

# Nature in Architecture

Aaron Brown

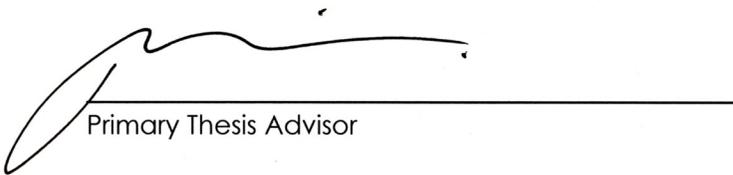
# NATURE IN ARCHITECTURE

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

By:

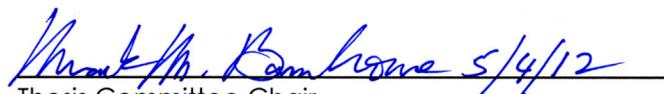
Aaron John Brown

In Partial Fulfillment of  
Requirements for the Degree of  
Master of Architecture



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Primary Thesis Advisor



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Thesis Committee Chair

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Statement of Intent

This thesis provides answers to the question: How can we, as architects, make a building of the environment in which it is built? The typology for the examination of this problem is multi-family housing. The theoretical premise and the unifying idea that guides the research is, "Architecture can bring about a greater use of the land by utilizing what is available in its location. It must respond to the environment and the materials in its own location." The project justification is, "Mass produced buildings are made with little respect to their environment. Understanding the site can help bring about better design." A concurrent-transformative strategy will be utilized in gathering qualitative and quantitative research. Careful study of the site in Minneapolis Minnesota will influence this research. Research and study on this project resulted in my thesis titled, "Nature in Architecture," with a building of 317,581 square feet.

**multi-family housing, organic architecture, sustainability**

How can we, as architects, make a building of the environment in which it is built?

TYPOLOGY: Low income Housing

CLAIM: Buildings are continually built that are not organic or are not of the land in which they are built.

ACTOR: buildings

ACTION: built

OBJECT: not organic

MANNER: continually

PREMISES:

ACTOR: Buildings in mass production do not utilize the land in which they are built.

ACTION: The ways in which buildings are produced are maximized for quantity and monetary gain.

OBJECT: These mass produced buildings do not utilize the land on which they are built.

MANNER: Housing developments are building the same way they have for years without end.

THEORETICAL PREMISE:

Architecture can bring about a greater use of the land by utilizing what is available in its location. It must respond to the environment and the materials in its own location.

PROJECT JUSTIFICATION:

Mass produced buildings are made with little respect to their environment. Understanding the site can help bring about better design.

Proposal

Buildings across the nation are in production without regard to site or the environment in which they are built. The materials chosen for these particular projects are not harvested or manufactured locally. In some cases, these materials are shipped from across the world. Not only do these buildings disregard the materials that are around them, but they also neglect the climate and natural aspects of the site that can be utilized for great benefit to the environment and those that live within. In a world where we are consuming our resources at an alarming rate, we need to use what we have to its fullest extent. This means fully analyzing the capabilities of each material used and why it is best for the environment. Too long have these mass-produced monstrosities defaced the landscape of our once great nation. A change in thought needs to happen for people to realize our finite amount of resources at hand. This lack of interest in the world's survival paints an obscenely disheartening picture for the future.

Architecture should be providing a service for the people and for the community, instead of building monuments to ideals of form and order. The working class citizens of this country deserve design in their life. These citizens are often relegated to mass produced buildings of low quality and life-span. Most of this type of construction requires copious amounts of maintenance to keep it in working order.

The urban environment chosen to build in the Midwest is known to house some low-income housing projects of the past. These projects addressed little of site and even less of materials used. In order to utilize the site and materials to their full extent, careful analysis must be made of the climate and surrounding environment.

The foremost factor in approaching this project should be analyzing the needs of the public. This thesis will address problems in designing for this seasonal climate, as well as sustainable solutions for low-income housing.

There seems to be a trend in most downtown locations to disregard site and materials. With this low-income housing development in downtown Minneapolis, there is a chance to address this issue. Ryan Companies Inc. is to be the organization developing the project. It will be made available primarily to residents and staff. The possibility for mixed-use building is a large possibility on the site. Having this possibility makes it available to businesses and restaurants. This natural environment will enhance these inhabitant's lives.

Housing Units  
Lobby  
Public Restrooms  
Gathering Spaces  
Green Roof  
Public Spaces  
Administration Offices  
Mixed-use



Figure 1. Minneapolis



Figure 2. Stone Arch Bridge



Figure 3. State Map

Figure 4. City Map Showing Site

Lying along the Mississippi River and just north of its joining with the Minnesota River, Minneapolis is the largest city in the state of Minnesota. The city has grown in population from 2000 to 2010 by 7.8% (U.S. Census Bureau, 2011).

With a revitalization program in place, Minneapolis is determined to set high standards for the neighborhoods of the city. Already having public housing in place, the city is no stranger to helping the community.

The site lies at West River Parkway. It is positioned on the Mississippi River almost directly between the Guthrie Theatre and the river.

Emphasis of this thesis is to enhance the natural world in which we live. The environment should influence the way in which our buildings are made. The mission is to create a sustainable, natural environment to improve the lives of those who inhabit it.

#### RESEARCH DIRECTION:

Areas to be researched include: typology, programming, theoretical premise, historical context, and site analysis.

#### DESIGN METHODOLOGY:

Methodologies that I will employ are: Mixed method quantitative/qualitative analysis, graphic analysis, digital analysis, and interviews. The technique to be used in completing the design will be a concurrent-transformative strategy. A larger theoretical perspective guides the entire research design. Implementation of this strategy means collecting both quantitative and qualitative data concurrently. The requirements of the theoretical premise/ unifying idea assign priority of data collected. Data integration will occur at several stages in the process of the research and will depend on the requirements of the examination of the theoretical premise. Analyzing, interpreting, and reporting of results will occur throughout the research process. It will be presented in both text and graphics.

#### DOCUMENTATION:

All documentation will be compiled digitally. Data collection of the process will occur weekly into a digital file and copied for preservation. Documentation will be made available to other scholars through the digital repository. All documentation will later be compiled into a physical book for presentation.

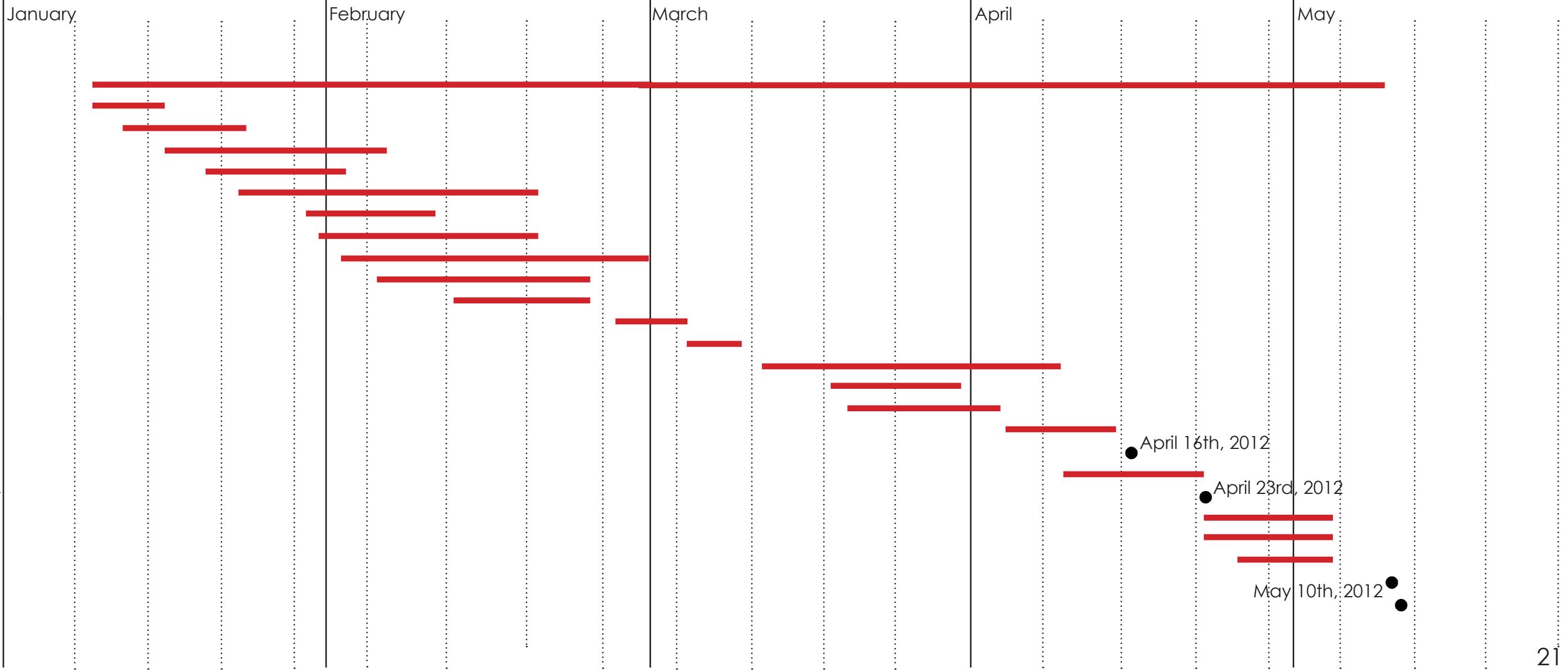


Figure 5. Schedule

### Second Year

Fall 2008

Stephen Wischer

Tea House

Rowing Club

Spring 2009

Darryl Booker

Dance Studio

Co-op Community House

### Third Year

Fall 2009

Steve Martens

Satellite School

Fire Station

Spring 2010

Milton Yergens

Agriculture Research Facility

Mixed-Use Development

Ice House

### Fourth Year

Fall 2010

Don Falkner

High Rise

KKE Contest

Spring 2011

Malini Srivastava

Design-Build Studio

### Fifth Year

Fall 2011

Paul Gleye

City Center

Signature Building

Program

In any architecture the building must respond to the environment in which it is built. Architecture in this day and age cannot survive if it does not utilize its environment in some way, shape, or form. This itself must be fully understood without a shred of doubt whatsoever.

Once this is established, there is another point that one must achieve to excel in design, and that point is to be part of the land in which the building is built. Architecture is not, or should no longer be, recognized as a large mansion atop the hill with a white picket fence. It is time to move beyond that impression of what architecture was once. People should know better by now.

The goal here is reconnecting ourselves with nature through an architecture that is one with its surroundings and client. With this reconnection with the environment and client, the architecture will be able to positively effect the lives of those who live within. It does this by imbuing the

architecture with a *sense of unity* or a *sense of place*. A major component of making these ideas work within the architecture is attention to human proportion. This kind of architecture has its roots in what Wright coined as *organic architecture* (Wright, 1954, pg. pg. 12-34).

“Lao Tze first declared that the reality of the building consisted not in the four walls and the roof but inhered in the space within, the space to be lived in” (Wright, 1939, pg. 3) Wright's work in his *organic architecture* stems from an idea that everything within a building must be of an *organic whole*. Everything in a building must be one with the building and its whole, like leaves and branches are to a tree. Wright (1939) stated, “...the time has come when buildings may be scientifically built, science and art and even religion must find expression, as one, in what we build. I believe that now more than ever his words can be justified in the work that we as architects do” (Wright, 1939, pg. 3).

