

Growing

& Aging

a new way of connecting generations



by *Sara Lillegaard*

# Growing & Aging a new way of connecting generations

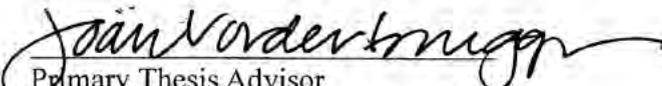
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A design Thesis Submitted to the  
Department of Architecture and Landscape Architecture  
of North Dakota State University

By

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In Partial Fulfillment of the Requirements  
for the Degree of  
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**Abstract**.....

“Growing and Aging: a new way of connecting generations,” is an exploration of a new architectural typology that tries to fill in the generation gap existing between young people and our aging society.

When looking at the increase in the number of seniors the U.S. and the world has been facing, questions start to rise as to how to provide quality care for the so called aging society. Studies have shown that socialization is still very important as we grow older, and a sense of connection and belonging is essential to a better quality of life.

Another group that would benefit from a greater sense of connection and belonging are troubled youth. Giving youth the opportunity to make a difference and simply communicate better with older adults might be just what they need for a better future.

The aim is to create a new sense of community that connects these generations through an exchange of energy, experiences, care, love, and guidance. This project will be a senior center connected to a youth center with residential for both age groups in Duluth, Minnesota.

Key words:

YOUTH, ELDERLY, SENIOR, CONNECTING GENERATIONS.

Problem Statement

STATEMENT  
OF INTENT

PROBLEM STATEMENT

How can architecture respond to the different needs of youth and elderly while improving their lives simultaneously?

## Statement of Intent

### TYPOLOGY

Senior and Youth Center with Residential Component.

### CLAIM

Architecture can reduce the generation gap we face in our society between youth and the elderly by providing opportunities that create a sense of belonging and connection for both groups.

### SUPPORTING PREMISES

The built environment has the capability of influencing how people act and feel about themselves and others in both positive and negative ways.

To improve the lives of our aging population there is much more than their physical needs that must be addressed. Marc Freedam reminds us in *Children Today* that the elderly also have emotional needs as they often lack a feeling of meaning in their lives as they get older (1989). When it comes to youth, a need for role models is essential for a healthy development, and a lot of troubled youth lack guidance and care from adults in their lives (Freedam 1989).

In our society, we face a large generation gap between our elders and young people. The elderly are often forgotten in nursing homes, feeling abandoned, isolated and without purpose. Young people who are considered at-risk are growing up isolated as well. They often lack guidance and care from older adults, affecting their self-esteem and hope for a better future. A place that allows for both these generations to naturally connect, share experiences, and help each other will not only provide the elderly with a greater sense of fulfillment, but give these troubled youth hope and a foundation for a better future (Archstone Foundation 1999).

This project aims to provide a small community that gives both the elderly and youth a sense of belonging and connection.

### CONCLUSION/UNIFYING IDEA

Creating a small community that encourages a natural bond between young people in need of personal growth and aging adults in need of basic human interaction could be the key to resolve the issue of their disconnection. By reconnecting these two generations, a change of quality of life for both these groups is expected.

### PROJECT JUSTIFICATION

As the number of senior citizens in need of long-term care increases due to the aging baby boomer generation, new ways of providing for their needs (physical, emotional and spiritual) will be necessary. Places where they can share their experiences and skills, giving them a sense of purpose should be essential. At the same time, young people that find themselves lacking the self-esteem necessary to succeed should not be ignored, but be understood and guided to a better future. Creating a place that encourages this connection in a natural, unintrusive way, can not only fill the needs of each group but create a better quality of life as these people grow and age together.

## THE PROPOSAL

## Narrative

I grew up very close to my maternal grandparents, physically and emotionally. They played a huge role in my life. Often, my little brother and I walked to our grandparent's house after school to eat lunch, spend the afternoons playing in their back yard, or just sitting in the porch with them listening to their stories. My grandma's name was Helena, and even though she passed away when I was only eleven years old, to this day I can taste her food, I can smell her house, I can feel her presence. Oh how I miss her! A couple years after she was gone, my family received the news that grandpa had Alzheimer's disease. He slowly started to forget little things, from how to tie his shoes to eventually forgetting how to get back home. After one of his wanderings, my mother brought him to our house to take care of him as his disease got worse. At this point I had just moved to the US to start college. My mother, with the help of my father and 14 year old brother, cared for grandpa Álvaro until the sad but relieving end, which came to be about seven years later. In those seven years, I visited home exactly four times. I watched my mother grow old and tired, but remain so strong. My brother went from being a teenager to becoming a man; a strong, caring, and selfless young adult.

In the US I grew very close to my paternal grandparents, who are now in their 90s. They both reside in an assisted living facility, which grandpa calls "his castle." I love visiting them and listening to their stories. The best part is watching their eyes light up when telling me about what it was like "back in the day" and all the things they went through together.

The relationship I had with my grandparents in Brazil and the one I still have with my grandparents here in the U.S. is a big part of my life. It has taught me to respect and care for the elderly. It made my brother and me better people, selfless and grateful to have these wonderful people in our lives. Our grandparents have gone through so much; they have always been a great inspiration to us. I couldn't imagine growing old myself without such a strong foundation.

## Major User/Client Description

To help them mature and make better decisions in their own lives, all young people should experience this relationship with older adults. As mentioned by Charles Appelstein, young people sometimes end up leading troubled lives, because they feel abandoned themselves which causes them to lose trust in all adults. Feeling that there is someone out there that not only needs them, but cares deeply about them could perhaps make a big difference in these young people's lives (Appelstein 1998).

According to the Department of Health and Human Services, the number of people over the age of 65 will double between 2000 and 2030. Many of these people will be left in places that will never feel like home, with people that will never treat them like family. What I find to be the saddest part is the fact that this is the end of their lives. After all they have done for their families and their community, it is unfortunate to see them being forgotten as if they were useless. That is not the way people should live the last years of their lives. Their life should be celebrated through allowing them to tell their story, share their experiences and knowledge, show their talents and feel appreciated for everything they have done.

One might ask "What does this have to do with architecture?" I must say everything. The opportunities that architecture can provide are immense! It is not just about shelter, but the ability to influence how people perceive their surroundings and reflect on their own lives. Architecture will be the tool for this much needed connection between these young and older people; a place that encourages and allows for interaction, connection and respect for others and the environment. Creating a sense of community and feeling of a friendly home might be just the beginning of a better future for all.

### ELDER

People in their senior years (70+) who would benefit from more social interaction and find themselves with the motivation to share their time and skills with others.

### YOUTH

There will be different after school programs for young people age 10-18 where they will receive tutoring, learn life skills and participate in activities with the older adults during afternoons and weekends. There will also be a program for young adults age 18-24, where they will be provided with room and board in the exchange of a variety of work opportunities at the center.

### CARETAKERS

These people will care for both the elders' and youth's physical, health and mental needs, some providing 24 hours services. They will be trained to deal with issues that may arise and provide the necessary care for both these groups, more specifically the elderly. The youth will have counselors and professionals specialized in psychological issues. Office spaces, counseling rooms, and nursing stations will be needed by the caretakers and psychologists.

### OTHER STAFF

There will be the need for various staff to run such a complex facility. Specialists such as administrators, janitors, maintenance crew, etc.

### CLIENT

This facility will be owned by a non-profit health organization, with the help of the city of Duluth.

## Major Project Elements

### HOUSING FOR BOTH ELDERLY AND YOUTH

- Youth housing -Apartments (one bedrooms) and lounge
- Elderly housing -Apartments (studio and one bedrooms)

### EDUCATIONAL SPACES

- Classrooms for youth programs
- Music Room
- Library
- Craft/Workshop

### COMMUNAL SPACES

- Open space for plays and lectures
- Dining and living areas
- Non-Denominational Chapel

### ADMINISTRATIVE OFFICES

- Offices
- Counseling rooms
- Nursing station
- Sleeping quarters

### OUTDOOR SPACES

- Outdoor areas
- Community garden
- Hiking trails
- Sports fields

### UTILITARIAN SPACES

- Laundry
- Garbage
- Delivery
- Mechanical

## Site Information macro



Northern Minnesota is known as a region of beautiful scenery. It is home to Lake Superior, which is the largest body of fresh water in the world and also contains many parks, which provide many outdoor activities.

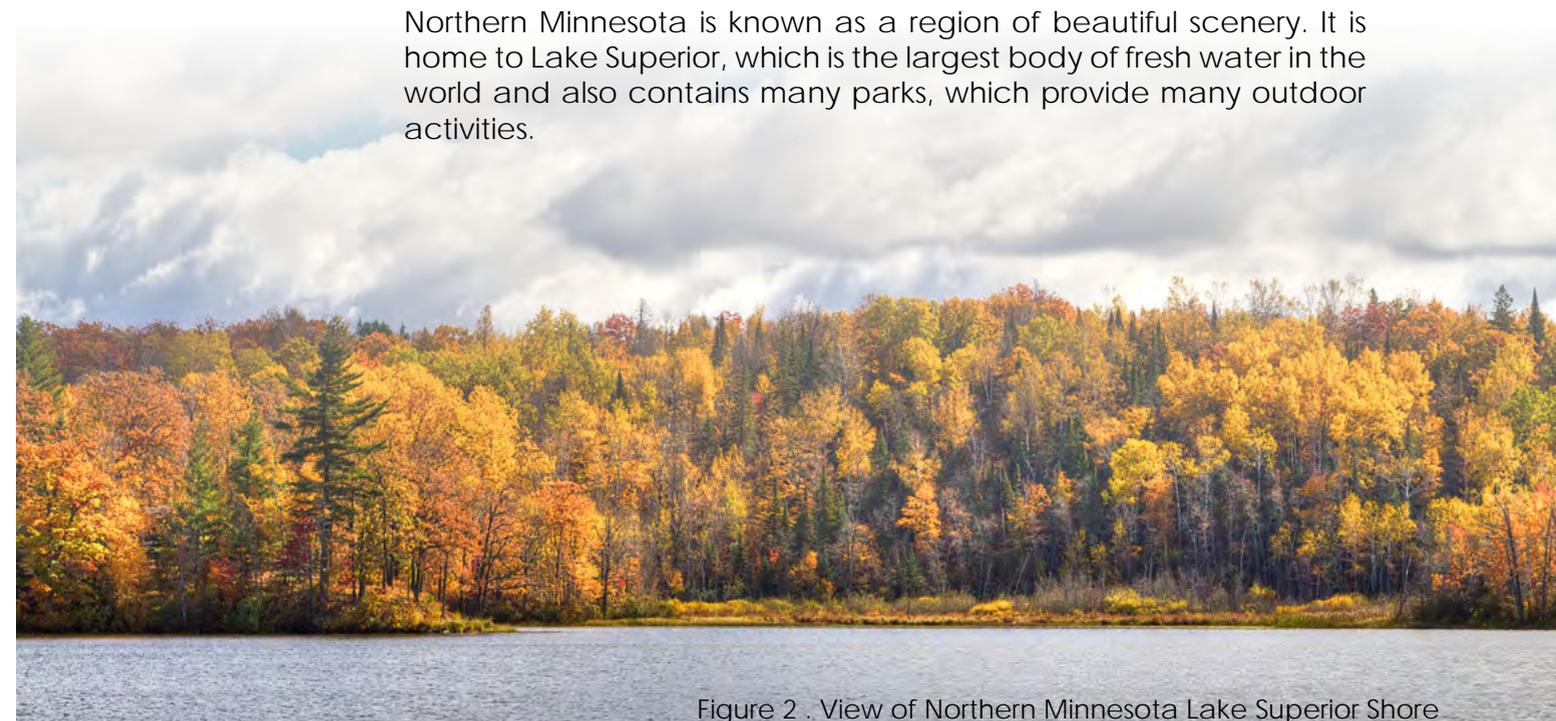


Figure 2 . View of Northern Minnesota Lake Superior Shore

## Site Information

### Macro

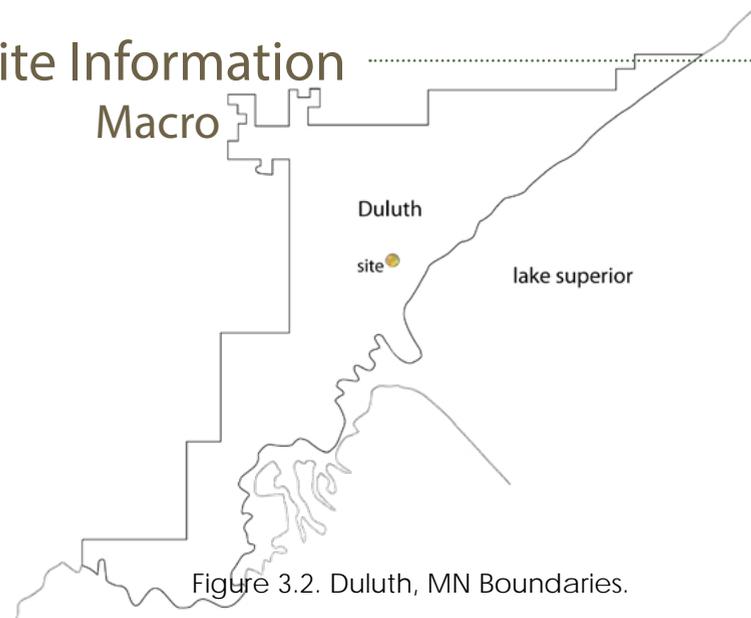


Figure 3.2. Duluth, MN Boundaries.

## DULUTH

Duluth is the fourth largest city in Minnesota. In 1869 it was the fastest growing city in the United States. At the turn of the century Duluth had more millionaires per capita than any other state in the United States. Much of this wealth is still visible through great historical buildings among the city, which not only reminds us of the past but provides us with great inspiration for the future with possibilities for adaptive reuse and historical preservation.



Figure 3.3. Duluth, MN Map

## Site Information

### Micro

800 EAST CENTRAL ENTRANCE  
DULUTH, MN 55811

The site sits on the top of a substantial hill, providing a breath-taking view of the city and Lake Superior. The site's location provides an opportunity for both an urban and rural connection. The top of the hill is a large area which includes wooded parts, yet it is centrally located within the city, near commercial and residential areas, and public transportation.

This site could provide many different opportunities for different activities for its users, while keeping a connection with the city.

The site was the location of Duluth Central High School until 2011, when the students were moved to other facilities. The building now serves as storage for the school district and is currently on the market. Here, there is an opportunity for exploration of an adaptive reuse project.

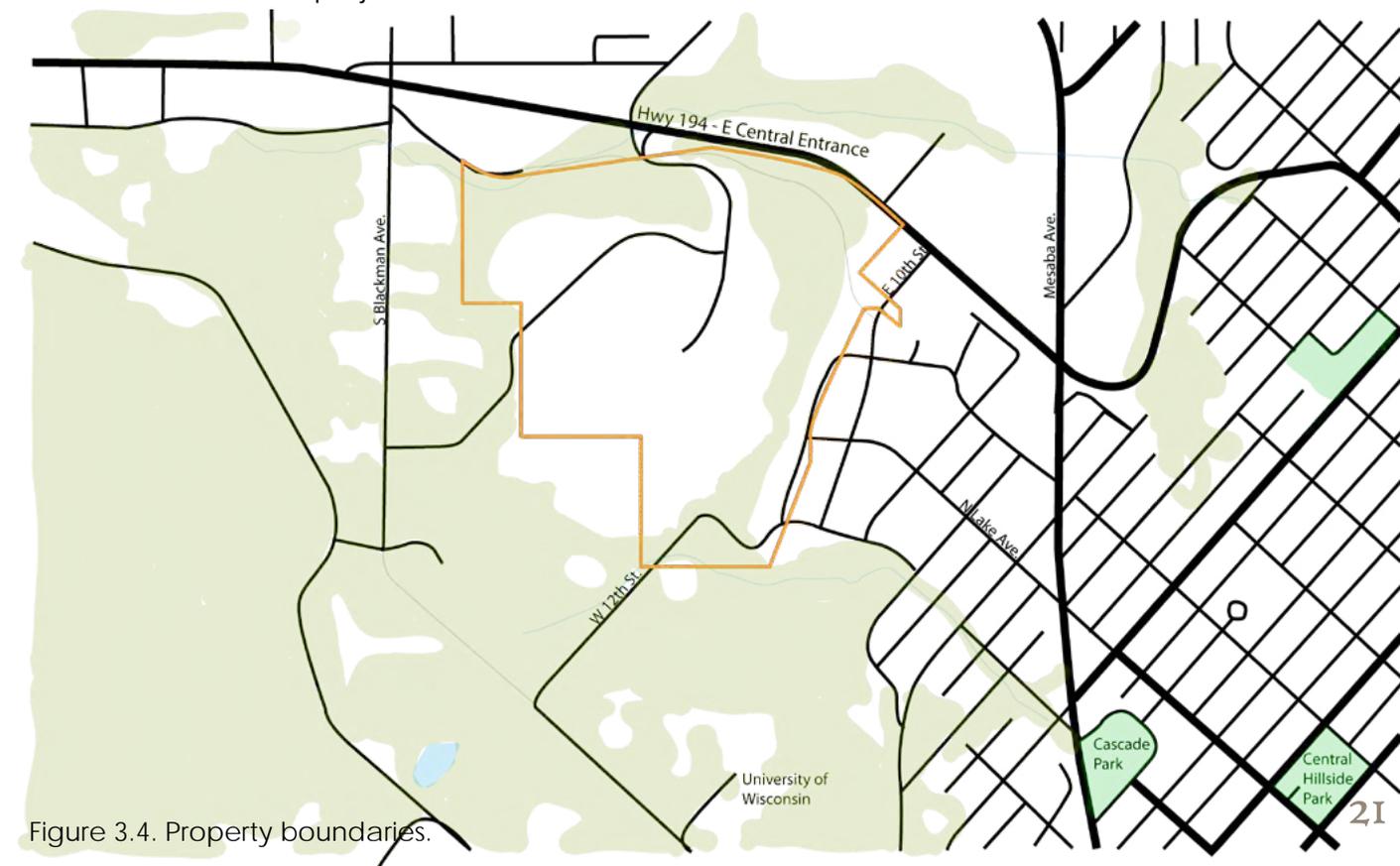


Figure 3.4. Property boundaries.

## Project Emphasis

The focus of this project is to develop a much needed connection between our elderly and our youth. The challenge will be to understand what these groups need independently, and then help them create strong relationships that feel natural to them. The goal is to create a community that feels like a family.

Holistically, the design will come into play to respond to those needs and help provide a place that naturally brings these groups of people together in an interactive and healthy way. The architecture of this place will also function as an inspiration to many as it will provide sustainable methods that will educate these people about caring for the environment they live in.

This place will provide a meaningful end of life for many elderly, and a foundation that many youth lack to go on with a safe and successful life.

## Plan for Proceeding

### RESEARCH DIRECTION

In order to fully comprehend this project, first research will be done to understand both the needs of youth and elderly separately, and learn how they can help and support each other with. Ultimately, ways of bringing them together not only physically but emotionally will be explored.

The history of retirement homes and youth facilities will be studied to realize how these have evolved and how they can come together in a way that makes sense to all.

I will keep my mind open to new and perhaps unexpected information regarding these subjects to keep the final design true and honest.

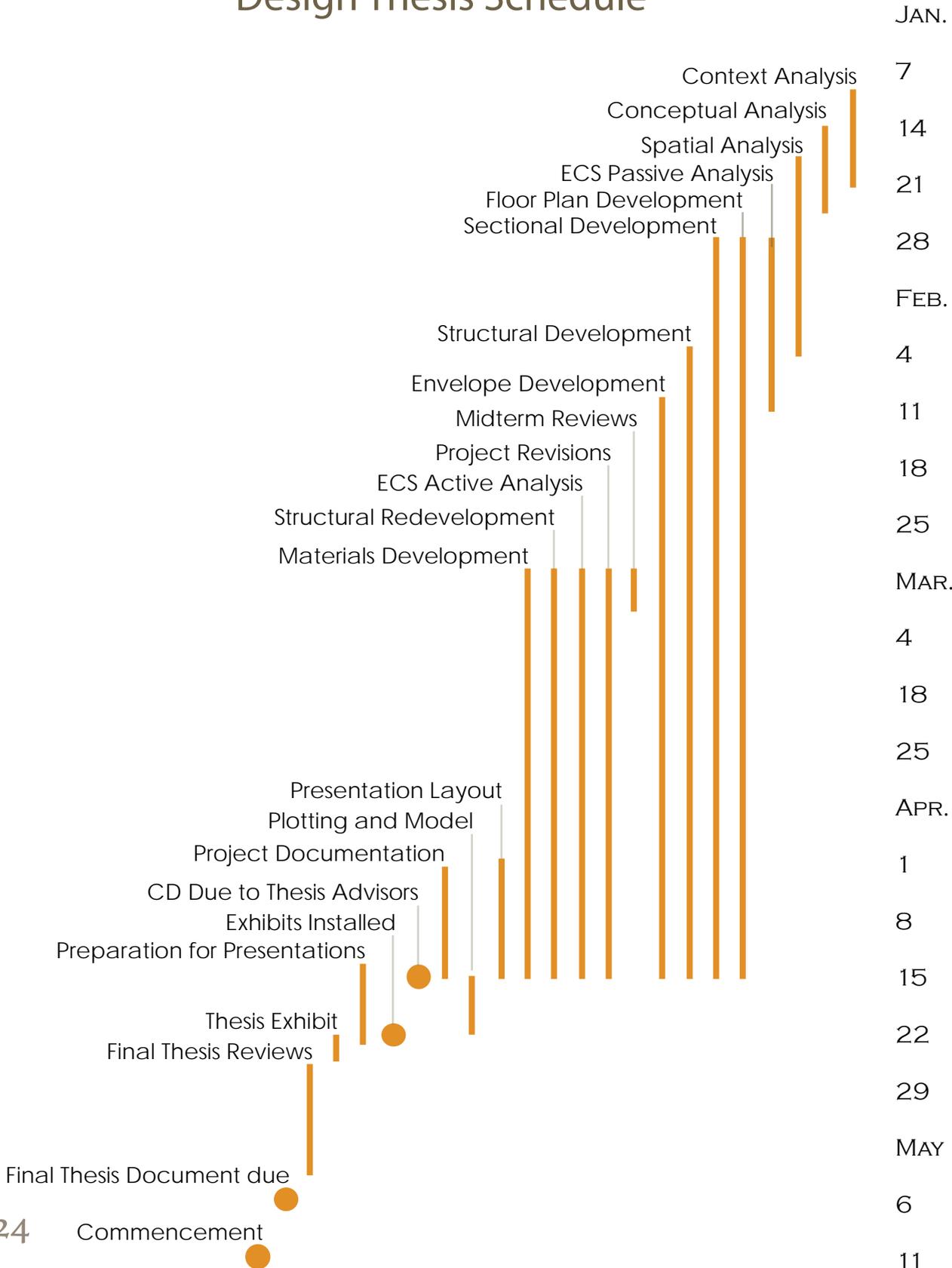
### DESIGN METHODOLOGY

A mixed method, quantitative/qualitative approach will be used for the research and design of this project. The strategy used for research will be guided by the theoretical premise/unifying idea. Findings will be shown in text, graphs and images.

### PROCESS DOCUMENTATION

The process of design will be documented weekly as to keep a system easy to monitor. All sketches, drawing, models, etc., will be shown in an order that helps follow the process of research, discovery, and decision making.

# Design Thesis Schedule



# Studio Experience

<p><b>Joan Vorderbruggen</b> Tea House. Fargo, ND Boathouse. Minneapolis, MN</p>	FALL 2009
<p><b>Darryl Booker</b> Montessori School. Fargo, ND Bird House. Fargo, ND. Sustainable Dwelling. Marfa, TX</p>	SPRING 2010
<p><b>Regan Shwaen</b> Hotel. Fargo, ND Office Building. Baltimore, MD</p>	FALL 2010
<p><b>Ron Ramsay</b> Shaker Barn. New Lebanon, NY Research Library. Chicago, IL</p>	SPRING 2011
<p><b>Bakr Ali Ahmed</b> Highrise. San Francisco, CA KKE Trash to Treasure</p>	FALL 2011
<p><b>Don Faulker</b> <b>Frank Kratky</b> Marvin Windows. Fargo, ND Kindred Urban Design. Kindred, ND</p>	SPRING 2012
<p><b>Paul Gleye</b> Fargo New Urban Center. Fargo, ND</p>	FALL 2012

## RESEARCH

### Theoretical Premise/ Unifying Idea Research

*"At the beginning of the 21st century the longevity of modern man and the younger population's lack of time to take care of the elderly are leading to a profound analysis of new environments and the search for an appropriate habitat for the older population. Architecture and new construction technologies offer a large range of specific solutions that help to improve the conditions of life in old age...And from a medical point of view one must also consider the requirements of the elderly and create environments that make them feel better in the last period of their lives"*

-Arian Mostaedi

#### ELDERLY

This research will begin its focus on the increasing number of elderly and what that means for architecture and long-term care facilities. It will attempt to find ways to improve the quality of life of these individuals both physically and emotionally in an assisted living facility they can call and feel like home. This research will also look into the life of today's youth who find themselves lacking a strong relationships with older adults and need to believe in themselves and create a better future for themselves. Finally, this research will try and find ways to respond to these different needs of both subjects and attempt to use architecture as a bridge to reconnect these generations and create a higher quality of life for all.

The need for assisted living has been increasing due to the growing number of elders, not only in the U.S. but in the world. For several reasons, adult children are not always able to care of their aging parents anymore. In some cases, older adults do not have immediate family or friends to count on for help; leaving them feeling lonely and useless. Many times, these elders believe they have a lot to give but feel deprived of the opportunity to share their knowledge, skills and talents.

There are two reasons for this increase in the number of elders. One reason is what we call the “baby-boomer” generation, which is the generation that began after World War II when the birth rate grew greatly (Engdahl, 2011). The first baby boomer turned 65 years old in 2011.

**Table 1. Growth in the Size of the older population in the U.S. from 1900 to 2030**

1900	3.1 million (actual)	4.1% of the total U.S. population
1920	4.9 million (actual)	
1940	9.0 million (actual)	
1960	16.6 million (actual)	
1980	25.5 million (actual)	
1990	31.2 million (actual)	
2000	35.0 million (actual)	
2010	40.2 million (projected)	
2020	54.8 million (projected)	
2030	72.1 million (projected)	19.3% of the total U.S. population

Source: U.S. Census Bureau. (2009). A profile of older Americans. Washington, DC. Retrieved March 9, 2010, from [http://www.aoa.gov/AoAroot/Aging\\_Statistics/Profile/index.aspx](http://www.aoa.gov/AoAroot/Aging_Statistics/Profile/index.aspx)

Another reason for this increase is that people are living longer than ever. According to data collected by the U.S. Census Bureau, people over the age of 100 counted for 53,364 persons in 2010, which is an increase of 53% from the 1990 number of 37,306 (Census 2010).

**Table 2. Growth in the size of older population in the U.S. by Age Subgroup**

65-74 age group	2007	19.4 million (actual)	8.8 times more than in 1990
75-84 age group	2007	13.0 million (actual)	17 times more than in 1990
85+ age group	2007	5.5 million (actual)	45 times more than in 1990
	2010	5.8 million (projected)	
Centenarians	1900	37,306 (actual)	
	2007	80,771 (actual)	117% increase since 1990

Source: U.S. Census Bureau. (2009). A profile of older Americans. Washington, DC. Retrieved March 9, 2010, from [http://www.aoa.gov/AoAroot/Aging\\_Statistics/Profile/index.aspx](http://www.aoa.gov/AoAroot/Aging_Statistics/Profile/index.aspx)



Figure 4  
Kermit Lillegaard  
on his 90th Birthday  
at RenVilla Health Center  
in Renville, MN

According to a study from the *Journal of Architectural and Planning Research*, today we have basically three levels of care for the aging population: nursing homes, residential care facilities and congregate apartments. Nursing homes have the greatest accessibility to professional nursing services and assistance with daily activities such as housekeeping, meals and personal care. Residential care facilities also provide great assistance with daily activities but less health services. Congregate apartments allow for the most independence to their residents, providing only meal services if necessary (Lemke & Moos, 2001).

