

BUILDING AS BRIDGE

RE-IMAGINING SUSTAINABLE LIVING THROUGH SYMPHONIC DESIGN

EMMA DEMARTELAERE



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RE-IMAGINING SUSTAINABLE LIVING THROUGH SYMPHONIC DESIGN

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Emma DeMartelaere

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Thesis Committee Chair

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THESIS ABSTRACT

Can architecture re-interpret our modern approach to sustainable design by re-connecting to the experiential realm of the human being, rather than being merely an application of scientific formulas to a building?

For German Philosopher, Martin Heidegger, a bridge is a manifestation of the fourfold—Earth, Sky, Divinities, and Mortals—which is at the root of all dwelling. He believed that preserving this fourfold is how we dwell in a holistic way on earth. This understanding of sustainable living requires human participation. Today, sustainable design has disregarded human participation with its specialized application, limiting our understanding of its relationship to the larger world. However, the task of architecture is not to reduce our understanding with the world, but rather to, like music, invite us into a space for interpretation; calling us to participate in its experience. My project re-interprets sustainable living based on Heidegger's sense of dwelling, by creating an atmosphere that establishes a harmonious relationship between all things—Earth, Sky, Divinities, and Mortals.

Located in the artistically dense community of downtown east Minneapolis, MN, I propose a mixed-use residence for artists participating in local residency programs. It includes retail, apartments, artist studios, exhibition space, a research library, and informal performance space. The design provides an opportunity for the city to engage in meaningful and multi-layered cultural exchange between communities through the works of visiting artists. Inspired by the way one participates in music and framed in the structure of a symphony, architecture brings all things together—bridging city to city, individual to community, nature to technology—into one harmonious composition.

NARRATIVE OF THE THEORETICAL ASPECT OF THE THESIS

Sustainability. This word carries a lot of weight today in the design field. It's innovative, it's GREEN! It will save our planet and allow our children's children to experience and enjoy this earth for generations to come.

Today, this term sustainability has been deemed the solution to all our Earth's environmental problems and it is practiced as a set of predefined formulas ready to apply to the next great sustainable design. Popular belief is that if you follow the path of LEED or other sustainable formulas, you are being ethically responsible to our planet. The reality though, is that sustainable design is not just a checklist or set of formulas that can be blindly tacked on to the design of a building. It must take into account environmental context, inhabitants and the building itself, bringing all things together into a harmonious existence, in order to truly be sustainable.

Today, sustainable design has lost touch with the everyday person. The formulaic response of sustainable design requires the knowledge of a specialist, making its practice abstract and inconsequential to the everyday person. Because of its specialization, people see sustainability as something that is out of their individual control and a problem for the trained architect or engineer to solve. This is part of our society's collective action problem, which is being heightened by globalization. We are becoming connected more and more globally and less and less locally each day, causing us to lose connection with our local environments and our place in the larger world.

The specialization of our modern culture can be seen in all areas of our lives. German Philosopher, Hans-Georg

Gadamer explains the specialization of culture in his book *The Enigma of Health*. He uses an example from the past when families would have one doctor for the entire family who would visit them in their home. This allowed the doctor to observe the home environment in its entirety giving indications of the patient's lifestyle which the doctor could take into account when evaluating the patient's health. Today's doctors no longer take this holistic approach to patient care. Now, each of us has many doctors, who each specializes in a different part of our health, and who gives us the same treatment as all other patients, after examining our health in the same unrevealing office environment.

The specialization of culture has created a disconnection between the specialist and the everyday person—between physician and patient. To a physician, illness is a state of the body that's defined by a collection of signs and symptoms. Assessing or focusing on the signs or symptoms he categorizes the illness as being a typical case of a certain disease. However, a patient does not see his illness in terms of signs and symptoms, rather he sees it in terms of how he is experiencing the illness—as an effect on his ability to do regular activities. “As Eric Cassell, MD and M.A.C.P, notes, ‘on being presented with a sick person, doctors do not attempt to find out what is the matter but, rather, attempt to make a diagnosis’” (Toombs, 1992, p. 12).

This is similar to the diagnostic applicability of sustainability to architecture. Architects complete an examination of a building to determine the correct formula, or diagnosis, to apply in order to make it sustainable, or healthy. However, sustainability, like health, cannot be analyzed exclusively in terms of science. Like health, it is to be understood in reference with the experiential realm of the human being.

This experiential realm is available to us through an embodied consciousness. We experience the world through our bodies, and in the process gain a better understanding of the world and of ourselves. Alberto Pérez-Gómez explains this concept in *Mood and Meaning in Architecture*, “The mind and the world are simply not separate and independent

of each other; the mind is an embodied dynamic system in the world, rather than merely a neural network in the head" (2015, p. 223). "This embodied, nondualistic understanding of reality includes our emotions and feelings; ...and its most significant experience is Stimmung: attunement, understood as a search for lost integrity, health, wholeness and holiness" (Pérez-Gómez, 2015, p. 221).

German Philosopher, Martin Heidegger refers to Stimmung, or mood, as our sense of being in the world. As writer Matthew Ratcliffe states in *Why Mood Matters*, "... 'mood' or [Stimmung] makes a substantial contribution to the sense that we have of belonging to a world" (2015, p. 1).

Our sense of being in the world is attuned through our bodily encounters with the world. Each of these encounters has the potential to significantly influence our mood. Seventeenth century German scholar, Athanasius Kircher would argue that music is one such encounter. His musical theory, "portrays the body...as an object assaulted by sound, in a state of constant excitement and agitation." He believed that, "The nerves and muscles in the human body are moved by music, like the strings of an instrument" (Spitzer, 2004, p. 158). In this way, we experience joy—an extension of the soul—when the strings of life are extended and sadness when they are contracted.

These moods are spontaneously express by our bodies, which others pick up on and respond to, our moods resonating between one another. Citing Gaston Bachelard, Pérez-Gómez explains this idea, "We literally resonate with another's experience. First there is reverberation, followed by the experience in oneself of resonances, and these eventually have repercussions in the way we perceive the world. This is how the poetic image is communicated, and we can all have the experience of being cocreators" (2015, p. 228).

These resonances between ourselves and our environments, between one another are how we exist in an ongoing historical order. It is important to acknowledge our own mortality and that after our individual existence, life continues, and the contributions we make here and now,

positive or negative, are the part of us that will continue to exist long after. As Karsten Harries states in *Lessons of a Dream*, "The individual who takes his own death to be the end that circumscribes all others would exist inauthentically precisely because he has refused to acknowledge the tragic tension between individual and species in a human being" (1996,p. 106). The common belief is that we as humans are self-sufficient wholes, but the reality is that we are a part of an ongoing community. And that community depends on "dwelling and building responsively," as Harries argues, "not just to our mortality, but to a love that lets us experience ourselves as essentially incomplete, in need of others, in need of community" (1996, p. 107). In need of being attuned to the people around us and to our environments.

This attunement is discussed in terms of dwelling by Heidegger, in his writing *Building Dwelling Thinking*. He speaks of dwelling in terms of the fourfold, "Earth, sky, divinities and mortals." Earth being the ground that supports us, sustaining gifts of food and water; sky being the sun, the moon and stars, the changing seasons; divinities as being tied to a sense of vocation or calling, our contributions to the world that continue to exist in an ongoing historical order; and mortals, being ourselves, the preservers of the fourfold but limited by our existence. Heidegger believed that preserving this fourfold in its essential being is how we dwell in a holistic way on earth. Heidegger rationalizes, "Mortals dwell in that they save the earth...To save really means to set something free in its own essence. To save the earth is more than to exploit it or even wear it out. Saving the earth does not master the earth and does not subjugate it, which is merely one step from boundless spoilation" (1977, p. 352). This was an earlier understanding of sustainable living. Sustainability was simply living in a way that preserved the earth's resources, living in harmony with and engaging the fourfold. And the only way to engage the fourfold was through mortals and their preserving. In other words, dwelling in a holistic or sustainable way required the human touch. With sustainable practices today, we have lost this relationship to human body. Sustainable design has disregarded our

embodied consciousness with its specialized application that can only be understood by a trained designer, limiting our understanding of its relationship to the larger world. However, the task of Architecture is not to limit our understanding of the world, but rather to, like music, invite us into a space for interpretation; calling us to participate in its experience, and in doing so, allowing for a greater understanding of the world and of our place in it.

Participating in architectural space is not a new concept and evidence of its earlier importance in architectural design can be seen back in examples of ancient Greek theaters. In one such theater, Epidaurus, people would come for psychosomatic healing that took place through the space of participation. "Vitruvius describes the manner in which the theatre conveys this sense to the spectators as they participate in the event of the dramatic representation... the whole event [Performance] becomes cathartic, a purification that allows for the spectator to understand, through their participation in the space and plot of drama—which is also the space of architecture—their place in the universe and in the civic world" (Pérez-Gómez, (n.d.), p. 9). A Catharsis allowed for the recognition of the presence of being in everyday life, which does not call upon ordinary language. The language of drama is poetic, it is the language of metaphor which has the power to expose and bridge a distance. This distance opens up a space for participation in the drama, in which the spectator fills the distance through their interpretation. This is similar to the space that is opened within the language of music.

For architect Stephen Holl, "music...is a powerful metaphor for the dynamic unfolding of experiences" (Kennicott, 2013). He uses music as his inspiration for his Daeyang Gallery and House in Seoul, South Korea. As inspiration for the plan, Holl used a drawing he discovered in a John Cage book of a 1967 musical score by the Hungarian-Canadian composer István Anhalt. "Music, in the form of graphic score, was a heuristic device that gave rise to the three-pavilion concept piercing a sheet of water" (Kennicott, 2013).

The design incorporates several skylights that trace the sun's path as it dances across the floors and walls, creating a play of light. Holl best describes his architecture as being "felt and understood by the 'subject-body,' which moves through space" (Kennicott, 2013).

This subject-body interaction is how we participate in the creation of space. We participate in the creation of space much like we participate in the creation of music. Each creates a distance opening a space for interpretation. This space of interpretation is important because it allows each person who encounters the space to complete the space for themselves, participating in its creation and finding themselves through architectural experience.

A beautiful story, of finding one's self through a unique interpretation of space, is told by Italo Calvino of Despina in his book *Invisible Cities*:

The city [Despina] displays one face to the traveler arriving overland and a different one to him who arrives by sea. When the camel driver sees, at the horizon of the tableland, the pinnacles of the skyscrapers come into view . . . he thinks of a ship; he knows it is a city, but he thinks of it as a vessel that will take him away from the desert, a windjammer about to cast off, with the breeze already swelling the sails. . . . In the coastline's haze, the sailor discerns the form of a camel's withers, an embroidered saddle with glittering fringe between two spotted humps . . . he knows it is a city, but he thinks of it as a camel from whose pack hang wineskins and bags of candied fruit, date wine, tobacco leaves, and already he sees himself at the head of a long caravan taking him away from the desert of the sea, toward oases of fresh water in the palm trees' . . . Each city receives its form from the desert it opposes; and so the camel driver and the sailor see Despina, a border city between two deserts. (1974, pp. 17-18)

To each traveler, the city is a reflection of themselves and their desires. They find themselves whole in the city of Despina.

Pérez-Gómez points out that, “Our architectural experience is always ultimately dependent upon our participation in an event housed in the space; it is in such circumstances that architecture ‘means’” (2015, p. 227). I intend to create meaning in architecture through a harmonious existence between the individual and community, and between nature and technology in an artist-in-residency development in the densely populated artistic community of downtown east Minneapolis, MN. By focusing on the experiential dimension of sustainable practices, people will be immersed in a dialogue between themselves and their environment that resonates in the body along with the other. This attunement to their environment will expand the previous distance created by the specialized nature of modern sustainable practices and will generate a better understanding in the everyday person and evoke a responsibility toward dwelling in a sustainable or holistic way on earth. As Pérez-Gómez states, “being attuned to a situation makes things matter to us: we feel more complete and become participants; our lives matter. This could be the humble yet crucial contribution of architecture...” (2015, pp. 228-229).

The earth calls us to participate with it—to play along in harmony, as one holistic being. Through an experiential approach to sustainable dwelling, we can join in its beautiful composition.



PROJECT TYPOLOGY

The typology of this thesis project is an artist-in-residence development. Minneapolis, Minnesota has an expansive and diverse artistic community with many institutions already participating in funding artist-in-residency programs. These programs invite artists, including musicians, poets, writers, architects, designers and all manners of creative people for a time away from their typical environment. They provide a time to reflect, research, present and produce new works. They also allow artists to explore his or her practice within another community, meet new people, use new materials, and experience a new location.

The problem in Minneapolis however, is that there is no place for these artists to reside. The design for this project will allow for meaningful and multi-layered cultural exchange between artistic communities, while focusing on the integration of sustainability in a way that allows inhabitants to participate in the experience of sustainable design, instead of sustainability being merely a series of un-relatable scientific formulas. In this way, the architecture will call for a greater understanding of sustainable design that allows one to see their connection to it and the larger world.

TYPOLOGICAL RESEARCH

CASE STUDY 1

HIGHPARK : Multifamily Residential
Multi-Use Complex

CASE STUDY 2

DAEYANG : Gallery and House
Architecture and Music

CASE STUDY 3

VLC CHAPEL : Remodeling of an old historic chapel
Architecture that invites Participation

CASE STUDY 4

THE HOUSE OF THE SUICIDE AND
THE HOUSE OF THE MOTHER OF THE SUICIDE : Architecture evoking a participation

CASE STUDY 5

LONG STRING INSTRUMENT : Sound in Space



Figure 02 | Highpark Entrance

HIGHPARK

ARCHITECT : Rojkind Arquitectos

SIZE : 375,000 square feet

COST : Withheld

COMPLETION : June 2015

LOCATION : Monterrey, Mexico



Figure 03 | Highpark Aerial Photo

Highpark is a mixed-use residential building set in Monterrey, Mexico that demonstrates how architectural design can look to its surrounding environment and cultural context for design inspiration.

PROGRAM:

The mixed-use project combines apartments with retail space and restaurants on the ground floor and offices on the second floor. Three floors of underground parking make room for a public plaza upon entrance to the building. Highpark offers a variety of large apartments ranging in size from 1,950 square feet to 7,000. Each has a unique layout with some consisting of two levels. This apartment complex is meant to be an alternative to single-family housing, so the units are very large to try and convince people to make the move to apartment living.

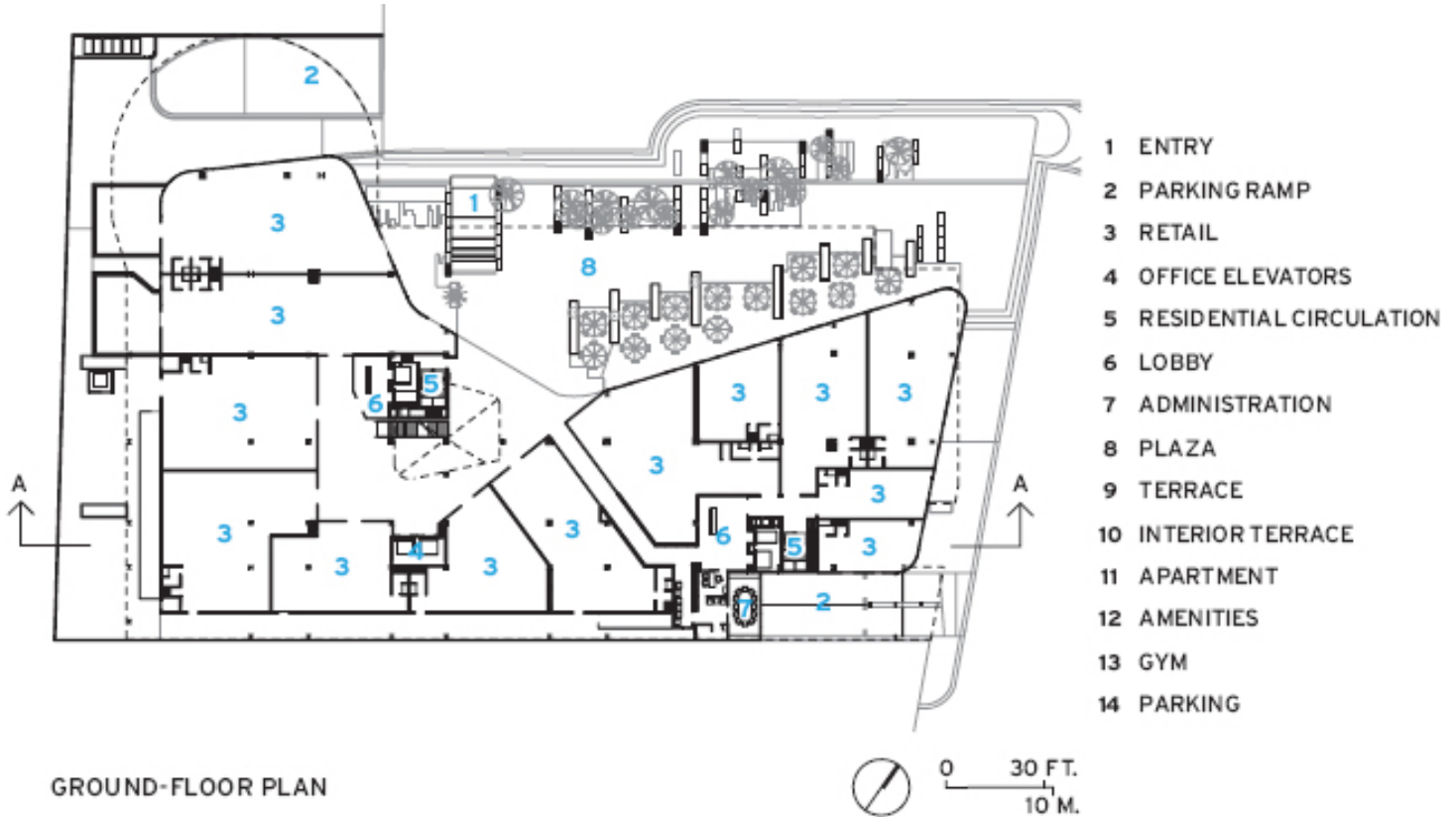
FORM:

The building's form plays off the Sierra Madre Oriental mountain range behind it giving the building a visual dialogue with its geographical context. The floor plates are curved, relating to the topographical lines on a map. The curving form of the floor plates also wrap around the front plaza as a welcoming gesture to the building's visitors.

STRUCTURE:

Steel Frame with lightweight concrete floor slabs.

PROGRAM



CONNECTION TO OUTDOORS:

The project invites many opportunities for engagement in the outdoors. The building's curved floor plates make room for balconies on each floor and also provide shade for apartments below. The structure's stepped profile allows space for additional terraces. Living walls are also scattered throughout these outdoor spaces, showcasing a variety of native plants. Furthermore, the ground floor lobby is not enclosed. Instead the lobby flows directly from the plaza cutting into the middle of the building providing an open shaded space for visitors, broadening a connection between indoors and out.



"People enjoy the convenience of a house for its connection to a garden, or exterior spaces, which normally apartments lack. By having a project which integrates, not only terraces but real gardens even at the upper levels, we have achieved an experience unique to Monterrey."

- Michel Rojkind,
founding partner



ENGAGEMENT WITH COMMUNITY:

The building has an outgoing personality, inviting visitors and the general public to engage with it through its energetic form and inviting ground floor presence. Architectural Record quotes Rojkind explaining this design choice, "Most developers put up gated apartment buildings here, using fences and walls to give residents a sense of security, but we opened Highpark to the city, so anyone can sit in front or use the restaurants." Special attention was also given to landscaping features to further invite visitors to stay awhile.

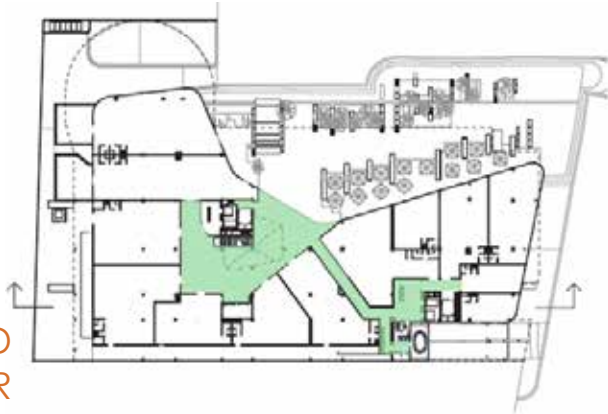


Figure 06-08 | Highpark Detail Photos

HORIZONTAL CIRCULATION

FORM

GROUND
FLOOR



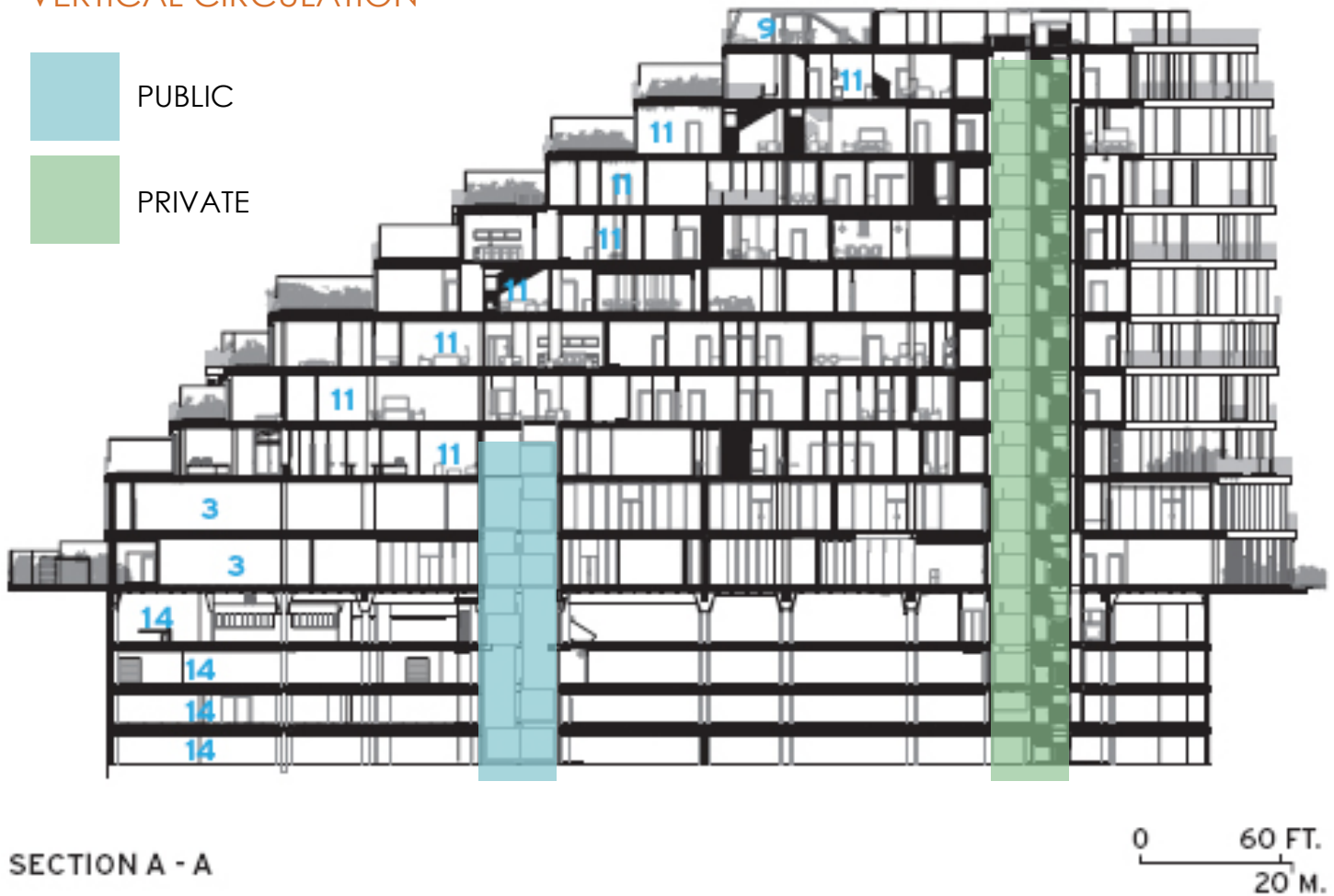
FIFTH
FLOOR



SIXTH
FLOOR



VERTICAL CIRCULATION



- | | |
|---------------------------|---------------------|
| 1 ENTRY | 8 PLAZA |
| 2 PARKING RAMP | 9 TERRACE |
| 3 RETAIL | 10 INTERIOR TERRACE |
| 4 OFFICE ELEVATORS | 11 APARTMENT |
| 5 RESIDENTIAL CIRCULATION | 12 AMENITIES |
| 6 LOBBY | 13 GYM |
| 7 ADMINISTRATION | 14 PARKING |

SUMMARY

Figure 15 | Highpark Section

The study of Highpark as an example of mixed-use and multi-family residential development will help inform the design solution of this thesis. Relationships between different programmatic elements and connection to the environment both physically and culturally will be key components to the design of this thesis.



