

NURTURE

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HEIGHTENED EXPERIENCES OF NATURE IN URBAN INTERIORS

Graduate Thesis Drexel University 2019-2020

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ACKNOWLEDGEMENTS

This thesis would not have been possible without the encouragement and support of my parents, sister, and family, who have always pushed me to pursue my passions. I thank my thesis adviser Carolyn Pearson for believing in my project and for investing her heart, expertise and time into it. You have been more than an adviser to me; a mentor, friend and well-wisher.

I thank all the Drexel faculty for showing me the extent and reach of Interior Design and for imparting a sense of responsibility in me as a designer. It is touching to see your love for Interior Design and your drive to make students the best versions of themselves. A big note of gratitude to my dear classmates and friends with whom I could share the ups and downs of life, in and out of school. It has been truly inspiring to be surrounded by such immense talent, relentless spirits and kind souls. Thank you so much.



*“WHAT WE REQUIRE NOW IS A RENEWED REALIZATION OF HOW
MUCH OUR PHYSICAL, MENTAL AND EVEN SPIRITUAL WELLBEING
CONTINUES TO RELY ON OUR RELATIONSHIP TO NATURAL SYSTEMS
AND PROCESSES.”*

- STEPHEN KELLERT

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EXECUTIVE SUMMARY

Today cities take up only 3% of the global landcover but are home to over 50% of the world population, that is around 3.9 billion people. This is an increasing number as people continue to move to cities in search of education, employment opportunities and lifestyle amenities.

Urban growth means an increased need for infrastructure to cater to the needs of the large masses, which often comes at the cost of natural landscape. The acute shortage of greenspaces, coupled with the demanding lifestyles of inhabitants leads to “nature deficiency”, a term used to describe the psychological and physical costs of human alienation from nature. Urban life also comes with stress inducers such as increased traffic, advertisements, and noise pollution that constantly demand our attention leading to exhaustion.

With an increased baseline for psychological arousal, stress and alertness, people tend to interact formally and retract from meaningful engagement. Living in cities is associated with increased levels of mental illnesses, higher risk of anxiety disorders, depression, and social isolation. The thesis explores how nature can be brought back into urban interiors, creating opportunities for inhabitants to benefit from its restorative properties?



LITERATURE REVIEW

NURTURE: Heightened Experience of Nature in Urban Interiors

Introduction

Nearing 2020, humankind has witnessed tremendous developments technologically over the last 200 years. We are nestled in services, products and comforts and are yet by far the loneliest and unhappiest generation. Rapid industrialization and urbanization since the 1850s have significantly impacted human¹ and planetary health.² Currently, the driving forces for worldwide urbanization are the mechanization of the agricultural sector and the concentration of wealth generation. People move to cities in search of education, employment, and lifestyle amenities. Opportunities and demands of the knowledge economy, coupled with diminished livelihood in rural areas, attract people to cities, creating continually growing urban areas, and global megacities.³

The infrastructure and buildings required to support these large numbers of people causes an increasingly greater impact on the natural world. The construction of buildings consumes a sixth of the world's fresh water supply, a quarter of its wood harvest, and four tenths of raw materials.⁴ Urban growth means loss of natural habitats and the consequent deterioration of biodiversity and associated ecosystems.⁵ Though cities take up only 3% of the land cover, they are responsible for 75% of the world's energy consumption and 80% of carbon emissions.⁶

In addition to harm to the earth, people also suffer from a degraded environment and the demands of urban life. There has been a decreased exposure to nature in everyday life, and people do not experience the physical and psychological benefits of connections with nature⁷. This lack of exposure and engagement puts people in a perpetual cycle of reduced knowledge of and appreciation for the environment, and further

decline in connection. At the same time, increased exposure to traffic noise and pollution are associated with higher levels of stress and aggression.⁸ Reduced access to green spaces and opportunities for recreation and physical activity hurts mental well-being.⁹ Frederick Law Olmsted, considered the father of American landscape architecture, brought to light the profound shortage of accessible green spaces in cities.¹⁰

Urban life has created an illusion that people are separate from nature¹¹. I believe inhabitants of cities need to be aware of the conditions shaping their lives and experiences and make conscious choices to create better environments that satisfy their personal and social needs. With my thesis I intend to address these issues, and this literature review will discuss a number of factors that can help us better understand the relationship between urban life and nature.

Mental and Physical Health in Urban Settings

Urban life comes with specific stress inducers characteristic of cities that can adversely affect inhabitants in different ways.¹² Firstly, cities overload inhabitants with sensory information, constantly demanding attention and decisions.¹³ As a method of self-preservation, people tend to retract from social interactions and engage more formally, losing opportunities for meaningful interactions that are more feasible in smaller communities¹⁴ and driving towards social isolation¹⁵. With an increased baseline for psychological arousal, stress and alertness, living in cities is associated with increased levels of mental illness, including 20% higher risk of anxiety disorders and 40% higher risk of depression.¹⁶ Secondly, the predominance of intellectualistic quality in urban life demands prolonged periods of directed attention and focus.¹⁷ Directed attention is a faculty of the mind employed when something does not simply attract, but requires, attention.¹⁸ Overuse of this capacity results in fatigue that is experienced by

⁸ "How the City Affects Mental Health." Centre for Urban Design and Mental Health. Accessed October 27, 2019. <https://www.urbandesignmentalhealth.com/how-the-city-affects-mental-health.html>.

⁹ Olmsted, Frederick Law. *Public Parks and the Enlargement of Towns*. Ann Arbor, MI: University Microfilms International, 1980, 337-344.

¹⁰ *Ibid*

¹¹ "The Illusion of Separation – the Cause of Our Current Crises." *The Nature of Business*, January 10, 2017. <https://thenatureofbusiness.org/2017/01/10/the-illusion-of-separation-the-cause-of-our-current-crises/>.

¹² Simmel, Georg. *Metropolis and Mental Life*. Syllabus Division, University of Chicago Press, 1961.

¹³ *Ibid*

¹⁴ Olmsted, Frederick Law. *Public Parks and the Enlargement of Towns*. Ann Arbor, MI: University Microfilms International, 1980, 337-344.

¹⁵ "How the City Affects Mental Health." Centre for Urban Design and Mental Health. Accessed October 27, 2019. <https://www.urbandesignmentalhealth.com/how-the-city-affects-mental-health.html>.

¹⁶ Lederbogen, Florian. "City Living and Urban Upbringing Affect Neural Social Stress Processing in Humans." *Letter*, May 12, 2011. <https://doi.org/10.1038/nature10190>.

¹⁷ Simmel, Georg. "Metropolis and Mental Life" Syllabus Division, University of Chicago Press, 1961.

¹⁸ Kaplan, Stephen. "The Restorative Benefits of Nature: Toward an Integrative Framework." *Journal of Environmental Psychology* 15, no. 3 (1995): 169-82. [https://doi.org/10.1016/0272-4944\(95\)90001-2](https://doi.org/10.1016/0272-4944(95)90001-2).

¹ Jowell, Ashley, Bright Zhou, and Michele Barry. "The Impact of Megacities on Health: Preparing for a Resilient Future." *The Lancet Planetary Health* 1, no. 5 (2017). [https://doi.org/10.1016/s2542-5196\(17\)30080-3](https://doi.org/10.1016/s2542-5196(17)30080-3).

² "Environmental Impacts of Urban Growth." Environmental Impacts of Urban Growth | Seto Lab. Accessed December 6, 2019. <https://urban.yale.edu/research/theme-4>.

³ Boyd, Bret. "Urbanization and the Mass Movement of People to Cities." Grayline Group, May 26, 2019. <https://graylinegroup.com/urbanization-catalyst-overview/>.

⁴ "UNITED NATIONS Climate Change - Summit 2019." United Nations. United Nations. Accessed November 16, 2019. <https://www.un.org/en/climatechange/cities-pollution.shtml#:~:targetText=Cities>

⁵ "Science." Science. Accessed December 14, 2019. [file:///C:/Users/gaish/Downloads/Grimm_etal_Science_2008\(2\).pdf](file:///C:/Users/gaish/Downloads/Grimm_etal_Science_2008(2).pdf).

⁶ "Cities Will Account for 75% of World Energy Consumption and 80% of Greenhouse Gas Emissions in 2030." Fundación Naturgy, December 13, 2016. <http://www.fundacionnaturgy.org/en/cities-will-account-for-75-of-world-energy-consumption-and-80-of-greenhouse-gas-emissions-in-2030/>.

⁷ Cox, Daniel T.c., Danielle F. Shanahan, Hannah L. Hudson, Richard A. Fuller, and Kevin J. Gaston. "The Impact of Urbanisation on Nature Dose and the Implications for Human Health." *Landscape and Urban Planning* 179 (2018): 72-80. <https://doi.org/10.1016/j.landurbplan.2018.07.013>.

humans as irritability, which is linked to lower desire in seeking other people and increased withdrawal.¹⁹ Thirdly, expanding urban populations have led to increased air, water, light and sound pollution that directly affect our physical well-being.²⁰ Mental and physical health are strongly interconnected, with evidence that people diagnosed with depression are at 50% higher risk of dying from cancer and 67% increased chances of heart disease²¹.

While there is clear evidence of these harmful outcomes, similar research shows how connection with nature and community have positive outcomes. Developing a sense of community has been linked to an increased interest in life and reduced isolation.²² A research study of older adults has shown that engaging in community activities has helped improve positive feelings and battle loneliness²³. Results from a field study of 44 adults in Michigan show that Nature exposure in everyday life can reduce stress levels with benefits increasing with extent of exposure.²⁴ Likewise, a connection with nature is also beneficial. The healing power of nature was established by Roger Ulrich by comparing the recovery rates of patients with and without views to nature, with results showing faster recovery rates in patients with access to views of greenery²⁵. Results from a study According to Kaplan, attention can be restored through exposure to nature.²⁶ These studies suggest that two primary ways people can improve their mental health are through connection with nature and engaging in a community of one's choice.

¹⁹ Cohen, Sheldon, and Shirlynn Spacapan. "The Aftereffects of Stress: An Attentional Interpretation." *Environmental Psychology and Nonverbal Behavior* 3, no. 1 (1978): 43-57. <https://doi.org/10.1007/bf01114531>.

²⁰ "Science." Science. Accessed December 14, 2019. file:///C:/Users/gaish/Downloads/Grimm_etal_Science_2008 (2).pdf.

²¹ "How Mental Health Affects Physical Health." Bradley University Online, September 18, 2019. <https://onlinedegrees.bradley.edu/blog/how-mental-health-affects-physical-health/>.

²² Mann, Farhana, Jessica K. Bone, Brynmor Lloyd-Evans, Johanna Frerichs, Vanessa Pinfeld, Ruimin Ma, Jingyi Wang, and Sonia Johnson. "A Life Less Lonely: the State of the Art in Interventions to Reduce Loneliness in People with Mental Health Problems." *Social Psychiatry and Psychiatric Epidemiology* 52, no. 6 (2017): 627-38. <https://doi.org/10.1007/s00127-017-1392-y>.

²³ Novotney, Amy. "Social Isolation: It Could Kill You." *Monitor on Psychology*. American Psychological Association. Accessed November 2, 2019. <https://www.apa.org/monitor/2019/05/ce-corner-isolation>.

²⁴ Hunter, Marycarol R., Brenda W. Gillespie, and Sophie Yu-Pu Chen. "Urban Nature Experiences Reduce Stress in the Context of Daily Life Based on Salivary Biomarkers." *Frontiers in Psychology* 10 (April 2019). <https://doi.org/10.3389/fpsyg.2019.00722>.

²⁵ Ulrich, R. "View through a Window May Influence Recovery from Surgery." *Science* 224, no. 4647 (1984): 420-21. <https://doi.org/10.1126/science.6143402>.

²⁶ Kaplan, Stephen. "The Restorative Benefits of Nature: Toward an Integrative Framework." *Journal of Environmental Psychology* 15, no. 3 (1995): 169-82. [https://doi.org/10.1016/0272-4944\(95\)90001-2](https://doi.org/10.1016/0272-4944(95)90001-2).

Connecting with Nature

"Partnership not Domination; Sustainability not Exploitation; Connection not Separation."²⁷ People connect with nature in many ways, and one way in particular—the idea of biophilia—has come to the forefront of design in recent years. Biophilic design considers people as a biological organism, respecting the mind-body systems as indicators of health and well-being in the context of what is locally appropriate and responsive.²⁸ Biophilic design is an approach to design that centers around humans innate attraction to life and life-like processes. The term was first coined by Edward O. Wilson in 1984. A biophilic design approach can quantifiably reduce stress, improve general mood, cognitive function and support healing.²⁹

Humankind has an innate affinity for nature and its phenomena that can inspire creativity and spark fascination or fear.³⁰ Designing to provide prospect/refuge, sensorial experiences, and opportunities to observe processes of natural systems are a few other ways to experience the benefits of nature through biophilic design.³¹ Lessons can be learned from gardens and parks to understand how a connection with nature can be fostered.

Urban gardens—another example of how people connect with nature—are intentional spaces within urban environments allocated to growing a variety of plants for food and pleasure.³² Forming community through urban gardening is especially beneficial in cities in light of the health issues discussed above.³³ According to one study, participants of a gardening group experienced a significant drop in cortisol stress levels and reported positive mood.³⁴ Urban gardens provide opportunity for intentional interaction with nature and people.³⁵ Urban gardens can foster connection with nature for participants through their engagement with soil, plants and an observation of natural cycles.³⁶

²⁷ Uhl, Christopher. *Developing Ecological Consciousness: the End of Separation*. S.I.: Rowman & Littlefield, 2020.

²⁸ Kellert, Stephen R., and Edward O. Wilson. *The Biophilia Hypothesis*. Island Press, 1993.

²⁹ *Ibid*

³⁰ "14 Patterns of Biophilic Design." *Terrapin Home - Terrapin Bright Green*, September 12, 2014. <https://www.terrapinbrightgreen.com/reports/14-patterns/>.

³¹ "14 Patterns of Biophilic Design." *Terrapin Home - Terrapin Bright Green*, September 12, 2014. <https://www.terrapinbrightgreen.com/reports/14-patterns/>.

³² Thayer, Amylyn. *Regis University*, 2017.