After thoroughly studying each type of facility, Lemke and Moos came to the conclusion that “residential settings for older people will continue to evolve as the number of older people increases, new economic forces come to bear, and patterns of disability and social support shift. As a consequence, the normative pattern of facility resources is likely to change significantly...” (Lemke & Moos, 2001, p. 206).

*We are witnessing the formation of special interest groups among the elderly in order to encourage recognition of the needs and lifestyles of elderly people. More people are living longer and maintaining activity-supporting health levels. These issues must also be taken into account when dealing with housing and addressed appropriately.*

(Green et al, 1975, p.1)

As we learn more about caring for the elderly, we are coming to the realization that these long-term care facilities need not only to help the elderly with their physical needs, but also improve the quality of their lives emotionally and perhaps spiritually. These facilities are feeling less institutionalized and creating a better sense of home, because that is what they are, a home where these people spend the rest of their lives. Improvements have been made to make these places more safe, healing, comfortable, and enjoyable; but there is always room for more improvement.

The change is not only in the number of elders but in their life style as well. Seniors are finding themselves leading a more active life which is found to be extremely beneficial to them both physically and psychologically. The built environment specifically, can have a great influence on physical activity patterns amongst the elderly.

*Regular physical activity in the form of walking or other moderate activities may alleviate depression in the elderly and improve their quality of life...walking within one's community may generate psychological benefits due to an increase in social interaction.*

(Frank, Engelke and Schmid, 2003, p. 87)

Walking is a great and easy physical activity that many people tends to do less as they age in the United States. Other countries have shown a different pattern though. According to Frank, Engelke, and Schmidt (2003), in many other countries such as Great Britain, New Zealand, Netherlands, etc, the elder population walk and bike for their main transportation mode (p. 91).

Another physical activity that seems enjoyable for all ages is gardening. An environment where elders can care for a vegetable and flower garden, sharing their skills and spending time with young people could be very beneficial for all. According to David Kamp (2011), "...contact with nature is essential for a balanced, healthy life. Time spent in the garden plays a critical role in the maintenance and restoration of health. This is true for the young and old, for the healthy as well as the frail. Successfully incorporating nature in Senior Living and Elder Care settings is predicated on enhancing communication" (overview section, para. 1).

A non-profit organization known as Planetree says that to create a long term care environment that is also healing, there are four cornerstones that must be considered: "physical care, socialization, psychological care, and consideration of spiritual needs" (Komarek, 2003, p. 265). Their model was founded in 1978 by a patient and it has been successful since. Planetree's philosophy and vision (2012), is that "care should be organized first and foremost around the needs of patients... [it] promotes the development and implementation of innovative models of healthcare that focus on healing and nurturing body, mind and spirit" (about us and planetree's vision sections).

Planetree believes that a good health care environment is one that focuses on the patient's needs. Many nursing homes have adapted to Planetree's settings and beliefs, creating homelike environments that allow for the residents to feel more comfortable. Sometimes, residents of nursing homes feel isolated and abandoned just by being placed in a nursing home, leading to possible depression. Planetree has created certain activities to involve the residents and help them adapt to the new environment. According to Komarek, some of the activities may include the following:

- Parties (birthdays, special occasions, holidays, etc.)
- Religious services
- Games
- Arts and Crafts
- Exercise
- Reading to others
- Grooming activities (haircuts, makeup)
- Councils
- Pet therapy
- Movie/television/music

(Komarek, 2003, p. 278)

Residents are encouraged to participate in these activities, increasing socialization and a sense of belonging. The long term goals for these activities are:

- The residents will comfortably socialize with others
- The residents will participate actively in activities without encouragement
- The resident will make friends in the facility
- The resident will maintain personal dignity

(Komarek, 2003, p. 280)

These are great ideas and ways of connecting the residents with their environment and creating a place for healthy activities and socialization.

#### YOUTH AND ELDERLY

Another thing that could better the quality of life of older adults is forming a connection with young people. There is a generation gap experienced by the elderly and the young that makes it very difficult for them to connect. Bringing these generations together to help them understand each other and give each other support could be very beneficial to both groups. In the article *Developing Intergenerational Relationships* it is mentioned that people over the age of 60 years old who have a relationship with a young person usually find meaning in the lives after all. It is believed that "developing connections with a younger generation can help older adults to feel a greater sense of fulfillment" (Spence & Radunovich, 2007, p. 1).

In cultures such as Native Americans, growing old is considered a beautiful thing, respected and celebrated by everyone else around them. Young people look up to their elders and are inspired by their stories. The elders are considered to have all the wisdom and knowledge and tend to assume the most important roles of teaching and passing along everything they know. They are well cared by the rest of the tribe and death is not something they fear, but accept as being part of life ("Native American elderly," 2012).

Many of us have grown up with a similar idea, but things have been changing. As the elderly move towards long term care facilities, their children are less able to visit them due to busier lives, and their grandchildren miss the opportunity of the memory of grandma/grandpa's house, which can be the most cherishable memory from childhood.

#### YOUTH

When it comes to troubled-youth, there are developmental theories that attempt to explain the reasons why some chose the road of trouble and others don't. Developmental theories says that if basic needs are not met at a very young age, children see adults as hostile and untrustworthy. The first three years are considered to be the most important. If during these first years, children do not form a healthy attachment and strong foundation from an adult, they will grow to rebel against adults and perceive the world as a unsafe place. These kids, many times, will grow to become criminals, drug and alcohol addicts. The world becomes a sad and hopeless place for them. Having that strong foundation and an adult they can trust is extremely important in these first years of their lives (Appelstein, 1998).

In the attempt to help these young people, it is important to understand what these kids have gone through and empathize with them. It is possible to help form the missing foundation at a later age. What they need is an adult they can trust and feel safe with so the foundation can be restored.

There are different types of troubled youth, according to Larry K. Brendtro and Arlin E. Ness (1983). They include:

- rebellious youth whose actions strike out against a world that seems hostile or unjust
- the empty child starving for love but unable to reach out, frightened of being hurt again
- the lonely, insecure youngster whose spirit has been crippled by neglect or failure.
- the conflicted young person desperately wanting something or someone to believe in, struggling for stability and identity in a world of confusing values.

A lot of times, these troubled kids find themselves in shelters and/or foster homes. By the time they are 18, they get thrown out of the system, even though they are not ready or prepared to face the world. It is estimated that each year, 20,000 youth turn 18 and have to leave the foster care system. That lack of foundation, of a place to call home, or having a person who believe in them, of not having someone with them in difficult life transitions, can be extremely difficult (Appelstein, 1998).

Table 3.

Outcomes during transition from care to adulthood	National Data	Regional or Local Data
Earned a high school diploma	54%	50% - 63%
Obtained a Bachelor's degree or higher	2%	2%
Became a parent	84%	42%
Were unemployed	84%	42%
Had no health insurance	30%	29%
Had been homeless	25%	36%
Were receiving public assistance	30%	26%

("Facts about children in foster care," 2012)

Helping these kids form a foundation and stay connected with them specially in times where they need to make decision for their lives could be the key for rehabilitation and a chance of a better future.

Another issue with young people is that many youth have negative perceptions of the elderly and vice-versa. Many times that happens because of the lack of a positive relationship between these generations. Once given the chance to spend some time to know each other, they may come to the realization that there is a lot of give and take that can happen between these two generations, and the benefits are immense for both as well (Reid-MacNevin, Estabrooks, Randall, & Frennette, 2012).

A program created by the Archstone Foundation called "Bridging the Age Gap" attempts to re-connect these generations and look at the benefits it brings to all involved. Their conclusions state the following:

*For the old, these intergenerational programs can provide a sense of linkage to the community. For the young, programs can provide them with the opportunity to draw on the knowledge and life experience of the seniors within the context of a nonthreatening, non-judgmental relationship, allowing for an unique interchange between young and old. For both, intergenerational programs can improve participants ability to develop strong, caring relationships with the other generation.*

(The Archstone Foundation, 1999, p. 7)

Some of the benefits the elderly receive from these programs are relief from depression and isolation, an opportunity to share their histories and experiences, influencing the future generation, playing a mentor role, etc.

Some of the benefits the youth receive from these programs are improving in confidence and self-esteem, learning practical, vocational, and life skills, receiving support, brightening an older person's life, deterrent from potentially harmful or criminal activities, etc. (The Archstone Foundation, 1999, p. 9)

These results were found in the report *Bridging the age gap - Promoting Mutual Health Benefits for the Young and Old*, which was sponsored by The Archstone Foundation and has proved to help direct many who are interested in programs related to connecting generations.

## Theoretical Premise Summary

This research looks at the increasing number of elderly and what that means for architecture and long-term care facilities. It searches ways to improve the quality of life of these individuals both physically and emotionally. Besides the elderly, this research also looks into the life of today's youth who find themselves in trouble due to a lack of healthy relationships with adults. Finally, this research tries to find ways to use architecture as a bridge to reconnect these generations and create a higher quality of life for all.

The need for long-term care has been established due to an increasing number of elders not only in the U.S. but in the world. There are two reasons for this increase. One reason is what we call the "baby-boomer" generation, who have passed the age of 65 and continue growing. Another reason is the change in life expectancy. People are living to much older years than before.

There are different levels of care for the aging population. These differ from the level of assistance needed by the elders. Facilities go from maximum accessibility to professional nursing to providing only meal services.

As the number of elders increase, their life styles changes as well. Seniors are becoming more active and wanting to still have some independence. The built environment can positively influence daily activities for the elderly and how they feel about themselves.

Planetree is a non-profit organization specialized in educating and improving health care services, including long-term care. Their model was founded in 1978 and it focuses on the needs of the patients and on the healing and nurturing of the body, mind and spirit. Planetree also does an extensive work of training and aiding the staff into providing the best quality service to the people in need.

It also has been mentioned that the quality of life of the elderly can improve greatly by having socialization and communication with younger people, which has been lacking due to a disconnection between the generations.

The elderly are not the only ones who would benefit from connecting with people. There are troubled-youth who find themselves in great need of a role model to assist them through life decisions. Elderly can provide that.

Developmental theories say that a lot of the problems with youth who find themselves in trouble with adults and sometimes the law, are from a lack of a strong foundation and healthy relationship with an adult. These young people have experienced abandonment and unhealthy relationships with adults from such a young age, they grow to rebel and perceive the world as a unsafe, unfair place.

In conclusion, creating an environment that shows these kids that there are still good people in this world and that they have a chance of a better future is crucial. They need a place that provides them with the much needed healthy relationship with older adults in a mutual supportive way. Times of transition are the most difficult for many people. Both the elderly and the youth will have the opportunity to be there for each other in challenging times.

As mentioned before, both the elderly and the youth can benefit from such an environment. The conclusion of existing programs is that integrating elderly and youth helps relieve depression and isolation in the elderly, and gives them an opportunity to share their history and experiences. The elderly can pass down their skills and talents, which makes them feel like they can still make a difference in someone's life by serving as mentors.

Youth seem to have an improvement in confidence and self-esteem, learning both practical and life related skills. These youth also feel like they can brighten someone else life just by helping them out and learning from them. These new skills and relationships help keep these young people away from criminal or harmful activities.

## Case Study I

### Health Centre and Houses for Elderly People

Architects: IPOSTUDIO Architects  
Location: Montemurlo Province of Prato, Italy  
Project Year: 2010

## TYOPOLOGICAL RESEARCH



Figure 5.1 Exterior view. Connection with site.

## Typological Research



Figure 5.2. Exterior view. Connection with site.



Figure 5.3. Roof top view of courtyard.

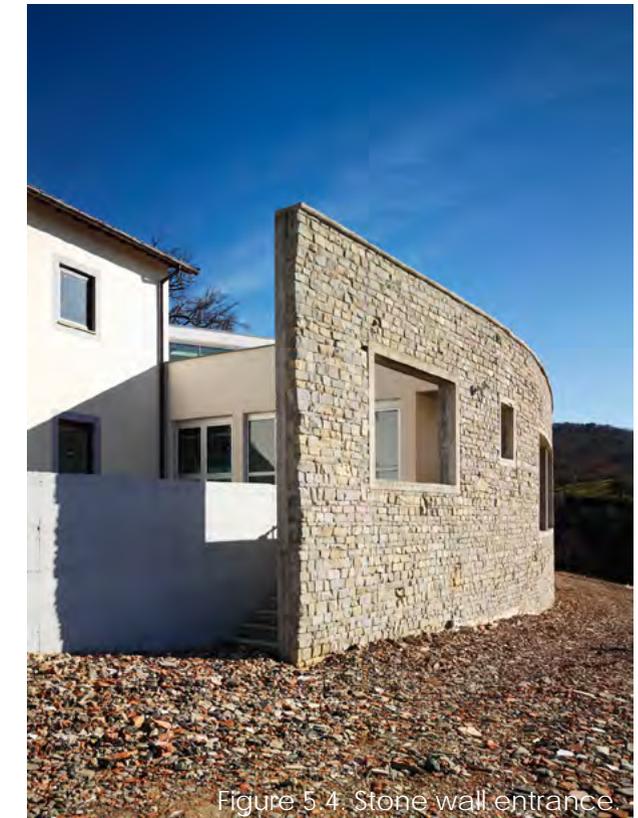


Figure 5.4. Stone wall entrance.

The Health Centre and House for Elderly People, designed by IPOSTUDIO Architects, is located in Montemurlo Province of Prato, Italy and was completed in 2010.

The project is a nursing home located in an area of agricultural traditions. The landscape is of great importance and influenced the design immensely. The site had complex soil and issues of settlement, challenging the design team greatly. That is how the idea of a single facade made of stone along with the valley came about, following the soil contours and becoming one with the surrounding landscape.

The site had existing rural buildings on it that were reused and integrated with the new structures.

The concept of the project was derived from the farmyard, which comes from farmhouses of Tuscan hills.

The residential units of the facility are located in the structure along the hill, between the stone wall and the hill slope. Within 2 stories, there are 24 residential units arranged in a radial grid. The commons area is located in the center of the long building. The roof top of this structure becomes then the ground level for the existing buildings,

The stone wall is located 5.9 feet from the building's exterior glass-wall, working as a double-skin envelope. Its shape following the contours of the land in a radial grid allows for great views to be provided to every resident.

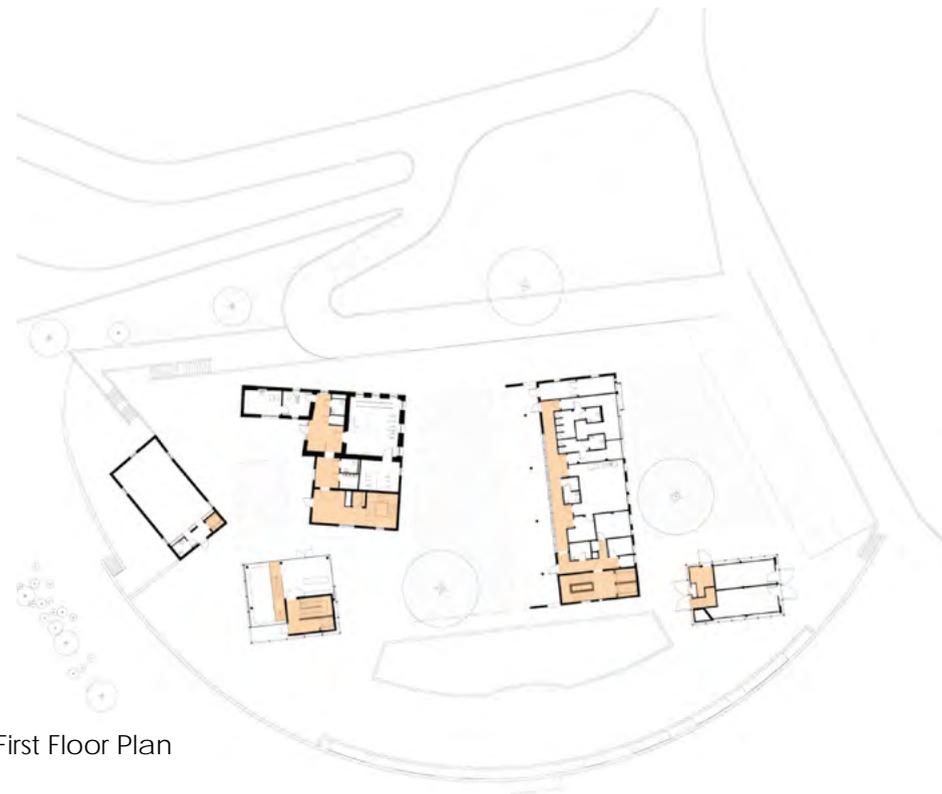
The stone wall is made of local stone cladding, taken from the excavation site, and is randomly perforated, allowing not only for great views of the valley but for light and ventilation as well. The randomness of the openings creates a way of identifying each room from its pattern.

This project is a wonderful example of working with respect to the site and not only reusing what is available, but celebrating its history and nature. It also provides a certain uniqueness allowing for residents to feel pride and excitement to be here.

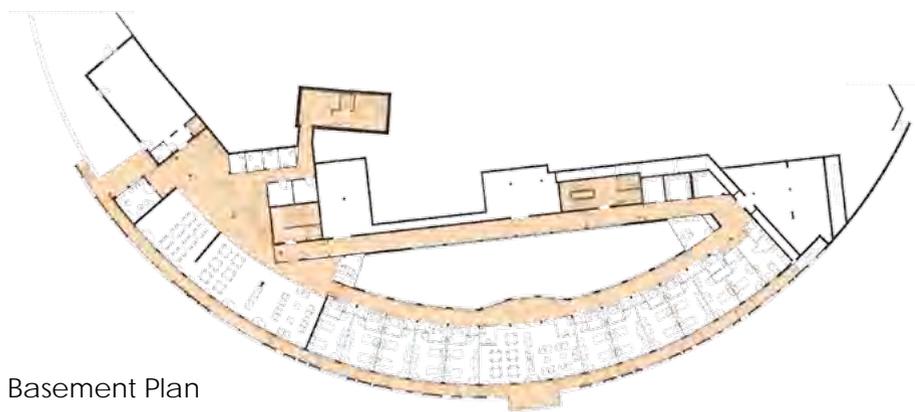
This case study is extremely relevant to my theoretical premise/ unifying idea as it shares site commonalities like the topography and an existence of other structures to work with. This project has inspired me to take a closer look at these things and see them as opportunities instead of restraints.



Figure 5.5. Stone wall openings.



First Floor Plan



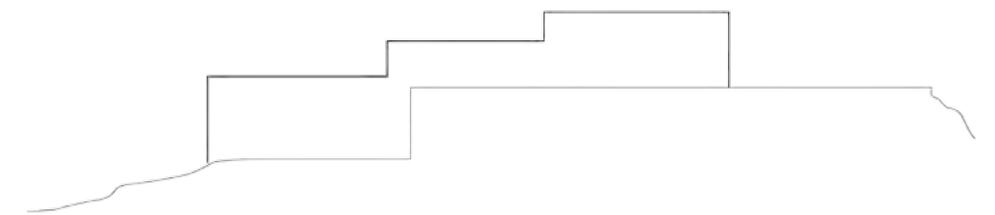
Basement Plan



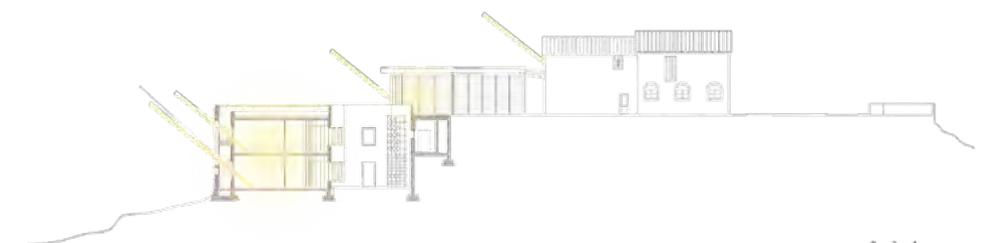
Circulation to Use



Massing



Hierarchy



Lighting



## Case Study II

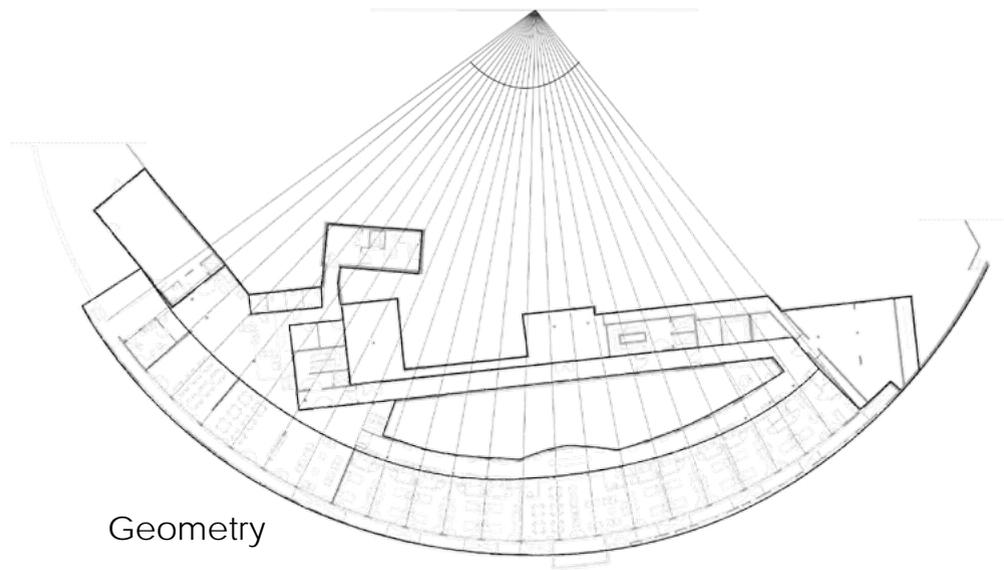
### Lar Casa de Magalhaes

Architects: Atelier Carvalho Araújo – José Manuel Carvalho Araújo

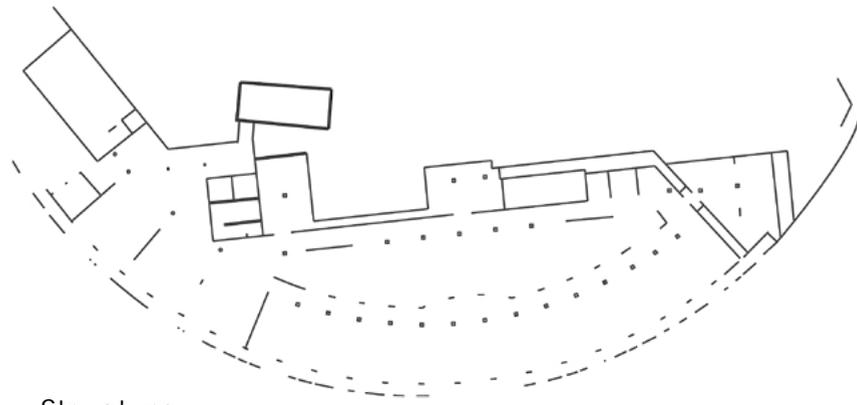
Location: Ponte de Lima, Portugal

Design Team: Joel Moniz, Alexandre Branco, Sandra Ferreira, Mónica Peixoto, Liliana Costa, Ana Vilar, Lília Costa, Nuno Vieira, Filipe Russell

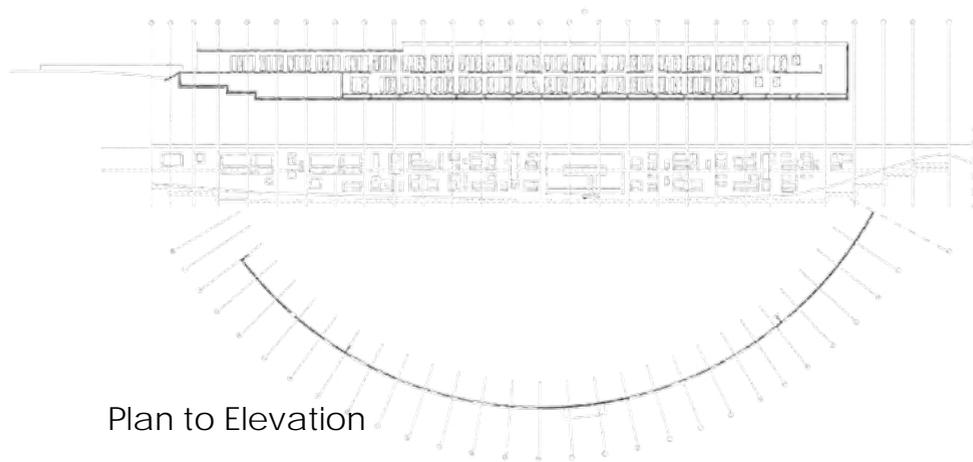
Completion: 2010



Geometry



Structure



Plan to Elevation



Figure 6.1 . Night view of exterior.

## Typological Research



Figure 6.2. Day view of exterior. Connection of the new with the old.



Figure 6.4. Exterior wall view.



Figure 6.3. Outdoor view.

Lar Casa de Magalhaes, designed by a team from Atelier Carvalho Araújo, is located in Ponte de Lima, Portugal and was completed in 2010.

An older lady donated her land, her house, and attachments so a home for elderly people could be built. She had one condition, which was that the construction had to be done before her death. Her house became the main focus of the new construction, symbolizing a new start.

The lady's home became the center of the new structure. The new home for the elderly started by expanding the platform of the existing house, creating a courtyard in the center as if part of the building was removed, exposing the interior.

The rhythm of the new facade is a reference to tree trunks, with the intention to highlight and celebrate the existing white house. The facility has 27 rooms surrounding a courtyard, with a hallway in between, allowing for every resident to have outside views at just about any place in the house.

The courtyard provides the residents with a safe way of enjoying the outside, while being protected from winds and wild life by the surrounding structure.

This elderly home was of great inspiration to me as it not only was able to happen through the selfless acts of an elderly woman, but it was designed with great respect to her original home and the site where it is located. The courtyard is a great way of bringing the outdoors "in."

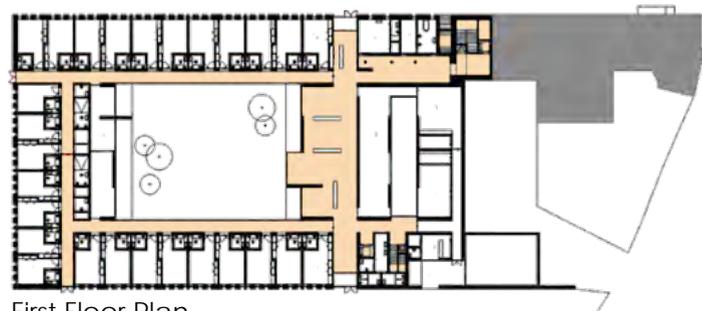
This project relates well with my theoretical premise/unifying idea as it makes usage of existing structures, allowing the old and the new to complement each other greatly. It also shows a different way of exploring the opportunity of reusing existing structures.



Figure 6.5. Rooftop view of courtyard and old house.



Figure 6.6. Courtyard. Transition from exterior to interior.

