ABSTRACT

Title of Thesis:	TESTING THE LIMITS: DC SUPERBLOCK CREATES COMMUNITY FOR EVERYONE
	Patricia Rowedder, Master of Architecture, 2019
Thesis Directed By:	Professor Julie Gabrielli and Department

Loneliness is an emotional feeling that represents disconnection. With one in five people suffering from loneliness, it has now become a public health crisis. Ranked second in the nation for loneliness, Washington DC is three times the national average. The transient nature of the greater DC population has created a negative perception of the city, causing people to either move on or move out, further influencing the population's conflict with loneliness. Such a progressive and influential city seems stuck in a stagnant pattern, not reacting to the constantly changing density, mobility, and needs of the built and non-built environment.

This thesis aims to explore the connections of ecology and psychology of architecture through a superblock typology in an effort to battle loneliness in the nation's capital. A superblock is a large-scale entity both extroverted and permeable composed of business, community, and other institutional programs, each different but overlapping in a common elements and connections.

The superblock throughout time has been given a negative connotation because of exploited failed attempts. When using the principles correctly, however, the superblock typology provides endless possibilities and solutions to connect, engage, and ignite community interaction through strategically placed nodes of space and diverse program.

If one were to create new principles that were site, culture, and health specific, could a meaningful interaction and connection through a ecoblock in DC be created?

TESTING THE LIMITS: A DC SUPERBLOCK CREATES COMMUNITY FOR EVERYONE

by

Patricia Rowedder

Thesis submitted to the Faculty of the Graduate School of the
University of Maryland, College Park, in partial fulfillment
of the requirements for the degree of
Master of Architecture
2019

Advisory Committee:
Professor Julie Gabrielli, Chair
Professor Matthew Bell

Professor Emeritus Karl DuPuy

Table of Contents

List of Figures

Chapter 1: An Introduction

Is a superblock really that bad?

The term ‘superblock,’ as well as the physical structure, has been used and misused over a long history of incorrect implementation. It’s beginnings in suburban planning sent it spiraling down the path of failure. However, there are success stories of this typology in a rich urban setting that we can use to propel our cities into a future centered around wellness and ecology.

The superblock has been an elusive term since the moment of conception and application. While rooted in urban terminology, the superblock was first defined in relation to its use in a suburban context. A superblock has been defined in many different ways over the past 75 years, but the two overlapping elements in every context are: the block is larger than average size and the connections of human mobility and vehicle mobility are adapted or modified to create better quality of human interaction.

Along with the vast collection of definitions, there has been a strong negative connotation to the term throughout history due to the failures that have been over analyzed and exploited. Chapter 2 explains the breakdown of the superblock typology rooted in an urban context and the major reasons for failed and successful superblocks. The vast misunderstandings and misconceptions of a superblock is perhaps one of the reasons why this typology could be so great to explore– the possibilities and potential this typology has when explored through a new perspective could be ground breaking. This thesis explores the connections of ecology and sociology of architecture through a superblock typology in an effort to battle loneliness in the nation's capital.

Why DC?

Washington DC is ranked second in the country for loneliness.[1] Closely behind Las Vegas, one might wonder why out of all the cities in the US, DC comes so close to the top. It might seem astonishing or perhaps sad, at first, but a deeper dive into the city will quickly enlighten. Although there is no single factor to accuse, four components could be seen as the key drivers to this epidemic in DC. The first is DC's competitive professional community. As the nation's capital there are many job opportunities, however specifically in DC and the surrounding Maryland and Virginia areas, there is an even stronger desire and blind ambition to work in the district. This creates an extremely competitive, and often hostile, job market. With the government and politics as the main professional career paths, people change over as often as policy.

Due to the intrinsic nature of DC, it is very temporal and constantly changing. People work for communal causes but have an individualistic approach or self-interest at heart. While the commuter culture causes the daily population to increase by 50% daily during work hours, more people are starting to move back to the city.[2] Between 2000 and 2010, 23% of the population growth was due to young adults ages

[1] Aaron Earls, *What is the Loneliest City in America?*
[2] Elizabeth Chang, Neely Tucker, Jessica Goldstein, Clinton Yates, *Millennials in Washington, DC*

of 20 to 34. The latest census data shows that between 2010 and 2012 half of the population growth was due to Millennials.[3] As one can see, there is a general uptick in overall population, but there isn't a large focus on community. Over roughly 25,000 apartments and condos were built in the past 10 years and a majority of the construction boom is one bedroom and studio apartments. This focus of living alone clearly correlates to the cultural importance we put on the individual.

In addition to the competitive job market, the focus towards the individual, living alone, and age demographics, DC is one of the wealthiest cities in the US and consequentially one of the most expensive places to live. The average household income is roughly 75% of the amount needed to live comfortably in DC. So what happens to the families or individuals who are not in the high paying job tier and are unable to spend the amount necessary to live in the district. Most are pushed out to the surround suburbs or barely squeeze by. This predicament leads to several things, of which includes a little to no savings, and a larger influx of commuters. Commuting times go up as more and more people travel further distances, and the social and emotional ties to the city continue to wither. To conclude, Washington DC is one of the busiest, most stressful, and most competitive areas in the US and therefore as a result it has become one of the loneliest cities to live in. But does this mean? What is 'loneliness'?

What is loneliness?

[3] Chang, Tucker, Goldstein, Yates, *Millennials in Washington, DC*

Explored more deeply in Chapter 4, Loneliness is currently recognized in the world of medicine as a public health crisis.[4] The recognition and research published about loneliness in the US today is treated almost exactly the same as obesity was 8 years ago. Loneliness is an emotion that everyone has experienced, however the severity of it is unique to each individual. Today, reports are showing an increase of people experiencing it more intensely and more frequently than ever before. This feeling is not simply affecting ones social circle, but also their physical well being. Loneliness, or the feeling of being alone, represents a social disconnect. However, "being connected to others socially is widely considered a fundamental human need – crucial to both well-being and survival."[5]

Chapter 4 discusses the differences of being alone and feeling alone, along with common misconceptions and advised approaches to recovering from deep social disconnect. It is important to understand the cause, affect, and course of remediation of loneliness in order to understand its connection to the built environment. This thesis will explore the superblock typology as a vehicle in which one could start to implement opportunities for resolutions to the problem.

Ecosystems & Wellness: Translating to Architecture

Chapter 3 and 4 explore the green building systems we have created to move our industry towards a sustainable future, however explores the question 'is this what is truly happening?' It seems that the design, development, and construction

[4] Julianne Holt-Lunstad, *The Public Health Relevance of Social Isolation and Loneliness*
[5] Julianne Holt-Lunstad, *So Lonely I could Die*

industries have only further separated us from the natural environment, twisting the goal towards recognition and reputation rather than the well-being of our planet and ourselves. On the other hand, Architectural Sociology in combination with other fields and professions, are exploring ways in which the human can be the center of attention again, while still remaining connected and responsible for the natural world around us.

Where do we go from here?

Let’s find out.

Chapter 2: What is a Superblock?

It's a bit extra, but what's wrong with that?

The superblock is a typology of architecture that has emerged over the last century in response to the need for a more wholistic block approach to architecture. However, the term has varied in meaning and application. For example, currently the Merriam-Webster dictionary states it as "a very large commercial or residential block barred to through traffic, crossed by pedestrian walks and sometimes access roads, and often spotted with grassed malls."[6] On the other hand, dictionary.com states that it is "an area of the city land larger than the usual block, treated according to a unified plan and generally closed to vehicular through traffic." [7] The common elements amongst these two definitions and every definition is a larger than average size block and a treatment to the hierarchy of human mobility. This vagueness is precisely this reason that the term and typology appears both exciting and deterring. This large gap has left many opportunities to harness the superblock's untapped potential.

The superblock has been used in a variety of scales and applications ranging from the suburban superblock of Radburn, NJ to the Unite Habitation, to megastructures in the Metabolist Movement and the massive modern buildings that stretch across multiple blocks. The emergence of this form and terminology, however, begins with the Garden City movement: the basic idea that Architecture must do more

[6] Webster Dictionary "Superblock." *Merriam-Webster.*
[7] Dictionary.com "Superblock." *Dictionary.com*

and encompass more to form a better the quality of life. With the exploration of the superblock has come many failed attempts, all of which have put a stain on the original intention. Often related to urban crime, the negative connotation that has been associated with the 'superblock' was a result of the poor implementation and execution of the principles, leading us to believe that the understanding of these ideals were lost in application.[8]

Although the superblock is understood as urban terminology, it ironically started as a theoretical exploration in the suburbs. "Unlike France or the rest of Europe, in the United States, governmental policies had more ramifications on the suburban than the urban landscape."[9] Legislation often encouraged suburban single-family residential development, resulting in less dense cities. Another interesting movement that still to this day subconsciously exists, especially in the nation's capital, is the idea of 'the public individual.' There is a competitive relationship between the collective social, political, and professional associations, individualism, and self-interest that has created an unsustainable model for community development.

Understanding the Urban Block

Before one can understand a building, they must first turn their attention to the conventional city block. This will help to understand the spatial relationships both inside and outside a building. An urban block is an architectural term composed of both spatial and social relationships. Plots, 2-dimensional boundaries of a given

---

[8] Whiting, Sarah. "SUPER!" *Log* No. 16 (April 1, 2009): 19–26. Accessed October 28, 2018
[9] Whiting, Sarah. "SUPER!"

property, in combination with buildings, individual built forms, create a 3-dimensional space, otherwise known as a block. The urban block, however, is unique due to the social, cultural, and economic connections it contains. “These socio-economic features are the communication between people and the built environment.”[10] In other words, the block is a built form that encompasses the major elements of the urban way of life.

As previously discussed, the definition of a superblock is often vague and varies from source to source. In order to fully comprehend the potential a superblock creates, one must understand the two components that make up the essence of a superblock and how they have progressed throughout time. First, its important to understanding what an ‘urban block’ is and how it has developed. Second, one must understand the built environment that encompasses the block and its progression as well. Going forward with these in mind, we can modernize urban traditions in an effort to maximize effect and efficiency. The following sections will break down time periods, major relevant architectural buildings, culture, and techniques to inform the upcoming design strategies. By going through case studies of each type, the failures and successes will be broken down into understandable concepts of which to use moving forward. Although every city has different geography, economics, culture, and history, each has been specifically chosen in relation to the type in which it is necessary to understand the principles.

[10] Oikonomou. “The Transformation of the Urban Block in the European City.”

Greek

It was in ancient Greece where the first cohesive planning and block structure occurred, therefore it is quite clear that this is where the analysis will begin. Each city was independent and therefore had its own rules and societal norms, however the overall city planning principles were quite similar. The city was divided into 2 sectors: private and public. The private sector was set on an orthogonal grid for housing, as this was the best way to offer each citizen plots of land. Commercial and residential were the two main programs contained in these blocks. The other sector contained public buildings such as theatres, gymnasiums, and the agora. These principles are best seen in Priene. Built around 370 with roughly 4,000 inhabitants, Priene was known as an ideal Greek City and thus is perfect for critique. The street network consisted of 6 primary streets running east-west and secondary running north-south, creating an orthogonal grid to which the city was built. The limited hierarchy created equal blocks, houses, and streets, with each block containing 8 orthogonal plots. The commercial buildings used for trade and storage were 1 story, while the residential buildings were 2, allowing for maximum light and air. [11]

In the diagram below one can see that there were both social and spatial implications of urban planning in Priene, specifically through the typologies in the city and mobility.

[11] Oikonomou. "The Transformation of the Urban Block in the European City."

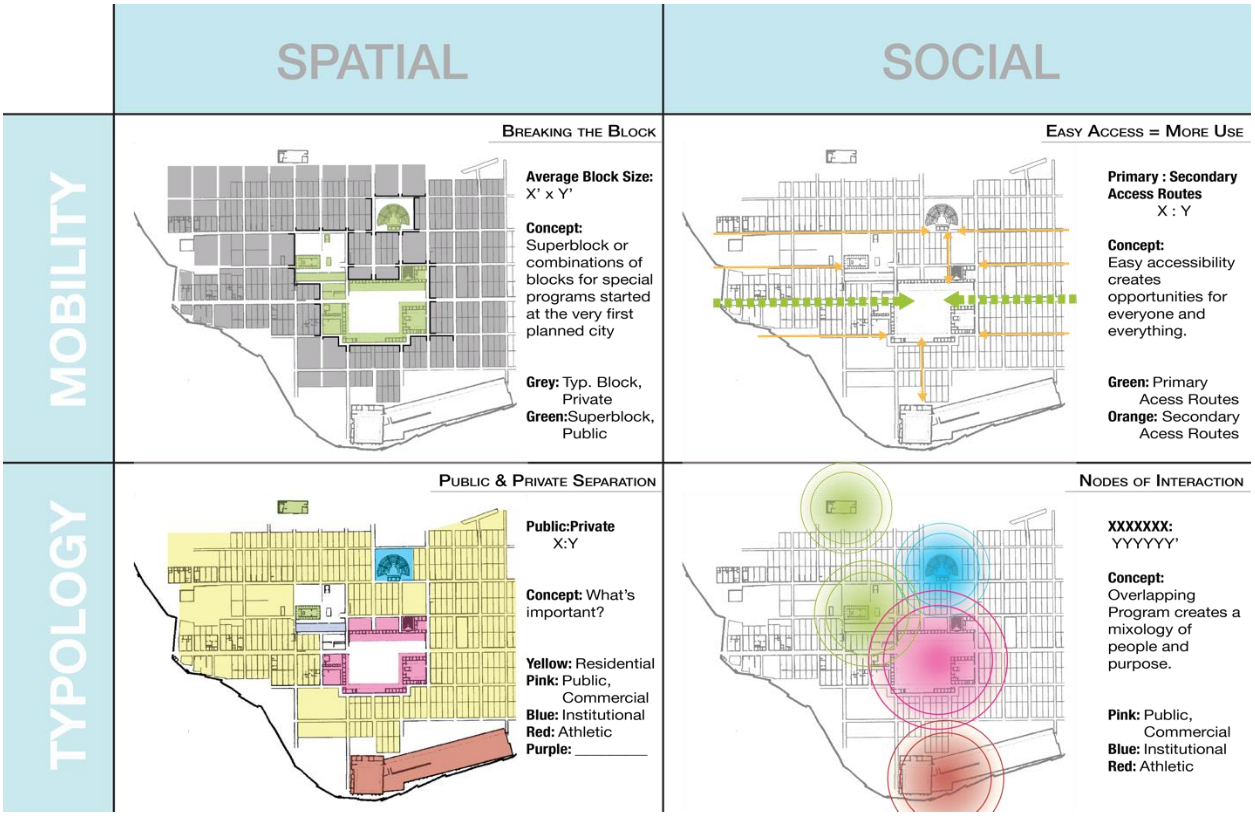
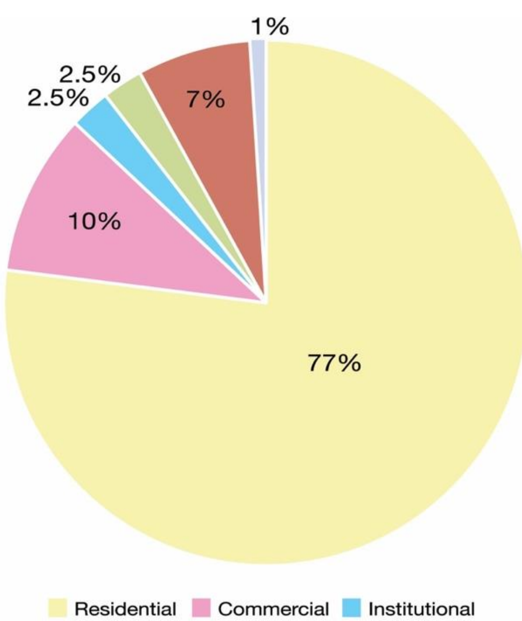


Figure 1 Greek Block Case Study (Source: by Author)



PRINCIPLES:

1. There are two types of blocks: a typical block that stays within the grid and a block of greater significance that breaks the grid becoming a combination of blocks

2. The blocks are oriented orthogonally, allowing for easy navigation and accessibility.

3. The scale of both the blocks and the city are at a human scale, easy for mobility and accessibilty.

Figure 1A Greek Block Program (Source: by Author)

Medieval

Following the Greeks came an even more established and developed era, the Roman Empire. There were no major changes in the block structure from Greek to Roman time periods. After its collapse however, many cities were either destroyed by barbarians or abandoned. This fall lead to a rise in urban expansion and new settlements often due to trade.[12] The most typical characteristic of a medieval city, other than its adhoc nature, is its separation of city and landscape through fortification.[13] Each medieval city's spontaneous development contained a cathedral that was the nucleus of the city. Attached to the church was the major market and from these two spaces radiated the town. The sporadic built environment in combination with a compact street network created a large variety of city formations. Medieval cities were also well known for a diverse mix of people and program. The variety of building typologies and programs were proof to the idea of mixing of status and power of individuals to create a dynamic community.