In careful study of Wright's work, one can see these ideas take shape in architecture. One need only look at Fallingwater to see the embodiment of his organic architecture. His careful use of local materials and response to the site are what give his architecture a *sense of unity* and *sense of place*.

Another architect that has had great response to site and building with nature is Rick Joy. I can see some of Wright's qualities in Joy's work. He pays careful attention to the environment in which he responds to nature. He also carries with him an attention to the atmosphere. This enables Joy's buildings to respond to the site that much more and become a part of nature. Further study will reveal the nuances behind achieving a *sense of place* (Howard, 2009).

To achieve *organic architecture* in our own work we must use materials that are from the site to become part of the site. With this also comes a careful attention to the environment and how

this affects the building. I believe that we can take it a step further and use the environment to our own advantage. This is by no means a new idea, as techniques to utilize the atmosphere have been used since the dawn of man-made buildings. These buildings are unique by incorporating a sustainable effort while achieving an *organic architecture*. Architecture that can be of nature and utilize the environment will greatly benefit the lives of those dwelling within.

Not only will these inhabitants receive nourishment from the environment, but they will also gain an appreciation for the place in which they live. Architecture should always strive to benefit the lives of others. With all this new technology at the fingertips, there should be a responsibility to better the environment in which we live and better the world. The time is now to start asking more from what can come of architecture.

In searching for thoughts on what makes a community Ichinowatari makes a good point that I

look to follow. "The primary objective of neighborhood preservation and development should be to maintain the individual human dignity of the residents while preserving/ developing the physical and social character of a neighborhood" (Ichinowatari, 1980, pg. 85-91).

Preservation and development of the social character must be the mission when attempting to create a building that houses people. Stemming from this notion I look at what maintains human dignity while also developing the physical and social character of the built environment. Through careful investigation I shall find what does just this for the environment in which people live.

Harkening back to Wright I look for inspiration in how I react to the site and how to manipulate the land. "The land is the simplest form of architecture" (Wright, 1953, pg. 34).

Using these words as a stepping stone I look toward the site in determining how to imbue the building with the physical and social character that it needs.

Human proportion is needed in all architecture, though in housing it plays a special role within the building. One must pay certain attention to this within the building, and how one will approach the building.

Integration to a building's surrounding environment is paramount in achieving a sense of unity within its site. Local material must be taken into account when considering how to create the built environment in which the inhabitants are to live.

Human needs are the main thing one should respond to in creating a housing environment for many individuals. One must cater to as many needs as possible when considering the spaces one is to create.

Structure of the building should be informed by its surroundings. Especially when located within an urban environment, the building must respond to its surroundings. The building must also be influenced by the nature of the environment also.

The building must be designed through careful thought and practice. One must continue the search for solutions beyond finding what is necessary. All that is humanly possible to do must be done in this respect.

An effort must be made to react to the surrounding environment in a sustainable manner. One should use the passive elements that are available to them to benefit the inhabitants within the building.







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Figure 8. Gallaratese Housing Photo 3

Completed: 1970  
Location: Milan, Italy  
Architect: Aldo Rossi  
Project Type: Modern Housing  
Programmatic Elements: 40 Housing Units, parking, shopping, offices

This post-war housing complex was made in response to an urgent need for housing.

Rossi designed this housing complex to be a *self-contained village*. He uses a distinct north-south axis to inform circulation throughout the building. He uses a set of principles when informing the space for this building: simple geometric forms, repetitive elements in the facade, and an axial orientation.

There is a good range in variation of housing units with an overall capacity of 2,400 inhabitants. Varying units consist of studios, 1, 2, and 3-bedroom, and duplexes. The materials used in this project are concrete, stucco, metal, and glass.

It gained high publicity when it was occupied by protestors in a reaction to the building's highly priced rent.

In creating a community as part of the building, it poses a contribution to the theoretical premise.

## Housing Complex at the Gallaratese Quarter



Figure 9. Gallaratese Housing Photo 4



Figure 10. Gallaratese Housing Photo 5



Figure 11. Gallaratese Housing Photo 6

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Aldo Rossi

Housing Complex at the Gallarate Quarter  
Milan, Italy  
1969-1974



Figure 13. Gallarate Housing Floor Plans



Figure 14. Gallarate Housing Section

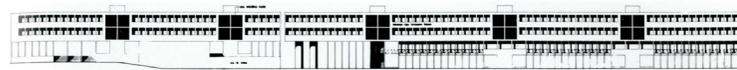


Figure 12. Gallarate Housing Elevation

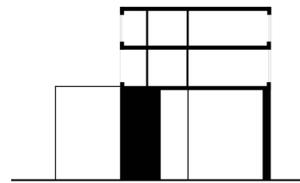


Figure 15. Gallarate Structure

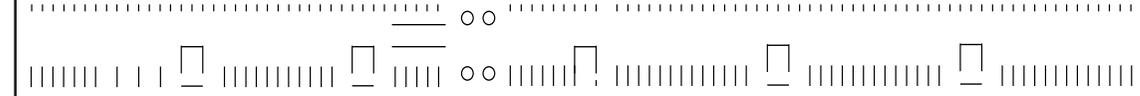


Figure 16. Gallarate Massing

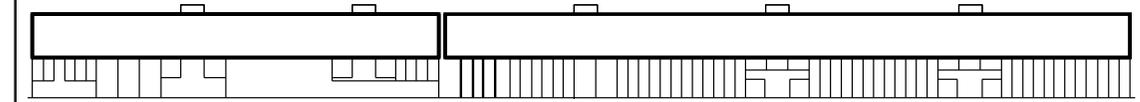


Figure 17. Gallarate Hierarchy

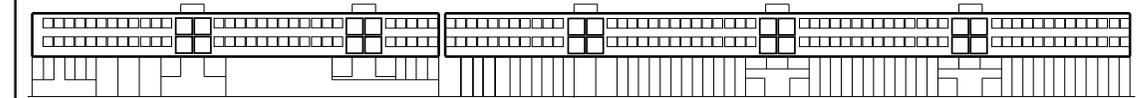


Figure 18. Gallarate Circulation to Use

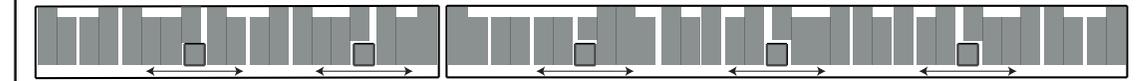


Figure 19. Gallarate Geometry

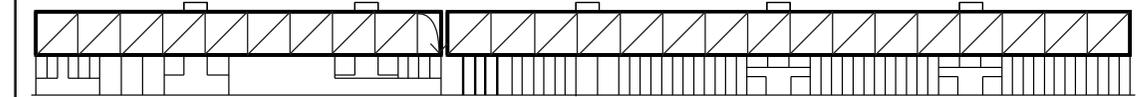


Figure 20. Gallarate Plan to Section

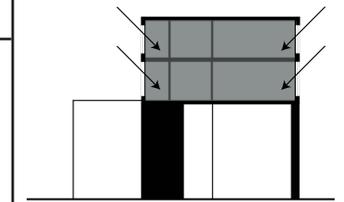


Figure 21. Gallarate Natural Light









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Figure 25. Unité d'Habitation Photo 4

Completed: 1952  
Location: Marseilles, France  
Architect: Le Corbusier  
Project Type: Large Scale Modern Housing  
Programmatic Elements: 337 housing units, retail, kindergarten, hotel, community functions

Yet another post-war housing complex helping to repopulate the city after the WWII's destruction.

The social climate of the time was ripe for Corbusier to implement his new ideas for urban design. He sought to create his own vertical city in a monolithic structure.

Utilizing an innovation in building planning, he uses an L-shaped section for dwelling units. Space is conserved, as well as allowing for light intake from both sides.

It is made primarily from concrete and glass. The main structure is reinforced concrete. The facade is made up of a repetitious window pattern broken only by the middle shopping area.

Its unique innovation in housing plan makes for a great contribution to the theoretical premise.

## Unité d'Habitation



Figure 26. Unité d'Habitation Photo 5



Figure 27. Unité d'Habitation Photo 6



Figure 28. Unité d'Habitation Photo 7



Figure 29. Unité d'Habitation Photo 8

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Le Corbusier

Unité d'Habitation  
Marseilles, France  
1946-1952

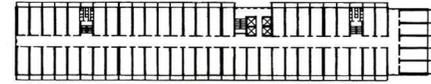


Figure 31. Unité Floor Plan

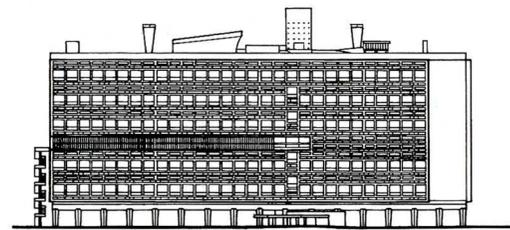


Figure 30. Unité Elevations

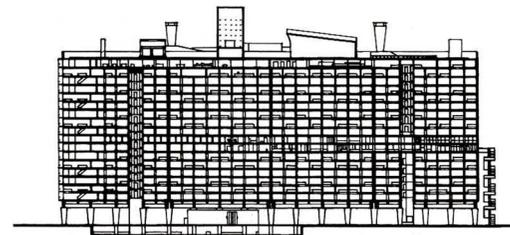


Figure 32. Unité Sections

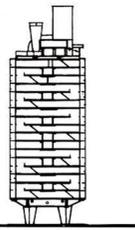


Figure 36. Unité  
Natural Light

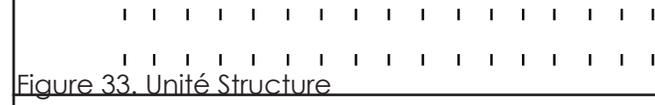


Figure 33. Unité Structure

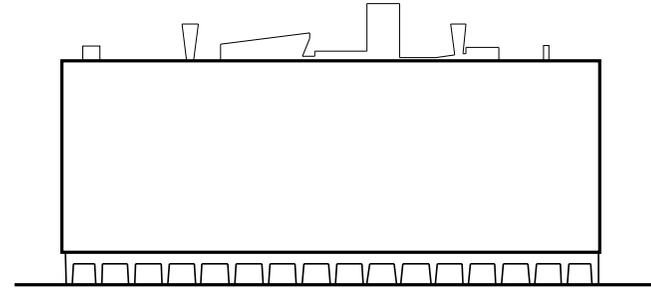


Figure 34. Unité Massing

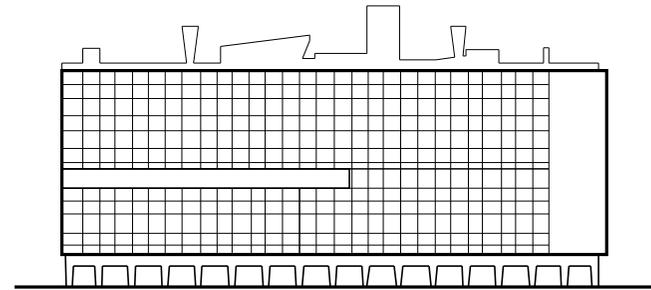


Figure 35. Unité Hierarchy

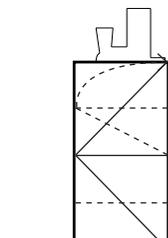


Figure 39. Unité Geometry

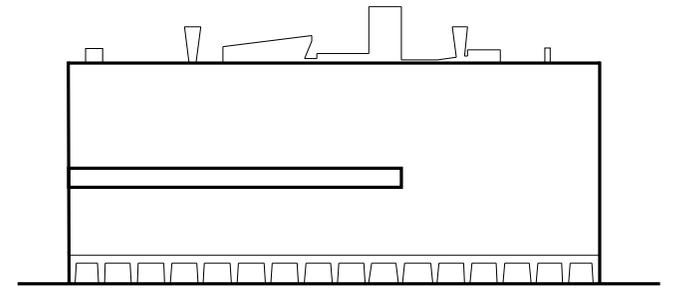
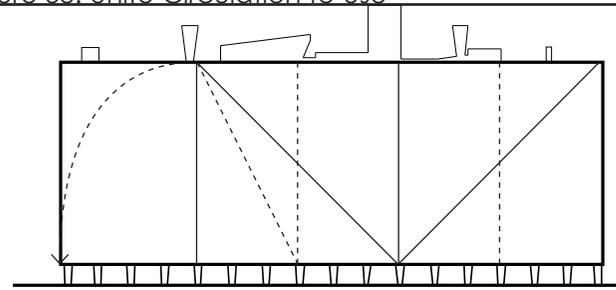