Figure 16 | Daeyang Exterior

DAEYANG GALLERY and HOUSE

ARCHITECT : Stephen Holl

SIZE : 1760.0 sqm

COMPLETION : 2012

LOCATION : Seoul, South Korea



Figure 17 | Daeyang Interior

The Daeyang gallery and house designed by Stephen Holl explores the relationship between music and architectural space.

The design is composed of three pavilions for the entry, residence and gallery. Its geometry is based off a sketch for a musical score by the composer Istavan Anhalt and the building's proportions also follow the patterns of this musical score. A reflecting pool sits in-between the three pavilions and atop many skylights that shine into the project's interior, creating a dynamic play of light on the building's interior.



Figure 18 | Daeyang Stairs

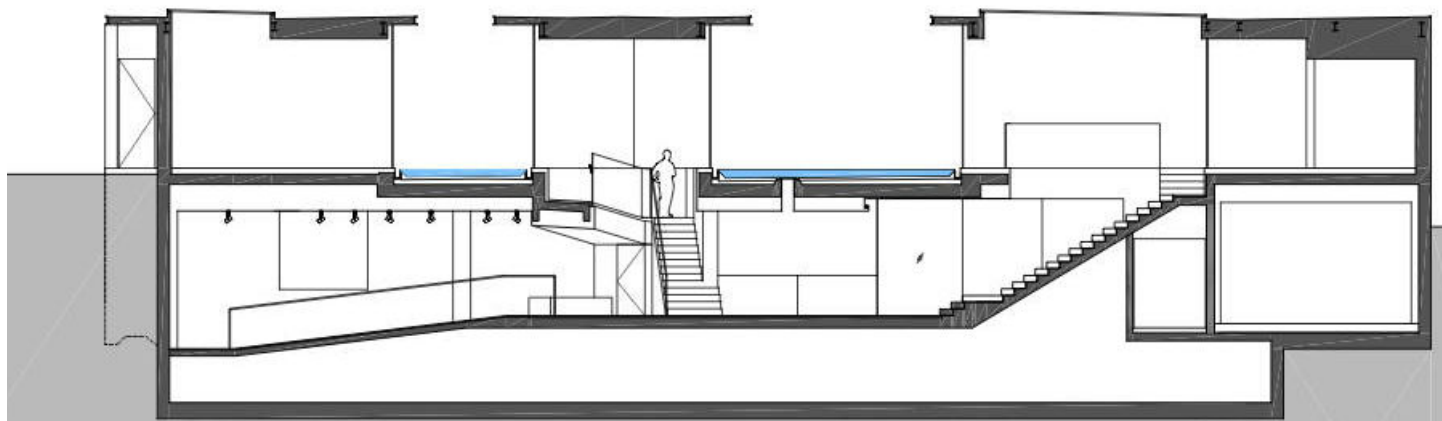


Figure 19 | Daeyang Section

One enters the building at the lower-level gallery. From there a series of descending stairs and ascending ramps lead you through the three gallery spaces that then lead to the upstairs pavilions. Throughout the project, 59 linear skylights, parallel but staggered irregularly, bring daylight inside. Many of the skylights are set in the reflecting pool, so light trickles through water before entering the galleries below and dances across walls and floors.

As described by Holl, “The skylights cutting through like [musical] staff lines allow sunlight to reconfigure the spaces daily and seasonally—as if the sun plays the music in light and space.”

“Architecture, Holl explains, is felt and understood by the ‘subject-body,’ which moves through space” (Kennicott, 2013).

SUMMARY

This thesis will further investigate how architecture can be inspired by music and engage a person’s embodied consciousness through creating a space of participation. We participate in the creation of space much like we participate in the creation of music. Each creates a distance opening a space for interpretation.

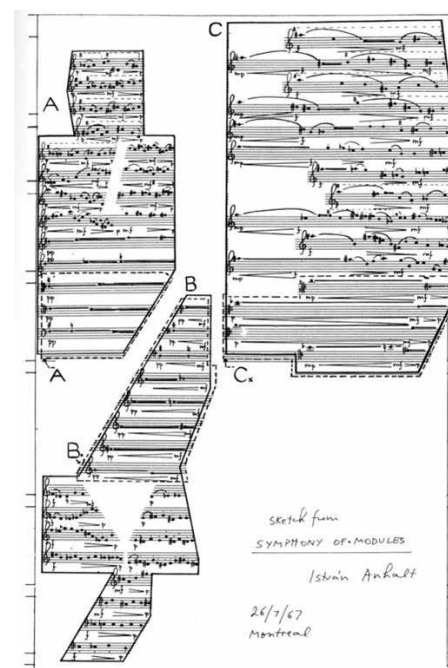
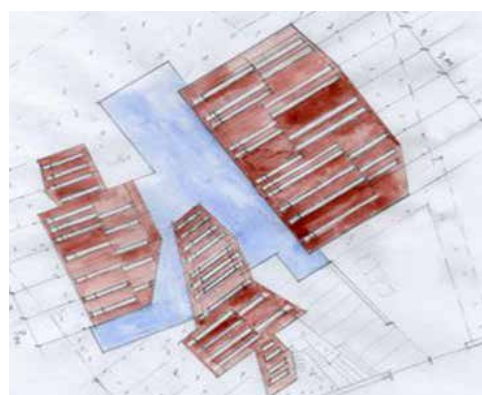


Figure 20-22 | Daeyang Gallery and House

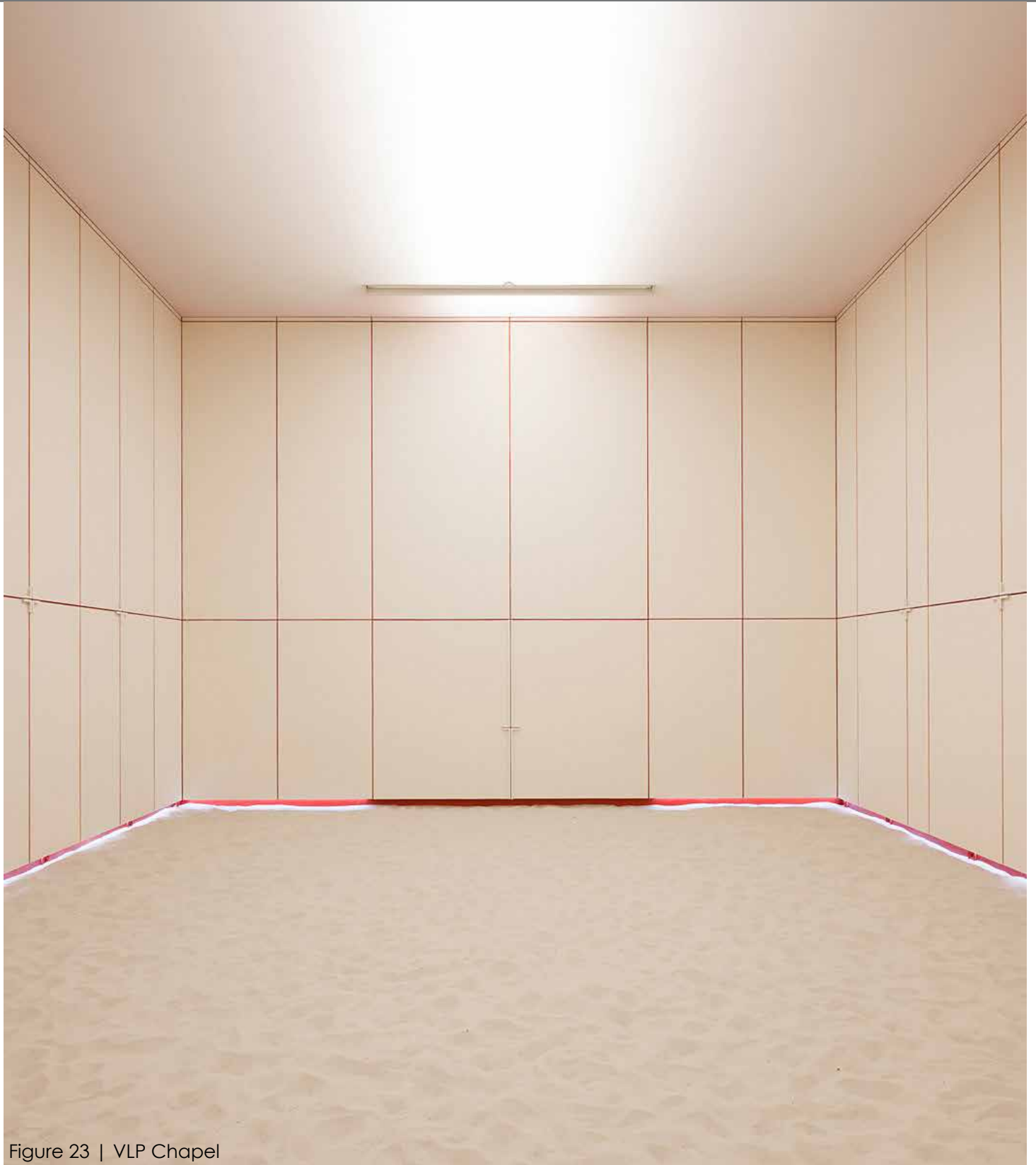


Figure 23 | VLP Chapel

VLP CHAPEL

ARCHITECT : tcct , Bruges, Belgium

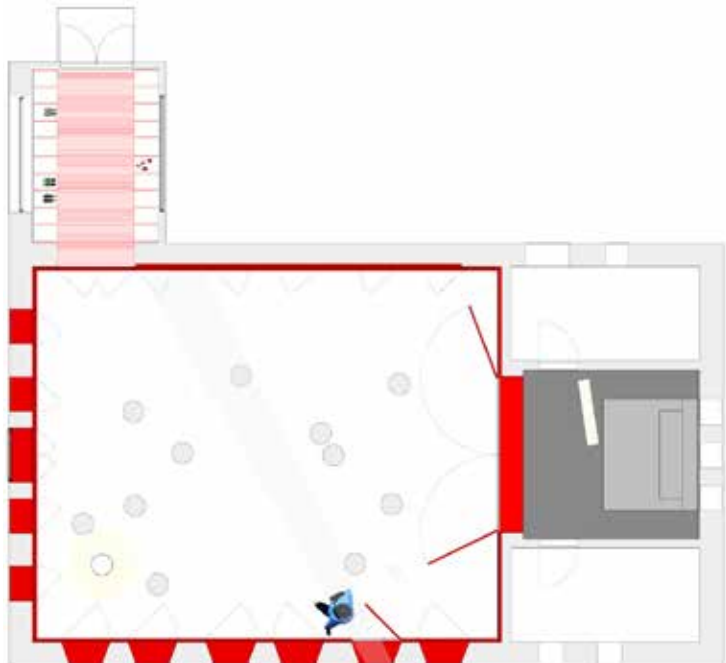
LOCATION : De La Salle Center in Grand-Bigard, Belgium

COMPLETION : 2011

The chapel project for VLP opens a space of participation for its visitors. The exterior of the chapel is left untouched, but the interior has been transformed into a white void, waiting to be filled with the stories of its visitors. The visitors enter into a totally unexpected and seemingly undefinable space with walls covered in blank, white shutters and a floor of white sand. The experience of this space allows visitors to define the space for themselves. An article on the Chapel by Archinect describes the project as, "...a metaphor for the pedagogic philosophy with which the institution embraces people: How can we transform the turmoil and unrest deep within us so the visitor can leave the space 'different', changed, rested, happy, saved?" The project is meant to allow visitors to find their own meaning in a place traditionally meant for worship.

SUMMARY

The chapel invites both a physical and imaginative participation with the space. Visitors can physically interact with the space, choosing to open certain shutters and not others, each person's experience different from the next. The blank canvas of the room allows the mind to image and interpret the space without preconceived notions of what the space should be. The sandy floor also becomes its own canvas, recording the impressions of previous visitors.



This experience of architecture as a space of participation by allowing visitors to complete the architecture through their own interpretation of the space is similar to the intended experience of this thesis. The resulting design solution of this thesis should evoke an active participation in its inhabitants both physically and mentally.

Figure 24 | VLP Chapel Plan

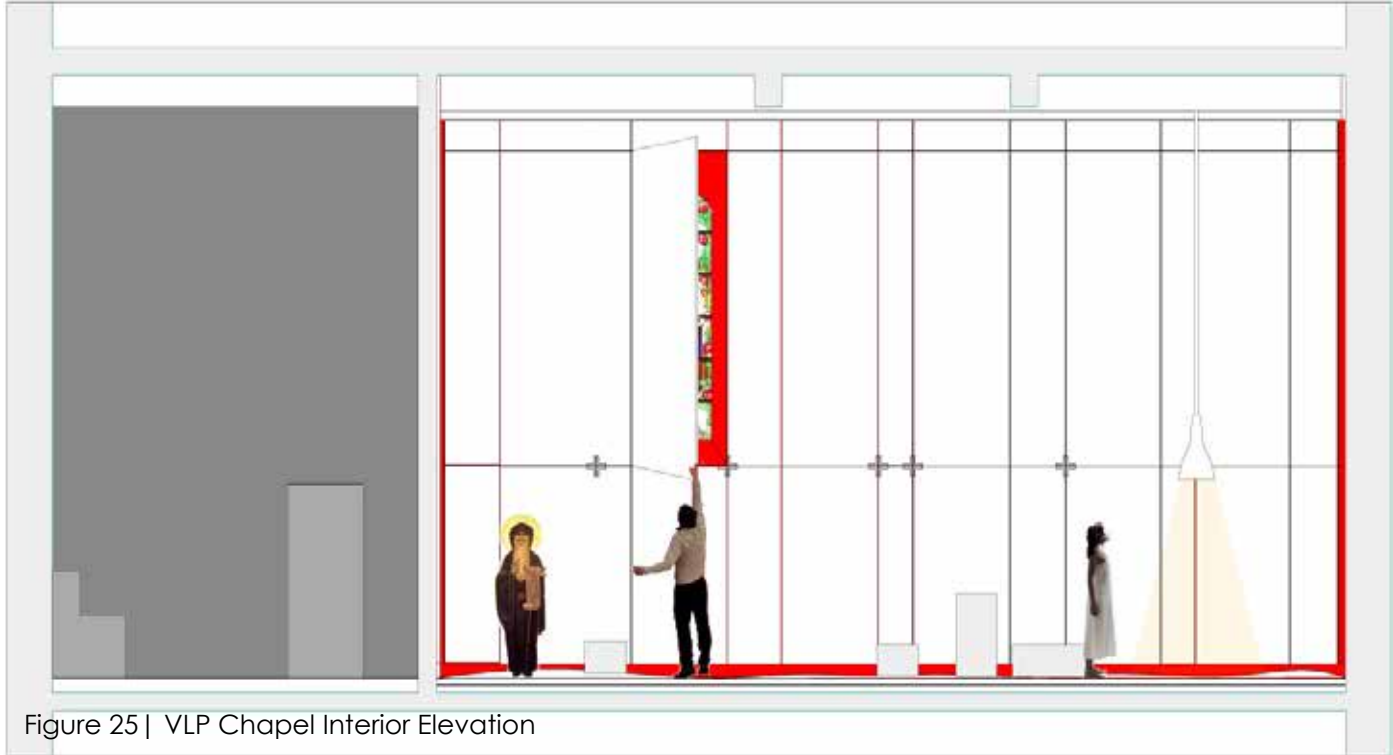


Figure 25 | VLP Chapel Interior Elevation

Figure 26-34 | VLP Chapel Interior

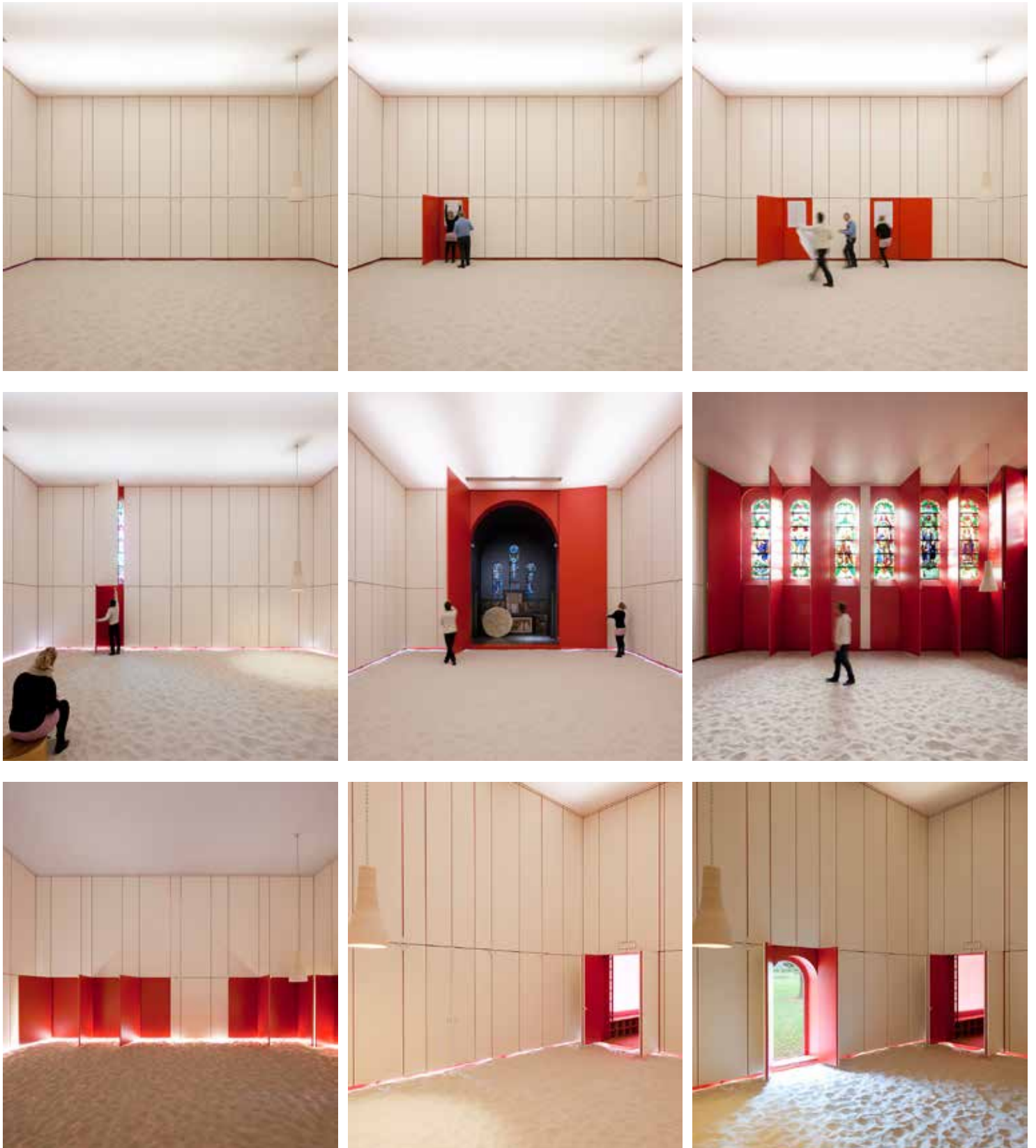




Figure 35 | House of Suicide

THE HOUSE OF THE SUICIDE

AND THE HOUSE OF THE MOTHER OF THE SUICIDE

ARCHITECT : John Hejduk

SIZE : 2.7 × 2.7 × 7.3m

COMPLETION : 1982

SERIES: Hejduk's Lancaster/
Hanover Masque

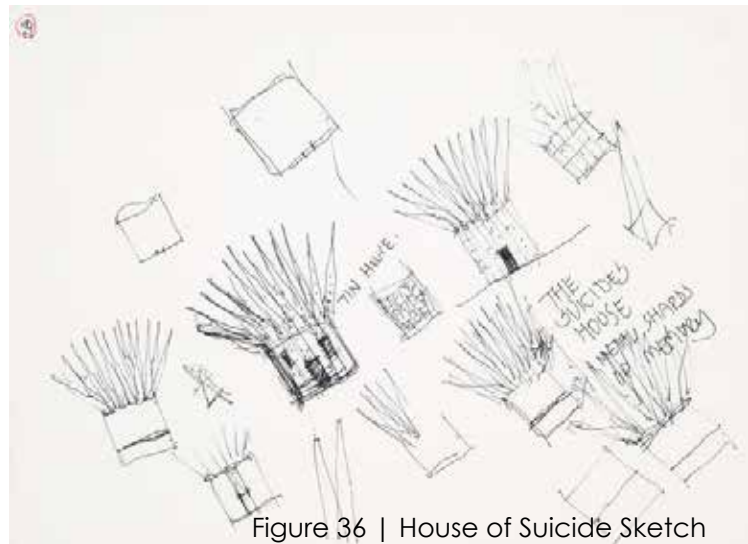


Figure 36 | House of Suicide Sketch

Through his works, Hejduk explored the idea of architecture as performance, and he regarded his works as characters.

This project is the only surviving of a series of 26 large-scale, architectural structures by John Hejduk. The work is two structures placed 4-5 meters apart. The houses face each other, locked in a dance. The first house, The House of Suicide, has angled spikes so as to deter entrance or further exploration. It is sealed so that it can only be viewed from the exterior. One can not visit but only imagine the experience of its entombed inhabitant. The second house, The House of the Mother of the Suicide, has vertical spikes. It has a small entry at its base. The interior is small and womb-like. There is a raised platform only large enough for one person to stand on and look through the small opening, to contemplate The House of Suicide. There is only one possible view, the view that haunts the mother.

This project tells a story, opening a space of participation for the viewers to complete the story and contemplate the emotions evoked by the work.



Figure 37 | Long String Instrument

LONG STRING INSTRUMENT

MUSICIAN : Ellen Fullman

LOCATION: University of Texas



Figure 38 | Ellen Fullman

Engaging people in architectural space through music is explored at the Music in Architecture Symposium at the University of Texas in Austin, where musicians, composers and architects collaborated to perform music that dramatized the spaces they were in, attempting to engage audiences with their architectural environments.

One such installation, The Long String Instrument, has been performed and developed by Ellen Fullman for over 30 years. The physical scale of the installation and the interactions of its overtones with the architectural space that it creates, turn the entire architectural environment into a musical instrument. This exploration of sound in architecture evolves into its own unique musical language. The music functioning on many levels: as a temporal composition, as sound in space and as sculpture. Music establishes a mood in the architectural space that resonates within the body of each audience member, creating a relationship between the body and architecture.

This relationship of the body to architecture through music is explored further in my own artefact investigation.

MAJOR PROJECT ELEMENTS

ARTIST RESIDENCES

These dwellings are an exploration of urban residential living with an emphasis on sustainable living.

SMALL PERFORMANCE SPACE

The design includes a small, open theater-like space, allowing for the expressive contribution of the inhabitants and the public.

PRIVATE OUTDOOR SPACE

Private or semi-private outdoor spaces are provided for all residents in the form of balconies and other communal outdoor gathering spaces.

