



# INTERCONNECTING ARCHITECTURE AND NATURE

## SIGNATURE PAGE

### ENVIRONMENTAL DESIGN WITHIN ARCHITECTURE

A Design Thesis submitted to the  
Department of Architecture  
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BY:  
Mariah Beverly Lease

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PRIMARY THESIS ADVISOR:  
Cindy Urness

THESIS COMMITTEE CHAIR:  
Stephen Wischer

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# THE PROPOSAL

## ABSTRACT

Over the last decade, if not more, Architecture has blown up and grown to be something that can be so wildly unique but also in today's day and age, so incredibly modern. This being said, I think sometimes Architects lose sight or even ignore what humans truly need for a healthy wellbeing and just focus on the beauty of the design. But, why not have both?

Ask yourself what is considered while designing a residential building? A lot does go into the process and phases but is the wellbeing of the resident being considered and what could be done/ designed to help them while they decide to reside there? This thesis helps answer the question, "How can interconnecting Architecture and nature within residential buildings affect residents in a positive way?" The goal within this thesis is to interconnect the natural world to residential building complexes using the research of biophilic design and environmental psychology. This will help to create a positive environment for people to live in and be a part of.

## NARRATIVE

Nature has been long thought of as a positive impact to our wellbeing as humans. We as humans are naturally interconnected with the natural world around us. Humans have this sense of need to emerge ourselves to the outside world. Nature not only can make one feel better emotionally, but physically as well. An environment, no matter what type it is, has the power to affect mental and physical health whether it is in a positive or a negative way. Look at the five basic human senses: touch, sight, hearing, smell and taste. All of these senses can have an effect to oneself and creating an environment that promotes these senses in a positive way can change the wellbeing as a whole. Incorporating nature within an everyday lifestyle can create a feel-good atmosphere that appeals to those senses while also being aesthetically appealing to the eye.

“Our surroundings built and natural alike, have an immediate and a continuing effect on the way we feel and act, and on our health and intelligence.”

- Tony Hiss  
The Experience of Place

## PROJECT TYPOLOGY

This design thesis can incorporate multiple typologies, but I will mainly be focusing on the courtyards of residential complexes within larger cities like Fargo/West Fargo. However, for my research I will not only be looking into other residential courtyards but also, commercial buildings and their way of incorporating the natural world within themselves. This design thesis will be based upon incorporating the natural world within courtyards centered within residential complexes.

## KEY WORDS:

Biophilia  
Environmental Psychology  
Nature  
Interconnected  
Peace  
Mind  
Courtyard

# CASE STUDIES

01

## BOSCO VERTICALE



FIGURE 01



FIGURE 02

02

FORD FOUNDATION  
CENTER FOR SOCIAL  
JUSTICE

12

# BOSCO VERTICALE

Architects: Boeri Studio  
Location: Milan, Italy  
Building Program: Residential

Bosco Verticale (Vertical Forest) is a pair of residential towers in the Porta Nuova district in Milan, Italy. Designed by Boeri Studio and involving the input from ethologists and botanists, these towers are 110m and 80m in height and spread over 27 stories with a total built up area of 40,000m<sup>2</sup> (Bosco Vericale).

This project was designed as part of a rehabilitation of the historic district of Milan. It combined the concepts of vertical urban densification to save the land and promote sustainable living. Aimed at creating a biological habitat and increasing biodiversity this project successfully created a metropolitan ecosystem linking the urban life and nature. The development of these vertical forests creates a true network of environmental passage and increases the true green spaces within the city.



FIGURE 03

FIGURE 04



13

## BIODIVERSITY

+90 Different Tree Species

## GREEN SURFACE

40,000 m<sup>2</sup> of Trees

## CO<sub>2</sub> ABSORBED

30 Tons Every Year

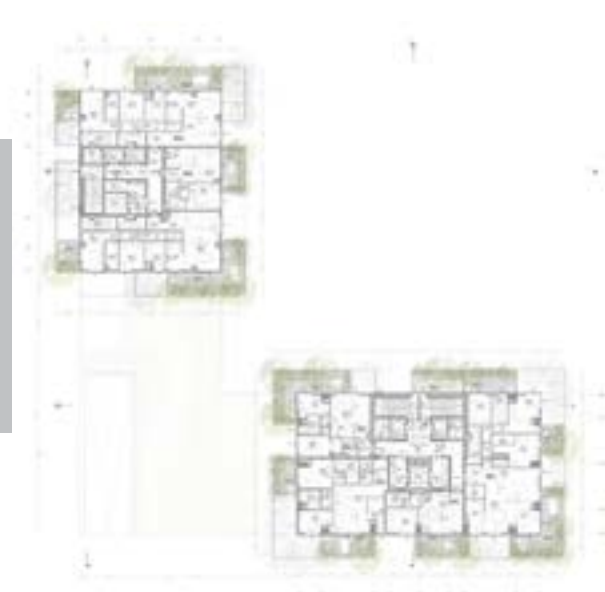
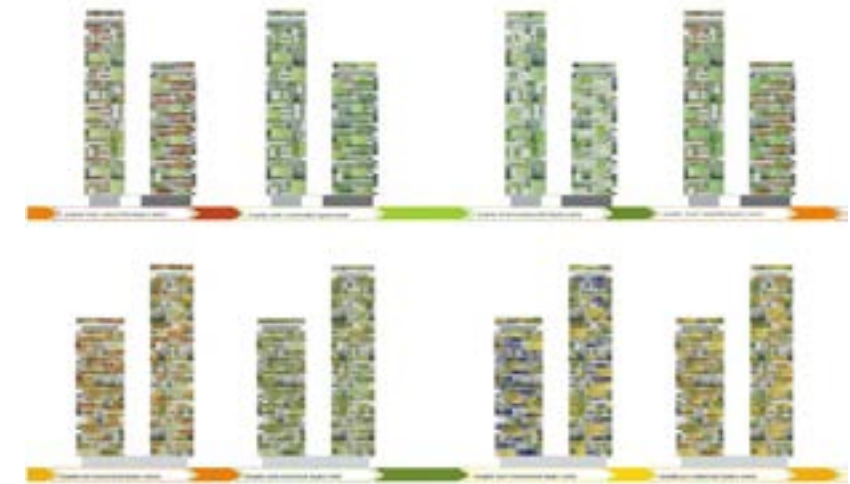


TABLE 1

A large variety of plants were tested and chosen to best suit the life for the vertical towers. Plants within the building are protected from the harsh Mediterranean sun during the summer but during the winter are protected by the trees that allow the sunlight to warm the interiors. The choices and decisions was the results of three years of studies and each plant were pre-cultivated in a nursery in order to uphold the similar conditions that would be found on the terraces (Sanchez D).

TABLE 3



This is an ever-evolving landmark of Milan, especially due to the color change throughout the year depending on the seed and the different natures of the plants.

These towers have a range of apartments from compact two-room apartments to penthouses and duplexes including a collected 96,000 sqft of terraces that are 28cm-thick and extend outwards for 3.35m in an erratic manner made of reinforced concrete. These terraces are home to 900 trees, 5,00 shrubs and 11,000 floral plants with the height of them ranging from 3m to 9m. These plants grow to a maximum height of 30ft and is equal to about 10,000m<sup>2</sup> of forest on flat land.

In each vertical forest there is a quantity of trees that would occupy an area of 20,000 m<sup>2</sup>



TABLE 1.2

TABLE 2

The vegetation within this building are irrigated using the greywater produced in the buildings.

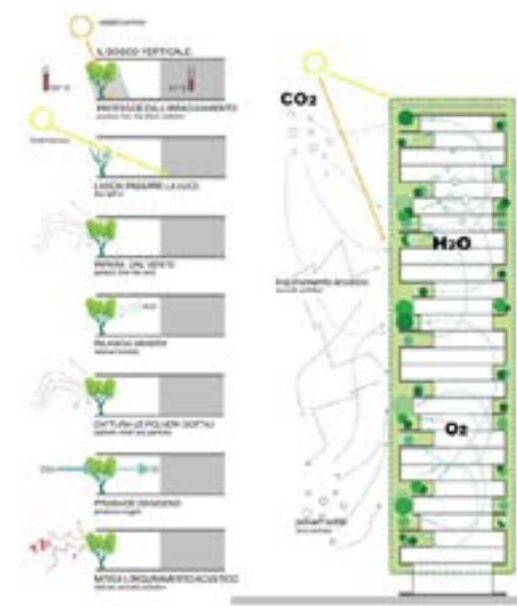


TABLE 4

The different variety of plants render different shades on each of the building exterior facades within the different season creating a unique style. These plants also absorb carbon emissions and dust particles, produce oxygen and protect the building from radiation and noise pollution for the heavy populated surrounding city.



# FORD FOUNDATION CENTER FOR SOCIAL JUSTICE

The Ford Foundation Center for Social Justice located in New York City was designed by Kevin Roche and John Dinkeloo and Associates in 1967. The building was designated a New York City landmark in 1997. This building was meant to express the high aspirations of Ford's social justice mission. Creating a place that lifts the spirits and ambitions of all who spend time within it (Volner, I., & Gerfen, K).

Throughout the years, they have updated the building repeatedly, retrofitting it as best as they could to the evolving spatial changes. This building includes a main signature feature which is an interior landscape in the form of an atrium. This atrium is twelve-stories, 5,290-square feet, 160-foot high, with an elevation change of 13 feet contained by glass walls that is open to the public as well as a view to the offices that layer two of the sides.

The Ford's atrium's garden was initially designed by Dan Kiley and was the first atrium of its kind in the United States. Trying to create nature and seasonality, Dan Kiley used the plants bloom sequence.

The underlying reason beyond the vegetation choices was to provide color, calming fragrances, and unique texture.

Between 2015 and 2018, the Ford Foundation building underwent major renovations and a restoration project under the work of Raymond Jungles, Inc. due to the fundamental challenges within the atrium. Trying to not change how Dan Kiley envisioned the atrium from the beginning, the team performed extensive analysis of the original plan and continued to collaborate during all phases of the project that led it to be successful. After the renovations of the atrium, the Ford Foundation was renamed to the Ford Foundation Center for Social Justice.

Architect: Gensler  
Location: New York, New York  
Building Program: Office,  
Public Assembly - Social/Meeting

FIGURE 05



This atrium was the first atrium of its kind in the United States. Like other interior landscapes, this includes an array of plants, trees, water features and walking paths within the design. An atrium being defined as a large open-air or skylight covered spaces surrounded by a building, it is construction just like any other atrium. What makes this atrium unique in the Architectural world is that it was designed and renovated with adaptations and innovativeness to ensure the survival and longevity of the landscape within designed with a glass roof composed of greenhouse-like "sawtooth" panels. However, because of the concentration of the surrounding skyscrapers, artificial light was used to illuminate the garden, lit originally with 76 spotlights located on the eleventh floor and 43 lights at ground level.

(Volner, I., & Gerfen, K)



FIGURE 07



FIGURE 06



TABLE 5

Intentions of the Interior Landscape: Roche had the intentions of creating a space that spurs informal encounters which also could be a unique meeting area for the surrounding community. The interior landscape contrasted the idea of contemporary international style structures which included plazas outside their buildings. Despite the intentions of the atrium, there were originally no benches installed within the atrium to prevent homeless people from sleeping overnight, nor did it offer any food concessions until it was decided to install a single bench located near the water feature.

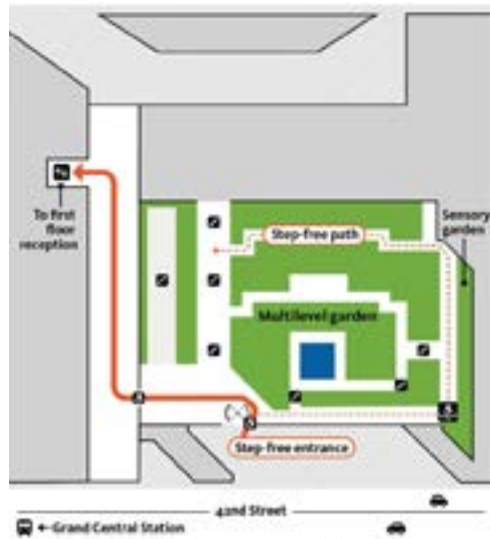


TABLE 6

The main entrance is set along 43rd Street leading to the lobby. A second entrance on 42nd Street leads to a large public atrium, the first such atrium in an office building in Manhattan. Most offices in the building are North and West of the atrium and are visible from other offices in the building.



TABLE 7

**- THE ATRIUM'S ENVIRONMENT -**

**CONSISTS OF OVER 40 TREES**

CHOSEN FOR PRESENCE AND FORM:

- MAGNOLIA
- EUCALYPTUS
- CRYPTOMERIA

CHOSEN FOR ENHANCING COLOR AND TEXTURE:

- JACARANDA
- PYRUS

CHOSEN TO CREATE PATTERNS AND VARIEGATED LIGHT

- 1,000 SHRUBS
- 22,000 VINES
- GROUND COVER



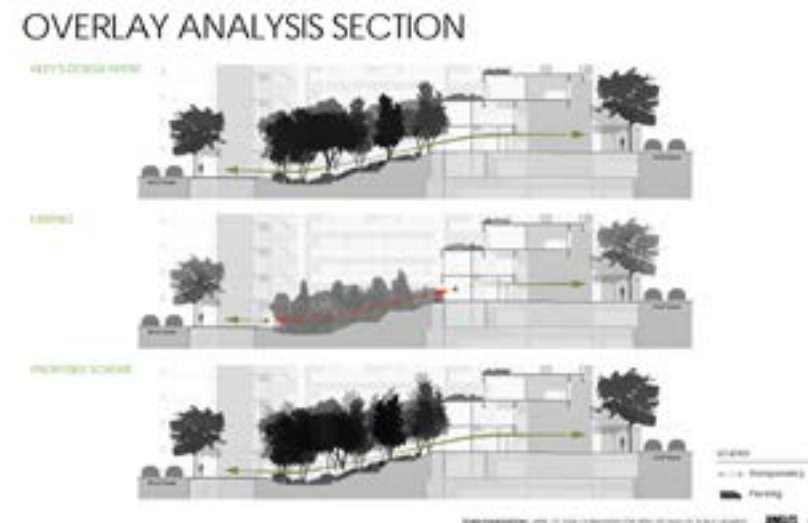
FIGURE 08

**EVERYBODY SHOULD HAVE ACCESS TO ALL THINGS, A FORD VISION.**

This glass wall atrium was shifted to a design of a predominantly open environment where one can see through the whole building. Almost everybody either within the building or standing outside either has a view or a window or looks onto the landscape atrium.