Figure 37. Unité Plan to Section



Figure 38. Unité Circulation to Use













Completed: 2010  
Location: Vienna, Austria  
Architect: Jean Nouvel  
Project Type: Mixed-Use Housing  
Programmatic Elements: 182 bedrooms, conference rooms,  
restaurant, retail, public parking, and  
fitness club

This building, by French architect Jean Nouvel (Pritzker Architecture Prize Winner of 2008), faces Vienna along the Danube River. It is helping to continue great architecture within the historic city.

Located in the business district of Vienna, the building rises 262 feet with 18 stories. Nouvel's work makes for a great combination of mixed-use within one building. At night the entire building lights up from the entrance, the lobby, and the top-floor restaurant.

Nouvel utilizes a glass facade for the greater part of the building. The illuminated glass is the work of a Swiss artist by the name of Pipilotti Rist. She has experimented in various other mediums and innovative techniques.

The unique contribution that this study makes to the Theoretical Premise is the use of art to showcase the building.

## Sofitel Vienna Stephansdom



Figure 45. Sofitel Photo 6



Figure 46. Sofitel Photo 7



Figure 47. Sofitel Photo 8

Jean Nouvel

Sofitel Vienna Stephansdom  
vienna, Austria  
2007-2010



Figure 49. Sofitel Floor Plan

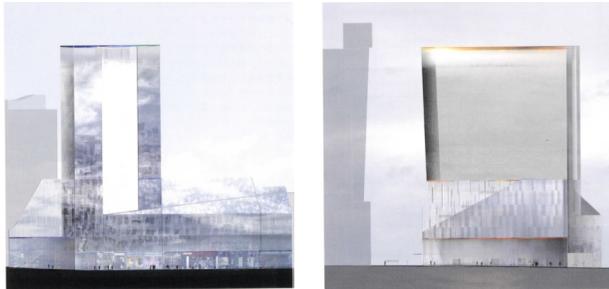


Figure 48. Sofitel Elevations

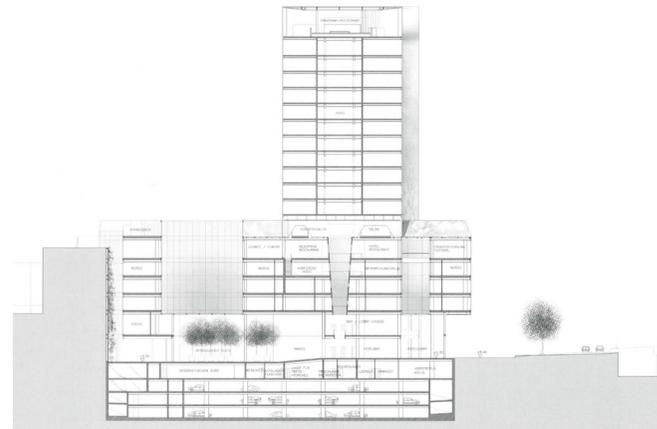


Figure 50. Sofitel Section

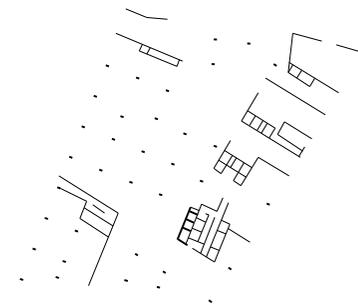


Figure 51. Sofitel Structure



Figure 52. Sofitel Massing

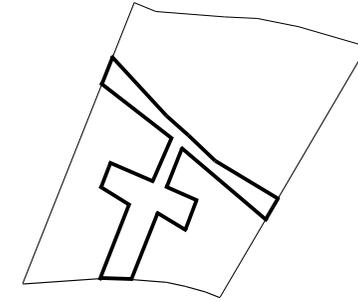


Figure 53. Sofitel Plan to Section

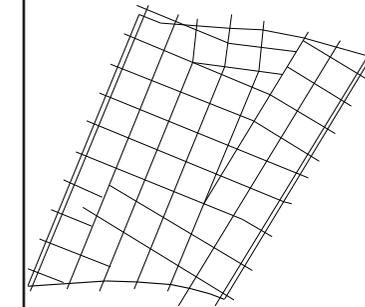


Figure 54. Geometry

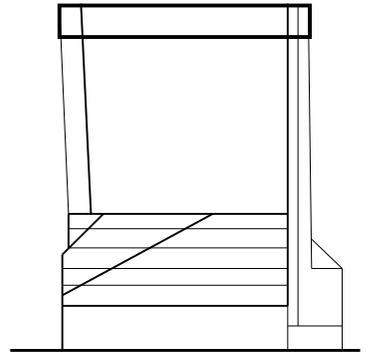


Figure 55. Sofitel Hierarchy

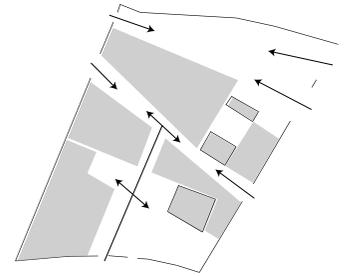


Figure 56. Sofitel Circulation to Use

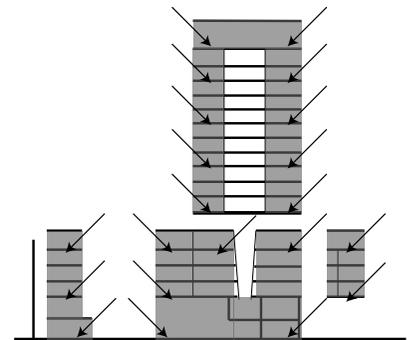
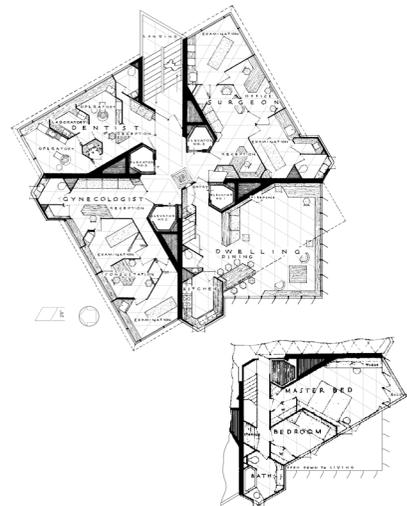
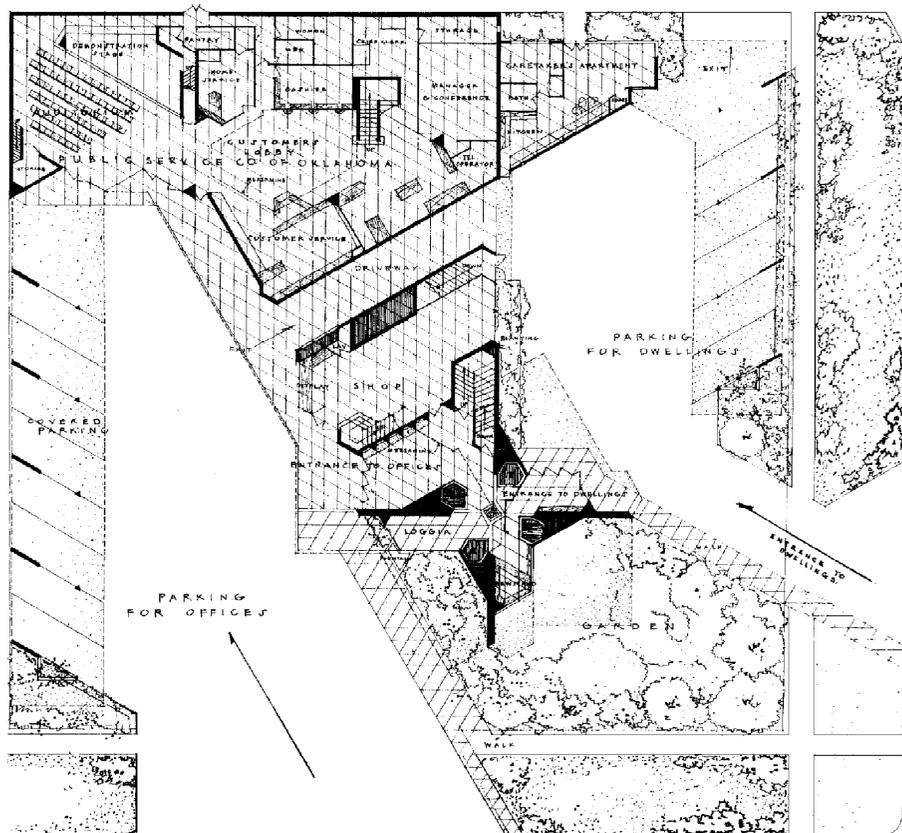


Figure 57. Sofitel Natural Light







Completed: 1956  
 Location: Bartlesville, Oklahoma  
 Architect: Frank Lloyd Wright  
 Project Type: Mixed-use Housing  
 Programmatic Elements: 37,000 square feet of office and apartments

The Price's had already had two homes designed by Wright, and they wanted to see what he could with a high rise building.

It is constructed using reinforced concrete with cantilevered floors, copper-faced parapets, and copper louvers.

In 1983 the tower won the American Institute of Architects 25-year Award. It has also been recognized by the institute as, "one of the seventeen American buildings designed by Frank Lloyd Wright to be retain as an example of his contribution to American culture" (Storrer, 2003).

The plan of the building displays a square over a pinwheel. It contains eight, two-story apartments.

The contribution made to the Theoretical premise is the unique use of structure.