³³ Gómez, María García, and Isabel Lema-Blanco. "Urban Ecological Gardens: Educating and Engaging Citizenship in the Improvement of Urban Biodiversity and Responsible Consumption Practices." *Urban Ecological Gardens: Educating and Engaging Citizenship in the Improvement of Urban Biodiversity and Responsible Consumption Practices | Connecting Nature*, May 15, 2019. <https://connectingnature.eu/blog/urban-ecological-gardens-educating-and-engaging-citizenship-improvement-urban-biodiversity-and>.

³⁴ Berg, Agnes E. Van Den, and Mariëtte H.g. Custers. "Gardening Promotes Neuroendocrine and Affective Restoration from Stress." *Journal of Health Psychology* 16, no. 1 (March 2010): 3-11. <https://doi.org/10.1177/1359105310365577>.

³⁵ *Ibid*

³⁶ Uhl, Christopher. *Developing Ecological Consciousness: the End of Separation*. S.I.: Rowman & Littlefield, 2020.

Nature in Interior Environments

According to an EPA report, Americans spend 90% of their time indoors³⁷. This suggests that we need to reorient our understanding of the built environment to take greater consideration of interior spaces. At the same time, it is imperative that nature be incorporated into these spaces. Interior landscapes and urban gardens within built environments offer places of refuge from the pressures of daily life and can establish social environments. These concepts can be traced back to the 5th century BC where private homes in Greece contained internal courtyards surrounded by colonnades filled with plants³⁸. Early Japanese gardens were an expression of religious ideas and had dry gardens that consisted of raked gravel and stones where they believed that all living things had a spirit that can be captured without mimicking it.³⁹ Islamic gardens in the 7th and 8th centuries had rectangular courtyards with clearly defined path of plants at the borders.⁴⁰ Moorish architecture of Spain during the 8th century made significant leaps in merging gardens with the buildings.⁴¹

Plants and gardens have historically been a source of beauty and entertainment, leading to an increased cultivation and trade of plants.⁴² As people came to realize that not all imported plants could adapt to new environments, they sought ways to create protective settings for them. Greenhouses, conservatories, or winter gardens were constructed to house and display the large collections of plants in the 19th century.⁴³ The first indoor garden was the Crystal Palace in London erected for the Great Exhibition of 1851, which included systems designed to house plants.

A more contemporary example of designing nature into the built environment is the Parkroyal on Pickering Hotel in Singapore by WOHA Architects. It is a green office and hotel space located in the center of the city's business district.⁴⁴ WOHA's intention was to restore a sense of place to the city center by creating a "communal building as garden for an idealized green city"⁴⁵. Its most striking feature is the layering of the cantilevered rock-like balconies that are capped with bountiful, lush greenery and penetrate the façade and extend inside. The multilevel plant



ALAHAMBRA, Spain
13th Century BC



PARKROYAL ON PICKERING, Singapore
21st Century

³⁷ "Report to Congress on Indoor Air Quality: Volume II - Assessment and Control of Indoor Air Pollution." EPA. Environmental Protection Agency. Accessed November 2, 2019.

<https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9100LMBU.TXT>.

³⁸ Cooper, Paul. *Interiorscapes: Gardens within Buildings*. London: Mitchell Beazley, 2003, 6-13.

³⁹ *Ibid*

⁴⁰ *Ibid*

⁴¹ *Ibid*

⁴² *Ibid*

⁴³ *Ibid*

⁴⁴ "PARKROYAL on Pickering / WOHA." ArchDaily, April 23, 2013. <https://www.archdaily.com/363164/parkroyal-on-pickering-woha-2>.

⁴⁵ "Parkroyal on Pickering - Terrapin Bright Green." Accessed November 4, 2019. https://www.terrapinbrightgreen.com/wp-content/uploads/2015/11/Parkroyal_Case-Study.pdf.

covered balconies and terraces are an ingenious way of not only making up for the lost greenery but provide four times the site's original green cover (15000 sq.m).⁴⁶

The Parkroyal on Pickering's relationship with nature is not only symbolic, it is utilitarian. Sustainable systems integrated throughout the hotel reduce its use of valuable resources and provide environmental co-benefits.⁴⁷ The lobby of the hotel conveys strong inspiration from biomorphic patterns with the use of custom, curvilinear reception desk, flooring and carpeting that mimic pavements and pastures. The intricate geometries and fractal patterns influencing Parkroyal's interior detailing is emphasized by the grand spiral staircase complex lattice of wood and metal that is reminiscent of the Fibonacci series.⁴⁸

Intimate passageways that are finished in natural materials such as wood and rough stone lead visitors from public spaces of the hotel to the guestrooms. Corridors and parts of the structure are open to the exterior, allowing one to directly experience the natural exterior conditions, bridging the gap between interior and exterior.⁴⁹ Brightly colored bird cages on the exterior, accessible by cantilevered platforms provide prospect views of the city, intimate areas of refuge and a sense of peril that evoke natural environments.⁵⁰

Conclusion

The rapid increase in high density urban settings and decreased access to nature has resulted in a loss of opportunity to connect with nature and utilize its nurturing and renewing properties. The immediacy of ecological crises has many inhabitants more proactive than ever for a reconciliation and a respectful relationship with nature. Understanding solutions can be drawn from our natural environment is key to addressing major mental and physical health issues faced by city inhabitants in the face of continuing urbanization. Numerous examples exist of successful places in which people connect with nature. There is a need for spaces for people to focus inward, connect to a higher entity and have the support of a community to create a shift based on knowledge, informed action and sharing.⁵¹ Combining connection to nature and connection to community can result in creative solutions using their promising synergy.

⁴⁶ Ibid

⁴⁷ "PARKROYAL on Pickering / WOHA." ArchDaily, April 23, 2013. <https://www.archdaily.com/363164/parkroyal-on-pickering-woha-2>.

⁴⁸ Ibid

⁴⁹ "Parkroyal on Pickering - Terrapin Bright Green." Accessed November 4, 2019. https://www.terrapinbrightgreen.com/wp-content/uploads/2015/11/Parkroyal_Case-Study.pdf.

⁵⁰ Ibid

⁵¹ Uhl, Christopher. *Developing Ecological Consciousness: the End of Separation*. S.I.: Rowman & Littlefield, 2020.



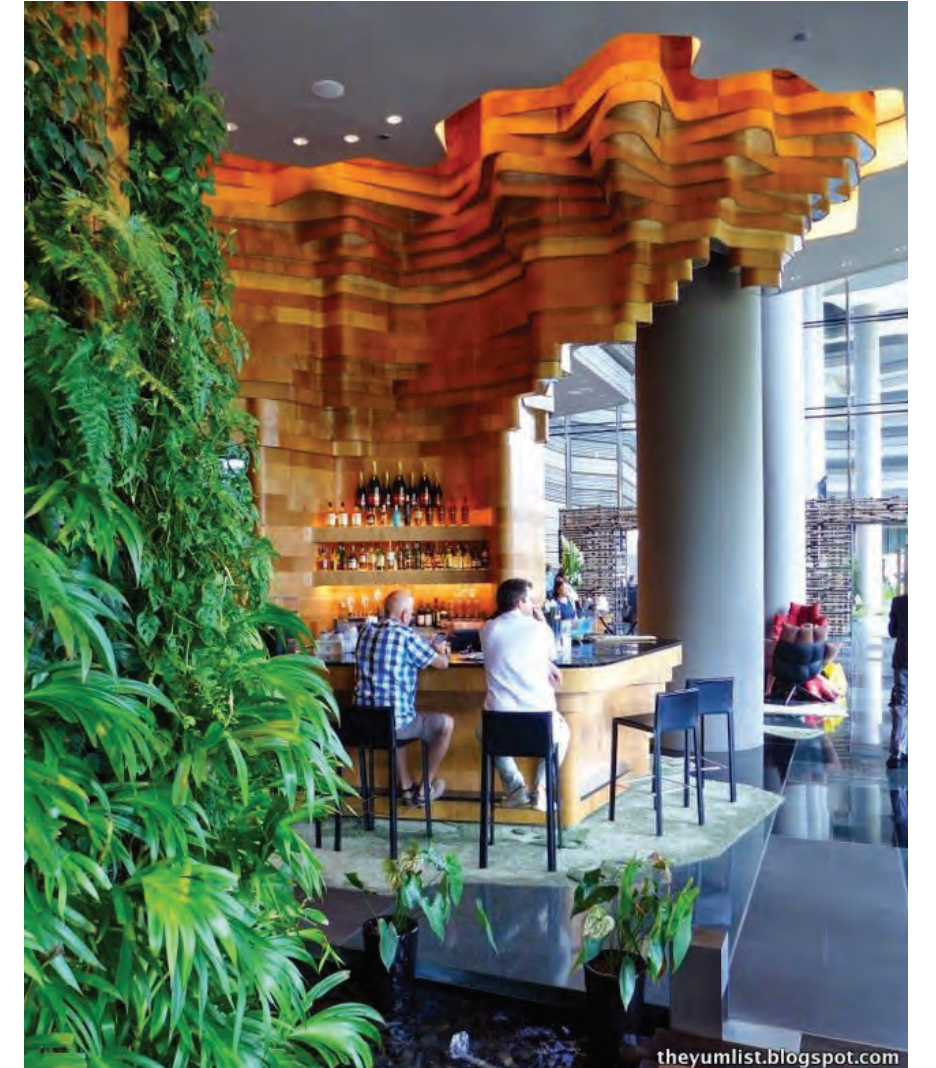
PRECEDENTS



PARKROYAL ON PICKERING, Singapore, WOHA Architects



PARKROYAL ON PICKERING, Singapore, WOHA Architects





FALLINGWATER HOUSE, United States, Frank Lloyd Wright



HIGHLINE, United States, James Corner Field Operations, Diller Scofidio + Renfro, and Piet Oudolf

BIOPHILIC DESIGN PRINCIPLES

VISUAL CONNECTION WITH NATURE

NON-VISUAL CONNECTION WITH NATURE

NON-RYTHMIC SENSORY STIMULI

CONNECTION WITH NATURAL SYSTEMS

DYNAMIC & DIFFUSED LIGHT

MATERIAL CONNECTION WITH NATURE

THERMAL & AIRFLOW VARIABILITY

COMPLEXITY & ORDER

REFUGE

RISK/PERIL

PROSPECT

MYSTERY

PRESENCE OF WATER

BIOMORPHIC FORMS & PATTERNS



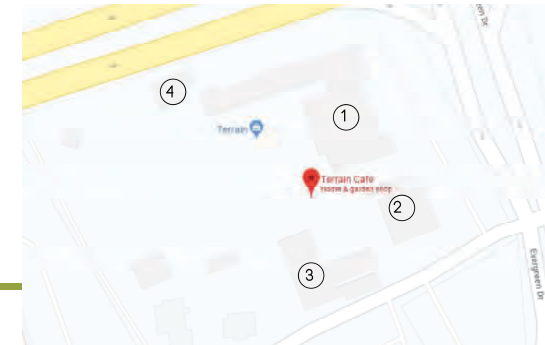
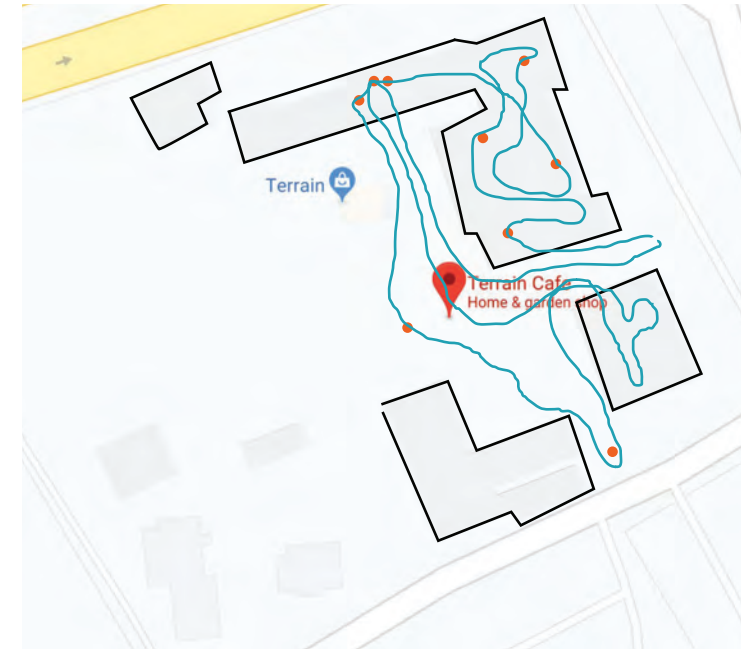
CASE STUDY

TERRAIN STYERS



DESIGN FEATURES

- Glass ceilings
- Stone flooring
- Fireplace seating
- Warehouse structure
- Garage doors
- Light filled rooms



	PROGRAM	AREA ESTIMATES
①	Retail & Restaurant	8000 sq ft
②	Retail	3500 sq ft
③	Event space	4500 sq ft
④	Back of house	2000 sq ft

ACTIVITY LOG

METHODOLOGY:

Logging position my activity every 20 minutes and 12:00 pm to

Sunday, January 19th, 22

We first visited the terrain styers store which had beautiful arrangements of plants, succulents, flowering plants, garden accessories, beauty & home products and more. The restaurant had a waiting time of 1 hour 30 minutes for walk in reservations. So, we went back to the terrain store and had a conversation with our key informant with whose help we bought a few plants. We sat near the lit fireplace which had a few visitors already. We then walked by the Mushroom shack event space and spent about half an hour in the shade room after which we got seating at the restaurant. An hour and a seasonally curated meal later, we left the premises.

CASE STUDY QUESTIONS

TERRAIN STYERS

Key Informant: Serena Meyers (Employee at Terrain Styers Store)

What is the main goal/purpose of your facility?

The main purpose of the facility is to sell a range of plant species, the tools and accessories required to grow healthy plants and other plant-based products. The Terrain Café offers seasonally changing brunch, lunch, and dinner menus featuring hand-selected local produce, meats, and dairy alongside a thoughtfully curated beverage program from near and far.

What is the square footage of your facility?

The square footage of the segmented indoor spaces is about 18,000 square feet with additional large outdoor spaces. Jkjkjkjkh how many occupants?

How does the design of your facility differ from other similar facilities? How is it the same?

The Longwoods garden is about a 15 min drive from Terrain and is a much larger facility with a focus on aesthetics, garden design, educational programs and cultural arts. They are more geared to accommodating large groups of students, especially with their Indoor children's garden. Shofuso Japanese House and Garden has a large, traditional-style Japanese garden which hosts cultural shows and some academic activities. It is however open seasonally.

Who are the types of people that come to this facility?