Within the landscape design, there is built in accessible lifts and sloped walkways creativity the ability for anyone whether being in a wheelchair or with any kind of disability is able to migrate through the whole building and be able to experience the atmosphere without struggle.

Another unique feature that this atrium provides is a touch-and-smell loggia garden with braille totem signage for the visually impaired. This circling back to the vision of, everybody should have access to all things.



(Volner, I., & Gerfen, K) TABLE 8



TABLE 9

SECTION A-A

- |                |                               |                   |
|----------------|-------------------------------|-------------------|
| 1. Entrance    | 5. Garden Atrium              | 9. Convening Room |
| 2. Reception   | 6. Workplace                  | 10. Pre-Function  |
| 3. Cafe/Lounge | 7. Closed Collaborative Space | 11. Fan Room      |
| 4. Art Gallery | 8. Communal Dining            | 12. Garden Entry  |

LEVEL A | CANOPY PLANS



TABLE 10



FIGURE 09

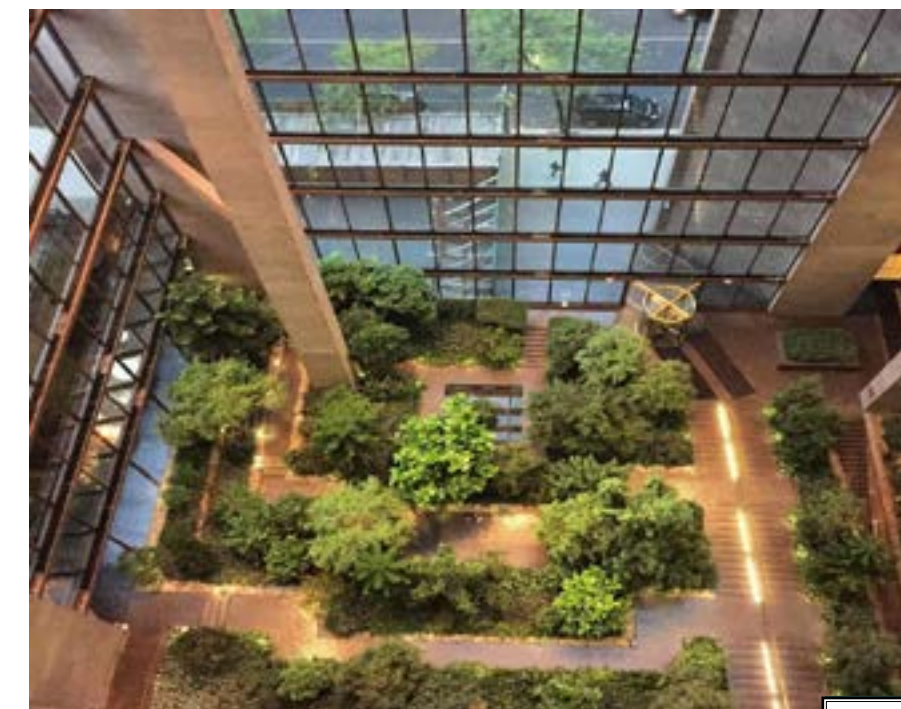


FIGURE 10

# ASKING WHY

Architects and designers truly have almost utter control over our built environment. Throughout time, us as humans have built this sort of isolation from nature and the idea of this interconnection with nature being important is starting to become recognized once again. We as designers and Architects have to find a way to change the way we design cities and buildings to connect with nature rather than disconnect.

Americans, on average, spend approximately 90% of their time indoors and almost 70% of which is spent at home, according to the Environmental Protection Agency (EPA). Which in such spaces the concentrations of pollutants can be up to two to five times higher than the typical outdoor concentrations (Environmental Protection Agency).

“OUR SURROUNDINGS BUILT AND NATURAL ALIKE, HAVE AN IMMEDIATE AND A CONTINUING EFFECT ON THE WAY WE FEEL AND ACT, AND ON OUR HEALTH AND INTELLIGENCE.”

- TONY HISS

THE EXPERIENCE OF PLACE

Everyone knows that something needs to change in this world for not only the climate but for the typical human being. According to SAMHSA, any mental illness (AMI) is defined as having any type of diagnosable mental, behavioral, or emotional disorder, other than a substance use or developmental disorder. AMI includes any person who have mild, moderate, and serious mental illness. Mental illness is a very broad term but a term that is very popular in today's age and is something that needs to be addressed. According to the Adult Prevalence of Mental Illness Map of 2022, equivalent to nearly 50million American adults are experiencing a mental illness, which is around 19.86% of adults.

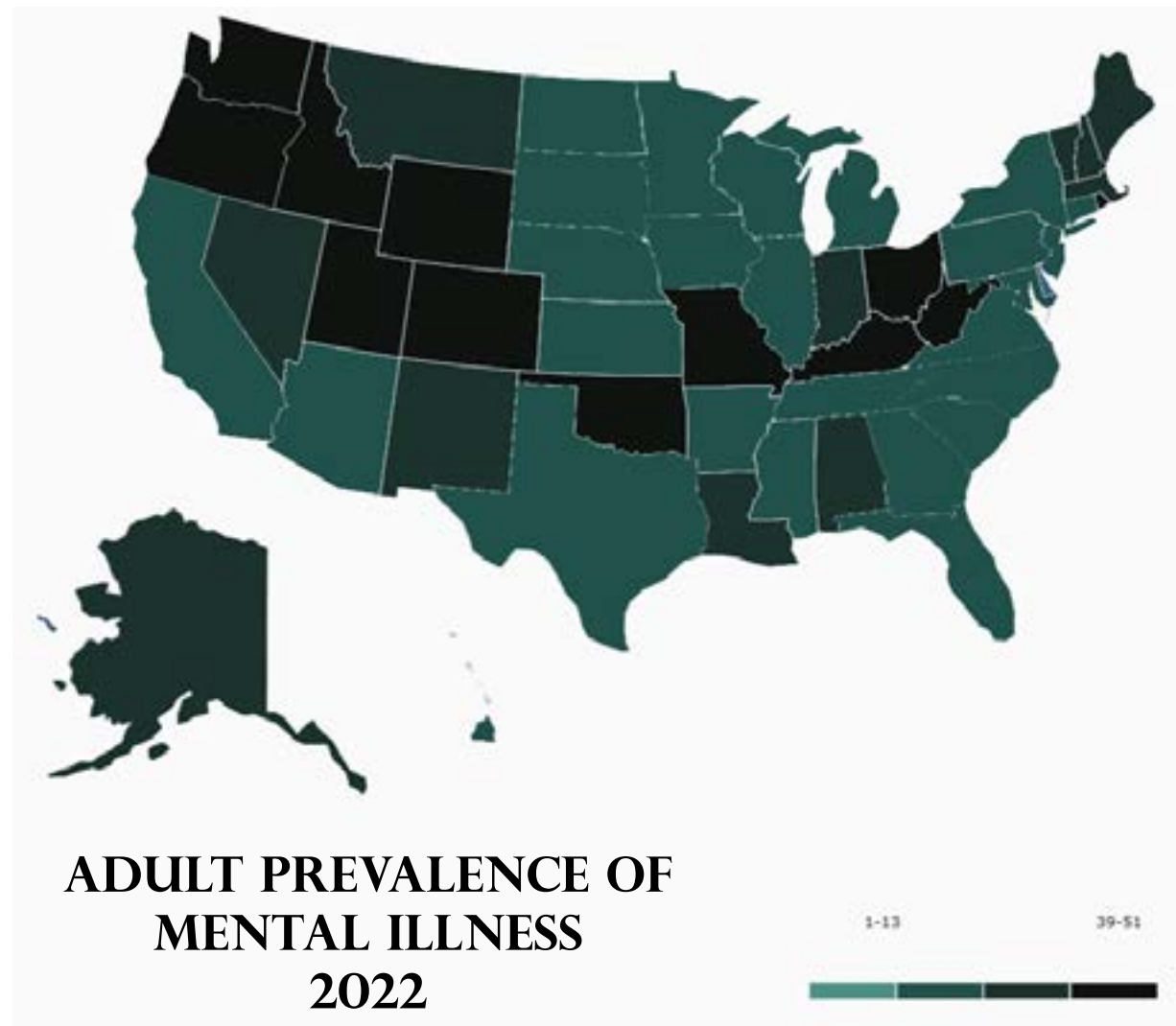


TABLE 11

Architecture is known to not only contribute to our physical health through ergonomics but also affect our emotional comfort hence improving quality of life and reducing mental stress. Many different aspects and key strategies can have an effect on a spatial environment such as natural ventilation and lighting, noise control systems, and a choice of materials and furniture. According to Arch Daily, creating spaces for interaction as well as spaces for isolation are truly essential to a healthy wellbeing, so people can choose the best space for each specific moment, feeling and activity within their life.



Biophilia (innate human instinct to connect with nature and other living beings), derived from the Greek words for “life” and “love or affection” making its literal translation “love of life”, plays a fundamental role in improving the quality of a space which therefore improves people’s mood and health. In high stress times and environments being immersed within nature and vegetation can positively influence humans social, physical, psychological, cognitive, environmental, and spiritual well-being. Dr. Charlie Hall states that increased access to green spaces also reduces psychological distress, depression symptoms, clinical anxiety, and mood disorders within adults. This reduction of stress and mental restoration can occur when individuals live near green spaces, have views of such vegetation, or just spend some time in natural settings.

There is a deep interconnection between people and nature, and within the last century research has revealed many ways humans are linked with the natural environment.

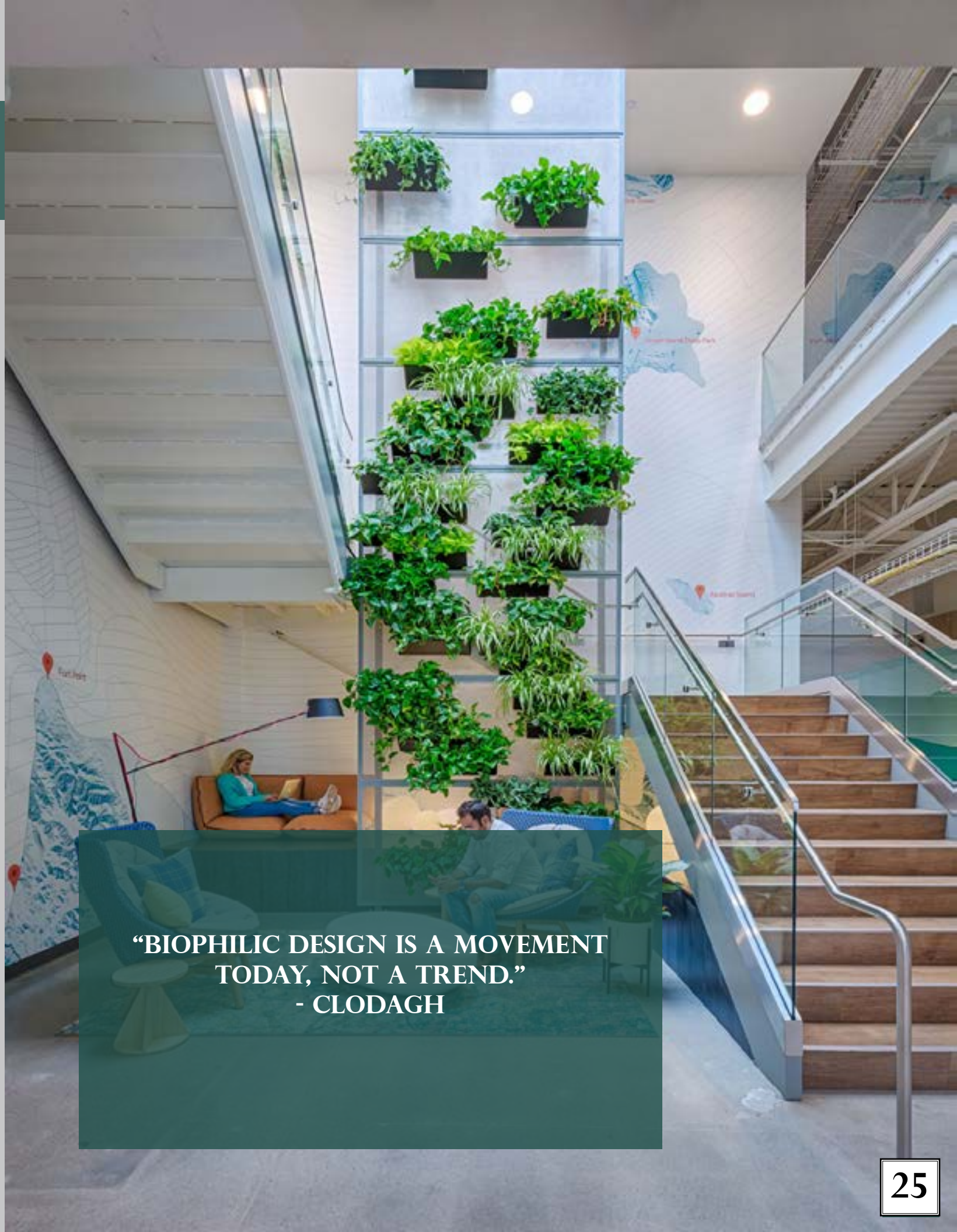
### - PHYSICAL HEALTH -

Health can also be a very broad term and there is already a widely established impacts on humans that can have major impacts on physical health. According to Frontiers, within the past 30 years research has also rationalized that exposure to nature whether what sense it is, visual, multisensory, or active is equally effective for effective for regulation diurnal body rhythms to ensure physical vitality as healthy eating and regular exercise .

### - MENTAL HEALTH -

The emergence of the Biophilia concept in the mid-1980s generated growing research of Mental Health connecting with nature. It's an instinct for humans to have a connection to nature, so it makes sense that us as humans feel better whether were in spaces that reflect the characteristics of the outdoor environment or have views or even access to natural vegetation and/or water features. Biophilic design offers incredible physiological and psychological health benefits, decreasing blood pressure and stress, boosts creativity, assists with healing, improves cognitive function, clarity of thought and boosts productivity (Reconnecting).