Figure 61. Price Photo 3



Figure 62. Price Photo 4





Completed: 1973  
Location: Minneapolis, Minnesota  
Architect: Ralph Rapson  
Project Type: Modern Apartment Complex  
Programmatic Elements: 1,303 apartments, retail, parking, daycare, education, healthcare, and community facilities

This housing complex is Rapson's attempt to design quality, affordable, high-density housing in Minneapolis. Rapson also hoped to create a living environment that would be beneficial to those living in it.

The 15 buildings on site range from two to forty stories. They contain apartments ranging from low-income public housing to luxury apartments.

Riverside Plaza emulates the structure of Unité d'Habitation in that its primary material is concrete. It is also similar in that it makes visible the repetition of its windows.

Gained from this study is the sense of a city within a city. This makes a good contribution to the theoretical premise.

## Riverside Plaza



Figure 65. Riverside Photo 3



Figure 66. Riverside Photo 4



Completed: Unbuilt, Designed 2007  
Location: Propose for Cairo, Egypt  
Architect: Zaha Hadid  
Project Type: Multi-purpose Skyscraper  
Programmatic Elements: 70 story hotel and apartment complex

In this very modern skyscraper design Hadid plays with the form of the building in trying to create motion from the motionless. The structural concrete fins rotate around the building, making for a unique plan in every floor.

It is proposed to be located in the heart of Cairo, next to the Nile River. As it would be the first 70-story skyscraper in Egypt, the building would add greatly to the skyline of the city.

Utilized in the structure is concrete fins that open to the inhabitants inside the building. The exterior is covered with glass and metal mullions. At the foot of the tower the facade drapes down to create an interior glass plaza.

What this study has to contribute to the theoretical premise is the creation of implied movement with the structure.

## Nile Tower

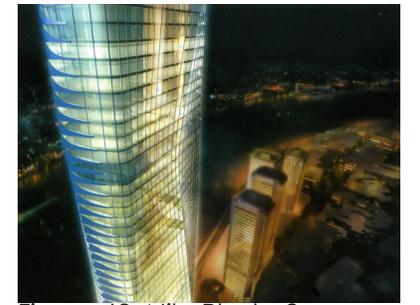


Figure 68. Nile Photo 2



Figure 69. Nile Photo 3



Figure 70. Nile Photo 4



Figure 71. Nile Photo 5

Every work of architecture studied represents a different design solution responding to its own site and context, each showing its own separate understanding of what housing should be. All were analyzed for their site relationship, programmatic elements, and form. All studies contrast from each other in different ways.

Though all studies are examples of urban housing, they all address certain issues in different ways. Most notable among the differences is the way in which the buildings respond to the site. Some seem more urban than the others. Whereas Unité d'Habitation and the Price Tower are surrounded by greenery, the Gallaratese II Housing, Sofitel Vienna Stephansdom, Riverside Plaza, and the Nile Tower are more urban in their approach. The way the buildings interact with the street and their surroundings makes them urban. Those buildings more urban make their access to the street very open and approachable. As the others are surrounded by greenery, it gives them a more natural effect and makes them seem as

more part of the environment, the natural environment that is. It is difficult to create a building of the natural environment that is located within an urban environment.

The buildings also deal with housing units in their own different ways. All studies have varying sizes in their housing units and differ from each other in how they are arranged. Though each is arranged differently in plan, Unité d'Habitation and Gallaratese II Housing are arranged along an axial plan. Sofitel Vienna Stephansdom, the Price Tower, Riverside Plaza, and the Nile Tower are arranged vertically, according to each building's own form. There is also an effort in these buildings to design densely, packing units in along side each other. With this effort to pack densely there must also be an effort to create quality in the work.

Each building also has a unique relationship that it creates in the individual unit to the form of the entire building. This changes with each

case study. Where Unité d'Habitation, Gallarate II Housing, and Riverside Plaza design their units to be packed densely, the others build for a quality of space. Most buildings studied here go beyond providing simple housing, they provide an environment or community within a building. This is true for that of Gallarate II Housing, Unité d'Habitation, Sofitel Vienna Stephansdom, the Price Tower, Riverside Plaza, and the Nile Tower. The buildings in recent production seem to go beyond providing simple retail beyond that of housing. Sofitel Vienna Stephansdom provides a restaurant, conference rooms, and fitness club beyond just housing. Where does providing more than housing benefit the inhabitants most? Is there more benefit in living entirely in a concentrated area or reaching out to the surrounding community?

With all these amenities being built into a single complex what need is there to venture outside its walls? Will this affect the inhabitants positively? These places within the building that are provid-

ed beyond the housing units do provide a venue for others to come to. Some might come solely to eat at the restaurant at the top floor of Sofitel Vienna Stephansdom. Offerings of this sort might further to integrate the building's inhabitants with the surrounding community.

Each building carries with it certain principles or philosophies in its own development. Do these help or hinder one's own view of the building and how it affects the inhabitants? One should only take from the building what was beneficial to those who inhabited it.

Much of the public housing of the past has been made using political policy on the matter. Only within this last century has the architect ventured to solve the kinds of problems involved in public housing.

Davis takes a look at the beginnings of social housing. From this is a point of view into why it first started. "The earliest social housing in the United States was motivated by concerns about the growing maladies of urban life, the diseases and social pathologies that tenements were thought to generate. The mission was not so much to improve the quality of life and environment for the residents living in squalid conditions as to protect the rest of society from them" (Davis, 1995, pg. 7).

The first policies enacted regarding social housing were in a response to make housing cleaner and safer. This was in New York that this problem was first encountered. "Fire protection, sanitation, and ventilation were the major concerns that

affected building form and construction" (Davis, 1995, pg.8).

The Depression sparked a government interest into the financial funding of housing. This was due to a larger need for affordable housing and in an effort to raise the economy.

A change happened in the 40s and 50s that saw the housing projects of the past to have too many amenities. The government now thought that government funded housing projects should be distinguished from housing of the public. "Large projects of repeating high-rise building would be strong reminders that the poor were being attended to in a dynamic fashion" (Davis, 1995, pg. 13).

The 1960s saw turmoil in social housing. Further regulations were enacted to combat problems, while the architectural reformers sought other more meaningful forms of putting their ideas into motion. "President Johnson helped to enact the

Housing Act of 1968 to further subsidize housing, but this was short lived" (Davis, 1995, pg.16).

With the failure of "Pruitt-Igoe, a large public-housing project in St. Louis that was demolished in 1976," (Davis, 1995, pg. 16) the nation was given a glimpse to the faults with social housing. One of its main problems was thinking society could warehouse the poor into a single location to be ignored. The architect is not the only one to blame because they were only giving form to policy. "The 60s and 70s showed a drift towards higher density housing instead of single-family houses. Nixon worked to suspend housing subsidies and put a voucher system into effect. Under this system people would receive cash for living in a lower cost dwelling" (Davis, 1995, pg. 18). "States began to establish their own agencies and programs for social housing. This started the rise of local community development corporations. They acted to replace what the government had done before, but they were less concerned about profit and more concerned with a

quality product" (Davis, 1995, pg.19).

"Perhaps the country's most famous nonprofit affordable housing developer is Habitat for Humanity, and ecumenical organization that relies heavily on volunteers to help build and renovate housing" (Davis, 1995, ). Most of its efforts are focussed on single family houses as it is easier for volunteers to work at this scale (Davis, 1995, pg. 19).

In the 1980s design competitions sought to keep the attention of architects. "They also allowed for the exploration of new markets, occupant groups, and technologies" (Davis, 1995, pg. 23).

Some interest in this area was generated in a response to provide housing for a great number of people after WWII. Many housing complexes were lost as a casualty to the combat. With a clean slate, so to speak, architects were able to utilize new ideas they had been having regarding public housing and providing housing for the

poor. These ideas were not only a reaction to create public housing, but an entire community complex. Their hopes were to create almost a *city within a city*. In this effort they were trying to intertwine the surrounding community within a single building.

As one may see from the past, a large portion of housing projects were funded by the government. "The form of housing is strongly influenced by politics, regulations, desires of the client, the needs of the user, and the expectations of the community. Throughout our social housing history, each element has taken place at the top of the list" (Davis, 1995, pg. 33). Lately, there has been an effort to apply sustainable design to public housing.

Davis gives a final word on what housing should be. "The architect must imbue the work with a spirit that elevates the structure from a building to a home. Housing that lacks spirit, dignity, and intellect, that caters only to regulation and produc-

tion, saps the vitality and degrades the values of its inhabitants" (Davis, 1995, pg. 33).

While studying architecture, the student comes to learn more about the world. In learning about the world we come to question problems in that world, and what we as students can do in response to the problems. In trying to solve one of those problems through our thesis we learn more about architecture and more about ourselves. It is invaluable in our hopes of one day becoming an architect.

#### Academic

In studying architecture at this school, I have taken many classes that explore many areas of study within the profession. I can only hope that this work exemplifies the accumulation of all my studies.

In this last area of study, I will do my utmost to solve this problem the way my previous classes have taught me how. I hope to generate a lasting impression through my work.

#### Professional

This work, being my final design in school, will serve as a springboard in pursuing architecture as a profession. With this thesis I hope to exhibit the skills necessary to being a part of the profession.

My thesis will show these necessary skills that I have acquired as a student. My interest in architecture goes beyond the hope to one day call myself an architect; I hope to help the world in which I live through my work.

#### Personal

Besides my hope of one day becoming an architect, this thesis will help me in learning more about architecture itself. I want to see that which I am most capable of doing.

I want to know that I am capable of producing a solid work of architecture that displays the skills that I have acquired over the years. If I do not get into the profession, my life will be made all the better for having design as part of my life that will never leave me.



Figure 72. Site Photo

This site was chosen for its connection to both an urban environment and a natural environment. Located so closely to the city, the building will be influenced by the Mississippi River and the adjacent environment.

Normally, when driving to Minneapolis I would cross the 35W bridge. While on that bridge, I would always notice a small outcropping of stone near the river. As I studied architecture more, I began to wonder what it would be like if a building would just manifest itself out of the stone.

Down at the site, near the river, I could not help but feel a sense of comfort in being so close to the river, with stone at my back. It felt like a cave one would find near the ocean, with water beating upon the rocks.

From the site one can see down the river to the east and west. To the north is a beautiful vista of the stone arch bridge. Through its arches, St.



Figure 73. Site Photo 2

## Site Narrative

Anthony Falls can be seen. There is a road at the bottom of the site, where trucks travel back and forth to the dam. Higher up the site is a walking path that travels through the site down to the river.

The stone and vegetation can be clearly seen throughout the entirety of the site. This outcropping of stone creates a fair slope, upon which is the walking path. Because it is located on the south side of the river, it is slightly shadowed by the topography.

There are few to none built features upon the site. Adjacent to the river is a shallow retaining wall, and there is a guard rail along the sidewalk. There are also the functioning path down to the river and the road to the dam.

Upon my visit to the site, light color was fairly grey for the day because it was an overcast day in winter. I could not see any sun rays, and the temperature was very cold.