PUBLIC OUTDOOR SPACE

There is public outdoor community space to facilitate community interaction and provide places for larger gatherings.

LIBRARY / COMMUNITY EVENT SPACE

All residents, as well as the public, have access to the art resource library and community spaces which not only provide a place for study and access to artistic resources but also foster a sense of community among residents and other members of the public.

STUDIO / REHEARSAL SPACES

Studio work spaces as well as rehearsal spaces for musicians are provided for each resident .

GALLERY

Gallery space provides opportunities for artists of all disciplines to showcase their work to the public, and also serve to bring the interest of the public to this project.

RETAIL

The development includes some retail that provides further opportunities to mix private and public uses.

USER / CLIENT DESCRIPTION

User / clients of new urban
artist-in-residence development

OWNER/LANDLORD

User Frequency: Monthly
This project will have one owner with residential spaces available to rent temporarily at weekly, monthly and yearly rates.

GROUNDS/FACILITIES CREW

User Frequency: weekly
The complex will be visited once per week by grounds keeping crew members as well as facilities cleaning crew member to ensure well-kept indoor and outdoor spaces for all users.

RESIDENTS

User Frequency: All hours
Residents of the apartment complex will have access to the facilities all day, every day.

RETAIL EMPLOYEES

User Frequency: Daily
Retail Employees will have access to retail, and all other public areas during operating hours.

PUBLIC

User Frequency: Daily
Members of the public can visit the gallery, library, performance, and community event spaces during daytime operating hours and special events. The small performance space will be accessible to the public during non-daytime operating hours for public performances or by scheduled use.

Educators and Students

User Frequency: Daily
All public spaces will be accessible during daytime operating hours, with additional access to private spaces, upon request, will be available for the purposes of educating students and the public on sustainable design.

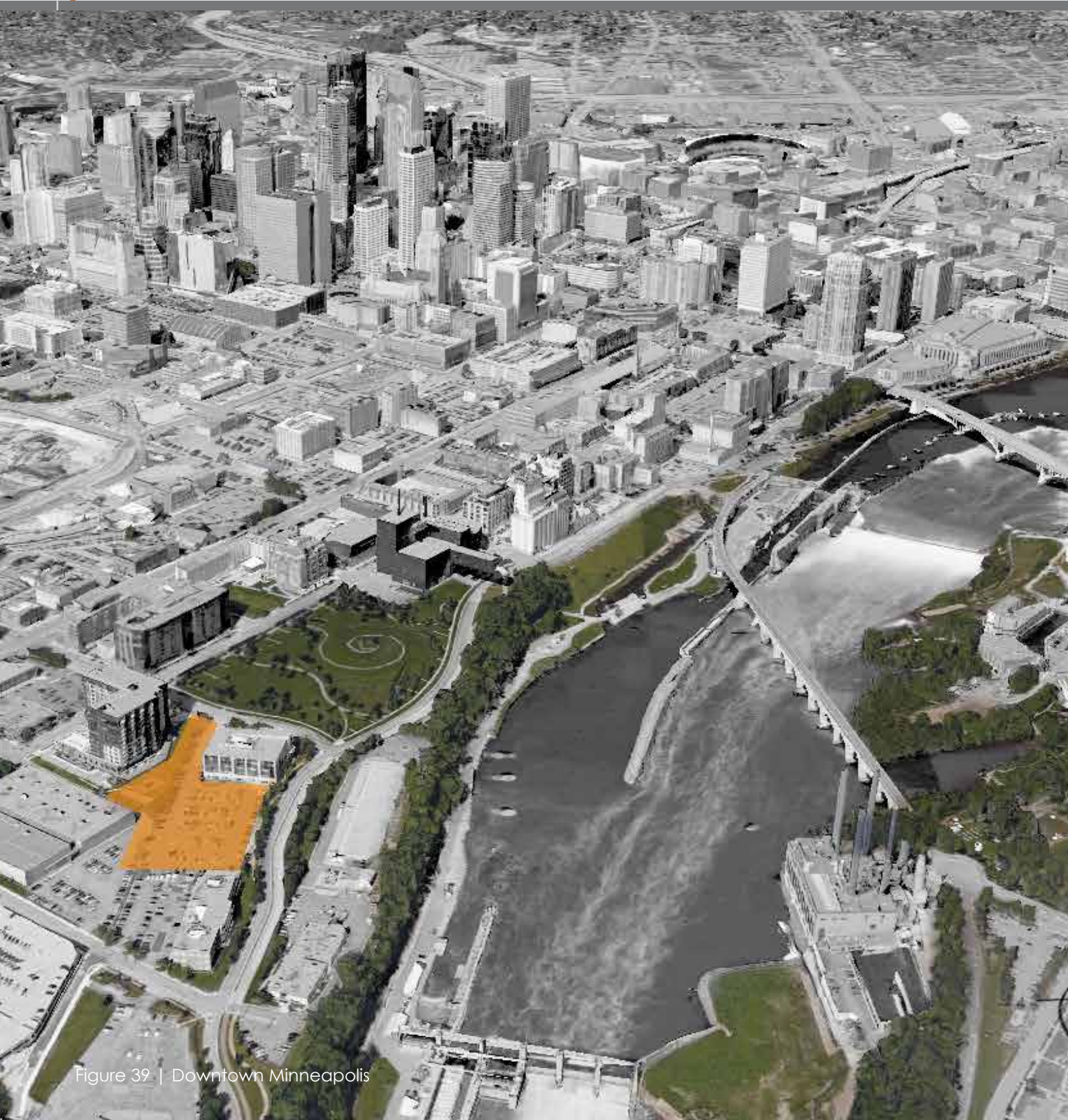


Figure 39 | Downtown Minneapolis

PROJECT SITE

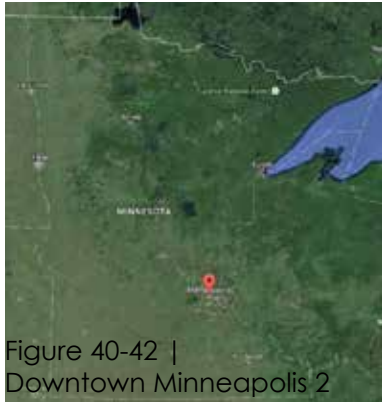
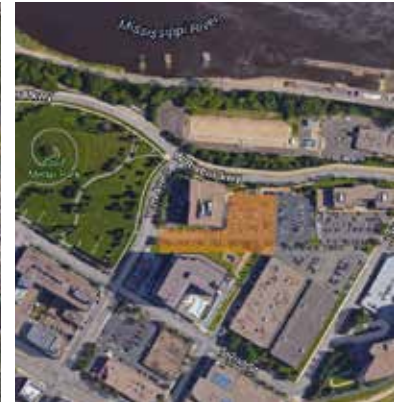


Figure 40-42 |
Downtown Minneapolis 2
Minneapolis, MN



Downtown Minneapolis



The Site

Location: Downtown Minneapolis, MN

Minneapolis, Minnesota was chosen as the location to investigate this thesis for the city's growing downtown population and thriving artistic community. Located near both the University of Minnesota and Minneapolis' many theaters, art museums, performing arts schools, music centers, and literary centers, there are a plethora of institutions already participating in artist-in-residence programs within close proximity to the site, creating sufficient need for the design of an appropriate and temporary place in which these artists may dwell.

The particular site is located on the east side Gold Medal Park. It is a beautiful location with views to the Mississippi River, Gold Medal Park, and Minneapolis' prized Guthrie Theater. This neighborhood was previously the site of several rail road lines, but has recently begun redevelopment and is becoming more populated and lively. This site brings lots of potential with its close proximity to central downtown and its connection to the many areas of interest along the riverfront.

PROJECT EMPHASIS

1. URBAN LIVING

To explore new forms of urban dwelling and reimagine what it means to dwell by inviting a participation between nature, architecture and inhabitants.

2. SUSTAINABLE DESIGN

The design focuses on integrating sustainability in a way that allows inhabitants to participate in the experience of sustainable design instead of sustainability being merely a series of un-relatable scientific formulas. This project reinterprets sustainable living based on Heidegger's sense of dwelling, by creating an atmosphere that establishes a harmonious relationship between all things—Earth, Sky, Divinities, and Mortals. In this way, the architecture calls for a greater understanding of sustainable design and emphasizes its importance in design today and the individual's role in its performance.

3. PUBLIC EDUCATION

The design creates an opportunity to educate the public on the importance of sustainable living. The design attempts to connect people to their local environments, provoking a sense of ownership and responsibility that can be translated into a desire to engage in a sustainable way of living.

ACADEMIC GOALS

The most immediate goal for the thesis is to fulfill the requirements for the Degree of Master of Architecture at North Dakota State University. Being awarded this degree upon completion of this thesis will fulfill my current educational goals. I hope this thesis will not only fulfill the requirements of this degree but also bring greater understanding and appreciation of sustainable design to my peers and colleagues. There are many ways in which to create a world better suited for our future needs and I am planning to focus on two of these: bringing people back to the city center and creating sustainable design solutions. Both of these goals will serve to create a more sustainable culture.

PROFESSIONAL GOALS

My professional goals include joining a firm in their quest for creating a greater future through sustainable architectural design. I believe the questions stated in my thesis are relevant to major problems confronting the architectural profession today and I hope my research will shed light on sustainable solutions to these design problems.

GOALS OF THE THESIS PROJECT

PERSONAL GOALS

This thesis will serve as my first contribution to the architectural community and I hope it will bring a fuller understanding of sustainable design as an obtainable and more complete goal for architectural design. I hope it will stand as a foundation for my passion of sustainable design solutions as I develop as a young architect. I hope to further my knowledge in sustainable design as I continue in my career and to bring my ideas to life in everyday context.

RESEARCH DIRECTION

Areas of Further Research:

- Sustainable technologies
- Elements of sustainability of the built environment that have the potential to engage everyday life in an urban context
- Further research of history and analysis of site
- Historical context of Minneapolis culture
- Architecture that invites a participation from its inhabitants
- Ways that Architecture can enable the engagement of elements of sustainability
- Programmatic elements of multi-family housing
- Programmatic elements of multi-use complexes

DESIGN METHODOLOGY

Research Methods Include:

- Quantitative Analysis of sustainable design methods
- Qualitative Analysis through historical and architectural theory readings
- Graphic Analysis of site conditions and sustainable design strategies
- Exploration of Architectural design through artefact development
- Case study research of applicable art and architectural projects

PLAN FOR PROCEEDING

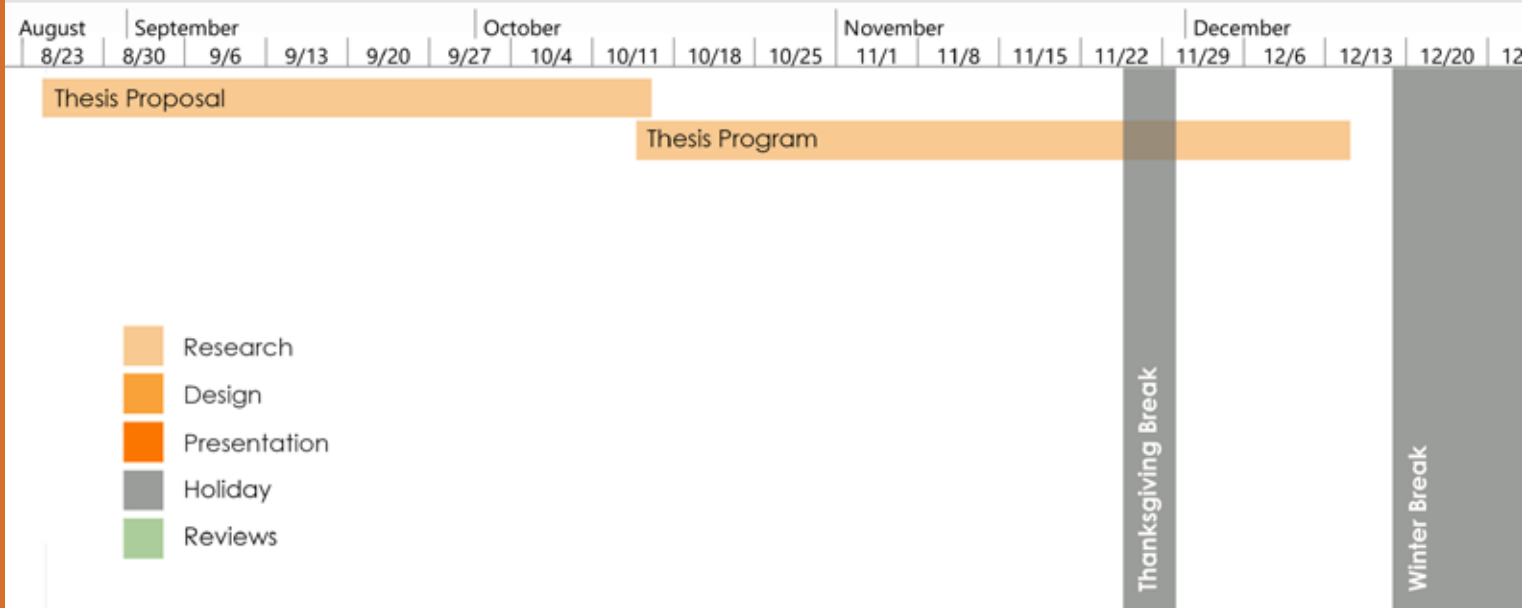
DOCUMENTATION OF DESIGN

Research findings will be recorded digitally and progress will be discussed with thesis advisor weekly.

Documentation of research and drawings will utilize design software including but not limited to: Revit, SketchUp, Photoshop, InDesign, and AutoCAD

Research conclusions and design solution will be presented orally at the end of Spring semester. The presentation will also include process models, an explanation and demonstration of artefact investigation and display of architectural drawings.

The completed thesis document including documentation of research, drawings, artefacts, and process models will be made available to the public through the North Dakota State University Repository.



FALL SEMESTER SCHEDULE 2015

- 25 Aug** First Full Day of Classes
- 25 Aug** 1st meeting ARCH 763 Course
- 7 Sept** Labor Day Holiday
- 8 Sept** 1st Draft of Thesis Proposal due to ARCH 763 Instructor
- 17 Sept** Draft of Thesis Proposal returned to students
- 15 Oct** Thesis Proposal due
- 12-16 Oct** Midterms for ARCH 771
- 29 Oct** Last day of ARCH 763
- 11 Nov** Veterans' Day Holiday
- 16-20 Nov** Final week of ARCH 771 Design Studio / Presentations
- 26-27 Nov** Thanksgiving Holiday
- 11 Dec** Last day of classes
- 14 Dec** Final Thesis Program due to ARCH 763 Instructor
- 14-18 Dec** Final Exams

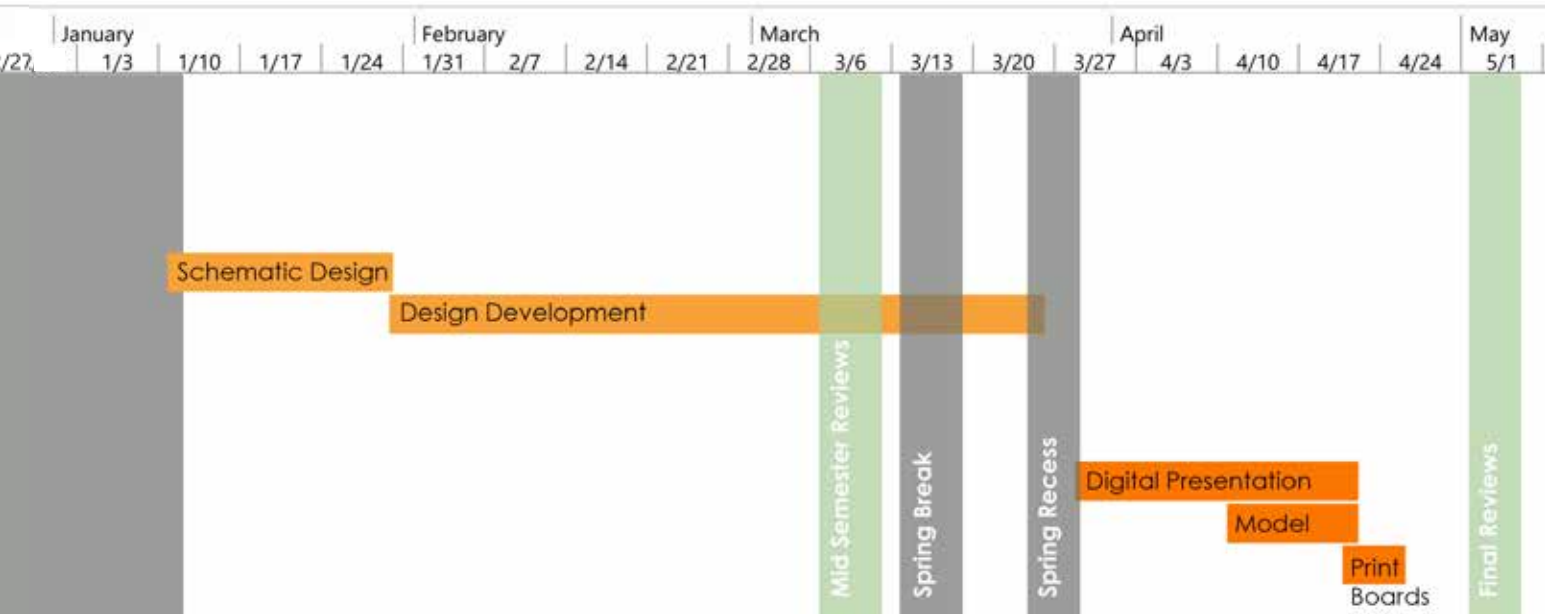


Figure 43 | Work Plan Schedule

SPRING SEMESTER SCHEDULE 2016

12 Jan	First Full Day of Classes
18 Jan	Martin Luther King, Jr. Holiday
15 Feb	President's Day Holiday
7-11 Mar	Mid-semester Thesis Reviews
14-18 Mar	Spring Break
25-28	Holiday Recess
21 Apr	Thesis Project Final Exhibits due in digital form to advisors at 5:00 pm
25 Apr	Physical exhibits for Thesis Project due at 9:00 am on 5th floor
25-27 Apr	Annual Thesis Exhibit opens on the 5th floor
02-05 May	Final Thesis Reviews
06 May	Last day of classes, Awards Ceremony
09 May	Digital copy of Final Documentation due to Instructors
09-13	Final exams, Thesis Awards Finalist Show
13 May	Final Thesis Document due at 5:00pm in the Institutional Repository
14 May	Commencement at Fargo Dome

RESULTS FROM THEORETICAL PREMISE RESEARCH

SHORT SUMMARIES OF SELECTED READINGS:

Architecture as Embodied Knowledge

Alberto Pérez-Gómez

In *Architecture as Embodied Knowledge*, Alberto Pérez-Gómez writes of the lack of clarity regarding the disciplinary bounds of architecture, and how it is often ignored by both architects and critics. He explains that usual criticism surrounding the architectural discipline is superficial and irrelevant to gaining a deeper comprehension of architectural significance. Architecture cannot be defined through the nearsightedness of recent history or objectivity of science, but only through a deeper understanding of its historical role in human culture.

Pérez-Gómez argues, "History shows that architecture has been a profound, 'interdisciplinary' form of knowledge, allowing humanity to dwell on the earth. This is not a metaphor, but a literal reality. Today we find it difficult to grasp that a 'radical orientation' is perhaps indispensable for the survival of culture, permitting humanity to transcend its mortal individuality and become part of a larger, significant and timeless reality." Knowledge can provide us with this orientation when it is understood as having an embodied consciousness, not simply as a plethora of unnecessary information. Knowledge as embodied consciousness is awareness of experiences of the body as having an influence on one's knowledge or understanding of the world beyond the brain. Pérez-Gómez maintains that knowledge, as embodied consciousness, is the wisdom humanity needs in order to, "remain open to Being and attain authentic well-

being, the fullness of human potential which characterizes dwelling and differentiates it from other orders of existence on earth.”

In the past, art and architecture acted as a source of embodied knowledge for society. The arts have always been an expression of not merely information but true knowledge. Through the act of making art or architecture (poiesis) we gain knowledge by transforming and continuing the world. Architecture was once much more than what we think of when we consider architecture today—built structures. Architecture could be, “a stone circle or a pyramid...a tomb or an altar, a Gothic cathedral, the setting for a mystery play, a Renaissance church, the ideal plan of a city, the text and drawings of Francesco Colonna, a Baroque palace and its garden, fireworks displays or the canvas and wood structures for urban celebrations...” Today, we have a hard time understanding how all these expressions of architectural ideas are, in essence, the same. It is due to the specialization of our culture that we now falsely identify the history of architecture as the history of buildings. We need to see past this misconception of architecture in order to truly understand our discipline.

Pérez-Gómez calls for a realization that there is a difference between information and knowledge. Today, we have many sources of information available to us whenever we need it. However, we are lacking in knowledge. When information takes the place of knowledge in our practice, we are left with only efficient and economic architecture that has no meaning.

Pérez-Gómez argues that, “Architecture is not the embodiment of information, it is the embodiment of meaning. It is the “geometrical engagement of humanity-in-the-world.” However, our architectural mindset today has shifted from a holistic definition, “dwelling” to a more functional definition, “shelter”. In order to shift back to a meaningful definition of architecture, the architect must have, “his or her own storia, the history-theory which is not a method but rather a new mythos, an understanding of the meaning of the architect’s

actions 'here and now' in relation to the totality of culture." This is the architect's basic knowledge which Pérez-Gómez argues is much more important than particular skills or techniques. This "storia," or body of knowledge stemming from past events, is what gives architecture its cultural significance, making it much more than just a building for shelter.

Pérez-Gómez urges educators to teach the fundamental questions affecting architecture and to avoid the false impression that architecture can be reduced to formulae or styles. Architecture needs to be understood once again as embodied knowledge. We are not computers. Our consciousness is always embodied, grounded in our lived experiences, and our bodies are directly related to our way of thinking. Our greatest tool is our human disposition, our curiosity of the world, which we explore through our bodies. Architecture must re-engage with our bodies, offering us true knowledge, or a greater understanding of the world, through our lived experience and in turn create something meaningful.

Architecture and the Crisis of Modern Science

Alberto Pérez-Gómez

Between the Renaissance and the nineteenth century, the definition of architecture and its traditional role as a fine art dramatically changed in response to the scientific revolution. In his writing *Architecture and the Crisis of Modern Science*, Pérez-Gómez argues that today architecture lacks meaning. This can be traced to the split between the transcendental dimension and the formal dimension in the seventeenth century. In order to restore meaning in architecture, it must be based on experience instead of mere mathematical formula.

Alberto Pérez-Gómez starts by saying, "Perception is our primary form of knowing and does not exist apart from the a priori of the body's structure and its engagement in the

world" (3). Here he means that what we know of the world is through our bodily experience. Our body interacts with the world spatially, through movement and time. Our body is our "instrument of meaning" (3). Everything we experience in the world is through our bodies, and it is through that bodily interaction that we gain knowledge.

This idea of gaining knowledge and meaning through our bodily experience used to be what drove architectural design. Architecture was created as an extension of the body, "the creation of an order resonant with the body's own" (3). This was the function of architecture.

Husserl describes that there are two dimensions from which every system derives meaning:

1. Formal dimension-structured and scientific
2. Transcendental dimension-human thought and action

These two dimensions used to work together when evaluating the meaning of something. However, the transcendental dimension of meaning has been in question during the last two centuries and now the formal dimension is held to a higher priority. Development in mathematics caused this transition when people started to believe they could control and dominate the external world through technology. People also started to believe that everything could be explained with science.

This switch, which Pérez-Gómez refers to as "the crisis," from transcendental dimension of human thought and action to formal dimension of structure and science took place after the Galilean revolution in the seventeenth century. This process was marked by two transformations, the first occurring at the end of the seventeenth century. This is when "the link between the human and the divine was finally brought into question by philosophy and science" (10), and also when, "Architects began to consider their discipline a technical challenge, whose problems could be solved with . . . number and geometry" (11).