Industrial Revolution

The next time period in which the structure of the urban block changes is during the Industrial Revolution. The immense opportunity for work created the first major rural migration back to the city. Due to these opportunities, the city grew rapidly, bursting beyond its city limits in order to accommodate for the mass influx of people. This massive arrival of people caused the return of the grid for a quick

[12] Oikonomou. "The Transformation of the Urban Block in the European City."
[13] Oikonomou. "The Transformation of the Urban Block in the European City."

solution to urban development. The urban blocks became enclosed square or rectangular buildings with interior courtyards to maximize their space. All buildings were typically 4 to 6 stories tall and compact with mixed use program on the first floor. [14]

A look to Berlin as a case study makes perfect sense for its large industrial history remaining among the morphology of the urban fabric to this day. The first regulations for the massive built block structures in 1853 dictated that the maximum height could be 6 stories or 22 meters high, and it must contain an inner courtyard minimum of 5 meters by 5 meters. These regulations led to horrible living conditions and quality of life, resulting in a second round of regulations in 1897. The second set of regulations called for compact high density with open hardscape spaces used as gathering spaces for tenants or workshops. [15] While the intention for a better quality of living was put in place through the second set of court demands, the over populated region and the desire for profit over the quality living was the downfall of the system.

The buildings, however, evolved into successful housing after the war because the block was broken into pieces allowing for a more porous block with greater connections and a decrease in density.

---

[14] Oikonomou. "The Transformation of the Urban Block in the European City."
[15] Oikonomou. "The Transformation of the Urban Block in the European City."

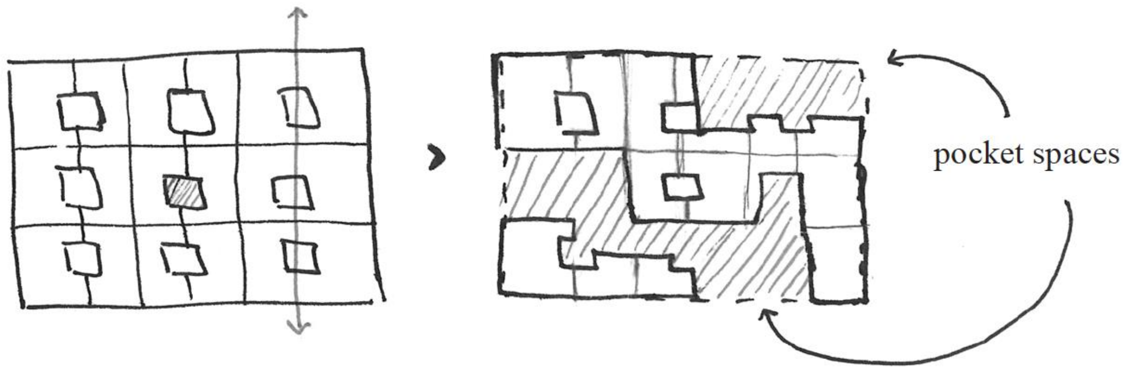


Figure 2 WW2 Destructions Results in Building Opportunity (Source: Soto Salas, Marisela. "The Berlin Block as an Urban Tool: Rethinking the Urban Fabric")

The dense prewar housing projects plagued many urban areas of that time. however post-war mentality for a better quality of life has led to more porous living through less built square footage and far less overcrowding.

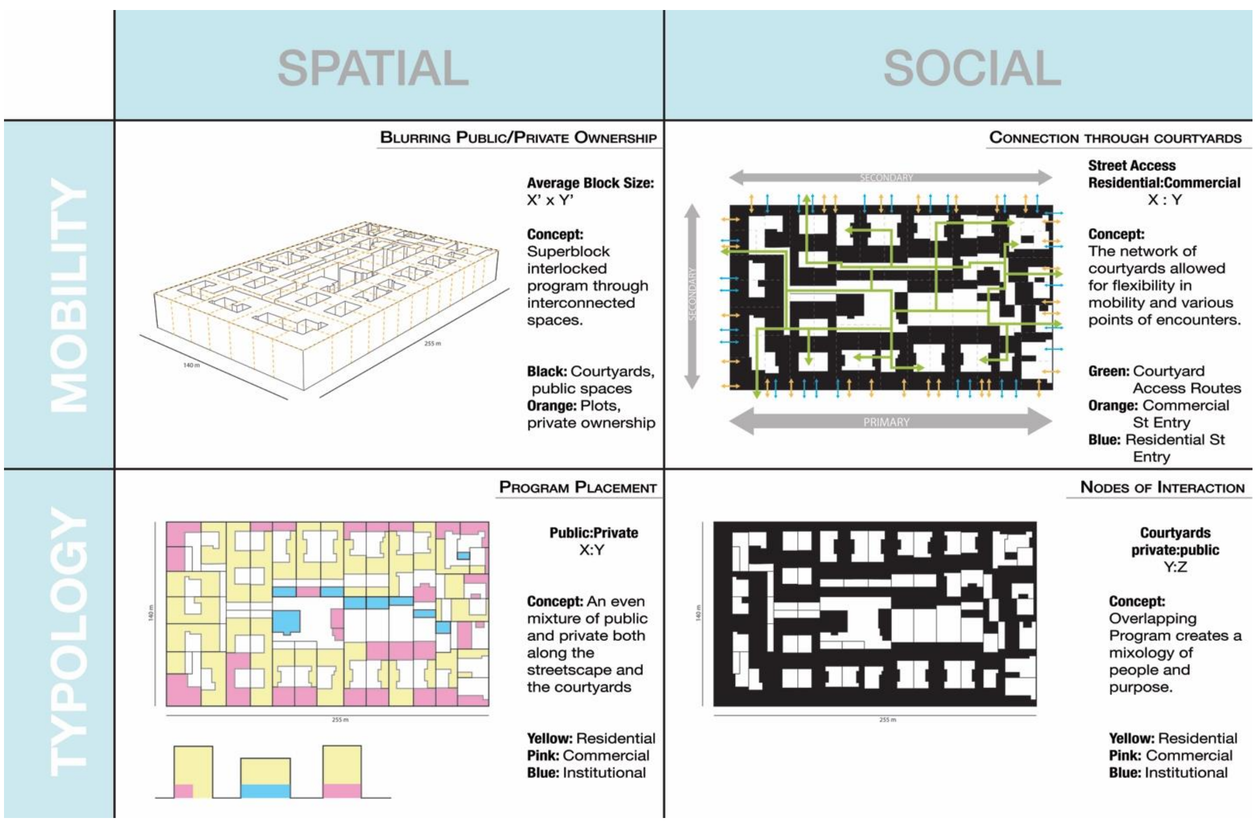


Figure 3 Berlin Case Study (Source: information from Soto Salas, Marisela. "The Berlin Block as an Urban Tool: Rethinking the Urban Fabric" and graphics by Author)

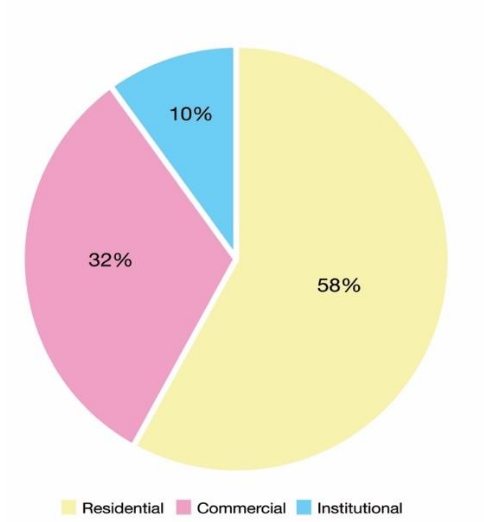


Figure 3A Berlin Case Study Program Percentage (Source: by Author)

The Modern City

With such heavy criticism of architecture and urban form of the industrial city came new theories and developments. The goal of the new theories and proposals were to "improve the quality of living in a way in contrast to what presently existed and propose plans that will 'promote symbiosis of living and working in nature."[16] From these ideas sparked the Garden City movement. Founded by Ebenezer Howard, the focus of the movement was to place nature as the priority in urban design. "The creation of a series of small, planned cities that would combine the amenities of urban life with the ready access to nature typical of rural environments."[17] Howard also dictated various regulations the cities should abide by in order to succeed. The five rules were: "(1) the purchase of a large area of agricultural land within a ring fence; (2) the planning of a compact town surrounded by a wide rural belt; (3) the

[16] Oikonomou. "The Transformation of the Urban Block in the European City."
[17] Britannica, The Editors of Encyclopaedia. "Garden City." *Encyclopædia Britannica*. Encyclopædia Britannica, inc., January 9, 2012. Accessed December 5, 2019

accommodation of residents, industry, and agriculture within the town; (4) the limitation of the extent of the town and prevention of encroachment upon the rural belt; and (5) the natural rise in land values to be used for the town's own general welfare."[18] Often times a hierarchy of movement paths for the vehicle and pedestrian were put in place to separate the different 'zones'.

Ebenezer Howard's famous diagrams of the garden city reflect the rules and principles of the garden city structure he designed and eventually implemented. The satellite cities acted very similarly to a super block structure, containing all the essential elements needed to not simply survive, but have a full and healthy quality of life.

Shortly after this movement, Le Corbusier was developing the principles of a Radiant City. Le Corbusier's city of the future was designed to not only provide residents with a better lifestyle but allow opportunities to contribute to creating a better society. [19] The city divided into zones of prefabricated and replicated parts, allows for standardization in a kit of parts scheme. Le Corbusier explains: "The city of today is a dying thing because its planning is not in the proportion of geometrical one fourth. The result of a true geometrical layout is repetition. The result of repetition is a standard. The perfect form."[20] The zones of Le Corbusier's plan included commercial, business, entertainment, and residential areas.

---

[18] Britannica, "Garden City."
[19] Merin, Gili. "AD Classics: Ville Radieuse / Le Corbusier." ArchDaily. Last modified August 11, 2013. Accessed December 1, 2018.
[20] Merin."AD Classics: Ville Radieuse / Le Corbusier."

Multiple American cities were designed on the principles of the Garden City movement, as well as Le Corbusier's Radiant City. The most prominent city, designed as a garden city and known as a superblock, is Radburn, New Jersey. Radburn was the first time the term 'superblock' was used in the Oxford English Dictionary in 1928. Stated often by the press, Radburn was considered an enlarged Manhattan block with a desire for a better quality of life.[21] The superblock was explicitly designed to separate modes of mobility: the car and the pedestrian allowing for interaction between program and people. In the figure below, one can see the hierarchy of 'routes' made possible for travel. The separation from the car signified a greater weight placed on human interaction and connection. Moving away from the industrial cities with cramped, polluted living conditions to a community structured around nature and space allow for better quality of life with access to nature. The size of the community and amount of people were key for it to survive. A balance of city and suburban aspects such as nature, people, institutional typologies, and commercial typologies, were all pieces of the Garden City dream.

Blocks, both urban and suburban continued to change as the overall understanding of the city shifted. With the boom of the industrial revolution, the city was understanding the importance of urban development, as well as the balance of a good quality of life. The city was beginning to be understood in larger 'chunks,' realizing the significance of community and interaction that was capable through a

[21] Whiting, Sarah. "SUPER!"

spectrum of scales. Here a nested hierarchy was created; a single entity that was recognized as part of a larger network and so on and so forth.

'BIG': comprehending skyscrapers & mega-structures [in relation to the block]

Based on the garden city movement, megastructures, skyscrapers, and stand-alone buildings became the next phase of architecture and is still practiced today. Hand in hand with the size of the urban block development, comes the development of the built form. In other words, while the sizes, shapes, and densities of blocks are changing, the building typologies and scales are as well. These typologies and land uses can be traced through the previous section in the Greek, Medieval, and Industrial periods. The garden city movement, however, sparked new 'big' structures and typologies as society struggled to bring both higher density and better quality of life to cities. This section will explain how the large building evolved from Metabolist and archigram architecture to 'bigness' and furthermore megastructures and superblocks as they are known today.

Archigram – what is it?

Unlike the other architecture theories, styles, and explorations after the war, Archigram approached architecture differently. Archigram is a magazine that transformed into an architecture group, briefly recognized as a firm, and furthermore a time period or style of work in the 1960s and 70s. Archigram envisioned architecture as a mobile, dynamic infrastructure of space, taking inspiration from the society they saw around them. "They proposed buildings that moved, that shone in the dark, that could be changed at their user's will."[22] The most common claim against Archigram is that the ideas were fantasies, unbuildable. The group however argued that every idea was constructible and the point of their schemes were to challenge the gap between what was built and what might be built.[23] The group believed that buildings should be designed in response to the people both in and around them and when that changed, the building should change as well. Rather than the infamous 'form follows function' that every other architect at this time was following, Archigram strived for form to follow an idea.[24] While one could question archigram's process, as you could with almost everyone, the quintessential aspect of Archigram is their attitude towards architecture. They sparked a desire, first in academia and later the profession, to ask and do more.

The most important takeaway from the Archigram movement was that the group pushed the limits. Although it was very controversial, in the end it resulted in people opening their minds and allowing for more dynamic explorations. This is extremely important for the superblock because of the negative connotation it carries. If people, both society and the architectural profession, were willing to dive deeper into the principles and apply them in new explorations, it may have a chance for exciting redevelopment. The principles have been slowly developing throughout time and now one is able to see and explore them in an exciting way similar to Archigrams

[22] Moore, Rowan. "The World According to Archigram." The Guardian. Guardian News and Media. Last modified November 18, 2018. Accessed November 20, 2018.
[23] Moore, Rowan. "The World According to Archigram."
[24] Moore, Rowan. "The World According to Archigram."

exploration of technology and ideas through a release of the negative preconceived notions of what a superblock could be.