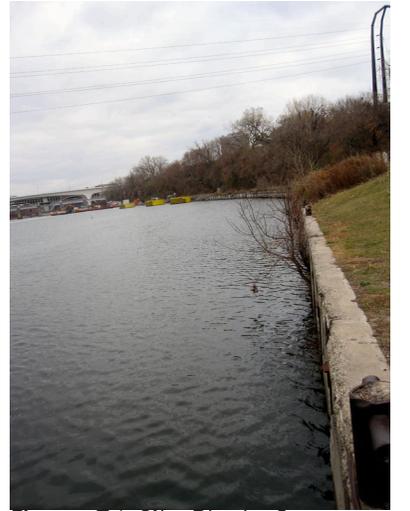


Figure 74. Site Photo 3

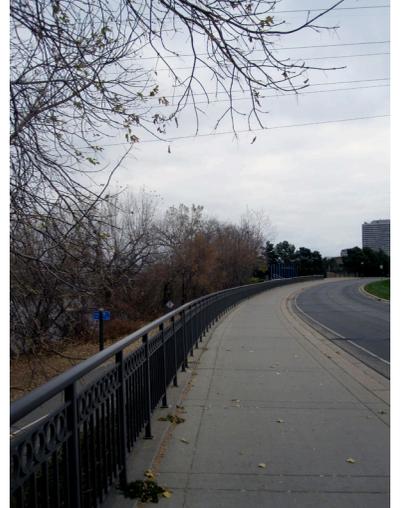


Figure 75. Site Photo 4



Figure 76. Site Photo 5

The Intensity of the light was dimmed.

Vegetation on and surrounding the site seems almost dead and lifeless in this winter month. The trees along the hillside are clinging to the rock. They are slightly decrepit in how they look there.

The Mississippi River seems to be running smoothly along the length of the site. It looks to be fairly clean water. This is a permanent part of the site.

The slight slope and proximity to the river increase the flow of wind slightly. The few features are negligible in influencing wind flow. The flow of wind changes throughout the year.

The site shows signs of human intervention as there is a walking path and a road through it. There is also human intervention in the retaining wall at the water's edge and the guard rail along the sidewalk. Most people on or around the site are passing through it, either by car, bike, truck, or walking.



Figure 77. Site Photo 6

There is little to no sign of distress on the site. Though the topography slopes into a hill there are to be seen no signs of erosion, or muddy water, but some trees look as though they might be dying.

Vehicle traffic follows along the road adjacent to the site at the top of the hill. Trucks follow along the lower road on the site towards the dam. Pedestrian traffic follows along the road on the adjacent sidewalk. Pedestrians also travel down the site on the walking path.

The proposed site occupies three city lots, 900, 1301, and park lots. The lots, as they are now, seem only to be used for circulation traffic. There is little to no built environment upon the site.

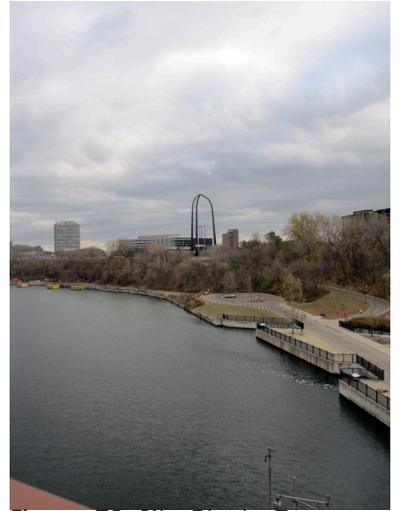


Figure 78. Site Photo 7

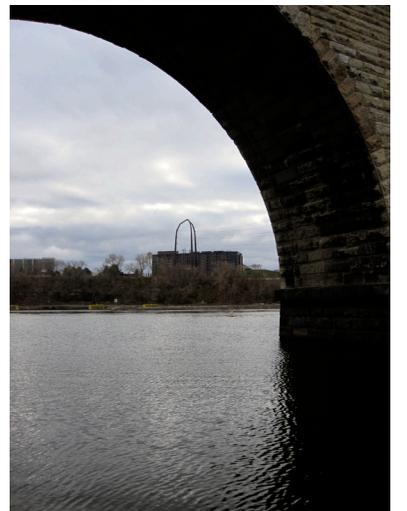
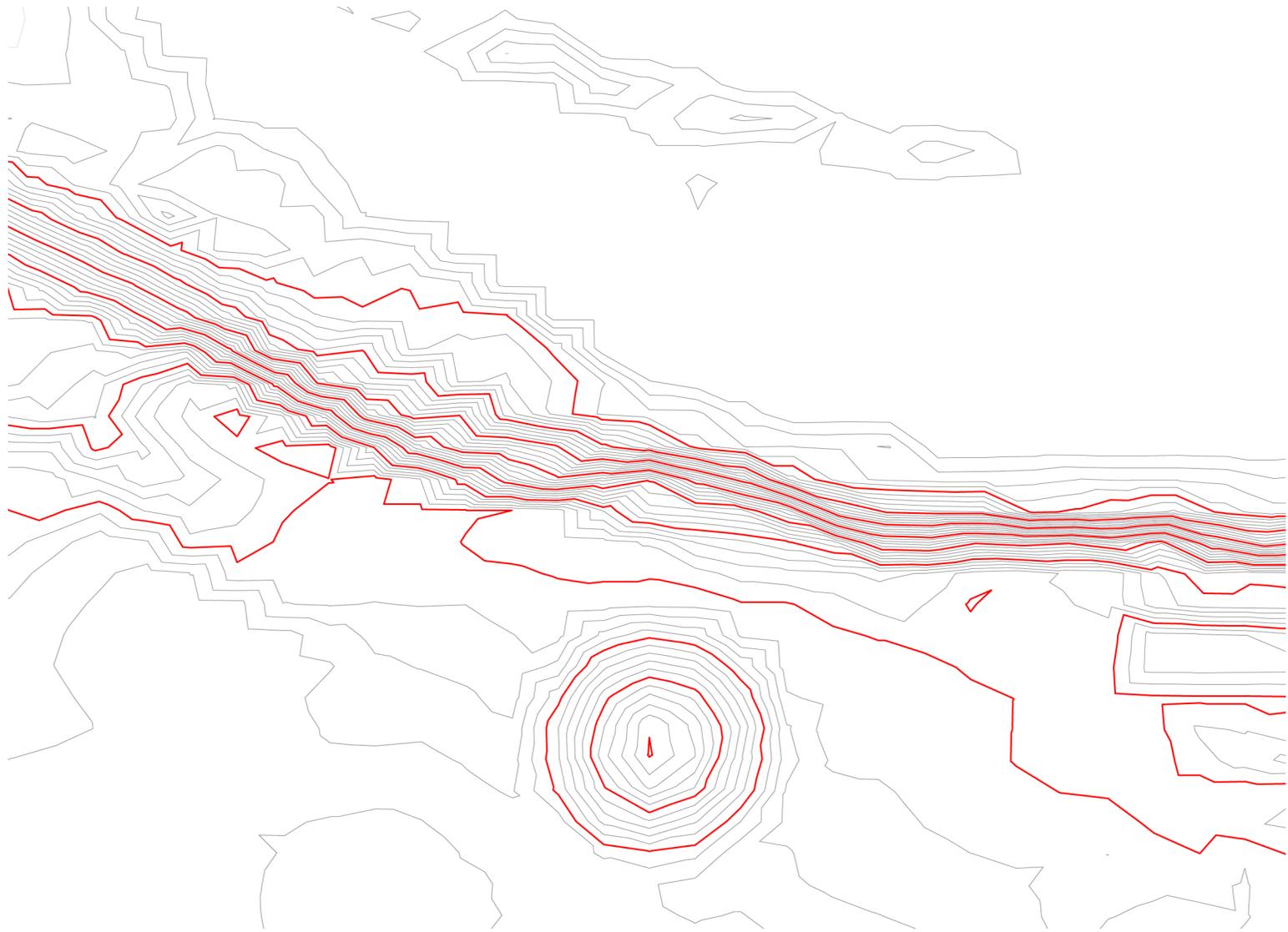
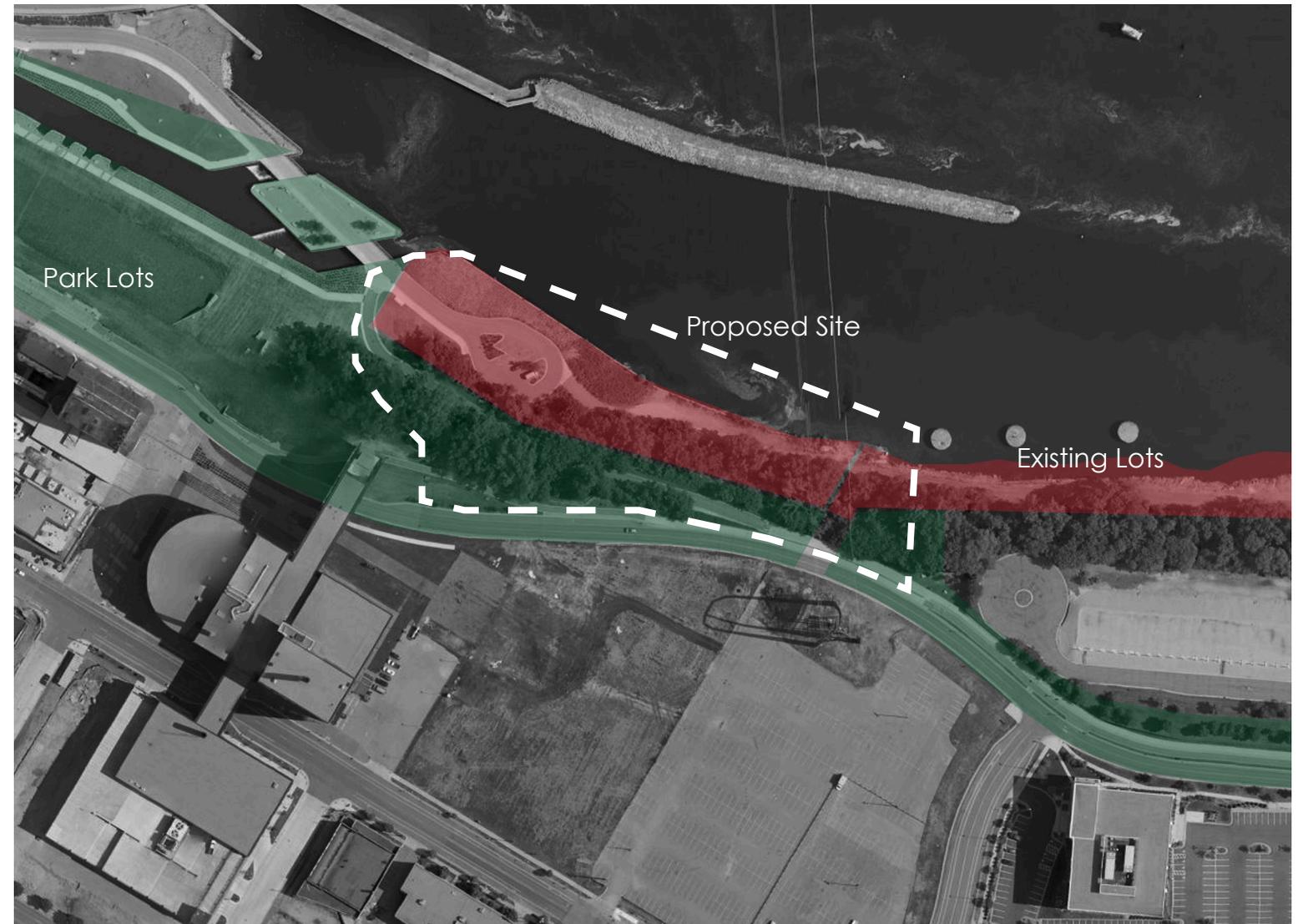