The second transformation occurred at the end of the eighteenth century, when faith and reason no longer co-existed. “Scientific thought came to be seen as the only serious and legitimate interpretation of reality denying any need for metaphysics” (11). Geometry and mathematics were now thought of as purely formal, without meaning or divine power, only instruments of technology. This is when contemporary architecture started to become popular. The world was no longer thought of as having a Divine Nature that could be revealed through bodily experience and observation, but became thought of as purely material. Architecture could no longer claim to be an “art of imitation.” “Deprived of a legitimate poetic content, architecture was reduced to either a prosaic technological process or mere decoration” (11). Architecture was now just material structure, with no larger meaning or attempt to connect our bodies with the knowledge of the world.

Pérez-Gómez concludes his writing with the claim, “Today architects often work under the absurd assumption that meaning and symbol are merely products of the mind, that they can be manufactured a priori and that they possess somehow the certainty of number” (12).

**The Integrative Design Guide to Green Building: Redefining
the Practice of Sustainability**

Bill Reed

and

Designing for Hope: Pathways to Regenerative Sustainability

Dominique Hes and Chrisna Du Plessis

Bill Reed, renowned sustainable architect and designer, argues that our current approach to sustainability does not grasp a complete picture. He believes sustainability should be looked at with a whole systems approach and that we need to realize our role as humans is to maintain the Earth's systems. In his book, *The Integrative Design Guide to Green Building*, Reed describes sustainability as, “not simply about efficient technologies and techniques. Sustainability literally

is about sustaining life—a practice by which living things such as forests, neighborhoods, people, businesses, watersheds, mushrooms, microbes, and polar bears contribute to the interrelationships that ensure the viability of each over the long haul” (2009, p. 41) Reed critiques the way we currently practice sustainable design calling it an “exercise in efficiency.” We use rating systems such as LEED as a guide to reduce the damage we are causing to the environment but we are not truly living in a sustainable manner. As Jonathon Porritt, former director of Friends of the Earth and Chairman of the UK Sustainable Development Commission, is quoted in the text saying, “If something is sustainable, it means we can go on doing it indefinitely. If it isn’t, we can’t” (Reed, 2009, p. 41)

A story of this whole systems approach being applied in practice is told by Bill Reed in *Designing for Hope*. Bill Reed discusses his experience in Brattleboro, Vermont when the Brattleboro food co-op sought out his team to help them become a LEED Gold grocery store. However, the project team’s main concern was to develop a sustainable project, whether that meant gaining LEED certification or not. After some investigation, the project designers soon realized several issues with the sustainability of the co-op, beginning with the issue that its produce was being shipped from all over the world. They realized that the first thing they needed to look at wasn’t the building but the larger food system that it was a part of. They found that all farmland within a 30 mile radius of Brattleboro had been abandoned due to a dying watershed, polluted water and depleted soil conditions. The team discovered that the best soil was actually in Brattleboro’s downtown. Because there was a city there, no one had even considered using the land in downtown to grow food. However, only 35% of the land in downtown was built upon. As a result, the project expanded to become an agricultural and soil extension service to teach people how to grow their own food again. Not only did the food co-op become a sustainable grocery store, but it became a credit union to start the operation of getting people to buy farms again, a forest service extension to begin helping the areas forests, a cannery so people could can their own food, an

abattoir so hunters could dress their own meat, and daycare center to take care of customers kids. The point of project is that the building may be a green building, but that doesn't mean it is sustainable. The real success of the Brattleboro food co-op is not the building itself; it's the farming, the land, the watershed, and the health of the community that allows the co-op to work as a whole system with its environment to sustain a successful food system (Hes, 2015, pp. 195-196).

Building Dwelling Thinking, In Basic Writings

Martin Heidegger

In his book *Basic Writings*, German Philosopher Martin Heidegger questions the relationship between building and dwelling in Chapter VIII *Building Dwelling Thinking*. He asks, "What is it to dwell?" (p. 323). He begins by giving us the obvious relationship of dwelling by means of building, but points out that not all building provides dwellings (rail roads, dams, markets) if dwelling is defined as lodging.

Heidegger then switches gears arguing that, "Building is not merely a means and a way toward dwelling—to build is in itself already to dwell" (p. 324). Building and dwelling are not two separate activities. He then explains that our understanding of the words building and dwelling as two separate things is a result of the history of language. Heidegger relays the history of the word *Bauen*, to build, whose proper meaning, to dwell, has been lost in language's history.

"But if we listen to what language says in the word *bauen* we hear three things:

1. Building is really dwelling.
2. Dwelling is the manner in which mortals are on the earth.
3. Building as dwelling unfolds into the building that cultivates growing things and the building that erects buildings" (p. 326).

Building as dwelling is nurturing things, both natural and man-made. To Heidegger, "The basic character of dwelling is to spare, to preserve" (p. 328). He speaks of dwelling in terms of the fourfold, "Earth, sky, divinities and mortals." Heidegger believed that preserving this fourfold in its essential being is how we dwell in a holistic way on earth. "Mortals dwell in that they save the earth—taking the word in the old sense still known to Lessing...To save really means to set something free in its own essence. To save the earth is more than to exploit it or even wear it out. Saving the earth does not master the earth and does not subjugate it, which is merely one step from boundless spoliation" (p. 328).

Humans exist in Heidegger's fourfold as mortals who dwell by their sparing of the earth and preserving of the fourfold. The fourfold is preserved by bringing its essence into things which is done by letting those things "be in their essence" (p. 329). In this way, building is the cultivating and construction completed by mortals which becomes dwelling in the preserving of the fourfold and sparing the earth.

COMPREHENSIVE SUMMARY OF SELECTED READINGS

After the scientific revolution, our way of viewing the world changed significantly. Science was seen as the answer to all of our problems and the world was viewed as something to be controlled by man. As Alberto Pérez-Gómez states in his writing, *Architecture and the Crisis of Modern Science*, "Development in mathematics augured the possibility that the external world of man could be effectively controlled and dominated by a functionalized theory substituted by technology" (p. 5). This view of the world has thrown us into a constant battle with our environment. We create new landforms, divert rivers, clear forests, all the while destroying existing ecosystems and disrupting well-oiled natural systems. We manipulate our environment until it can't give us any more and then we move on to pick our next battle. Instead of trying to control nature through technology we can use technology to create a mutually beneficial relationship with nature.

Bill Reed calls us to live in a mutually beneficial relationship with nature in his writing *The Integrative Design Guide to Green Building*. Instead of looking at human systems and natural systems as separate parts, we need to view them as a whole, interrelated network that can only survive if all the parts are working together. We also need to approach technology with a new mindset. Instead of viewing technology as a means to control nature to fit our needs, we should view it as a driver for benefiting both human and natural systems. Humans are a part of nature. Therefore, I would argue that everything man-made is also a part of nature. Technology, being a man-made construct, should also be viewed as a part of nature and its use should work for, instead of against nature. In order to sustain our Earth, I believe we need a different approach to sustainability. We need to not only reduce the damage we are causing the environment, but discontinue the damage. And as Bill Reed urges us to do, we need participate with our environments, designing with a whole systems approach.

This new approach to sustainability also has roots in the old way of viewing sustainable living—before it was termed “sustainable.” Previously, sustainable living was a simple concept: living in a way that preserved the earth’s resources. Living in this way is how Heidegger defined dwelling, “Mortals dwell in that they save the earth” (p. 328). According to Heidegger, we dwell by living in harmony with nature and engaging the fourfold. And the only way to engage the fourfold is through mortals and their preserving. In other words, dwelling in a holistic or sustainable way on earth requires the human touch. However, with sustainable practices today, we have lost this human touch aspect. Today, sustainable design is applied to a building without any indication to the public of its presence or impact. Sustainable design has become purely scientific, no longer relating to humans or the human body. The problem with this is that we learn through our bodily interactions with the world. In order better understand sustainable design and our role in its success, it must be reconnected to the human bodily experience.

Pérez-Gómez explains this relation of the human body to meaning, specifically to meaning in architecture, in *Architecture and the Crisis of Modern Science*, “The a priori of the world, which is the ultimate frame of reference for any truly meaningful architecture, is hidden beneath a thick layer of formal explanations . . . contemporary man lives with the illusion of the infinite power or reason. He has forgotten his fragility and his capacity for wonder, generally assuming that all the phenomena of his world, from water or fire to perception or human behavior, have been ‘explained’” (p. 6). The problem with this way of thinking is that science alone cannot explain or truly understand human behavior and symbolic thought through static formulas because these things are dynamic and ambiguous. This way of thinking causes us to forget to listen to our bodily experiences of the world. Today, mathematical logic has replaced metaphor as a model of thought. Art is rarely understood as “a profound form of knowledge” (Pérez-Gómez, 1983, p. 6). But art and metaphor help us create meaning that resonates. We now look to formulas and universal standards to create successful

designs, but with this methodology we have lost the ability to create truly meaningful buildings.

In *Architecture as Embodied Knowledge*, Pérez-Gómez addresses the issue of the loss of meaning in architectural design. He calls for a re-evaluation of the architectural discipline, explaining that our modern society has reduced the definition of architecture to a merely efficient and economic means of shelter. Our evaluation of architecture focuses on a building's stylistic applications instead of its cultural significance. No longer does architecture point beyond itself offering true knowledge and meaning. To combat the purely functional direction that architecture has taken, we must connect our architectural designs to an embodied consciousness in order to redeem architecture from cultural irrelevance.

This thesis attempts to take note from these readings and re-define our current sustainable design practices. It attempts to help us acknowledge our place in an on-going historical order and realize that we are not self-sufficient wholes, but must dwell holistically or sustainably within the fourfold or our larger cultural environment. This thesis attempts these things through architectural design that connects with our experiences rather than relying solely on scientific constructs; engaging our embodied consciousness to create a deeper understanding of our place in our larger historical, cultural and environmental communities.

PROJECT JUSTIFICATION

For German Philosopher, Martin Heidegger, a bridge is a manifestation of the fourfold—Earth, Sky, Divinities, and Mortals—which is at the root of all dwelling. He believed that preserving this fourfold is how we dwell in a holistic way on earth. This understanding of sustainable living requires human participation. Today, sustainable design has disregarded human participation with its specialized application, limiting our understanding of its relationship to the larger world. However, the task of Architecture is not to reduce our interaction with the world, but rather to, like music, invite us into a space for interpretation; calling us to participate in its experience. This thesis attempts to reinterpret sustainable living based on Heidegger's sense of dwelling, by creating an atmosphere that establishes a harmonious relationship between all things—Earth, Sky, Divinities, and Mortals.



Figure 44 | Guthrie Theater

HISTORICAL, SOCIAL, CULTURAL CONTEXT OF THESIS

The historical and cultural context of Minneapolis is very rich with a well-known dedication to the visual arts and music. Minneapolis and St. Paul, combined contain the second most theater seats per capita in the nation, behind New York City, and Minneapolis has the third-largest theater market in the U.S. behind New York and Chicago. The Guthrie Theater in Minneapolis largely contributes to this as Minneapolis' largest theater company, operating year-round and employing more than 500 people per year.

The Guthrie Theater opened on May 7, 1963, with a production of Hamlet directed by Sir Tyrone Guthrie. The theater became an important prototype for a new kind of theater—a resident theater. The idea of the resident theater was an alternative to the commercialism of Broadway that had become associated with high costs and no longer encouraged the production of great works of literature, the development of artists' talents nor the satisfaction of audiences. This new kind of theater was chosen to be located in Minneapolis, MN.

"The idea of a major resident theater was introduced to the American public in a small paragraph on the drama page of The New York Times on September 30, 1959, which invited cities to indicate interest in Tyrone Guthrie's idea. Seven cities responded: Waltham, MA, Cleveland, Chicago, Detroit, Milwaukee, San Francisco and Minneapolis/St. Paul (which was not only interested but eager). Guthrie, Rea and Zeisler visited the seven cities, but were drawn to Minneapolis/St. Paul because of its location in the heartland of America, the vitality of the cultural community, the presence of a large state university and many small colleges, and the enthusiasm shown by the Upper Midwest for the new theater project" (Theater History, 2015).

Since the construction of the Guthrie in the 1960's, the theater has undergone many renovations, expansions and even relocation. In 2001, the theater began its journey of relocating to its current location along the Mississippi River. French architect Jean Nouvel became the Design Architect for the new theater which opened on June 25, 2006. The theater continues to grow and change as the community that founded it changes. The Guthrie Theater remains a reflection of the culture and human spirit of its audiences today.

Minneapolis is home to many other theaters, art museums and institutes, and concert halls as well. The Walker Art Center is one of the five largest modern art museums in the U.S. located just outside Minneapolis' downtown, and the Grammy nominated Minnesota Orchestra plays in downtown Minneapolis' Orchestra Hall. Minneapolis' commitment to the arts is made clear by simply taking a quick walk through downtown. Its well-known creative culture continually draws creative people and audiences to the city year after year.

The design of this thesis plays on the already richly artistic culture of the downtown Minneapolis area. It creates housing for visiting artists and opportunities for people of different cultures to come together and share in the creation of new ideas and cultural works.



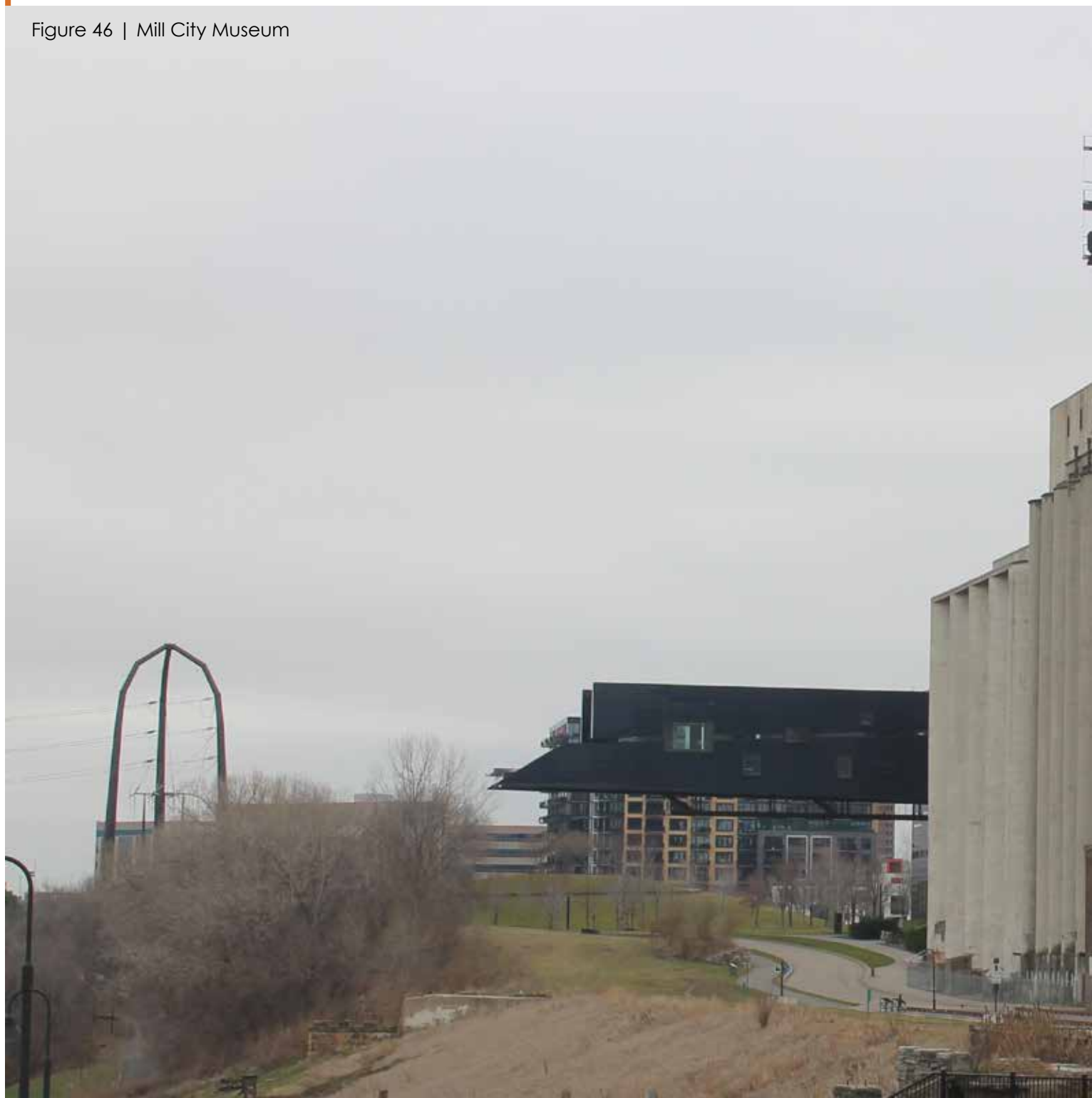
Figure 45 | Minneapolis Stone Arch Bridge

Minneapolis was also developed around a major water resource—the Mississippi River. Minneapolis used the river for more than just transportation unlike most developing cities. The falling water of St. Anthony was harnessed to create power for what became the most important milling complex in the nation. Although the milling industry is merely a memory today along the Mississippi River’s edge, the buildings that developed the city into a milling and trade center remain in what is designated as the St. Anthony Falls Historic District.

The St. Anthony Falls is the only major waterfall on the Mississippi River. It was named by Father Louis Hennepin, a Belgian missionary, in 1680. The falls were used to power the Minneapolis Mill Company’s flour mill which lead to Minneapolis’ rise as the milling capital of the nation.

This thesis sees great opportunity in the Mississippi Riverfront and seeks to engage in its deep cultural roots. Pulling from the history of Minneapolis' pine lumber mill near St. Anthony Falls, this project chose wood as its primary building material. The use of cross-laminated timber panels and glulam beams make for a more sustainable design solution while maintaining the natural qualities of heavy timber. The proximity to the water and many trails also create many opportunities to enjoy the natural beauty of the site.

Figure 46 | Mill City Museum



The falls of St. Anthony were vital in the city's development throughout history and contributed to the city's natural beauty making Minneapolis a great place to live, work, and play today.





Figure 47 | Minneapolis, MN Downtown Site

SITE ANALYSIS



SITE NARRATIVE

Minneapolis is the largest city in the state of Minnesota with a population density of 3.8 million. Along with St. Paul, Minneapolis is the second largest economic center in the mid-west, after Chicago. Minneapolis contains America's fifth-highest concentration of fortune 500 companies categorizing it as a global city.

Despite its colder climate, Minneapolis does not lack in outdoor activity. It's known for its many lakes, parks and heavily used bike trails, giving residents many opportunities to connect to the outdoors.



Figure 48 | Site Viewed from Inside Guthrie Theater

SITE ANALYSIS

QUALITATIVE ASPECTS

Minneapolis has a rapidly growing downtown area. The site, located in East Downtown Minneapolis, is conveniently located near many indoor and outdoor entertainment venues including: the Guthrie Theater, Mills City Museum, Gold Medal Park and the Mississippi River with pedestrian and bike trails.

The site was previously a railway site, that has been redeveloped in recent years into a thriving and exciting area to live, work and play right along the beautiful Mississippi river.

Although the site has undergone much redevelopment, it still lacks a few key uses. The site is surrounded by several office buildings, multi-family residences and several areas of entertainment, but lacks any place for retail. Since the area is surrounded by many artistic venues and is known for its creative culture, I imagine small retail such as an art supply shop would be very successful in this area.

In my response to the site, I intend to open up the design to both sides of the site, city and riverfront, and take advantage of the pedestrian and bike trails along the river to bring the public into the design.

LIGHT QUALITY

The site is well lit by natural sunlight. The most interfering shadows on the site are cast by the 11 story residential building on the site's south-west corner. All other surrounding structures have very little effect on the quality of daylight accessing the site.

HUMAN CHARACTERISTICS

The site is currently a surface parking lot, wedged between a residential complex to the south and a commercial office building to the north. New development can be seen going up all around the site, the nearest new building being a residential complex one block to the west of the site. The site is currently unused by humans other than for the purpose of parking their vehicle before quickly transitioning to inside one of the surrounding buildings.

DISTRESS

Being a parking lot, distress on the site is hard to determine in terms of soil conditions. All immediate surrounding structures are currently in use and the asphalt surface of the parking lot appears smooth and well-maintained.



VEGETATION

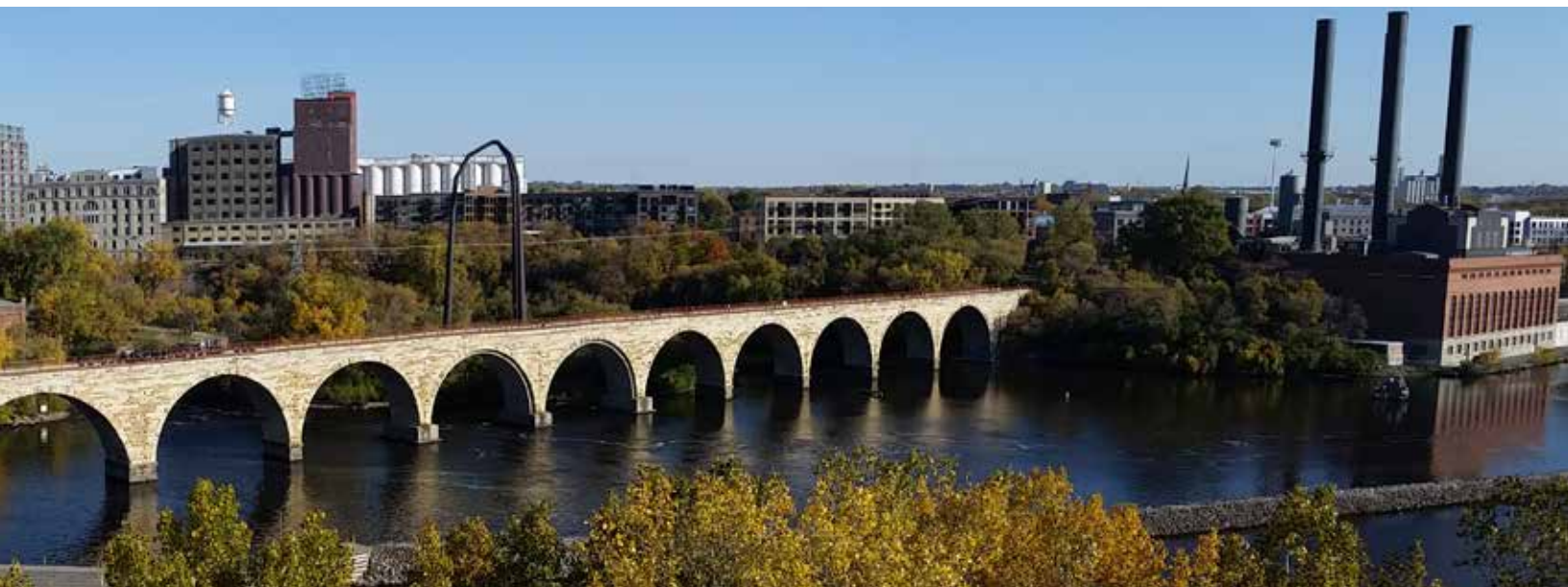
Currently there is little vegetation on the actual site. Very few deciduous trees are scattered throughout the parking lot atop small islands of turf grass. To the north though, various deciduous trees heavily line the Mississippi River's edge.

WIND

The site is fairly protected from wind. Mid to High-rise buildings border the site's East, West, and South sides. To the north, heavy tree coverage along the river deters most winter wind gusts. The west side of the site creates a potential wind tunnel between the two taller residential and commercial buildings.

WATER

The site is less than 500 ft. from the edge of the Mississippi River. In the winter, the river is visible from the street level of the site. In the summer, trees block a clear view of the river from the site's street level, however the sound of water running over the damn and the freshness of the air contribute to creating a pleasant outdoor ambiance year round.