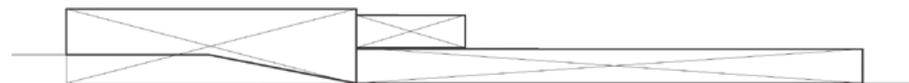


First Floor Plan



Second Floor Plan

Circulation to Use



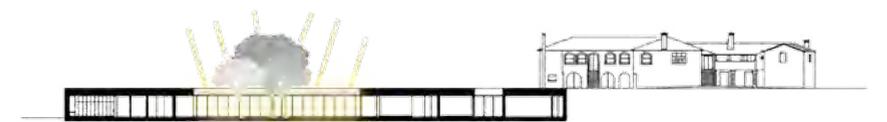
Geometry



Massing



Hierarchy



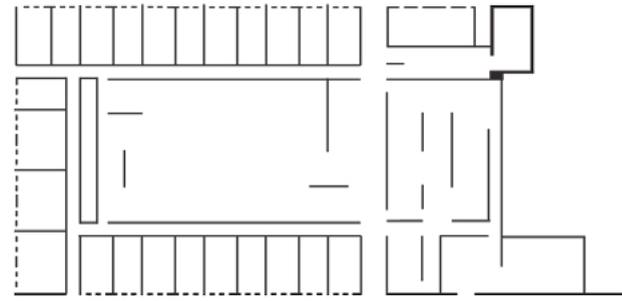
Lighting

## Case Study III

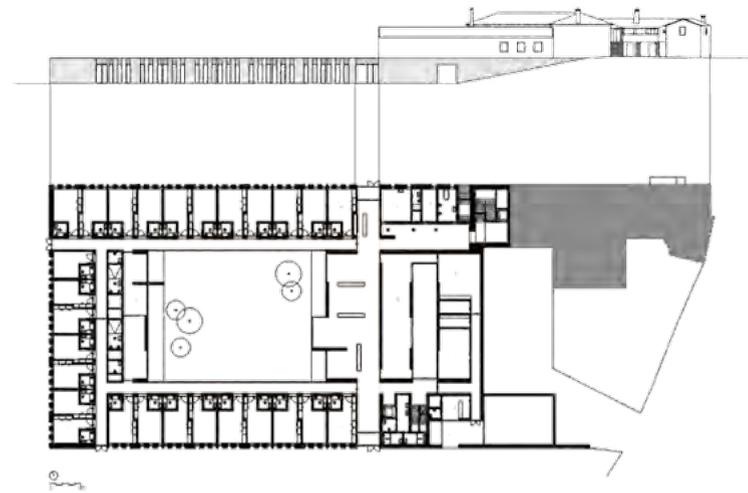
### Child and Youth Center Helene P.

Architect: Kauffmann Theilig & Partners  
Location: Obere Weinsteige 9, 70597 Stuttgart-Degerloch, Germany  
Project Year: 2006

Structure



Plan to Elevation



## Typological Research



Figure 7.2. New construction. Looking out.



Figure 7.4. View of entrance.

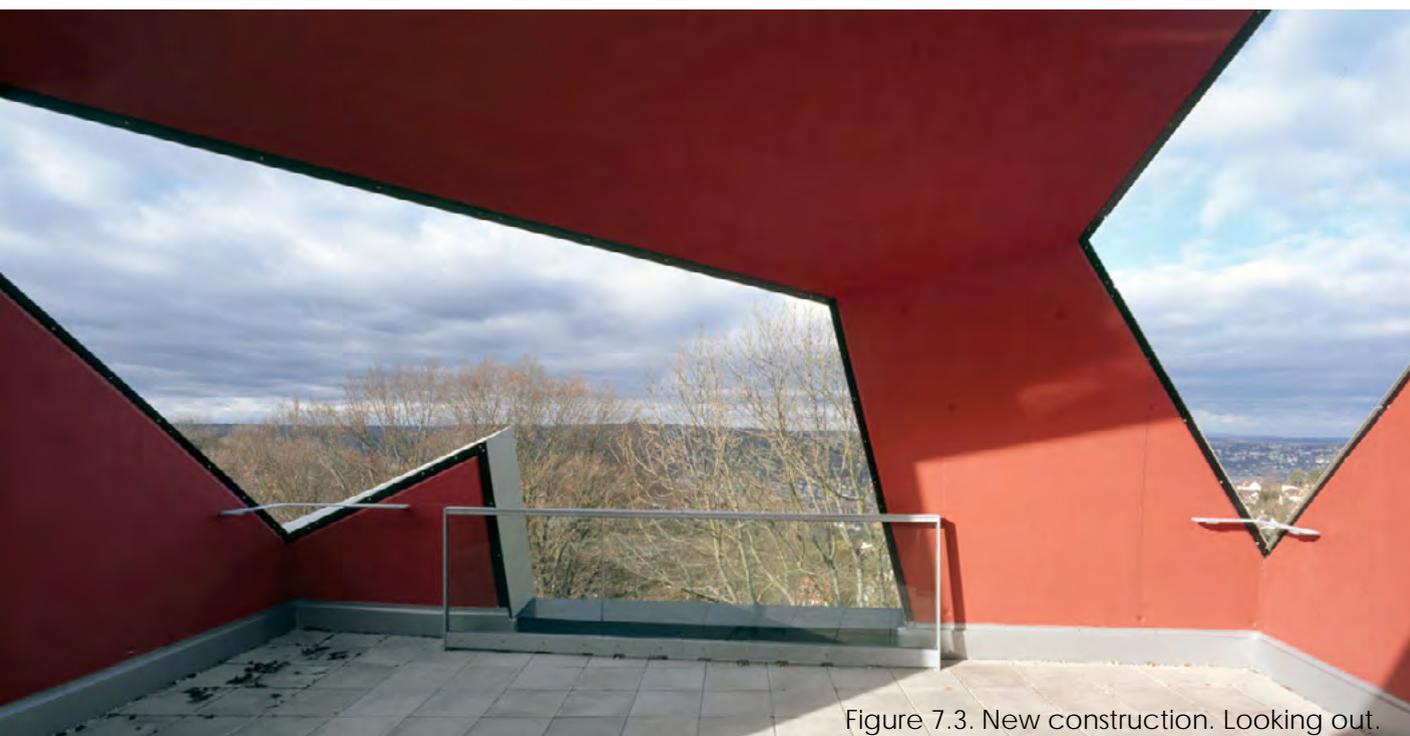


Figure 7.3. New construction. Looking out.

Child and Youth Centre Helene P. was designed by Kauffmann Theilig & Partners. It is located in Stuttgart-Degerloch, Germany and was completed in 2006.

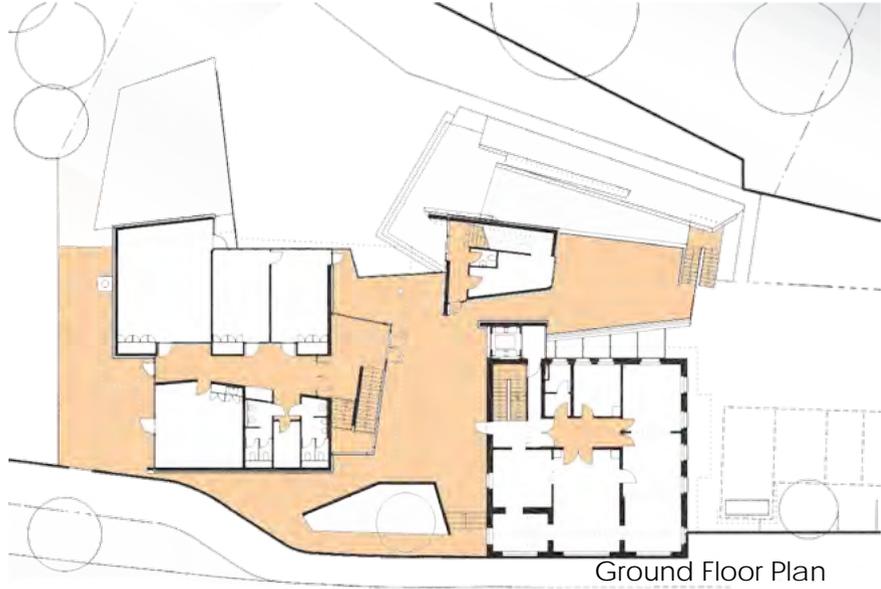
This youth center is an extension of a former chemist's mansion from 1870. The mansion was renovated and an addition to the existing structure tries to appear as much as possible like an artificial landscape. The unique design of the new structure seems to fit in with the youth of Stuttgart. The center is a place for the youth to identify with.

Each building component is used differently. There is an open youth work area for the young people in the old villa, a mobile youth work area for people with migrant background in the tower, and a day care center for children closer to the street. Each part of the center is arranged so it can be used independently. Even though there are separate buildings, they are all connected through the basement, where all the kids can come together to enjoy a multi-purpose room and a cafeteria.

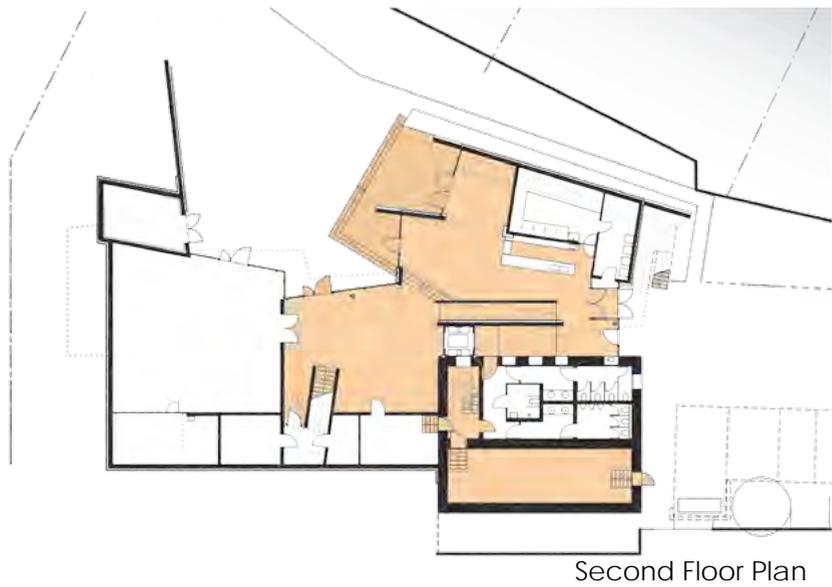
From nearly all the rooms of the building, there are great panoramic views of the city. There is also an outdoor area with sport facilities for the youth. Majority of the new construction is concrete with green roofs. The facades are lined with metal and fireboard panels.

Even though this case study differs greatly in site, being that it is located in a city, it is still interesting to me how the new structure was used to contrast with the old in a creative and fun way to fit in with the users of the building, energetic youth.

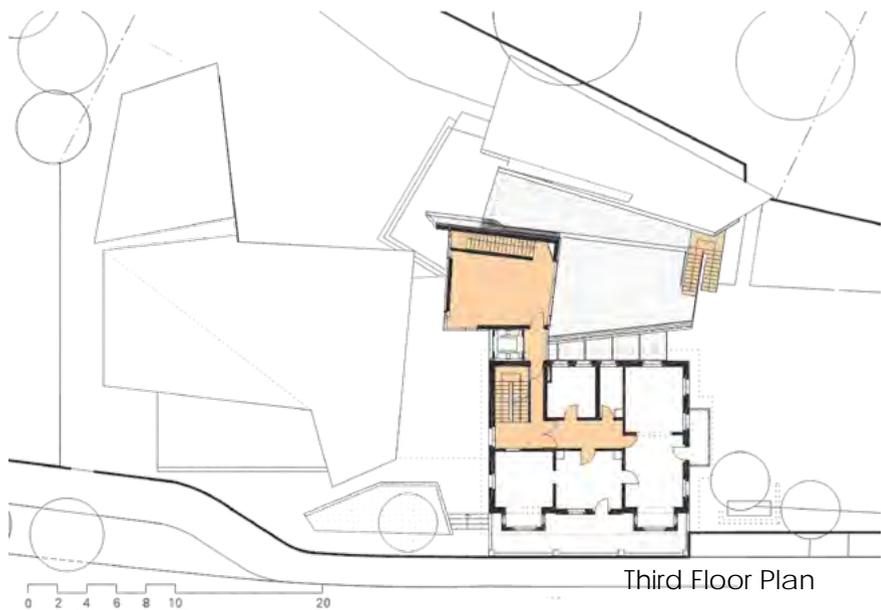




Ground Floor Plan



Second Floor Plan

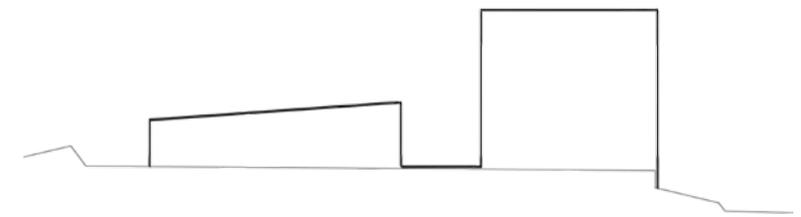


Third Floor Plan

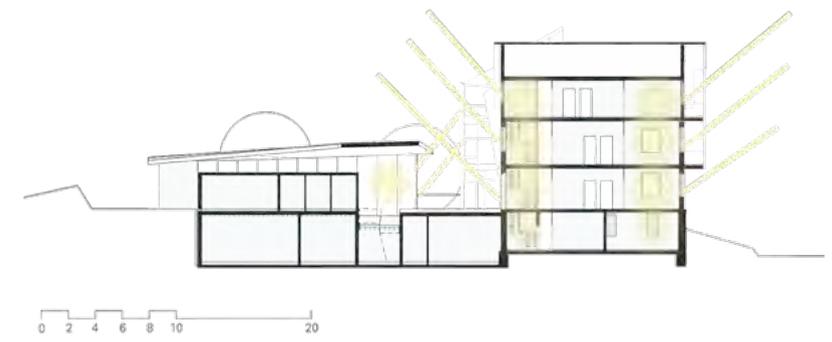
Massing



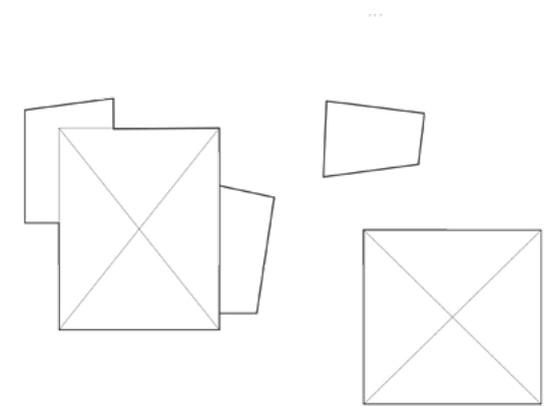
Hierarchy



Lighting



Geometry



## Typological Summary

The typological research looks into three different projects in three very different sites.

Health Centre and Houses for the Elderly People, located in Italy, is a nursing home placed in an agricultural area, which uses features of the land as an inspiration for its design.

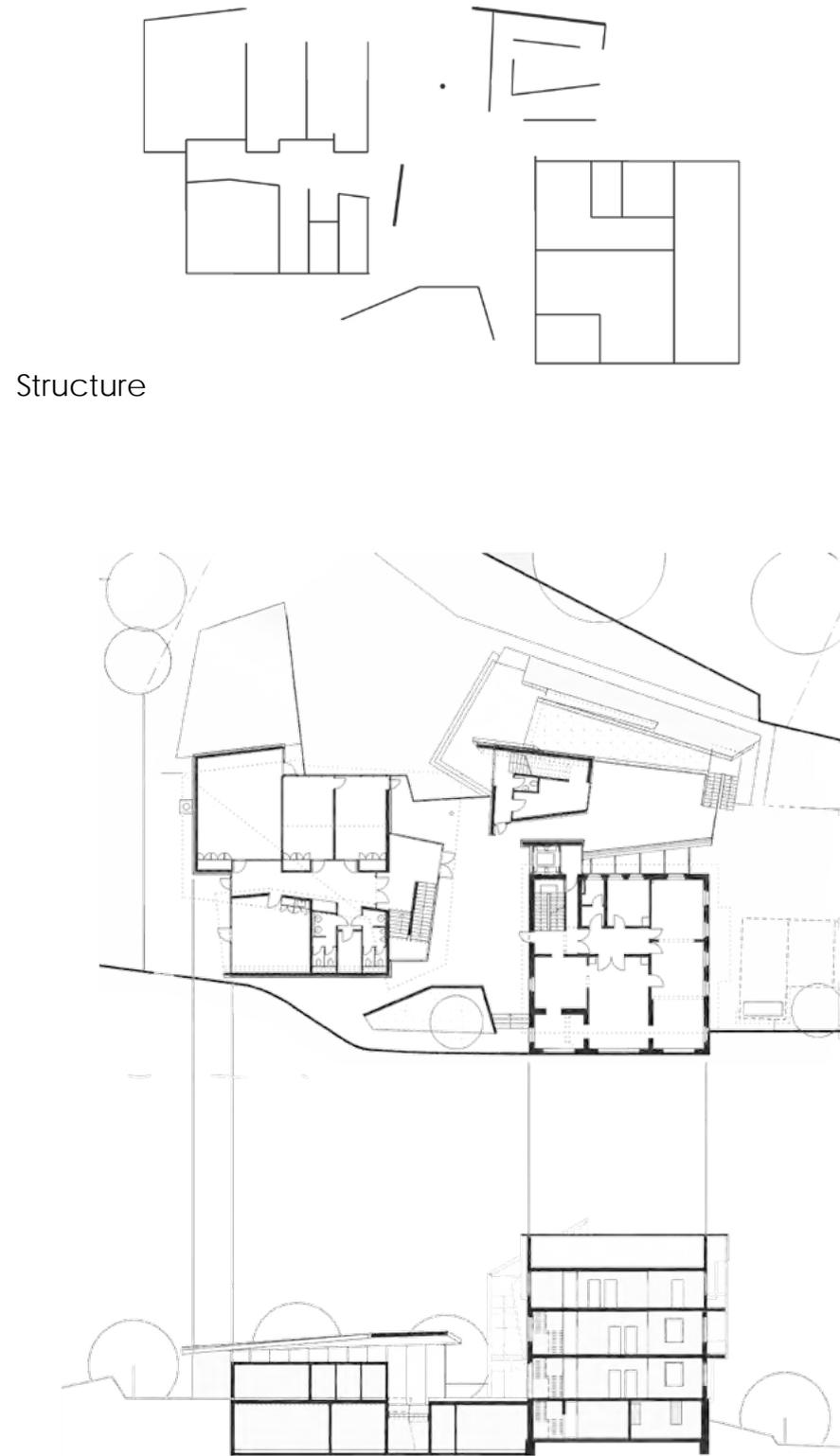
Lar Casa de Magalhaes, located in Portugal, is a nursing home which land and home was donated by an older lady, which becomes the inspiration for the new structure.

Child and Youth Center Helene P. is a youth center located in Germany. The center is a renovation of an old structure plus a new addition. The building is placed in an urban area and responds greatly to the energy and needs of the local youth through its design and materials.

Because my typology deals with both elderly and youth together in one project, I had to find case studies on both subjects separately and will have to combine them in a community/village type setting. Because my focus became on the relationship of the building with its site, I chose projects that I believe were successful in that relationship. All three case studies also deal with existing structures in the site where adaptive-reuse was done.

Case study one, Health Centre and Houses for the Elderly People, dealt with great change in grade. Their response to the site was done beautifully through a stone wall that somewhat follows the contour lines of the site. Because my site has great deal of grade change too, I found this case study extremely appropriate and inspiring.

Case study two, Lar Casa de Magalhaes, has a inspiring story behind the project of an old lady donating her home and land to become a elderly home. The design created a beautiful courtyard completely surrounded by the residents' rooms, making it appear as if the middle of the structure was removed to bring light in. The building also plays a little with grade level changes.



Structure

Plan to Section

## Historical Context

Case study three, Child and Youth Center Helene P., also deals with an existing structure but this time the project is set in an urban area. Being a youth center, the design and materials choices are very dynamic, which fits well with the energy of young people that use the building on a daily basis.

The three different projects give me a variety of solutions dealing with similar problems. When I say “problems,” I mean opportunities. Each project seemed to have its own solution, yet I consider them all to be very successful. The way these projects found inspiration with the site, the history and the local people will be considered when thinking of my own project, in the attempt to seem successful as well.

### HISTORY OF LONG TERM CARE

In the twenty-first century, nursing homes and assisted living facilities have become the standard form of care for the aging society. History tells us it has not always been this way. The idea of nursing homes is relatively recent. There were no such long-term care institutions before the nineteenth-century for several reasons.

In the 1700's, the United States consisted mostly of young people. Back in that time, life expectancy was much lower than today, which meant that few people lived to a very old age. Also, before 1800, people lived mostly in rural areas with their extended families, allowing for them to stay close and care for each other without major costs. When an elder did need care, it was expected to be provided by their adult children. If the elder did not have children but had money, he/she would hire help. If childless and poor, the elder ended up dependent mostly on charity. (The History of Nursing Homes, 2012)

In the 1800's, a cost-effective system called “indoor relief” was created. These were poorhouses, almshouses, poor farms, that were placed alongside the insane, the inebriated, or the homeless. (The History of Nursing Homes, 2012) In order to be self-sufficient, many of the poorhouses had attached farms. (Stevenson 2009)



**Figure 8.1**

Lombard Farm Poorhouse,  
Barnstable, MA  
Built as poor farm in 1769,  
building replaced in 1821.  
Retrieved from Library of  
Congress: Historic American  
Buildings Survey (HABS)

Because of several issues with the poorhouses in terms of overcrowding and quality of care, nonprofit organizations began to use old age homes to help the elderly receive better care. In the beginning of the nineteenth century, women's and church groups began to open special homes to care for elderly (Stevenson 2009).

In the late 19th century, nursing emerged as a profession. Wealthy families began to hire these nurses for live-in care providers for those in need (Stevenson 2009).



**Figure 8.2**  
National Library of Medicine: History of Medicine: National League for Nursing Archives, 1894-1952.

The life expectancy of people has begun to increase in the 20th century. People have begun to live to much an older age. "The average life expectancy at birth increased by 10 years from 1900 to 1930, and increased by another 15 years from 1930 to 1990" (Stevenson 2009). Besides living longer, people in the United States also started to move the cities, breaking up the idea of extended family staying close.

**Table 4. Number of People Age 65+ Living in Institutions**

Institutionalized Population by Location	1904	1910	1930
Institutionalized Residents 65 (% of pop.)	2%	2%	3%
Facilities for the mentally ill	20,000	35,000	100,000
Poorhouses & almshouses	53,000	46,000	50,000
Voluntary and Proprietary Facilities	??	??	50,000

Source: Vladeck, 1980; Johnson, 1985

During the Great Depression, things got a lot harder for everybody. Working conditions change when nearly half of the working population in some parts of the United States became unemployed. The portion of the population that got hit hardest was the elderly. People who were retired or near retirement saw all of the savings disappear and most of them were not able to work anymore. Thus many of these elderly became dependent on their families, who were also having a hard time themselves. At this point, several elders would end up at the poorhouse for lack of better options and rely on the government for help. Only the very wealthy could afford home care with private nurses. Nursing homes started to emerge all over the country (Stevenson 2009).

A 1937 Social Security pamphlet said,

*"Old people, like children, have lost much of their economic value to a household. Most American families no longer live in houses where one can build on a room or a wing to shelter aging parents and aunts and uncles and cousins. They no longer have gardens, sewing rooms, and big kitchens where old people can help make the family's living. Old people were not dependent upon their relatives when there was need in a household for work they could do. They have become dependent since their room and their board cost money, while they have little to give in return. Now they need money of their own to keep the dignity and independence they had when their share in work was the equivalent in money."*

(Stevenson 2009)

In 1935, legislators decided we needed to help the elderly population and numerous plans were made to assist them. Aging became an issue of national interest. All of the assistance from the government helped people gain independence again and allowed them to provide for themselves without depending on their families.

The first ever national inventory of nursing homes was done in 1954. The results confirmed 270,000 people living in 9,000 homes that were classified as nursing care homes or personal care with nursing. These were all for-profit facilities; 86% of all nursing homes were proprietary, 10% were voluntary, and only 4% were public.

Mid 1950's, facilities for the aged started to focus on providing both medical and residential care, so we began to have skilled nursing homes. Between 1960 and 1976, there was a 140% increase in the number of nursing homes. In 1971 more regulations began to appear in order to make sure that these facilities were providing quality care for their residents. ("The History of Nursing Homes," 2012)

*"By 2000, nursing homes had become a 100 billion dollar industry, paid largely by Medicaid, Medicare, and out-of-pocket expenses."*

- "The History of Nursing Homes," 2012

Although we do not have poorhouses anymore, we are still in the process of creating an environment that cares for our beloved elders with a much better understanding of their needs. As time passes, the way we care for our aging society must adapt to the changes in their life styles. The smartest thing we can do is stay aware of these changes and listen to these people who have already gone through so much and still have much more to give.

#### HISTORY OF DEVELOPMENTAL PROGRAM

"Youth development programs seek to improve the lives of children and adolescents by meeting their basic physical, developmental, and social needs and by helping them to build the competencies needed to become successful adults." ("Youth development programs," 2012)

The concept that childhood is an important stage of human development is a recent idea. Until the mid-1800s, people believed children to be miniature adults that needed strict guidance for adult families. Without such tough guidance, these mini adults would follow their natural inclination towards "aggression, stubbornness, sinfulness, and idleness to their doom." ("Youth development programs," 2012) Because of such beliefs, the earliest programs that dealt with children that were poor, orphaned, delinquent, or that had mental illnesses focused on not allowing them to follow their natural aggressive instincts and helping them manage their behavior.

Older children were provided with a apprenticeship setting, while younger children were put in almshouses as were elderly. In the almshouses, these young kids were provided with education, morals, and health care to improve their future as adults. ("Youth development programs," 2012)

Things changed around mid-1800s. New theories of looking at children arose. Some of the important philosophers and psychologists of that time had great influence in changing the way people viewed childhood. Some of these were John Locke (1632-1704) who raised the view of children as innocent and pure, who learn behavior mainly from experience. ("Youth development programs," 2012)

The nineteenth-century English naturalist Charles Darwin's theory of evolution contributed to the belief that children needed appropriate nurturing to grow up to be successful. German educator and founder of the kindergarten movement, Friedrich Froebel (1782-1852) strongly encouraged this idea that children should be given support to learn and thrive through this period of their lives. ("Youth development programs," 2012)

The book *Adolescence* published in 1904 by Steven Hall confirmed the idea and helped create a foundation for the psychology of children and influenced Charles Darwin. Finally, childhood became a very important part of human development.

Once the period of adolescence began to be viewed differently, new types of institutions to deal with children and adolescents began to arise. Kids were no longer put in almshouses. The earliest institution for children dates from 1700, but it was not until 1861 that the first state statute, passed by Ohio, imposed the removal of all children from the almshouses. By 1890, 600 institutions were working to support indigent children. These institutions' approach to helping these kids was basically formed by discipline, training, and rehabilitation. There was no individualized attention, the programs treated this kid in masses. ("Youth development programs," 2012)

Because these institutions were so far from a family life, they began to be replaced by farm families, where children could receive family care and guidance. The idea failed for many reasons such as "families" taking advantage of the kid's laboring services and not providing the type of care they were supposed to.

Juvenile delinquency began to be an issue of interest to many psychologists in the first half of the twentieth century. They started to look at parenting and did not limit their studies to the poor. This is when the realization that simply punishing the youth was not necessarily the right direction, as they would continue with their behavior and most often return to these institutions. ("Youth development programs," 2012)

Consequently, new ways of treating troubled youth rather than punishing them began to arise, leading to the creation of the juvenile court system, which focuses on rehabilitation and cure. More theories were brought up as to explain delinquent behavior. Theories such as the Opportunity theory, which suggests that what at-risk youth need are more opportunities to create a better future for themselves to prevent delinquency.

In the twenty-first century, schools are viewed as the primary component for development efforts. One way in which schools attempt to keep young people busy are activities that provide them with the necessary skills to succeed are after-school programs.

Both the history of the elderly and youth have a rough start. Together they were first put in almshouses (poorhouses) as if they did not belong with the rest of society. Great progress has been made in both issues, and this thesis is for the hope of reuniting these generations so they can support each other in an environment that feels like home to them all.

#### HISTORY OF DULUTH, MN

Lake Superior was first inhabited by tribes such as Dakota, Fox, Menoninee, Nipigon, Noquet and Gos Ventres, preceding the Anishinaabe (also known as Objubwe or Chippewa) who occupied the region for five hundred years. Once the Europeans arrived, the Anishinaabe helped them out with trades and soon dominated the region forcing out other tribes. By the mid-18th century, the Objubwe had occupied all of the Lake Superior shores.