Figure 79. Site Photo 8



92 Topography

Figure 80. Topography



Proposed Site

Figure 81. Proposed Site



94 North

Figure 82. Site Photo 9



South

Figure 83. Site Photo 10

95



96 East

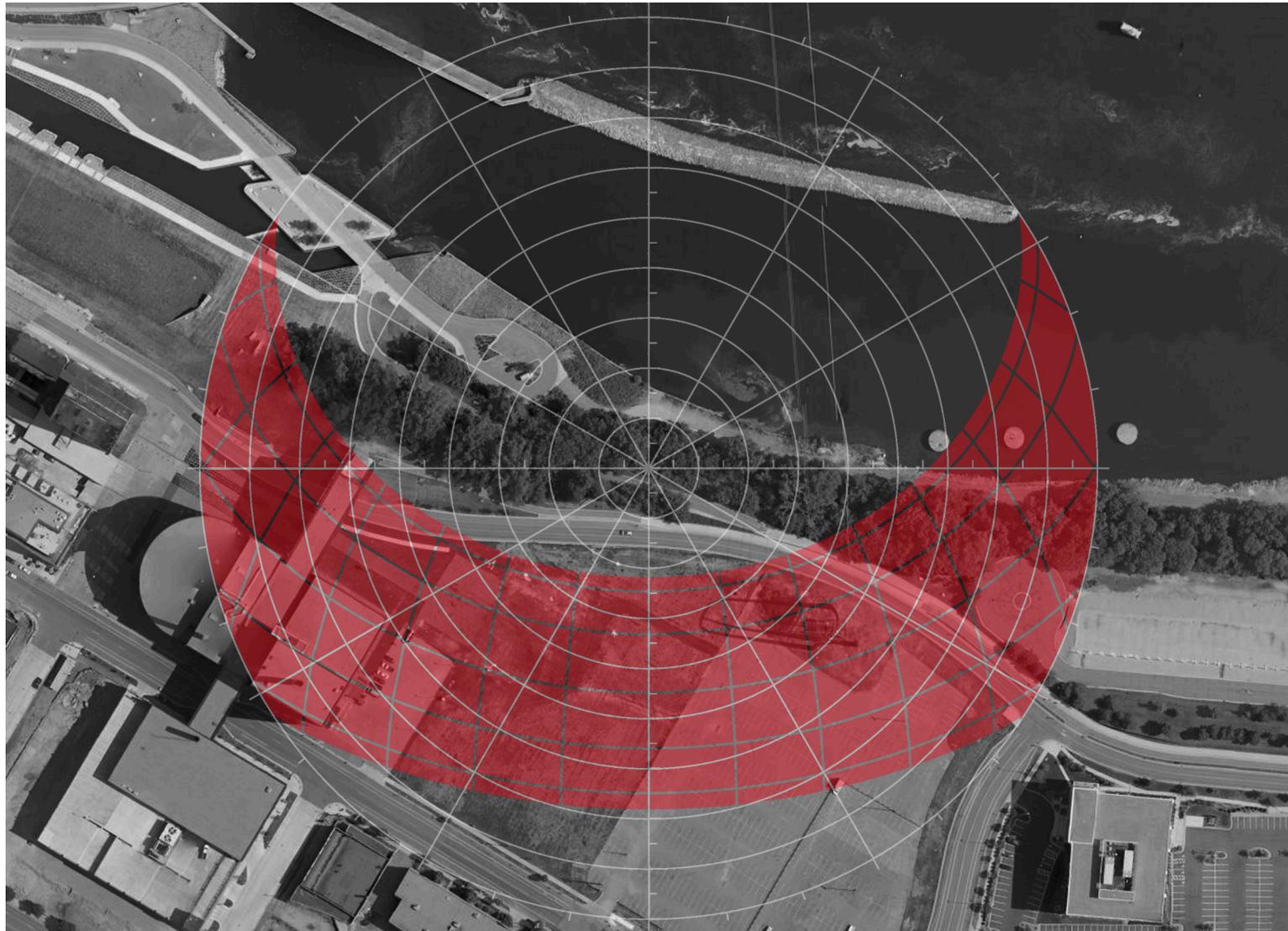
Figure 84. Site Photo 11



West

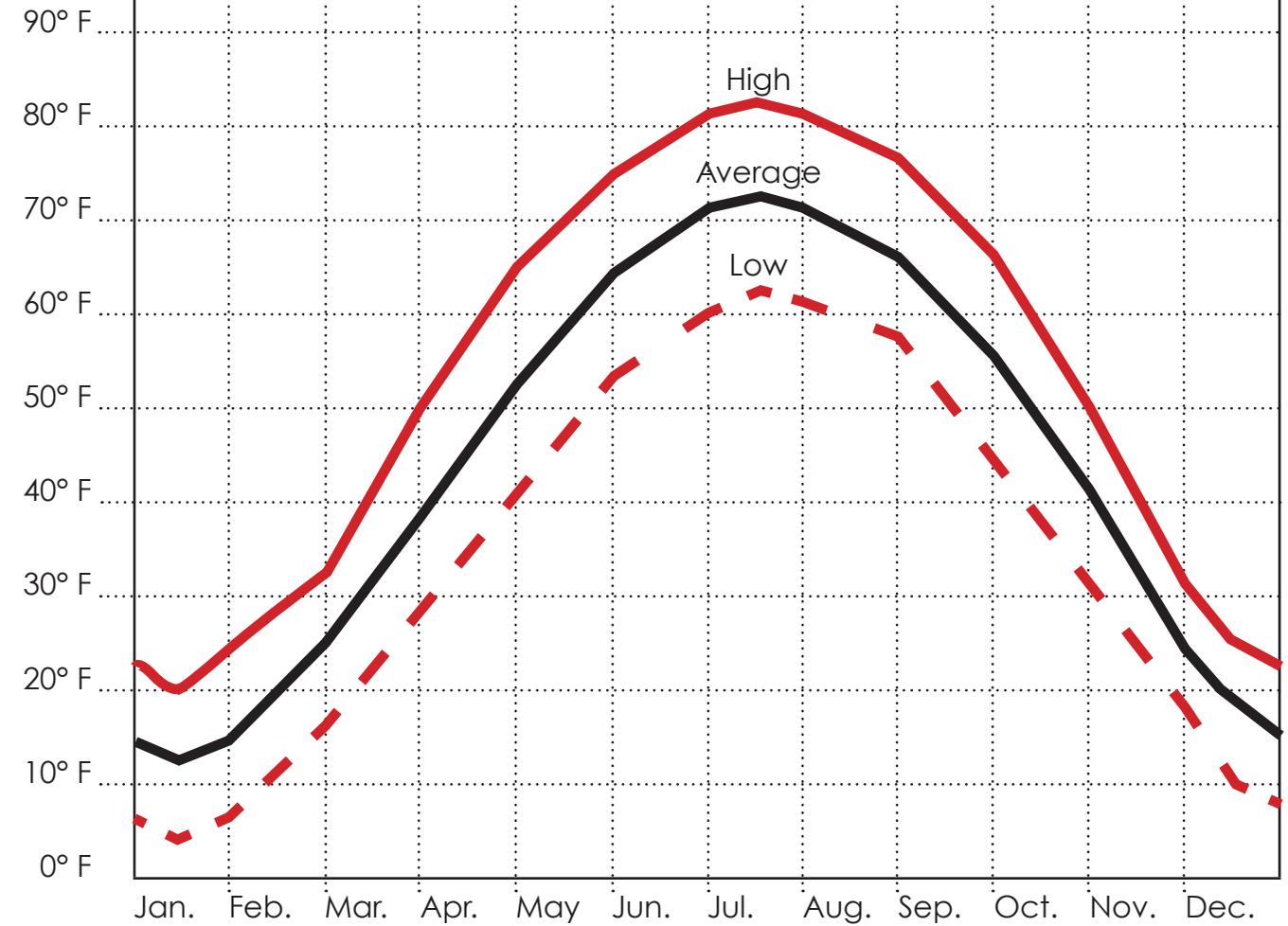
Figure 85. Site Photo 12

97



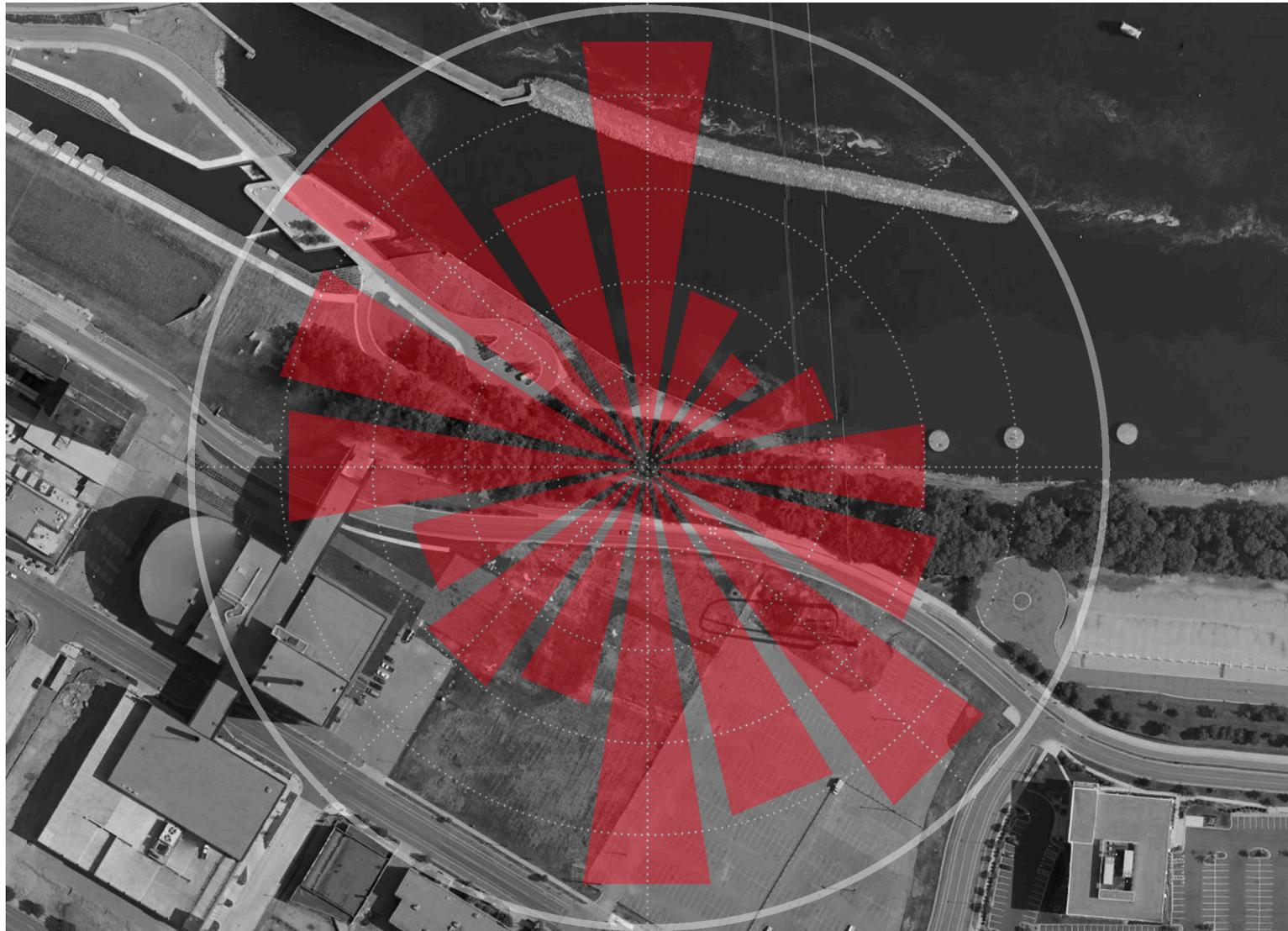
98 Sun Path Diagram

Figure 86. Sun Path Diagram



Average Temperatures

Figure 87. Average Temperatures