BUILT FEATURES

The site is currently a surface parking lot surrounding by several built features. Building types include: residential, commercial, industrial, and entertainment venues such as the Guthrie Theater and Mill City Museum. Other areas of interest include Gold Metal Park and the Mississippi River trails.



Figure 50 | Built Features Isometric Map

In order for this area of downtown to become a more self sufficient neighborhood that is convient for people to live in, I believe it needs the addition of grocery/food venues and retail options.

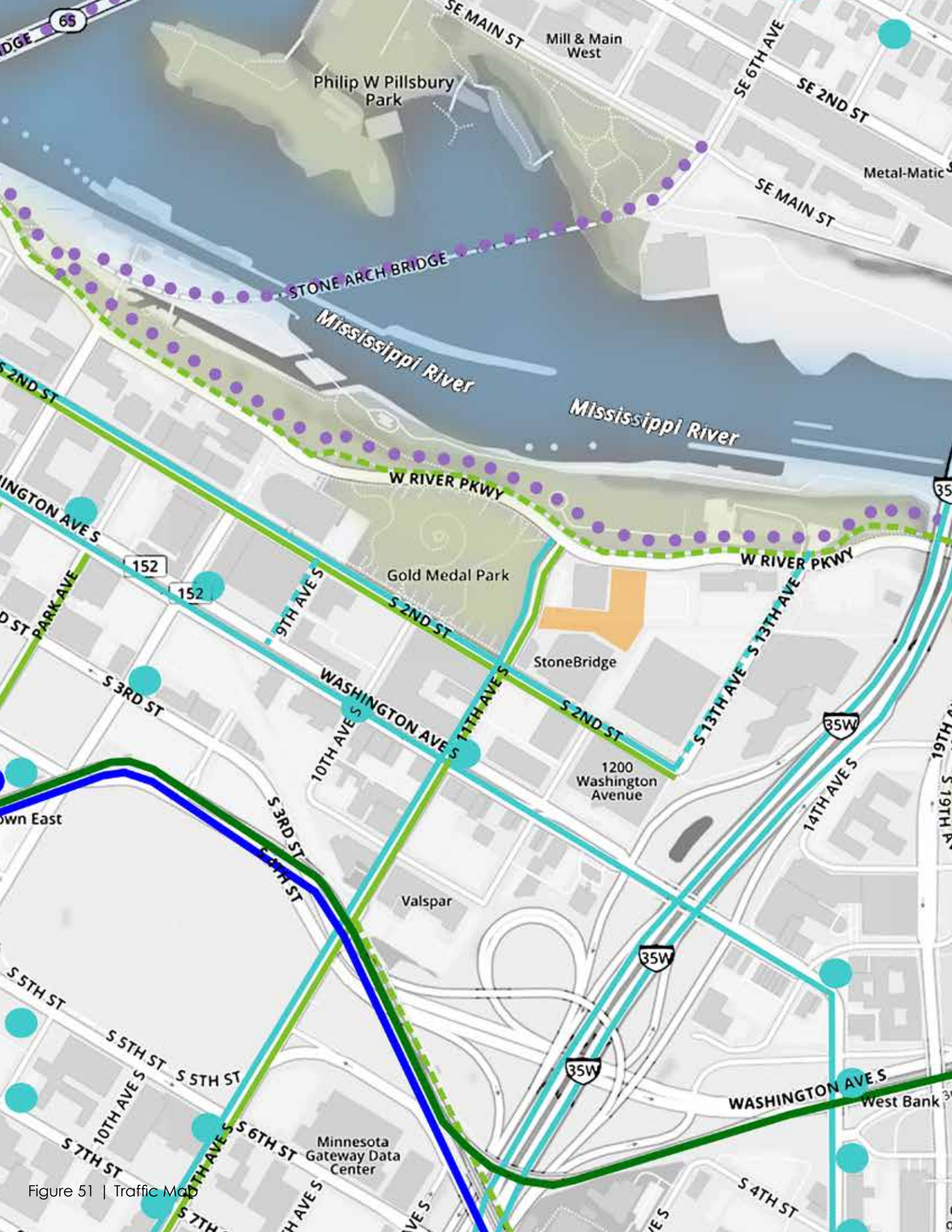


Figure 51 | Traffic Map

SITE ANALYSIS

QUANTITATIVE ASPECTS

SITE CHARACTER

The site appears to be well-maintained. No signs of distress are visible in the surrounding vegetation and landscape. Surrounding buildings are currently in use and well-kept. Overall, the site is situated in a very pleasant environment.

PEDESTRIAN TRAFFIC

Pedestrian Traffic is very low on the immediate site. However, the adjacent Gold Medal Park and the Trails along the river receive much higher pedestrian activity.

BIKE TRAFFIC

Off street bike trails receive very high traffic in the spring, summer and falls months, with reduced traffic in the winter. While few on street bike lanes are provided near the site, Minneapolis is known for its extensive bike lane system with high popularity all year round. With the growing density around the site, additional on street bike lanes will be necessary in the near future.

LEGEND

Site	
Bike Trail (off street)	
Bike Lane (on street)	
Pedestrian Short Cut	
Heavy Vehicular Traffic	
Light Vehicular Traffic	
Light Rail - Green Line	
Light Rail - Blue Line	
Light Rail Stop	
Bus Stop	

VEHICULAR TRAFFIC

Vehicular Traffic around the site is minimal with the exception of 11th street to the west where a few cars pass every minute. A block and a half to the east is the 35W overpass which contains the highest density traffic and can be vaguely heard on site.

VIEWS

Views of each cardinal direction facing out from the site.

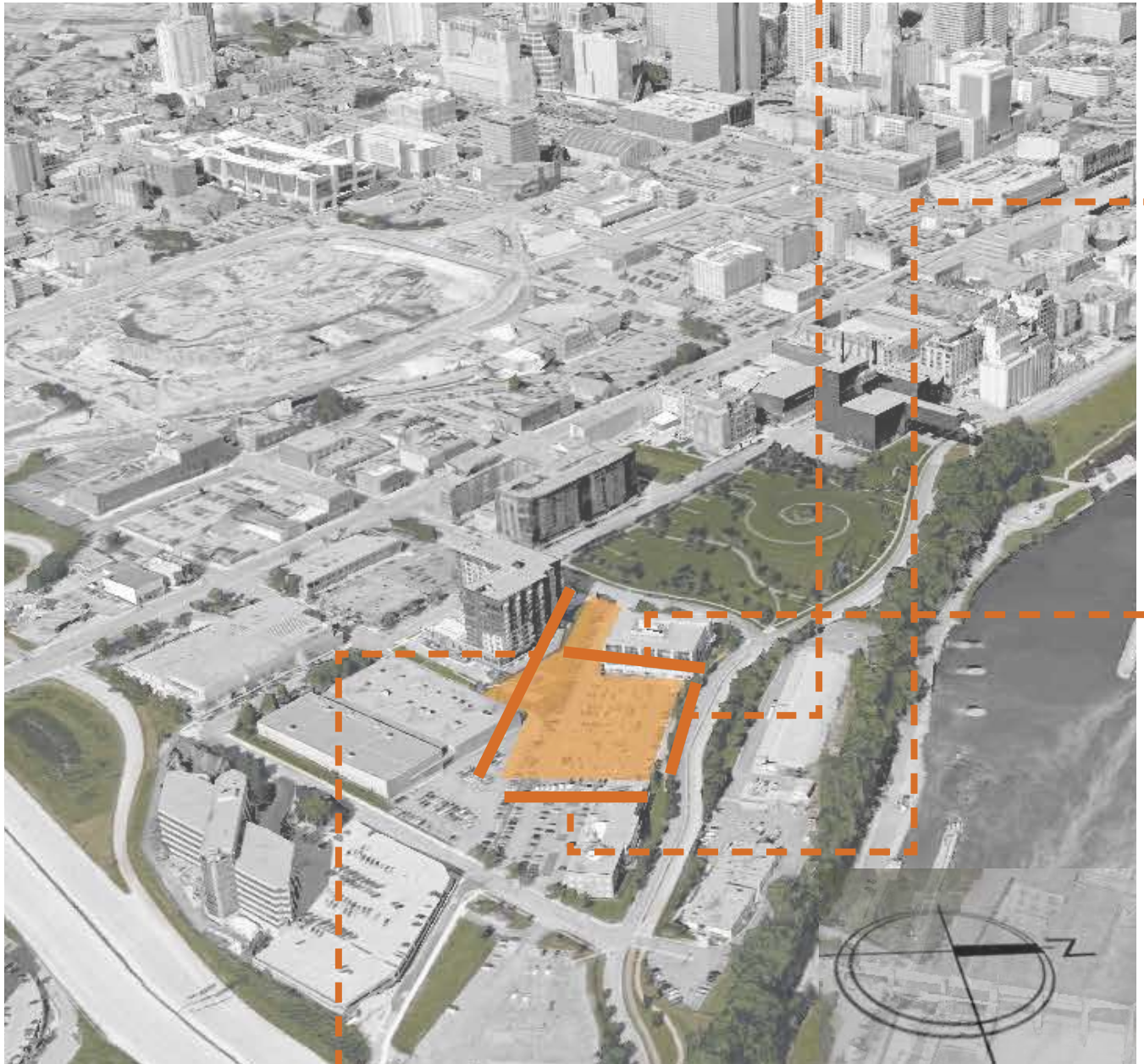


Figure 52 | Views from Site Diagram



LOOKING NORTH



LOOKING EAST



LOOKING WEST



LOOKING SOUTH

Figure 53-56 | Views from Site



Figure 57 | Topography and Soil Map

SOIL AND TOPOGRAPHY

The soil classification unit for this site is U4A. This signifies that the soil on this site is Urban land-Udipsamments (cut and fill land). This makes sense because cut and fill land is commonly used in the construction of railways and this site was previously a railway site.



The slope of the site is between 2-3%. This means that the site is very flat, but will still drain fairly easily. The flat even surface of the site will make it suitable for all kinds of activities and will work well as the site of a mixed-use residential building.

ZONING DISTRICTS

I1 – Light Industrial District

The I1 Light Industrial District is established to provide clean, attractive locations for low impact and technology-based light industrial uses, research and development, and similar uses which produce little or no noise, odor, vibration, glare or other objectionable influences, and have little or no adverse effect on surrounding properties.

OVERLAY DISTRICTS

IL – Industrial Living Overlay District

The Industrial Living Overlay District is established to encourage the rehabilitation and reuse of existing industrial structures and to provide for limited residential and retail uses in the I1 and I2 Industrial Districts where such uses are compatible with other uses in the area.

DH – Downtown Height Overlay District

The Downtown Height Overlay District is established to regulate the building bulk requirements of structures within portions of the downtown area where such regulation is consistent with the planned character of the area and its surroundings.

The maximum height of all principal structures, except single and two-family dwellings and cluster developments, shall be eight (8) stories or one hundred twelve (112) feet, whichever is less, for properties located between Washington Avenue South and Second Street South. The maximum height for all other properties shall be six (6) stories or eighty-four (84) feet, whichever is less.

DP – Downtown Parking Overlay District

The Downtown Parking Overlay District is established to preserve significant and useful buildings and to protect the unique character of the downtown area and the mixed-use downtown neighborhoods by restricting the establishment or expansion of surface parking lots and establishing certain minimum and maximum off-street parking standards in the downtown area.

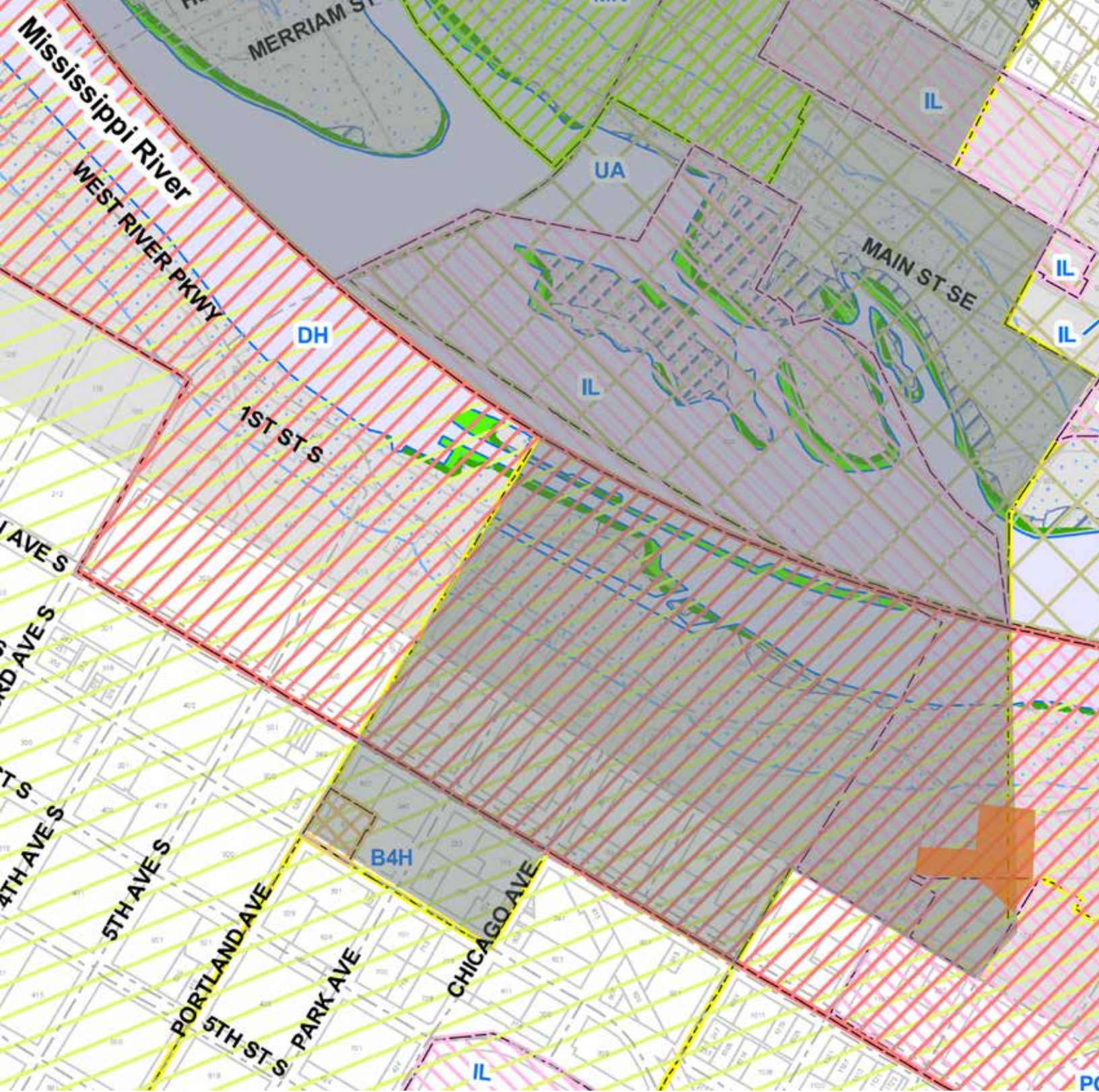





Figure 58 | Zoning Map

ZONING DISTRICTS

-  I1 - Light Industrial District
-  Site


OVERLAY DISTRICTS

-  Industrial Living
-  Downtown Height
-  Downtown Parking

Downtown Parking Requirements

Table 541-2 Specific Off-Street Parking Requirements - Downtown Districts

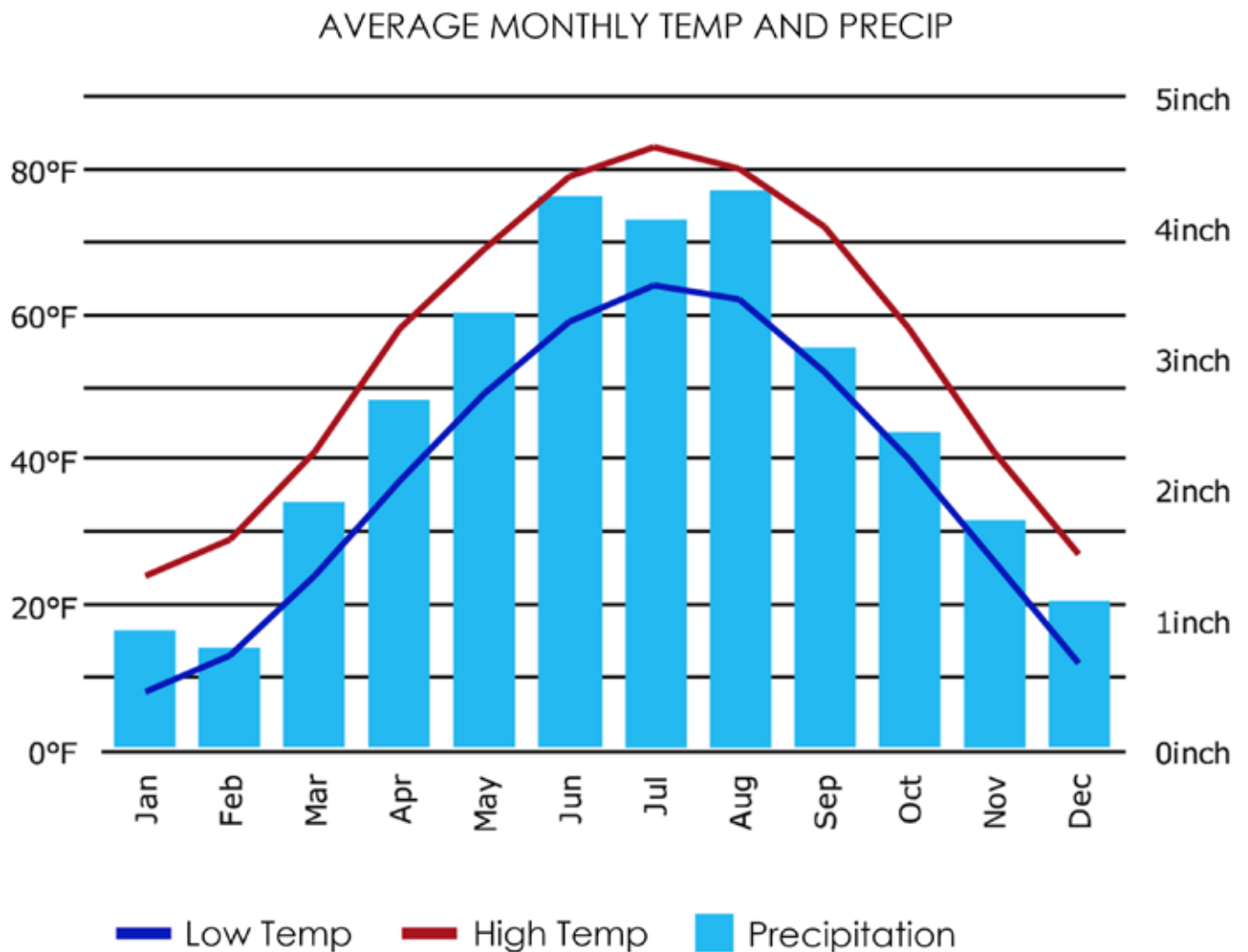
Use	Minimum Parking Requirement
<p>Maximum parking allowed, downtown districts, in general. Uses subject to a maximum parking requirement may shall not be restricted to fewer than ten (10) total accessory parking spaces on a zoning lot.</p>	
<p>RESIDENTIAL USES</p>	
	<p>None except that multiple-family dwellings of 50 or more units that provide off-street parking for residents shall also provide designated visitor parking at a ratio of not less than one visitor space per 50 dwelling units</p>
<p>INSTITUTIONAL AND PUBLIC USES</p>	
	<p>None</p>
<p>COMMERCIAL USES</p>	
<p>Retail sales and services</p>	<p>None</p>
<p>Offices</p>	<p>None</p>
<p>Automobile services</p>	<p>None</p>
<p>Food and beverages</p>	<p>None</p>
<p>Commercial recreation, entertainment and lodging</p>	<p>None</p>
<p>Medical facilities</p>	<p>None</p>
<p>Transportation</p>	<p>None</p>
<p>PRODUCTION, PROCESSING AND STORAGE</p>	<p>None</p>
<p>PUBLIC SERVICES AND UTILITIES</p>	<p>None</p>

Maximum Parking Allowed	
	provide parking up to the amount specified below provided that a development with one (1) or more non-residential uses
	<p style="text-align: center;">1.5 spaces per dwelling unit or rooming unit in the B4 District; 1.6 spaces per dwelling or rooming unit in the B4S, B4C and B4N Districts; Developments with fewer than 10 dwelling or rooming units shall be subject to a maximum parking requirement of 2 spaces per unit in the downtown districts; Accessible spaces required for residential uses by the Minnesota State Building Code and visitor parking spaces required by this ordinance shall not count toward the maximum parking requirement.</p> 
	1 space per 1,000 sq. ft. of GFA
	1 space per 500 sq. ft. of GFA except that the maximum parking requirement for grocery stores shall be 1 space per 300 sq. ft.
	1 space per 1,000 sq. ft. of GFA
	1 space per 200 sq. ft. of GFA+ 2 spaces per service bay
	1 space per 200 sq. ft. of GFA
	30% of the capacity of persons except that the maximum requirement for hotels shall be 1 space per guest room + parking equal to 30% of the capacity of persons for affiliated uses such as dining or meeting rooms
	1 space per 1,000 sq. ft. of GFA except that the maximum requirement for hospitals shall be as approved by C.U. based on a parking study of the institution, but not more than 1 space per 2 beds
	1 space per 1,000 sq. ft. of GFA
	1 space per 1,500 sq. ft. of GFA
	1 space per 1,000 sq. ft. of GFA

CLIMATE

Minneapolis has the coldest average temperature of any major metropolitan area in the United States.

Winters are very cold, summers are warm to hot and often humid, snowfall is common in the winter and thunderstorms with heavy rainfall occur during the spring, summer and fall.



MONTHLY AVERAGES

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average high in °F:	24	29	41	58	69	79	83	80	72	58	41	27
Average low in °F:	8	13	24	37	49	59	64	62	52	40	26	12
Av. precipitation in inch:	0.91	0.79	1.89	2.68	3.35	4.25	4.06	4.29	3.07	2.44	1.77	1.14
Days with precipitation:	8	7	11	9	11	13	10	10	9	8	8	8
Hours of sunshine:	140	166	200	231	272	302	343	296	237	193	115	112
Average snowfall in inch:	12	8	10	3	0	0	0	0	0	1	9	12

Figure 61 | Monthly Weather Averages Chart

ANNUAL AVERAGES

Annual high temperature:	55.1°F
Annual low temperature:	37.2°F
Average temperature:	46.15°F
Average annual precipitation - rainfall:	30.64 inch
Days per year with precipitation - rainfall:	112 days
Annual hours of sunshine:	2607 hours
Av. annual snowfall:	55 inch

Figure 62 | Annual Weather Averages Chart

Temperatures in Minneapolis have been known to range anywhere between -40 degrees F with wind chill in the winter, to infrequent cases reaching above 100 degrees F in the summer. Average temperatures though range from 8-83, which is a fairly large range of yearly temperatures.