We have a variety of people come, middle to higher middle income. Men, women and children of all ages come to enjoy a few hours at Terrain.

What is the average age/ability range of the occupants?

The average age range of visitors would be 25-55. The design is not suitable for wheelchair access except for a portion of the restaurant, which is also difficult to traverse to. The gravel and irregular stone flooring that is ideal for maintaining plants, to absorb water and hide debris is not suitable for wheelchairs.

What are your busiest seasons or times in a day? Does it get overcrowded?

The place has a flow of visitors year round, but is the most busiest from months April to May and September to November. As the lace is sectioned into different areas with multile doors, there aren't many times its crowded.

What are the different departments within your facility? What do they do?

There are different departments - retail stores, restaurant, cleaning, cooking. There are staff for Cashiers, Gardeners, Landscape, Visual Merchandiser, Cleaning staff, Restaurant Waiters and chefs.

Number of staff? How many at facility at a time?

The staff is about 25 people with 4-6 people in a facility at a time.

How do departments interact? Are there any special adjacencies?

The restaurant is adjacent to the staff spaces, kitchen and back of house for efficiency and convenience. In times of events, food is supplied from the kitchen at Terrain Café.

What type of workspaces does the staff require?

The staff requires a workspace with space to keep personal belongings and ample storage for tools and equipment. For the restaurant, a kitchen, with pantry and cold storage is required.

What are the public areas in the space? Who uses them?

The public areas of Terrain are the two retail stores (Terrain, The shade house), the restaurant and the two event spaces. Apart from these, there are outdoor open areas with fireplaces for visitors to converse and enjoy.

Are there any special equipment, plumbing, lighting, technology, or ventilation requirements?

There are special heating and ventilation requirements to maintaining a variety of plants in cold weathers. It is absolutely necessary to maintain a certain temperature. Drain holes are requires

What activities take place in the public areas? What works? What doesn't?

The activities of buying, observing, interacting with nature, eating, celebrating occur in this environment. The careful branding and pleasing aesthetic of Terrain lend themselves to an Instagram worthy location that people like to travel to out of the city.

What are the circulation paths of public, staff, deliveries?

The visitors enter from the main entrance between the terrain styers store and the shade room. The driveway after that leads to the service entrance for deliveries.

Explain the process of coming in and going out and the spaces needed for this.

Upon entering from the Evergreen Dr, visitors and staff enter the parking lot of terrain styers. One enters in between the terrain styers store and the shade house and can enter either. The terrain store and restaurant are interconnected, with two main points of entrance and exit, and people can navigate freely through both the spaces. The warehouses that support these activities have numerous garage door on their sides that can be opened if necessary though there are specific points of entry and exit.

KEY INFORMANT INTERVIEW

NAME: Susanne Collins
OCCUPATION: Employee at City Planter



1. When was your first gardening experience or interaction with plants? How would you describe it?

My first experience was in my mother's garden as a kid. I remember mostly the tactile and sensory experiences of it--the way the various plants felt, smelled, and tasted. I also remember enjoying the wildlife that came along for the ride, like butterflies and ants.

2. Do you find gardening/ being surrounded by plants and tress therapeutic? Do they reduce your stress?

I definitely find being surrounded by plants and nature therapeutic. I do find more therapy in my outdoor garden than with my houseplants.

3. Do you like to garden as a means to connect with a community or by yourself?

I personally like to garden as a solo activity, but I connect with my community online about gardening.

4. Has your time in nature affected your decisions that impact the environment? Have they encouraged you to make more environment friendly decisions?

I think my time in in national parks and wildlife habitats has affected my environmental decisions much more than my backyard gardening.

5. What got you into working with plants? How often do you physically interact with plants, soil and water in the process?

I got into plants about five years ago after getting myself a succulent and my love for plants just kept expanding from there. Since I work in the plant world now, I interact with plants and soil on a daily basis.

6. Do you find a difference when you are gardening or interacting with nature indoors vs outdoors?

Absolutely--houseplants and outdoor gardening are completely different worlds with very little overlap. Outdoor gardening requires much more attention and constant care, usually watering every day, while indoor houseplant care is more of a hobby mixed with interior design, and requires much less frequent watering. Gardening outdoors connects me to the earth much more than houseplants do, although I adore both worlds.

7. Would you say Philadelphia has sufficient greenspaces?

I don't think Philly has enough greenspace. I've been disappointed with the way that the city has taken possible greenspaces like LOVE park and Dillworth Plaza and made them mostly paved. While fairmount is huge, it's not accessible to everyone. I think people deserve to have grass to play in and gardens to touch and play with.

8. Has your time in nature affected your lifestyle in any way? Does it encourage you to be out more often?

I would not say that my time in nature encourages me to "go out" but it does encourage me to carve out time to enjoy the outdoors outside of the city (like wissahickon) as often as I can.

9. Do you believe plants have feelings; do you talk to your plants?What is your view on plants being pets?

I personally don't believe that plants have feelings--I don't talk to my plants at home (I have lots of real pets though). I think its okay if plants die or get sick, it's part of a learning process. But I think treating plants as something beloved to care for is good for mental health.

10. Do you feel people should interact or surround themselves with more plants?

I think that being surrounded by plants is great, but it's not for everyone. I think that if caring for plants isn't someone's forte, having no plants might be better than having sad-looking plants. Some people also just don't like to get dirty and that's ok.

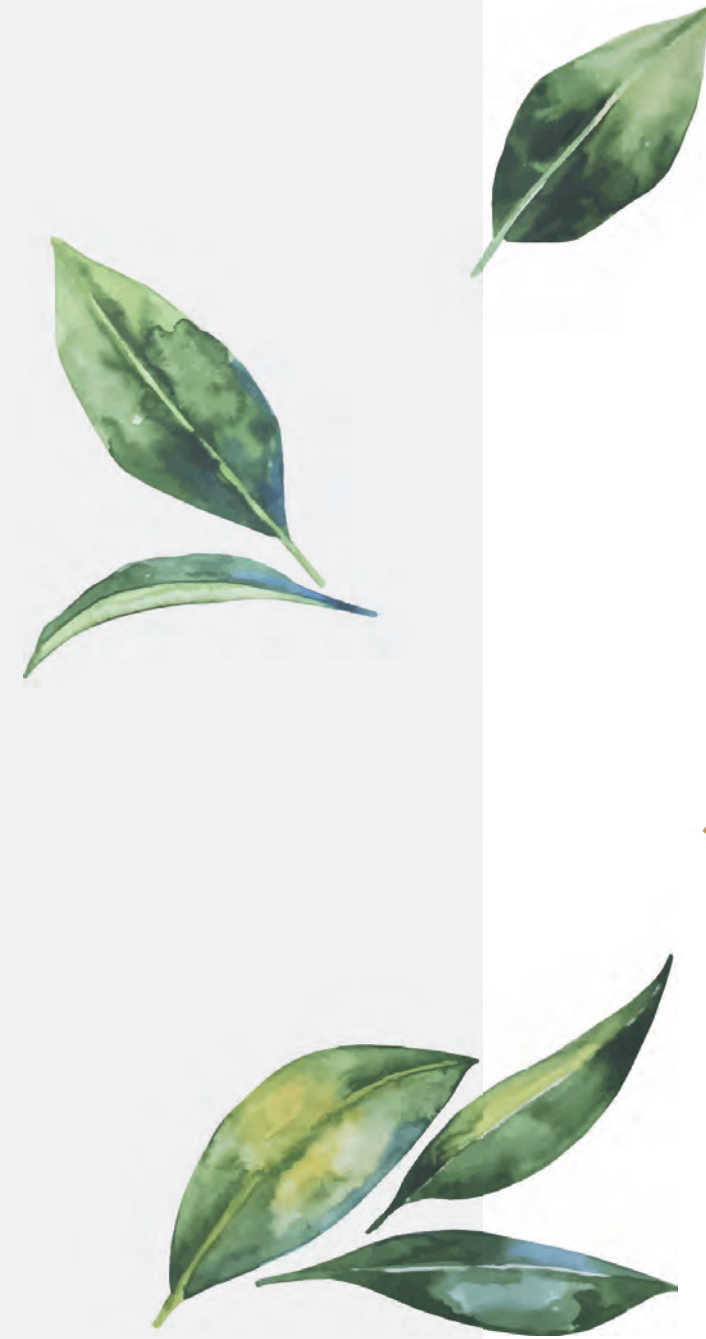
11. Is there a difference when working with plants that bear fruits or vegetables as opposed to plants that do not? What kind of plants do you prefer to grow and why?

There is definitely a difference--for one, fruiting plants and veg usually must be grown outdoors. They require a lot more care and attention than ornamental or houseplants--they need frequent waterings, they have a seasonal planting schedule, and they need to be fertilized and checked for pests often. Because of this, it is so rewarding when I actually get to harvest my productive crops however! I grow greens, peppers, herbs, and tomatoes in my garden and I have a lemon tree that I put outside every summer. I do not have any edible plants as houseplants though.



“ATTACHMENT IS A SENSORY EXPERIENCE”

- Anonymous



SITE DOCUMENTATION

LOCUST ON THE PARK



Previously known as the Lanston Monotype building, the site was the house of the Lanston Monotype factory

The building was originally a five-story brick structure of 200,000 square-feet that housed making, letter drafting, tooling, assembling, milling, casting, inspection, engineering and training facilities

Today the only remainders of the Philadelphia Monotype factory are the stone letters over the door

First built in 1912 as Lanston Monotype building, it was later redeveloped into Locust on the park in 1999 by Dranoff properties, which offers residential condominium units

Currently, Locust on the Park has 152 loft apartments impressive views of the waterfront and University City

201 S 25TH STREET, PHILADELPHIA

2 part building with 6 to 8 floors

272, 000 sq.ft

Situated along the Schuylkill river park and diagonally opposite to the Schuylkill Community garden

Column structure with Brick and Stone facade

Registered as National historic site



**Preservation in Action:
Locust on the Park**

The \$24-million redevelopment of the historic National Publishing Company Building has created over 200 construction jobs, as it transforms a vacant book bindery into a revitalized residential hub and helps boost the city's tax base. Built in 1912 with a 1919 addition, and known originally as the Lanston Monotype Building, Locust on the Park will consist of 152 luxury apartments, the first new large-scale rental building introduced in Center City in a decade.

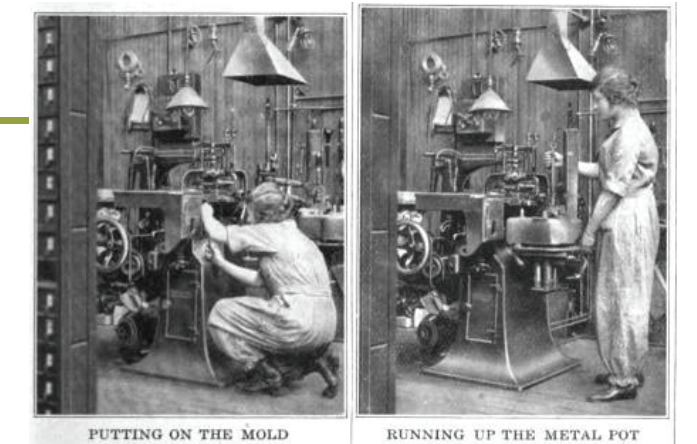
A combination of Philadelphia's office conversion tax abatement and federal rehabilitation tax credits made developer Carl Dranoff's vision of urban renaissance a reality. Philadelphia's 10-year tax abatement ordinance helped Dranoff Properties to secure financing to purchase the building. Under the 1997 ordinance, an older office building converted to residential use is taxed only on its assessed value before improvements are made. After a decade, the property is reassessed and taxed fully.

In addition to the local tax abatement, Dranoff utilized federal tax credits that provide a 20 percent tax credit for the rehabilitation of income-producing historic buildings. Locust on the Park qualified for the credits because the property is listed on the National Register of Historic Places and the rehabilitation met the standards outlined by the National Park Service.

Throughout much of his career, Dranoff has specialized in the adaptive reuse of historic buildings using the federal rehabilitation tax credits. As president of Historic Landmarks for Living during the 1980s, Dranoff developed 69 historic properties throughout the East and the Midwest with a combined value of nearly \$500 million.

Upon completion, Locust on the Park, located at 25th and Locust streets, will house high-income "knowledge workers" seeking the convenience and vitality of in-town living.