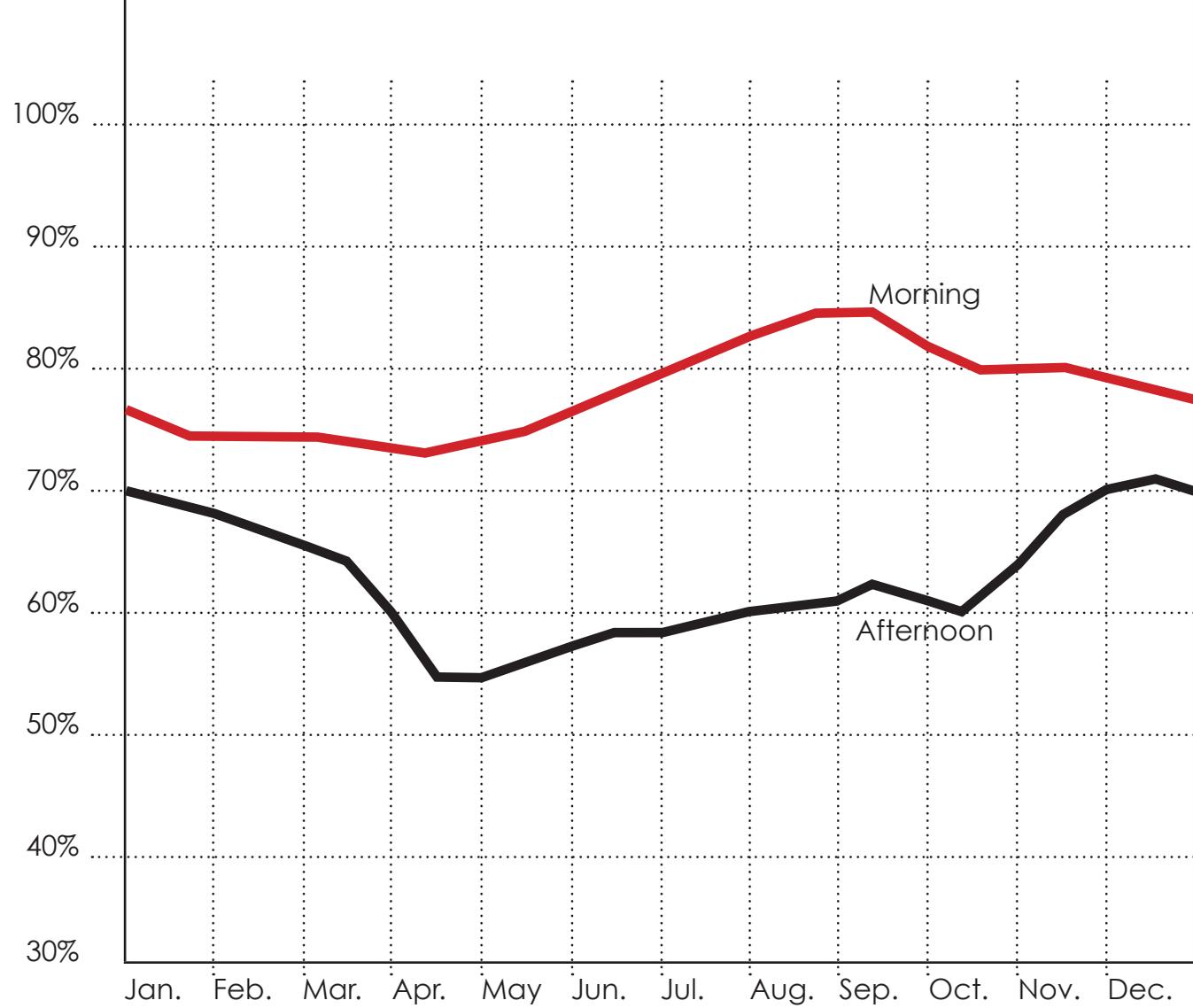
100 Annual Wind Rose Diagram

Figure 88. Annual Wind Rose



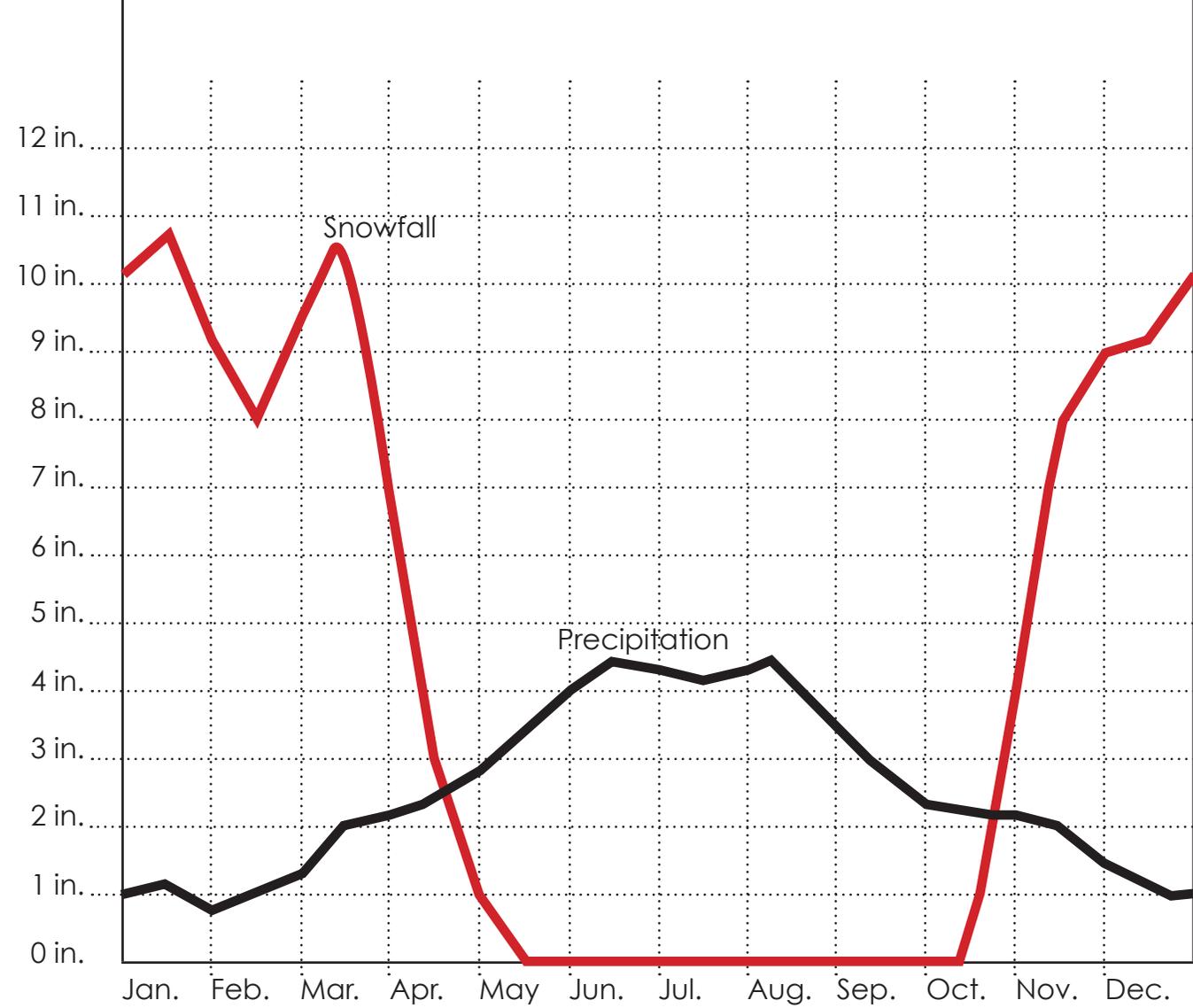
Wind Speed (mph)

Figure 89. Wind Speed



## 102 Humidity

Figure 90. Humidity



## Precipitation & Snowfall

Figure 91. Precipitation & Snowfall

This list is a put together with an understanding of the program at the time. It is not limited to the spaces stated here. The purpose here is to begin to develop a spacial program.