In the 19th century, Duluth was the only U.S. port that had access to both the Atlantic and Pacific Oceans. That access allowed the rest of the country to take advantage of its extensive lumber, ample wheat, and ore mining opportunities. With the railroad arrival, Duluth was able to transport people, products and prosperity within the city.

In 1869, Duluth became the largest growing city in the United States. Although the city went through some hard times when the stock market crash in 1873, all of its natural resources and viable transportation helped the city survive.

By the turn of the century, Duluth had more millionaires per capita than any state in the nation, some even say the world. Homes, roads and business were built and the workforce prospered.

Economic decline began in the 1950s, but the rich history is still seen throughout the city. A large portion of downtown buildings are designated by the National Park Service as National Historic Register District.

“The buildings represent significant commercial adaptation of architectural styles popular during the district’s period of significance (1872-1929), including Romanesque, the Revival Styles and vernacular commercial modes.” (“History of Duluth,” 2007)

Duluth, MN has several historical buildings, some of them being the Civic Center, Old Main School and Glensheen Mansion, plus individual listings that appear on the National Register, including the Aerial Lift Bridge, Hartley Building, and Irving School.

Duluth is now a great tourist destination with beautiful natural features, fine restaurants and unique shops. “In Canal Park, life in the shadow of the historic Aerial Lift Bridge is the perfect playground for tourists. Once-tired warehouses are filled with a serendipitous array of shops, pubs and restaurants. Here, you can step onto the three mile Lake walk which offers a chance to walk, run or bike alongside the breathtaking Lake Superior scenery.” (“History of Duluth,” 2007)

## Thesis Goals

### ACADEMICALLY

My primary goal for thesis is to create architecture that addresses all the issues I have found through research and to respond to the needs of the users in the best of my abilities.

This thesis project should also reinforce everything I have learned in my five years at North Dakota State while showing a great sense of creativity and risk taking. I hope to create something that shows some hard work and full understanding of all levels of design from site design to mechanical systems. My goal is to use all the resources provided to me by NDSU in order to create a project that embodies great design, technology, and sustainable systems.

I will use everything I have learned about sustainability throughout all phases of the design to provide a final product with sustainable factors that allow the building to use mostly energy from renewable sources such as wind and solar.

I also hope to use the knowledge I have received from a minor in Psychology. Psychology has been another great passion of mine and it is great inspiration for me to create architecture that improves quality of lives for those mostly in need. Social and psychological needs that many people are not even aware they have.

### PROFESSIONALLY

My professional goals are to create a project that shows creativity, hard work, and passion for design. I hope to show possible employers the level of my work and the passion I carry with me through design. I hope my work in this thesis provides a certain understanding of what architecture means to me. I see it as a great opportunity to show how architecture can change how people view those residing in assisted living facilities. My goal is to show my passion in social issues and architecture and how when combined, they can create a better world.

I hope this project generates a new view of the way we have been dealing with the increase of the number of elders in need of care, and encourages others to invent new ways of reestablishing these people into society in a safe and dignified way.

### PERSONALLY

Personally, my goal is to create something I am proud to stand in front of and present to others. This is a chance for me to use my architecture and psychology degrees together in one project, in an attempt to show the benefits of having this knowledge.

I also anticipate that this thesis will speak clearly about the real necessity to not lose hope for our youth and not forget about our elder either. I hope it inspires others to connect with someone older or younger to form a relationship of mutual understanding, respect, and love.

This thesis is happening because of my grandparents and for everything they have taught me and because of my brother for caring for my grandpa selflessly and with so much love and care. In the end, I hope they are all proud.

## SITE ANALYSIS

qualitative & quantitative

## Site Narrative



Figure 9.1. View from site looking south.

### Why Duluth?

I have chosen this site for several reasons. I have been in love with the city of Duluth and its history since the first time I went there on a camping trip back in 2007. I found Duluth to be a very inspiring place and full of potential, with beautiful historical architecture and great opportunities to connect with nature.

When I started thinking of my thesis project and trying to figure out a place I believed could provide the best environment for the users of my building and the community. I imagined a place where the elderly could find some quietness and fun at the same time, and a place where young people could never get bored. Duluth came to mind right away. As I said, Duluth has become a great inspiration for me as a town with such rich history and breath-taking natural environments.

Duluth is located on Lake Superior, the largest of the five Great Lakes of North America. It is considered the largest body of freshwater in the world by surface area. Lake Superior has been a great source of transportation to many towns around the lake. Several of these towns are still engaged in processing or shipping. Today, tourism has become a significant industry in the town of Duluth.

When searching for a specific site, I decided to look for an existing building in the attempt to do adaptive reuse work. As I searched for possible buildings, I came along Central High, the high school on top of the hill that so many people from Duluth talked about because of the beautiful views it offered. The school was recently closed and the students moved to different schools in the area. I arranged a tour with someone from the Duluth Public Schools facility management. When driving up the hill I found myself holding my breath. I found myself excited and in peace. Before I even looked inside the building itself I knew the site was exactly what I was looking for.

Being on top of the hill, overlooking the city and Lake Superior gives one the feeling of being on the top of the world. The lake is beautiful and large, looking almost like the ocean. Water has been known to bring a feeling of peace and healing to people, and that is exactly what the view of Lake Superior does. The view is extraordinary and the opportunities are immense.

The site is large enough to fit my program, with beautiful hills and wooded areas. The great thing about this site is the location relating to the city of Duluth. Central High is centrally located in the city, close to housing, commercial areas, public transportation and not too far from the downtown. Simultaneously, the site is large enough to be surrounded by nature, creating a feeling of seclusion from it all.

The site contains a very large parking lot and a couple of buildings from when the school was still functioning. The school is a little too large for the program I plan on designing, but I believe I can still make use of the structure in a innovative way in order for it to become more like what I have imagined for my community. The wooded areas have a cross-country ski path and great opportunity for camping and other outdoor activities.

This site does a great job at triggering all five senses...

Sight with the views of the lake and city

Smell with the pine trees and opportunities for flower gardens

Touch with the wind and textures of the surrounding nature

Hearing with the wildlife and the wind blowing on the trees

Taste with the opportunities for vegetable gardens

Triggering the senses in a positive way is known for having great benefits for people, and design is capable of bringing these together to create a comfortable and captivating environment.

The constant change in elevation on the site also creates great opportunities for an intriguing and innovative design that works with the land.



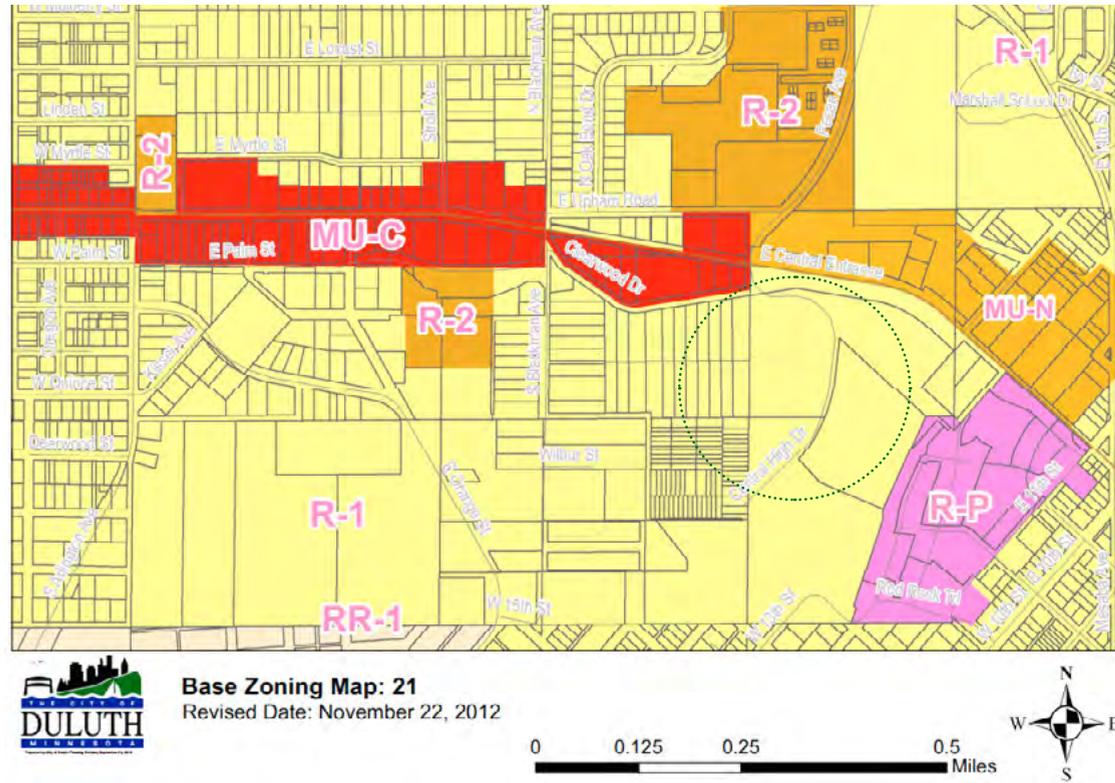
Figure 9.2. Panorama of site from East to West.

# Site Photography



Figure 9.3. Views of and from site.

# Zoning, Legal Lines and Boundaries



- |                             |                               |
|-----------------------------|-------------------------------|
| Residential                 | Mixed Use                     |
| R-C Rural-Conservation      | MU-N Mixed Use- Neighborhood  |
| RR-1 Residential -Rural 1   | MU-C Mixed Use- Commercial    |
| RR-2 Residential -Rural 2   | MU-I Mixed Use- Institutional |
| R-1 Residential Traditional | MU-B Mixed Use- Business Park |
| R-2 Residential Urban       | MU-W Mixed Use- Water Front   |
| R-P Residential-Planned     |                               |

Figure 10. Zoning map.

## Utilities

Since there are existing buildings on the site that were in function until 2011, utilities such as electricity and sewage are current in the site, leaving no need to bring new utilities. There are no power lines on site, meaning that they are placed underground, coming together in the mechanical room behind the school building.



Figure 9.4. Images of site.

## Existing Grids

Much of Duluth is built upon the hills, overlooking Lake Superior. The incredible views have been greatly taken advantage of by the built city. The topography has guided the layout of the streets and the flow of the water. Expansion have occurred further inland in more level areas.

## Views/Vistas

- Commercial Area
- Housing  
Downtown  
Lake Superior
- Forest



Figure 11.1. Site Views and Vistas.

## Human Characteristics/Distress

Artificial landscapes are found throughout the site with local rocks and small logs lined up. A little trash can be found in a few areas, showing that the place has been a little abandoned since the closing of the school.

There are still a couple of buildings in function on site. The Duluth school district facility management are still using parts of the building until the property is sold. The lawn is kept mowed and mostly clean.

The natural environment seems healthy in the area, no sign of extreme distress found.



## Textures

Throughout the site, there are several different textures to be found, both natural and man made.

The existing building facades are mostly brick, concrete blocks, metal and little glazing. The ground has an extensive concrete parking lot surface.

The site has a lot of rock surfaces and trees. The site is surrounded by grass and forests.



## Vegetation

About 32% of the City of Duluth is covered in forest. These forests are approximately 27% aspen/birch, 4% northern hardwoods, 1% upland conifers (pine), and less than 1% lowland hardwoods. ("Natural Systems", 2006)

From the site, we find an extensive amount of aspen/birch, pines, and long grasses as shown below. This site gives opportunities for a better connection between humans and nature.



Figure 9.5. Images of site.

## Wildlife

Northern Minnesota is home for hundreds of species of birds and animals. In Duluth, the most common wildlife are various fresh water fish, water birds and waterfowl, migratory shorebirds and songbirds, and many more. These are found more near Lake Superior. Once a little further inland, there are deer, elk, moose, bears, etc.

The region of Duluth/Superior is one of the largest bird migration areas in the world because of the varied habitats of forests, beaches, rocky ridges, and Lake Superior itself. Bird houses and baths can be used on site to attract birds, for them beauty of singing and flying.



Figure 12. Images of Minnesota Wildlife. Blue bird and deer.

On the site of my project, I found signs of a deer. The image on the left shows a deer step mark on the gravel. The image on the right shows a bud missing from a tree, which was most likely eaten by a deer. This shows how this site is visited by wildlife, giving the residents and the deer a chance to inhabit the same space in harmony.



Figure 9.6. Images of site.

## Soils

As seen in the image below, the soil in Duluth can vary from very deep in flatter areas to thinner on steep slopes and summits. The steep slopes that overlook Lake Superior are mostly of red clay, which is very prone to erosion and is poorly drained. A very high clay content is found in the soils along the shore line with clay, sandy clay and gravelly clay. There are organic soils, peat, peaty loam and muck that can be found in the flatter areas where the fertility levels are higher.

In the topography prevalent in Duluth of steep hills, erosion prevention is very important in order to keep the terrestrial and aquatic communities safe, prevent erosion problems, and preserve the quality of water. ("Natural Systems", 2006)



Figure 9.7. Rock on site

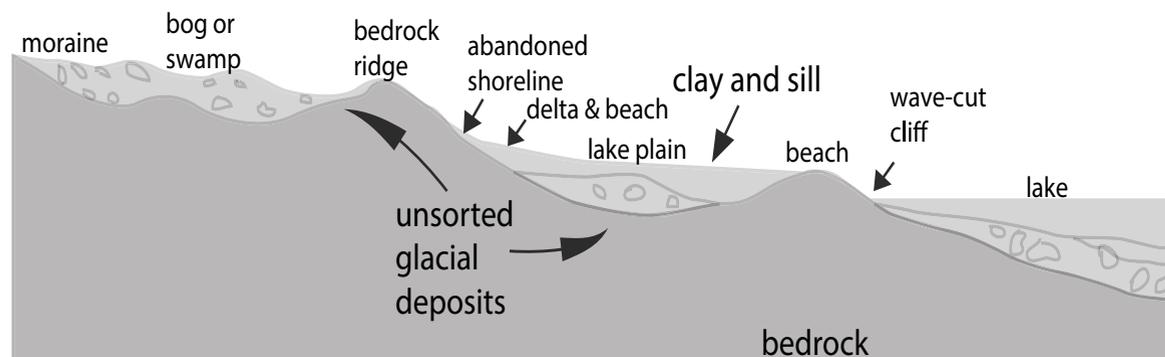


Figure 13. Duluth, MN bedrock section.

## Water

### WATERSHEDS AND STREAMS

Duluth is home for one of the 10 watersheds basins in Minnesota, defining the draining area to Lake Superior. This watershed is divided into two sub watersheds, Lake Superior South and St. Louis River watersheds. From these sub watersheds, they are divided into 23 minor watersheds which are drains for a total of 43 streams.

Duluth's watersheds are usually small in area. They are efficient at moving stormwater quickly off the land and into the streams before bringing into Lake Superior. ("Natural Systems", 2006)

As the water runs through streets, it picks up sediments, pollutants, and heat from developed surfaces, which is a source of pollution that affect aquatic and terrestrial habitats within the watersheds. Thus, finding a way to allow the ground to absorb as much water as possible instead of letting it run off is preferred.

From the site, even though from far away, the main view of water is of Lake Superior. There are two creek that runs through or near my site. These are not major bodies of water. One is a creek running through the site along the bike path called Brewery Creek. Another is a creek found near the site in the south side.

### FLOODPLAINS AND WETLANDS

There are not significant areas of floodplains or wetlands in the southeastern area of Duluth because of its steep topography. The only areas where floodplains and wetland are found are in the northwest of the ridge line, the southern half of the city near the Lake Superior shoreline, and along the St. Louis River estuary.

Wetlands are not only important for wildlife habitat but also for recreational activities (hunting, fishing, birding, etc.). ("Natural Systems", 2006)



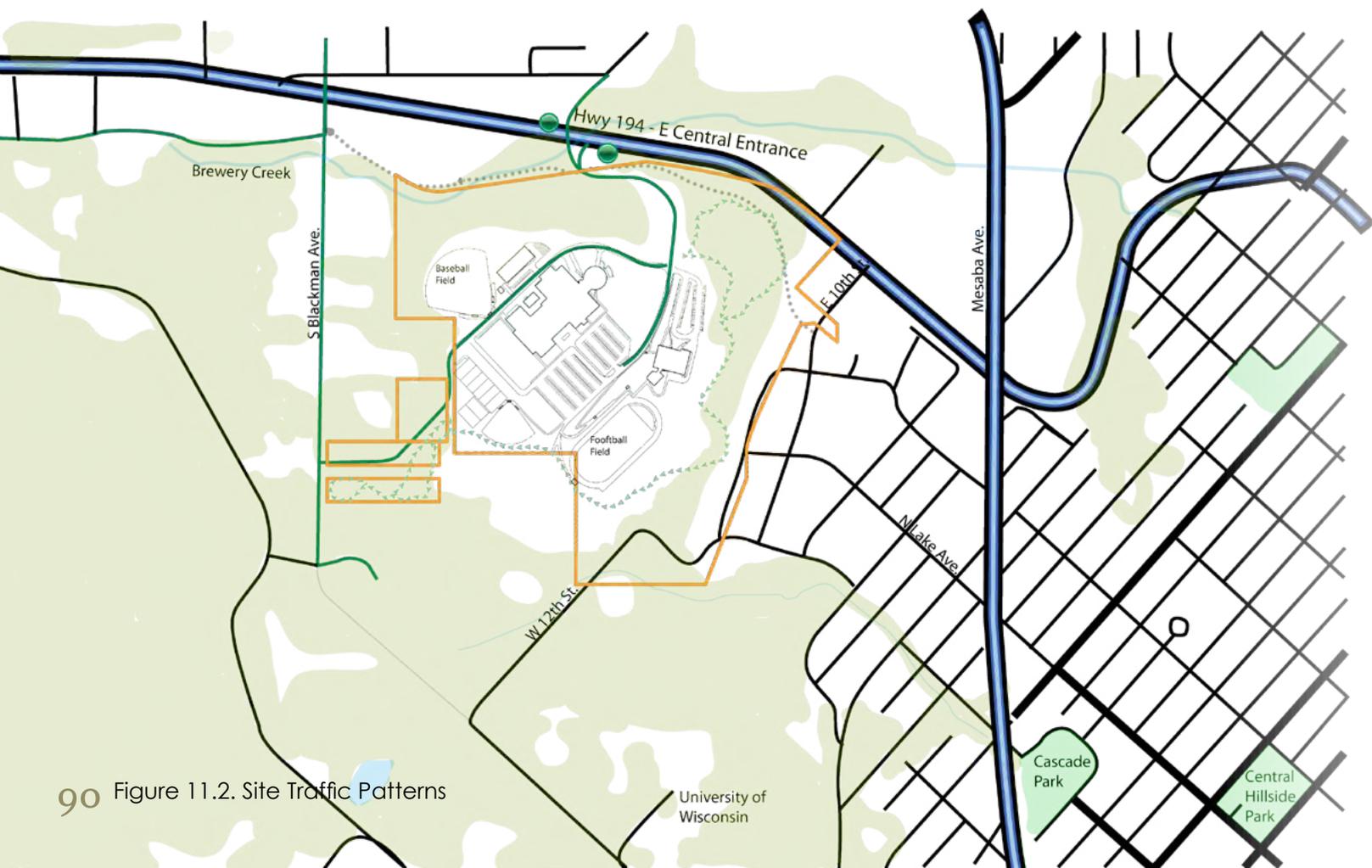
Figure 14. View of Lake Superior.

# Traffic

-  Mild Traffic
-  Light Traffic
-  Heavy Traffic
-  Cross Country Ski Path
-  Bike Path
-  Bus Stop near entrance

Most of the traffic is happening off the site. The extensive entry road allows for less traffic on site and more safety for the residents.

Bike and walking paths are existence separate from motor traffic for safety.



90 Figure 11.2. Site Traffic Patterns

The site has great opportunities for physical activities and connection with nature in different times of the year.

There is a bus stop next to the entrance of the property, making it easy for the users of the building to use public transportation. There are several other bus stops near this area also.

Immediately off the entrance, a bike path pierces through the property. Having this amenity will encourage people to ride their bikes as a physical fun activity in the warmer times of the year.

A Cross Country Ski Trail runs through and around the site. This is a great opportunities for both summer and winter nature walks.