"The availability of rehabilitation tax credits and the amount of vacant historic buildings in Philadelphia are the key factors behind the growing investment in the city's rental housing market. No other city in America, with the possible exception of Boston and New York, has such an abundance of potential adaptive reuse projects." Carl Dranoff



LOCATION



RESIDENTIAL



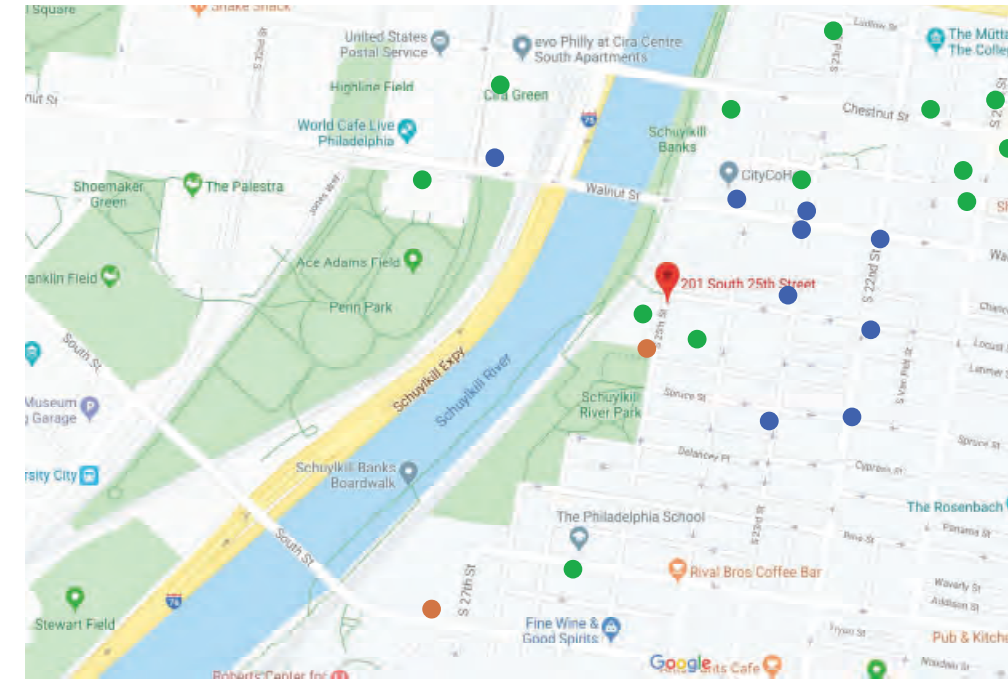
COMMERCIAL



EDUCATIONAL



TRANSPORT



- BIKE SHARE
- SEPTA TRAIN, BUS STOP
- CAR PARKING



Schuylkill river Biking trail connects cyclers and pedestrians to site

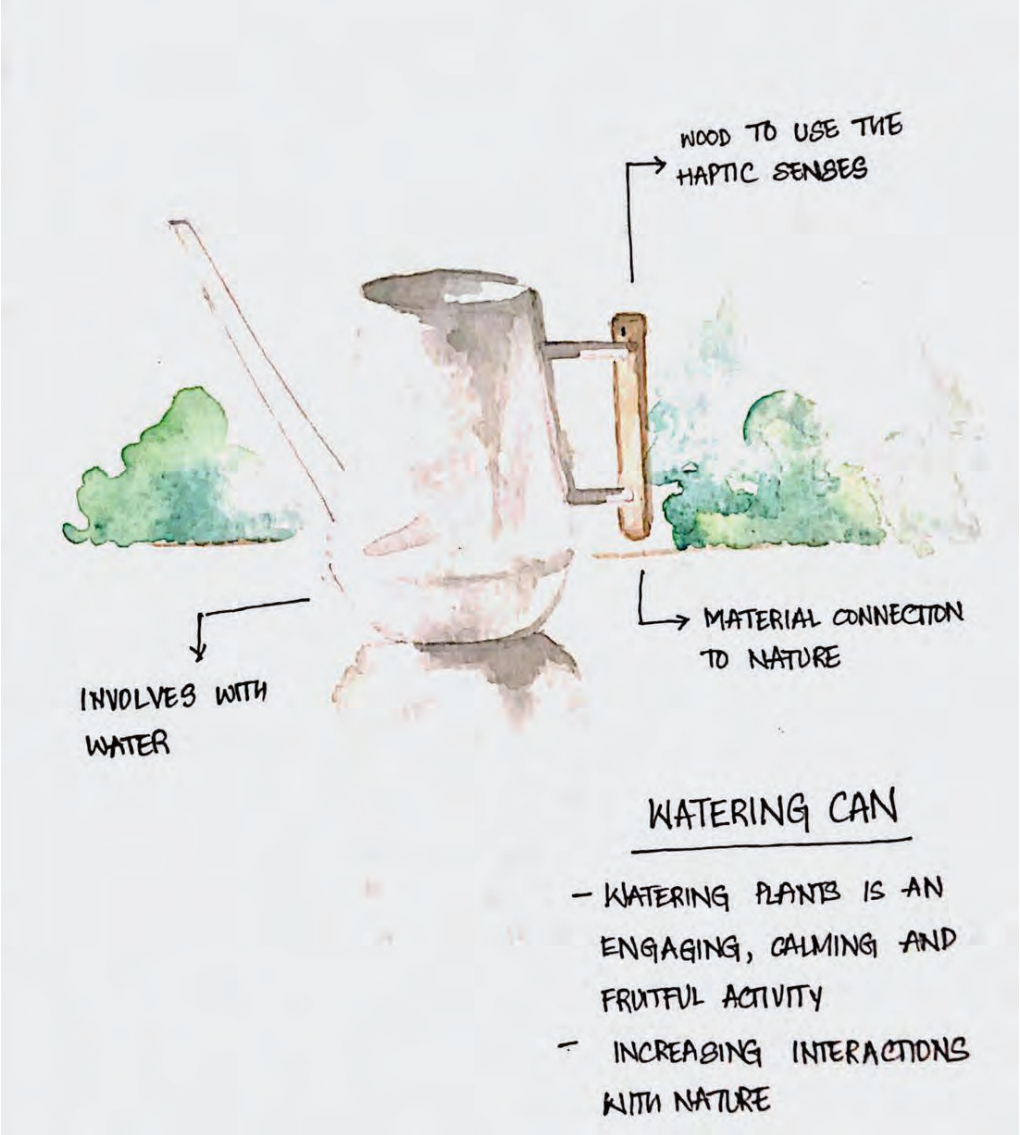


Limited on-site parking
Parking sites available



Within 10-15 minutes via
Septa buses, subway from
key locations

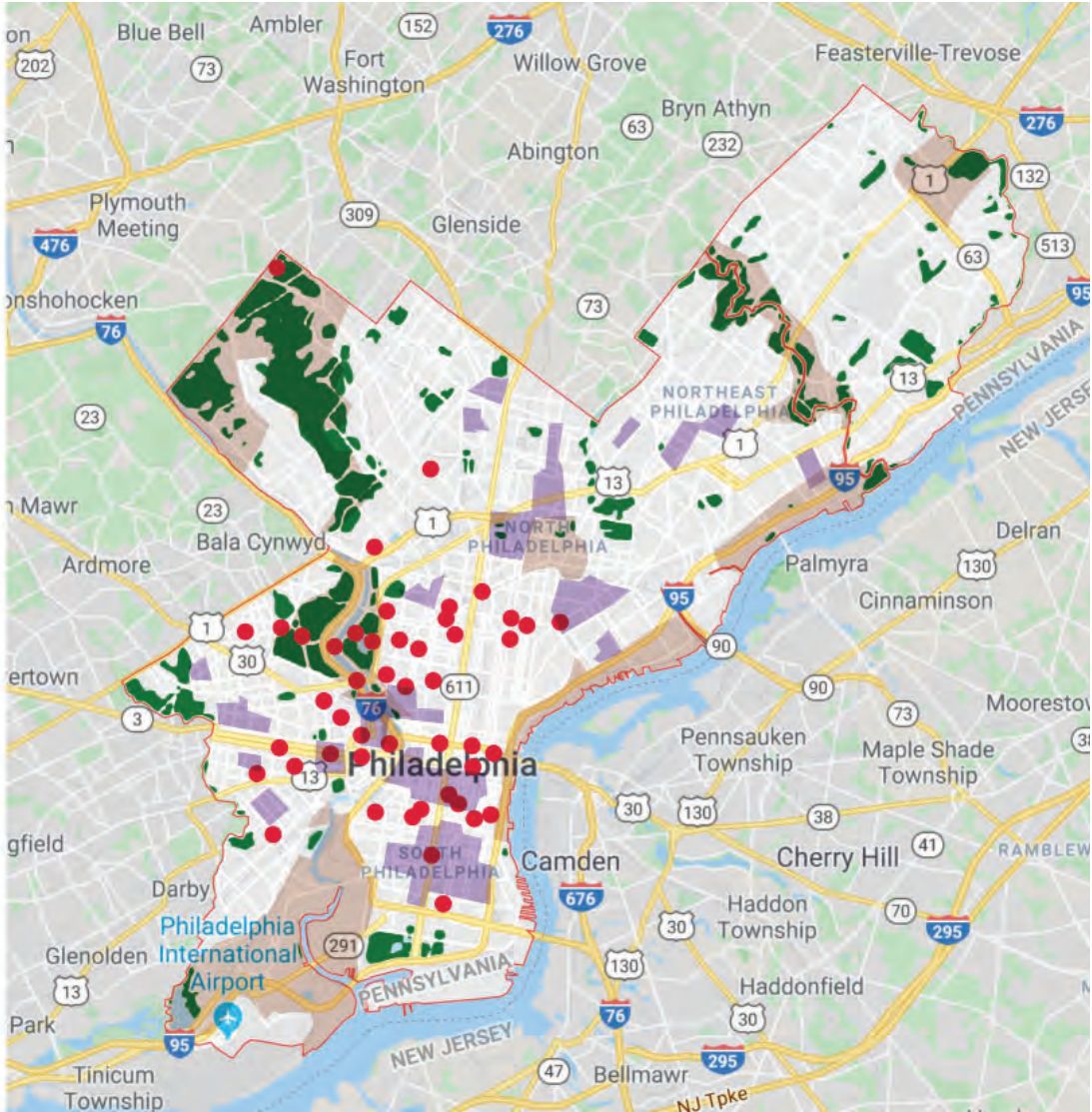
DESIGN PROBE: SCALE



HUMAN SCALE

MAPPING: GARDENS, GREEN SPACES PHILADELPHIA

Aishwarya Rekha Gunta



CITY SCALE



CONCEPTUAL COLLAGE



PROGRAM

PROGRAM

LEARNING

SOCIALIZING

SHARING

MENTAL HEALTH

PHYSICAL HEALTH

NATURE EXPERIENCES
5973 sq.ft

RETAIL
1745 sq.ft

COMMUNITY SPACES
10721 sq.ft

WORKSPACES
2792 sq.ft

COOKING+ DINING
5230 sq.ft

SUPPORT AREAS
2276 sq.ft

Description	Quantity	Sq. Ft	Total Sq. Ft
NATURE CENTRIC EXP			5973
Sensory garden	1	2200	2200
Butterfly Park	1	630	630
Hydroponic Lab	1	1350	1350
Mushroom Cove	1	620	620
Zen Gardens	2	105	210
Wind Chimes	1	423	423
Indoor Garden	1	540	540
RETAIL			1745
Urban Grove store	1	1520	1520
Herb store/Bakery	1	225	225
COOKING+DINING			5230
Outdoor Café	1	540	540
Indoor Café	1	300	300
Food Hall	1	1330	1330
Community Kitchen	1	1700	1700
Juice Bar	1	1360	1360
COMMUNITY/SOCIAL SPACES			10721
Kids Play zone	1	740	740
Lounge 1	1	780	780
Gym	1	2270	2270
Yoga Space	1	506	506
Lounge 3	1	580	580
Lounge 4	1	250	250
Event Space	1	635	635
Coat check	1	250	250
Reception	1	670	670
Gaming zone	1	210	210
Library	1	1470	1470
Elevator Lounge	1	300	300
Lounges 2	1	2800	2800
SUPPORT AREAS			2276
Restrooms	2	52	104
Public restroom	1	50	50
Restrooms 2	2	52	104
Unisex Toilet rooms	2	40	80
Dishwasher room	1	113	113
Pantry	1	115	115
Elevator 2	2	80	160
Elevator	2	150	300
Retail Storage room	1	150	150
Central Stair	2	550	1100
WORKSPACES			2792
Team Spaces	3	124	372
Quiet zone	1	460	460
Workspace Lounge	1	625	625
Co-working spaces	1	430	430
Team Dedicated seats	1	655	655
Office Reception	1	250	250

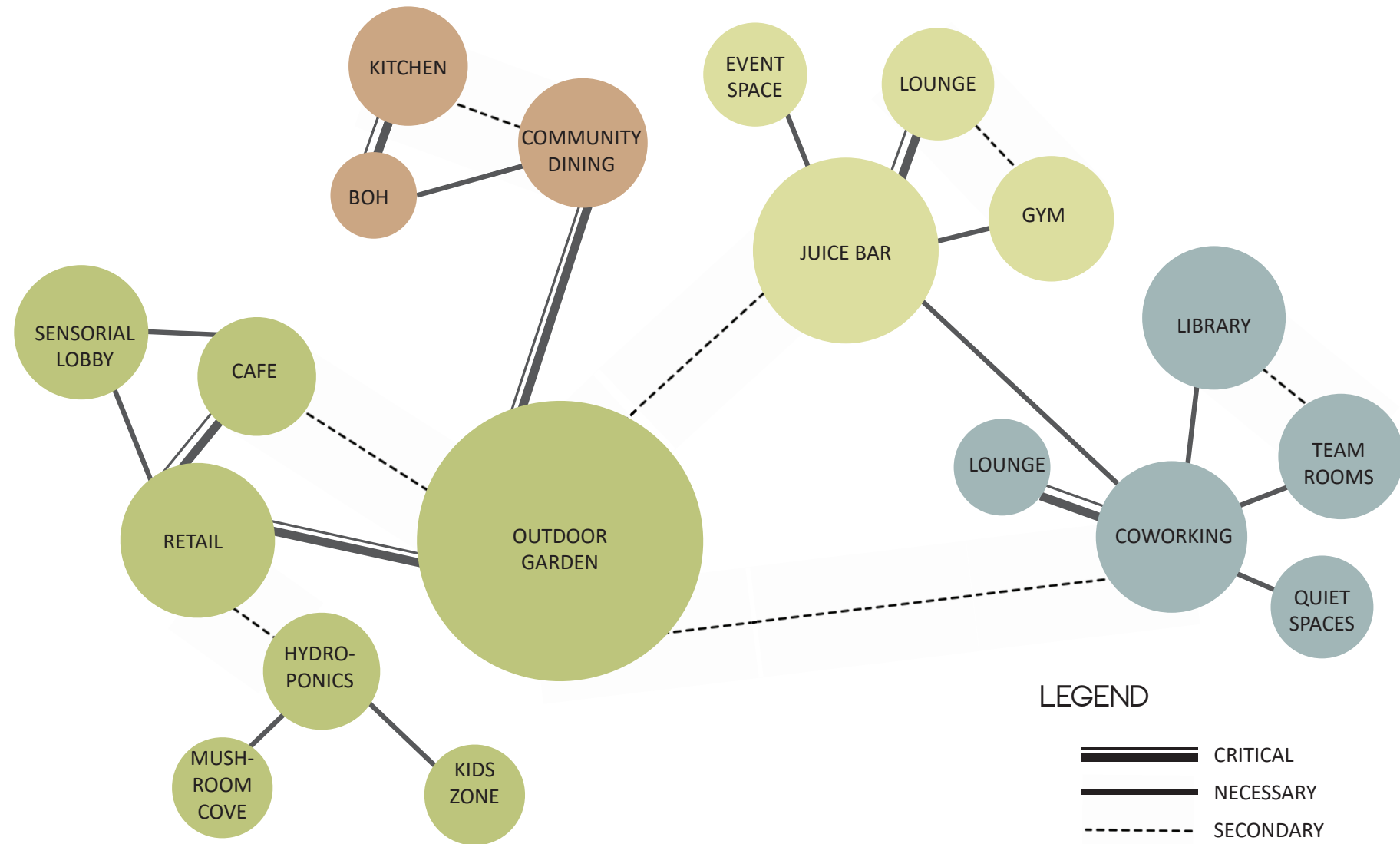
Total Area 29477 sq.ft
Total Area with circulation 30% 38,320 sq.ft