Same Time, Different Place – Metabolism

Similar time period to Archigram was the Japanese Metabolist movement. Archigram challenged architecture believing the limits of mobility, technology, and adaptability should be explored. Metabolists on the other hand, focused solely on the idea of architecture as a living organism, organic and ever changing, consisting of a prefabricated infrastructure whose units could be replaced similar to a cell. “Metabolist architects and designers believed that cities and buildings are not static entities, but are ever-changing—organic with a ‘metabolism.’” [25] Both movements understood that architecture must be adaptable in order to survive the test of time, however Metabolism approached this specifically through the use of a prefabricated kit of parts that could change scale when needed. A few Archigram designs were built, most of the work remained conceptual, while several Metabolist structures were built. With the Postwar-Rebuilding mentality, both Archigram and Metabolism shifted the scale of architecture to larger, singular entities that met more than one need or purpose. While Nakagin’s Capsule Tower in Tokyo may be the most famous Japanese example of the Metabolist Movement, in North America, the best example of Metabolist architecture is arguably Habitat 67. [26]

Habitat 67 is a residential superblock built for the Expo 67 in Montreal by Moshe Safdie. The metabolist complex is composed solely of residential program, but

[25] Craven, Jackie. “The Metabolist Movement in Architecture.” ThoughtCo. Last modified April 22, 2019. Accessed September 20, 2018.
[26] Craven, Jackie. “The Metabolist Movement in Architecture.”

was a superblock none the less. Relating to the garden city movement, the building aimed to give every occupant a garden in the hopes that allowing nature into the lives of middle class people will keep them staying in the city rather than moving to the suburbs. On the other hand, Safdie use the prefabricated kit of parts as an exploration of the Metabolist movement. He understood the importance of a city, the opportunities and communities a superblock could create, and the need for people in it. The building was known as a failure typically for the misuse of the principles of it: (1) the city sold it as luxury apartments or public housing, while it was meant for middle class occupants; (2) the building made out of concrete and not very advanced technology quickly started to fall apart because as the time and ideas of architecture changed, there were no longer people interested in the building, nor could the city afford it; (3) the building was later renovated and most units now are 3 or 4 units combined to create luxury apartments, therefore the intention to keep people in the city was completely disregarded as the amount who can live there went down and the class that can live there went up. Using the principles of metabolism, the units were meant for adaptation throughout time as needed, but the complete disregard for the intended demographic, the blocks reason for being, is what lead to project to failure.

This thesis will extracting the principles and lessons learned from the development of the urban block, as well as the case studies presented from the different movements and time periods, to create a large dynamic infrastructure to explore human interaction. Along with these principles, knowledge from the following chapters will be used to formulate the final eco-block principles. This thesis uses a megastructure as a way to explore, test, perhaps even prototype a typology filled will mixed program, form, people, and materials as a method to revive community in DC. Superblocks allow unique opportunities to explore a variety of not only scales, but of type, location, function, and furthermore their connections to one another.

Chapter 3: Eco-Architecture

"We have good reason to believe that human kind will build more buildings in the next 50 yrs than in the past 5,000." [27]

The biggest source of emissions and energy consumption in the world currently is buildings. The US annual energy consumption is expected to increase by 37% in the next 20 years. Likewise, greenhouse gas emissions are projected to rise 36%. Architects hold the key to impacting these statistics and yet, often times there is no change. Design decisions such as building form, glass properties and location, material selection, daylighting analysis, heating, cooling, and ventilation strategies, are some of the few ways that make crucial impacts on a building's energy consumption, and yet it is intentionally not an essential part of many designs. [28]

Architecture and Landscape will always act as informants to the communities and people around and inside them. Whether designed well or poorly, the design and final product have an effect on both our minds and subsequently our actions. Winston Churchill once said, "We shape our buildings, thereafter they shape us." Design inevitably informs us about our relationships to nature and people that makes us more or less ecologically intelligent. Therefore, the ultimate object of design, especially in reference to ecology, is for the human mind.[29]

---

[27] Orr, David. "Architecture, Ecological Design & HumanEcology." Scribd. 2001. Accessed November 4, 2018.
[28] Department of Energy. Chapter 5, "Increasing Efficiency of Building Systems and Technologies"
[29] David Orr, *Architecture Ecological Design.*.

Two Separate Paths: Humans and Nature

Before modern settlements, nature was either integrated or coexisted peacefully with the built environment. However, the industrial revolution lead to mass urbanization and expansion causing a disconnect between the built and natural world. “Urban dwellers became increasingly disconnected from nature,” so much so that now “most people no longer understand the connection of a healthy ecosystem and healthy cities.” [30] The schism of the built environment and the natural environment has caused a dysconnectivity to the importance of nature. While a city cannot exist without architecture, or buildings, the “biggest portion of the built environment is building blocks and their attachments.” [31]The block and its surrounding connections are the essential elements of a functioning city and therefore this may be the place in which to reevaluate first. Kevah Samiei writes, “ecological urbanism without ecological architecture is impossible,”[32] meaning one ecosystem cannot exist without the other – they are interdependent. Perhaps this thesis will explore the conjunction of the two: a hybrid of eco-urbanism and eco-architecture creating an Eco-block. This crossing of ecosystems is quite possible for architecture that is larger than the average block and community size. Through the development of this large scale Eco-block, one can begin to solve the societal problem of human ecology.

---

[30] Samiei, Kaveh. "Architecture and Urban Ecosystems: From Segregation to Integration – The Nature of Cities." The Nature of Cities. September 18, 2016. Accessed November 5, 2018.
[31] Samiei. "Architecture and Urban Ecosystems: From Segregation to Integration – The Nature of Cities."
[32] Samiei. "Architecture and Urban Ecosystems: From Segregation to Integration – The Nature of Cities."

The Problem of Human Ecology

Every environmental problem has one characteristic in common: they are results of an action that began with a separate intention. In other words, it started as an intention, good or bad, and resulted in an environmental problem that was not intended. In architecture, this could simply be understood as a design failure. Understanding the possible repercussions our actions might have on the environment is the first step to better design. The goal is to achieve the intended result through a close working of both human purpose and ecological systems. Even though it is impossible to know completely the future result of our actions, beginning to understand the possibilities is a step in the right direction. "The natural world is continually modified by human actions, culture, and ecology… shifting parts of the equation that can never be solved."[33] It is up to mankind to evaluate the directions and actions in which to proceed. "How and how intelligently we weave the human presence into the natural world will reduce or intensify other problems having to do with ethnic conflicts, economics, hunger, political stability, health, and human happiness." This domino effect can drastically shape the ecosystems around us.

Understanding Our Ecological Footprint

The average American citizen uses more than 180,000 calories of energy everyday - whether that be though the commute, a product of actions done while at the office or home, or a variety of other possibilities. An interconnected web of

---

[33] David Orr, *Architecture Ecological Design*..

transportation and production systems are what bring our essential everyday life materials to us, however it's highly unusual that we ever understand the repercussions many of these actions have. Orr wrote, "the average food molecule is said to have traveled over 1300 miles from where it was grown or produced to where it is eaten."[34] This concealment from our everyday reality and likeliness to never impact our routine makes it easy to be ignorant. It is unavoidable, however, that the more we produce and consume, the worse the environment becomes. One can begin to understand the personal effects they have on the environment through their ecological footprint. An ecological footprint "measures the ecological assets that a given population requires to produce the natural resources it consumes and to absorb its waste, especially carbon dioxide." [35] The global footprint network establishes five categories of measurements used to understand how fast we take or create compared to how quickly nature can replenish those resources. Our carbon footprint directly relates to energy consumption, Built-up land to cities, Forests to timber and paper, Crop land and pasture correlates to food and fiber, and lastly fisheries to seafood.

Based on our current consumption and production rates, the average North American "requires some 5 hectares of arable land per person per year. But at the current population level the world has only 1.3 hectares of useable land per person."[36] To put that into perspective, 5 hectares of land is roughly 10 football fields and we would need an additional 2 earths to support our current 'needs.' Looking at the current population growth, production demand, and ecological capacity, continuing

[34] Orr, *Architecture Ecological Design*..
[35] "Global Footprint Network." Global Footprint Network. Accessed November 15, 2018
[36] Orr, *Architecture Ecological Design*..

on our current path is not an option – the future isn't looking too bright. Our instinct in this digital world is to turn to simple technological actions and applications. However, a small act has a small impact. We can't depend on the machines to make the change for us. Fixing the problem, doing the dirty work, starts with us. Only then can society begin to appreciate and understand what great lengths we must go to save our planet.

Not just One Ecosystem

Throughout history, the built environment has both embraced and rejected nature. What started as a refuge against the wild and unpleasant conditions of nature has changed to a focus of making life more convenient, which in turn has led to a neglect of nature. "The cost of disregarding nature extends also to the quality of life."[37] At the surface level and simplistic view, the destruction of the natural environment leads us to less clean air, less natural resources, and a surplus of waste. Ironically, nature has been the constant throughout time. Acting as the framework within which communities are built, whether they worked for or against this constant, nature has always remained the solid ground we build our cities upon. However, the separation of nature and culture has been driven further and further into our minds the more we develop and expand our cities. "Our contemporary cities may look greener, but they have displaced energy sources, food supply, water sources and waste streams

[37] Samiei. "Architecture and Urban Ecosystems: From Segregation to Integration – The Nature of Cities."

beyond our immediate sensate experience as well as the public life."[38] We need to understand the nature of cities as a natural-cultural continuum instead of the cutting and spreading pieces of nature in cities. The nature-culture continuum is the understanding that nature and culture are not two separate entities but rather one that has been fused together throughout time, whether the intention towards both is good or bad. Once we begin to understand the natural ecosystem and the human ecosystem not only coexist but inform one another, we can begin to understand our connection to one another (and other people) as well as the environment as an essential component to our quality of life that is currently severely lacking in our society.

Biophilia is the innate "urge to affiliate with other forms of life." [39]It is a "core element in our nature that connects us to the nature in which we evolved and which nurtures and sustains us."[40] Biophilia is not to say that everyone loves being immersed in nature, but rather that after millions of years of evolution and contact with nature, it would be impossible not to have that connection - no matter how deep, the connection it exists. We naturally do better in nature. "We do better with sunlight, contact with animals, and in settings that include trees, flowers, flowing water, birds, and natural processes than in their absence."[41] Therefore, we need to create places and communities that contain these elements that relate back to our origin. There is also a need for our cities to connect to organic structures systematically. In order to make a difference in the current situation, our society must work together, solving the

[38] McGrath, Brian. "Architecture, Ecology and the Nature-Culture Continuum – The Nature of Cities." The Nature of Cities. February 09, 2015. Accessed November 8, 2018.
[39] David Orr, *Architecture,,Ecological Design, & Human Ecology*
[40] Orr, *Architecture Ecological Design..*
[41] Orr, *Architecture Ecological Design..*

problem through interdisciplinary action. And the best way to do this is through a systematic approach – one in which everyone can understand. While we might not always realize it, we have been using nature as a precedent study to solve problems since the beginning of man. Biomimicry is exactly this. 'Bio' meaning life and 'mimesis' meaning imitation, biomimicry is "the design and production of materials, structures, and systems that are modeled on biological entities and processes."[42] Some believe that a "biomimetic approach to architectural design that incorporates an understanding of ecosystems could become a vehicle for creating a built environment that goes beyond simply sustaining current conditions to a restorative practice where the built environment becomes a vital component in the integration with and regeneration of natural ecosystems." [43] Biomimicry provides endless opportunities and examples of solutions, adaptations, and resilient strategies nature has been using for billions of years.

Through an understanding of human ecology, the nature-culture continuum, biophilia, and biomimicry, it is easy to see that not only do we influence our urban ecosystems and ecological conditions, but they in turn influence us. For example, building new construction on a plot of land that has never been developed disrupts many ecosystems and elements including the soil, plants, air, and animals. Likewise, how and where we choose to build our housing, schools, offices, etc., is influenced by the ecological conditions presented. An ecosystem is a system or a group of interconnected elements, formed by the interaction of a community or organisms with

---

[42] Dictionary.com
[43] Zari, Maibritt Pedersen. "BIOMIMETIC APPROACHES TO ARCHITECTURAL DESIGN FOR INCREASED SUSTAINABILITY." School of Architecture, Victoria University (n.d.)

their environment. [44] It is not simply a repetitive cycle, but one that cannot occur without the other. There are not necessarily distinct ecosystems, but rather parts of many different overlapping ecosystems.

What are the boundaries of an urban ecosystem? Technically there are none…

Ecosystems are always observed in relation to those around it for an ecosystem cannot occur or survive alone. Throughout the chapter thus far there have been multiple discussions and examples of ecosystems including, the urban ecosystem, natural ecosystems, human ecosystems, which begs the question: *is a superblock an ecosystem?* Similarly to nature, mankind has developed nesting hierarchies as ways in which to organize and understand different parts of our world. Nesting hierarchy is the idea that a separate entity could not survive, but could be recognized on its own, and also seen in relation to a greater system at the same time. The organization of our cities is no different. The individual materials or systems of a building relate to the building as a whole which relates to the block, the block to a city, city to a region, region to a nation, and so on and so forth. A superblock holds a unique position in this system. Larger than a block, most likely able to survive on its own, but still relatable to the human scale and the city, the superblock straddles both architecture and urbanism - stuck in the 'inbetween.' While no ecosystem can exist

[44] Dictionary.com

without another, a superblock is its own ecosystem entirely. Relating to the human ecosystem, the natural ecosystem, as well as the urban ecosystem, the Eco-block tests the boundaries and scales, both spatially and sociologically. "Urban Ecologists define urban ecological system boundaries as a fusion of human and natural constraints…"[45] Expanding upon the aforementioned spatial and social boundaries, this also defines the fusion of human and nature. Understanding now that everything is connected, intertwined, influencing and influenced by one another, it is clear that there is no simple solution. We need a shift in paradigm.

We need an Ecological Revolution

To start resolving the problems of human ecology, we must carefully examine the means and ends to which we act. While there are many ways to attack this, a transformation in energy and resources efficiency, as well as a net zero approach seem to be the most effective. Becoming more efficient not only increases the profit, but decreases the resources used. On the other hand, could a net zero approach work? Big decisions need to be made in the way of waste reduction. Instead of putting a filter on our waste, what if it was permanently capped? There are big implications, yes, but there are also big payoffs. Orr states we need a deeper revolution of thinking, one that starts by "putting filters on our minds not at the ends of pipes."[46] Nature has been developing successful strategies for nearly 3.8 billion years – looking to her example through biomimicry will at least start us in the right direction. Ecological

[45] Samiei. "Architecture and Urban Ecosystems: From Segregation to Integration – The Nature of Cities."
[46] Orr, *Architecture, Ecological Design.*.

design is “any design that minimizes environmentally destructive impacts by integrating itself with living processes… the effective adaptation to and integration with nature’s processes.”[47] It is a blend of human purpose and patterns and flows of the natural world, studying both to inform human action. Through the fusion of human purpose and natural world patterns, the Eco-block can begin to take shape, but how can one ensure a successful execution?