Bus Stop



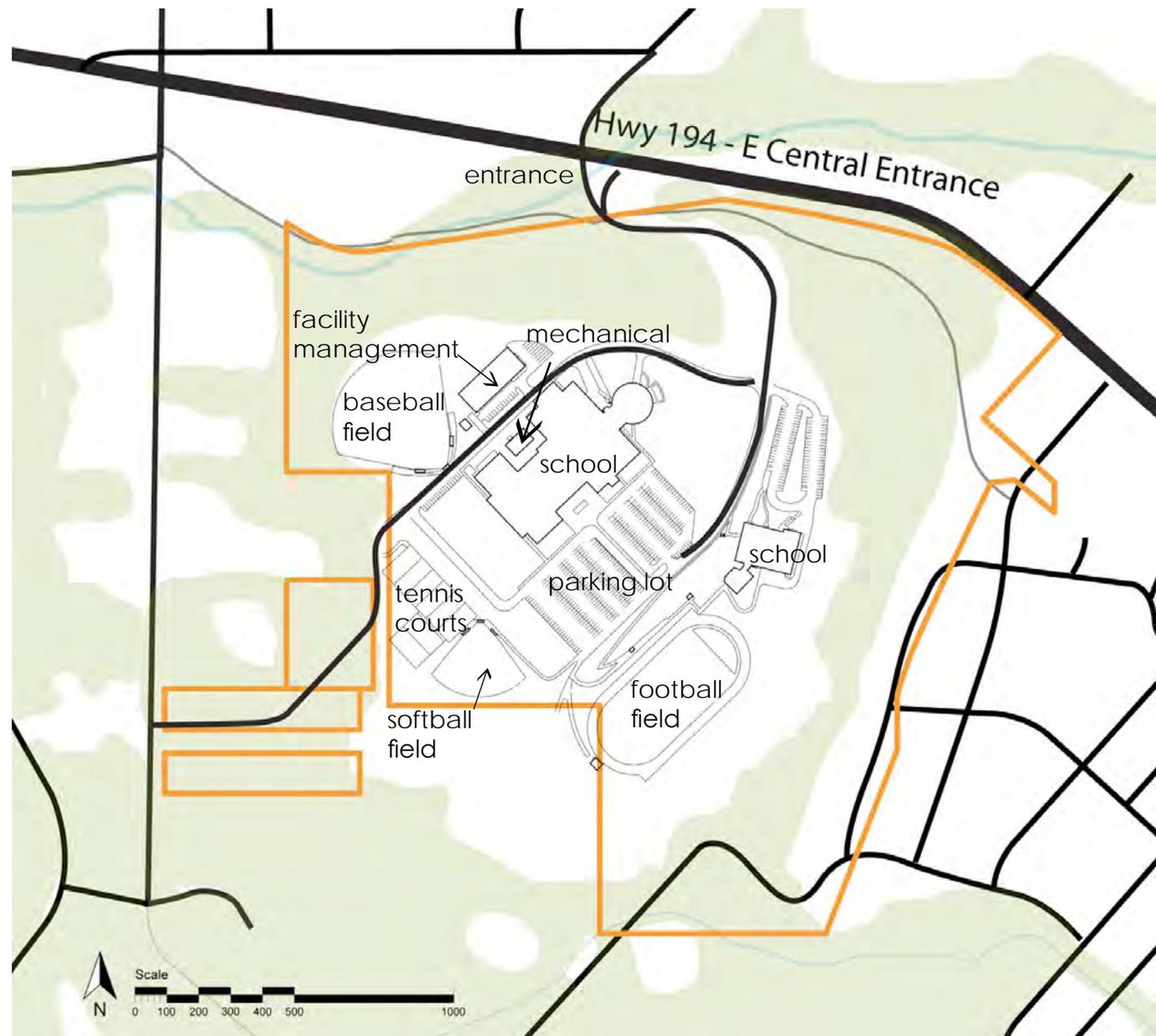
Bike Path



Cross Country Ski Trail

Figure 15. Site Activities Opportunities 91

## Existing Structures



## Climate Data

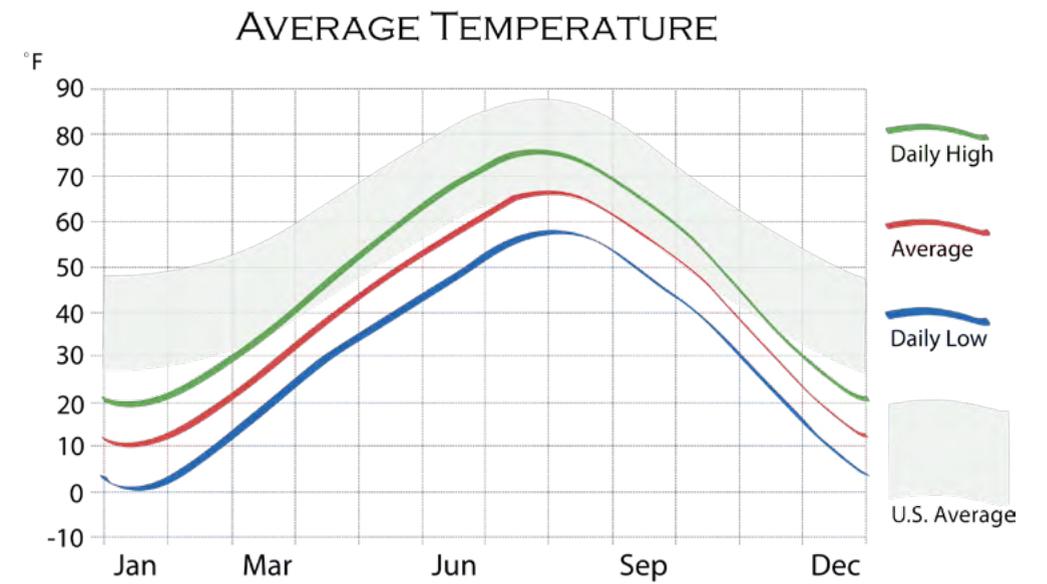


Figure 16.1

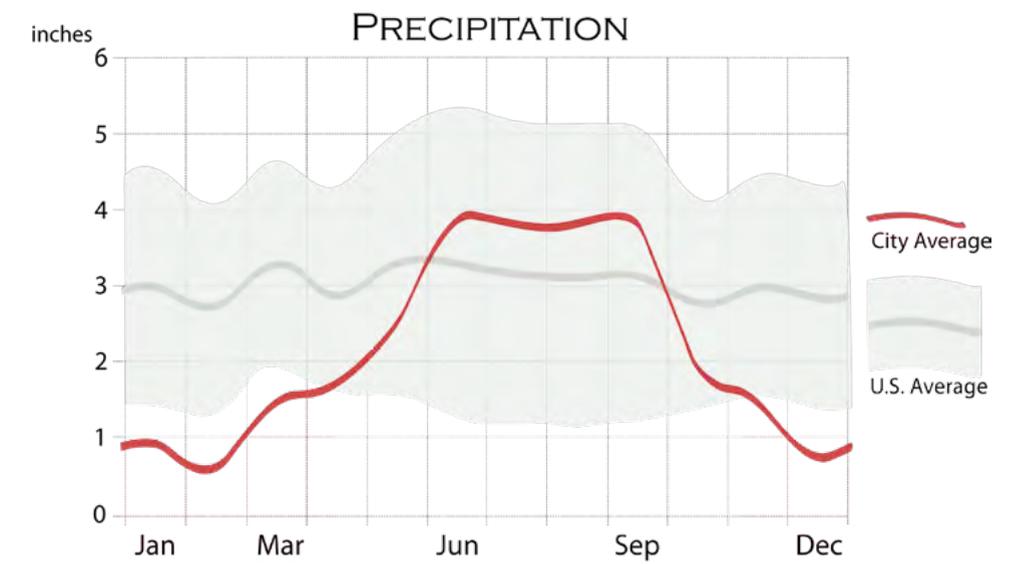


Figure 16.2

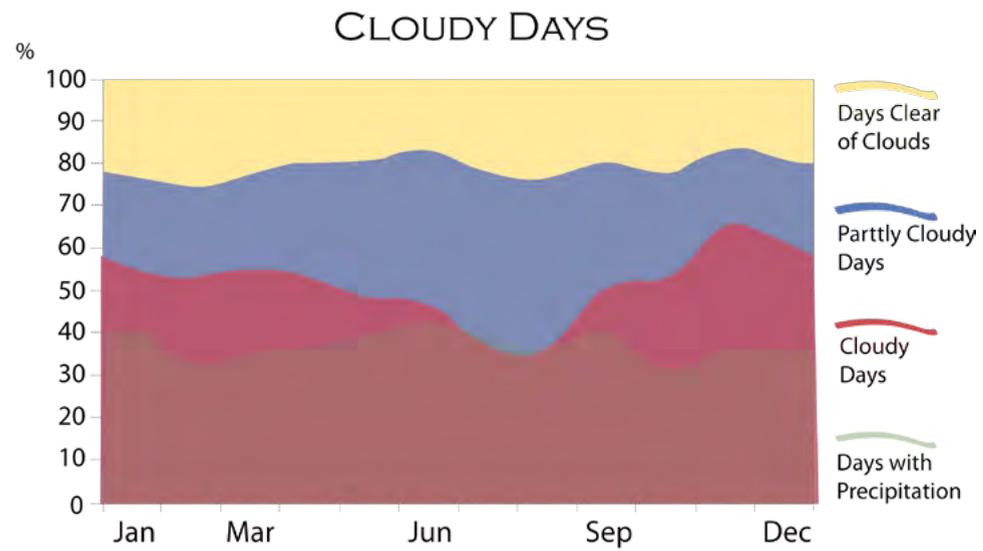


Figure 16.3

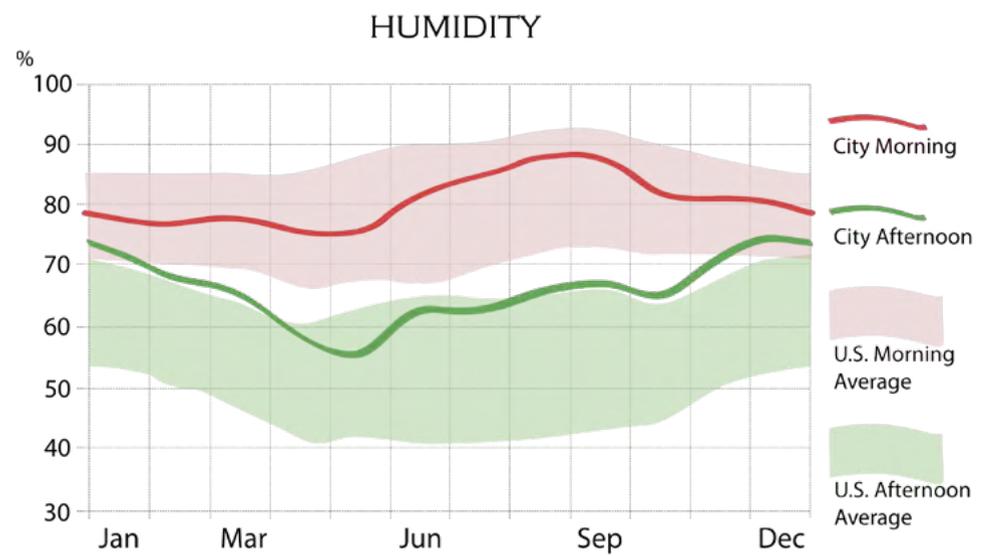


Figure 16.4

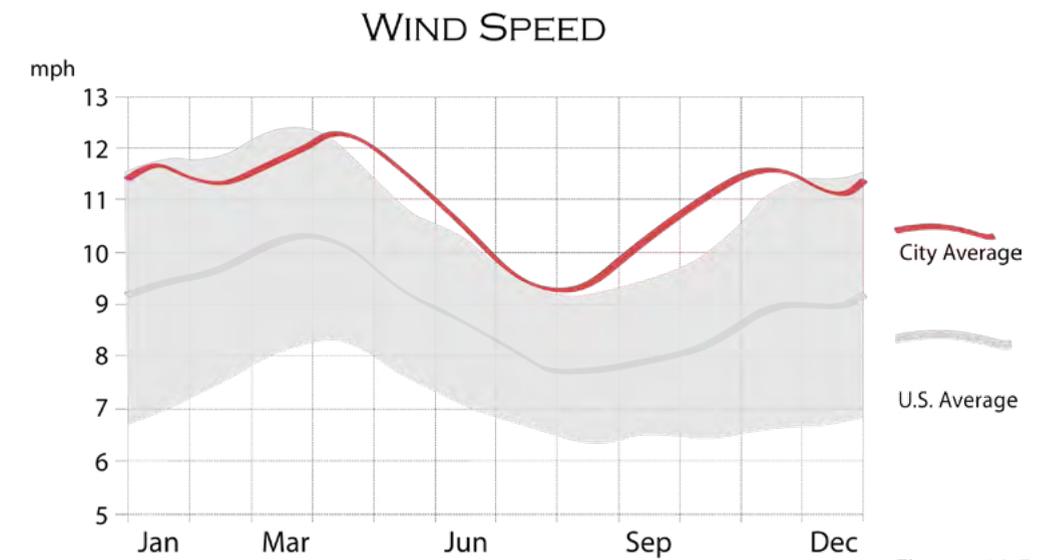


Figure 16.5

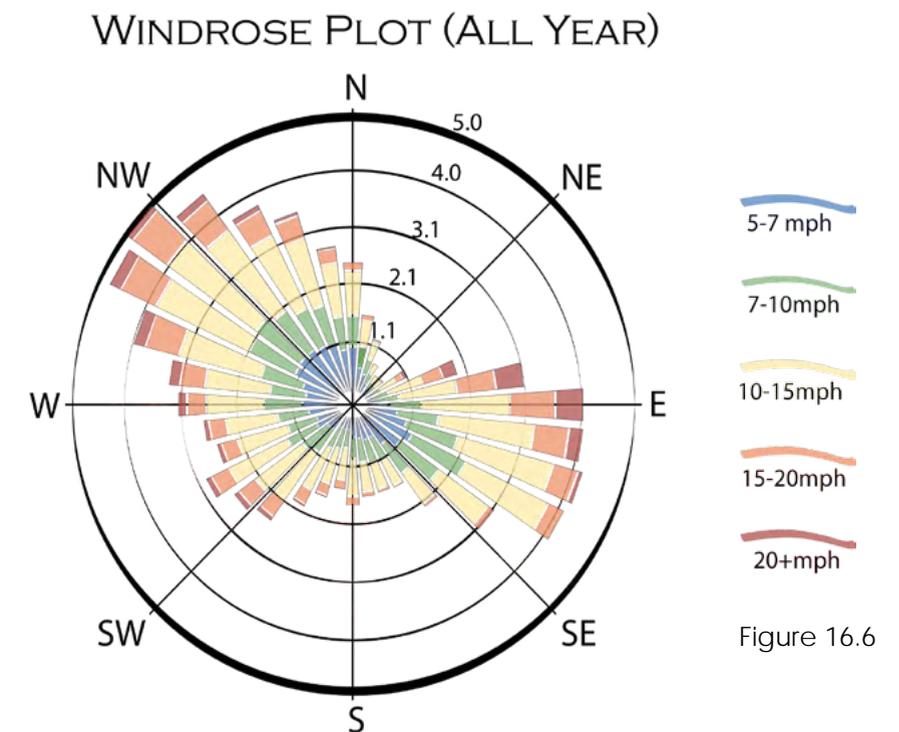


Figure 16.6

# Shading Study

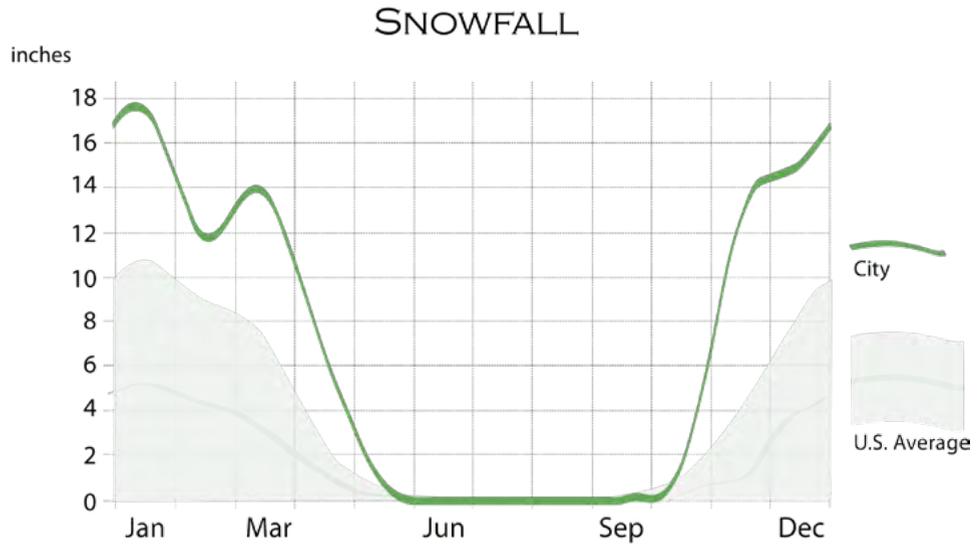


Figure 16.7

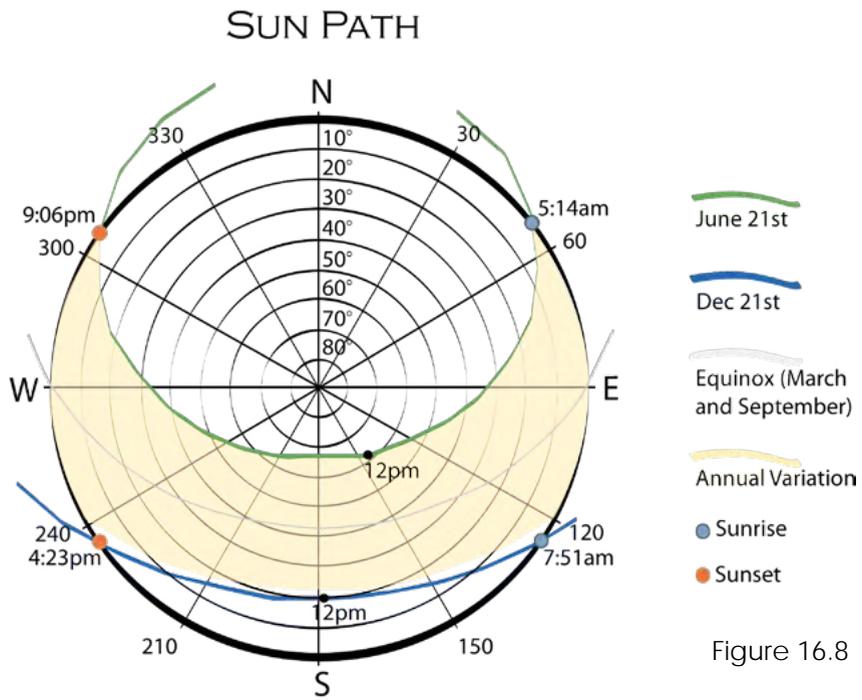


Figure 16.8

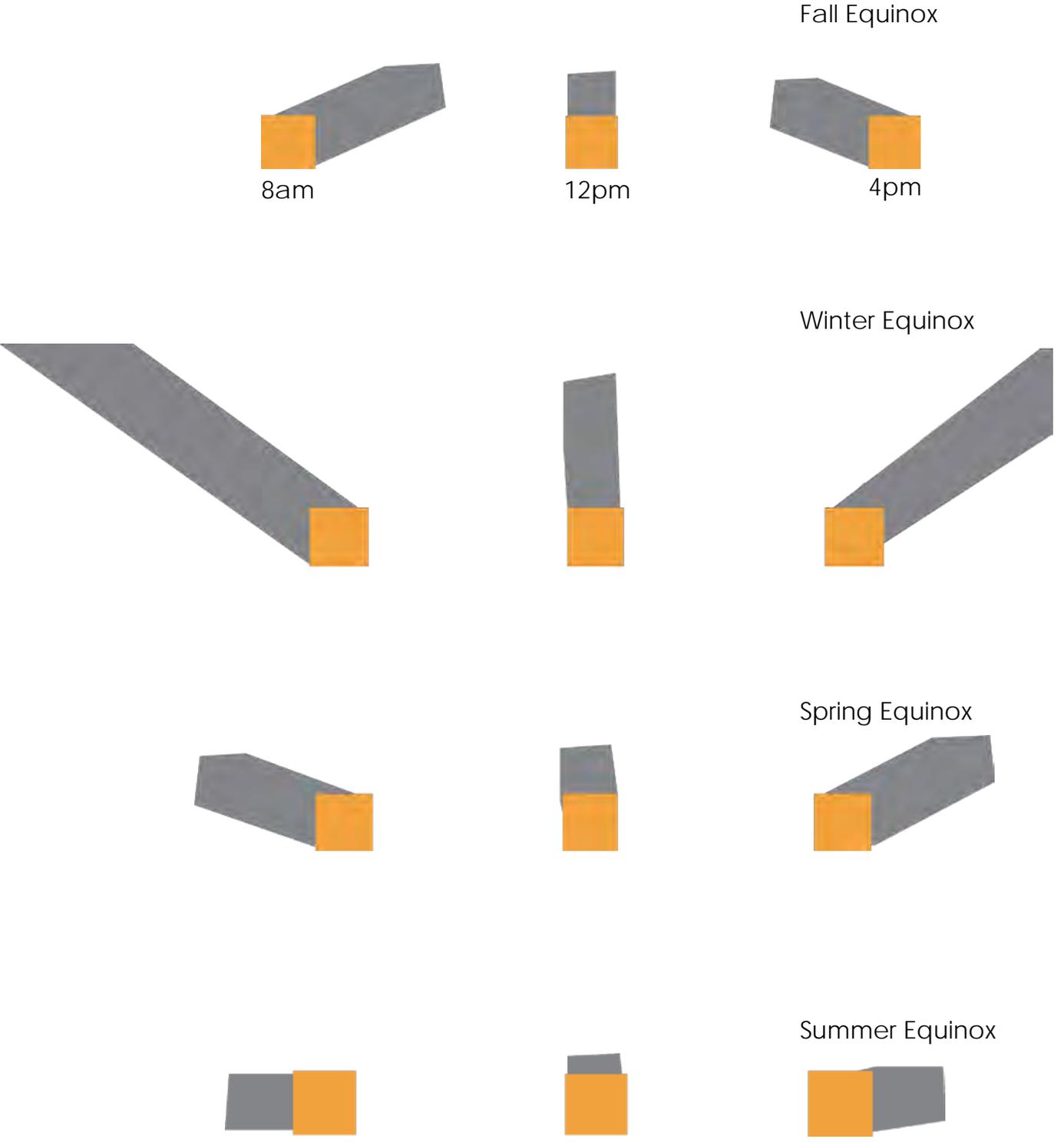


Figure 17. Shading Stud-97

## Climate

The climate in Duluth is characterized by cold winters full of snow and cool to moderately warm summers. Because of the lake effects, there are great variations in weather patterns. The climate is moderated by Lake Superior, which makes winters warmer and summers cooler.

Buildings must respond to the climate as a way to both protect from winter weather and embrace the beautiful summers. Being able to create an outside feeling in the inside of the building would be ideal for the long winter months. Plants should be able to thrive in the inside to keep the natural feeling all year long.

## Wind

The shore and slopes facing the lake experience the strongest winds that blow off the water. In the fall, when low pressure systems pass over the lake, strong winds and rain are experienced. ("Natural Systems", 2006) With the north side mostly protected with trees, the summer breezes will be welcome and embraced with operable windows. A way to protect the building from moisture damage caused by rain should be explored.

## Light Quality

Between spring and fall, there is fog along the shore while the inland areas are full of sunshine. These warm-season fogs occur when moisture in the warm air condenses as it flows over the cold lake." ("Natural Systems", 2006)

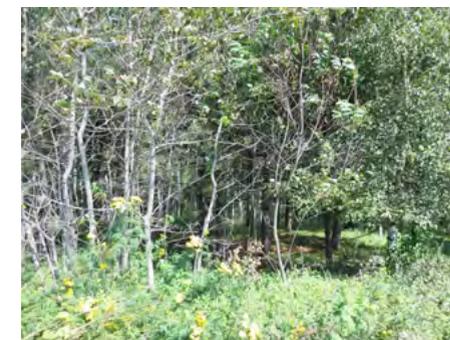
The next images show a difference between photos taken on a warm bright sunny day vs. photos taken on a cold and rainy fall day. Both carry with them something special about the way the colors and textures change.

## Summer & Fall Photos

Sunny August 10th, 2012



Cloudy November 10th, 2012



## Topography

The topography of Duluth is known for being dominated by steep hillsides. These steep ridges can rise up to 600 - 800 feet above sea level. Because of such dramatic landforms, sometimes in the cool season while there is rain near the lake, there can be snow further inland due to the air rising and cooling. Some flatter areas have a 1 - 3 % gradient, along the escarpment, stream slopes range from 5 - 20%." ("Natural Systems", 2006) The lake, steep ridges and rock outcropping bring great character to Duluth. The flattest part of the city follows the St. Louis River and Bay.

"Citizens of Duluth highly value the water and features along the water's edge as reflected by the shape and orientation of the city." ("Natural Systems", 2006) The site chosen allows for great views of the Lake Superior, creating opportunities for reflection and admiration.

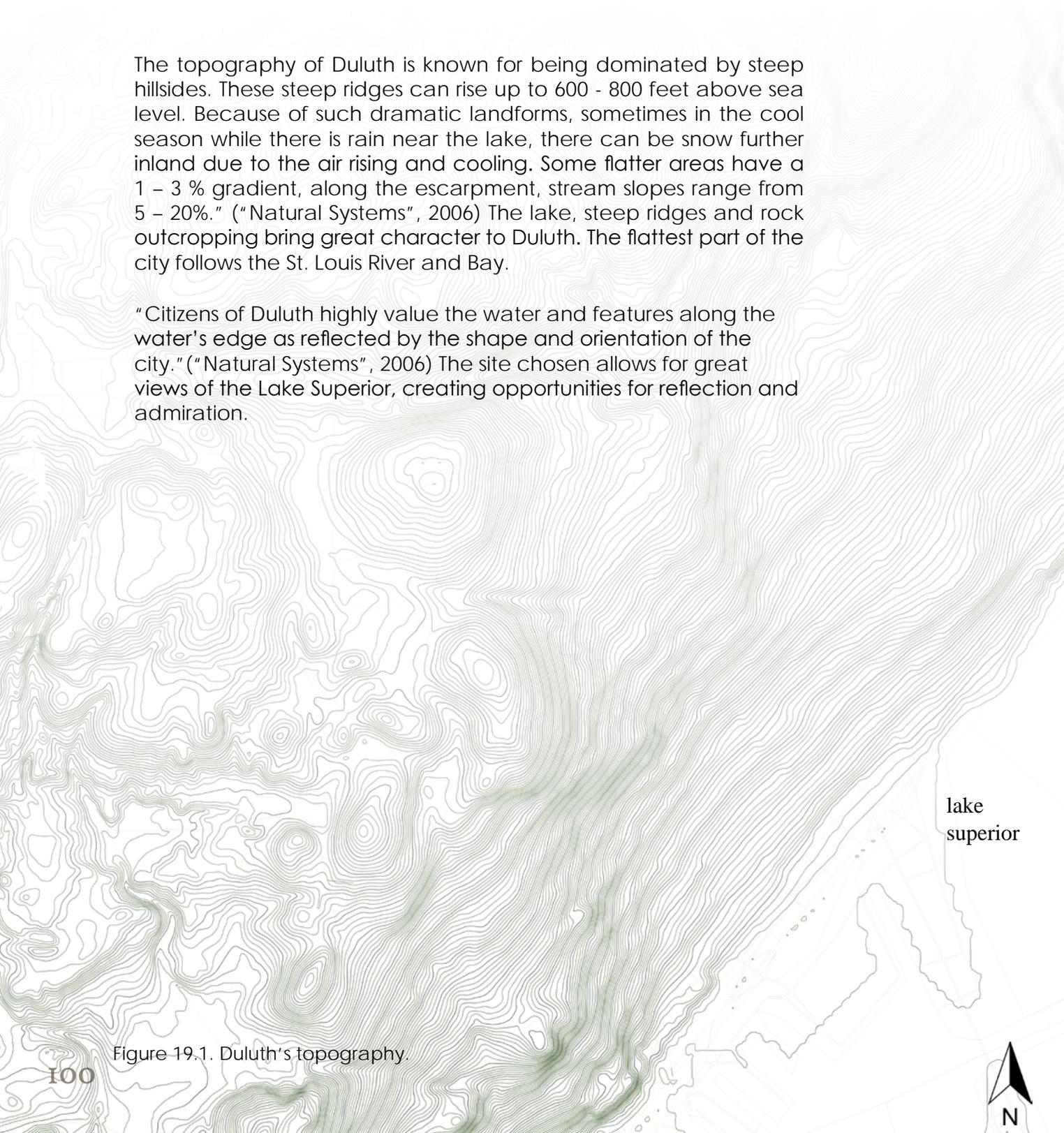


Figure 19.1. Duluth's topography.

## Slope Analysis

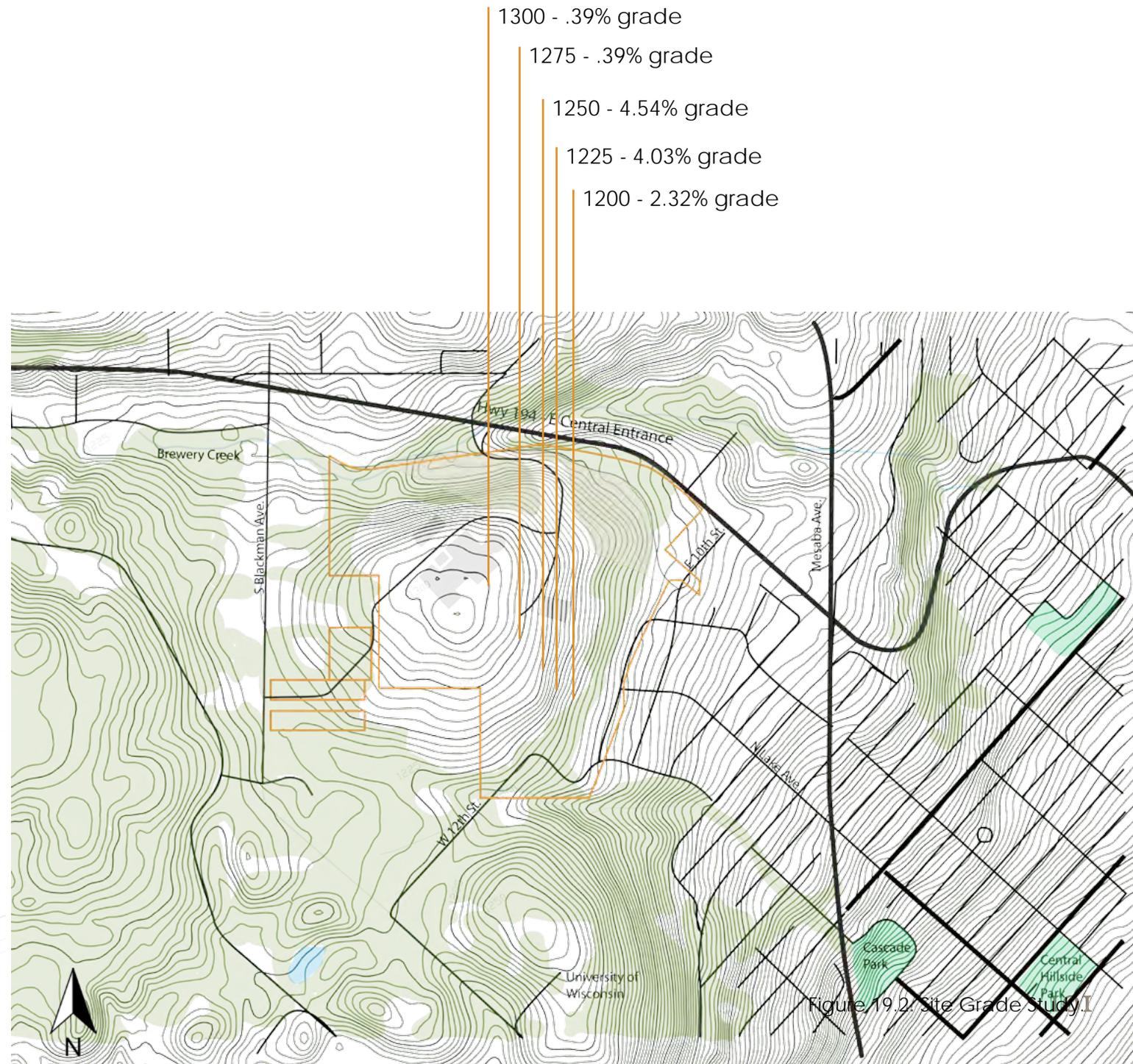


Figure 19.2. Site Grade Study I

# Noise and Wind Analysis



As mentioned before, major traffic happens mainly off the site, so the site finds itself protected from traffic noise.

A heavy amount of conifer trees protect the site from harsh winter winds, while receiving all the lake versus in the summer.