CRITERIA MATRIX

- Immediate Adjacent
- * Reasonably Adjacent
- Unimportant Adjacency
- Undesired Adjacency

	SQ. FOOTAGE	ADJACENCIES	PUBLIC ACCESS	DAYLIGHT/VIEW	PRIVACY	PLUMBING	SPECIAL EQUIP	PLUMBING	REMARKS
1. Indoor Garden	3500	2.3.6.	Y	Y	L	Y		N	
2. Outdoor Garden	8000	3.7.8.1.	Y	Y	L	Y		Y	
3. Kids Zone	500	2.1.10.	Y	Y	M			N	Strict supervision of staff
4. Exhibit Space	500	5.	Y		M			N	
5. Gathering Space	500	6.7.	Y		L			N	
6. Retail	2000	1.5.7.	Y	Y	L			N	Street view advantageous
7. Cafe	1000	2.5.6.	Y	Y	L	Y		Y	Street view advantageous
8. Community Dining	1000	2.9.	N	Y	L	Y	Y	Y	
9. BOH	400	8.	N		H	Y		Y	
10. Classrooms	2000	2.1.10.	Y	Y	M		Y	N	
11. Lecture room	700	3.	N		M		Y	N	Under supervision of staff
12. Library	700	13.	Y	Y	L			N	
13. Innovation Lounge	400	12.14.	N		M		Y	N	
14. Coworking space	700	13.17.	Y	Y	L		Y	N	Controlled access using keycards
15. Meeting rooms	750	16.	N	Y	H			N	
16. Offices	720	15.	N	Y	H			N	
17. Break Area	200	14.	N	Y	L	Y	Y	Y	

BUBBLE DIAGRAM



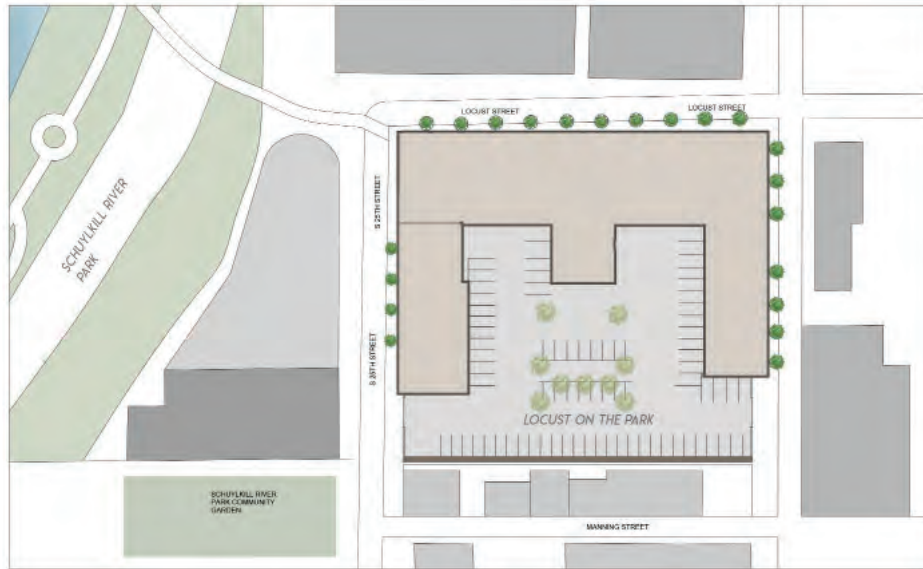
DESIGN STRATEGY



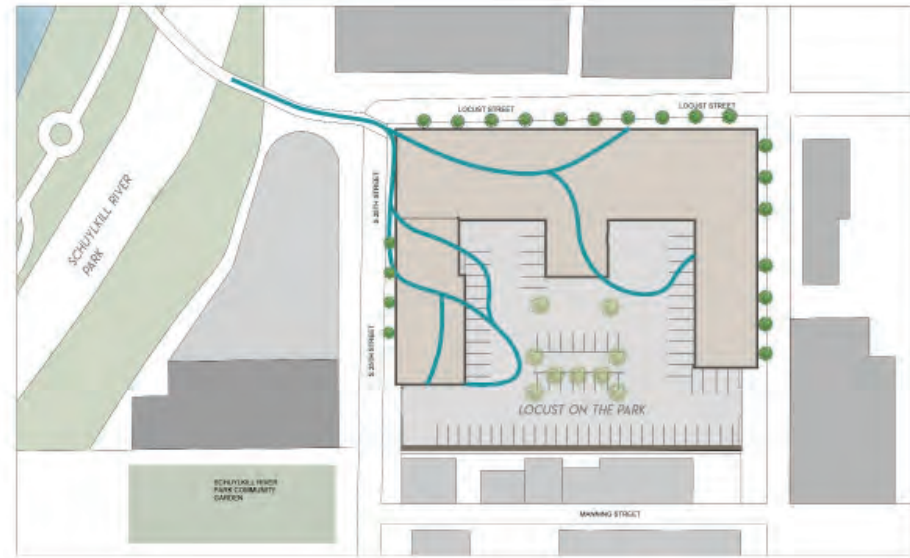
The purpose of the Rooted Community center is to provide city inhabitants a wide range of spaces that encourage conscious and subconscious interactions with nature through settings that are conducive of learning, sharing, and socializing. Further, it will promote healthier physical and mental lifestyles by reconnecting people with nature and creating a strong sense of community.



PRELIMINARY DESIGN



EXISTING SITE PLAN
Scale: 1/128" = 1' 0"

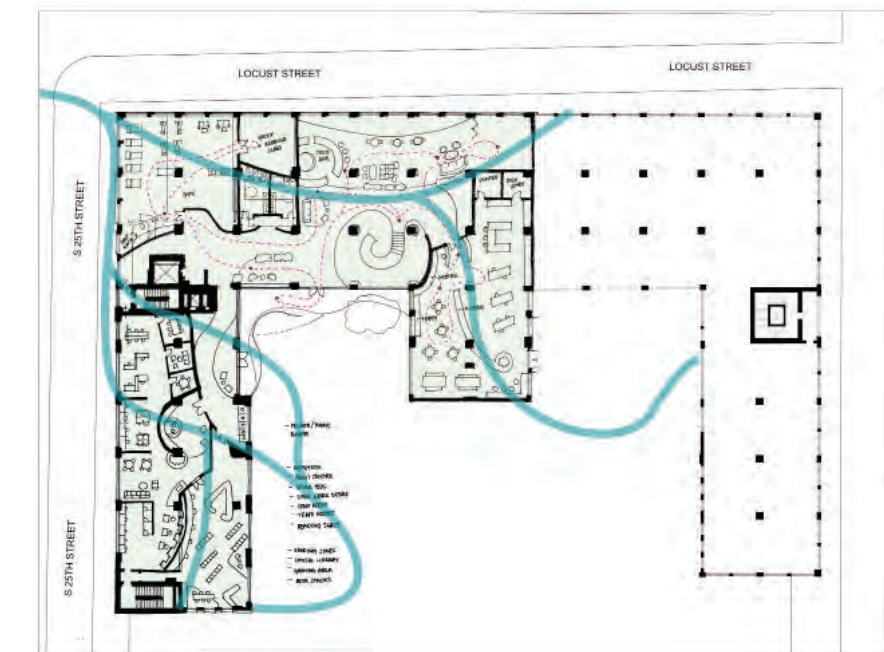
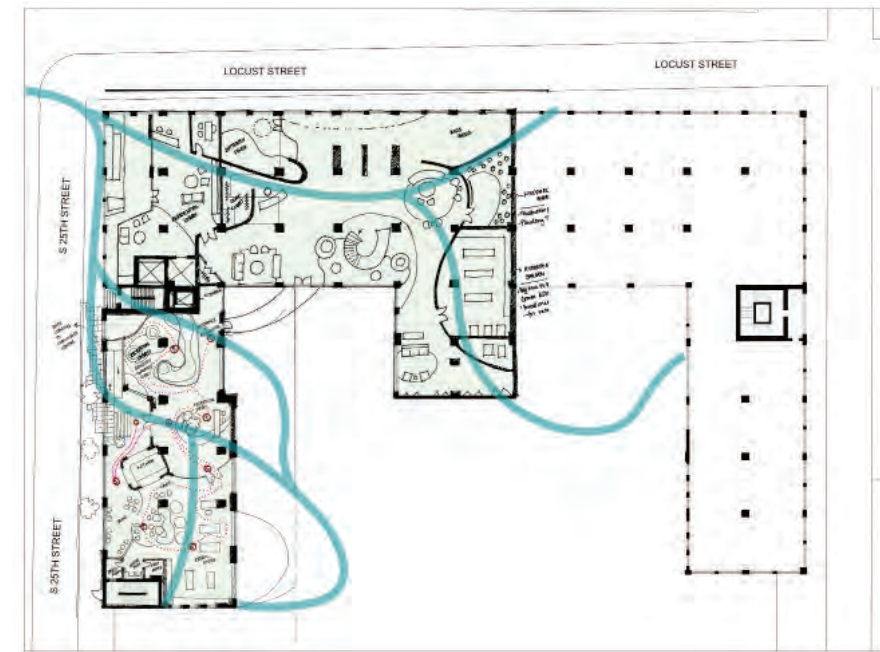
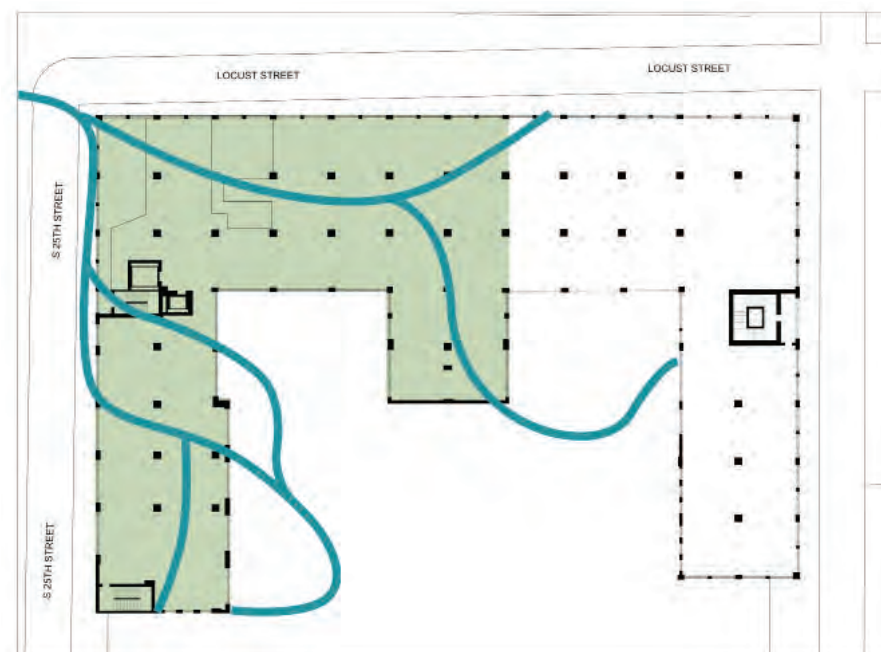
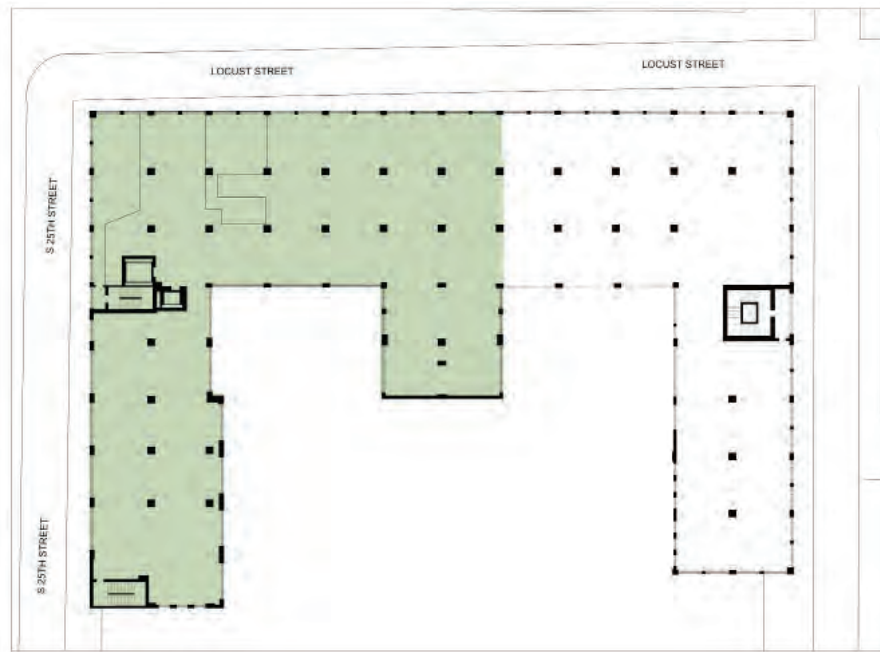


PARTI PLAN
Scale: 1/128" = 1' 0"



NEW SITE PLAN
Scale: 1/128" = 1' 0"

At this scale, connections were drawn to the center, through a directional parti that branches off like roots of a tree, also symbolizing the river distributing into multiple streams. A Belgian block paving is incorporated from the Schuylkill river trail to the Rooted Center, gently leading people towards it. The paving starts off in a linear, rigid pattern and grows more organic as one moves towards the site.