Ecological Design calls us to action and guides us through six design principles. The first principle is to “make things fit gracefully over long periods of time in a particular ecological, social, and cultural context.”[48] Designing to the specific context of the location, time, and use is as equally important as making something that will stand the test of time, and do it gracefully. A change in thinking must occur, as well, resulting in an understanding of who people are and their relation to the earth and the city rather than the objects they have. The third principle lies in responsibility. Who holds the power? Who makes the first move? Perhaps the superblock, or *eco-block*, is the perfect example to implement this philosophy. With the responsibility is the needed comprehension of the politics and power that comes with ecological design. In ecological design the responsibility does not lie solely with one person or association, but becomes a negotiation between a community and the ecology of a particular place. The fifth ecological design principle is the ecological ladder. It is a bottom up approach to design. Starting with recognition, understanding, and care of soil to plants, animals, and lastly humans, we become more aware of all

[47] Orr, *Architecture Ecological Design.*.
[48] Orr, *Architecture Ecological Design.*.

the components of the ecosystems and the effects our actions could or will have. Along with an understanding of ecological systems, it is crucial to recognize that mankind is simply part of a large system at work. Briefly discussed before the nesting hierarchy of our planet and ecosystems is a key component to successful ecological design. It gives way to the idea that a superblock can be a stand alone ecological entity in and of itself, while at the same time fitting into the network of the urban fabric.

This ecological superblock becomes an eco-block: a morphosis of ecology and a superblock building typology. Speak about previously mentioned components like scale, program, people, and nature. An eco-block allows for the design principles to be explored. This new ecosystem is limiting the ecological footprint through strategies such as biomimicry, biophilia, specific technological implementations and established systems like those of the Living Building Challenge.

Chapter 4: Wellness

Wellness Through Architecture

At the 2017 Wellness Architecture Initiative Roundtable forum, the architects, engineers, and construction professionals unanimously declared that there is enough scientific evidence to support that the built environment affects all dimensions of human wellness: physical, social, mental, occupational, emotional, and spiritual.[49] Now is the time to act and we need to take advantage of that, with architects reporting more private and public clients interested in the overall wellness and productivity of the user. It is no longer enough for high performance buildings to simply collect enough points or reach net zero. Today, the challenge of the built environment is to reach beyond their impact on the local, regional, or even global natural environment and positively impact humans. In the design industry, the buildings are receiving more attention than the people who will be occupying them. Perhaps that is a great place to start. There is no need to reinvent the wheel, but with a shift in focus or an edit of the scope, could we shift the paradigms?

Green wellness, a current buzzword, has the opportunity to transcend to human wellness. New wellness standards, not only across the US, but throughout the world, are reshaping how we design, build, and think about architecture. "The building and construction industries determine, by and large, how residents interpret

[49] "Wellness Architecture Roundtable." Global Wellness Institute. Last modified June 27, 2017. Accessed December 1, 2018.

their surroundings and built environment. As such, it is vital to re-engineer our cities and towns to correspond more directly to the natural landscapes they inhabit.” [50]

The International Future Living Institute is a nonprofit organization “working to build an ecologically-minded, restorative world for all people.” [51] With a goal of a world without use of fossil fuels, IFLI is responsible for several challenges and programs in the design and construction industry, including the Living Building Challenge known as one of the world’s most rigorous green building standards. These challenges and programs however have pushed green buildings to literal & figural new heights, but what does this truly mean?

According to the World Green Building Counsel, “A ‘green’ building is a building that, in its design, construction, or operation, reduces or eliminates negative impacts, and can create positive impacts, on our climate and natural environment. Green buildings preserve precious natural resources and improve our quality of life.”[52] Some of the other programs initiated by the IFLI include: the Living Product Challenge, the Living Community Challenge, as well as the Reveal, Declare, and Just labels. All of the configured programs create a framework from which people can be guided in design, building, and planning.

The Living Building Challenge is a more stringent rating system than any other in the US. To meet the requirements, the building must reach net-positive energy, be free of any toxic chemicals, and decrease the energy footprint well below

[50] “FAQ | International Living Future Institute.” *International Living Future Institute*. Last modified May 13, 2019. Accessed December 1, 2018.
[51] “FAQ | International Living Future Institute.” *International Living Future Institute*
[52] “Wellness Architecture Roundtable.” Global Wellness Institute.

the average typical commercial structure. [53] There are 3 types of levels of certification: Living Building Certification, Petal Certification, or Net Zero Energy Building Certification. Each level has different expectations all of which the building must meet while also achieving specific performance requirements through 12 months of observation.

While LEED, or Leadership in Energy and Environmental Design, has been effective in implementing a business model for making ‘green buildings’ a reality, it has yet to make a large impact on the human mentality and reality of the current environmental problems. The USGBC has done incredible amounts of research, all of which has given LEED the credibility needed to take foot in the built environment.[54] With a deeper look into long term efficiency strategies for energy consumption and healthier, more productive working environments for building users, LEED set the standards that directed the focus towards the life cycle of a building. Most importantly, LEED can be argued as a successful business strategy. LEED is a well established certification, whose name holds a lot of weight in the design community. Previously, developers weren’t interested in the certification, but now with popularity, the LEED certification has become desired by clients, buyers, etc. Before LEED, most developers did not make any choices due to the impact on the environment because they saw no advantage in doing so.

The more popular LEED becomes, the more of a game, rather than a mentality, it becomes. The status symbol and points system relates the program

---

[53] “FAQ | International Living Future Institute.” *International Living Future Institute*

[54] Quirk, Vanessa. “Where Is LEED Leading Us?...And Should We Follow?” ArchDaily. Last modified April 23, 2012. Accessed December 1, 2018.

requirements to sport system rather than its original intention of improving the environment through building practices. Not only is it a point system, but it is unweighted which only enforces the game mentality even further. For example, it is one point to introduce a certain amount of bike racks to a project. Likewise, it is one point to clean and redevelop a “brownfield” site, something of much greater risk and cost than simple bike racks. This inequivalent point system has led to a further increase in the mentality to do the minimum rather than the initial intention of leading our world to a better future through design of the built environment.

While LEED is difficult, expensive, and continues to evaluate projects holistically rather than contextually, it has made a momentous step in the right direction for our profession. It has broken the seemingly impossible barrier that stood between architecture and the field of green building design.

Similar to the Living Building Challenge’s seven petal approach, WELL building standards evaluates architecture according to seven key elements crucial to the health of the buildings’ users: air, water, nourishment, light, fitness, comfort, and the mind. In “over 100 different features of design, operations, and behavior” [55] are opportunities to improve human wellness. While LEED made strides at improving the wellness of the construction and function of architecture, it has paved the way for new standards of occupant wellness through programs such as WELL. Using these in cohesion with one another they produce an overall healthier environment. In juxtaposition, LEED focuses on the performance of the building, whereas WELL focuses on how humans feel and interact with a space. With the addition of human

[55] Quirk, Vanessa. “Where Is LEED Leading Us?...”

wellness to the equation, it becomes important to examine human psychology and sociology and how it is affected by the built environment.

What is Sociology & How does it have a role in architecture?

Through the lense of human ecology, it becomes apparent that the built environment has a major effect on social constructs. Sociology is "the application of social theory and methods to the architectural design process", or perhaps better stated it "addresses the purpose of architecture as it relates to our society."[56] With an umbrella approach, sociology "draws on the fields of environmental psychology, ecological sociology, organizational ecology, organizational sociology, and community sociology."[57] By linking to so many fields, data, and studies intended to inform a more rigorous design and construction strategy, sociology is able to create the connection between the creator, the form, and the user, declaring both the user and the building of equal importance.

There is an unarguable connection between a building and its user. The building informs the user, not only of what it is, the purpose and function, but also how to feel and relate to other people and the environment. Often the large scale decisions are the focus of a design while the details of connection and interaction amongst materials, systems, people, and nature, are overlooked. Ironic when considering the pure essence of Architecture is the formation spaces and spaces do not function nor exist without people, groups, and activities to fill them. Considered a

---

[56] Beaman, Jean. "Architectural Sociology." American Sociological Association. 2002. Accessed December 05, 2018.
[57] Beaman. "Architectural Sociology."

public health epidemic, Loneliness is not necessarily an issue at the forefront of designer's, developer's, and architect's minds. While the topic seems to evade any type of response in the design industry, health professionals are considering Loneliness in the same manner as they did obesity less than ten years ago.[58] Loneliness can lead to several health issues and yet the design industry continues to push the false ideas of sustainability and wellness, missing the mark of a truly sustainable environment – one of health, joy, and connection. Why is this? Why is it that industry with the largest impact on humans is blind to our current social state?

Our highly individuate and technology driven society has contributed and generated a need for real social networks and a sense of place especially in large cities. Vivek Murthy in Harvard Business Review wrote, "We live in the most technologically connected age in the history of civilization, yet rates of loneliness have doubled since the 1980s." If this is true, then what is the source of this problem? Is it more than simply a drive towards technology? Could it be that architecture is linked to, or perhaps even responsible for, some of the loneliness that exists in our city?

While loneliness is a feeling that has been around since the beginning of time and will never disappear, it is important to understand what actions we can take to aid in the solution to the problem. However, in order to understand possible solutions, one must understand the problem. Loneliness is a feeling that represents social disconnection; it is a cyclical phenomena. Naturally, our bodies separate from other when feeling the need for rest, both physically and socially. Loneliness however is

[58] Julianne Holt-Lunstad, *The Public Health Relevance of Social Isolation and Loneliness*

found when the feeling of disconnection rises and one is unable to reconnect. Shown in figure 4 below, it starts with physical separation and leads to a decrease of well being. One becomes aware of his or her situation and yet, does not understand the steps to take to reintroduce themselves socially. From here they become even further removed, further physically and mentally unwell, and the process continues to spiral until physical symptoms present themselves and treatment and help is given. A Social Neuroscientist from the University of Chicago, John Cacioppo, gave an analogy comparing loneliness to hungriness. Both are feelings of the body you instinctively recognize, but unlike food, the apparent solution to the problem is not always evident. In other words, while you may instinctively know to have a snack or go to the grocery to solve your pain of hunger, the remedy for loneliness is not an innate reaction to the pain one is experiencing. [insert connecting sentence] This begs the question, how can we create social interaction and personal connection through architecture?

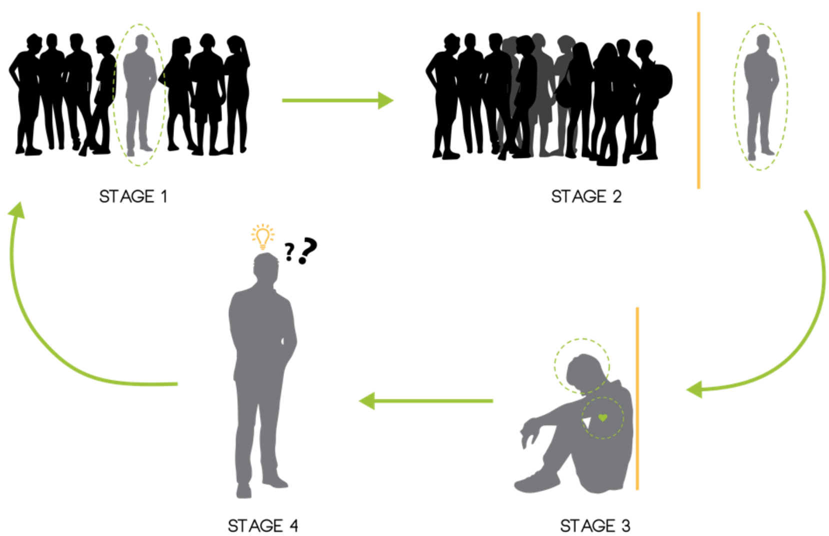


Figure 4 Loneliness is Cyclical (Source: by Author)

Through a variety of scales and use, slowly one can be reintroduced to society. Figure 5 below, shows a variety of nodes in which people can actively or passively partake. Opposite of the stages of loneliness, interACTion nodes allow for flexibility in the social reintroduction. Starting with social exposure, such as a stair well, or small public gather space in an office, and working towards large spaces such as collaborative open offices are just some of the spaces in which this new cycle could start to occur. The formation of a variety of good quality of spaces, both interior and exterior, allow intentional and spontaneous interaction essential to support meaningful relationships in an effort to combat loneliness in DC. The proposed ecoblock explores these connections in relation to program as well as the physical and natural environments.

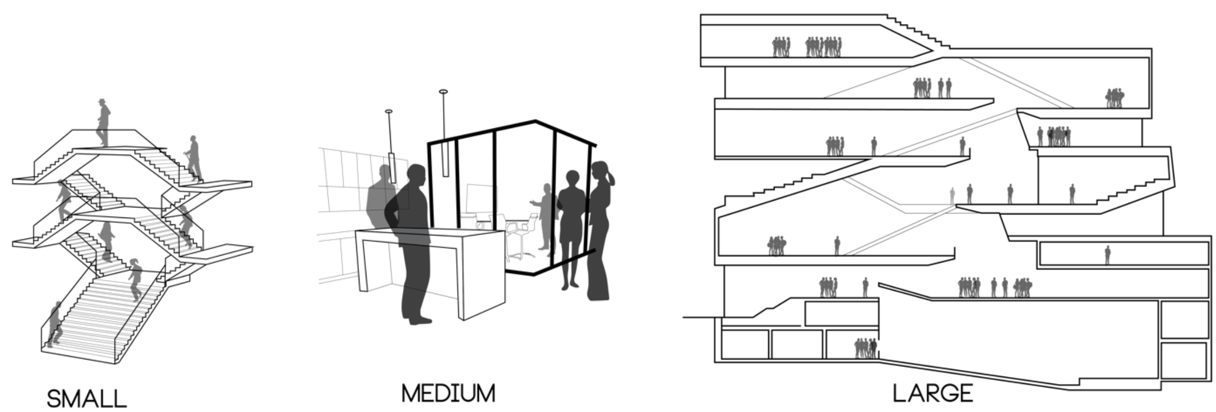


Figure 5 Interaction at a Variety of Scales (Source: by Author)

Chapter 5: Site Selection and Analysis

Washington DC: the nation's capital

Washington DC is historically renown for its organization, density, and public space. While the height limit of the capital has contricted the low-rise city, the limitation has also given opportunities for innovative ways to maximize public space. Building out rather than up has led to a dense urban fabric. This density has created space for higher population but also a broken sense of community.

In searching for a place to foster interaction and connection, the city was analyzed in its entirety to determine zones. Once zones were selected, a secondary analysis was conducted to determine specific urban blocks that would be compared through 4 basic categories: typology, demographics, outdoor spaces, and sustainability. Typologies with possibilities for "aging in place" is an essential component in the surrounding vicinity of an ecoblock when striving for a flourishing community in a transient city. Therefore, in choosing which neighborhood in the city for a future site there must be multiple residential, commercial, and institutional typologies. Demographics are important as well for the interaction and connection fulfilled through an ecoblock. Public outdoor spaces allow for programmatic decisions and opportunities that can influence the building form and craft spaces throughout. Lastly and arguably the most important, is the opportunity for sustainable building and living practices to be introduced or built onto existing infrastructure. In figure 6, one can see these components throughout the city and the 5 selected locations for analysis.