Total: 650,000 Square Feet

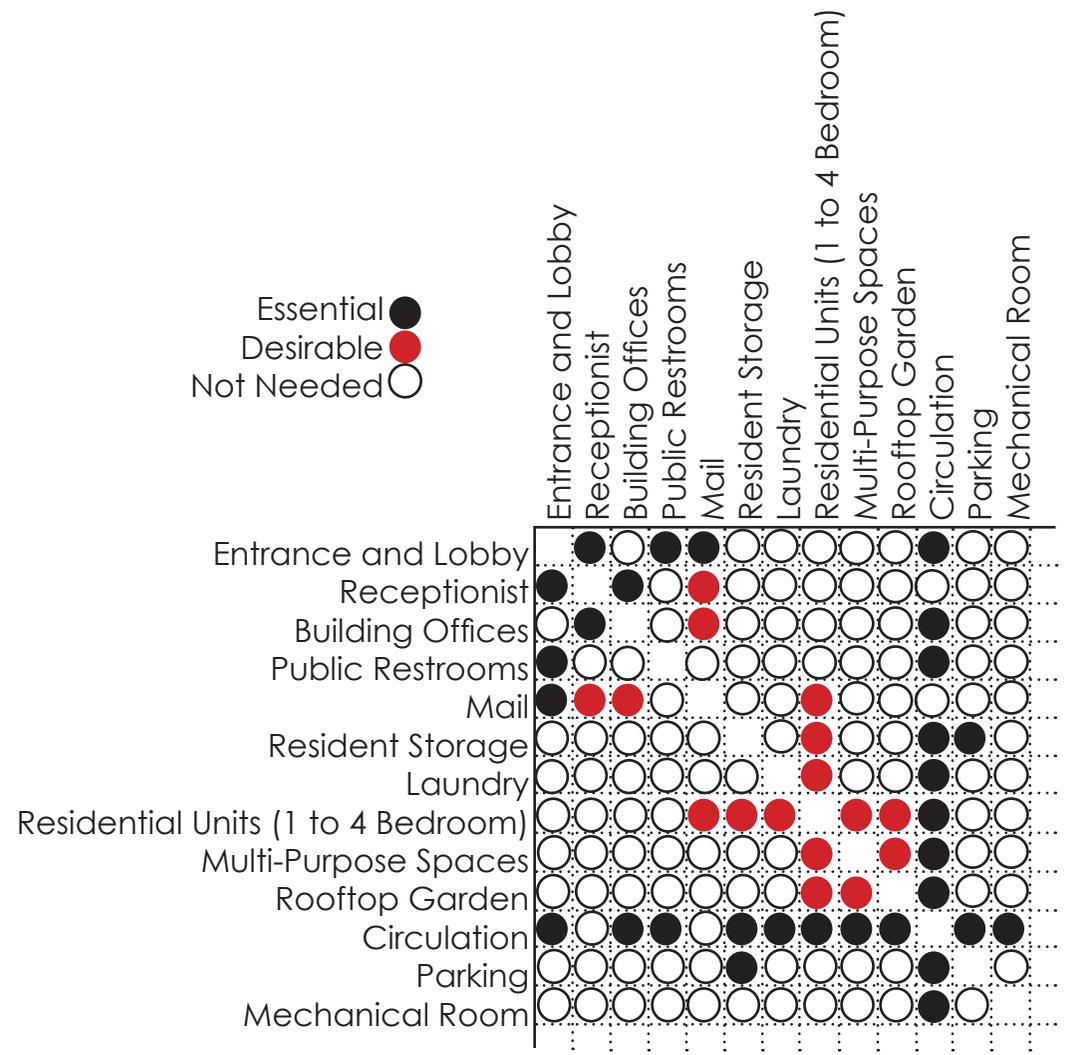
Residential Units: 268,450 Square Feet (41.3%)  
Units - 800-1500 Square Feet Each (200-300 Units) (40%)  
Storage - 6,500 Square Feet (1%)  
Laundry - 1,950 Square Feet (0.3%)

Administrative Space: 13,390 Square Feet (2.06%)  
Receptionist - 325 Square Feet (0.05%)  
Offices - 13,000 Square Feet (2%)  
Mail - 65 Square Feet (0.01%)

Communal Space: 95,160 Square Feet (14.64%)  
Entrance and Lobby - 5,200 Square Feet (0.8%)  
Public Restrooms - 5,460 Square Feet (0.84%)  
Rooftop Garden - 58,500 Square Feet (9%)  
Multi-Purpose Spaces - 26,000 Square Feet (4%)

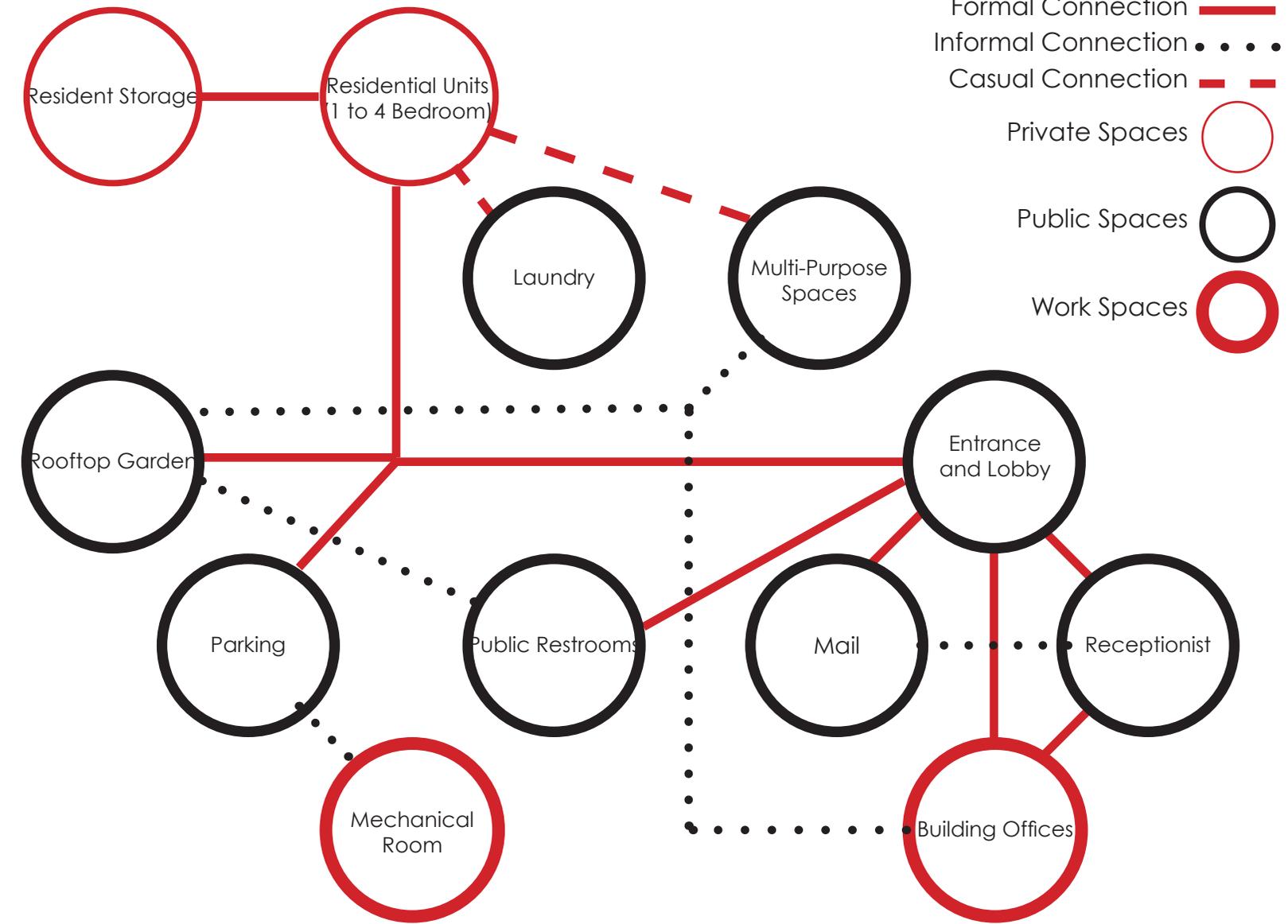
Other: 273,000 Square Feet (42%)  
Circulation - 65,000 Square Feet (10%)  
Parking - 130,000 Square Feet (20%)  
Mechanical - 65,000 Square Feet (10%)  
Structure - 13,000 Square Feet (2%)

Essential ●  
 Desirable ●  
 Not Needed ○



### 106 Interaction Matrix

Figure 92. Interaction Matrix



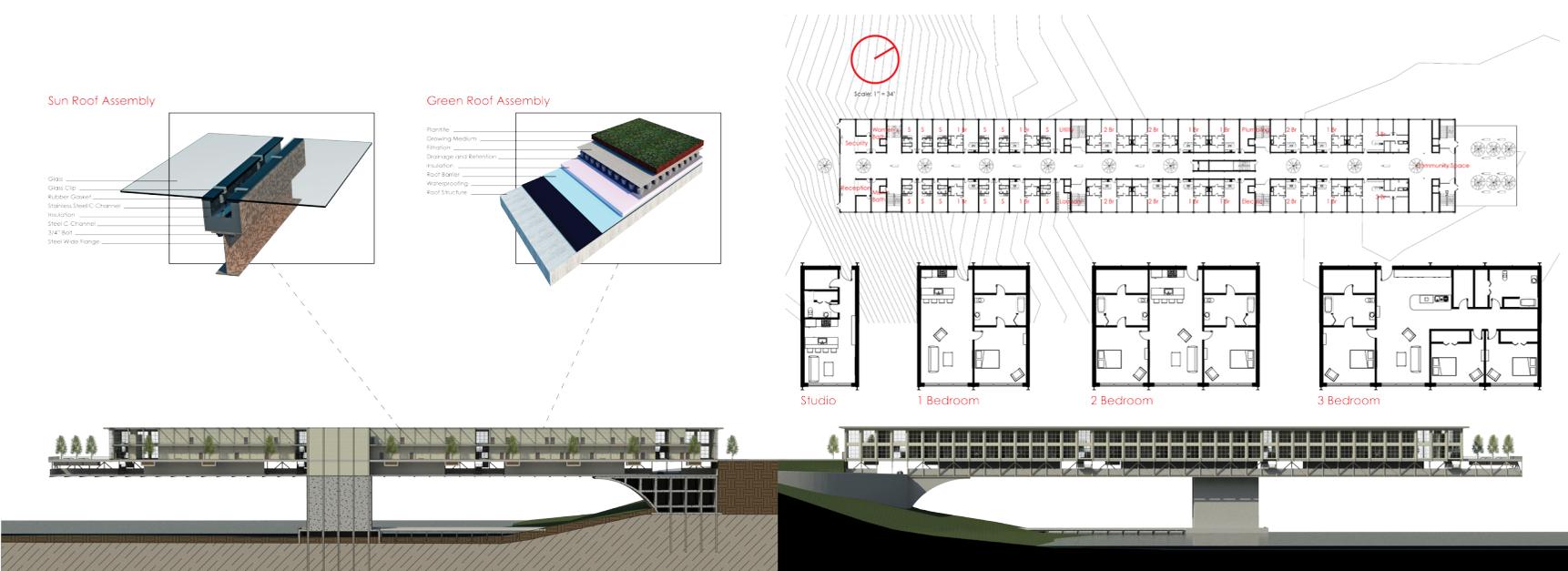
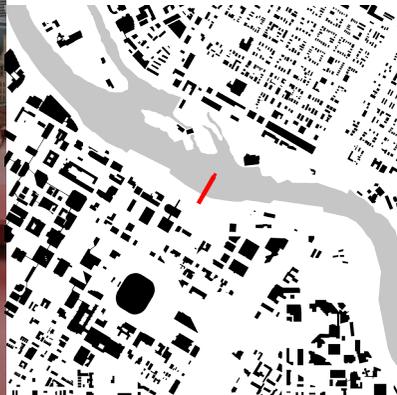
### Interaction Net

Figure 93. Interaction Net

Final Project



Nature in Architecture  
Multi-Family Housing  
Minneapolis, MN





**THEORETICAL PREMISE:**  
 Architecture can bring about a greater use of the land by utilizing what is available in its location. It must respond to the environment and the materials in its own location.

**PROJECT JUSTIFICATION:**  
 Mass produced buildings are made with little respect to their environment. Understanding the site can help bring about better design.

**PROJECT:**  
 Design determined from analysis of the site as well as a drive to house a fair amount of people. Inspiration took me to seek a building with a panopticon along which the inhabitants travel to their rooms. The structure being such a large concern in a building of this size, it should be celebrated. Not only this, but the richness of the building is brought about by breathing life into it with planted trees along the panopticon. Inhabitants are provided with a great environment for living. They receive the unique experience of living over the Mississippi River.





114

Figure 98. Model Photo 2



115

Figure 99 Model Photo 3

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Adobe Photoshop CS4

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Autodesk Autocad 2012

Autodesk Revit Architecture 2012

Google Earth 2011

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"An idea is salvation by imagination."  
-Frank Lloyd Wright