Minneapolis Monthly Humidity

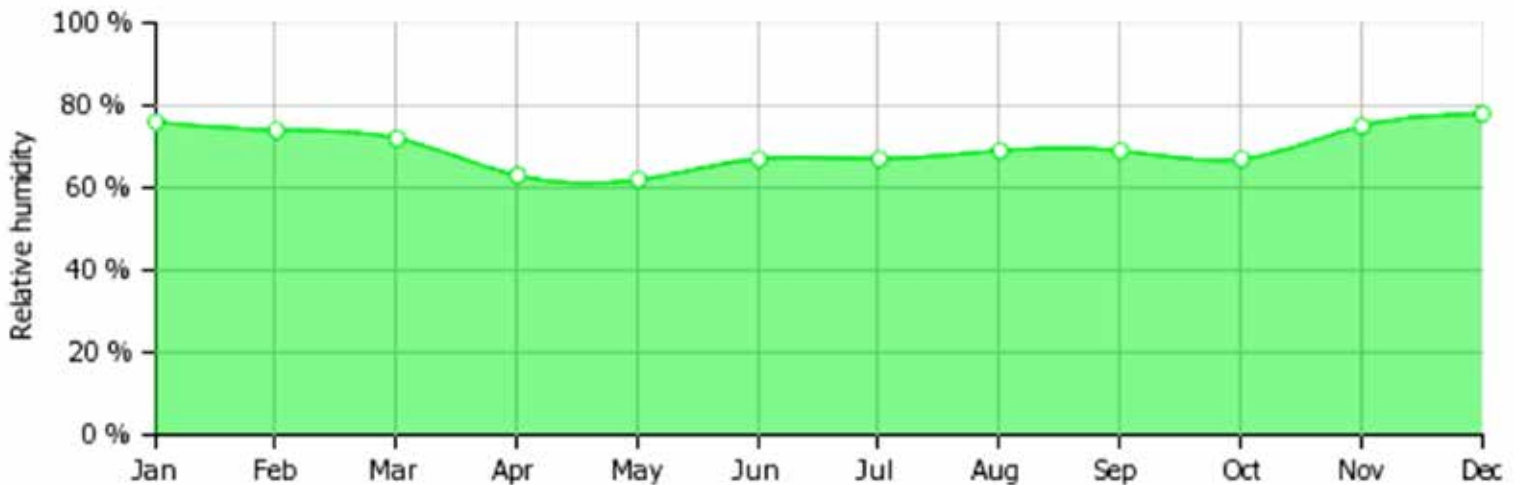


Figure 63 | Humidity Graph

MINNEAPOLIS WIND DIAGRAM

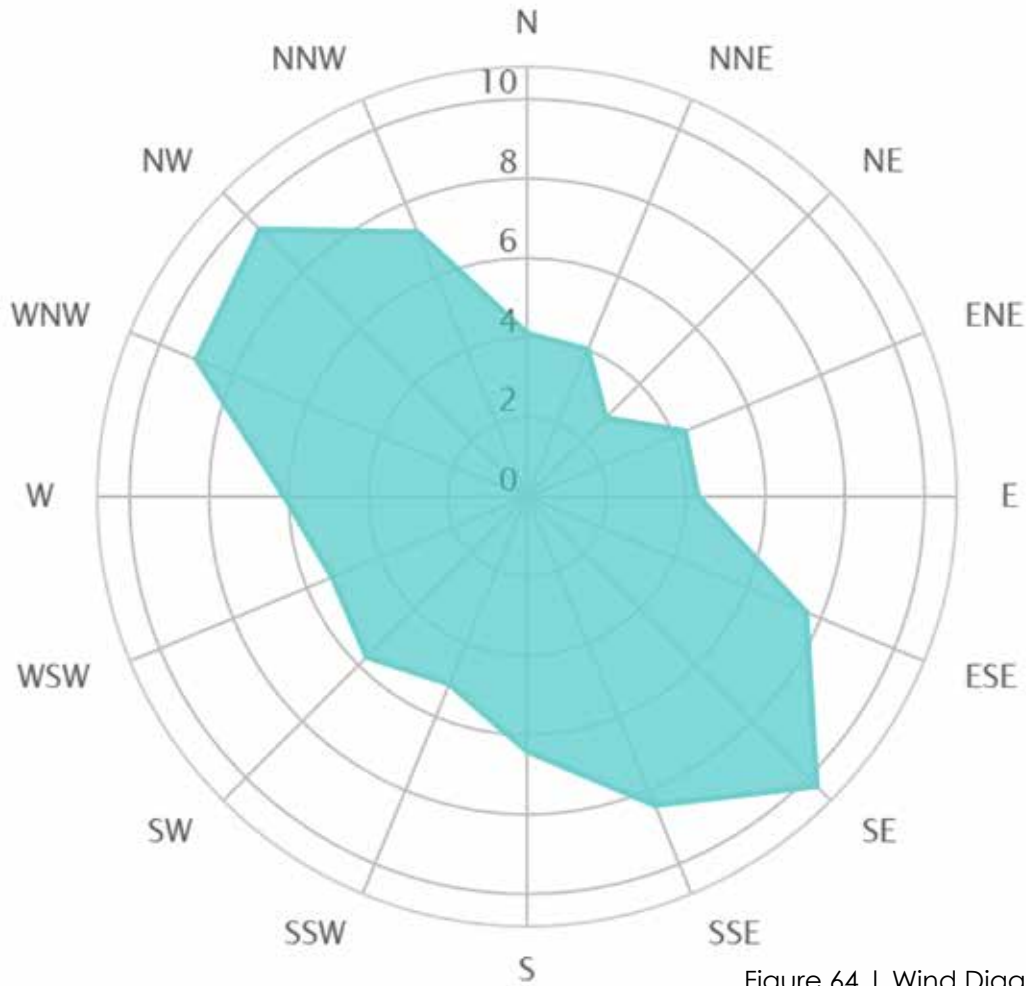


Figure 64 | Wind Diagram

MINNEAPOLIS WIND SPEED AND DIRECTION

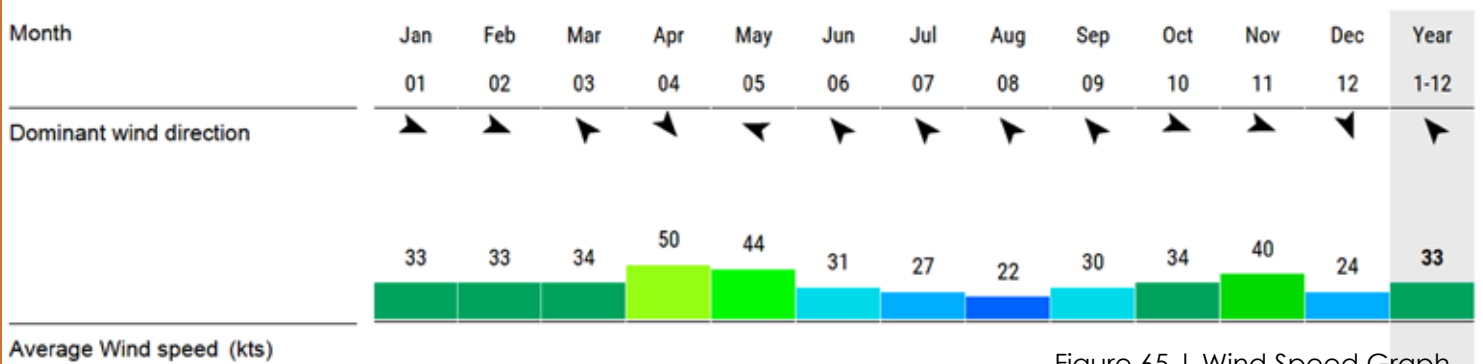


Figure 65 | Wind Speed Graph

The wind in Minneapolis averages in speed from 22-50 knots throughout the year with the windiest month being April. The direction of the wind tends to come from the SE in the summer and from the NW in the winter.

SUNPATH DIAGRAM FOR 45 DEGREES N

Summer Solstice

Sunrise: 4:30am
Sunset: 7:45pm

Winter Solstice

Sunrise: 7:45am
Sunset: 4:30pm

Spring/Fall Equinox

Sunrise: 6am
Sunset: 6pm

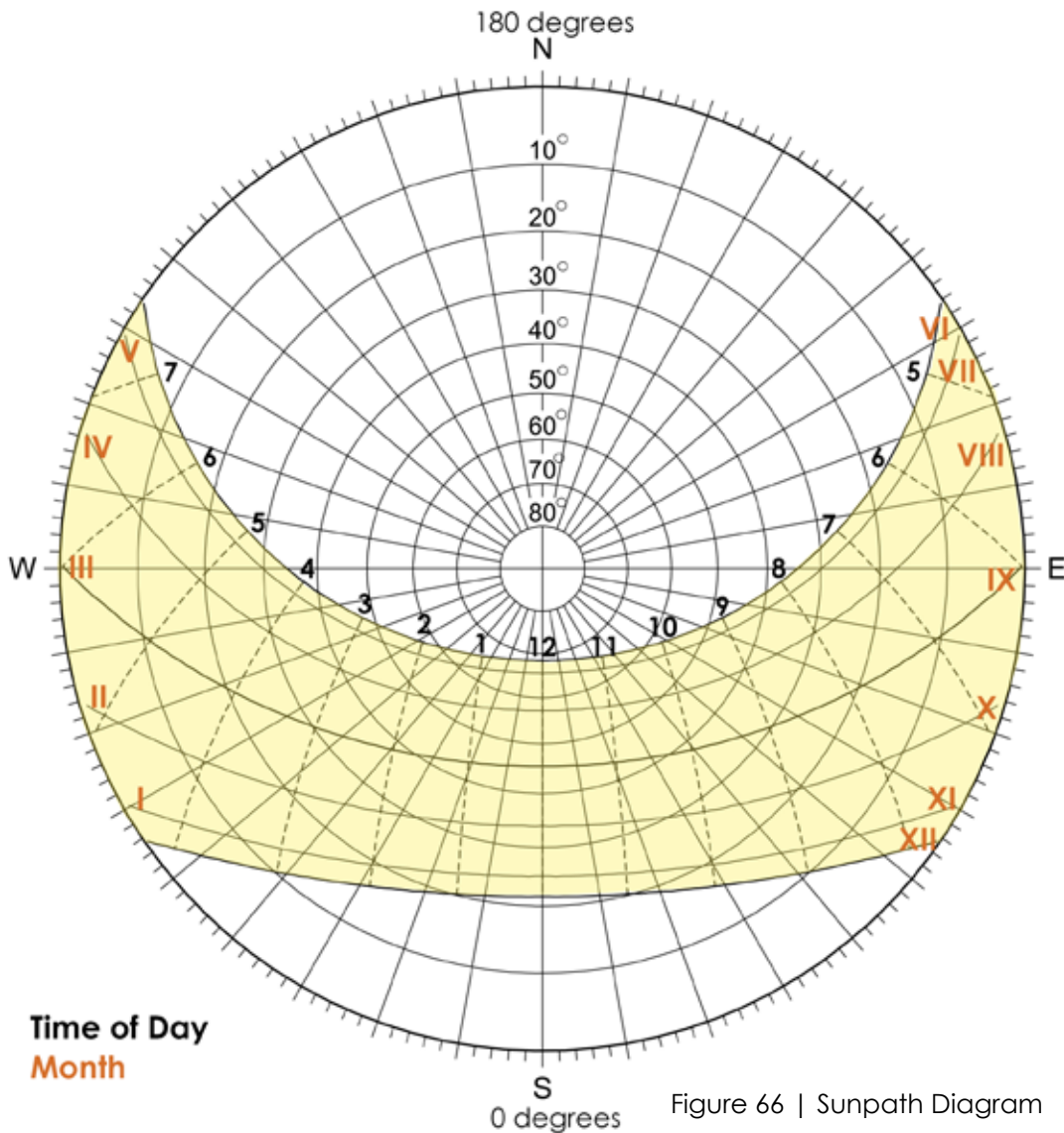


Figure 66 | Sunpath Diagram

MINNEAPOLIS MONTHLY CLOUD COVERAGE

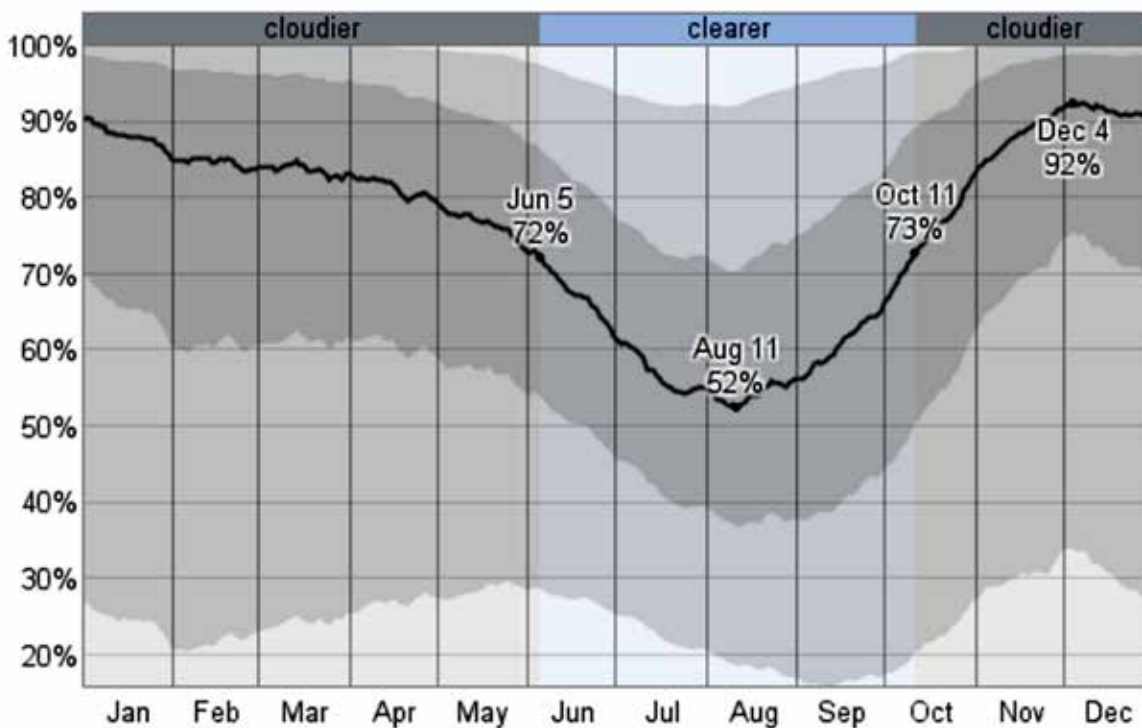


Figure 67 | Cloud Coverage Graph

SPACES

Sq Ft

Main Lobby

Reception Area	200
Lounge	300
Admin Office	200
Mail Room	85
Public Restrooms	300
2 Elevator Shafts	160
2 Stair Cases	580

1,825

Retail Units

Storage	220
Restroom	60
Sales Space	1,100
Cashier Area	150
Office / Break Room	120
Display	50

1,700

Small Performance Space

Stage	800
Seating/Stading	1000
Circulation	400

2,200

Gallery

Display Space	5,500
Circulation	1,000

6,500

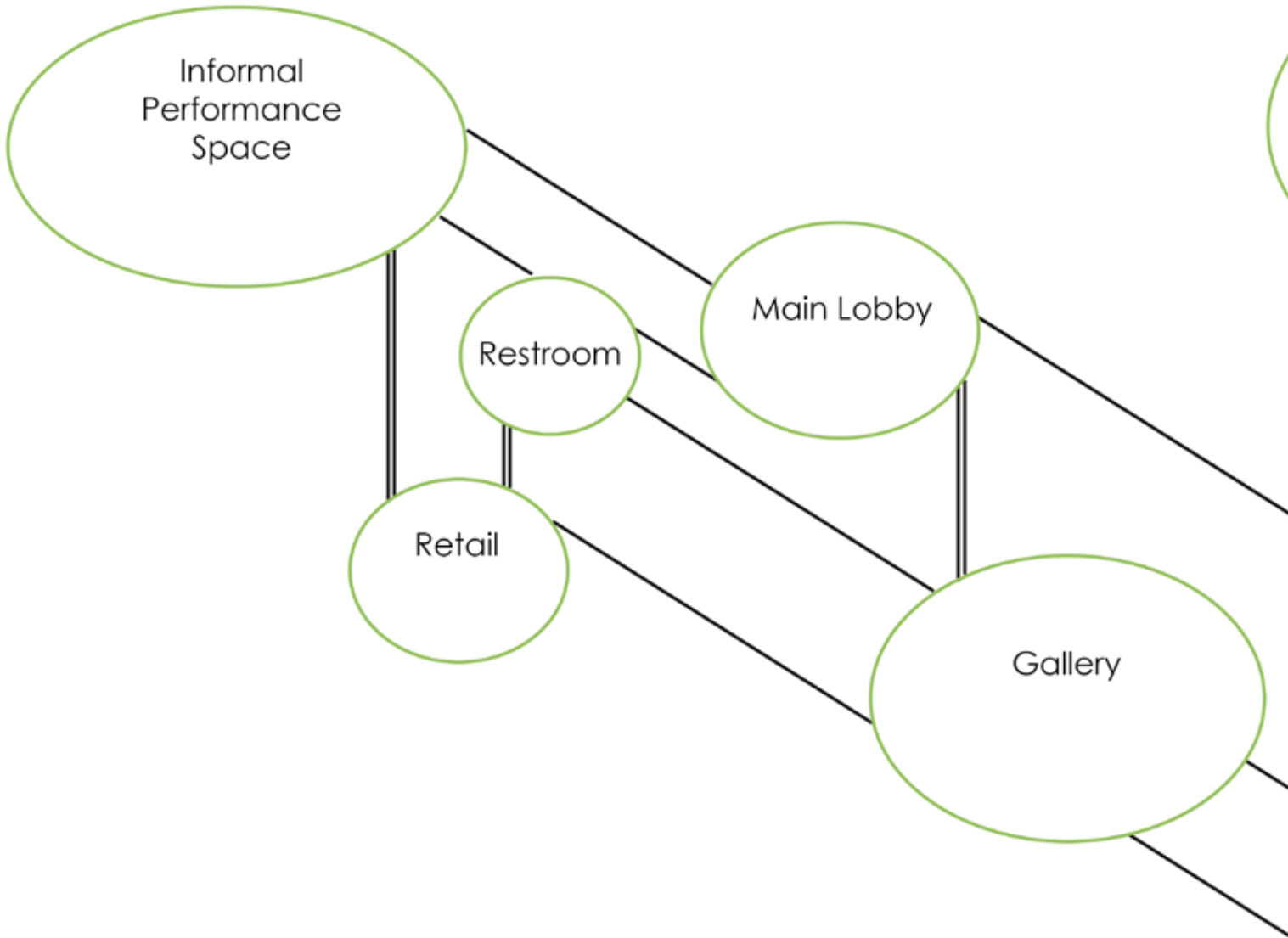
Library

Stacks	1,000
Study Space	900
Flex Event Space	1,000
Circulation	400

3,300

BUILDING PROGRAM

Artist Studios	
Open Workspace	5,600
Music Rooms	
Ensemble Rooms	680
Practice Rooms	150
	2,940
Residential units	
Restrooms	70-80
Bedroom	130-140
Living / Kitchen Area	260-280
Private Terrace	20-25
Laundry	20 x
Storage	20 x
	520-565
Support Spaces	
Mechanical	1100
Electrical	60
Trash	60
Custodial	60
Elevator Room	126
	1,406
Residential Unit SqFt Totals	
1 Bedroom / 1 Bath	560
2 Bedroom / 1 Bath	700



Street Access



Public



Private



Adjacent



Accessible

NETWORK DIAGRAM

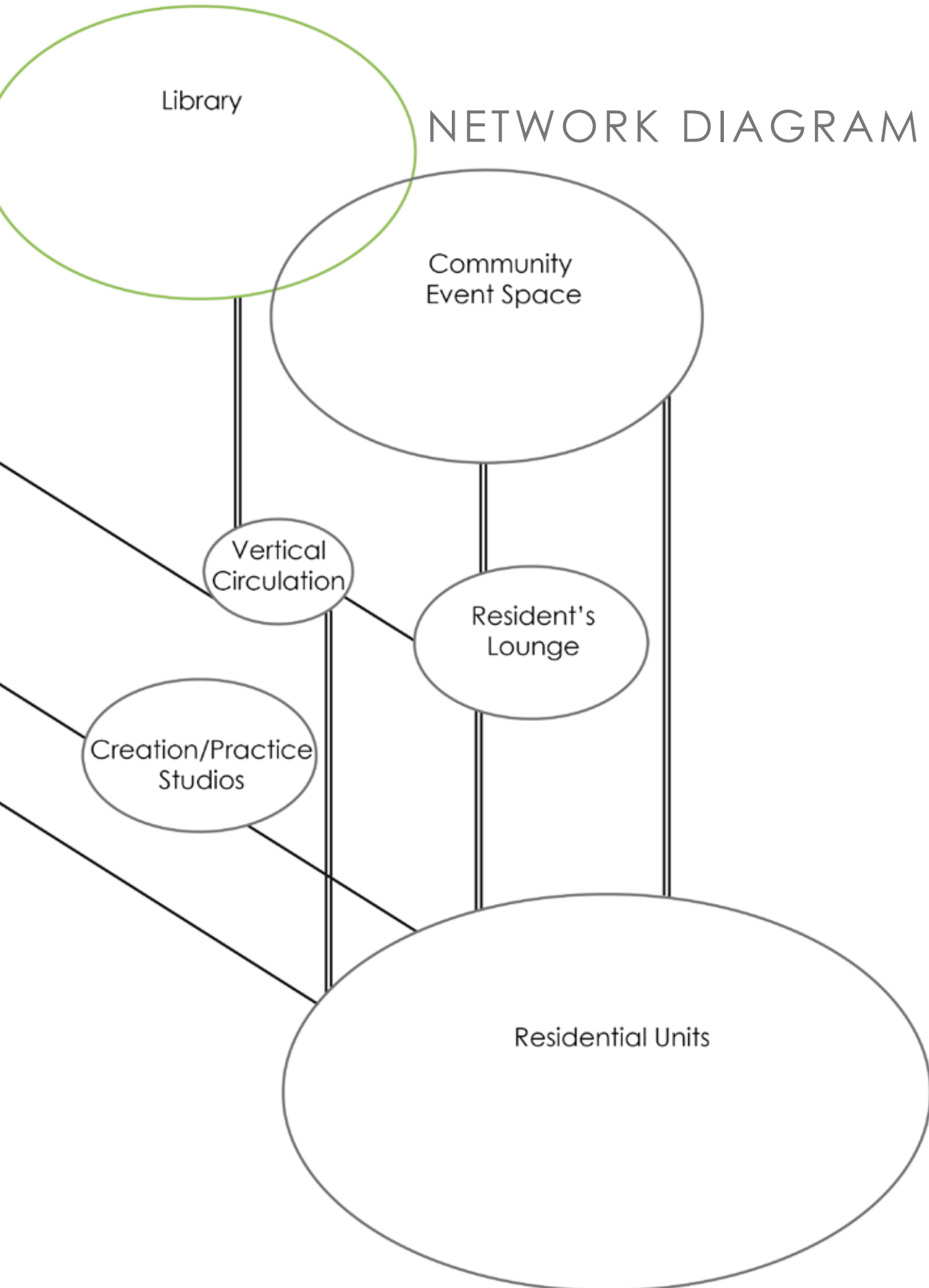


Figure 68 | Network Diagram



Figure 69-71 | Artefact

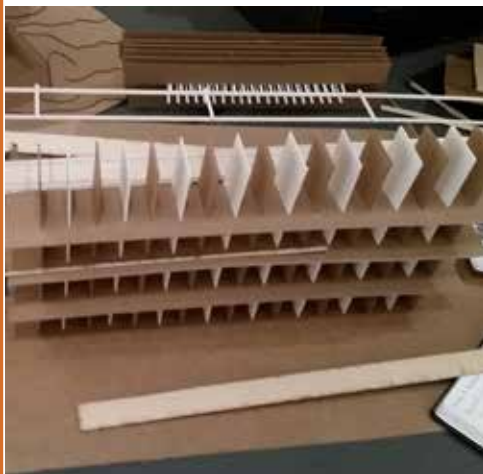
ARTEFACT INVESTIGATION

To further investigate the ideas of this thesis, I have created an artefact which is an architectural representation that communicates through participation in present space and time.