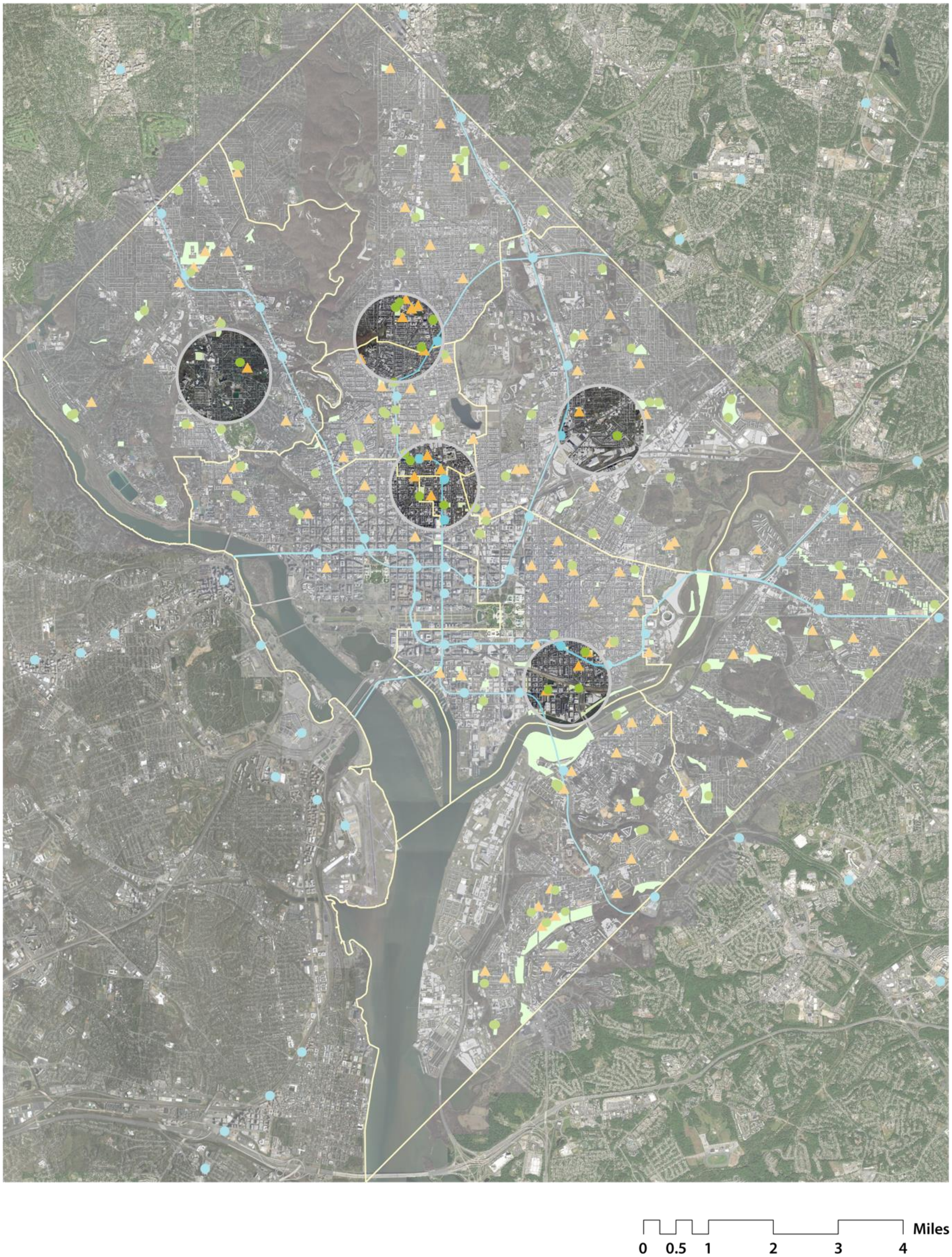


Figure 6 Zooming in to DC: Site Selection (Source: GIS, graphics by Author)

	CRITERIA	WASHINGTON NATIONAL CATHEDRAL	SOUTH PETWORTH	PLEASANT PLAINS/ CARDOZO	BRENTWOOD	WASHINGTON NAVY YARD
TYPOLOGY	**Mixed Use:** common and flexible program space for business	7	3	4	6	8
	Housing: “Age in place” possibility within 5 block radius	10	4	4	2	4
	Cultural/ Social Space: Cultural and social amenities within 1 block radius	7	3	6	1	10
DEMOGRAPHICS	**Age:** no more than 50% of pop in one age range	6	4	5	7	2
	Race: minimum of 4 cultures represented	3	4	7	3	4
	wealth: 70% of pop low to mid income housing	2	1	8	5	5
OUTDOOR SPACE	**Plazas:** space for social gatherings	8	1	4	2	9
	Pedestrian Street: limited vehicular access	2	2	3	1	8
	Green Space: contains nature within city block	8	7	3	6	8
	Unused Potential: Space underutilized, but maintained	10	5	5	7	2
SUSTAINABILITY	**Access to bike lanes:** lane must be established within 1/4 mi walking distance	4	4	4	5	10
	Acess to metro: metro is within 1/4 mi walking dist.	0	7	9	6	7
	Ability to create vegetated space: large sunlit spaces perferable containing tree canopy	9	3	4	6	5
	TOTAL **Scoring: X of 130 pts** [1 = weak, 5 = neutral, & 10 = strong]	76	48	66	57	82

Figure 6A Site Selection Mattrix (Source: by Author)

Where's the Site?

DC is comprised of several different neighborhoods, each unique in its architecture, community, and public space. In scoring the essential parameters of the 5 specific neighborhoods, Washington National Cathedral, South Petworth, Pleasant Plains/Cardozo, Brentwood, and the Washington Navy Yard, the Navy Yard ranked the highest. Each evaluated site had specific benefits and drawbacks, but overall the Navy Yard received an 82, becoming the site with the highest potential for successful development and exploration of an ecoblock. The results are located in figure 12 with the specific parameters and scores of each neighborhood. The ecoblock has not only great local connections to the immediate surrounding context, but several strong connections to the greater Washington DC area. Shown in figure 7, some of the many connections include the metro, parks systems, water, and major roadways.

Figure 7 Greater DC Connections: Metro, Parks, Water, Highway (Source: by Author)

The Eco-block site is located between several major elements including Highway 695, M st, the Anacostia River, and Nationals Ballpark. The site is 400’x1200’, with four existing buildings, shown in figure 8 on the following page. All of the buildings on site are currently in use, however, the two on the northern portion are only partially used and are in a state of disrepair. The two large buildings on the southeast portion of the site are Naval property, one an office building and the other a storage and service facility. However, neither of the two southern buildings are contained within the walls of the Navy Property.

The surrounding site includes two main typologies: (1) the old historic context primarily serving as a historic district with government and ancillary buildings only used during typical workday hours and (2) a new modern, mixed use, area attracting a lively crowd with a more sustainable life style. The building programs are very diverse, ranging from new mixed-use apartment buildings, a grocery store, trapeze training center, and a fenced in (shown in a white line) navy campus, to schools, and a variety of food and entertainment. In figure 9 below, one can see all of these building programs indicated with icons.

Figure 8 Locating the Site (Source: Google Earth & graphics by Author)

Figure 9 Surrounding Program (Source: by Author)

Figure 10 Walkability Diagram (Source: by Author)

The Anacostia waterfront has a variety of opportunities to connect with the river, which will be swimmable in the next three to five years. Some of these connections include the Anacostia Riverwalk Trail, access to the Yards Park, the proposed pedestrian bridge, and water activities such as kayak and sailing.

The site has multiple points of accessibility, whether it is getting to or going from. As shown in figure 10, mobility methods of all transportation are included: walking, biking, driving, riding a bus or metro, as well as water transport such as the DC Water Taxi. Currently there are no streets that come through the site except for a pedestrian street. The only approach or access by car is on the north M st, or Tingey St SE. There is an alley as well, but the public is only permitted access to the parking garage and loading access on the building on the northeast side of the site. The site is within a ¼ mi walk to the metro or water taxi locations and contains, street parking, bike parking, and garage parking on the periphery. The only difficulty of the site is access on the east side due to the gate naval campus.

Site Observations & Proposals

There were multiple observations discovered through a site visit that were not able to be seen from research and personal knowledge of the area. First and foremost was the state of the buildings on the site, as well as the use. The existing buildings on site, with exception to the Office building, were both under utilized and in disrepair. This was essential in deciding whether or not the buildings should be included in the future ecoblock design.

Secondly, as show in figure 11 below, the site was the end of the open, renovated Anacostia Riverfront walk. At the intersection of the perimeter of the Navy Yard and the riverfront, the Trail becomes an enclosed boardwalk, secured and maintained by the Navy Yard. This observation meant that the ecoblock's connection to the water and treatment to the south end of the site was greatly important and contain high potential for interaction. Also seen in figure 11, there are several schools within a mile radius of my site. With more schools, there is a greater opportunity for connection, interaction, and engagement in the ecoblock as well as its program development. The use of the park systems, larger school population, and end to the open Waterfront Trail were all great factors in the development of the site.

Figure 11 Pedestrian Access (Source: by Author)

In addition to observations of the natural environment and the school population, the surrounding built fabric was only able to be fully grasped when present on site. The DC zoning, diagramed in figure 12 on the following page, shows that half of the site is specially zoned for the Navy Yard while the northern half is specially zoned for the Waterfront neighborhood. In examining the zoning and buildings more closely, almost each building in the surrounding context is specially zoned for their site. This made it difficult to understand which zoning could and should be used for the ecoblock. After careful considerations of the surrounding context, as well as the program selection, the new proposed ecoblock is considered to follow the zoning of the neighboring sites, with a heavier focus on commercial and mix-use.

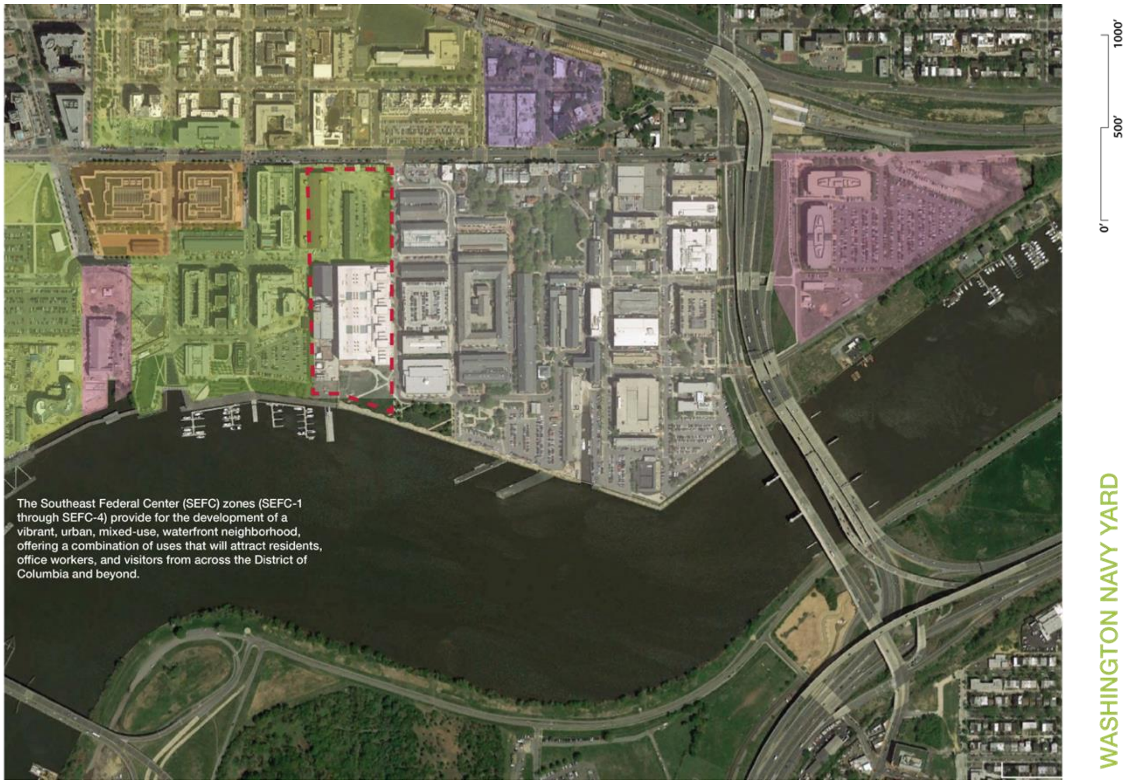


Figure 12 Site Zoning (Source: DC Zoning, graphics by Author)

Lastly, a new proposed street network and circulation pattern around the site allows for better movement amongst both the cars and the pedestrians. Currently the site is only accessible from one side as the Navy Yard security boards the other. To avoid risk of disrupting the Navy's security, a new street is to be placed on the east and south side of the site allowing for complete circulation around the ecoblock. However, with risk of creating a street that divides the ecoblock from its neighbors, there will be placement of low development, such as residential townhomes or small scale commercial along this new street. This new development will not only act as a buffer between the larger ecoblock, and industrial Navy Yard, but it will also allow fronts to face fronts, and likewise backs of buildings to face backs. The streetnetwork will connect back to the original historic L’Enfant grid allowing for easy and accessibility of the surrounding area.

Figure 13 New Connections (Source: by Author)

Overall, site analysis, observations, and diagrams were vital in understanding the essence of the ecoblock site. Each method intertwined with the next, helped to inform the process and future ecoblock design further explained in Chapter 7.

Chapter 6: Precedents

This chapter is a compilation of the precedents discussed in the previous chapters. As a glossary of sorts, the chapter aims to give a brief overview of each precedent including: building name, architect, location, program, concise explanation of the project, and its relevance to this thesis. Along with the 2D written information is graphic diagrams and images to start to delve deeper in the understanding of each precedent spatially.

Markthal: Market Hall Rotterdam
// Architect: MVRDV
Total Square Feet: 1,076,000 sqft
Location: Markthal, Rotterdam, Netherlands
Program: Residential, Food Market, Retail, Parking, Service

What is it:

Markthal is a vital building in the heart of Rotterdam combining two major uses: residential and retail. The two lower floors are divided into 96 food stalls and 20 hospitality and retail units. A total of 228 apartments are on the upper 9 stories and 1200 parking spaces below grade. The building is 120 meters long, 70 meters wide, and 40 meters tall, constructed with uniquely designed architectural and structural elements in the shape of an upside down horseshoe. The market hall has no designated front or back side. It is not only a core piece of the city, but it also brings 4.5+ million visitors every year.[59]

Why is it important:

This megastructure provides valuable information on the success of a large interior public space within a network of public spaces. The Markthal radiates a lively energy from within its large hall with the elaborate artwork, dynamic program, and the residential onlooks into the space. The innovative and sustainable building techniques set a new precedent for buildings of similar scale to use as a guide to successful dynamic and environmentally conscious designs.[60]

[59] MVRDV, Windy Maas, Jacob van Rijs, Nathalie de Vries, *Markthal*
[60] MVRDV, ArchDaily, *Markthal Rotterdam/MVRDV*

De Hallen, Amsterdam

// Architect: Publieke werken Amsterdam

Total Square Feet: 236,800 sqft

Location: Amsterdam, Netherlands

Program: Entertainment, Social, Restaurant, Retail, Gallery, Library, Residential

What is it:

De Hallen is an old Tram Depot converted into 10 linked halls between 250-325 ft in length. Using the culture of the surrounding neighborhood as inspiration for the program, the structure was developed into a central hub for media, culture, fashion, and craft. Some of the programs included in De Hallen are a hotel, library, theatre, bars, restaurants, daycare center, and vehicle and bike parking garage. De Hallen is a simple flexible structure that has been catered to fit the needs of the current surrounding community but has the ability to adapt to future needs.[61]

Why is it important:

De Hallen has the opportunity to be a resilient piece of architecture in the community. It explores a combination of dynamic and static programs. A large piece of the design is its connection to the surrounding fabric. It is masked on street level, blending in with the neighboring buildings - even the locations of the entrances and loading areas are concealed. The adaptive reuse of this tram depot reactivated a large and underutilized area of Amsterdam.