FIRST FLOOR PLAN

SECOND FLOOR PLAN



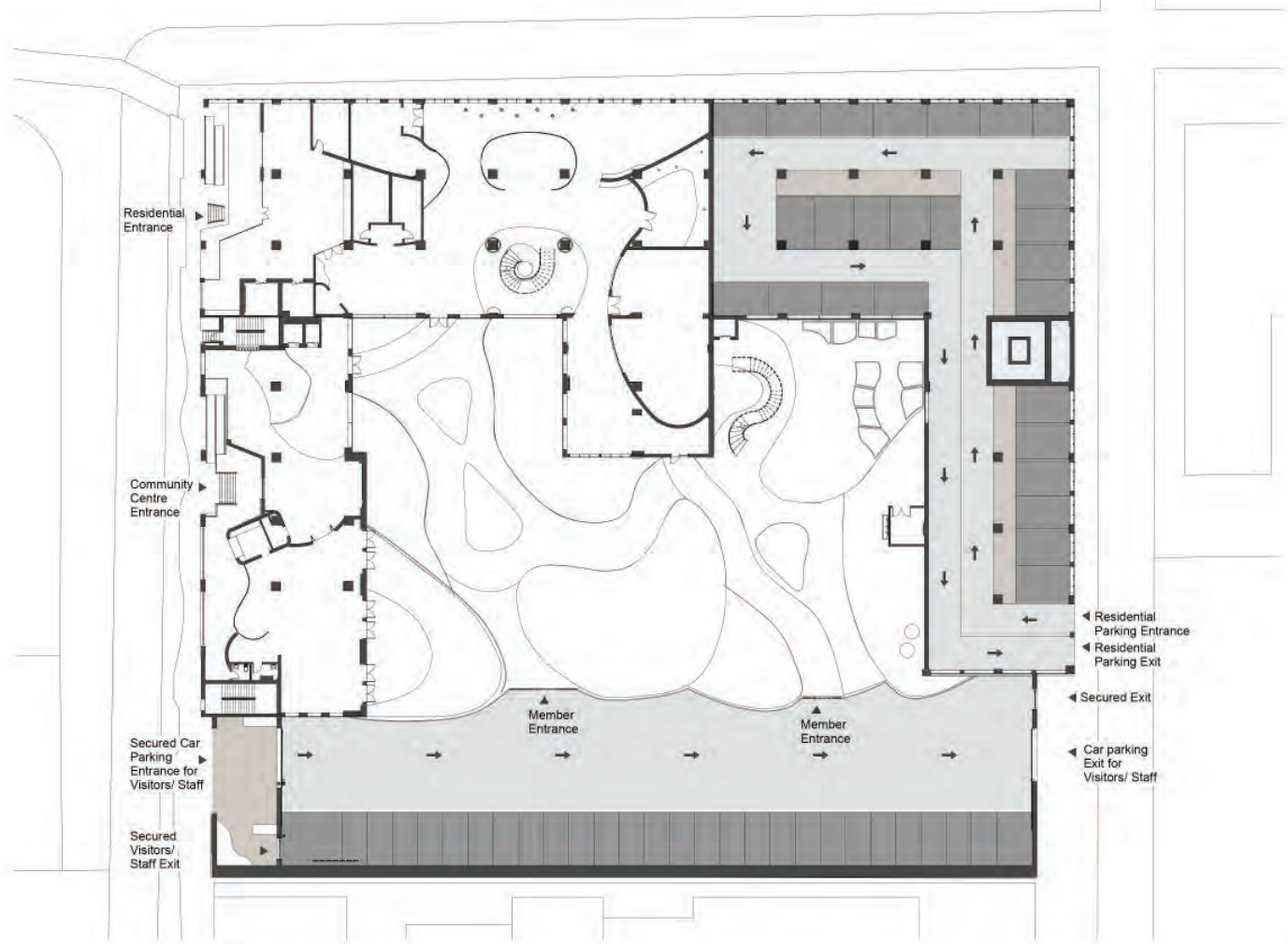
The center occupies portions of the first and the second floors of this building. It is zoned off into some major spaces using the parti, resulting in organic and harmonious curves in place of its rigid linear walls.

PROGRAM-IN-SITE



- COMMUNITY SPACES
- COOKING + DINING
- RETAIL
- WORKSPACES
- SUPPORT SPACES

PARKING & ENTRANCE DIAGRAM



FIRST FLOOR PLAN
Not to Scale

CONCEPT SKETCHES



OUTDOOR GARDENS



COMMUNITY KITCHEN



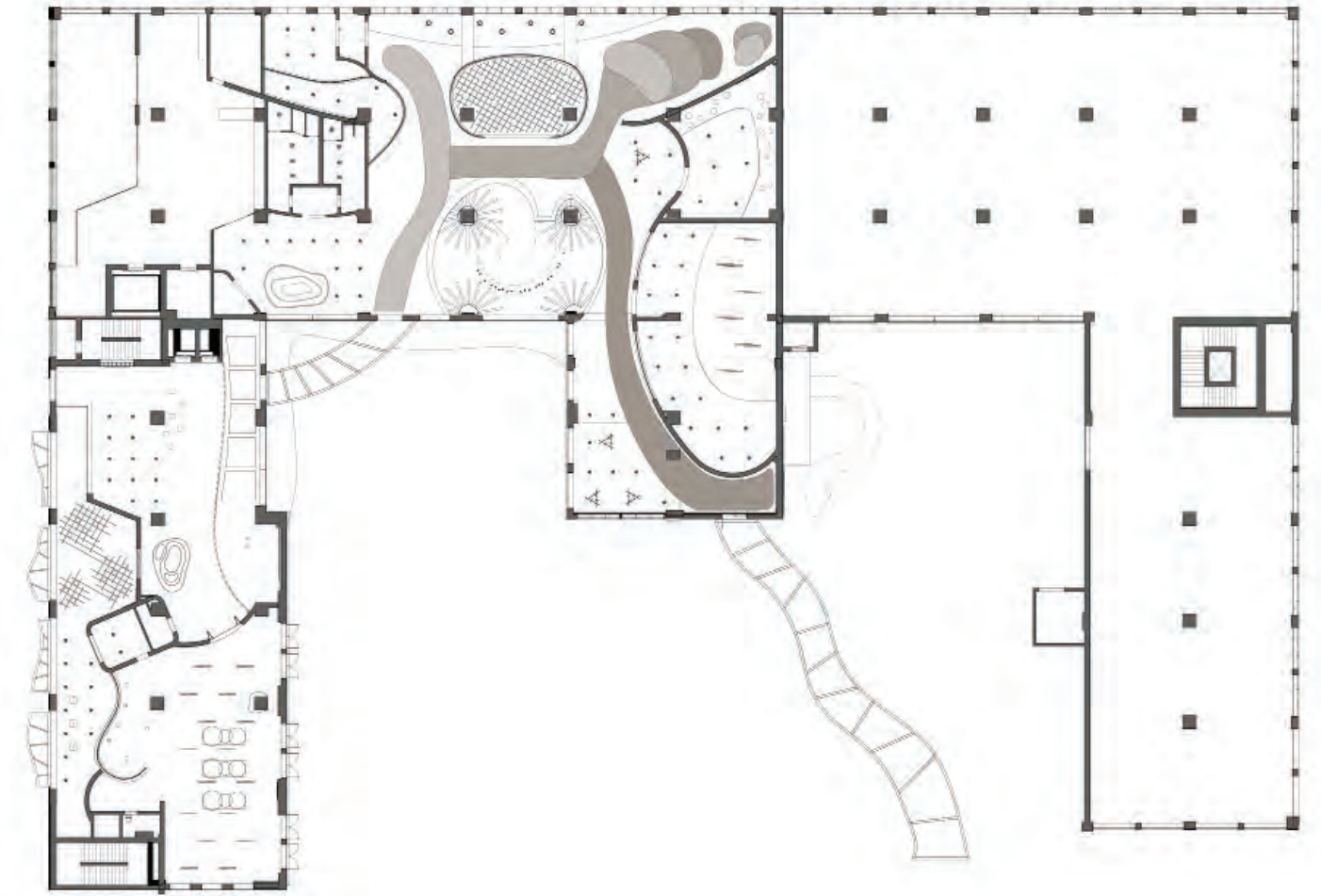
FINAL DESIGN

The first floor houses many of the activities that are centered around visitors' engagement with nature. The place is designed to take one on a journey of curiosity and mystery that also translates to the activities inside. One is captured by the glimpses they get of the upcoming areas as they navigate. The lush greenery in the Urban Grove when in the Outdoor Cafe; the view of the bustling Outdoor Garden when in the Urban Grove; a taste of the bountiful harvest when in the Sensorial Lobby and a peek of the floor above with the use of the majestic tree-like columns.



WAYFINDING STRATEGY

Acoustic ceiling clouds, equipped with cove lighting are suspended at different height as a subtle method of wayfinding, gently leading visitors to all the activities in the different corners, without overpowering the engaging activities in the floor plane.



FIRST FLOOR RCP
Scale: 3/128" = 1'0"



MAIN ENTRANCE & OUTDOOR CAFE

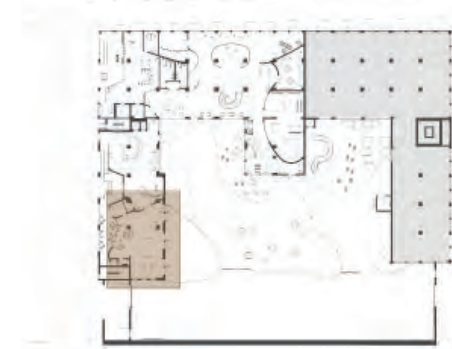


SENSORY LOBBY

The sensory lobby is designed to engage one's sense of touch, taste, smell, sight and sound, giving visitors a glimpse of the experiences to come.



URBAN GROVE STORE



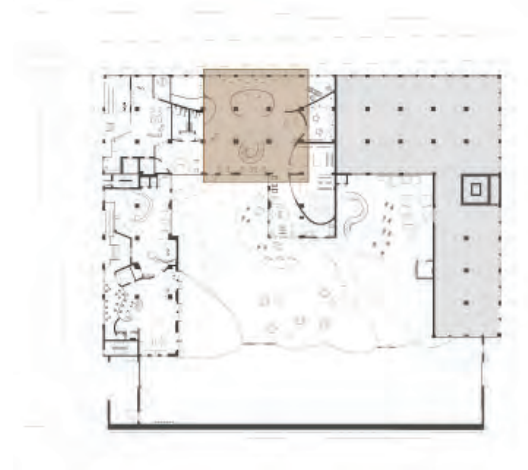
Urban grove, is a retail store that specializes in vegetative, decorative and companion plants that visitors can learn more about and take home to grow inside their own homes and yards. The outdoor area, houses a vast collection of plants and garden accessories, which is bound by a waist-high organic fence.

The store is also connected to the cafe area, allowing visitors to be surrounded by the lush greenery while they grab a drink in the shade and breathe in the fresh air.





CENTRAL LOBBY



Upon entering the central space, visitors are met with a grand spiral staircase that winds around an enormous locust tree. Surrounding the stair are wooden column covers that mimic the trunk of a tree, that bring a sense of monumentality to the lobby and lead one's eyes upward. The bases of their trunks disappear into the floor plane and appear as if springing from the earth below.

Through the first floor, materials are chosen to mimic the outdoors; fabrics with natural content, deep, rich, wood flooring, a color palette of green, blue and brown.





SECTION A-A
Not to Scale





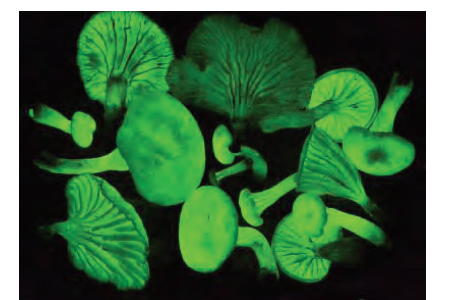
MUSHROOM COVE

Mushrooms, a type of fungi, are an ancient source of nutrition and differ from plants in that they do not sunlight to grow. Mushrooms can be grown indoors from using just tree logs and mushroom spore plugs.

They require a cool, dark and damp place to flourish. Here, visitors can take a guided tour of the mushroom cove, learn about 50 different species of mushrooms, go on a mushroom forage, and partake in a glow in the dark mushroom show



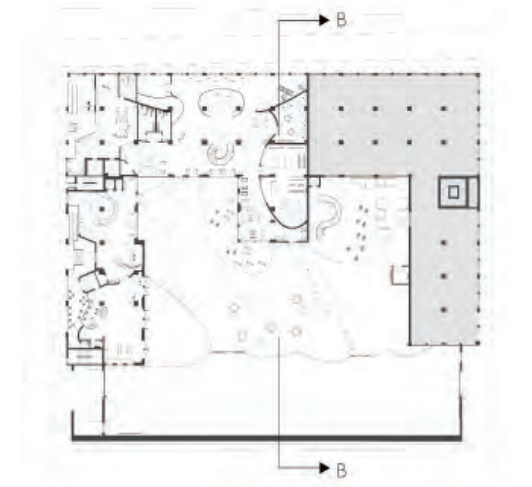
AT-HOME MUSHROOM KIT



GLOW-IN-THE-DARK MUSHROOMS



SECTION B-B
Not to Scale



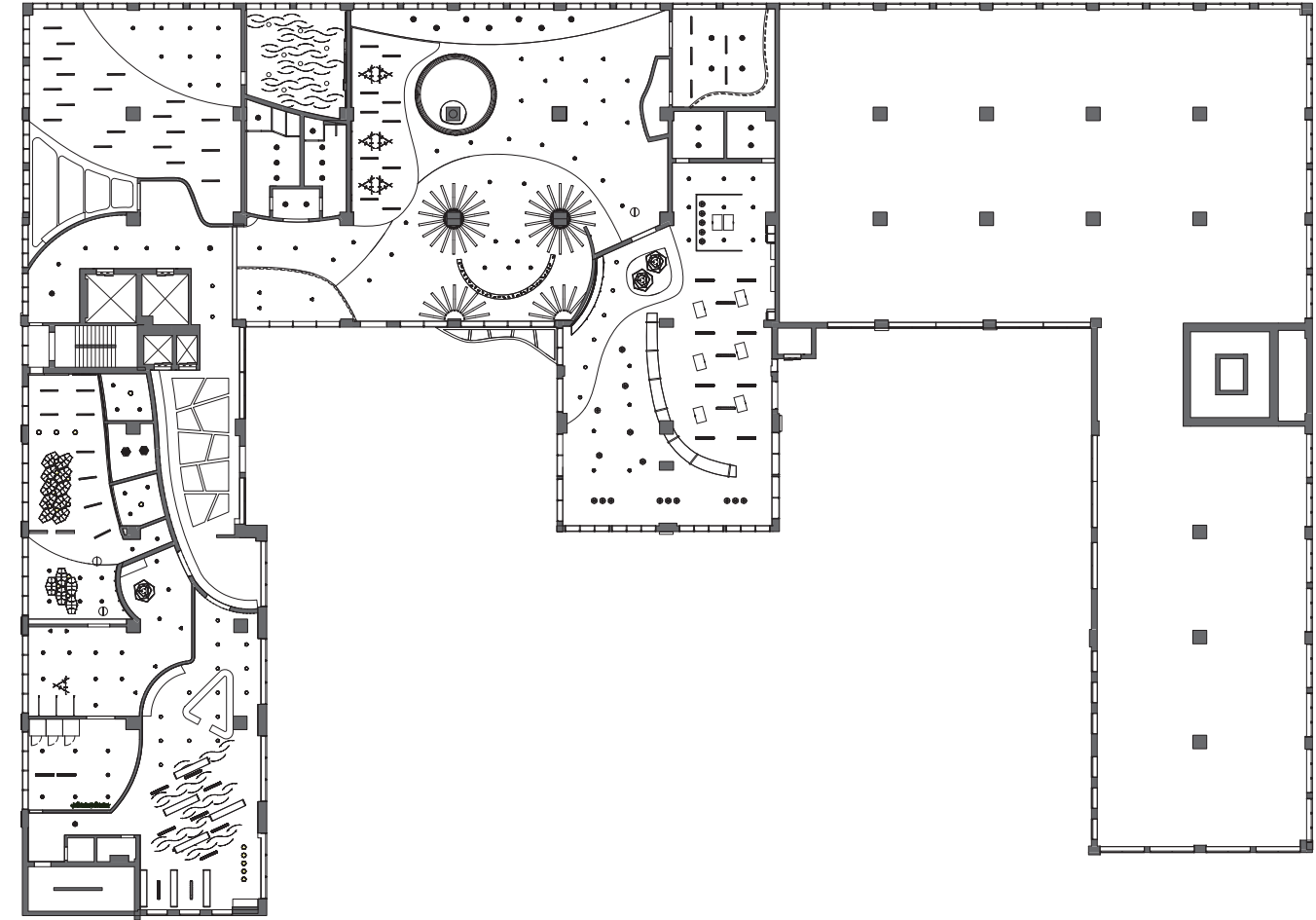


The second floor consists of activities that one performs on a regular basis and is designed for the regular use of the community center members and residents of the apartment complex. It provides access to catwalks that serve as an opportunity for one to step outside, take in the weather, immerse themselves in the treetops, and feel connected to the outdoors without having to exit the floor