- EASING ANXIETY AND DEPRESSION THROUGH GREENERY AND NATURE**
- Visiting Parks
  - Nature Walks
  - Walking with Others
  - Watching Birds
  - Gardening
  - Access to and Views of Nature
  - Improved Air Quality and Ventilation
    - Natural Lighting
    - Improved Acoustics
  - Natural Materials and Calming Colors



**“BIOPHILIC DESIGN IS A MOVEMENT TODAY, NOT A TREND.”  
- CLODAGH**

## PROJECT JUSTIFICATION

Throughout my life, I have lived in a variety of atmospheres. Growing up in a small town and a big back yard being the most important to me. As I moved to college, I transferred between houses and apartments. A house with a yard, an apartment that had nothing to offer besides a big concrete parking lot and an apartment that had a little bit of both. Each space creating a different emotional and mental connection to it.

Emotional connection to the outside natural world is an important predictor of well-being and ecological behavior, especially in the world we live in today. By providing research and creating a design that brings this aspect to a deeper level, it could initially improve people's wellbeing living in the comfort of their own home. Using the study of Architecture and mixing it with the research of Biophilia and Environmental Psychology, this design thesis will be built upon shaping spaces to best meet the needs of the people who interact with them and help eliminate some of the negative impacts of modernism has had on multi-complex residential Architecture.

## PROJECT EMPHASIS

This thesis focuses on the interconnection between residential living and the natural world. This is done by incorporating the research of Biophilia and environmental psychology and creating a way to prove how important the natural world is to people and their environment they surround themselves with.

# BRINGING THE OUTSIDE IN

# MAJOR PROJECT ELEMENTS

## LIVING WALLS:

Living walls are assumed to be self-sufficient vertical gardens that are designed to be attached to the exterior or the interior of buildings. Their environmental properties are remarkable and great for space saving purposes. These green installations can be custom-made to the buildings needs and personal design preferences. These walls can be installed by using a range of different systems making it highly universal to building types/designs.

## VEGETATION:

Vegetation is important to this design thesis. Incorporating all different types of vegetation allows the space to become more immerse into a natural environment. That is including trees, shrubs, flowers, all different sorts of plants. This element truly covers the rest of the elements within the project.

## GROUND COVERING:

Ground covering is a great way to enhance any commerical landscapes. This usually refers to low-lying plants that spread and creep across the ground and is a cost-effective way to cover the soil. This provides visible appeal with minimal maintenance and comes in a wide variety of color and textures.

## WATER FEATURE:

A water feature will be incorporated into the courtyards landscape. Not just to add a decorative touch to the landscape, this type of feature also provides soothing and serene sights with sounds that can contribute to improving physical and mental well-being. Further enhancing the ambiance of the space, a water feature also brings texture and can soften lines of the environment surrounding it.

## NATURAL ELEMENTS

Natural elements will be the main and most important element to this design thesis project. Incorporating natural elements within a built environment can increase positive feelings, reduce stress and unpleasant thoughts. Natural scenery in general can not only make people feel better emotionally by physically as well. This is not just including vegetation but also natural materials used within the design of the building and the features that lie within.

# USER/CLIENT DESCRIPTION

This integrated and high quality courtyard designed within this Design Thesis will be for the private use of the residents that reside there. This space will be designed in a way that can be utilized by all residents of all ages/abilities. Creating both a physical and mental space, this new atmosphere is meant to create a natural environment for residents to escape their everyday life within the city, the chaos of the world around them without having to leave the comfort of their own home. Nature is made out to bring a sense of individualism, natural harmony, and peace to who experiences it.

This courtyard will not only be a space that provides a sense of nature within it but it will be a space that provides a “backyard” for those that live in apartments that do not have the opportunity to have one. Creating spaces for people to relax, play outside games, grill, garden, and just be able to enjoy the outside world.

# SITE/CONTEXT

## LOCATION:

West Fargo, North Dakota, USA

## SIZE:

Total Area: 25,131.71 ft<sup>2</sup> (2,334.81 m<sup>2</sup>)

## LAND USE:

Currently: DMU: Downtown Mixed Use

## SITE POSITIVES:

West Fargo continues to grow year after year, within the last decade West Fargo has continued to expand. Splitting itself between an older Downtown to a newer modern expansion, the city of West Fargo wants to bring the life of Downtown back into existence.

## SITE NEGATIVES:

This site is located in a very industrial area. As West Fargo tries to modernize its Downtown area with newer buildings, it still stays the industrial part of the city.

## REGIONAL MAP



TABLE 12

### Region:

North Dakota, USA

### Regional Demographics:

Population: 800,394 people  
 Land Area: 70,700 Square miles  
 Counties: 53 Counties  
 Persons/Sq. Mile: 9.7 people  
 Total Housing Units: 383,303 units

North Dakota is the 19th largest state in the country but incredibly scarcely populated compared to the size. It is also the only 47th most densely populated state in the entire country. Which West Fargo resides the fifth largest city in the state with a population of 38,487 within the most populated county, Cass County with 177,787 residents (West Fargo, Nd).

## CITY MAP

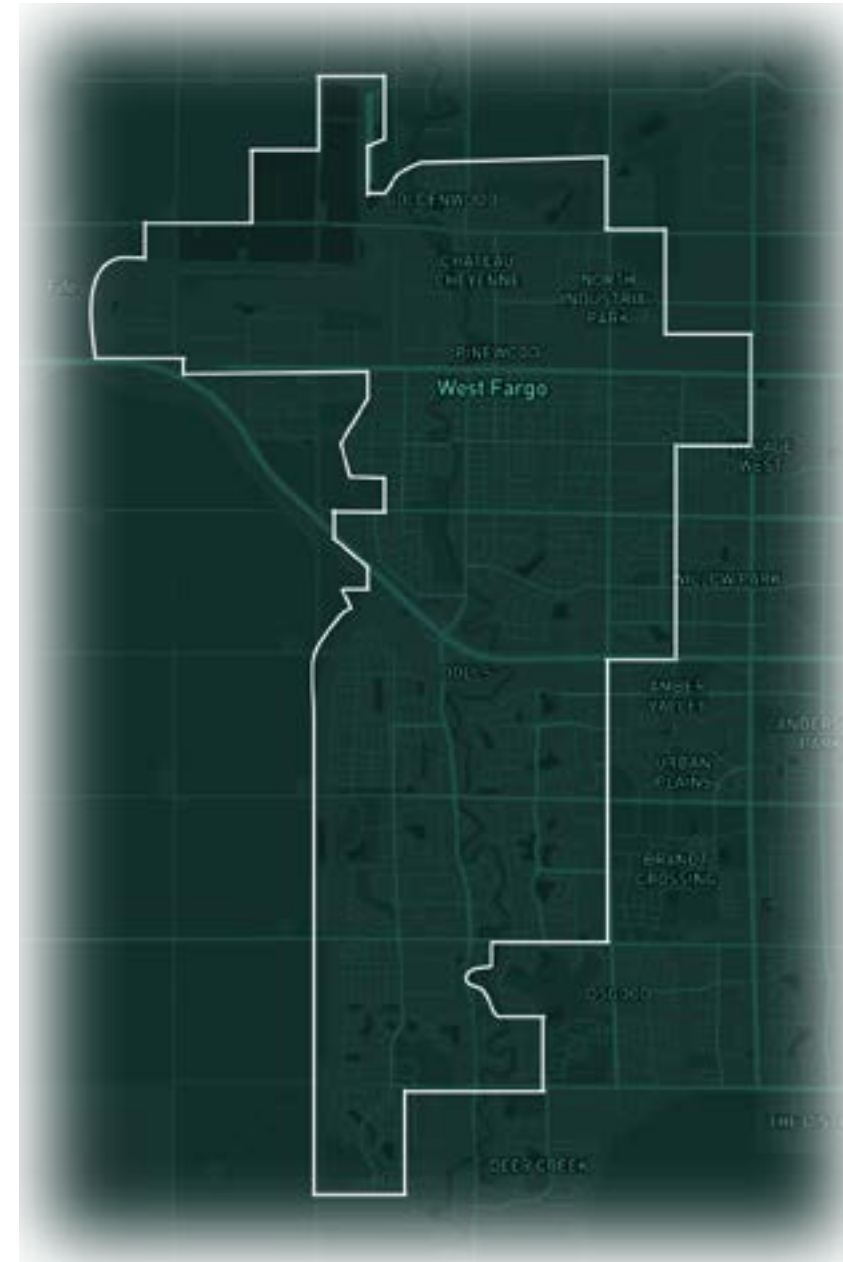


TABLE 13

### City:

West Fargo, North Dakota

### City Demographics:

Population: 38,487 people  
 Land Area: 16.42 Square miles  
 County: Cass County  
 Density: 2,388.01/sq mi  
 Growth Rate: 3.21%  
 State Rank: Fifth Largest

**A SMALL TOWN WITH BIG CITY AMENITIES.**



## SITE MAP

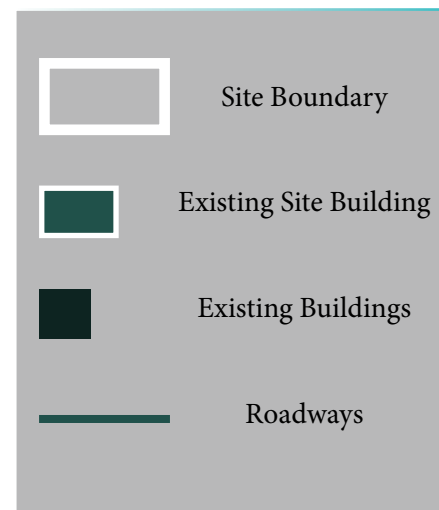
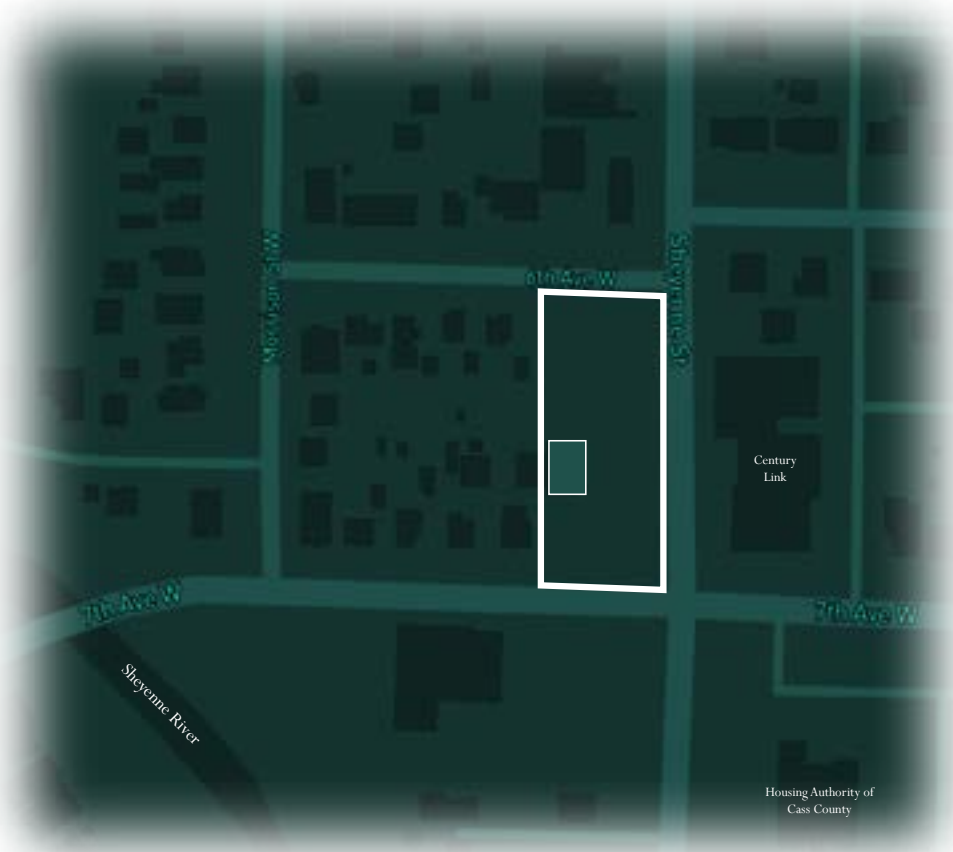


TABLE 14

This projected site is located on a long block spreading between 6th Avenue and 7th Avenue West right off a very important road of the Downtown area, Sheyenne Street. This block is located on the edge of Downtown and the residential sector of this area.

46°52' N 96°54' 16" W

## WEST FARGO

“A small town with big city Amenities” has been one of the longstanding attributes that best describes this city as a whole. As West Fargo’s development has changed in the last two decades, the city has grown from around 5,000 to an expected 40,000. West Fargo is considered one of the fastest growing communities in North Dakota, with a growth rate of 72.9% and the population reaching over 38k (West Fargo, Nd).

As West Fargo is not the same city nor has the same identity that it had 20 years ago, that doesn’t change the fact that the “old” era is still a part of the city’s identity. The city of West Fargo plans to incorporate not only the small town feel into the distincts identity that will set the city of West Fargo apart but one that will mix with the other two metro cities it connects to, Fargo and Moorehead. The residents of West Fargo understand the importance of the growth and development plans for its city. With these plans in mind, the hope for the city is to create a much stronger local economy, greater sustainability and improve quality of light for not only the residents that currently reside there but for future residents that seem to continue to keep arriving.

The idea of these developments is to continue to preserve the character of the city of West Fargo by its rural community, addressing the idea of the growth within the city while protecting and improving the high quality of life for all the residents.

As West Fargo continues to grow, over the last decade or so it has gone from building outwards to learning to build up. A whole development plan called, West Fargo 2.0 has sparked the idea of a whole new atmosphere and areas tackling the areas of Downtown West Fargo, 32nd Ave W and Sheyenne Street, The Wilds South, and the Lagoons.

## DOWNTOWN WEST FARGO

The West Fargo Downtown is located at the intersection of Sheyenne Street and Main Avenue, within the northern and oldest part of the city. Downtown is actually not considered the center of the city. However, continuing the redevelopment of the city, there is multiple new mixed-use projects under development on Sheyenne Street that will begin the pattern of Downtown and change the character of the area as a whole (Reuer, W.). This development truly has the hopes to create a “true” downtown giving the area a geographic heart to the city and create a space that local residents want to gather.