[61] The Organisation De Hallen Amsterdam, *The Building*

Blagden Alley, DC

// Architect: Various

Total Square Feet: 120,000 sq ft

Location: Washington, DC

Program: Entertainment, Social, Restaurant, Retail

What is it:

"By 1880, there were 42 households in Blagden Alley and 22 in Naylor Court. By the 1990's, about 11 percent of the city's population was living in alley dwellings." [62] These 2 story houses were built smaller than today's average size 1 bedroom apartment in DC, constructed of wood and brick, and built without present day commodities such as heating, running water, and sewage drains, until updated in the 1950s. Blagden alley was redeveloped in 2009 with several new business including, restaurants, cafes, and even an art gallery.[63]

Why is it important:

Blagden Alley is a local adaptive reuse development that points towards the use of both interior and exterior space as opportunities for program. It takes a typical block in the dense fabric of Washington D.C. and activates the inner alleyway to create lively spaces in a what-would-be underutilized and unusable space.

---

[62] Dana Gooley, *Blagden Alley: Home to coffee shops, bars, pre-Civil War 'dwellings'*

[63] Gooley, *Blagden Alley: Home to coffee shops…*

Pearl Brewery

// Architect: Lake - Flato

Total Square Feet: 26 Acres

Location: San Antonio, Texas

Program: Residential, Restaurant, Social, Entertainment, Commercial

What is it:

A 26-acre abandoned Brewery in San Antonio that once sat desolate with a collection of empty buildings and pavement with little to no landscaping now is a booming active hub for the city with 100% occupied programed space. The site is recognized by locals as 'an economic and social powerhouse,' bringing thousands of people weekly. Although praised for its restaurants, the site includes 30 local businesses. It is the home to 3 nonprofit organizations, a nationally recognized Culinary institute, 350 residential units, 150 hotel rooms, several offices, educational, and retail spaces. The programs occupy over 300,000 square feet of salvaged and new buildings.[64]

Why is it important:

This project is a historic redevelopment that beautifully creates interconnected spaces lined with buildings. The development brought community and connection back to vacant area. This area was successful at taking large, abandoned shells of old buildings and breaking them up into usable, sustainable, and attractive spaces that invite community and business.

[64] Deane Madsen, *Pearl Brewery Redevelopment Master Plan*

Simmons Hall

// Architect: Steven Holl

Total Square Feet: 195,000 sqft

Location: MIT, Cambridge, MA

Program: Residential, Dining, Gathering

What is it:

The main theme of the MIT dormitory is 'porosity'. Described as a 'vertical slice of city', the dormitory is 10 stories tall and 382' long, providing 340 residential units, a 125 seat theater, a night café, and street level dining. Steven Holl's "sponge" concept transforms the building through a series of programmatic and bio-technical functions. The building has many connections to the surrounding site including large openings corresponding to main entrances, view corridors, and outdoor activity terraces. Steven Holl references the large, dynamic openings as the lungs of the building, bringing natural light down and moving air up. The walls of the building are 18inches in depth creating a shade to block out the summer sun while allowing the low angled winter sun to help heat the building.[65]

Why is it important:

The dormitory's major focus is on interior public space. The building stretches across blocks but continues to maintain access for the campus around and through the building. It uniquely explores the conflict of solid and porous. Used in several different ways, light is a dominant element of the building that connects spaces and impacts both human and environmental systems.

---

[65] Steven Holl Architects, *Simmons Hall - MIT*

Toronto Eaton Centre
// Architect: Eberhard Zeidler, B+H Architects
Total Square Feet: 1,720,000 sqft
Location: Toronto, ON, Canada
Program: Retail, Dining, Hospitality

What is it:

Toronto Eaton Center is a major mall located in the heart of the city. In order to create such a large retail building, the city had to demap a street. While the street was physically closed to traffic, the designers of this center kept the exterior facades creating now new interior facades for a portion of the center. This mix between new and old breaks up this long and narrow footprint into sizable masses that focus on maintaining access and easy wayfinding through its porous layout. Another major component of the malls design is the huge Galleria and Skylight roof that covers the main atrium. The entire mall complex orients itself inwards except for at specific moments of connection and access to the exterior.

Why is it important:

The mall typology is an interesting one to study in order to understand circulation, service, and proportions of megastructure. Traditionally, mall buildings focuses solely on the interior of the building, however with the location of this site, the Eaton Center had a unique opportunity and need to connect to the urban fabric. The Eaton Center is a great precedent in helping to understand the complexities of a major structure and infrastructure in a dense urban area.

Habitat 67

// Architect: Moshe Safdie

Total Square Feet: 250,000+ sqft

Location: Montreal, Canada

Program: Residential

What is it:

Made of 354 identical prefabricated concrete modules, Habitat 67 challenged the idea of providing repetitive high-quality housing in a dense urban environment. Starting as his thesis project, Moshe Safdie submitted and built this metabolist megastructure for the World Exposition of 1967 in Montreal. The building contains 158 residential units (now less after renovations) all varying in size and shape, but made up of the same prefabricated modular units. Each dwelling unit is given its own green terrace and view to the water. The circulation through the structure is comprised mainly of pedestrian streets, bridges, elevators, and stairs.[66]

Why is it important:

This is the only Metabolist Megastructure in North America. Habitat 67 is famously known as a failed superblock, but only because it wasn't used in the way in which it was designed and intended. Understanding the principle for design, the circumstances of the context, and the outcome are all important to realize the reason for failure. Prefabricated modules allowed for flexibility and constructability. Safdie was interested in design a building that allowed for good quality of life in dense city.

---

[66] Gili Merin, *Architecture Classics: Habitat 67 / Safdie Architects*

Radburn, NJ

// Architect: Stein and Wright

Total Square Feet: 149 acres (original designed for 1200 acres)[67]

Location: Radburn, New Jersey

Program: Residential, Commercial, Institutional, & Industrial

What is it:

Based on the Garden City Movement, Radburn was the first American superblock. The design intended to allow for a better quality of life than the industrial, overcrowded cities of its time. Designed as a community and a self-sufficient entity, it contained all the essential program and typologies, including: residential, commercial, institutional, and industrial. Stein and Wright considered heavily the mobility and systems of the city. Grouping cul-de-sacs, interior parklands, and other elements, Radburn paved the way for the pedestrian to dominate and the car to become secondary.[68]

Why is it important:

This is the first time a superblock is used in the United States and therefore it is crucial in understanding the principles and intentions of the city. Ebenezer Howard designed Garden Cities as 'perfect sized' towns and thus this self-sufficient city is not only important for analyzing circulation, but also scale, quantities, typologies, programs, hierarchy, and layout.

[67] Amsterdam Museum Het Schip, *Radburn Garden Homes*
[68] Michael Fagence, *The Radburn Idea*

Paris Opera House

// Architect: Charles Garnier

Total Square Feet: 118,404 sq ft (11,000 sq meters)

Location: Paris, France

Program: Entertainment

What is it:

Built in 1878 with 2,200 seats, the Paris Opera House is an architectural masterpiece of its time. Located at the northern end of Avenue de l'Opera in France, it is purposefully located as the terminal axial point in the urban fabric suggesting to the pedestrian that this program and public space is a significant need or symbol in the community. Through the complex systems of circulation and open spaces in the building, it is quite clear that the opera house was intended as a social event and gathering space for the city. It presented the idea of ‘see and be seen’ through its network of spaces.[69]

Why is it important:

The Paris Opera House exemplifies the importance of creating spaces of interaction and directing views. At this time in Paris, going to the Opera House was an event of social interaction, and thus the building design reflects that as well aided in those cultural dynamics. The creation of nodes at varying scales for social connections as well as intentional routes of circulation is also very relevant for this thesis.

---

[69] Megan Sveiven, *AD Classics: Paris Opera / Charles Garnier*

Seattle Public Library
// Architect: OMA
Total Square Feet: 38,300 m^2
Location: Seattle, Washington
Program: Institutional, Commercial, Restaurant

What is it:

"The Seattle Central Library redefines the library as an institution no longer exclusively dedicated to the book, but as an information store where all potent forms of media – new and old – are presented equally and legibly."[70] OMA designed the library and the circulation through compartmentalizing the program into pieces, but leaving enough of the form for flexibility and adaptability. By analyzing all the program needed in a library that could survive the test of time, they combined programs that shared similar characteristics and identified clusters of stable and instable program. Shifting and mixing the two types of program allowed for dynamism in the spaces, form, and people. The spaces between these designed clusters act as information hubs with the librarians, visitor workstations, and small seating for interaction and information exchange between the users.[71]

Why is it important:

The library explores a nesting hierarchy of program. The program locations are reflected in the building's massing, allowing opportunities for views, lighting and spatial qualities specific to each. The library also used innovative technology and materials.

[70] Igor Fracalossi, *Seattle Central Library / OMA+LMN*
[71] Igor Fracalossi, *Seattle Central Library / OMA+LMN*

Blox

// Architect: OMA

Total Square Feet: 28,000 m^2

Location: Copenhagen, Denmark

Program: Institutional, Public & Private Mixed Use, Restaurant, Residential

What is it:

"A space for cars becomes a space for people; a space to pass through becomes a space to reside," shared OMA.[72] The BLOX is a non-traditional mix use project that has spaced designed for several programs including exhibition spaces, offices and co-working spaces, a café, a bookstore, a fitness center, a restaurant, 20+ residential units and an underground public parking garage. While bridging across the road with public connections both above and below, BLOX most importantly connects the surrounding district back to the waterfront. The interesting mix of program, both private and public, in combination with the bold circulation and massing, has revived and energized the area.[73]

Why is it important:

Blox displays smooth circulation and a balance of public and private program. It joined two blocks and two areas of a city without impacting roadway that was a major means of circulation for the city. It responded to the needs of the community with open, public spaces for the city and neighborhood. The area was reintroduced through the building to the waterfront. Blox embodies activated design, dynamic massing, and thoughtful program placement.

---

[72] OMA, *BLOX/OMA/Ellen Van Loon*

[73] OMA, *BLOX/OMA/Ellen Van Loon*

Chapter 7: Design and Exploration

Washington, DC is different from any other urban area in the US. Some of the most significant reasons for this are the restricted building height, limited area within the district for sprawl, and the plentiful public space and attractions along the national mall. One would think with all these factors, DC would feel like a small, intimate, and tight knit city that thrives through personal relationships and meaningful interaction - but rather this city and many of its residents have found themselves alone in a city that was built on unity.

In chapter 3, an eco-block was discussed and defined. Throughout this chapter the principles, rules, and reason for being will unfold more fully. It is publicly well known that the biggest source of emissions and energy consumption in the world is buildings. Architecture and Landscape will always act as informants to the communities and people who inhabit or simply bypass them. Whether designed well, or poorly, the final product has an effect on both our minds and subsequently our actions.

The schism of the built environment and the natural environment has caused a dysconnectivity in our understanding of the importance of nature. The urban block and its surrounding connections are the essential elements of a functioning city and therefore this is a great place to start when reevaluating.

Put simply, ecosystems are a community of all the living and non-living things in a specific geographic area. An ecosystem can be small, such as a back yard or garden, or it can be large like an entire park system. Most people think of an ecosystem as something rooted only in nature, but through architecture we have helped to define other complex ecosystems such as the human ecosystem. An eco-block is a term I created for the intersection of these ecosystems in the urban fabric. In an urban environment these ecosystems constantly overlap and for a great quality of life cannot exist without the other – they are interdependent.

This thesis explored the development of dynamic interior and exterior spaces throughout not only a building, but an entire ecoblock system, so that forced and happenstance connections and interaction of people are created as a means to revitalize community in DC. This new ecoblock requires both interchangeable and permanent pieces through a series of programmatic, architectural, and landscape elements, forming a community that can self-sustain and adapt overtime.

To tackle such a large idea, basic principles were defined that would guide the project. The six principles of an ecoblock (illustrated in Figure 14 below) allow for a large area of design; accessibility to all modes of transportation, specifically a focus on the pedestrian while allowing strategized car connections and circulation; equal access for every person to amenities, exterior spaces, light and air.

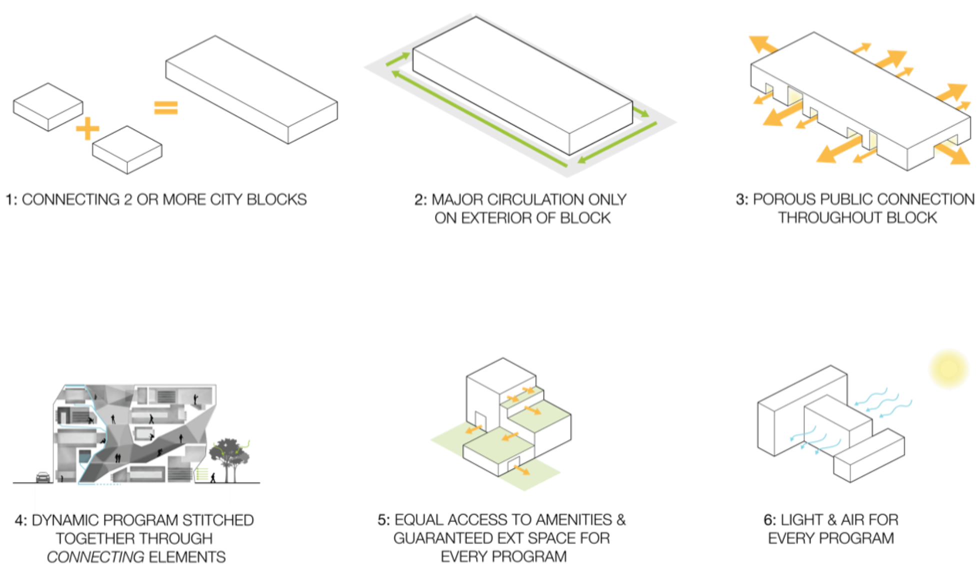


Figure 14 Ecoblock Principles (Source: by author)

The ecoblock principles inspired a more refined specific set of rules to which the ecoblock must abide. While the principles set up larger, idealistic standards, the rules gave a specificity to the site and project. Establishing a precise, easy, and understandable circulation to the ecoblock is vital for its success. While autonomous cars may be the next generation of vehicles, it doesn't seem like cars, or public transportation, will be leaving the scene anytime soon. In this ecoblock all service has been placed underground, along with a majority of the on-site parking. Four entrances, one in each quadrant of the superblock allow for easy access as well as smooth flow in and out (shown in figure 15). Circulation at grade is shared between the pedestrian and the vehicle. The interior corridor, with the exception of emergency vehicles, is reserved soley for the pedestrian. In addition to M street and the waterfront, each quadrant receives a drop off zone (noted in green in figure 16) with a minimum dimension of 10'x50' to maximize the accessibility to the site. The newly developed street to the west is the only street in which there is parallel parking.

