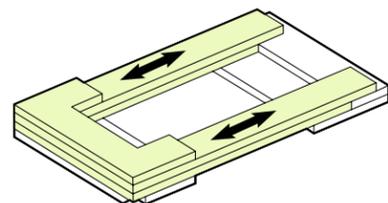
Cascading to ensure central space gets sunlight. North end stacked higher to increase growing centres access sunlight.



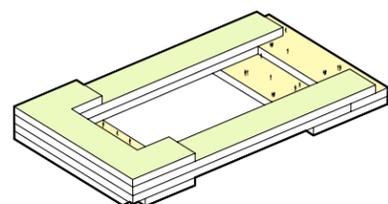
Shallower floor plates to ensure deeper penetration of natural light into interior spaces.



Open access to the street to ensure strong connection with street while connecting East and West ends of site through central social space.



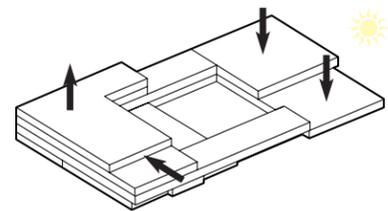
Main building masses connected through growing centre bridge. Allow access to growing centre from education centre or market.



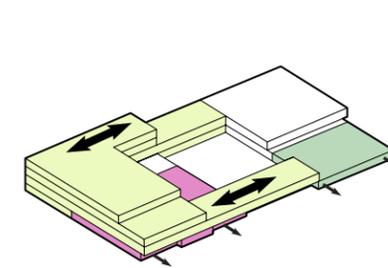
Cascading rooftops allow for places for sitting, eating and planting. Other rooftops not accessible to public used as rainwater collection green roofs.

Figure E.11. Massing 3 Drawings. Image By Author

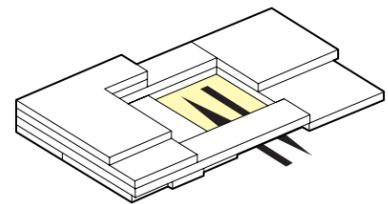
Design Concept Massing 4



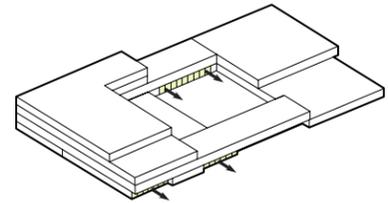
Building mass lowest at Southwest corner of site and highest at Northeast to maximize sunlight within central space and increase southern facade solar gain.



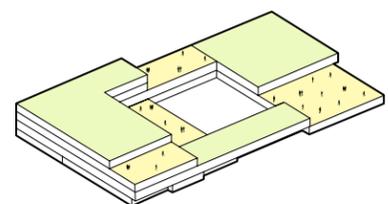
Growing centre used to connect market and incubator. Incubator and market face towards the main street to increase public exposure/access.



Central social space primarily accessible from Parliament St. allowing easy access, while entrance is semi-protected by growing centre bridge at 2nd level.



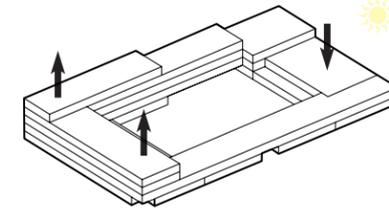
Market and ground level growing feature operable curtain walls which open up during warmer months merging interior and exterior spaces and allowing passage from the East to the West end of the site.



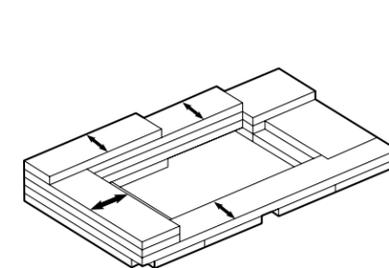
Various level rooftops allow for public and public spaces for sitting, eating and planting. Other rooftops used as rainwater collection green roofs.

Figure E.12. Massing 4 Drawings. Image By Author

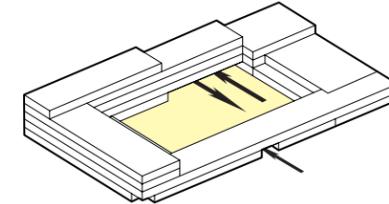
Design Concept Massing 5



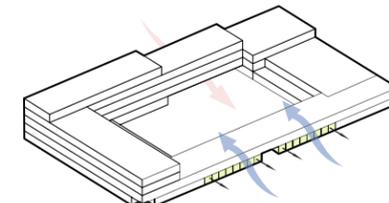
Building mass highest point at Northeast corner, with lowest point at the Southwest corner to maximize daylight in central social space.



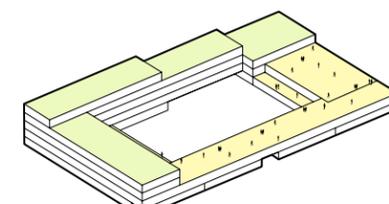
Growing centre floor plates shallower (50') to ensure deeper penetration of natural light into interior spaces.



Access to Parliament ensures connection with street while establishing a strong connection with the neighbourhood to the East end of the site through central social space.



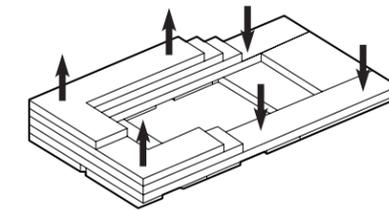
Operable curtain wall closed during winter to block harsh Western wind. Open during summer to allow Eastern summer breeze to circulate through central social space.



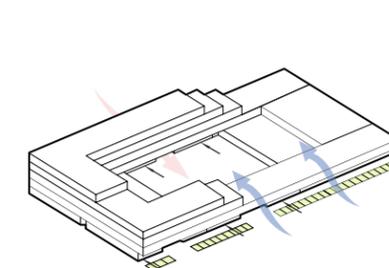
Rooftops on southwest of site establishing social spaces that get good access to sunlight while other non accessible roofs are used to collect rainwater.

Figure E.13. Massing 5 Drawings. Image By Author

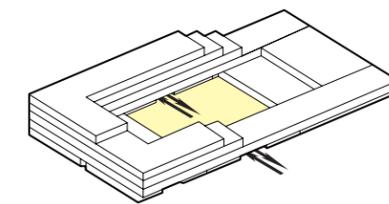
Design Concept Massing 6



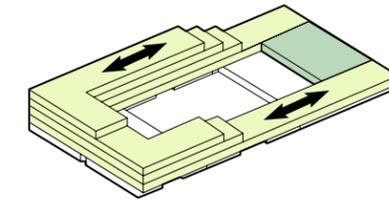
Building mass higher to North of site and lower to South to maximize sunlight in central space throughout the day, while increasing southern facades solar gain.



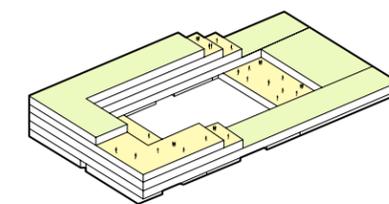
Building pushed back from street to increase public activity and introduce community garden plots. Operable curtain wall used to block winter wind while opening up during warmer months.



Strong connection with street while connecting East and West ends of site through central social space. Operable curtain walls containing planting spaces.



Main building masses connected through growing centre bridge. Allow access to growing centre from education centre or market.



Cascading rooftops allow for places for sitting, eating and planting. Other rooftops not accessible to public used as rainwater collection green roofs.

Figure E.14. Massing 6 Drawings. Image By Author

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