For the Idea of involving new mixed-use buildings is to define blocks and create walkable streets and bring the buildings right up to the sidewalk to create an active pedestrian environment. The new mixed-use buildings would incorporate the usual retail/restaurants on the ground floor while having offices or residential areas on the remaining upper levels. This is the hope to bring more people into the Downtown area and create more of a round the clock vibrancy. On the other hand, there is the idea of apartment housing that are more of a smaller multifamily housing. These are looked at to provide a grand transition from the new mixed-use projects along Sheyenne Street and Main Avenue to the single-family residential housing present in the adjacent neighborhoods (About West Fargo Economic Development).

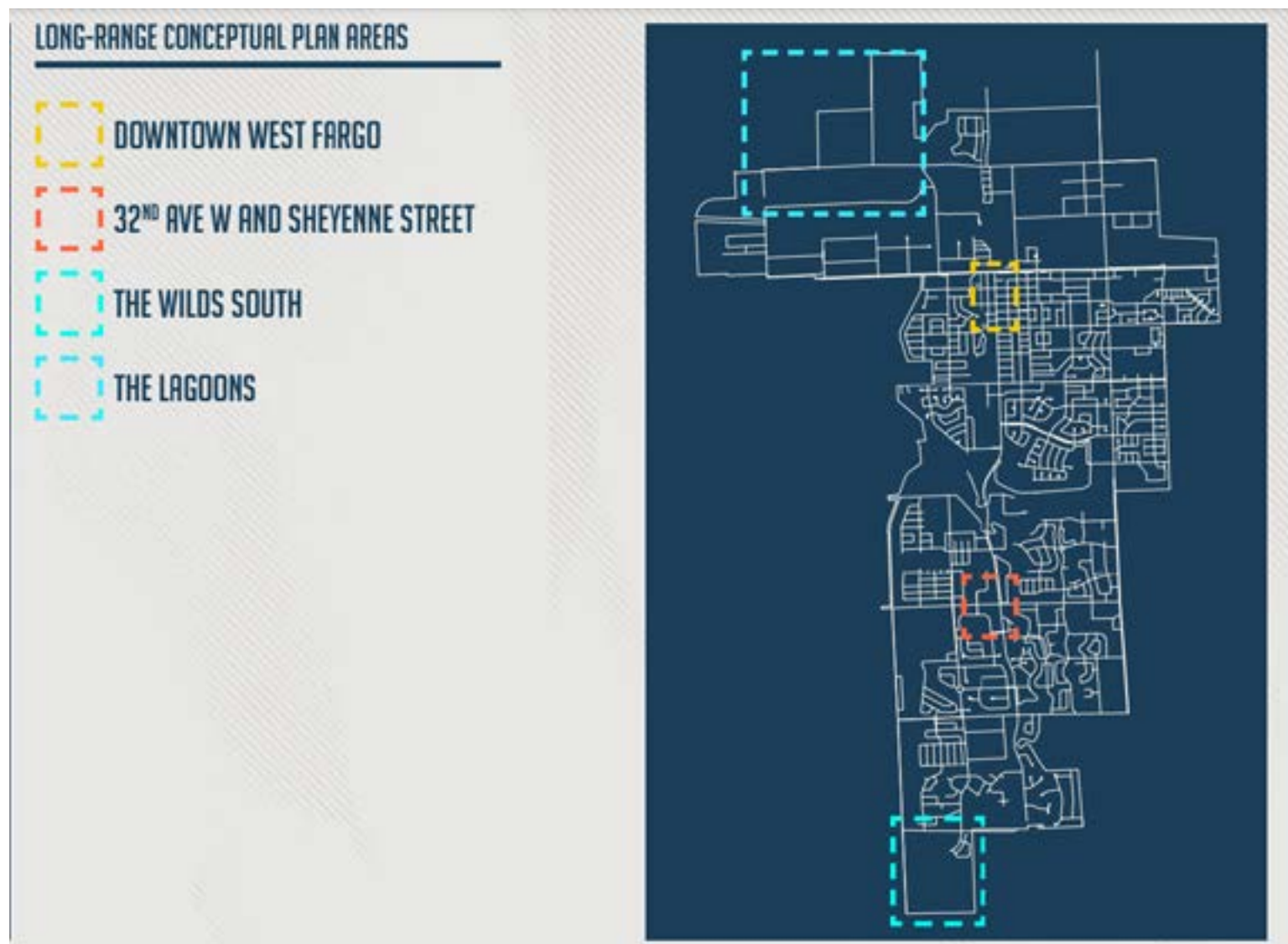


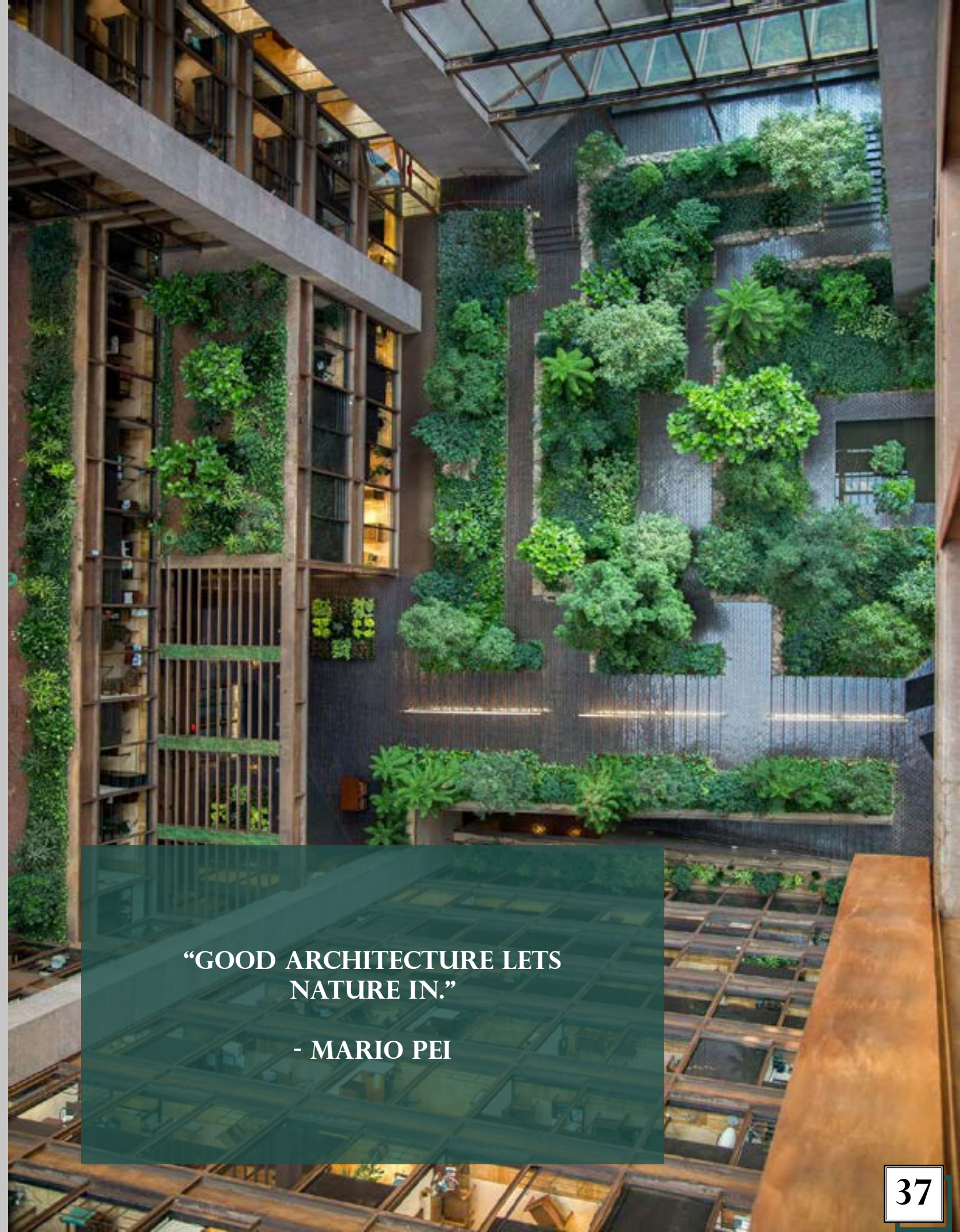
TABLE 15



TABLE 16

**FUTURISTIC DEVELOPMENT PLANS**

- New Downtown Square
- Pedestrian Connection to Armour Park
- Armour Park Redesign
- New Civic Center
- New Mixed-Use Buildings
- New Multifamily Units
- Possible Parking Garage



“GOOD ARCHITECTURE LETS NATURE IN.”  
- MARIO PEI

# GOALS OF THESIS

## 01 LEARN HOW TO RESEARCH DEEP WITHIN A TOPIC

Research is the core of a thesis, without research, a thesis truly could not be possible or informative enough. I have never had to research a topic as deep as I will need to for this thesis. Learning how to do the research will help creating this design thesis in a way that I am proud and have expanded my knowledge on the topic.

## 02 TO CREATE A DEEPER UNDERSTANDING OF MY TOPIC

This is a topic that I never truly considered until Architecture school and while living in places that did not quite hit the mark of a truly healthy well-being environment. Doing my thesis on this topic will push my knowledge of this and be able to help me bring it to my professional career and hopefully be able to incorporate it within my designs in the future.

## 03 SHOW THAT ENVIRONMENTAL DESIGN AND BIOPHILIA ARE IMPORTANT

As I have stated before, I think Architecture has become so modern and has forgotten the deep emotional and mental needs of the humans that reside within that space. I believe doing this research and creating a final design thesis based around it, can help people that read my thesis have a deeper understanding of why my topic should be taken into consideration in each and every design.

## 04 BE ABLE TO SUCCESSFULLY INTEGRATE COMPONENTS

After all the research is done, I want to be able to successfully incorporate all the different components and ideas that I have found to be important to this topic into my design to truly be able to show and not just tell.

## 05 TO CREATE SOMETHING ALL ON MY OWN PROCESS

A thesis in general is meant to be a statement of theory that is put forward as a premise to be maintained or proved. Within my thesis, a lot of research is needed to be able to prove what I am trying to say. But luckily this is not just a regular thesis but a design thesis. I want to be able to create a design entirely on the progress I have made and the research I have done. I think this will truly improve my own design process and further me in my readiness for my future career.

## 06 I WANT TO CREATE SOMETHING THAT I AM PROUD OF

This is honestly my main goal. I want this thesis, the research, the knowledge, the ending design to be something that I am beyond proud of.

# PLAN FOR PROCEEDING

At this point within the thesis project, not a whole lot of research has been finished, just started. Moving forward and continuing to improve my proposal, will be done by a whole lot of research, digging into new ideas and new angles that will help bring my topic to life. During the finishing of the research aspect of the project, I will start the creation of my design and slowly evolving it into something that mimics my research and shows what I am trying to tell within this thesis. This portion of the project will take a lot of sketchbook pages and a lot of new changes or completely starting over. As the time moves forward, and my design becomes more detailed, I will be able to bring it all together into a concise design that shows my research in multiple aspects. Moving quickly into the final stages, I will be able to move my design digitally and start writing and creating my final presentation.

## DESIGN METHODOLOGY:

Design Methodology is the development of a system or method for a unique situation. The key is finding the best solution for each design situation. This stresses the use of brainstorming to encourage innovative ideas and collaborative thinking to work through a proposed idea and arrive at the best solution. This will help with meeting the needs and wants of the end product. This will be done by analysis and testing, first starting with deciding on an idea, then researching the topic that leads to finding out new ideas and angles on the topic to find what will work best. 3. Then it moves to testing of the new ideas. 4. Creating your own design opinions and looking into the design solutions. 5. Formulation your own opinions into a set end conclusion to be used within the ending design.

## DOCUMENTATION OF DESIGN

### STAGES

#### 1. Research within Sketchbook

- Stating ideas/aspects
- Major emphasis on the topic

#### 2. By Hand

- Sketching
- Modeling

#### 3. Digital Design Software

- Sketchup
- Revit
- Lumion
- Illustrator
- Photoshop

Documentation of a design is truly important; the evolution of a design continues to change in ways that the designer never expected. A design that is originally brought to, will more than likely look completely different in the end. This is brought by constant documentation of the little changes throughout the process. The thought of the design started when the research started and as my idea has evolved. But nothing concrete, just ideas and thoughts within my head. All research will be collected digitally and within a sketchbook for the little emphasis. When the design process starts to become to, this will be shown through sketches, conceptual drawings, many scribbles, and pages with empty promises. But, as the process improves and move forward, it will eventually be moved digitally through the usage of computer design software.

# MONTHLY PROJECT WORK SCHEDULE

## FALL SEMESTER 2022

	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
<b>1</b>			<b>PROPOSE</b>		
<b>2</b>					
<b>3</b>					
<b>4</b>					

### DEADLINES:

THESIS PROPOSAL (10/13)

THESIS PROGRAM (12/13)

# MONTHLY PROJECT WORK SCHEDULE

SPRING SEMESTER 2023

	JANUARY	FEBRUARY	MARCH	APRIL	MAY
<b>PROGRAM</b>					
<b>DESIGN</b>					
<b>PRESENT</b>					

**DEADLINES:**

DIGITAL EXHIBIT (4/?)

THESIS BOOK (5/?)

# PERFORMANCE CRITERIA

## SPACE ALLOCATION

The spatial criteria within my design thesis is definitely an important aspect of the project. Due to the fact that my design truly revolves around a prototype for other possibilities within residential designs, I still have to pay attention and put in the effort for the surrounding building the prototype lays within. This prototype not only has to accommodate the surrounding building but also facilitate the program of the project. This will be done by research surrounding the ideal atmosphere and paying close attention to how other projects have been successful within the criteria.

## ENERGY CONSUMPTION

Although energy consumption isn't a primary aspect to me design, it still can play a crucial role in the design since the prototype that I am designing has to do with involving the nature world. Creating a recreational space that includes natural lighting, natural ventilation, and the need for survival of the vegetation within, energy consumption could come to a high cost unless it is greatly considered and what materials are used to build/design the space.