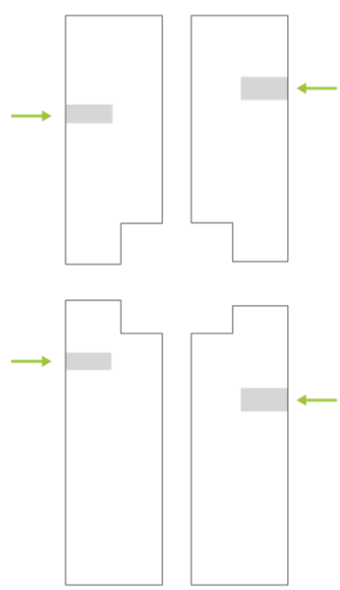


Figure 15 Service & Parking Access (Source:by Author)

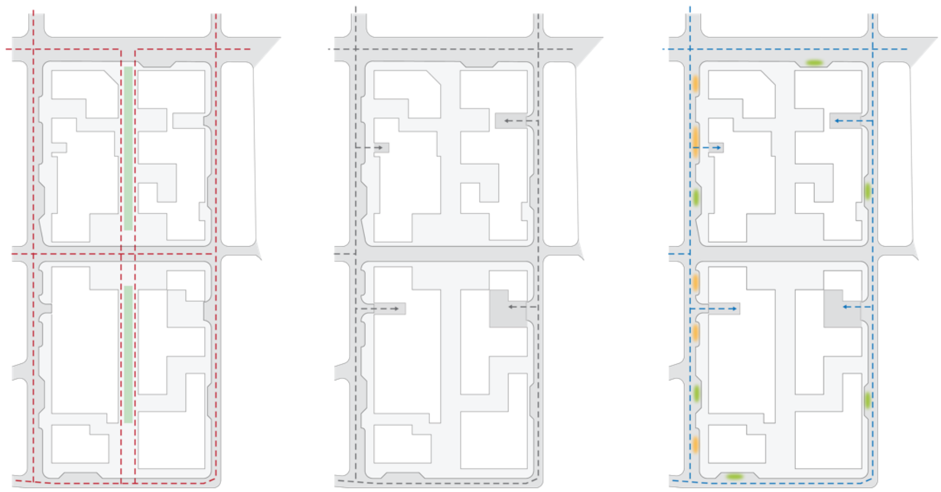


Figure 16 Emergency, Service, and Visitor Car Circulation (Source: by Author)

The second rule addresses the need for dynamic mixture of program, not only on the ground floor, but sectionally. Figure 17 shows two North-South sections of the ecoblock, exposing the programmatic connections and interactions. A heavy mixture of program throughout the ecoblock is necessary to create an active environment, no matter the time of day or season, that allows for a variety of interactions amongst its users.

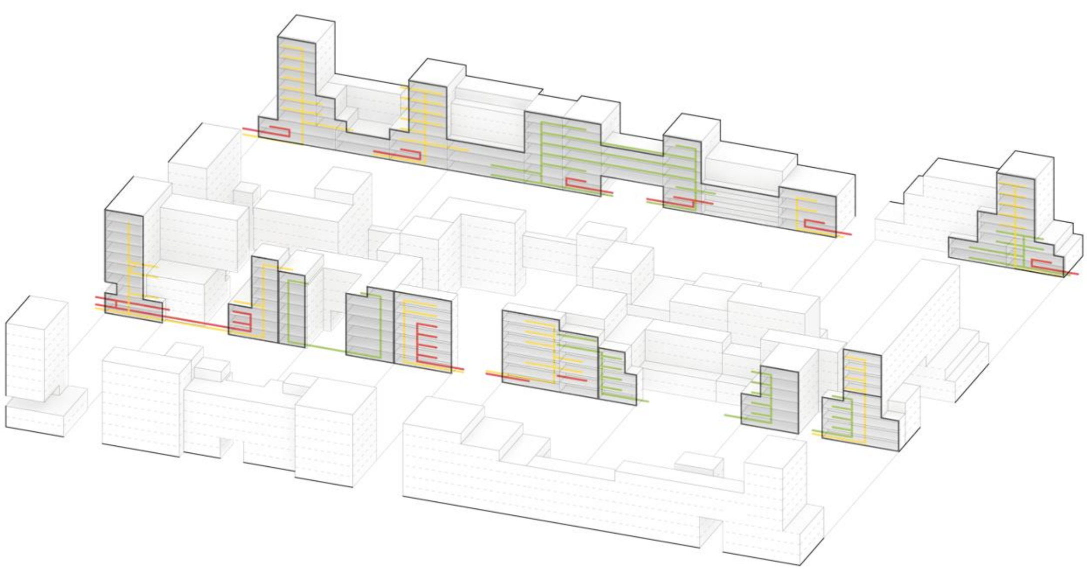


Figure 17 Program Circulation Section Diagram (Source: by Author)

The third rule established a system of building setbacks to allow light and air into every space. See below diagrams of a conceptual courtyard section and perspective section of the ecoblock corridor showing a 60 degrees setback zone from the theoretical property line or parcel edge. Not only does this allow each program to receive a healthy amount of light and air regardless of the season or time of day, but it also formed new opportunities to engage the rooftops of the ecoblock. This interior space of the superblock provides the ground floor with a unique treatment, often disregarded in most cities, as well as allows the roofs to become a new paradigm of interaction and function.

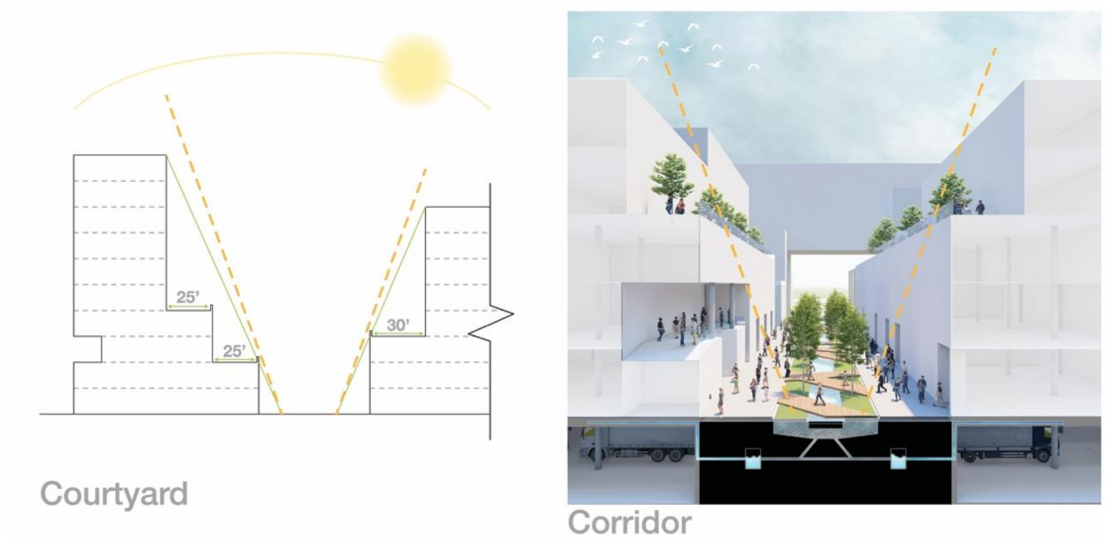


Figure 18 Light and Air Rules Diagram (Source: by Author)

The last rule, and nonetheless important, is a modular massing to establish the built form. Certain typologies and programs relate to certain size spaces, but in American cities and architecture the boundaries are pushed, creating oversized buildings that become unhealthy to live and work. By creating a modular system, it the allows for thinner, healthier buildings in which each user is granted light and air, something that should be a fundamental rule in the world of design. Three modular pieces, a large, medium, and small, allows for maximum flexibility of the developer, designer, the program, and the future sustainability. Also seen in figure 19, a minimum massing size is established as 25’x75’ illustrating that no program could be supported that meet the needs of the rules and principles identified if they were smaller than the minimum dimension. Combining the justified rules and principles, and ecoblock was formed.

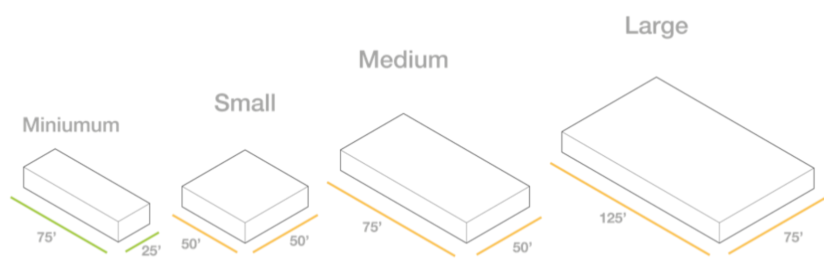


Figure 19 Massing Programatic Density Pieces (Source: by Author)

My site, as explained previously in Chapter 5, is located in the Navy Yard neighborhood, east of the Washington National’s stadium. This rapidly developing area has many benefits, some of which include connections to the city, local community, and surrounding environment. The northern portion of the site connects to M street, a major corridor that crosses DC east to west and brings along with its cars, people, and development. The southern portion of the site meets the Anacostia River. Here there is a calm atmosphere as it ends the open, public waterfront trail before funneling to the boardwalk in front of the Naval Yard. Both the North-South axis and the East-West connected public to private zones. While the area is rapidly developing, the historic Naval Yard holds as a steady anchor to the ecoblock design.

With the ecoblock Principles, Rules, site analysis, and program in mind I developed the ecoblock massing. Filling the site to its full extents, I cut a cross axis allowing easy flow, connection, and navigation from the aforementioned Public M street to calm water front, as well as the private western Naval Yard boarder to the active Tingley street. Stepping down towards the water creates light and air to reach the interior corridor and courtyards. However, due to the great amenity of the water front, increasing the density allowed me to maximized the program on the south. Next locating the nodes based on current site conditions, I carved out the courtyards, following the rules and regulations previously mentioned. Here is where the ecoblock was formed.

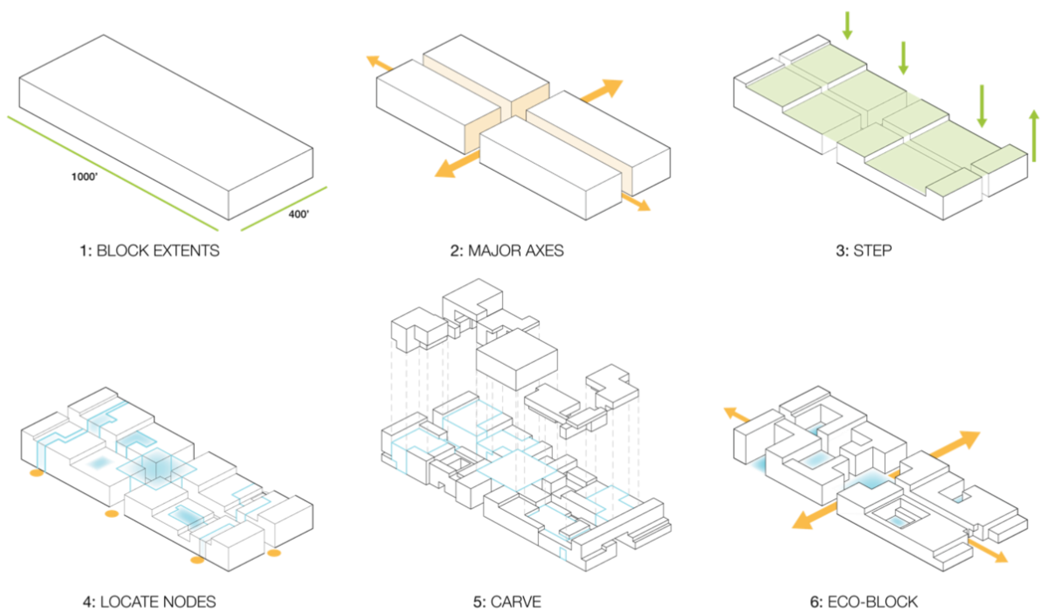


Figure 20 Massing Steps (Source: by Author)

In creating principles, rules, and modules, the once intended simple system had seemed overly complex and unrealistic. That is until you take a closer look. The massing was designed specifically so that the site could be divided into parcels and developed at different times and perhaps in different styles. The proposed massing gives one idea of how the site could be developed based on the analysis, principles, and rules that have been established. To be successful, the ecoblock needed to be constructible and adaptable. In figures 21 and 22, the parcels and pieces clearly illustrate the modularity of the site, and thus constructability.

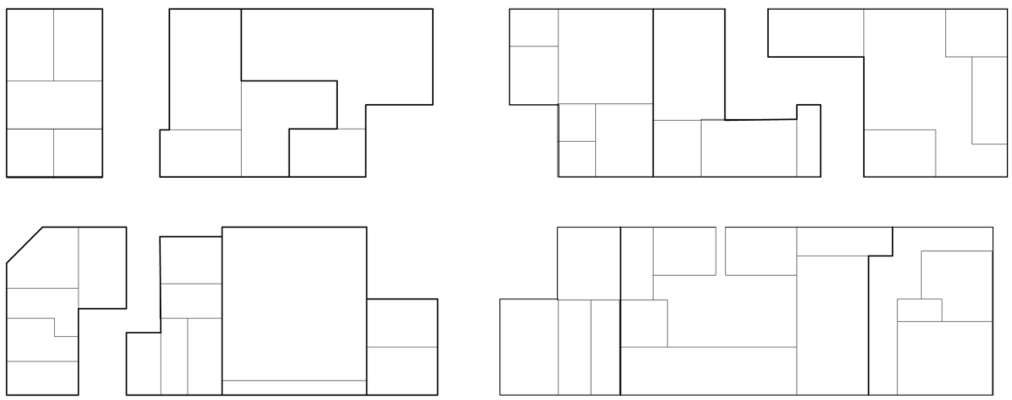


Figure 21 Parcels Diagram (Source: by Author)

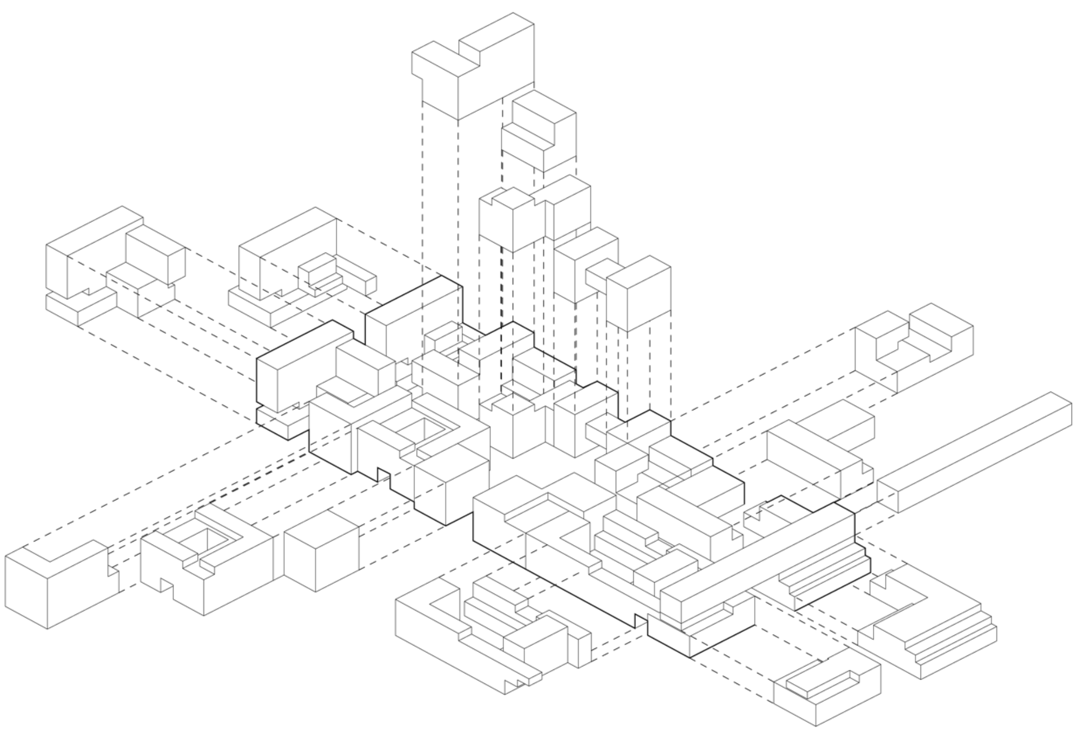


Figure 22 Pieces of the Parcels (Source by Author)

Once parcels and pieces were identified, the construction method became quite clear. Shown in figure 23, using a loft construction methods, allowed a simple framework that provides an open floor plan and flexibility for easy, future adaptations. In a city with changing urban programs, urban and social lifestyles, as well as natural maintenance and design changes, loft construction creates a resilient community that can flourish and adapt overtime.