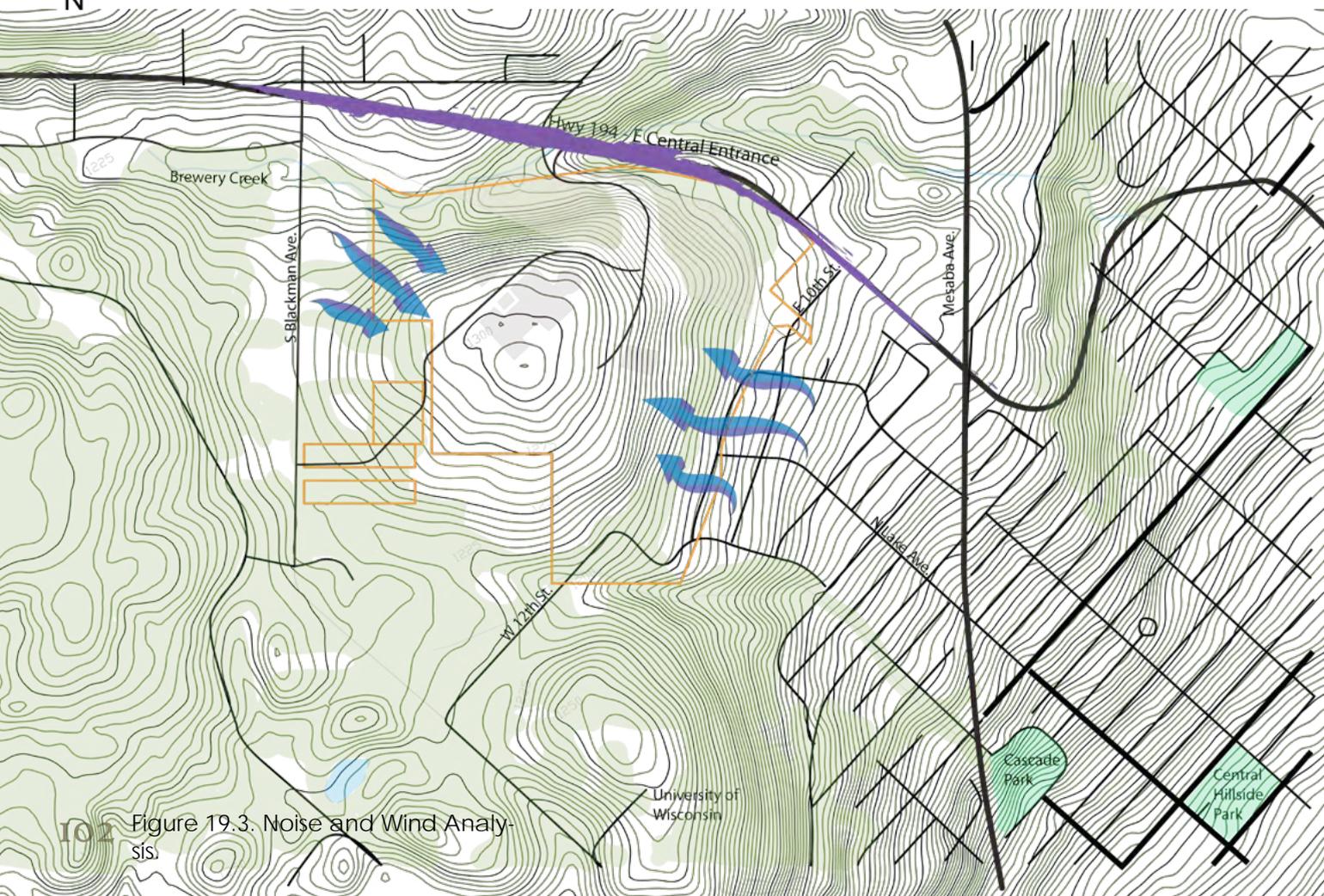
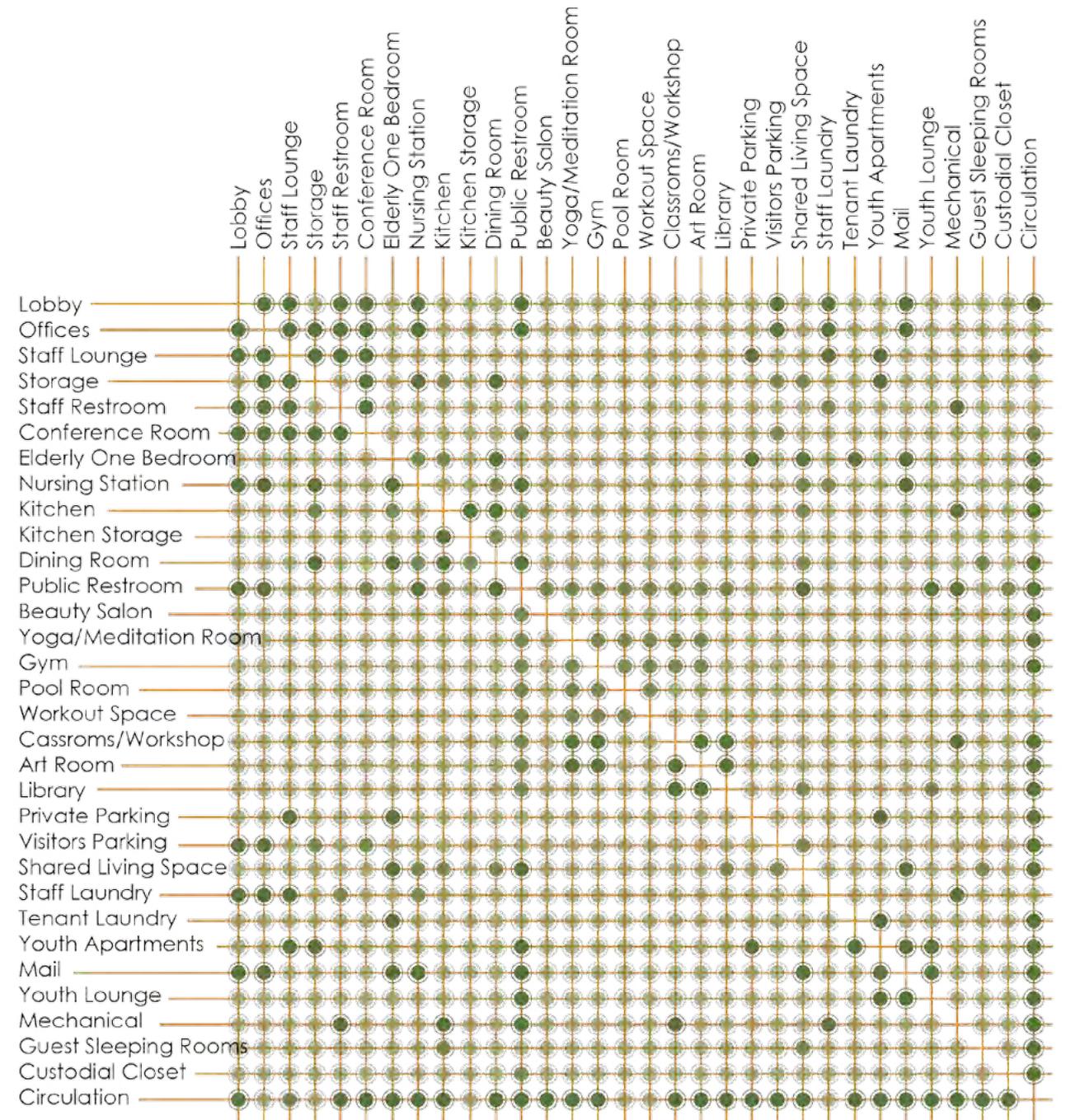


Figure 19.3. Noise and Wind Analysis.

# PROGRAM

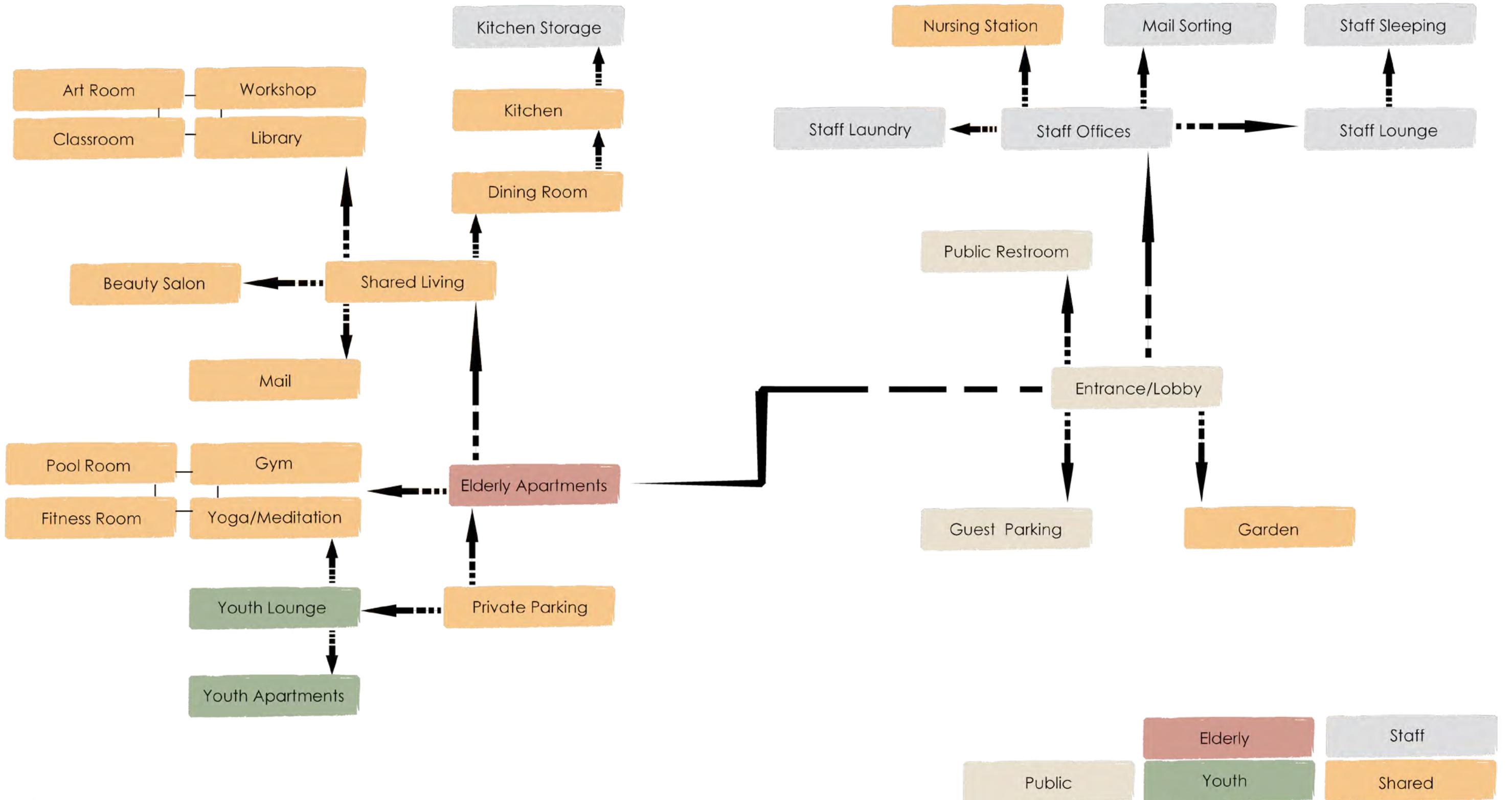
# Interaction Matrix



## Program Sq. Ft.

Lobby	1020 sq. ft.
Reception	240 sq. ft.
Offices (x 8)	150 sq. ft.
Staff Lounge	278 sq. ft.
Storage (x 4)	80 sq. ft.
Staff Restroom	150 sq. ft.
Conference Room	300 sq. ft.
Mail Area	50 sq. ft.
Counseling (x2)	500 sq. ft.
Nursing Station	200 sq. ft.
Elderly One Bedroom apt. (x30)	650 sq. ft.
Kitchen	1200 sq. ft.
Pantry	400 sq. ft.
Dining Room	6000 sq. ft.
Public Restroom (x8)	300 sq. ft.
Beauty Salon	500 sq. ft.
Yoga/Meditation Room	600 sq. ft.
Physical Therapy	500 sq. ft.
Pool Room	5000 sq. ft.
Fitness	2000 sq. ft.
Locker Room (x2)	2000 sq. ft.
Workshop	2600 sq. ft.
Art Studio	3200 sq. ft.
Classrooms (x4)	730 sq. ft.
Library	4000 sq. ft.
Laundry (x2)	150 sq. ft.
Shared Living Spaces	1800 sq. ft.
Multi Purpose Room	4000 sq. ft.
Youth One Bedroom apt. (x18)	650 sq. ft.
Parking	T.B.D.
Youth Lounge	1000 sq. ft.
Game Room	600 sq. ft.
Loading Dock	T.B.D.
Custodial Closet (x4)	80 sq. ft.
Mechanical Room	400 sq. ft.
Circulation	20% of building areas
	69,348 sq. ft.
	Total: 83,217 sq. ft.

# Interaction Net

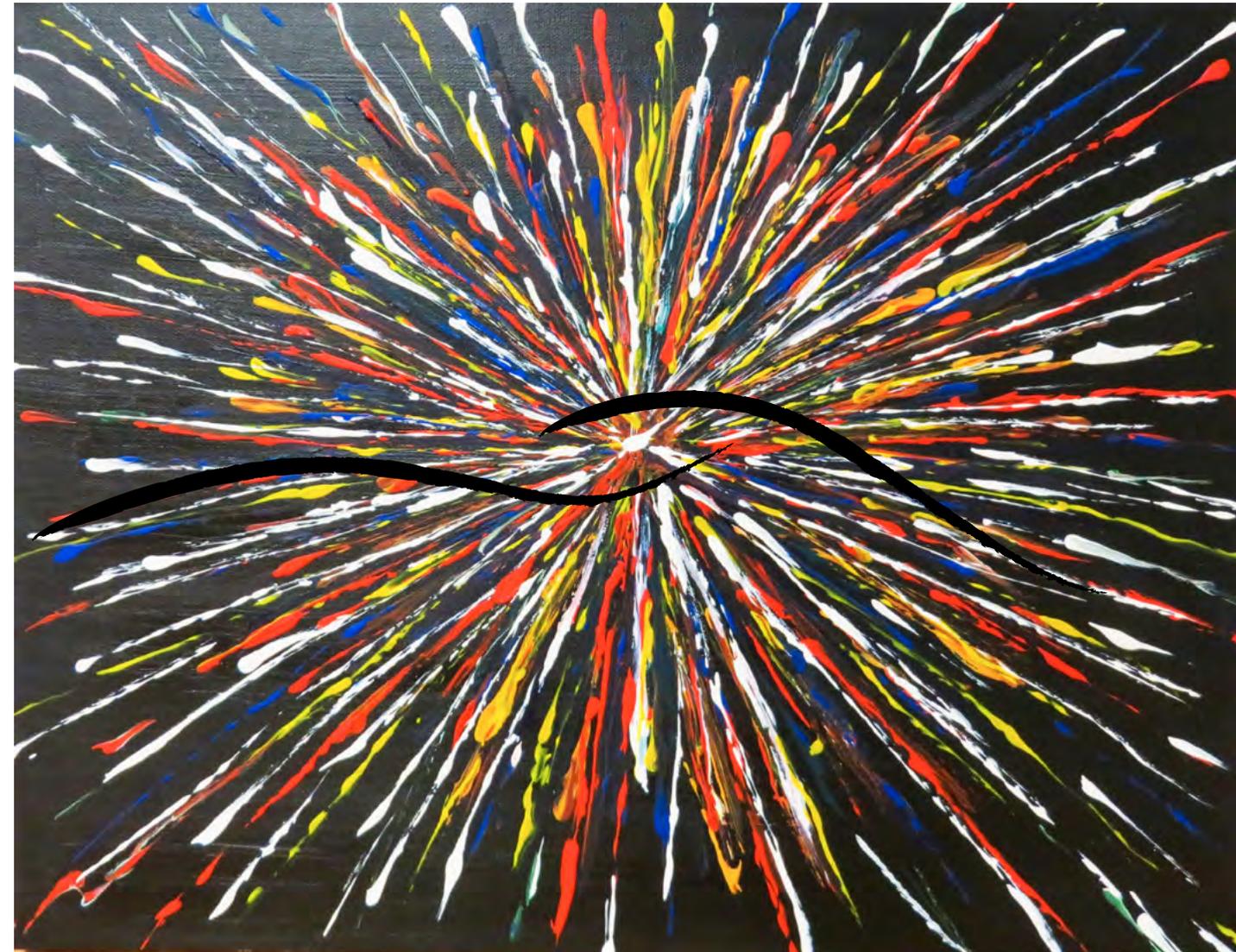


DESIGN PROCESS



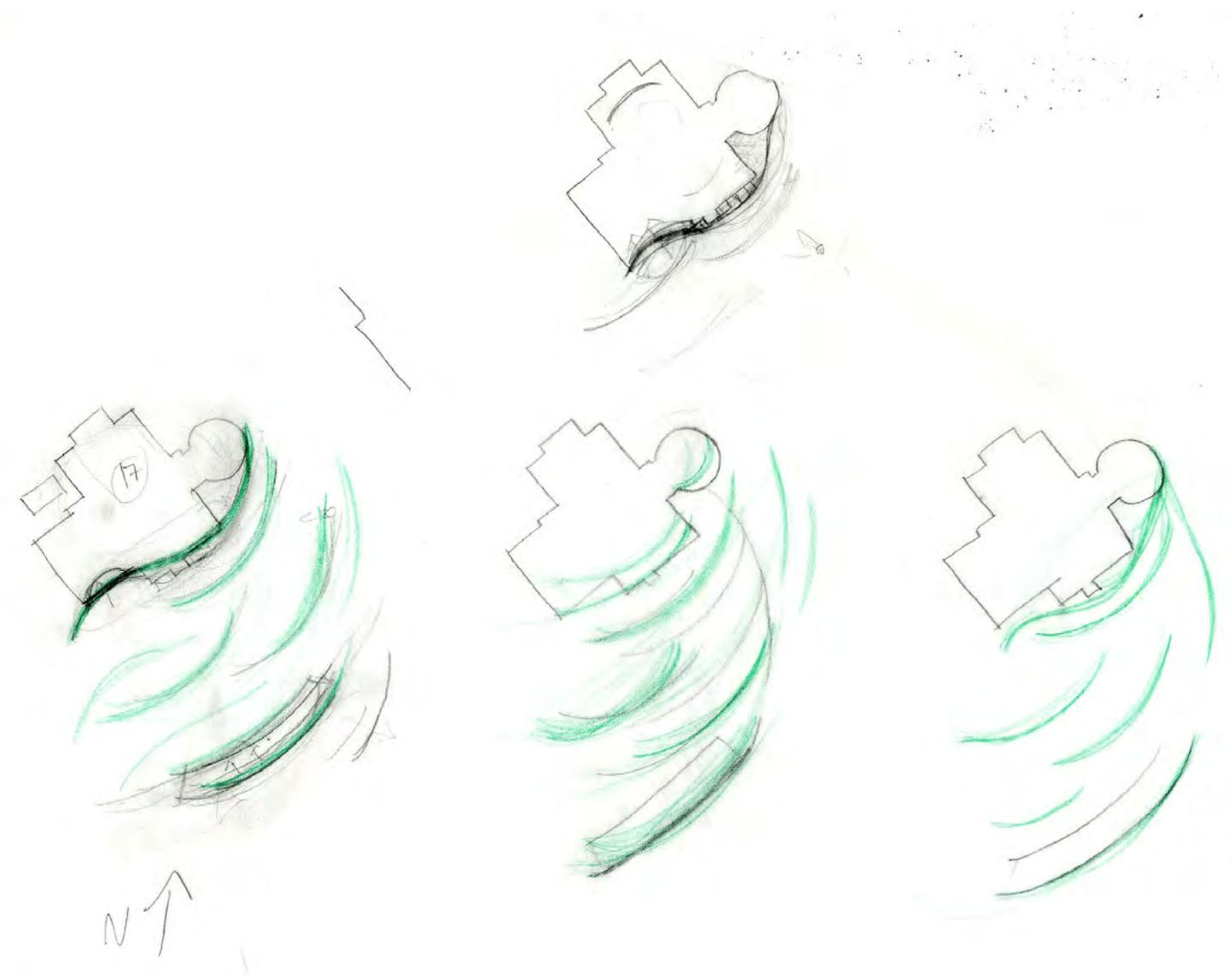


When exploring a concept, several different forms of art were experimented with in order to find the power of what it all meant for the design- from planting new life to an old log, to painting and sculpting.

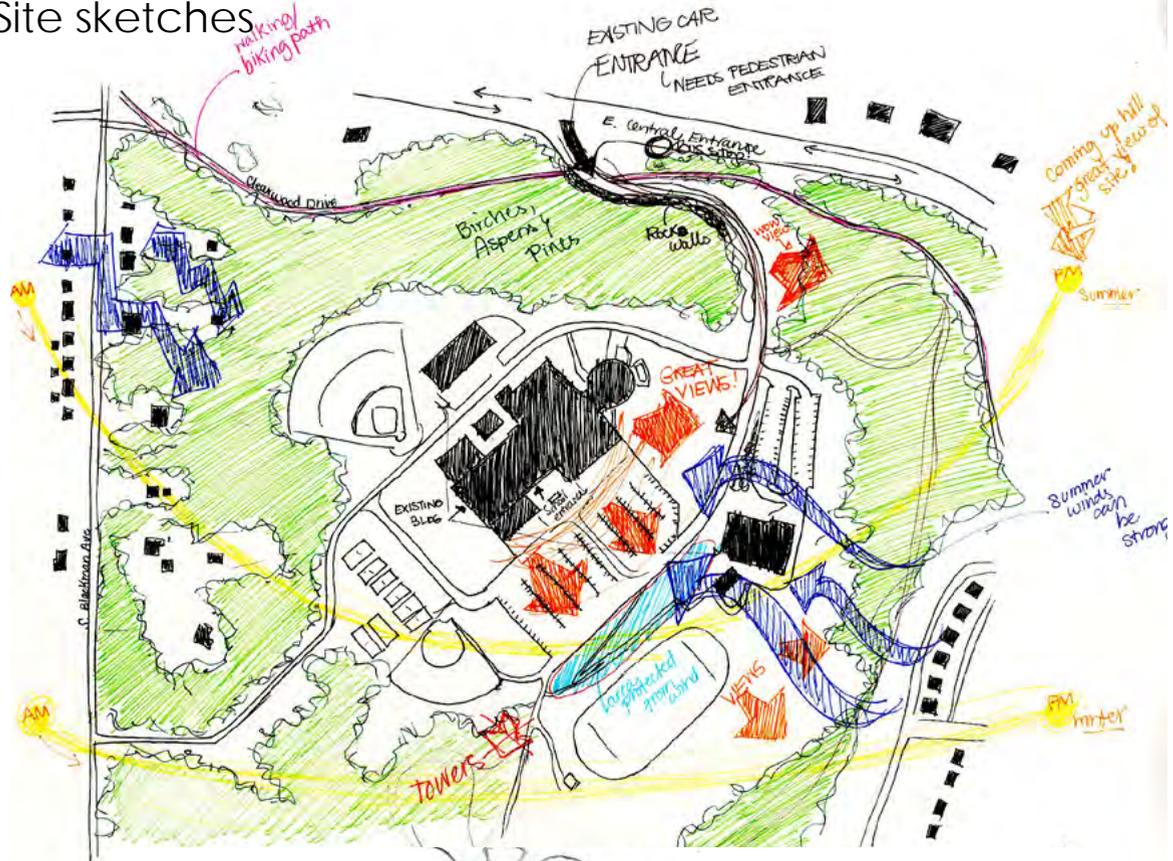




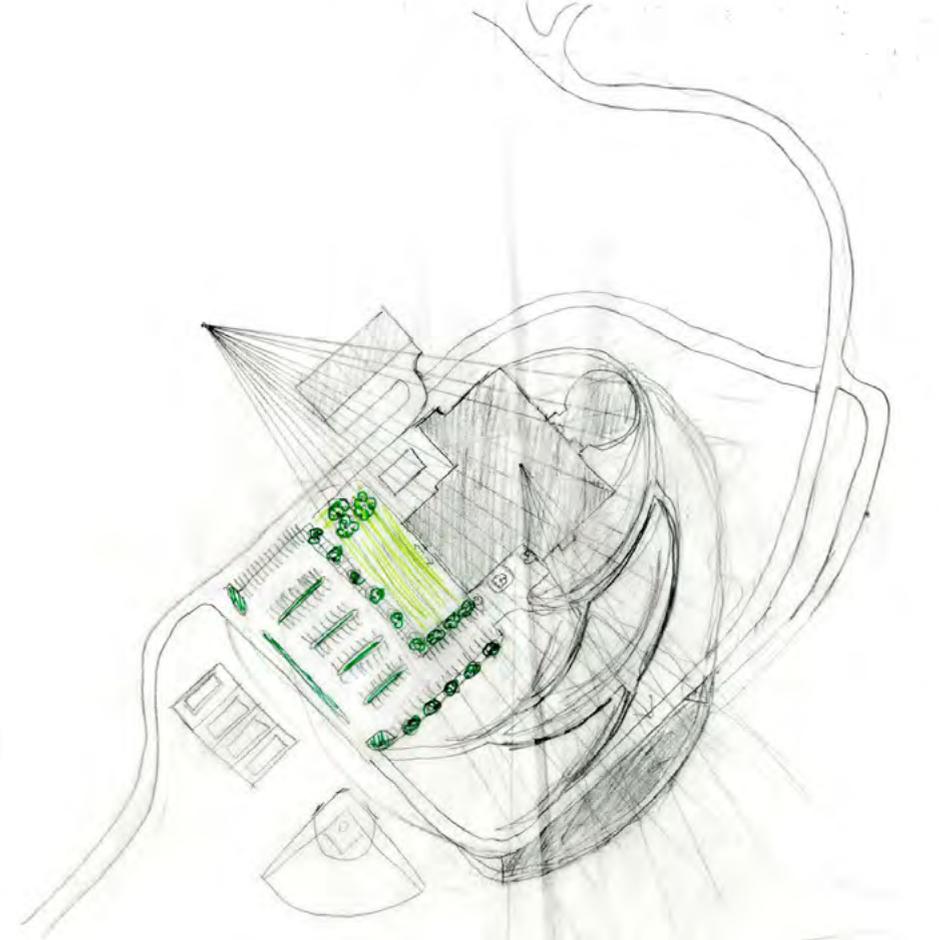
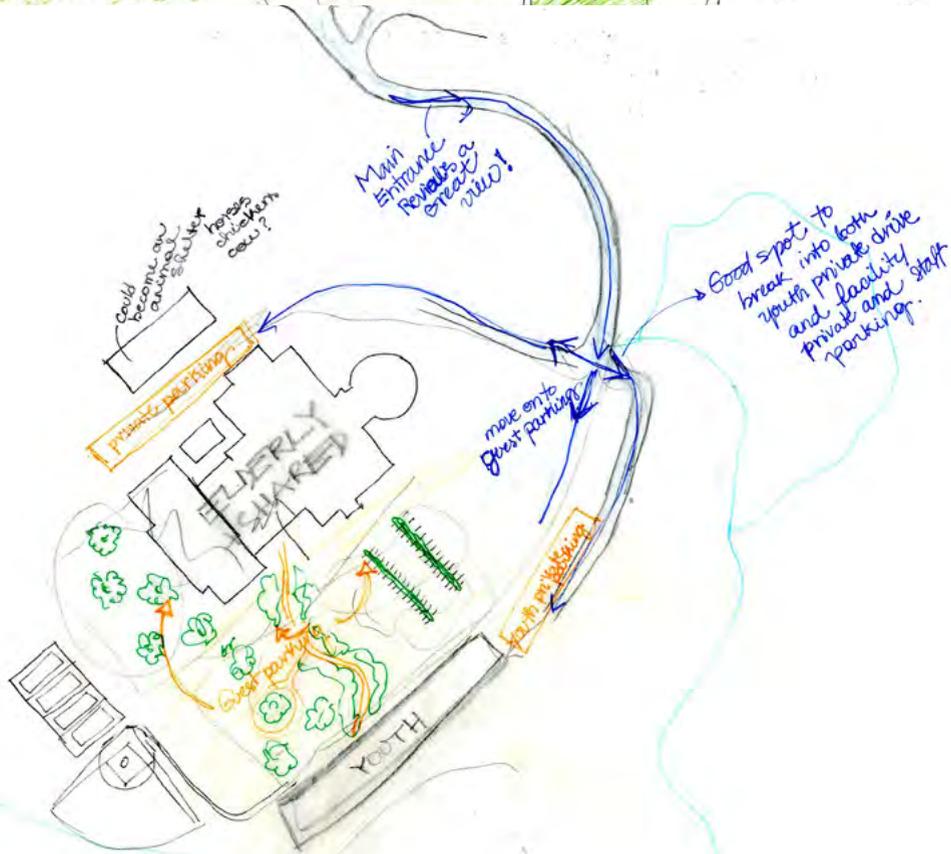
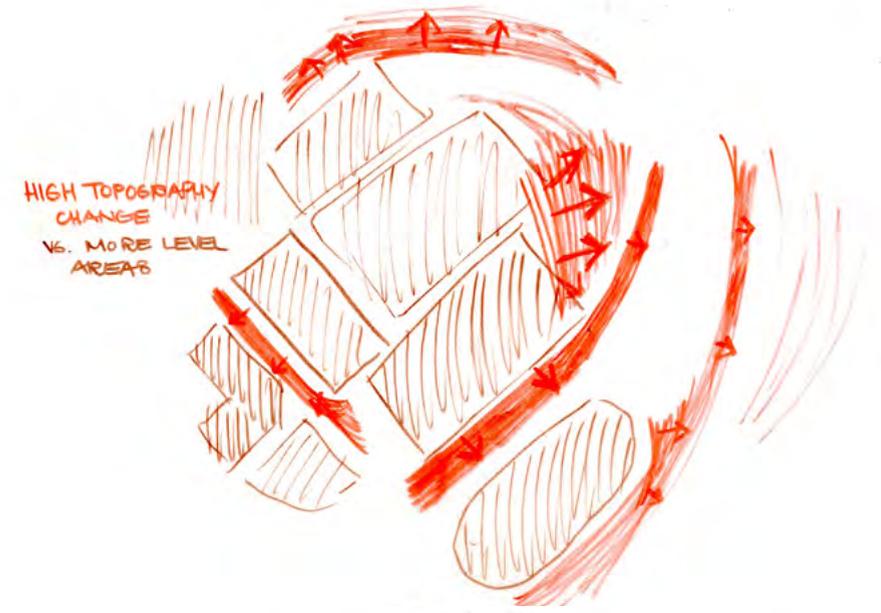
Sketches