## BEHAVIORAL PERFORMANCE

Behavioral impact cannot be gauged quite yet during the design process but more by the activity of the area in the future. For example, how often residents use the private courtyard, How often the public visits and uses the public courtyard, How the spaces are used and are they playing a crucial role in the residents life.

## PSYCHOLOGICAL IMPACT

This part of the criteria is huge, mainly for the idea that a lot of the reasoning behind this design is due to improving a human's quality of life involving their physical and mental health. This could possibly be the most important goal of this project to investigate how positively the impact of this space could be physically, mentally, behavioral wise. It is important to strive to create this space that serves the purpose of positively impacting the quality of one's life.

## ENVIRONMENTAL IMPACT

This design is built upon the idea on bringing the natural world within, creating an interconnecting between nature and architecture. The environmental impact is not quite the most important idea of the project but still will make an ending difference. Creating more green spaces in a world like today is crucial, it is important to keep green alive especially within bigger cities like this site that was chosen.

## CODE COMPLIANCE

Due to the fact this project would be built and designed from scratch, I hope to complete the design that would be completely code complaint and meets all the newest and updated ADA standards.

## COST

The cost of this design would be challenging to come up with an estimate. It is nice due to the fact that majority of the site is a parking lot, however there is an existing building that is an old gas station. This can be a significant cost concerning not only the tear down of the existing building but taking out the fuel tanks that lie beneath part of the parking lot. On the other hand, if I plan to create this building at sustainability as possible, the materials to build the courtyard could come at quite a high price, especially if i design an interior yar around courtyard instead of seasonal.

# SPATIAL PROGRAM

A very important point part of research is into the physical space the design hopes and plans to create. This is the task of how certain spaces will interact with each other and the impact the spaces will have with the users. Spatial programming is one of the first steps needed in any space delivery project, it's a way to define the requirements of the users and the space.

## SPATIAL PROGRAMMING:

- Identifying Problems and Needs
  - Providing the right amount
  - providing the right type of space
    - equipment
- furniture needed to function efficiently

Even though this thesis design mainly revolves around the prototype of a courtyard, I will also have to create a spatial program for the building as a whole to truly understand the space and what the purpose of this project is. It will have to involve all aspects and spaces of the building to show the relation of each space and how it interacts with the other.

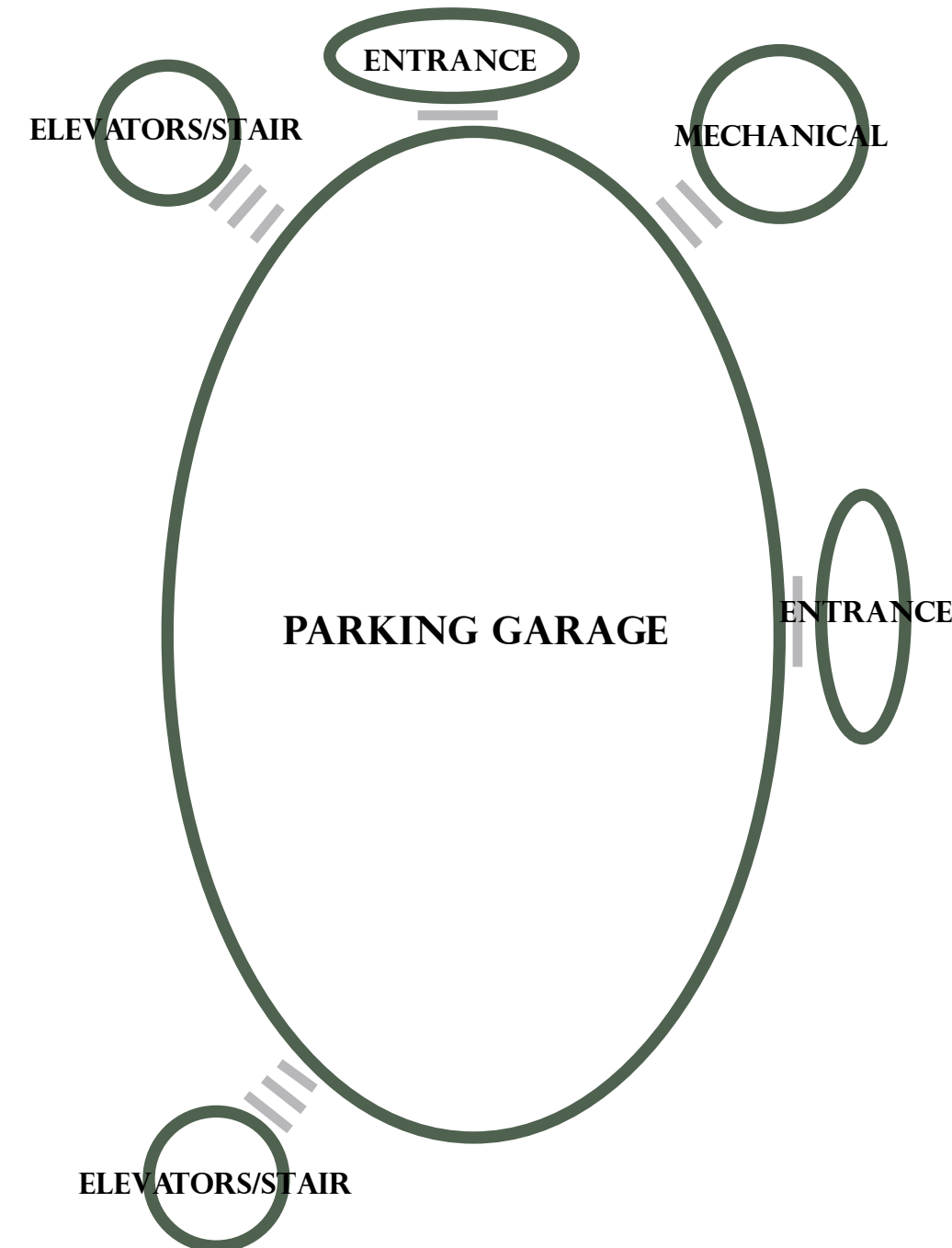
## TOTAL SITE

Total Area: 25,131.71 ft<sup>2</sup> (2,334.81 m<sup>2</sup>)

## MAJORITY OF SITE SPACES:

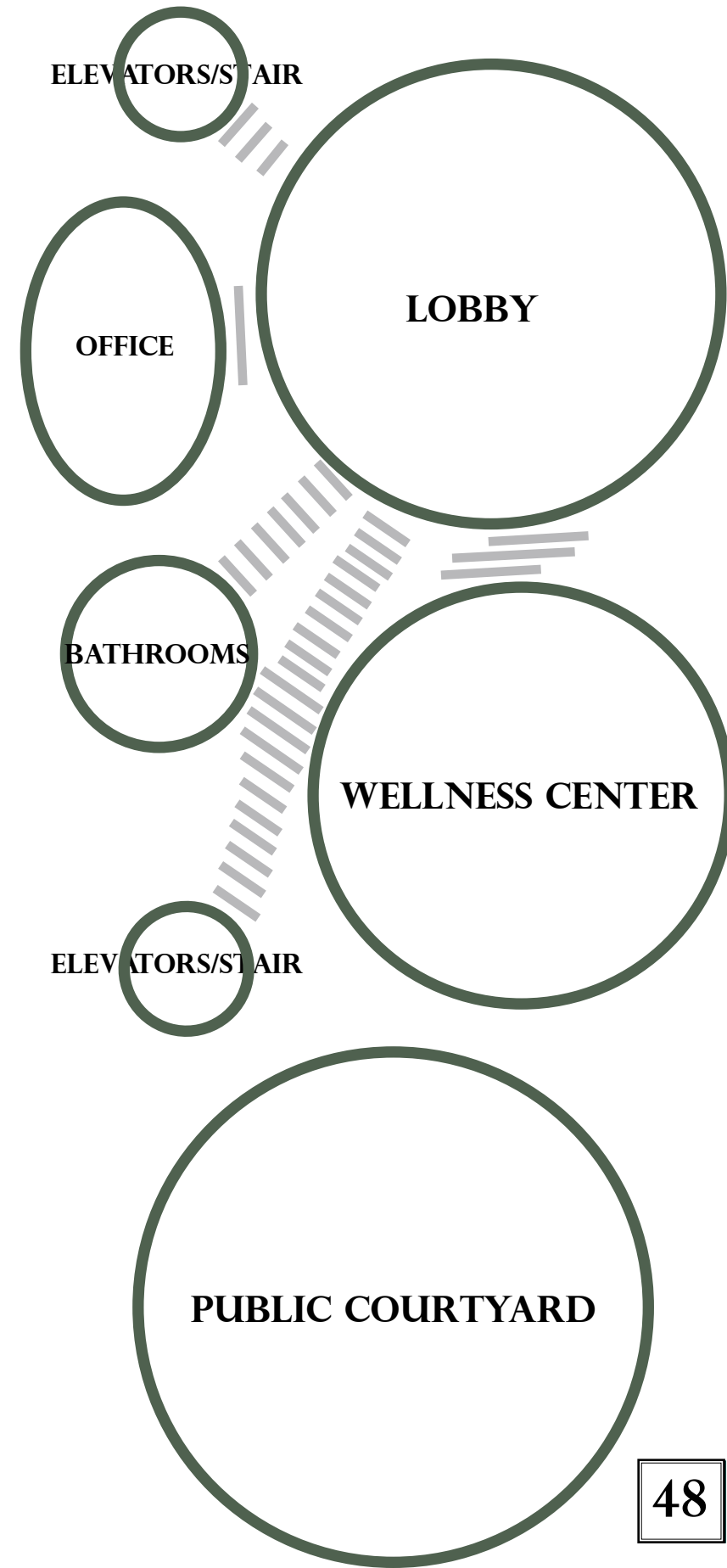
- Public Courtyard
- Private Courtyard
- Residential Space (Apartments)
  - Parking Garage
    - Lobby
    - Office
  - Workout Space
  - Restrooms