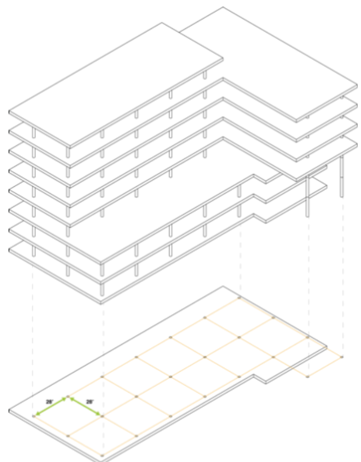


Figure 23 Loft Diagram of Eco-block Piece (Source: by Author)

Not only will the ecoblock address the real need for social networks, in a city of loneliness, but the dynamic mixture of program a loft building could support helps form a sustainable, diverse, and inclusive community. Because of this flexibility and the modularity of the design, each building in the eco-block built in this loft style has the opportunity to could easily integrate more complex sustainable technologies and strategies.

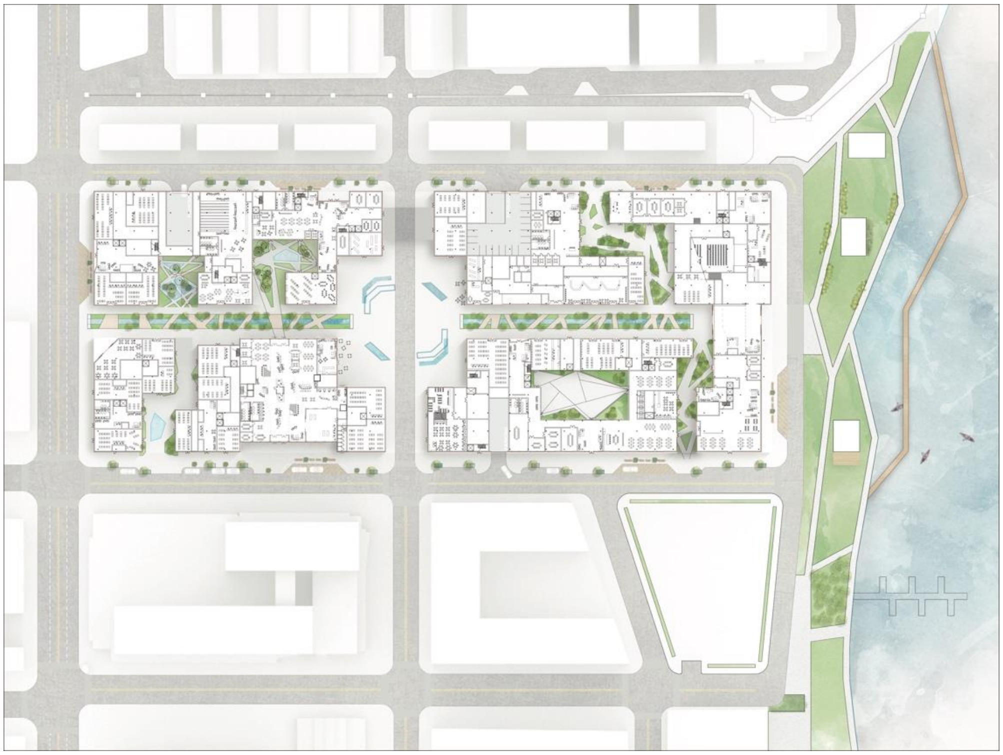


Figure 24 Site Plan (Source: by Author)

Diving even further into detail, one building or piece of the Eco-block was fully designed and developed. Located in northeast quadrant of the site, the Innovation Center is the main hub of the think tank and innovation campus that lives in this Eco-block. Here, there are 7 floors that explore different mixtures of program from private intimate spaces to large public ones. The iCenter due to its function and density is constructed on the largest module piece. For this reason, a large central atrium is connected through the building. Around this open core, the main circulation spirals up to the roof and down to the ground floor. Pushing elevator circulation to the edges, forcing movement through articular public spaces as well as open stairs along the interior of the core, allows for just a few moments of interaction and connection. The buildings richly diverse spaces are balanced in public and private program, allowing for collaboration, and individual work. The iCenter creates a variety of interACTion nodes described earlier in the document. It provides small, medium, and large scale moments of interaction that give opportunity for the development of meaningful relationships.

Figure 25 iCenter Section Perspective (Source: by Author)

The iCenter not only forms spaces for connection with people, but it allows for the necessary connection with nature. The ground floor has two major points of connection to its local context, one on the interior ecoblock corridor, as well as one on the exterior street. Using a network of 'green' courtyards and corridors, the landscape is given the opportunity to knit the buildings together in a cohesive system with different moments of public and private human interactions. Because of the diverse spectrum of people and uses in the ecoblock, these nodes create a network of connections not only locally, but in the surrounding community and city wide.

In conclusion, buildings and blocks can have the sense of inclusion, diversity, and community by creating a spectrum of spaces that include a variety of scale and use for engagement with one another and nature. Not only does this present a possible solution, or very least an aid, to the health crisis (loneliness in DC), can infuse the city with a sense of belonging and personal connection to one another and their surroundings.

Bibliography

1. Earls, Aaron. "What Is the Loneliest City in America?" Facts & Trends. Lifeway, March 5, 2018. Last modified March 5, 2018. Accessed August 28, 2018, https://factsandtrends.net/2018/03/05/loneliest-city-america/.

2. Elizabeth Chang, Neely Tucker, Jessica Goldstein, Cllinton Yates. "Millennials in Washington, D.C." *The Washington Post*. WP Company, October 13, 2013. Last modified October 13, 2013. Accessed September 6, 2018. https://www.washingtonpost.com/sf/style/2013/10/18/march-of-the-millennials/?noredirect=on&utm_term=.bec5d9cb347d.

3. Holt-Lunstad, Julianne. "The Potential Public Health Relevance of Social Isolation and Loneliness." OUP Academic, January 2, 2018. Accessed November 2018. https://academic.oup.com/ppar/article/27/4/127/4782506.

4. Holt-Lunstad, Julianne. "So Lonely I Could Die." American Psychological Association, August 5, 2017. Accessed October 2018. https://www.apa.org/news/press/releases/2017/08/lonely-die.

5. Rabaça, Armando, and Carlos Moura Martins. "On Bigness and the Problem of Urban Form." *FOOTPRINT Delt Architecture Theory Journal*. JAP SAM BOOKS, 2018. Last modified 2018. Accessed September 25, 2018. https://journals.open.tudelft.nl/index.php/footprint/article/view/1776.

6. Oikonomou, Maria. "The Transformation of the Urban Block in the European City." 2017.

7. Khazan, Olga. "How to Break the Dangerous Cycle of Loneliness." *CityLab*, 6 Apr. 2017, www.citylab.com/life/2017/04/how-to-break-the-dangerous-cycle-of-loneliness/522180/.

8. Chatterjee, Rhitu. "Americans Are A Lonely Lot, And Young People Bear The Heaviest Burden." *NPR*, NPR, 1 May 2018, www.npr.org/sections/health-shots/2018/05/01/606588504/americans-are-a-lonely-lot-and-young-people-bear-the-heaviest-burden.

9. Anderson, G. Oscar. "Loneliness Among Older Adults: A National Survey of Adults 45+." *AARP*, 1 Sept. 2010, www.aarp.org/research/topics/life/info-2014/loneliness_2010.html.

10. American Psychological Association, www.apa.org/news/press/releases/2017/08/lonely-die.aspx.

11. Beaman, Jean. "Architectural Sociology." American Sociological Association. 2002. Accessed December 05, 2018. http://www.asanet.org/sites/default/files/savvy/footnotes/dec02/fn17.html.

12. Gray, Audrey. "How New Wellness Standards Are Reshaping Architecture." JLL. 2017. Accessed December 14, 2018. https://projectmanagementjll.uberflip.com/curated-news-trends/how-new-wellness-standards-are-reshaping-architecture.

13. Kovacs Silvis, Jennifer. "Additional Resources." CNU. October 08, 2015. Accessed November 5, 2018. https://www.cnu.org/our-projects/health-districts/additional-resources.

14. McGrath, Brian. "Architecture, Ecology and the Nature-Culture Continuum – The Nature of Cities." The Nature of Cities. February 09, 2015. Accessed November 8, 2018. https://www.thenatureofcities.com/2012/08/28/architecture-ecology-and-the-nature-culture-continuum/.

15. Orr, David. "Orr,David Architecture,EcologicalDesign&HumanEcology." Scribd. 2001. Accessed November 4, 2018. https://www.scribd.com/document/237129100/Orr-David-Architecture-EcologicalDesign-HumanEcology.

16. Department of Energy, US. "Increasing Efficiency of Building Systems and Technologies." Department of Energy: Quadrennial Technology Review, 2015. Accessed November 2018. https://www.energy.gov/sites/prod/files/2017/03/f34/qtr-2015-chapter5.pdf.

17. Paiement, Genevieve. "Habitat 67, Montreal's 'failed Dream' – a History of Cities in 50 Buildings, Day 35." The Guardian. May 13, 2015. Accessed October 5, 2018. https://www.theguardian.com/cities/2015/may/13/habitat-67-montreal-expo-moshe-safdie-history-cities-50-buildings-day-35.

18. Samiei, Kaveh. "Architecture and Urban Ecosystems: From Segregation to Integration – The Nature of Cities." The Nature of Cities. September 18, 2016. Accessed November 5, 2018. https://www.thenatureofcities.com/2013/05/26/architecture-and-urban-ecosystems-from-segregation-to-integration/.

19. Whiting, Sarah. "SUPER!" *Log* No. 16 (April 1, 2009): 19–26. Accessed October 28, 2018. http://www.jstor.org/stable/10.2307/41765274?refreqid=search-gateway:bb3d9ad9719891275de5cf0d0afa9867 .

20. Britannica, The Editors of Encyclopaedia. “Garden City.” *Encyclopædia Britannica*. Encyclopædia Britannica, inc., January 9, 2012. Last modified January 9, 2012. Accessed December 5, 2019. https://www.britannica.com/topic/garden-city-urban-planning .

21. “FAQ | International Living Future Institute.” *International Living Future Institute*. Last modified May 13, 2019. Accessed December 1, 2018. https://living-future.org/contact-us/faq/ .

22. “Wellness Architecture Roundtable.” *Global Wellness Institute*. Last modified June 27, 2017. Accessed December 1, 2018. https://globalwellnessinstitute.org/roundtables/wellnessarchitectureroundtable/

23. Quirk, Vanessa. “Where Is LEED Leading Us?...And Should We Follow?” *ArchDaily*. ArchDaily, April 23, 2012. Last modified April 23, 2012. Accessed December 1, 2018. https://www.archdaily.com/227934/where-is-leed-leading-us-and-should-we-follow.

24. Maas, Winy; van Rijs, Jacob; and de Vries, Nathalie. “Markthal.” MVRDV, 2018. Accessed November 2018. https://www.mvrdv.com/projects/115/markthal.

25. Aguilar, Cristian. “Markthal Rotterdam / MVRDV.” ArchDaily, October 8, 2014. Accessed November 2018. https://www.archdaily.com/553933/markthal-rotterdam-mvrdv.

26. The organisation of De Hallen Amsterdam. “The Building.” De Hallen Amsterdam, October 12, 2018. Accessed November 2018. https://dehallen-amsterdam.nl/en/the-building/.

27. Gooley, Dana. “Blagden Alley: Home to Coffee Shops, Bars and Pre-Civil War ‘Dwellings.’” WTOP News, April 25, 2016. Accessed November 2018. https://wtop.com/life-style/2016/04/blagden-alley-home-to-coffee-shops-bars-and-pre-civil-war-dwellings/#:~:text=The%20alleys%20became%20home%20to,population%20lived%20in%20alley%20dwellings.

28. Madsen, Deane. “Pearl Brewery Redevelopment Master Plan.” Architect Magazine, January 9, 2014. Accessed October 2019. https://www.architectmagazine.com/project-gallery/pearl-brewery-redevelopment-master-plan .

29. Steven Holl Architects. “Simmons Hall - MIT.” STEVEN HOLL ARCHITECTS, July 27, 2005. Accessed October 2018. https://www.stevenholl.com/project/mit-simmons-hall/.

30. Merin, Gili. “Architecture Classics: Habitat 67 / Safdie Architects.” ArchDaily, February 2017. Accessed November 2018. https://www.archdaily.com/404803/ad-classics-habitat-67-moshe-safdie.

31. Fagence, Michael. “The Radburn Idea - 1.” Article. In *Built Environment (1972-1975)* Vol 2, No 8, pg467–70. Alexandrine Press, n.d. Accessed 2018.

32. Amsterdam School Museum Het Schip. “Radburn Garden Homes.” Radburn - World Garden Cities, 2015. Accessed November 2018. https://www.worldgardencities.com/garden-cities/radburn,-new-jersey-united-states.

33. Sveiven, Megan. “AD Classics: Paris Opera / Charles Garnier.” ArchDaily, January 23, 2011. Accessed November 2018. https://www.archdaily.com/105785/ad-classics-paris-opera-charles-garnier.

34. Fracalossi, Igor. “Seattle Central Library / OMA + LMN.” ArchDaily, February 10, 2009. Accessed November 2018. https://www.archdaily.com/11651/seattle-central-library-oma-lmn.

35. OMA. “Blox / OMA / Ellen Van Loon.” ArchDaily, May 7, 2018. Accessed November 2018. https://www.archdaily.com/893920/blox-oma-ellen-van-loon.

35.