ACOUSTICS STRATEGY

Ceilings are dropped above areas of conversation to create a more cosy atmosphere and create intimate spaces. Acoustic ceiling forms are used in the Gym, Yoga, Office and Library areas to control the noise to provide regular members the optimal conditions to perform daily activities.



SECOND FLOOR RCP

Scale: 3/128" = 1'0"



JUICE BAR & LOBBY



The central space is a juice bar and lobby area that people can use to rejuvenate through the day from any of the activities they are engaged in. The juice bar serves health drinks by day and specialty cocktails by night for people to unwind.

The 'slice' opening in the floor here creates another direct connection to the activities downstairs. The wind chimes hung from the ceiling of the second floor further this connection through their auditory input. A Tea Island invites one to self-serve tasting of teas created from the garden harvest.





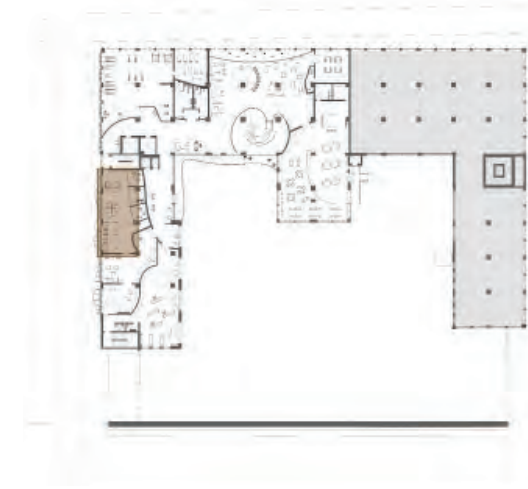
YOGA &
MEDITATION SPACE



Physical and mental health have strong interconnections and need to be exercised for our overall wellbeing. The Bloom fitness center along with the yoga and meditation space provides settings for users to activate their body, mind and soul with direct views to the Schuylkill park and river. Views to the nature can boost our mood, lower perceived exertion, and reduce stress.



ROOTED CO-WORKING SPACE



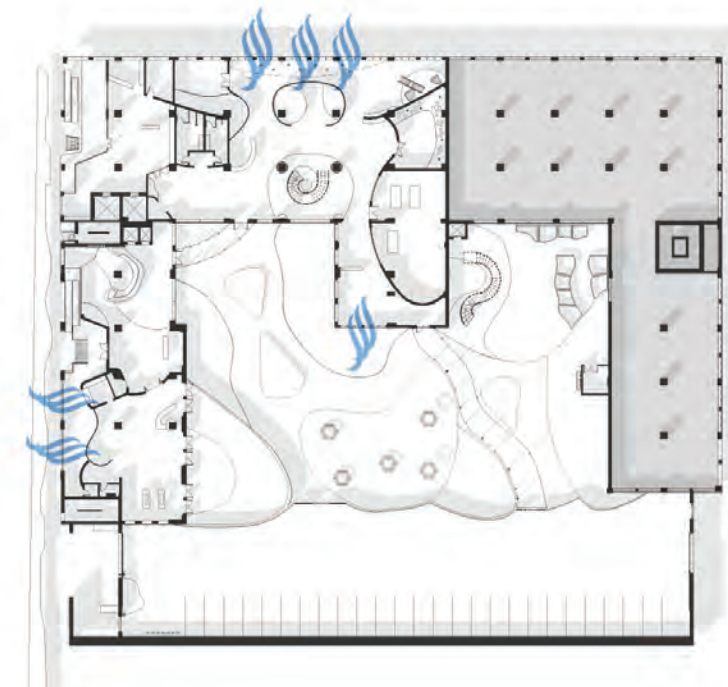
The second floor is much quieter compared to the first floor, especially as people move away from the central area, allowing users to focus and concentrate. The Rooted coworking space consists of a lobby, heads down quiet spaces, coworking areas, team and conference room. The west facing windows give users access to the window planters on the outside.

Members can book their spot to sit by these windows, water them on a regular basis, watch them grow and change through the various seasons. They can chat with their co-mates regarding them and interact with the Urban Grove below for curating their own unique planter landscapes, thus creating an attachment with nature, place, and community.

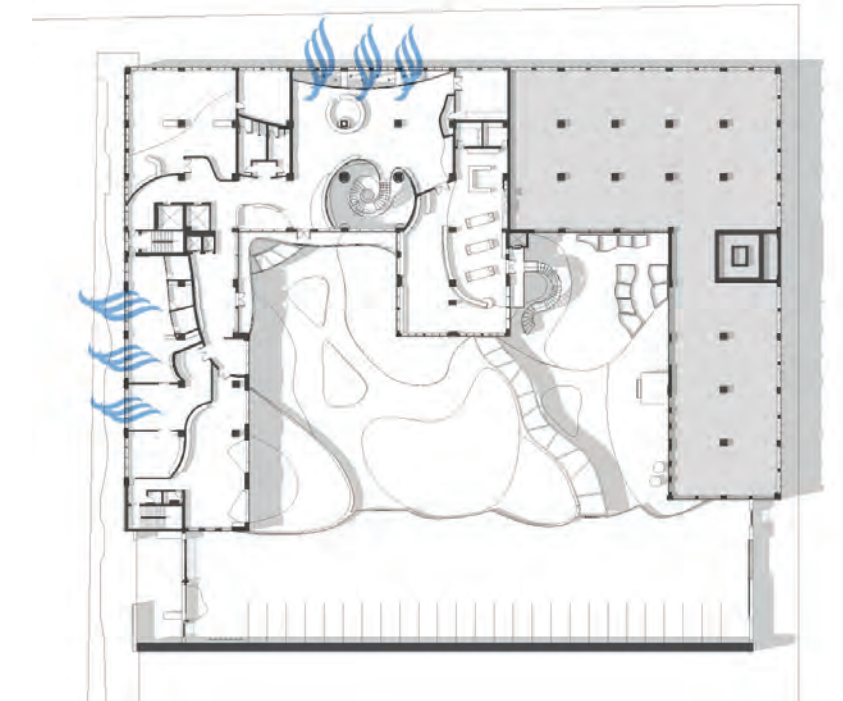


FENESTRATION PLANS

Throughout the Center, selected windows on the first and second floors are casement fixtures, and so are operable allowing for the choice of thermal and airflow variability.



FIRST FLOOR FENESTRATION PLAN



SECOND FLOOR FENESTRATION PLAN



COMMUNITY KITCHEN & DINING HALL



The community kitchen and dining hall are situated together in an open plan and are divided by a custom buffet station. The dining hall also has a connected retail section where one can buy fresh herbs, baked goods or rooted memorabilia.

In the kitchen, visitors can participate in group cooking classes, food awareness events, grab a quick meal through their day or indulge in surprise tasting menus. Engaging with nature on a regular basis can make us more proactive about the environment and push us to take eco-friendly decisions, thereby repairing our connections with nature.





A door from the kitchen gives access to a stair that leads one to outdoor garden area and vegetation plots. This way, members can pluck fresh herbs and vegetables for cooking; creating a powerful subconscious recognition of how our food grows and where it comes from.

After a productive and engaging day, one can rest outdoors at dusk by the fire pit, listening to crickets chirp and feeling the slow breeze. Inviting benches are laid across the outdoor garden for visitors to sit in it's different sections.

MATERIAL MATRIX

MATERIAL NAME	LEED POINTS	3rd PARTY CERTIFICATION	FIRE OR SAFETY RATING	LOW VOC	ADHESIVES	AIR QUALITY	NATURAL CONTENT	RECYCLED CONTENT	SPECIAL MAINTENANCE
Bright Cube 004 (Kvadrat)		■	■	■		■	■		■
Stainless Steel Woven Wire 20 Mesh				■		■		■	
Artificial Turf Grass	■	■		■	■	■			
Puzzle Bozed Edge Olive Galaxy 0108 (Kvadrat)		■	■	■		■			■
Poured Concrete Floor			■	■		■	■	■	
Erica Tanov Cement tile			■	■	■	■			■
Burke décor Mushroom city wallpaper			■			■	■		■
Hardwood Flooring									
Seaport Tapacio Ceramic tile			■	■	■				■
Bright Cube (Kvadrat) 004		■	■	■		■	■	■	■
Terracotta metal (Bridger Steel)		■	■	■		■		■	■
Dust 3form resin	■		■	■	■	■		■	■
Messenger 5 acoustic (Kvadrat)	■	■	■	■		■	■	■	■
Shaw Contract Community Argan 01100	■	■	■	■	■			■	■
Layers Garden 003 (Kvadrat)		■	■	■		■	■		■
MSI River white Granite	■	■		■		■	■		



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APPENDIX

SUN STUDIES

6 AM

9 AM

12 PM

3 PM

6 PM

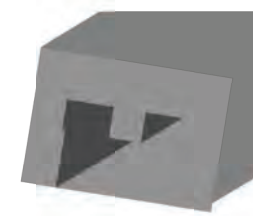
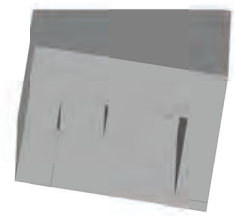
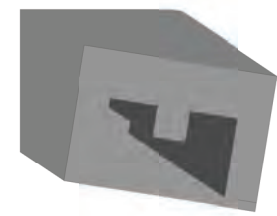
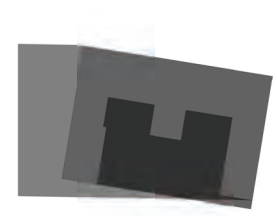
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9 AM

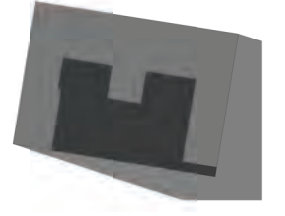
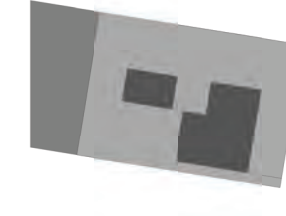
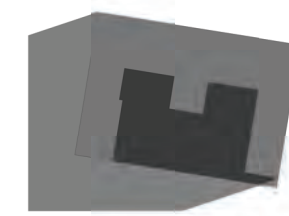
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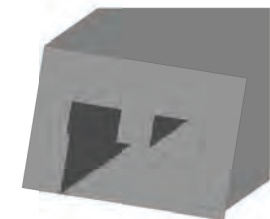
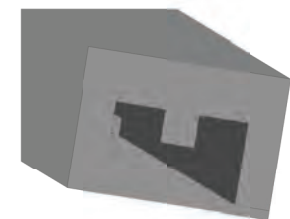
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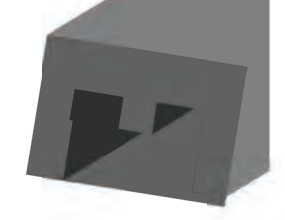
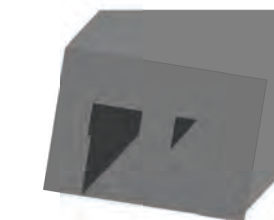
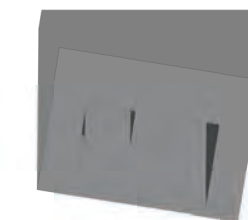
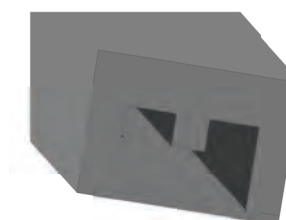
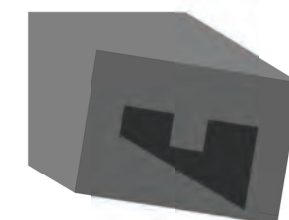
FALL EQUINOX