## UNDERGROUND SPACE

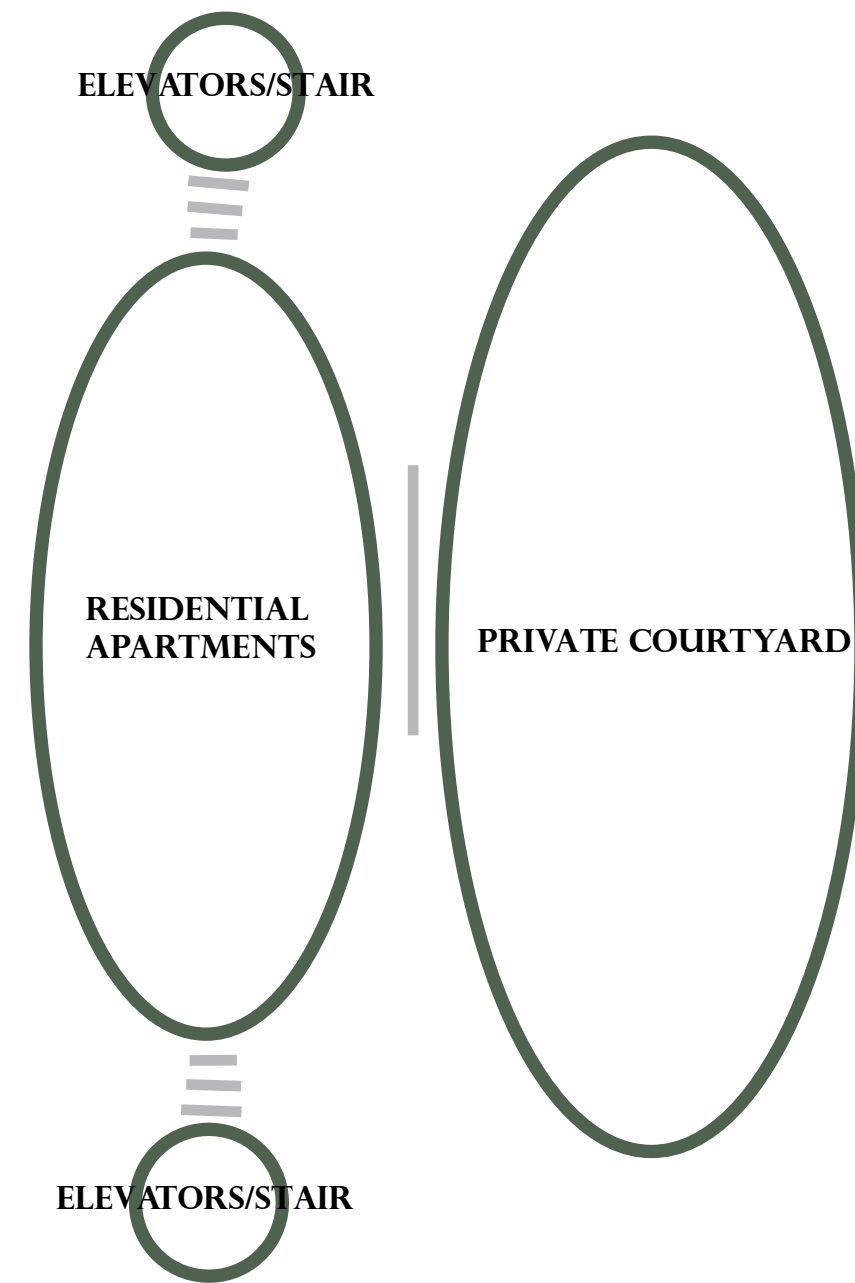




# FIRST FLOOR SPACE ALLOCATION

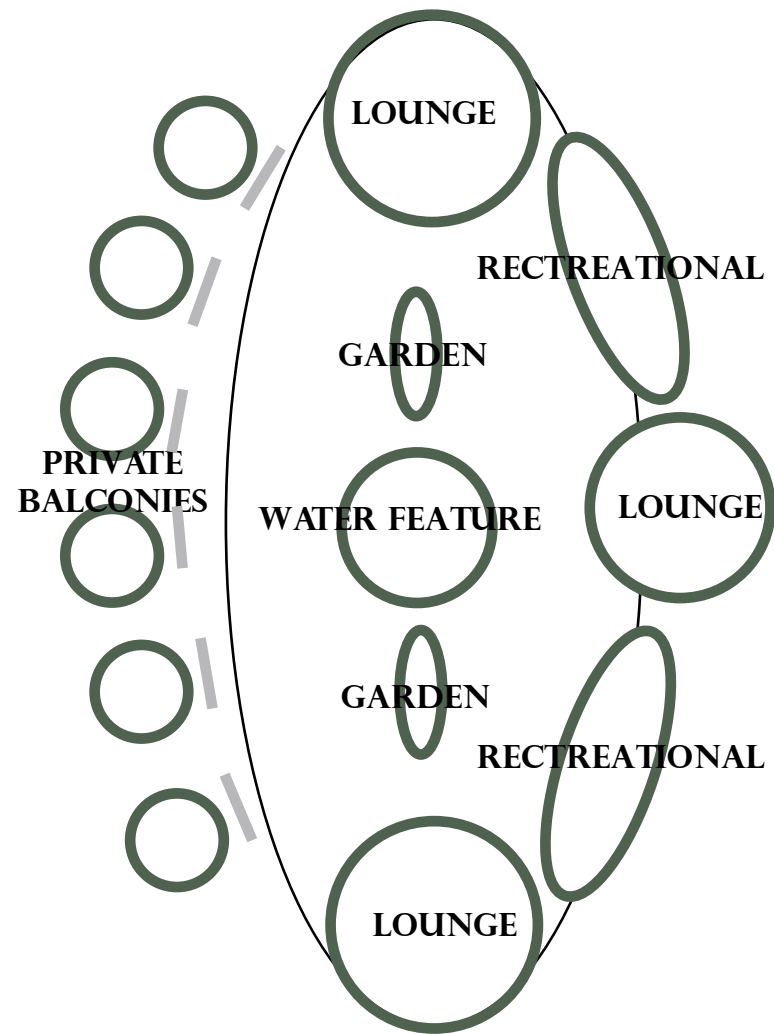


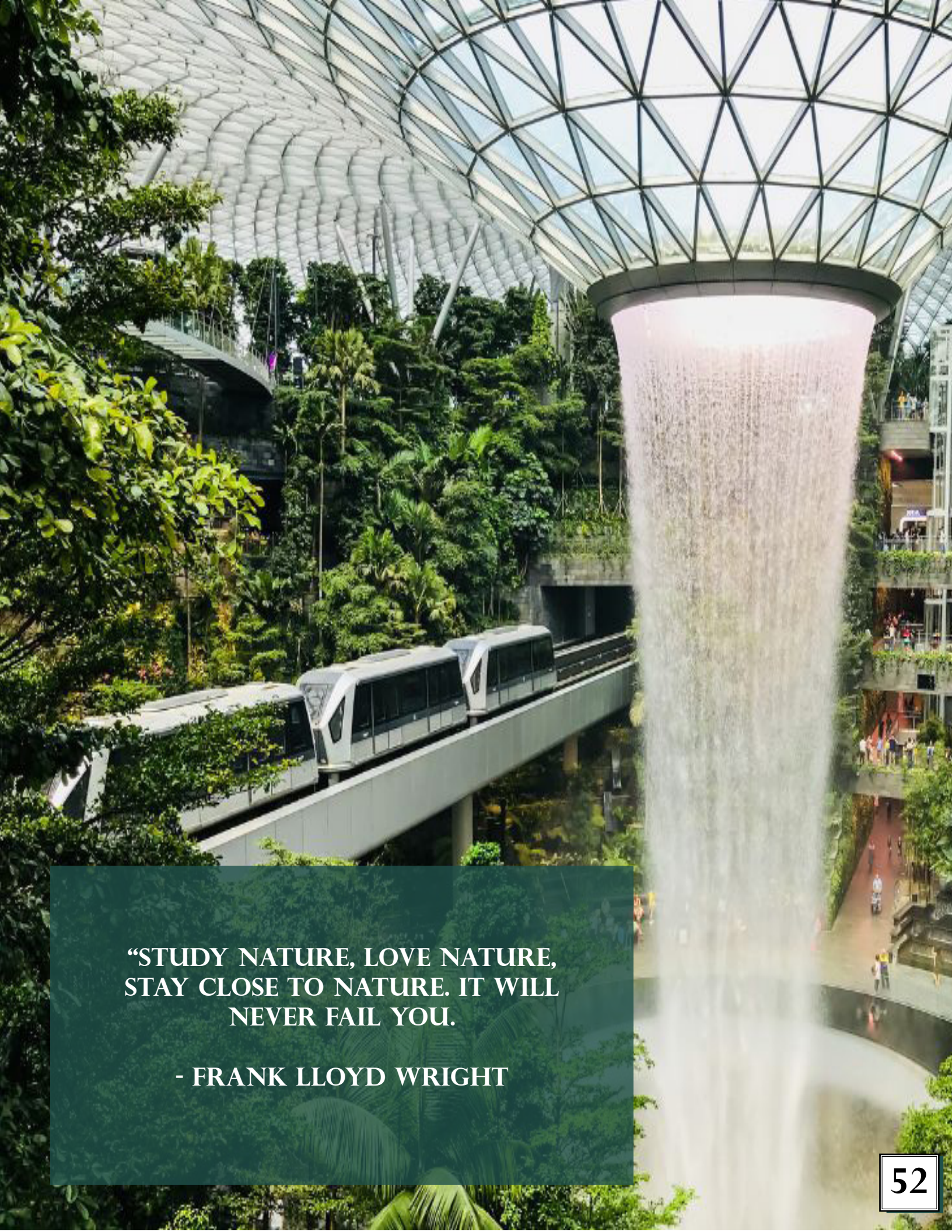
# SECOND FLOOR SPACE ALLOCATION



**COURTYARD SPACE ALLOCATION**

**THIRD FLOOR SPACE ALLOCATION**



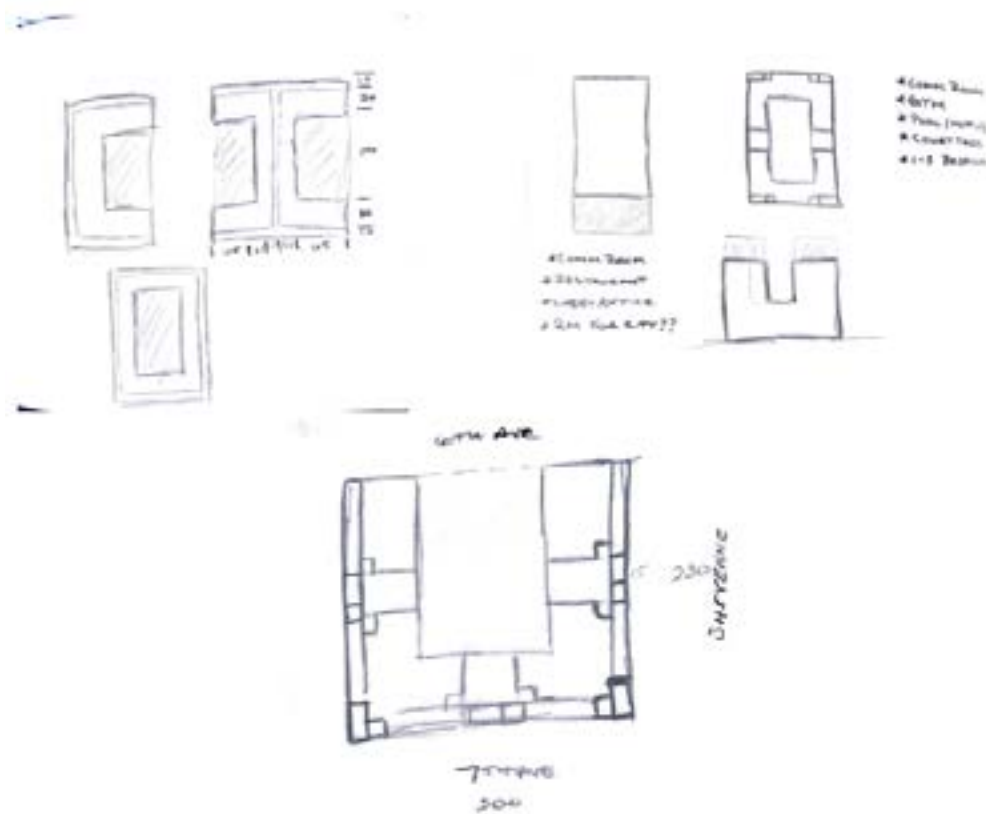
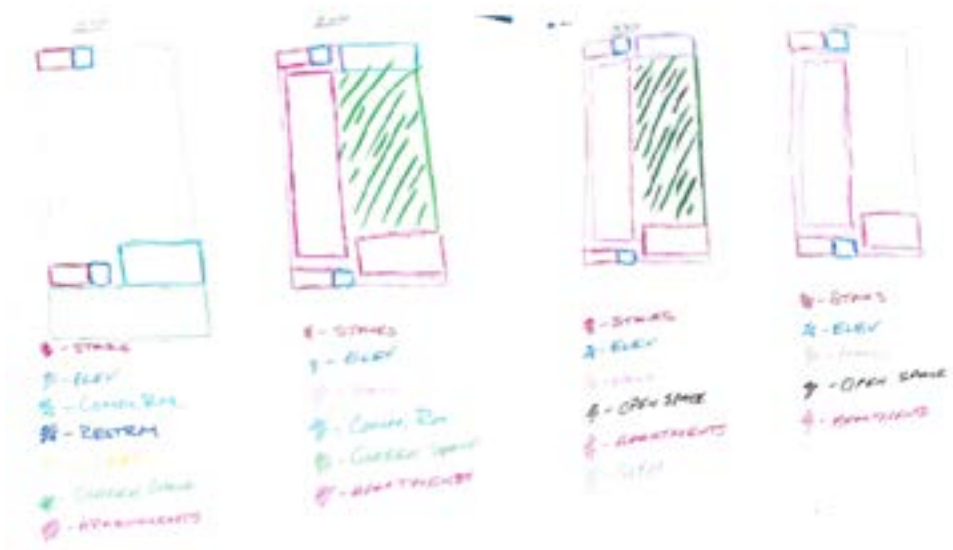


“STUDY NATURE, LOVE NATURE,  
STAY CLOSE TO NATURE. IT WILL  
NEVER FAIL YOU.

- FRANK LLOYD WRIGHT

## FINAL BUILDING PROGRAM

## PROCESS



The process of this design consisted of orientation of the building and the layout of the site and the central courtyard itself. As the orientation moved and shifted, so did the spatial programming of the whole building. Going from an only residential apartment building and turning it into a mixed-use build.

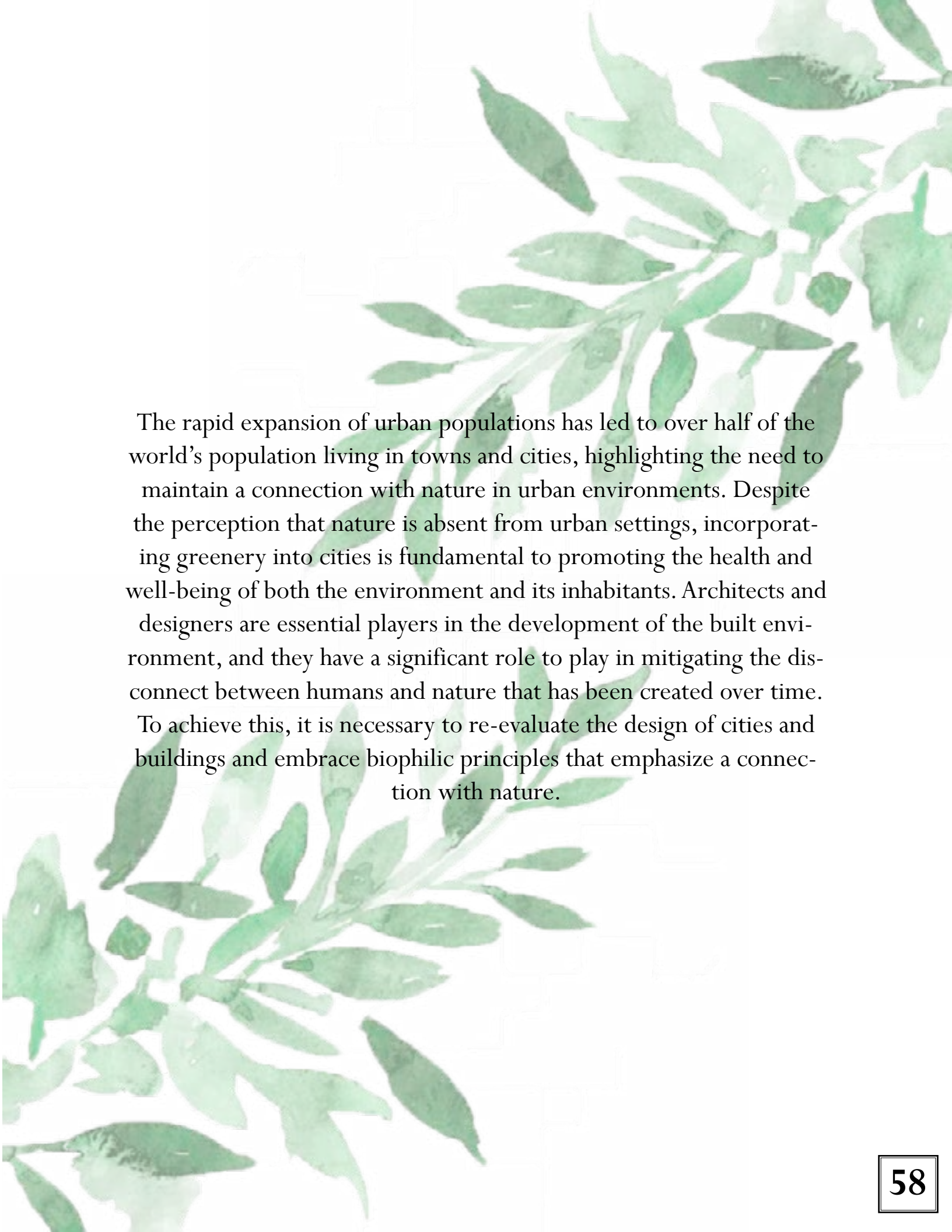


# DELIVERY

## THE SITE



The West Fargo Downtown is located at the intersection of Sheyenne Street and Main Avenue, within the northern and oldest part of the city. Downtown is actually not considered the center of the city. However, continuing the redevelopment of the city, there are multiple new mixed-use projects under development on Sheyenne Street that will begin the pattern of Downtown and change the character of the area as a whole. This development truly has the hopes to create a “true” downtown giving the area a geographic heart to the city and create a space that local residents want to gather. For the Idea of involving new mixed-use buildings is to define blocks and create walkable streets and bring the buildings right up to the sidewalk to create an active pedestrian environment. The new mixed-use buildings would incorporate the usual retail/restaurants on the ground floor while having offices or residential areas on the remaining upper levels. This is the hope to bring more people into the Downtown area and create more of a round the clock vibrancy. On the other hand, there is the idea of apartment housing that is more of a smaller multifamily housing. These are looked at to provide a grand transition from the new mixed-use projects along Sheyenne Street and Main Avenue to the single-family residential housing present in the adjacent neighborhoods.