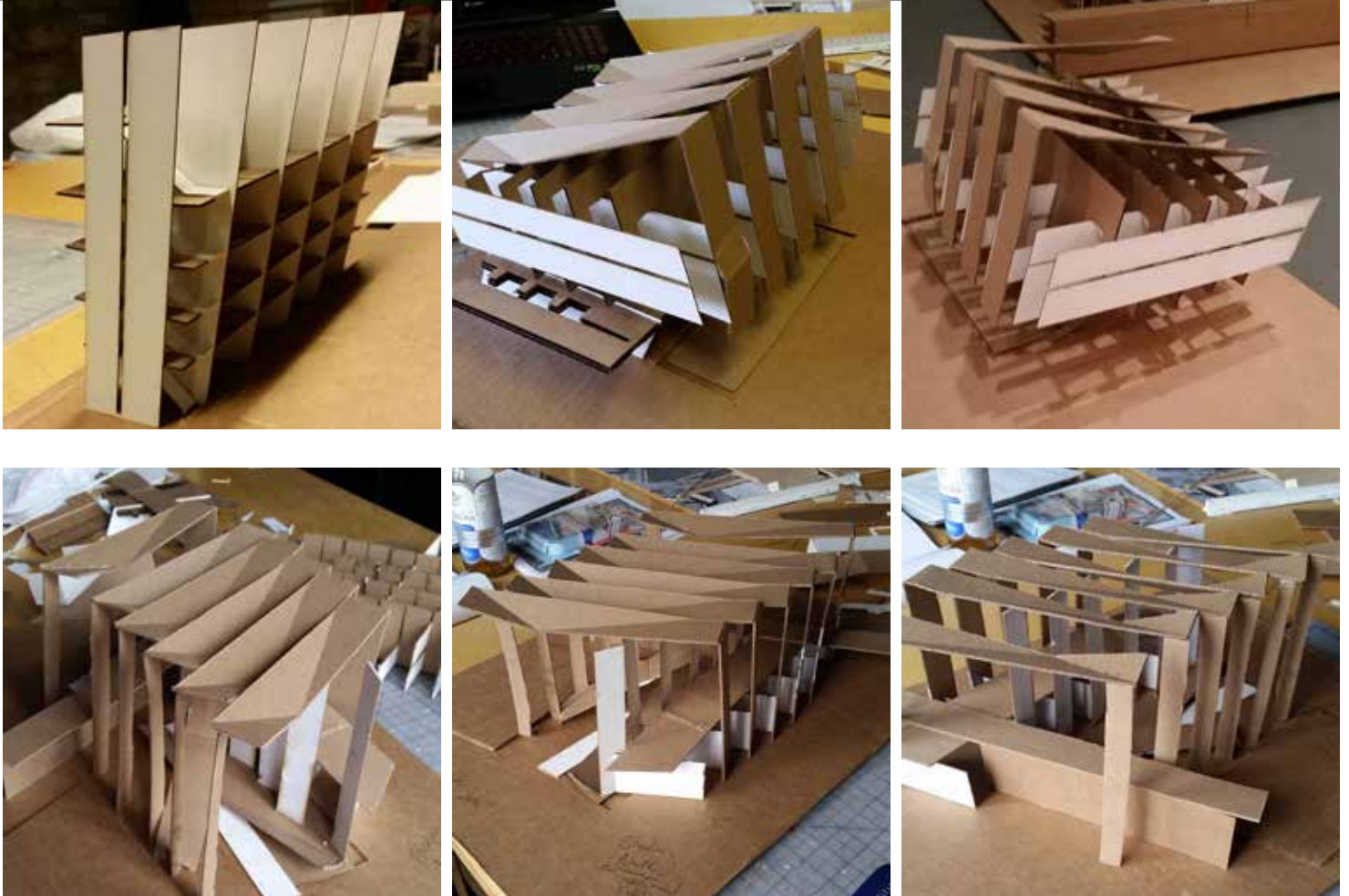
I created an instrument composed of 3 strings spanning the entire length of a 5 story stairwell and terminating at the foot of the stairs into a pool of water. It is played by water released as single drops from a shallow vessel above that cling to the strings as they fall through the stairwell.

Like the feeling one experiences while listening to a moving musical composition, the drop pierces the spine of the building, trickling down just as music creeps through the nerves of the body and shutters back through the spine, resonating within the body of audience and architecture alike.

This artefact alludes to Heidegger's four-fold, connecting Earth, Sky, Divinities, and Mortals. Played by water (given from the sky and sustained by the earth) that exists as a single drop for only a brief moment in time (acknowledging our mortality) before joining the pool of water at the foot of the stairwell. It continues to exist only as the ripples it leaves behind in the pool of water and the sounds waves that resonate outward, into the community, touching the audience, contributing to an ongoing historical order.



PROCESS MODELS



Many different architectural solutions were explored through process models. These models allowed for the exploration of architectural tectonics, connections between spaces, and the way light interacted with each of those spaces.

Many iterations were created to investigate different ways to connect public and private spaces, and engage the Earth's natural elements.

Eventually, a design inspired by the structure of a symphony gave way to the final design. Emphasizing a large central atrium, it aims to "bridge" individuals' cultural works with the community and engage Heidegger's fourfold.

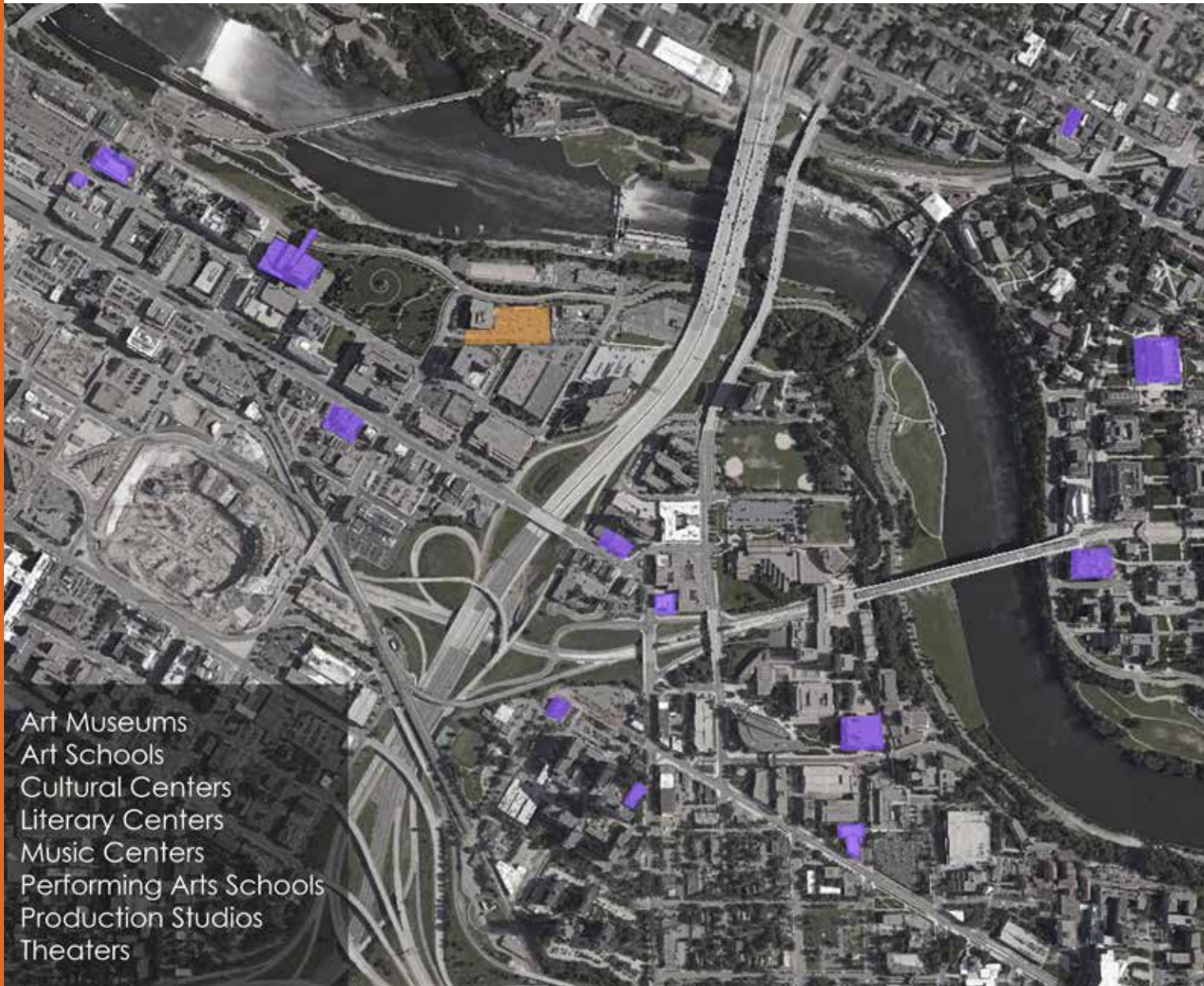


Figure 87 | Art Venue Map

ARCHITECTURE and PERFORMANCE ANALYSIS

Located in the artistically dense community of downtown east Minneapolis, MN, I propose a mixed-use residence for artists participating in local residency programs. It includes retail, apartments, artist studios, exhibition space, a research library, and informal performance space. The design provides an opportunity for the city to engage in meaningful and multi-layered cultural exchange between communities through the works of visiting artists. Inspired by the way one participates in music and framed in the structure of a symphony, architecture brings all things together—bridging city to city, individual to community, nature to technology—into one harmonious composition.

My project reinterprets sustainable living based on Heidegger's sense of dwelling, by creating an atmosphere that establishes a harmonious relationship between all things—Earth, Sky, Divinities, and Mortals.



Figure 88 | Intro 1

One approaches this architectural symphony under large wooden chords, drawing one's eye up to the sky while simultaneously calling attention to one's relationship to the ground.



Figure 89 | Intro 2

Like the **Introduction** to a symphony, one is introduced to the architectural movement slowly, down a long, gradual ramp, increasing the weight of the architectural movement before its **Exposition**.

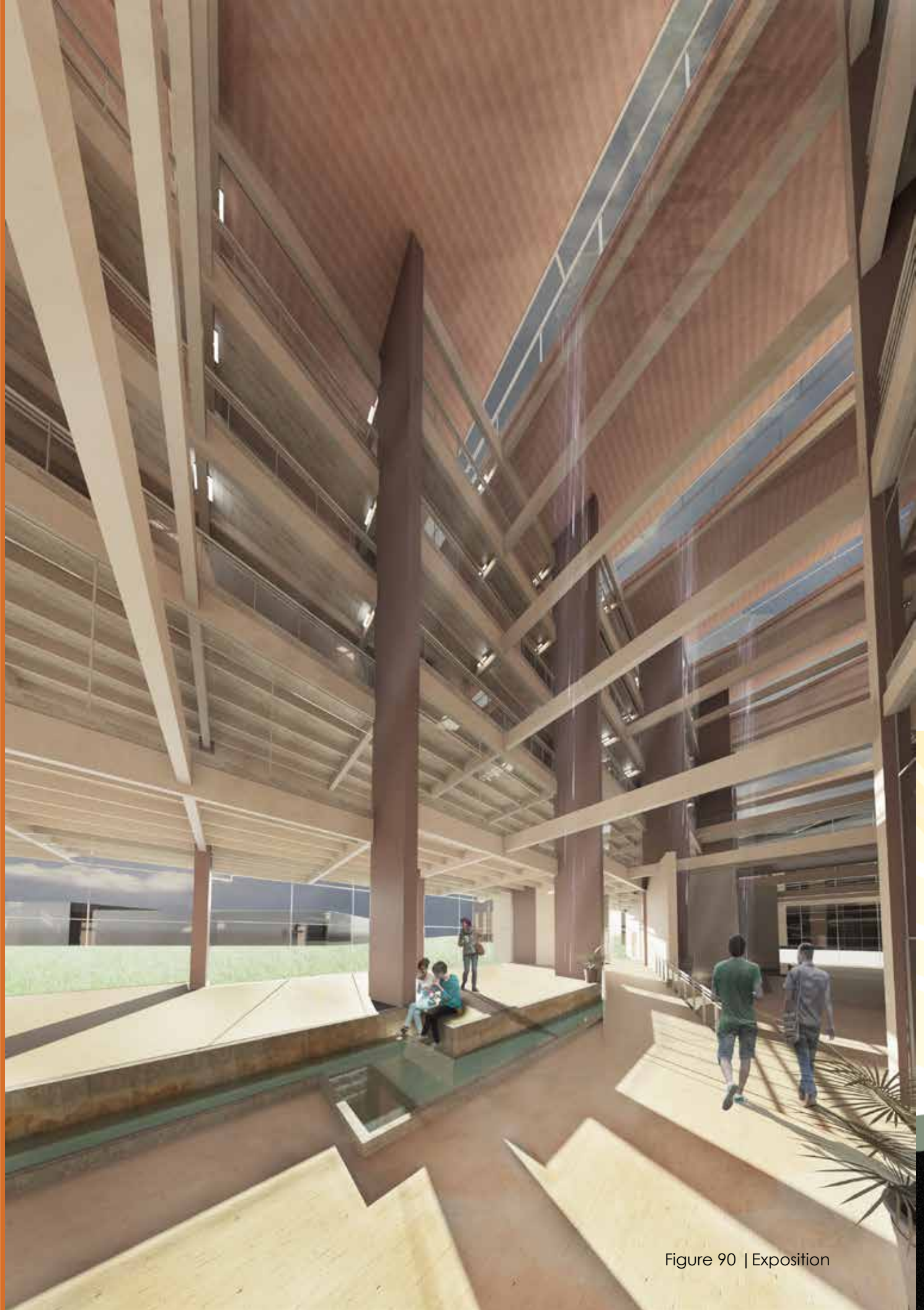


Figure 90 | Exposition

The **Introduction** crescendos to a huge 5-story atrium. Performing as a symphony's **Exposition**, the atrium connects all parts of the movement and exposes its primary themes. The atrium brings all things together—earth, sky, divinities and mortals—by folding the sky into the building, exposing the elements of the earth, displaying cultural works for the public, and connecting individuals with community.

The roof dips to the edge of each of its panels opening the atrium to the sky and creating a play of sunlight as it traces along floors and walls. These openings also allow for natural ventilation through the stack effect during warm summer months and allow rain to fall through the building's interior where it is collected in a shallow pool at the foot of the atrium and stored to be later used as greywater.

The play of light, flow of air, sound of water drops and fresh scent of a rainy day are amplified by the architecture. The building's interior acting as musical score for the earth's natural systems, recording their paths and cycles as they change throughout the days and seasons.



Figure 91 | Systems Section

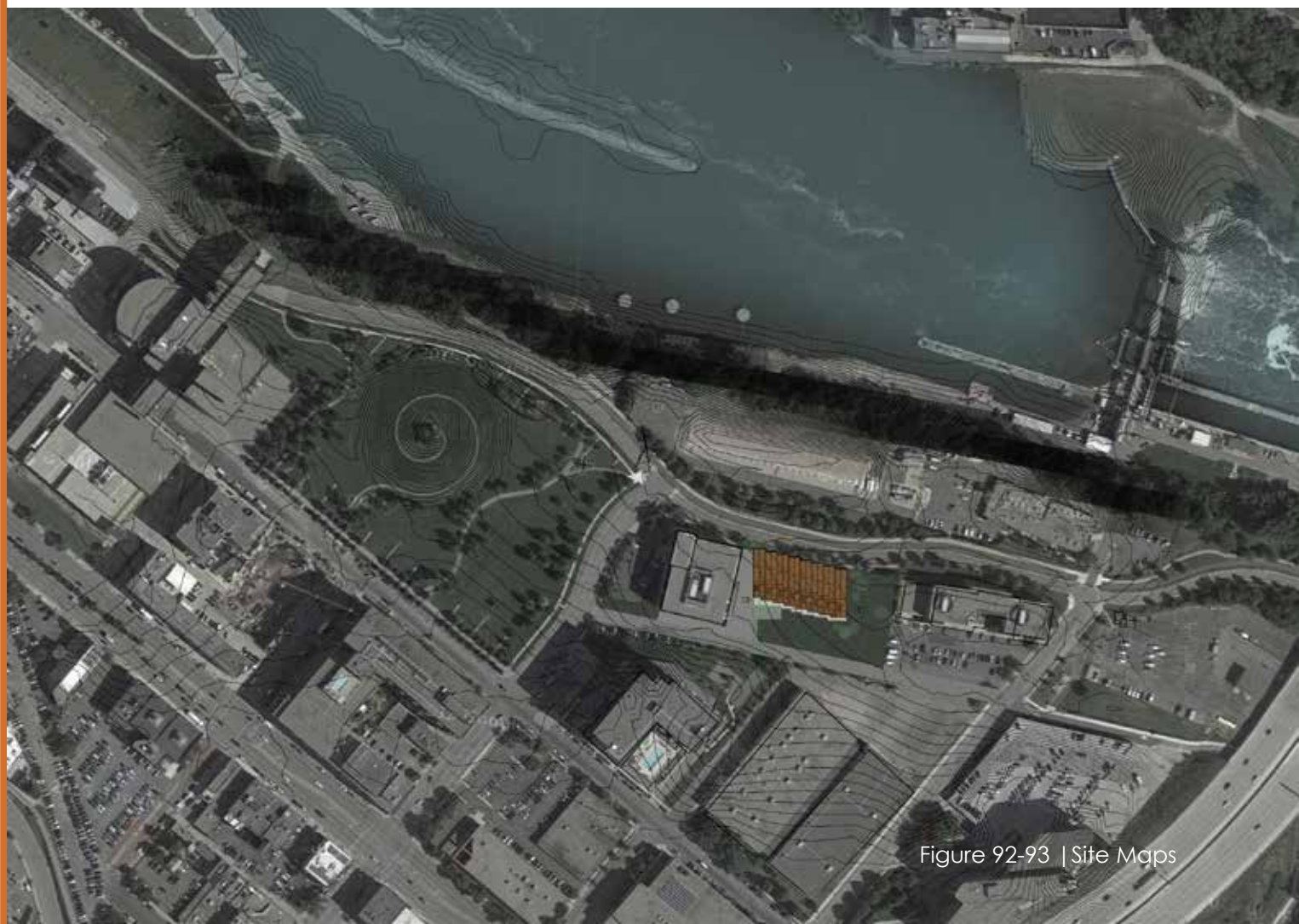
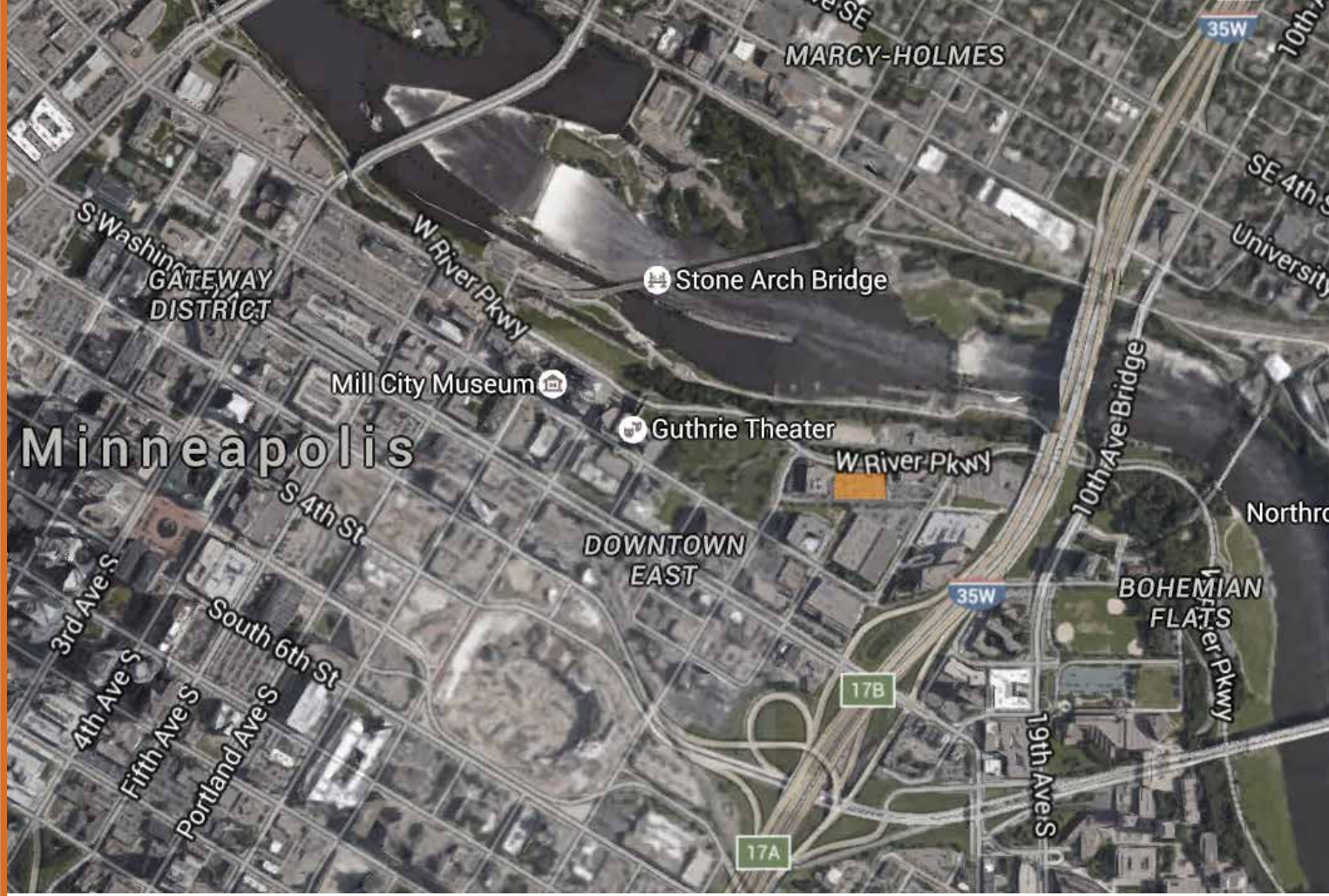


Figure 92-93 | Site Maps

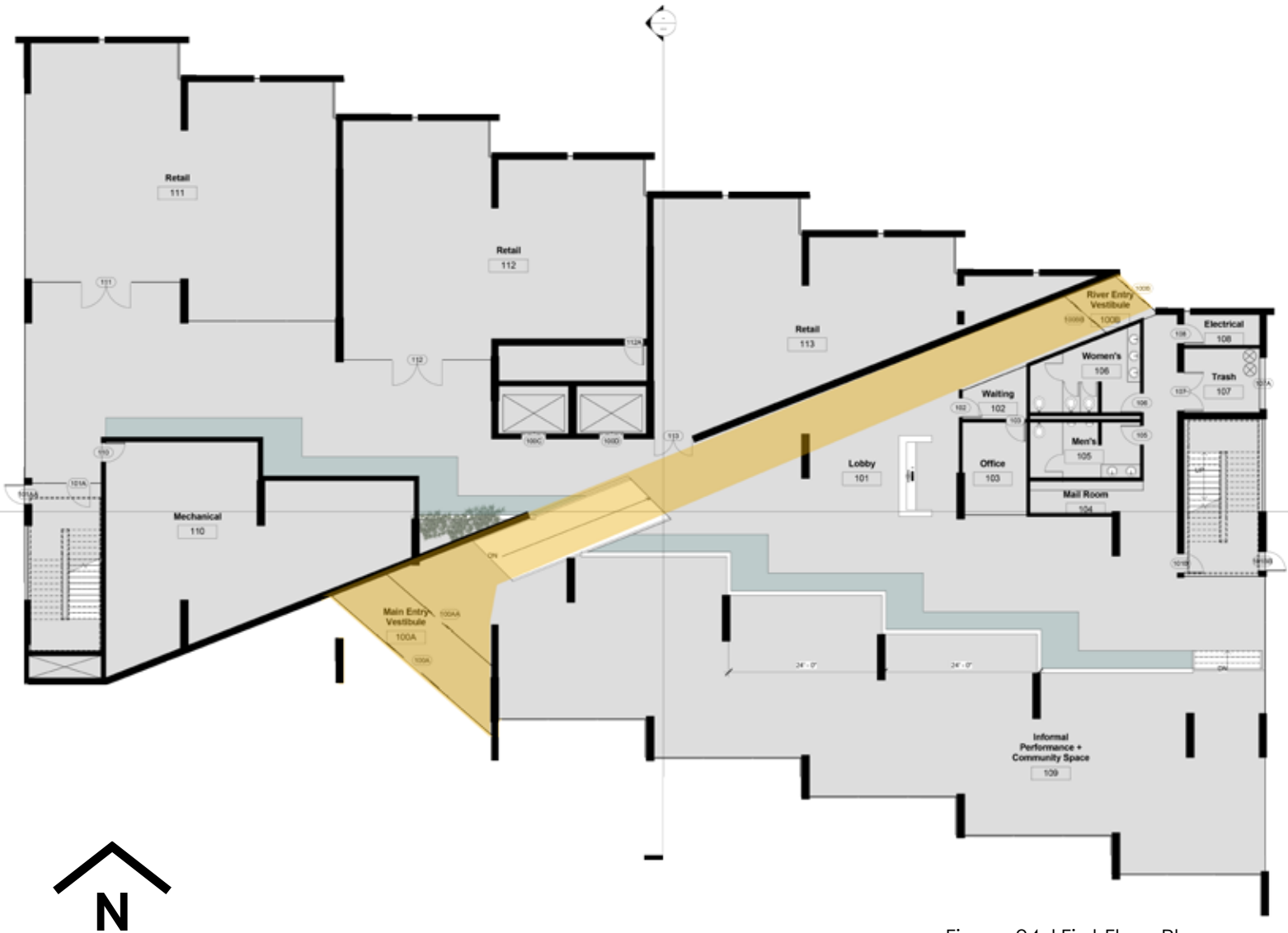


Figure 94 | First Floor Plan

The first floor acts as an interior street, housing retail, lobby and gathering space for small informal performances. Opening to both downtown Minneapolis to the south and riverfront to the north, the building bridges city and nature.