SUMMER SOLISTICE



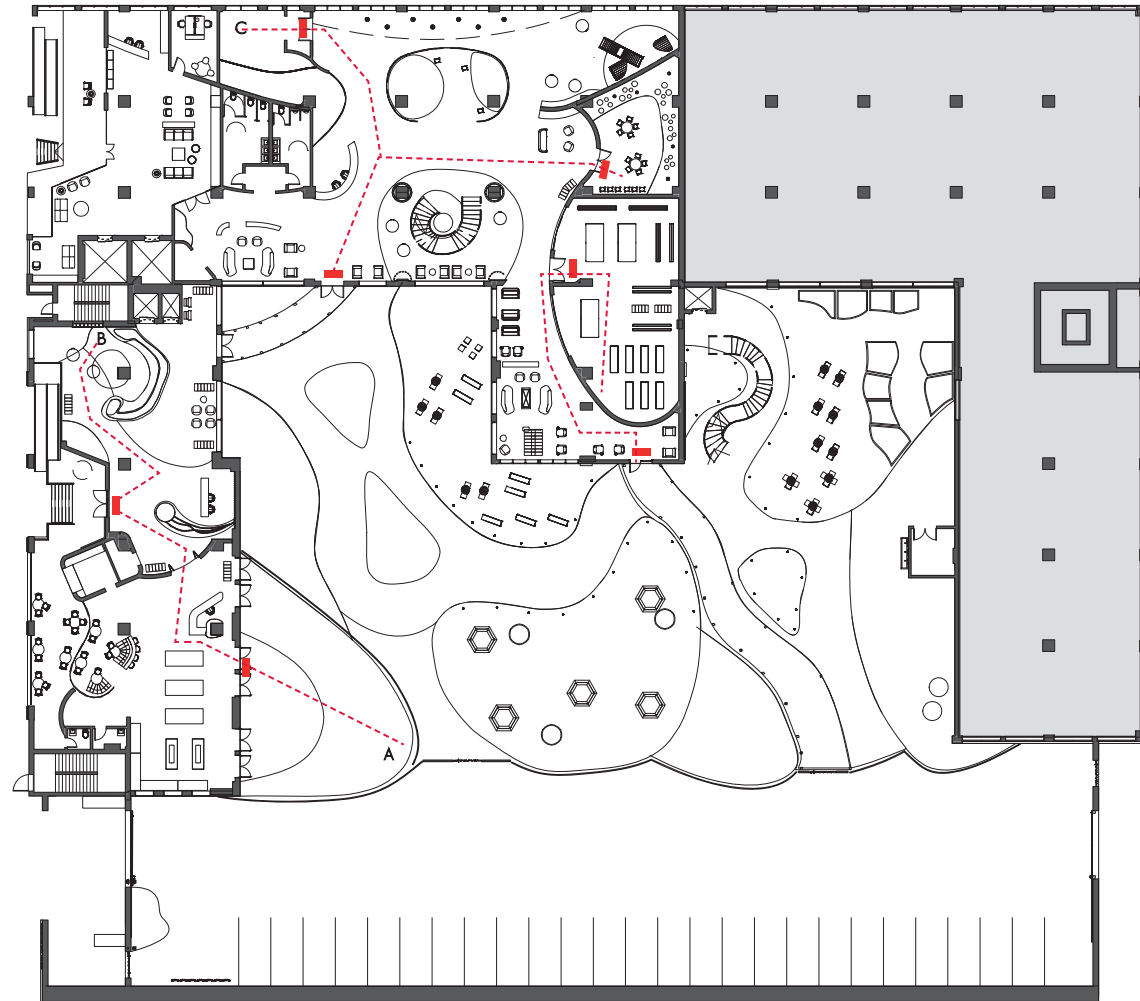
SPRING EQUINOX



WINTER SOLISTICE

CODE ANALYSIS

FIRST FLOOR



FIRST FLOOR PLAN

Scale: 1" = 50'

EGRESS PATHS

Building Classification A,B,E

Fully sprinklered: max : 250'

A - 113'

B - 62'

C - 98'

D - 103'

E - 118'

FIRE RATING REQUIREMENTS:

Automatic Sprinkler System provided

3 Hour rated EXTERIOR WALLS

2 Hour rated PARTY WALLS

1 Hour rated INTERIOR WALLS

OCCUPANCY CALCULATION:

IBC 1004.1.2

ROOM	CLASSIFICATION	SQ. FT	LOAD FACTOR	OCCUPANCY
Cafe	A	840	30	28
Retail Space	A	1520	50	31
Sensory Lobby	A	2200	50	44
Lounges	A	3080	50	61
Hydroponic Lab	E	1350	200	7
Butterfly Park	E	630	100	6
Mushroom Cove	E	620	100	6
Kids zone	A	740	50	14

TOTAL OCCUPANCY LOAD = 197

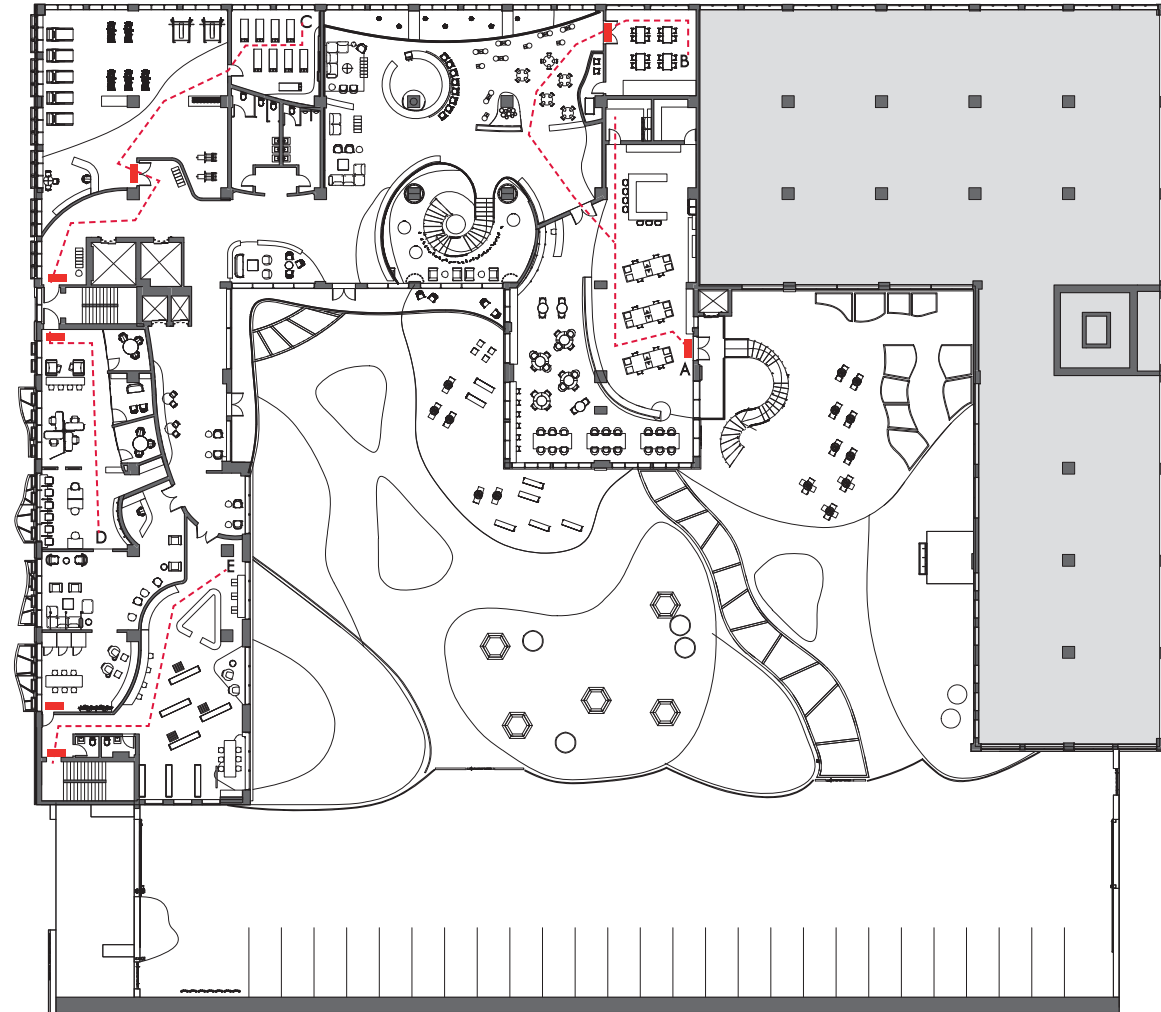
PLUMBING FIXTURES:

Philadelphia Plumbing Code 2019

	REQUIRED	PROVIDED
Water closets	4	5
Urinals	2	2
Lavatories	4	8
Drinking fountains	1	2

CODE ANALYSIS

SECOND FLOOR



SECOND FLOOR PLAN

Scale: 1" = 50'

EGRESS PATHS

Building Classification A,B,E

Fully sprinklered: max : 250'

A - 83'

B - 138'

C - 125'

D - 65'

E - 81'

FIRE RATING REQUIREMENTS:

Automatic Sprinkler System provided

3 Hour rated EXTERIOR WALLS

2 Hour rated PARTY WALLS

1 Hour rated INTERIOR WALLS

OCCUPANCY CALCULATION:

IBC 1004.1.2

ROOM	CLASSIFICATION	SQ. FT	LOAD FACTOR	OCCUPANCY
Juice Bar	A	1360	30	45
Event Space	A	635	50	12
Gym	A	2270	50	45
Yoga Room	A	506	50	10
Community Kitchen	E	1700	150	12
Dining Hall	A	1330	40	33
Workspaces	B	2792	100	27
Library	E	1470	100	14
Lounges	A	830	50	17

TOTAL OCCUPANCY LOAD = 215

PLUMBING FIXTURES:

Philadelphia Plumbing Code 2019

	REQUIRED	PROVIDED
Water closets	6	6
Urinals	3	3
Lavatories	6	8
Drinking fountains	1	2

USER SURVEY QUESTIONS

Please choose all that apply where needed. Thank you for taking the survey.

Name of Participant:

1. On an average, how often do you go to Terrain Styers in a year?
2. What was the main purpose of your last visit to Terrain?
 - Purchase of Plants
 - Purchase of Garden tools/ accessories
 - Dining
 - Event
 - Workshop
 - Other: _____
3. What all did you engage with on your visit apart from your main purpose of visit?
 - Purchase of Plants
 - Purchase of Garden tools/ accessories
 - Dining
 - Event
 - Workshop
 - Other: _____
4. How far is the location from your place of stay?
5. What is your usual mode of transport?
 - Own car
 - Rented car
 - Uber, Lyft, Taxi
 - Bus
 - Subway
 - Other: _____
6. Have you attended or had an event at Terrain?
7. Have you attended any workshops at Terrain?
8. In a few words, what do you like about Terrain the most?
9. Would you go to a place like Terrain more often if it was close to you? (On a scale of 1 to 5, 5 = most likely)
10. What are some activities or facilities you would use if present at the location or would like to add?
 - Kids Play zone
 - Outdoor gardening zone
 - Information sessions regarding plants
 - Dance Classes
 - Other: _____
11. What is your preferred time of visit for this space? (10 am - 9 pm)
12. How long does your visit usually last?
13. Any comments about Terrain Styers and your experience?

INTERVIEW

NAME: Craig Johnson

OCCUPATION: Owner of Interpret Green, Philadelphia

He creates nature installations, interactive installation for museums, schools

- The topic is core to our survival. Access to green spaces, be it arks, garden or school yards are provided as amenities whereas they should be treated as necessities.
- Interaction with nature and time in nature is especially essential for children.
- Grades k to 5. This time is crucial as children are developing understanding of the world and are establishing what is important. More than any other time in their life, this is when they benefit from a deep connection with nature.
- Research confirms without doubt that time in nature lays a huge part in their physical, emotional and neurological development. Just like we have attention deficit disorder, there are nature deficit disorders. Neurologically humans have a dee need to connect with nature.
- He has worked with 3 different schools in different localities that have family incomes of \$18,000, \$40,000 and \$130,000 per year.
- Though the approach differs for each school, there are some key things they follow; Introducing nature play, safe outdoor play in nature rich environments. Not with excessive supervision.
- Their goal for younger children is not the acquisition of knowledge about nature but to make them fall in love with nature and community. Not operating on a cognitive level but on an emotional and spiritual level.
- The activities introduced are neighborhood dependent.
- Aim is not just to create landscapes but create habitats that allows them to see and appreciate life forms. One activity they do is bring plants and make kids re-pot them and take them home, which imparts some responsibility and empathy. This helps in

connecting nature to home.

- Many kids come from high stress backgrounds and sometimes more than activity they need sanctuary spaces to just sit and feel safe and protected which can be achieved from the various design strategies of biophilic design. Sound of birds, water, play of light.
- Another important issue is making the invisible visible to children. It is rooted in STEAM education. It is less about educating and training and more about making kids see the world in a different way. Microscopes, Telescopes, Slow motion videos, cameras. Kids once spent half an hour looking at ants coming out of ant holes.
- They have introduced bird feeders in schools with cameras inside to show kids the processes. Other ways are bird feeders, butterfly gardens and pollinator houses; welcoming children and children of all species. In an hour there were many birds at the bird feeders.
- We can't think of the world in binary terms. Domestic vs Non-domestic, Dead vs Live. Everything is connected and alive.
- Not just designing spaces as landscapes but as habitats, introducing various forms of engagement

INTERVIEW

NAME: Mark Fields

OCCUPATION: Executive Director of The Grand Opera House, Beekeeper by hobby

- He has always had gardens since he was a kid and observed how birds and animals would always come seek such an environment.
- He was asked to develop a garden in Wilmington, right on market street in the summer of 2016. His gardening options were limited in an apartment. That summer there were 16 people who raised gardens in plots and grew their own food. It was good for the image of downtown to have such a flourishing place right in the middle of buildings.
- When there was a fire in an adjacent building, he was not allowed to go ahead with his plans of creating a beehive on this garden site in Wilmington.
- After research, he installed a beehive on the roof of The Grand. It turned out to be a great place for the beehive as the building was 4 storeys high, lifting the hive from disturbances, with many plants and flowers in and around the building.
- As they are up on the building, they are also free from a lot of pests that trouble them when on the ground. The usual pests are mice, the small hive beetles, wax moths and the most destructive, varroa mites.
- In the summer of 2019, he harvested 14 pounds of honey from those beehives, which is a very productive amount. As a gratitude, he sells the honey and donates the money back to the grand.
- Two harvests can be done in a year, one in the summer and one in the Fall. The main reason they make honey is to have food when they hibernate
- There is generally no feeding required for the bees except for some water to save them from having to go in search of it. In winters, when there is a lack of food, sugar syrup is used as feed for the bees.
- people are fascinated by the idea of having bees downtown, especially on the top of a performance building.

- In the active season, he goes up to the hive at least once a week to make sure they have water and that they are healthy. Other than that, he only opens the hive once every couple of weeks as opening it too many times disrupts their act
- The entire professional gear is compulsory when handling bees or interacting with them. The gear consists of the protective suit, gloves, a veil. It is an equipment intensive hobby.