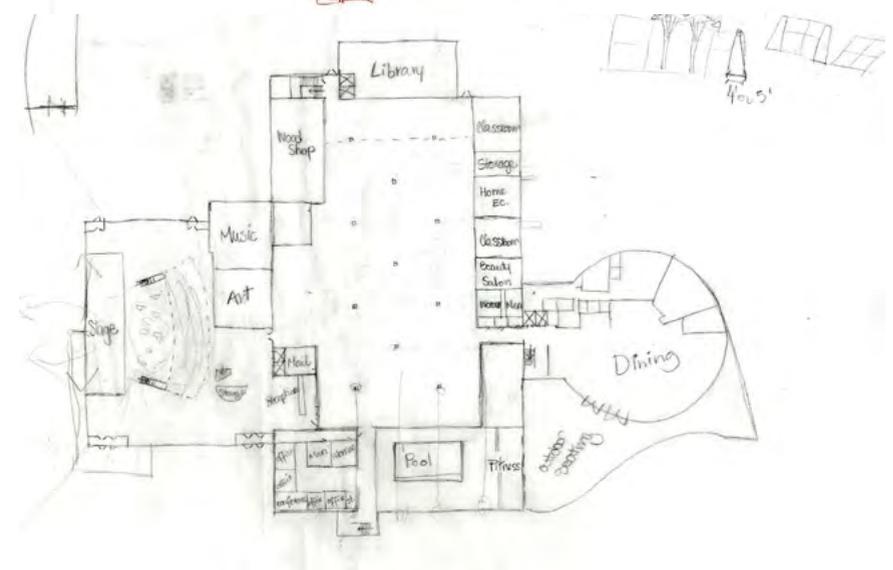
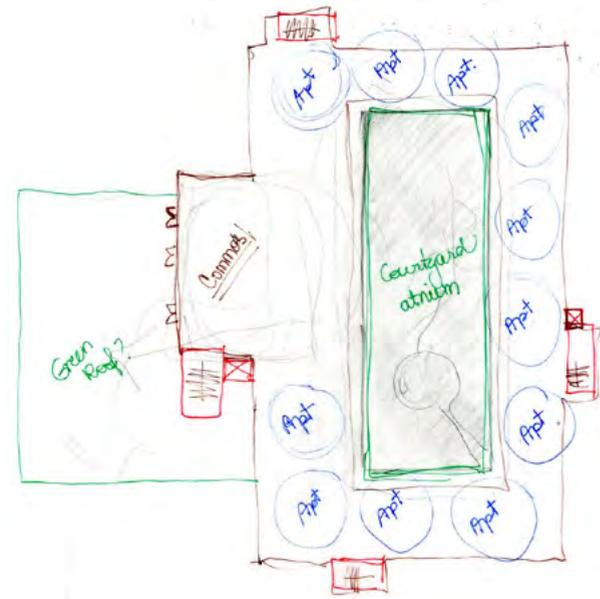
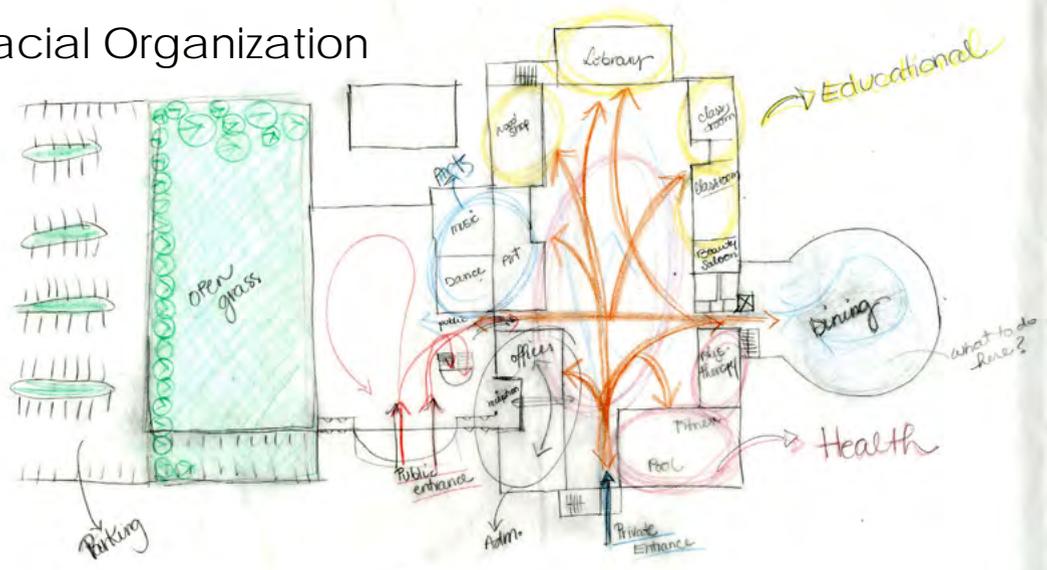
Site sketches



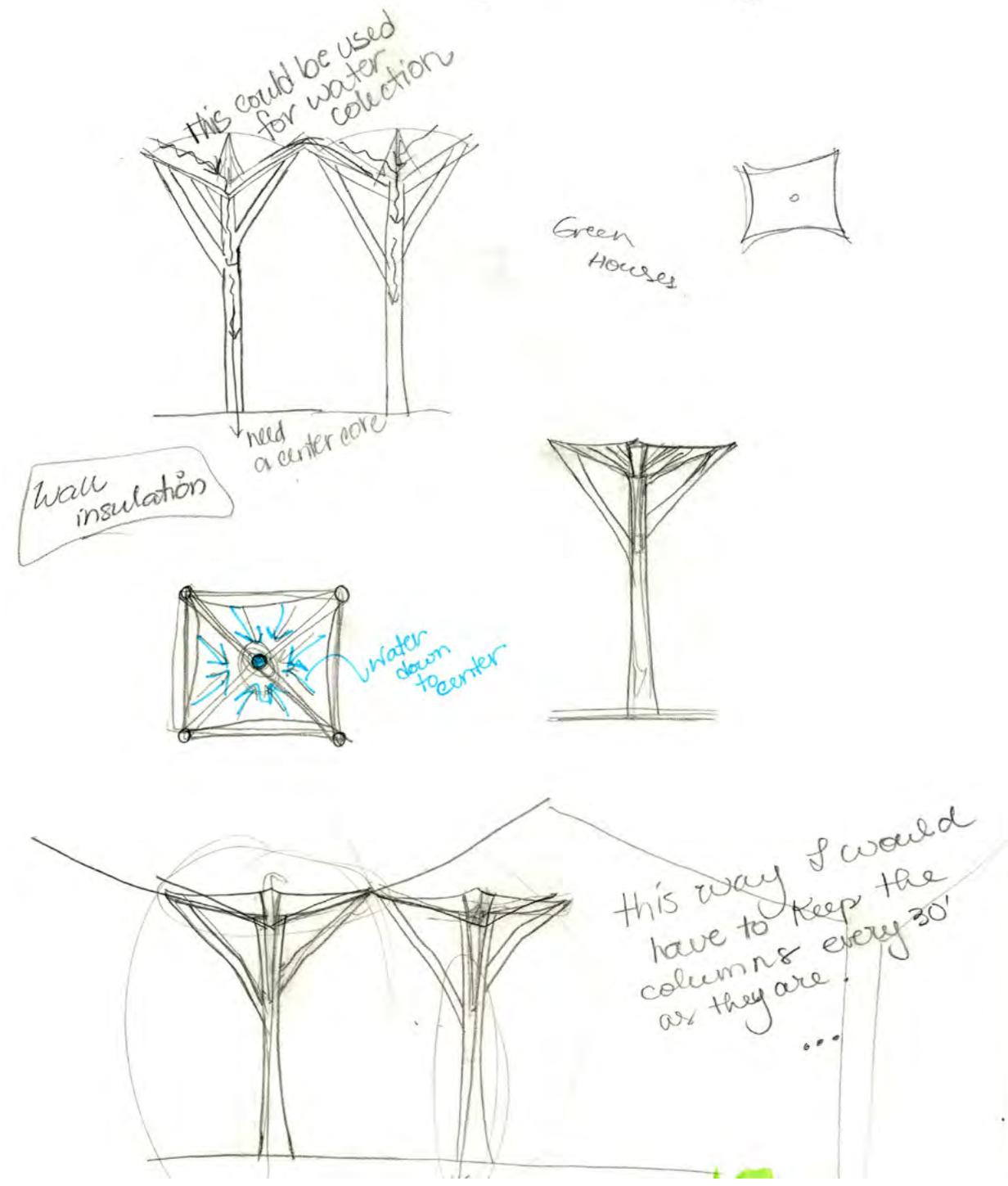
Site sketches



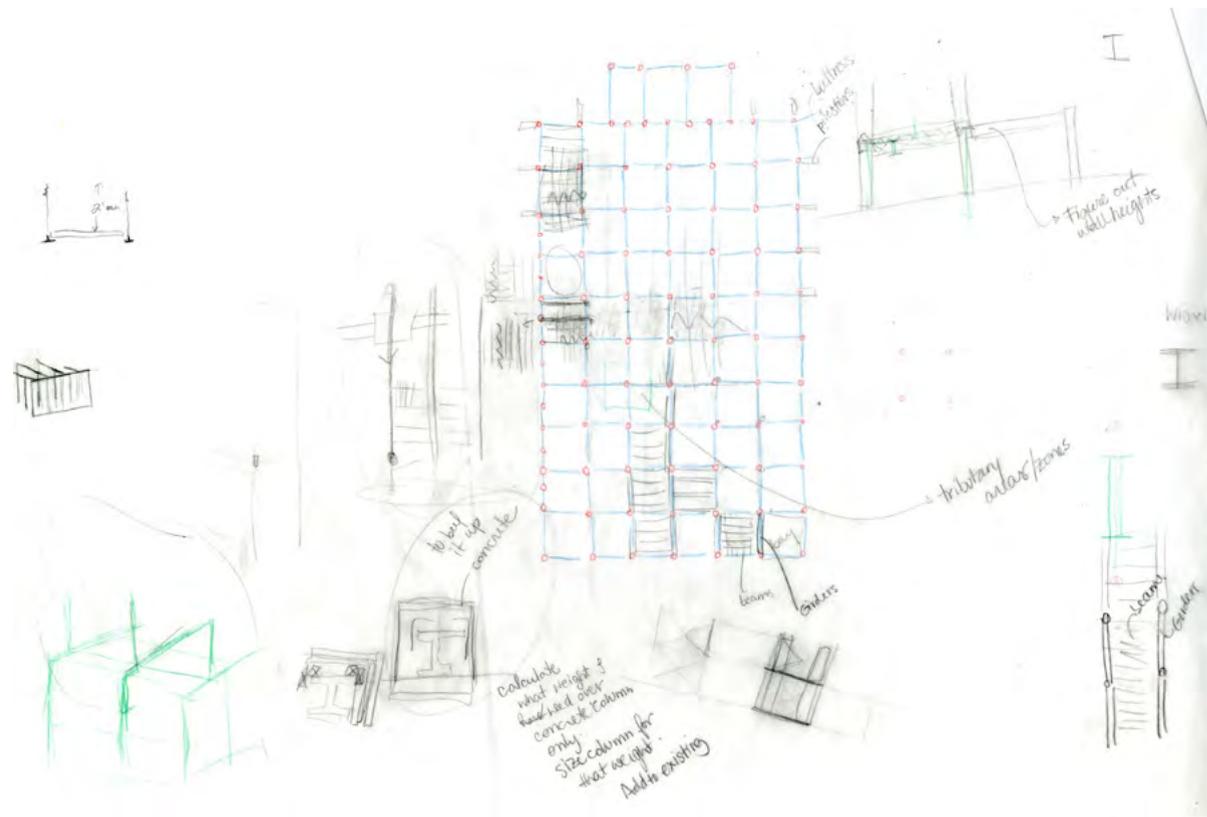
# Spatial Organization



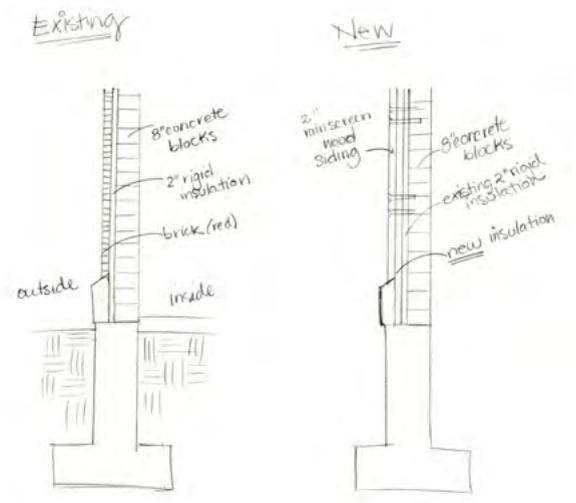
# Column Design



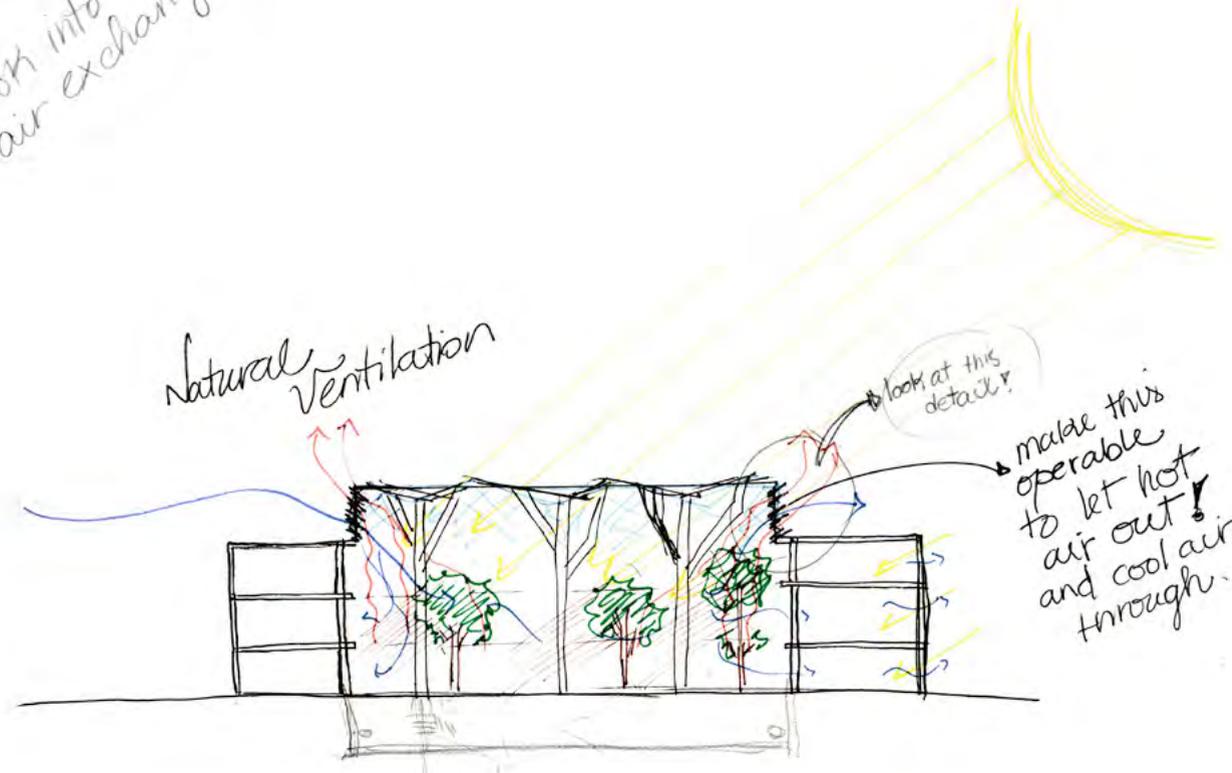
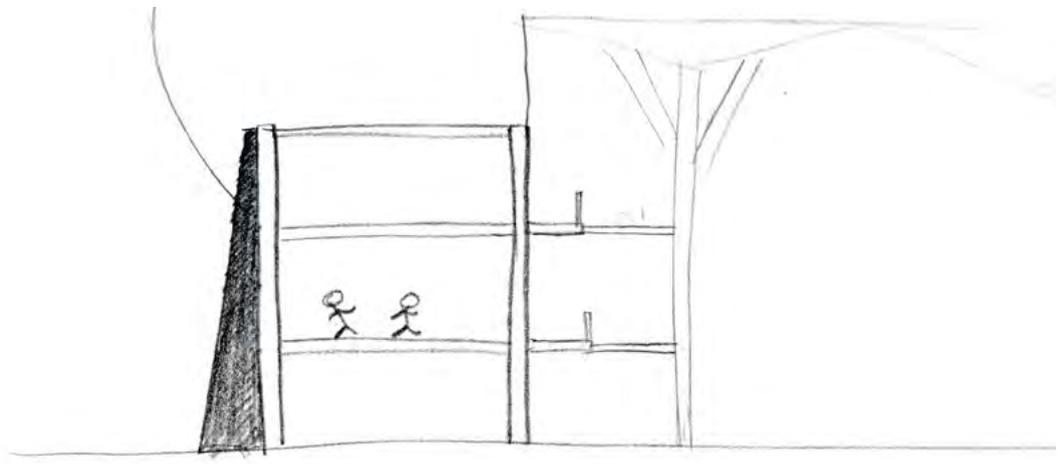
Structure



Passive/Human Comfort



look into air exchange



# Active/Human Comfort

## About Infloor Heating

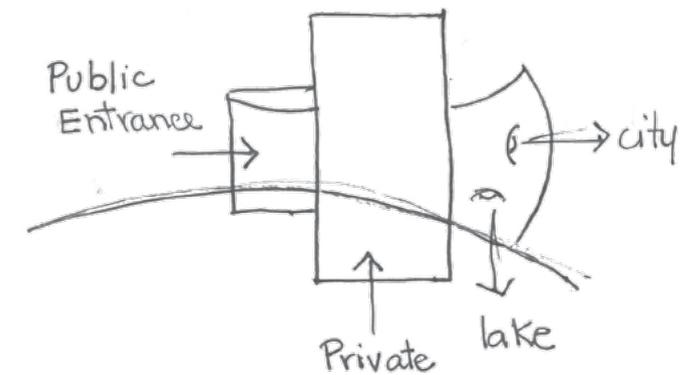
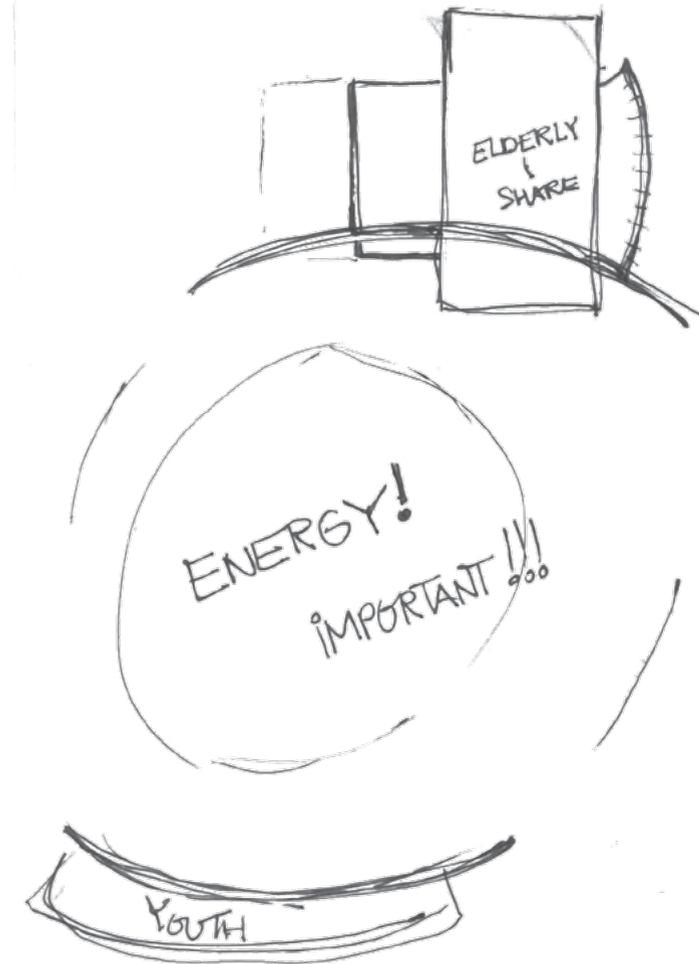
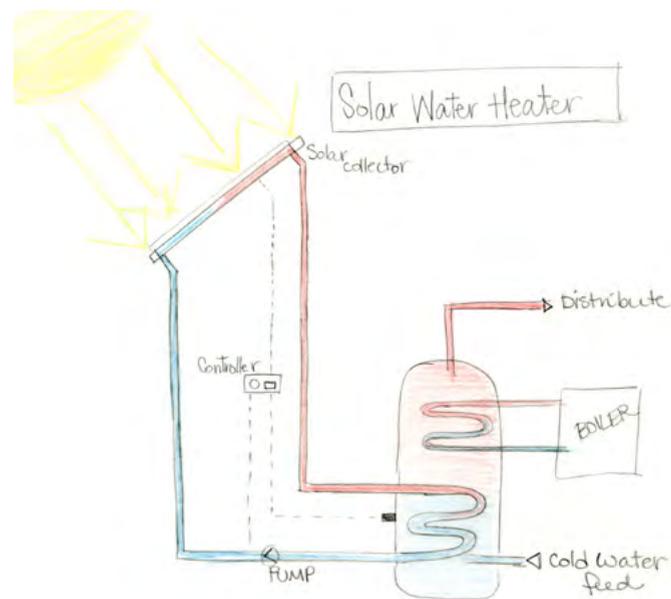


Heat rooms evenly!  
Distribute heat better!

- Allows for several zones to have their own temperature.
- Almost maintenance free. Boiler maintenance is all.
- the boiler (and solar) that heats the water for your flooring also heats your domestic hot water.

Can use stone, carpet, tile, etc..

Terrazzo could be good!



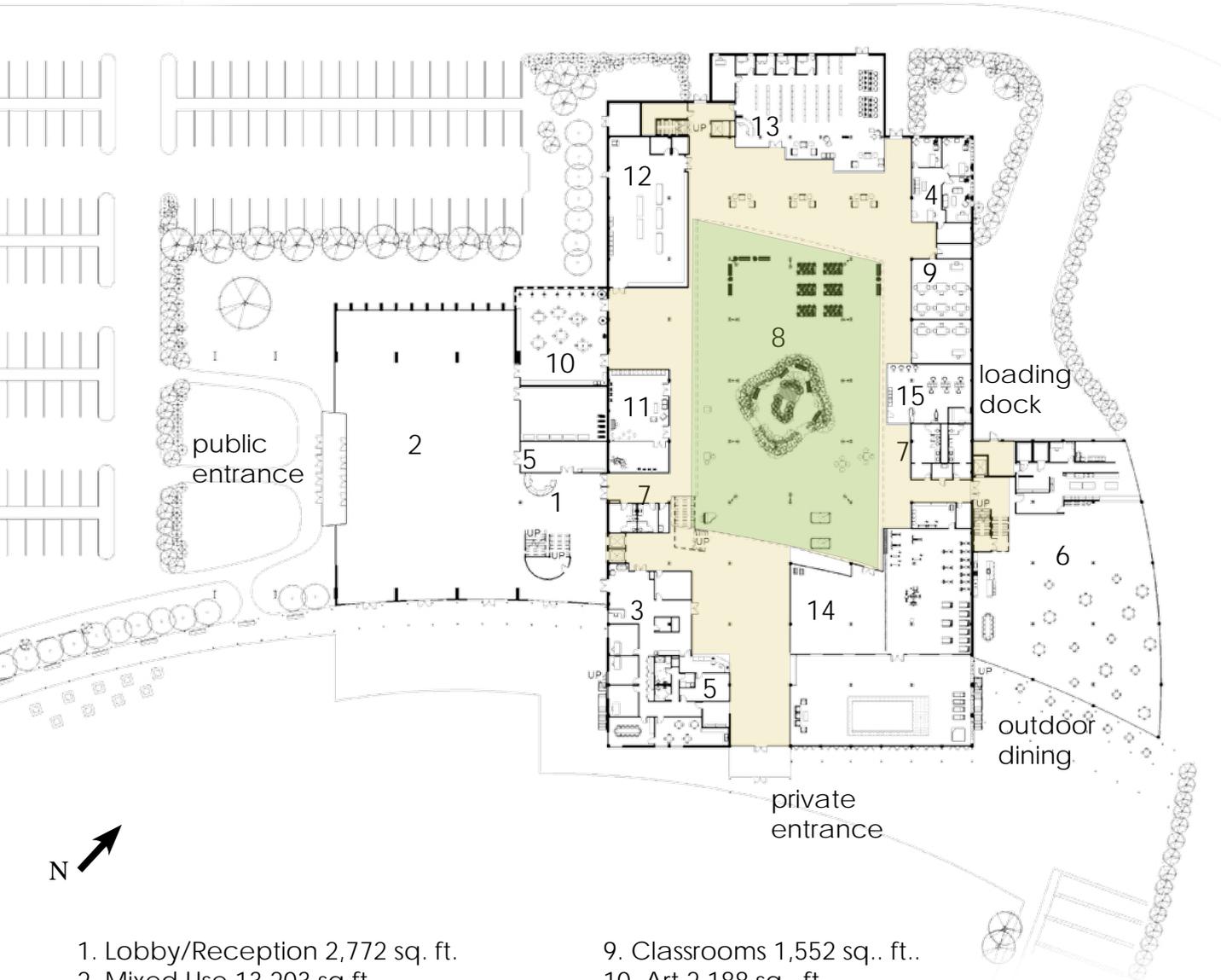
FINAL DESIGN



# Main Building

## Level 1

78,000 sq. ft.