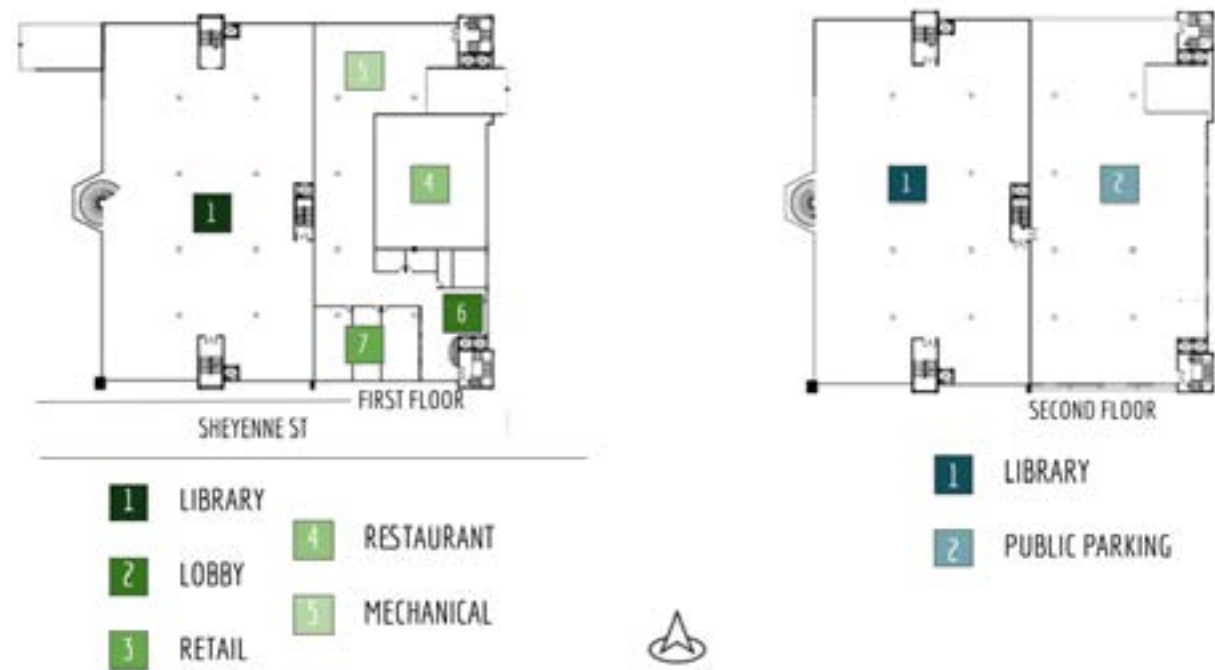


The rapid expansion of urban populations has led to over half of the world's population living in towns and cities, highlighting the need to maintain a connection with nature in urban environments. Despite the perception that nature is absent from urban settings, incorporating greenery into cities is fundamental to promoting the health and well-being of both the environment and its inhabitants. Architects and designers are essential players in the development of the built environment, and they have a significant role to play in mitigating the disconnect between humans and nature that has been created over time. To achieve this, it is necessary to re-evaluate the design of cities and buildings and embrace biophilic principles that emphasize a connection with nature.

Using natural materials such as wood, stone, and clay in the design of buildings and spaces can create a tactile and sensory experience that connects occupants with the natural world. Incorporating these within a built environment can be a contributing factor of increased human health, positive feelings, stress reducer, and overall well being. Natural scenery in general can not only make people feel better emotionally but physically as well

Vegetation is crucial to this design and is planted throughout the whole building. With the use of planters, living walls and ground coverage, incorporating all different types of vegetation allows for the design to become more immersed into a natural atmosphere This is done by including small trees, shrubs, flowers, grasses and all different types of plants throughout. To ensure ground coverage, artificial turf was utilized in the central courtyard and rooftop, providing a cost-effective and low-maintenance way of adding natural appeal to the space.

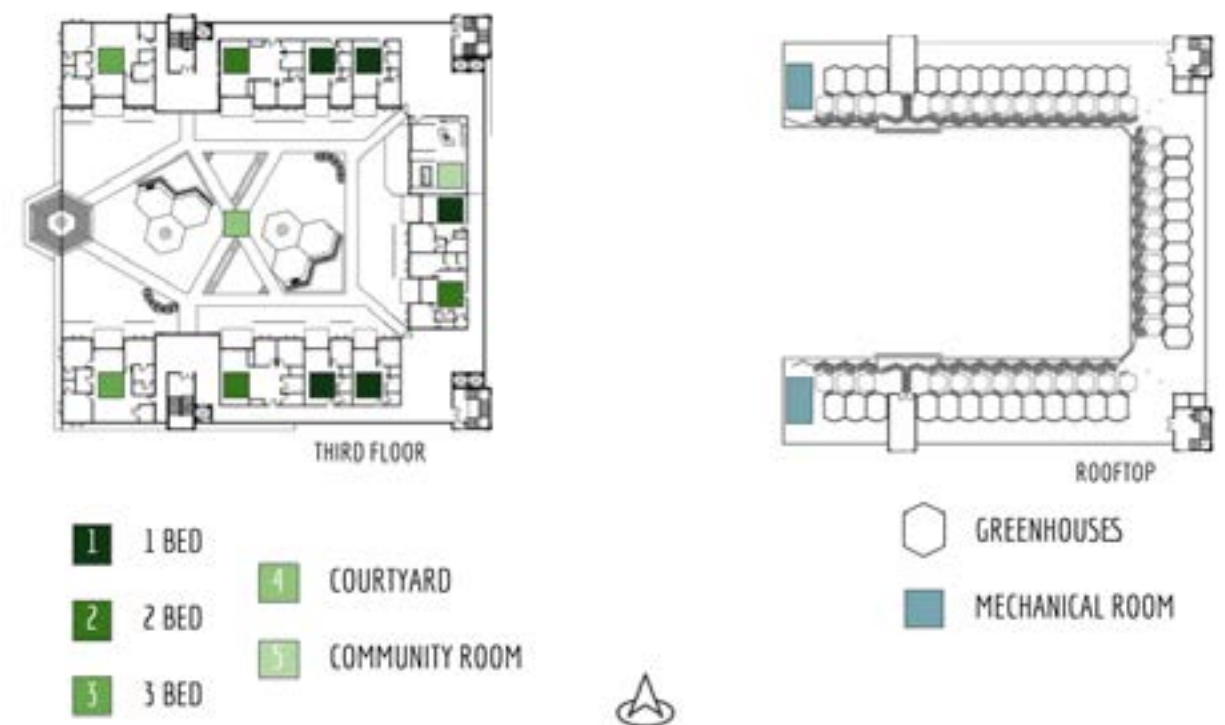




The third floor starts the residential level continuing up to through the fourth and fifth floor. However, the third floor contains the heart and soul purpose of this whole design, the central courtyard. This central courtyard and designed through the ideas of Biophilia and the concepts that surround it. Containing open recreational green spaces, multiple garden spaces, water features, various types of vegetation throughout the whole space. This central courtyard was designed to create a natural environment for residents to enjoy and embrace without having to leave the comfort of their own home or have to search for spaces within the city limits.

The rooftop level contains 34 greenhouses, two large pergolas and two mechanical/maintenance rooms for the building and the living walls on each wing.

The first and second floor of this mixed-use building covers the usually retail/restaurant portion of the design. However, due to the fact that West Fargo is in major need of a new library, I incorporated a library within half the first and second floor. The other portions of the first floor consist of normal retail and restaurant space with the addition space being the main lobby for the building and the back portion being mechanical and maintenance rooms. The other half of the second floor consists of a public parking garage to provide accessible parking for the visitors. Private parking for the residents takes place in an underground single story parking garage with the entrance being on the southwest corner.





A living wall facade was created for three sides of the building, mainly consisting of the exterior walls of this single corridor building. The reasoning behind the single corridor was to allow for a larger courtyard and to allow natural light within the hallways. To allow for the natural light, large tinted colored windows were used between the living walls to give off a more vibrant touch. To create this wall, a facade bound system was used with a watering system that starts at the roof and travels downwards. Living walls in the Midwest can be difficult to manage due to the harsh climates but using certain professional companies, techniques and vegetation, living walls in this area can be very successful.

To also bring the biophilia design within the building and not just on the exterior, living walls and water features are used within the building through the lobby and the hallways.







GRILL & LOUNGE

Located within the heart of the courtyard are two spaces designed for residents to be able to enjoy the outdoors and can be used in various ways. This area provides a large grill with surrounding counter top spaces, a long patio bench and patio table as well as cushioned couches and chairs surrounding a tabletop fireplace.

Providing residents with spaces like these, gives them more of an opportunity to spend time outdoors and within this biophilic designed space without having to go searching within the city. A lot of apartments now a days have little balconies and may not have space for grilling, providing a large lounge space to enjoy at any time of the day, with any company they want, may encourage them to spend more time outdoors and overall, just gives them that extra opportunity that they may not have otherwise.

On the South side of the courtyard, pushing out a little bit from the building itself, another lounge space was placed and designed mainly for a more excluded area for residents to enjoy leisure time around a fireplace without having to be in the middle of the courtyard, not only surrounded by the building but the presence of the other residents. This area is meant to give an even more open feel than the rest of the courtyard, looking out over the public courtyard placed below. This space provides not only the fireplace but another set of cushioned furniture and two bench swings.



FIREPLACE



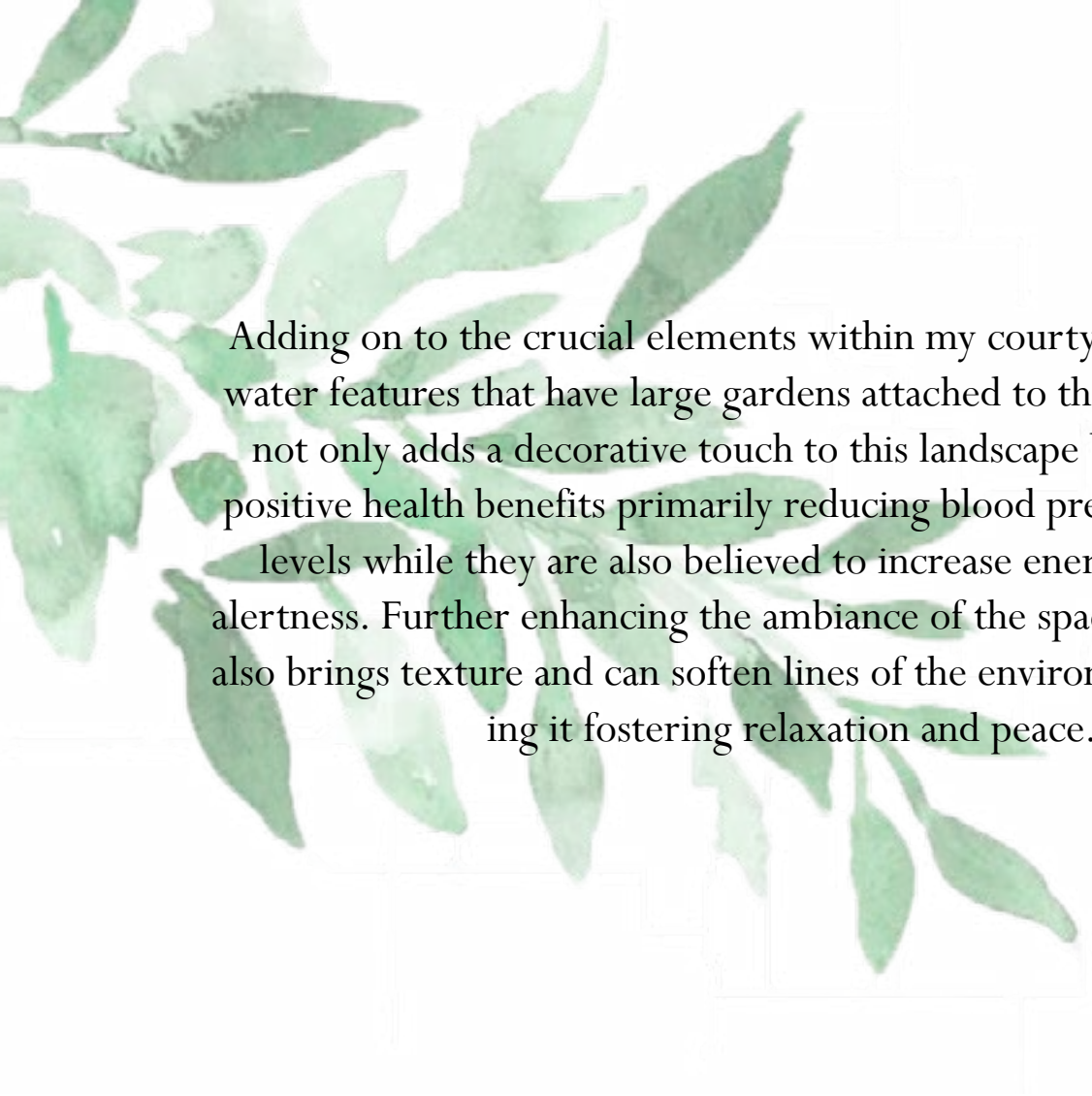
Located in multiple spots along the walkways within the central courtyard are large stone and wood garden spaces that consist of multiple types of grass and small trees. These not only add a decorative touch to the space but trees also provide natural shade and add to the natural environment atmosphere that this thesis is shooting for. An environment that includes natural elements and plants brings a positive outlook on life and helps boost people into feeling more alive and active

There are two unique benches located along the walkways within the courtyard. These benches are made up of the same materials that have been consistently used throughout the area. These benches have pots attached to the back of them used for a backrest that includes flower beds and small trees for slight shading. Plants can act as a natural happiness booster, particularly flowering plants.