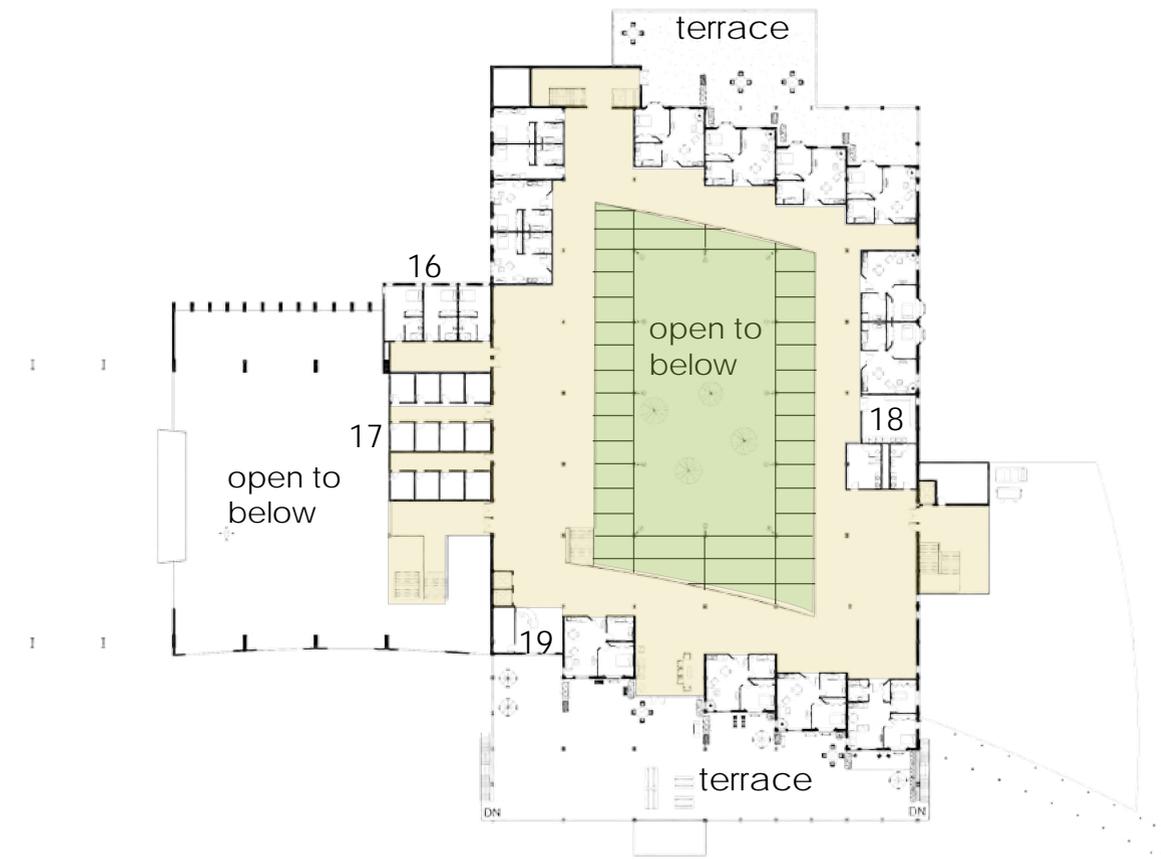
- 1. Lobby/Reception 2,772 sq. ft.
- 2. Mixed Use 13,203 sq.ft.
- 3. Administration 4,950 sq. ft.
- 4. Counseling 1,567 sq. ft.
- 5. Storage 1,166 sq. ft.
- 6. Dining 10,992 sq. ft.
- 7. Public Bathrooms 1,777 sq. ft.
- 8. Atrium/Activities 14,065 sq. ft.

- 9. Classrooms 1,552 sq.. ft..
- 10. Art 2,188 sq.. ft..
- 11. Music 1,540 sq.. ft..
- 12. Woodshop 2,940 sq.. ft..
- 13. Library 4,100 sq.. ft..
- 14. Health & Fitness 9,060 sq.. ft..
- 15. Beauty Salon 1,254 sq.. ft..
- Circulation 4,874



## Level 2

45,500 sq. ft.



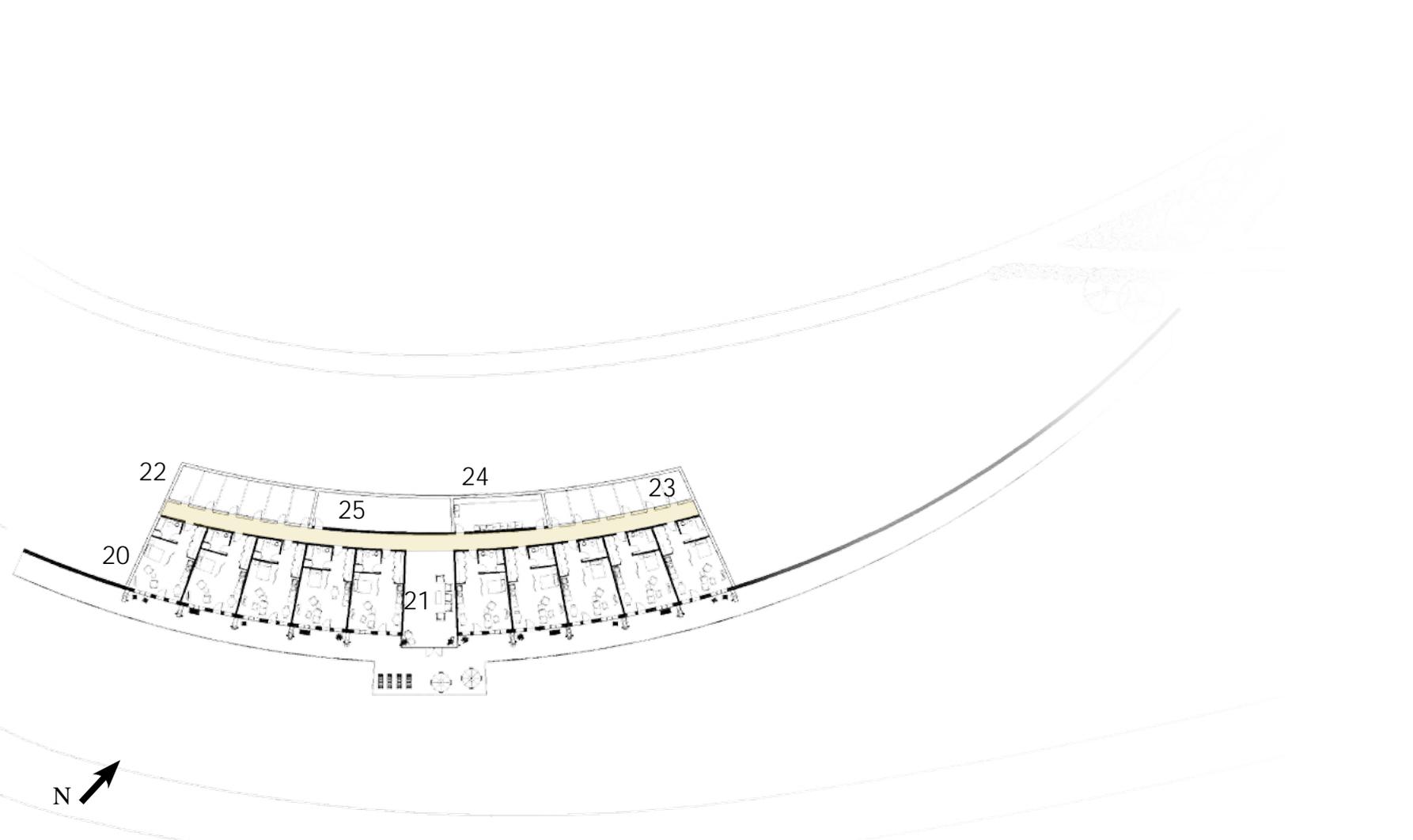
- Apt. Studio (x2) 460 sq.. ft..
- (x2) 560 sq.. ft..
- Apt. 1 Bed. (x9) 730 sq.. ft..
- 770 sq.. ft..
- Apt. 2 Bed. 876 sq.. ft..
- 16. Guest Rooms (x3) 350 sq.. ft..
- 17. Resident's Storage (x12) 130 sq.. ft..
- 18. Laundry 490 sq.. ft..

- 19. Office/Storage 560 sq.. ft..
- Terrace 13,674 sq.. ft..
- Circulation/Hang out 17,910 sq.. ft..
- Mech..... 4,783 sq.. ft..



# Ground Level - Studio Apartments

9,825 sq.. ft..

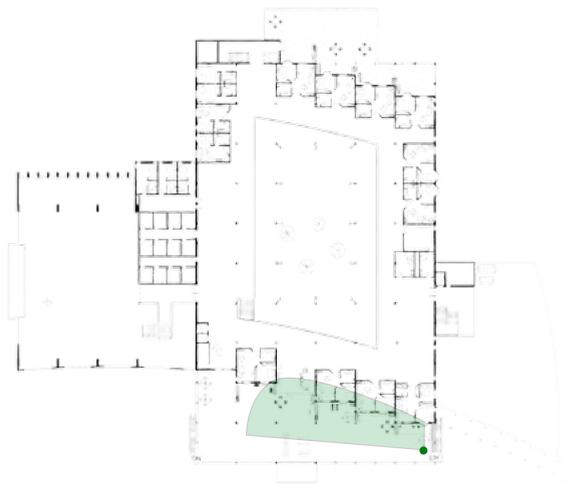


- 20. Studio Apt. (x10) 580 sq.. ft..
- 21. Lounge 685 sq.. ft..
- 22. Resident's Storage (x10) 150 sq.. ft..
- 23. Storage (x2) 150 sq.. ft..
- 24. Laundry 450 sq.. ft..
- 25. Mechanical 420 sq.. ft..
- Circulation 520 sq.. ft..

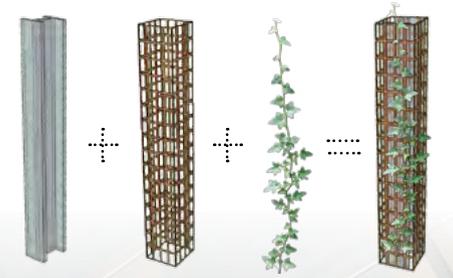


Exterior Views





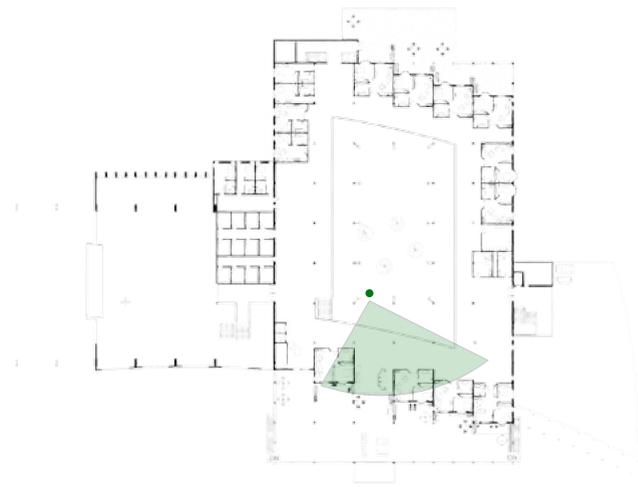
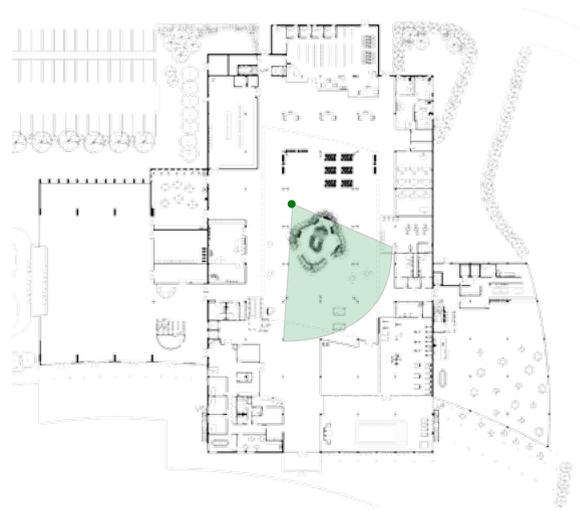
Opportunity



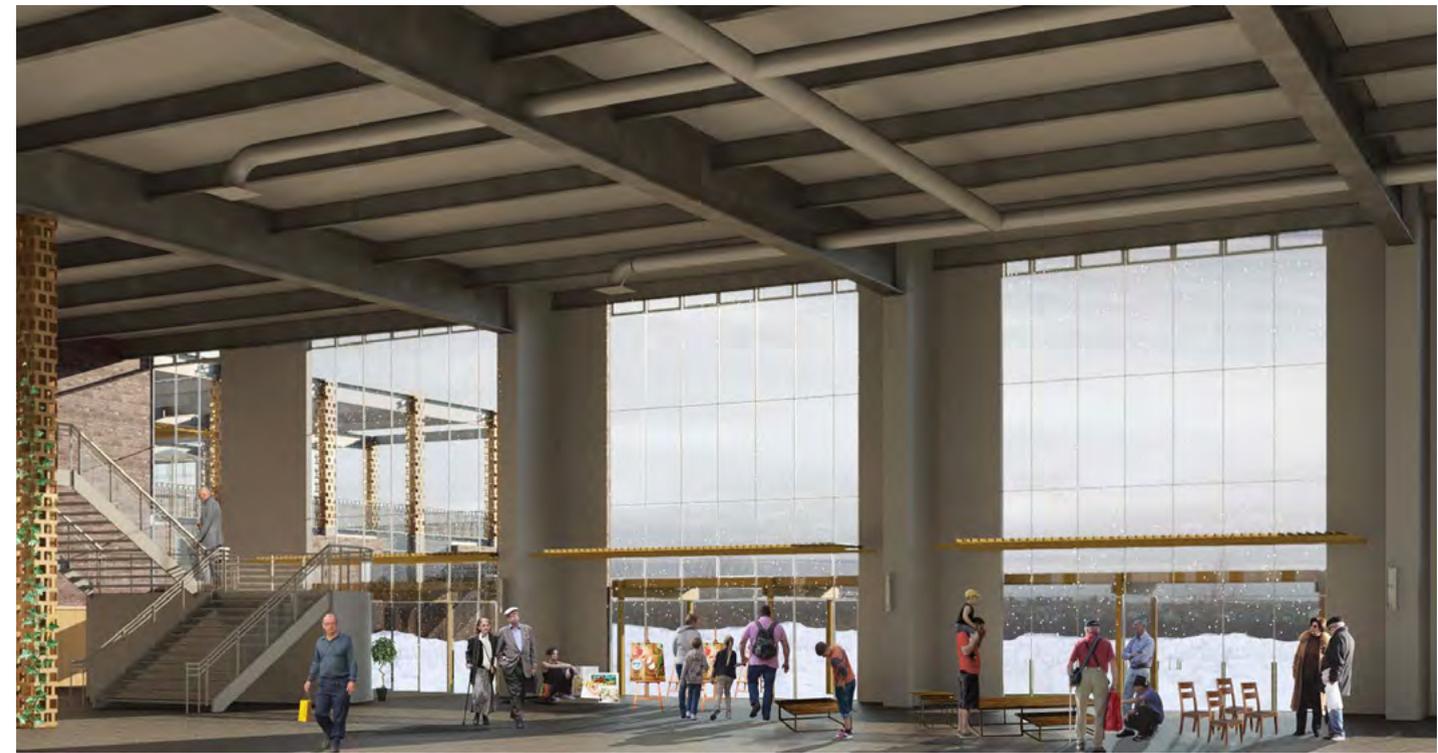
Senior's Terrace



Atrium Gardening

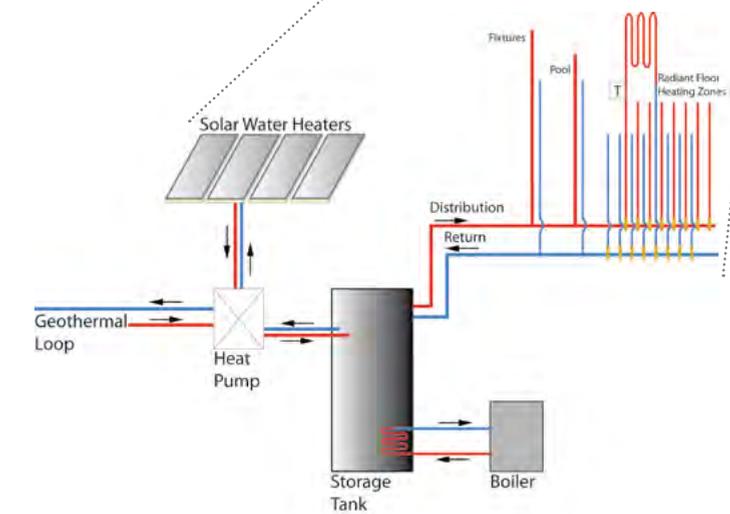
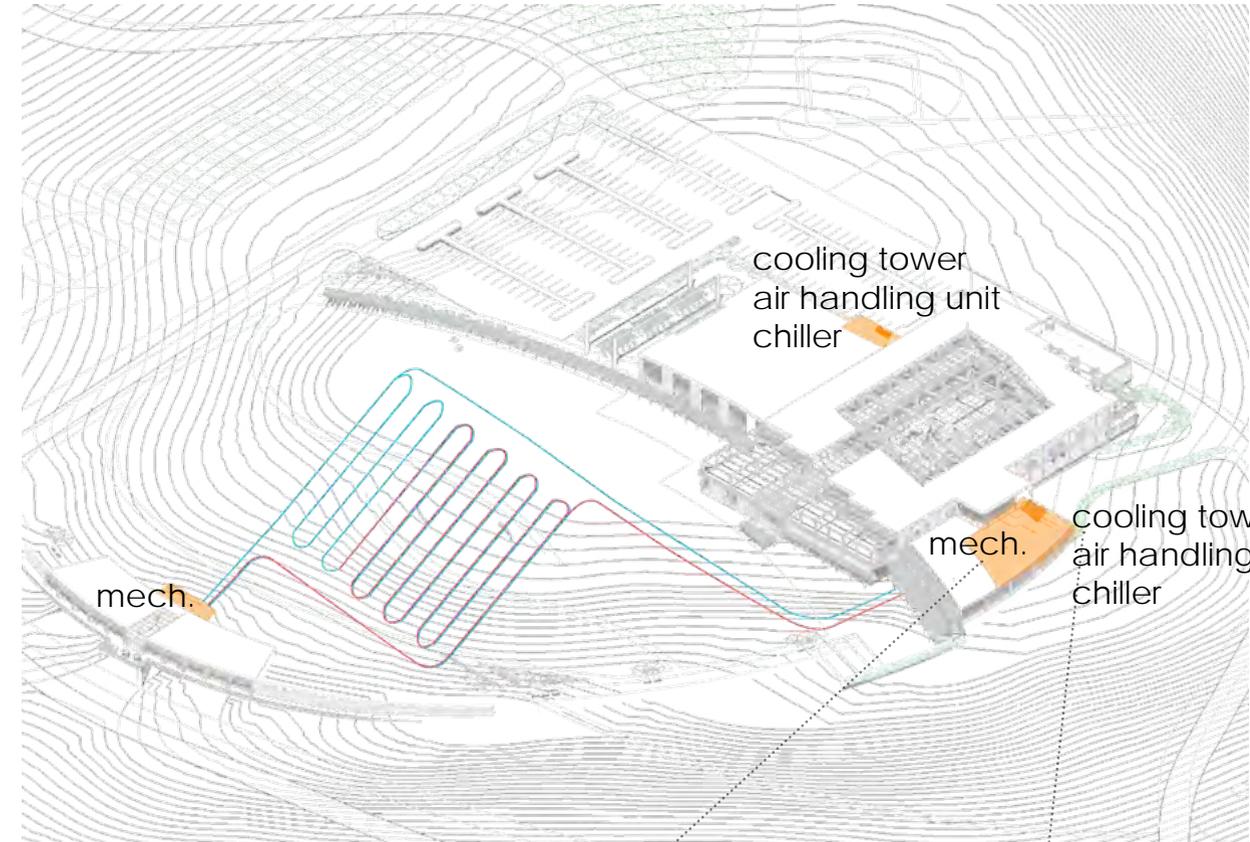
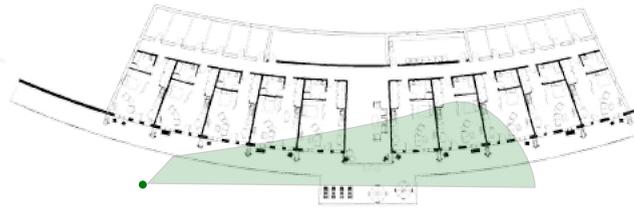


Atrium Zen Garden



Market Day

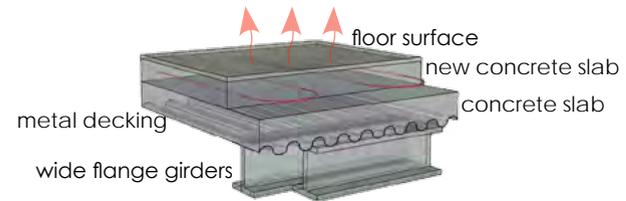
# Geothermal



Youth Exterior

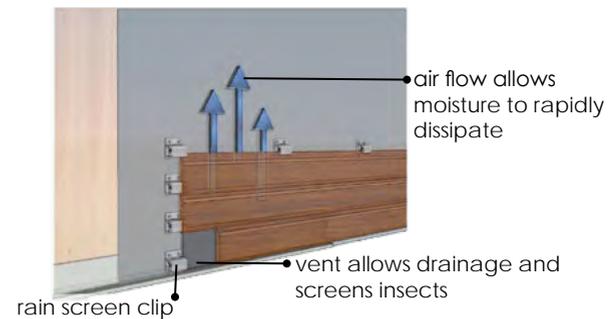
## Infloor Radiant Heating

Radiant Infloor Heating is comfortable, efficient and quiet. It provides even and consistent heat without dealing with dry air blown in the room.

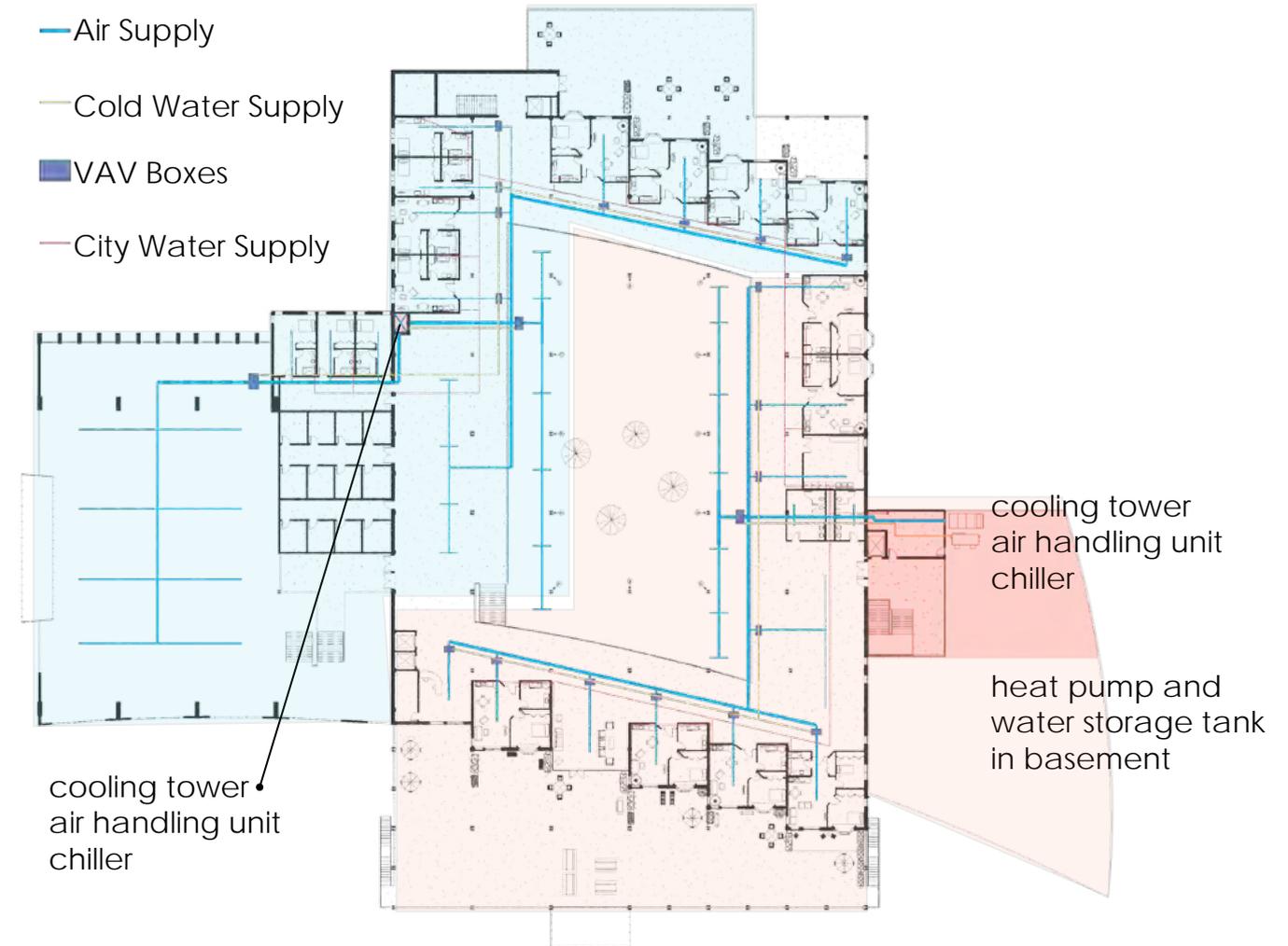


## Rain Screen

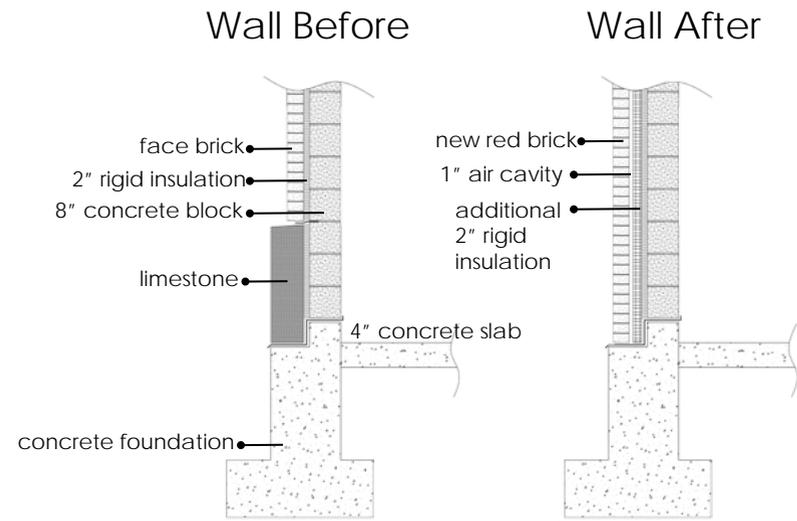
With rain screens, moisture from inside structure passes to the outside and water that penetrates through the joints in the rain screen can escape. It works as a defense from the elements including wind driven rain.



## HVAC Central Variable Air Volume

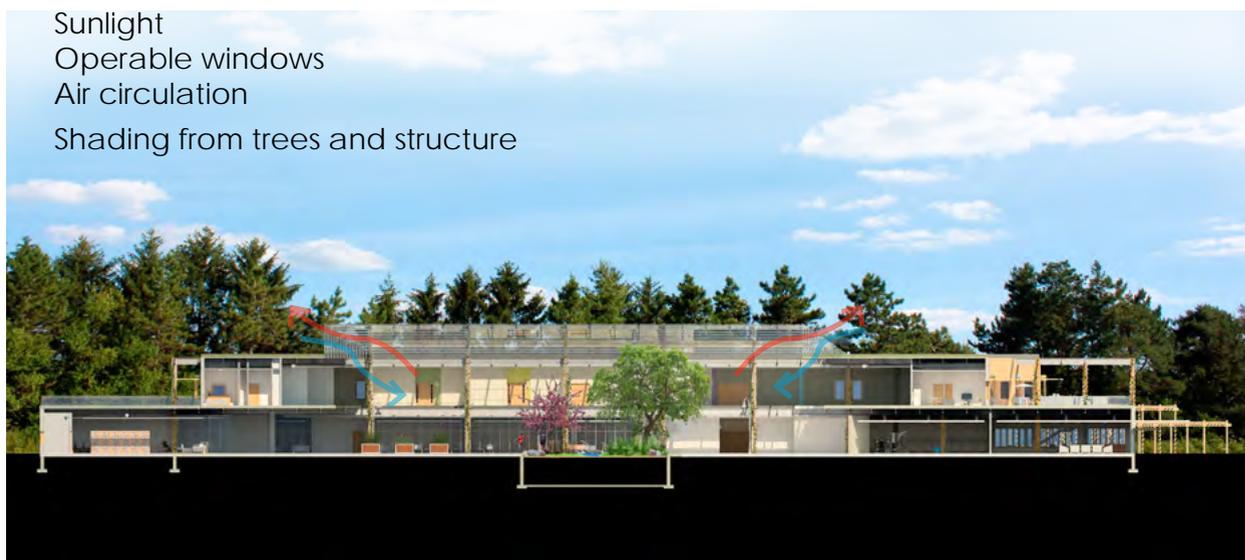


# Section



Before

After





Thesis Installation

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