Flowers have been found to release oxytocin and dopamine, the neurotransmitters associated with motivation, feeling of security, peace and love.



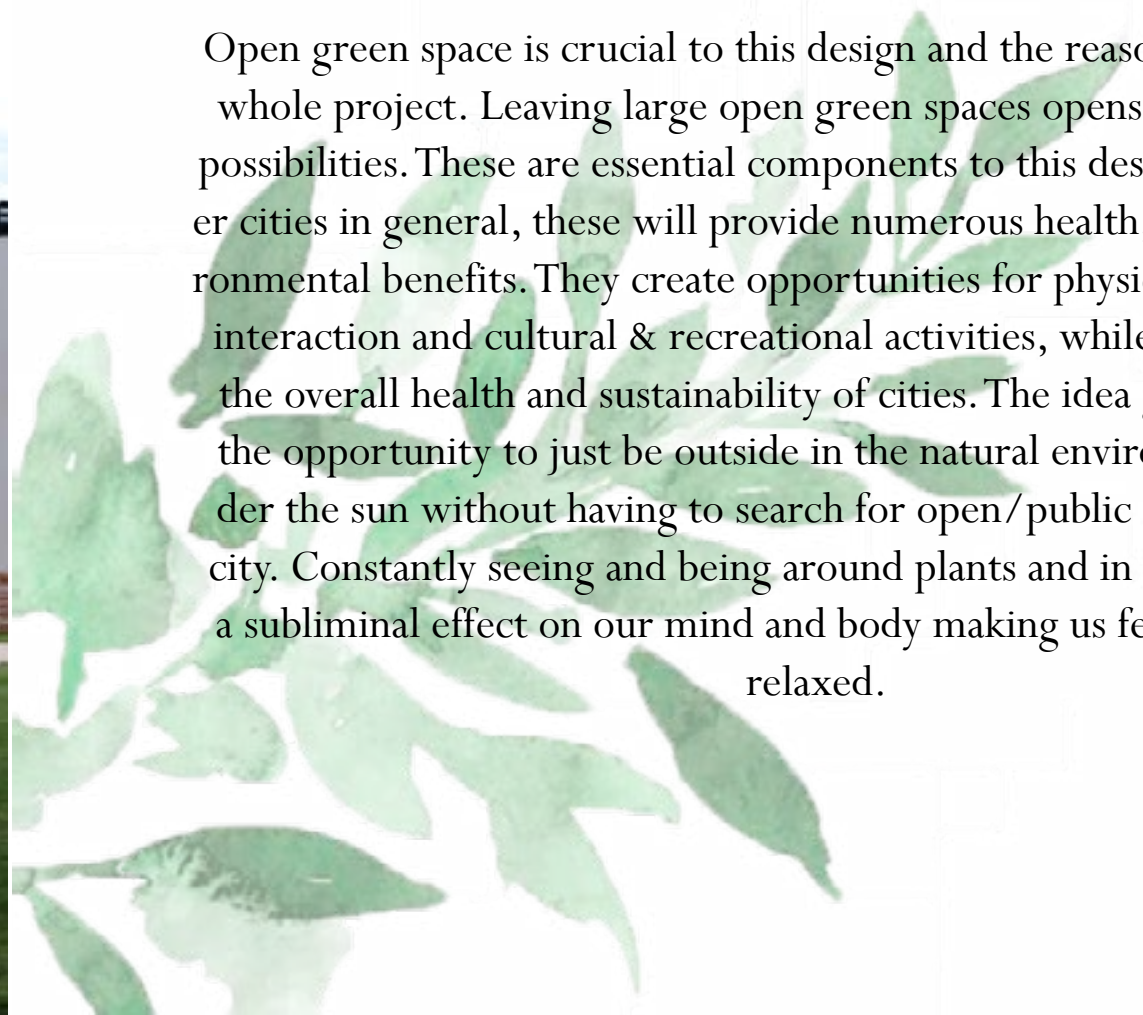
Each apartment complex comes with its very own greenhouse that is located on the rooftop. These are 120 Square feet in size and each has its own individual patio space. This gives residents the opportunity to create their own natural living space whether they want to grow their own vegetables all year long or cultivate their favorite plants. Gardening has been shown to lighten mood and lower stress and anxiety levels. This serves as a separate personal natural environment for residents to enjoy alone or with company. This space alone extends residents' growing season and gives them versatility when it comes to what they want to grow.



Adding on to the crucial elements within my courtyard remain two water features that have large gardens attached to them. This feature not only adds a decorative touch to this landscape but it can have positive health benefits primarily reducing blood pressure and stress levels while they are also believed to increase energy, focus, and alertness. Further enhancing the ambiance of the space, water feature also brings texture and can soften lines of the environment surrounding it fostering relaxation and peace.



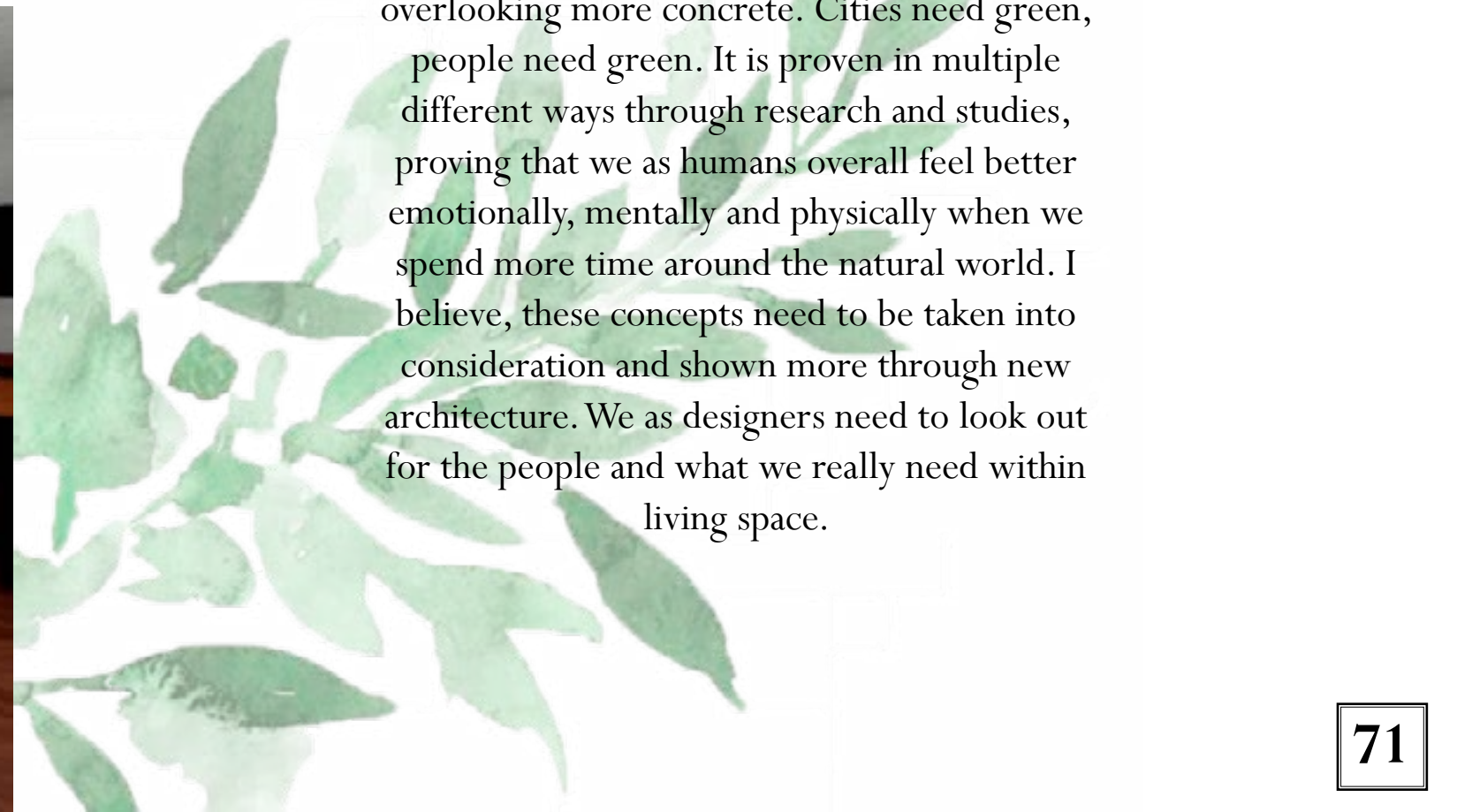
Open green space is crucial to this design and the reasoning behind this whole project. Leaving large open green spaces opens it up to endless possibilities. These are essential components to this design but also larger cities in general, these will provide numerous health, social, and environmental benefits. They create opportunities for physical activity, social interaction and cultural & recreational activities, while also improving the overall health and sustainability of cities. The idea grants residents the opportunity to just be outside in the natural environment and under the sun without having to search for open/public areas within the city. Constantly seeing and being around plants and in the sun can have a subliminal effect on our mind and body making us feel more calm & relaxed.



Being around things or vegetation that can improve your mood and wellbeing is important but so is being around friends and family that make you feel that same way. Within this design, I decided to add an important interior aspect, a community room. This room meant to me used and reserved out by residents has many benefits to it. This space is meant to allow for 24/7 access to a inside recreational room that provides a full kitchen, lounge area, TV, pool tables, dart board and two large garage doors that open up to the courtyard to let the outside in. This gives resides extra space to have company and bring people together and be able to take advantage of living here even if it is not the nicest outside and being inside is needed. Allowing the 24/7 access and open access to the courtyard provides residents of all lifestyles recreational opportunities no matter what the time or weather is.



No one wants to live within a concrete block overlooking more concrete. Cities need green, people need green. It is proven in multiple different ways through research and studies, proving that we as humans overall feel better emotionally, mentally and physically when we spend more time around the natural world. I believe, these concepts need to be taken into consideration and shown more through new architecture. We as designers need to look out for the people and what we really need within living space.





# FORCE OF NATURE

INTERCONNECTING ARCHITECTURE AND NATURE

Force of Nature is a multi-story residential building designed to integrate nature into its architecture. The building features a central courtyard with greenery and a modern, colorful facade. The design emphasizes a connection between the built environment and the natural world.



Interior spaces are designed to be bright, airy, and connected to nature. Large windows and indoor plants create a sense of openness and well-being. The use of natural materials and colors further enhances the connection to the outdoors.



The courtyard is a central green space surrounded by the building. It features a paved walkway, greenery, and a modern, colorful facade. The design emphasizes a connection between the built environment and the natural world.



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# APPENDIX

## WEST FARGO SOURCES

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Holl, G., & About The Author Gillian Holl Gillian is the founder and lead architect at Veld Architects. Her passion is grounded in all things Architecture and her work reflects that. Every detail is carefully crafted while making her client's dream homes come. (2022, February 22). Why biophilic design matters in architecture? Veld Architects. Retrieved December 15, 2022

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# PREVIOUS STUDIO EXPERIENCE

## 3RD YEAR

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### FALL 2020 - REGIN SCHWAEN

Brick Construction Project - History Inverted  
International Group Project  
City Puzzle and Puzzle City  
Group Project

### SPRING 2021 - NILOUFAR ALENJERY

Apls Wellness Retreat  
Fargo Pavilion - Elemental  
Group Project

## 5TH YEAR

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### FALL 2022 - CINDY URNESS

Wetlands Research Facility  
Thesis Project

### SPRING 2023 - CINDY URNESS

Thesis Project  
Interconnecting Architecture and Nature

## 2ND YEAR

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### FALL 2019 - MILT YERGENS

Artist Residence Project  
Boathouse Project

### SPRING 2020 - CINDY URNESS

Marfa Dwelling Project  
Mixed-Use/Multi-Family  
Group Project

## 4TH YEAR

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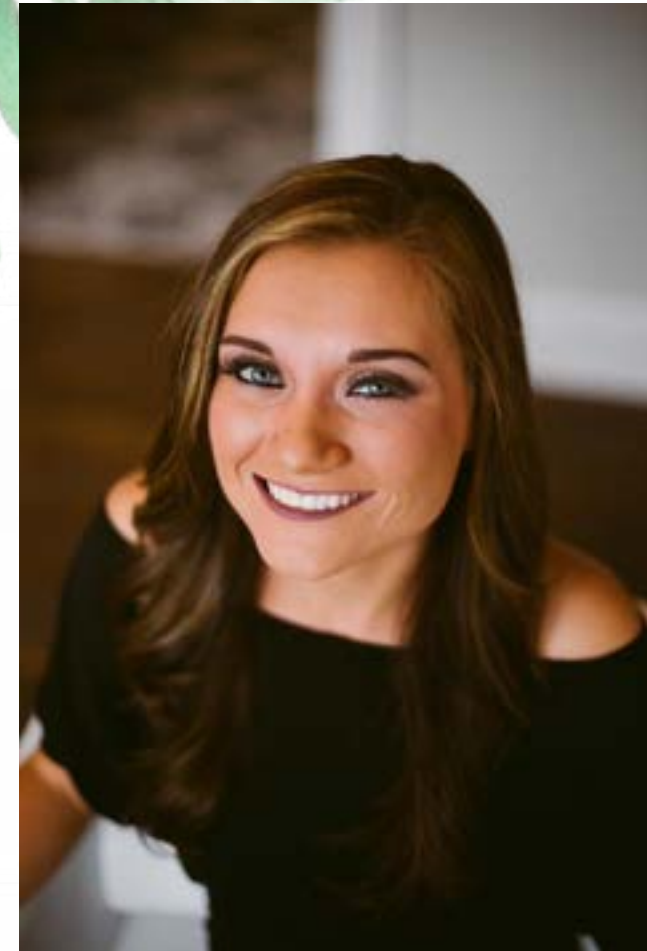
### FALL 2021 - DAVID CRUTCHFIELD

Capstone  
Miami High Rise

### SPRING 2022 - KRISTI HANSON

Marvin Windows Residential Project  
Medora Project

# MARIAH LEASE



MASTERS ARCHITECTURE STUDENT