The upper floors break from the movement's **Exposition** forming the symphony's **Development** where the movement is altered and new themes and ideas are introduced.



Second Floor:
Library and Gallery Spaces

Figure 95 | Second Floor Plan

Included in these developmental spaces are a library, gallery, residences, studios, and music rooms, all allowing for the composition of cultural contributions by the public and artist residents.



Third Floor:
Residences and Studio Spaces

Figure 96 | Third-Fifth Floor Plans



June 10:00 AM

Figure 97 | Development: Residence Summer



December 10:00 AM

Figure 98 | Development: Residence Winter



Figure 99 | Development: Gallery

Acknowledging the sun's qualities of light, Studios and gallery spaces face soft, cool northern light while the library and residences enjoy warm southern light, allowing residents to wake and sleep with the pattern of the sun, following its daily and seasonal cycles.



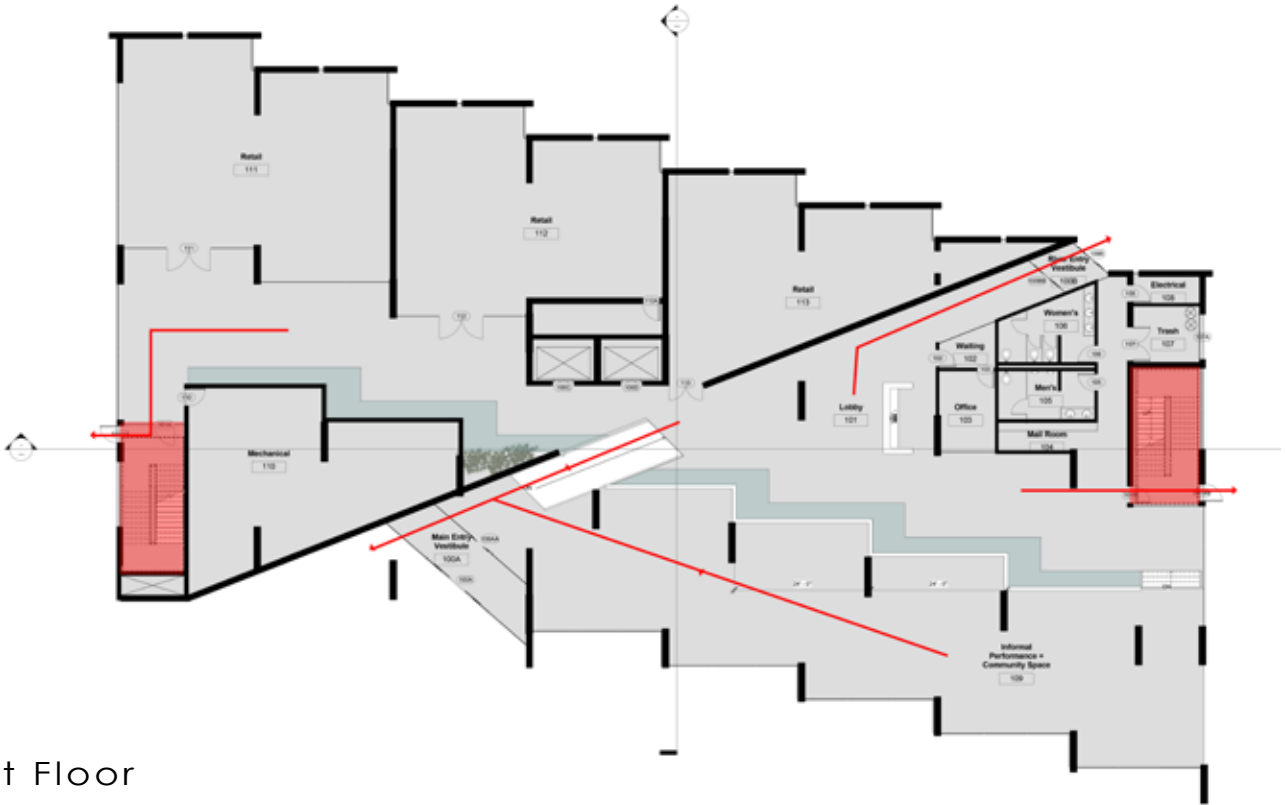
Figure 100 | Development: Library



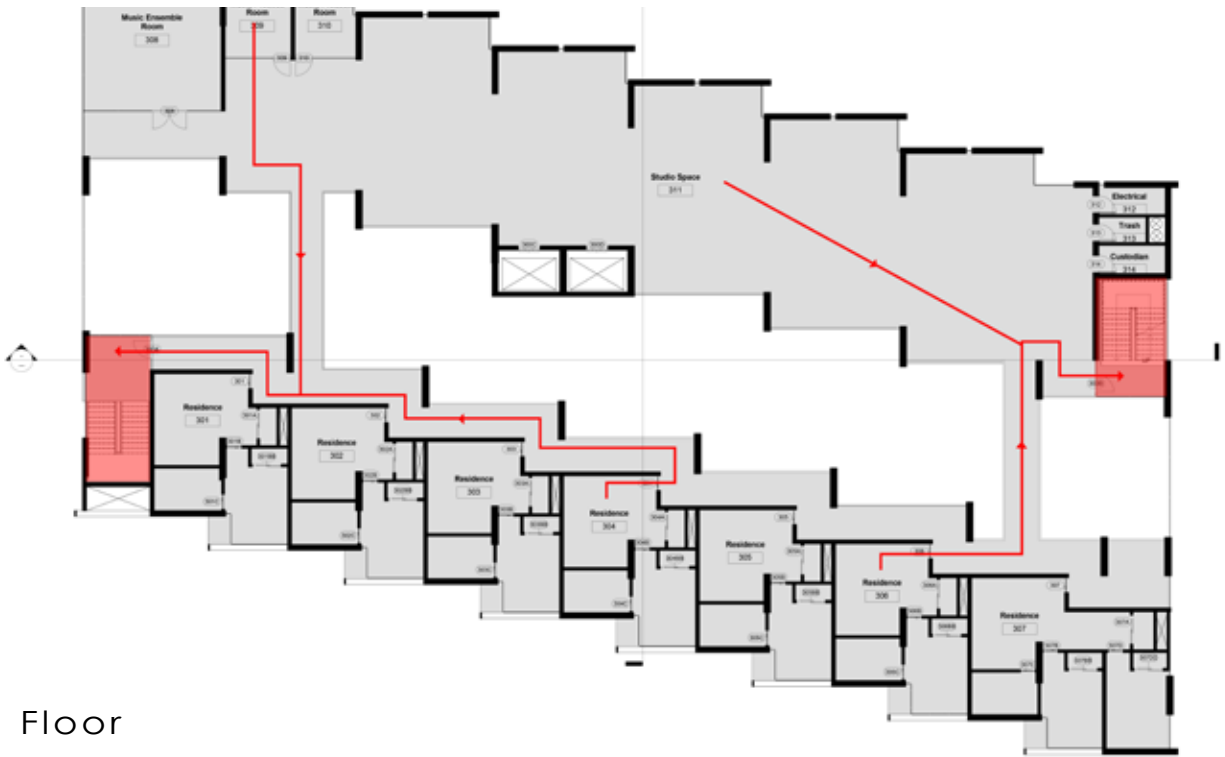
Figure 101 | Recapitulation

All spaces open back up into the atrium, transitioning into the movement's **Recapitulation**—an altered repeat of the **Exposition**. This closing cadence continuously reconnects all things, bridging earth and sky, city and riverfront, individual and community.

Egress Plans



First Floor



Third Floor

Figure 102-103 | Egress



Figure 104 | Greywater Section

Passive Design Strategies:

The design is oriented to allow for maximum direct gain from the sun in the winter with fixed horizontal louvers for shade in the summer. Tubes of water running through the floors are used as thermal mass to absorb heat from the sun, to prevent daytime overheating and to store for nighttime use. Natural ventilation is achieved through both cross-ventilation and stack effect through the central atrium. The roof's design allows for the collection of rainwater to be distributed for grey water uses.

Hydronic Heating System

The sun heats tubes of water embedded in a 1-1/2" layer of concrete during the day, which is then stored and recirculated throughout the building at night. This system is also connected to Minneapolis's Central Heat Generation Plant that provides steam and chilled water as a back-up system during extreme heating and cooling days.

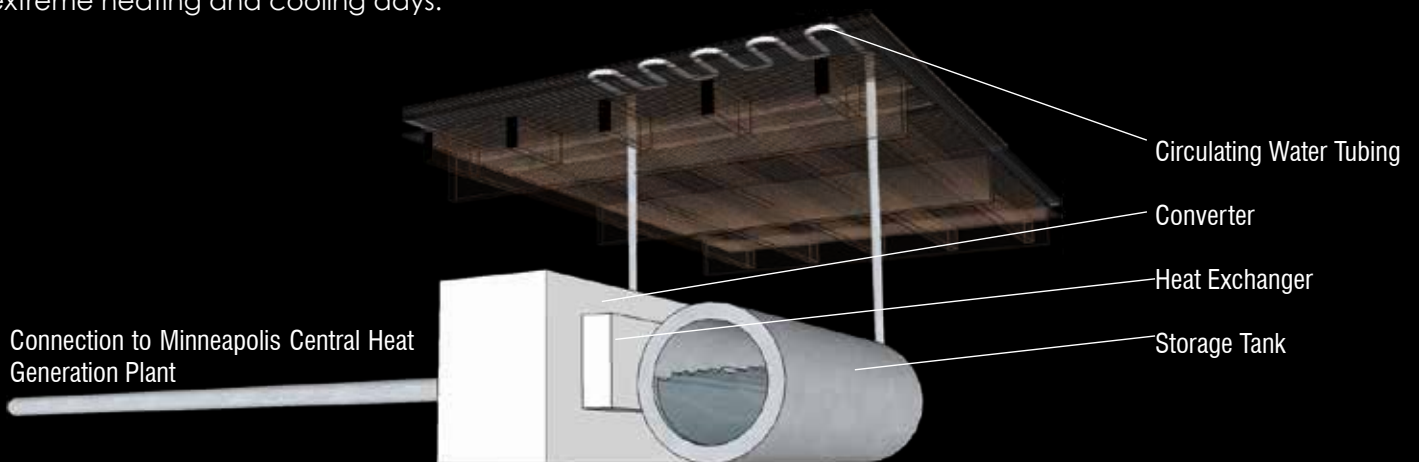


Figure 105 | Hydronic Heating System

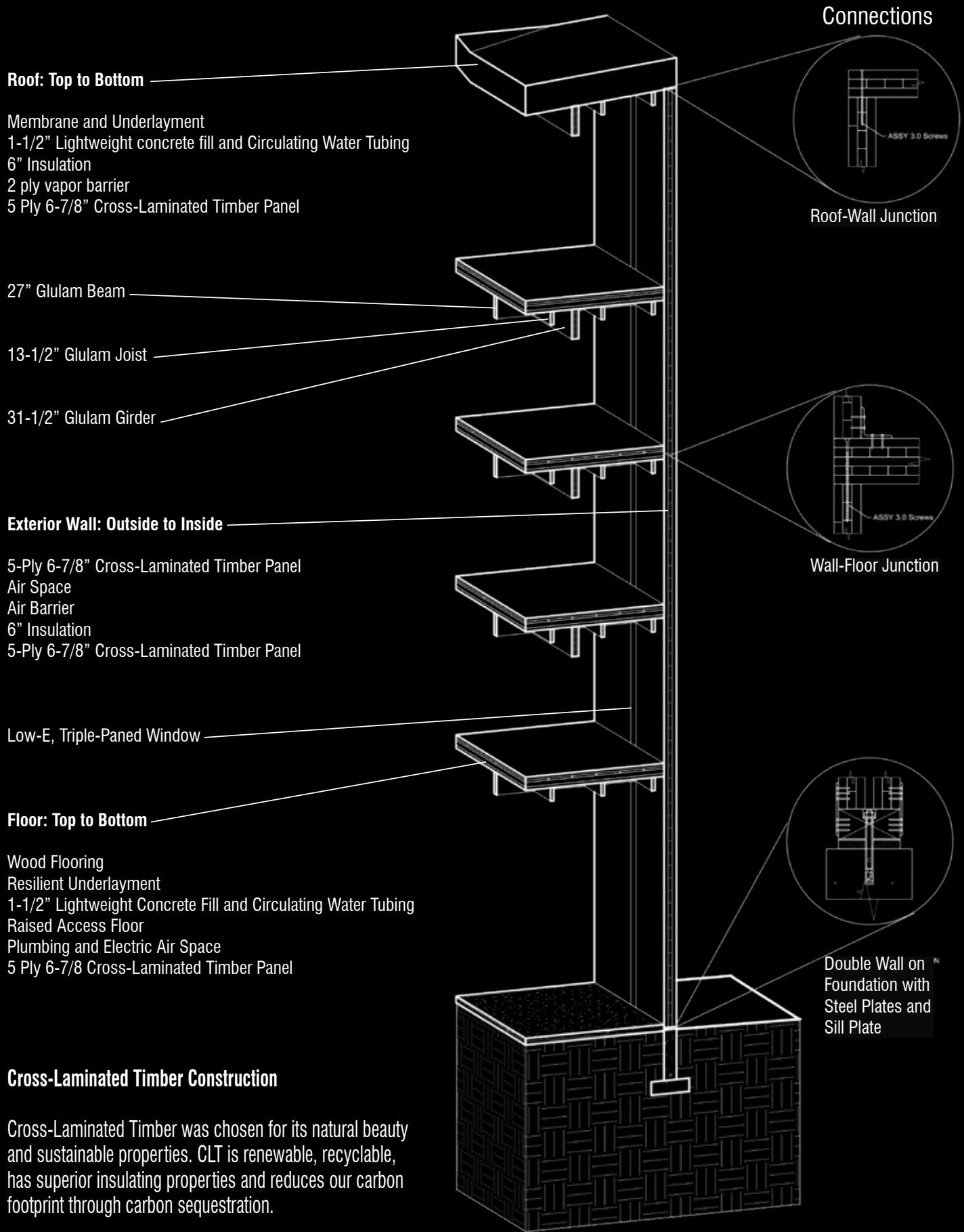
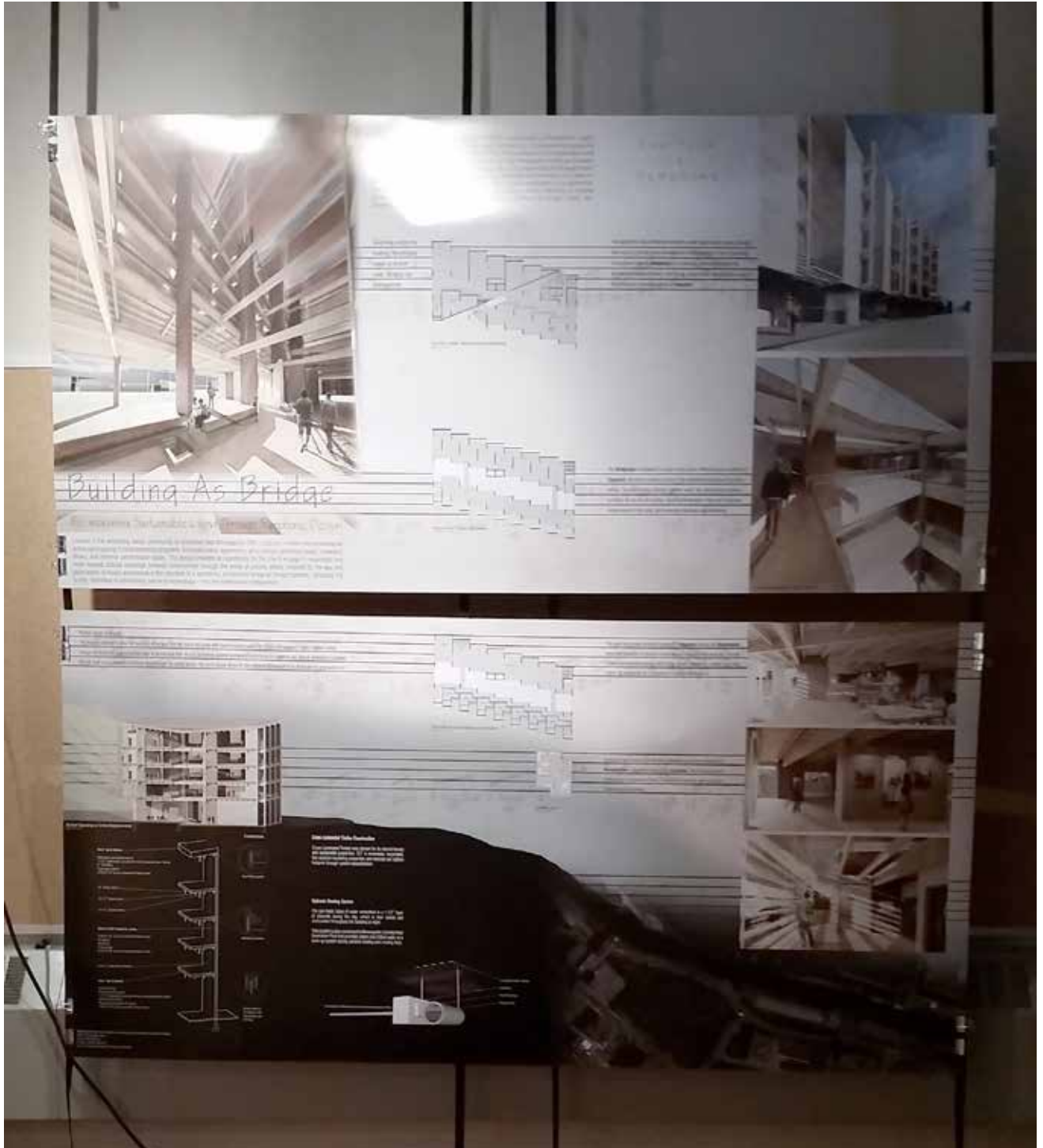
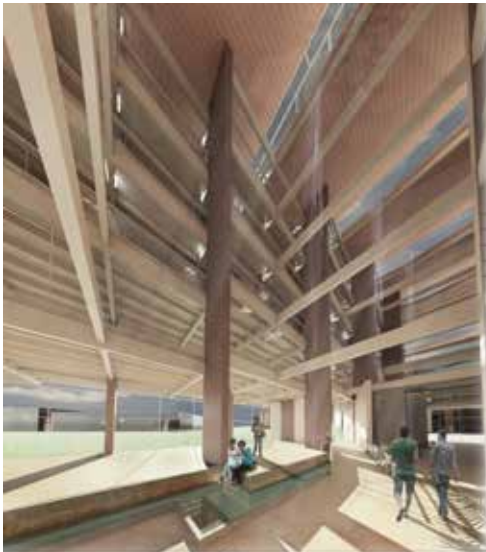


Figure 106 | Wall Section



PRESENTATION



Building As Bridge

Re-imagining Sustainable Living Through Symphonic Design

Located in the artistically dense community of downtown east Minneapolis, MN, I propose a mixed-use residence for artists participating in local residency programs. It includes retail, apartments, artist studios, exhibition space, a research library, and informal performance space. The design provides an opportunity for the city to engage in meaningful and multi-layered cultural exchange between communities through the works of visiting artists. Inspired by the way one participates in music and framed in the structure of a symphony, architecture brings all things together—bridging city to city, individual to community, nature to technology—into one harmonious composition.

For German Philosopher, Martin Heidegger, a bridge is a manifestation of the fourfold—Earth, Sky, Divinities, and Mortals—which is at the root of all dwelling. He believed that preserving this fourfold is how we dwell in a holistic way on earth. This understanding of sustainable living requires human participation. Today, sustainable design has disregarded human participation with its specialized application, limiting our understanding of its relationship to the larger world. However, the task of Architecture is not to reduce our interaction with the world, but rather, to like music, invite us into a space for interpretation; calling us to participate in its experience. My project reinterprets sustainable living based on Heidegger's sense of dwelling, by creating an atmosphere that establishes a harmonious relationship between all things—Earth, Sky, Divinities, and Mortals.

Fourfold in Symphony






Stretching across the building, the entrance opens up to both sides, bridging city and riverfront.

One approaches this architectural symphony under large wooden chords, drawing one's eye up to the sky while simultaneously calling attention to one's relationship to the ground. Like the **Introduction** to a symphony, one is introduced to the architectural movement slowly, down a long, gradual ramp, increasing the weight of the architectural movement before its **Exposition**.

The **Introduction** concludes to a huge 5-story atrium. Performing as a symphony's **Exposition**, the atrium connects all parts of the movement and exposes its primary themes. The atrium brings all things together—earth, sky, divinities and mortals—by folding the sky into the building, exposing the elements of the earth, displaying cultural works for the public, and connecting individuals with community.


The upper floors break from the movement's **Exposition** forming the **Development** where the movement is altered and new themes and ideas are introduced. Included in these developmental spaces are a library, gallery, residences, studios, and music rooms, all allowing for the composition of cultural contributions.

All spaces open back up into the atrium, transitioning into the movement's **Recapitulation**—an altered repeat of the **Exposition**. This closing cadence continuously reconnects all things, bridging earth and sky, city and nature, individual and community.

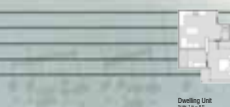






Passive Design Strategies:

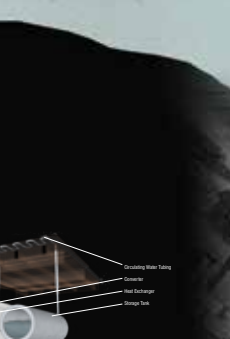
The design is oriented to allow for maximum direct gain from the sun in the winter with fixed horizontal louvers for shade in the summer. Tubes of water running through the floors are used as thermal mass to absorb heat from the sun, to prevent daytime overheating and to store for nighttime use. Natural ventilation is achieved through both cross-ventilation and stack effect through the central atrium. The roof's design allows for the collection of rainwater to be distributed for grey water uses.



Third-Fifth Floors: Residence and Studios
Scale: 1/8" = 1'-0"



Dwelling Unit
Scale: 1/8" = 1'-0"



Cross-Laminated Timber Construction

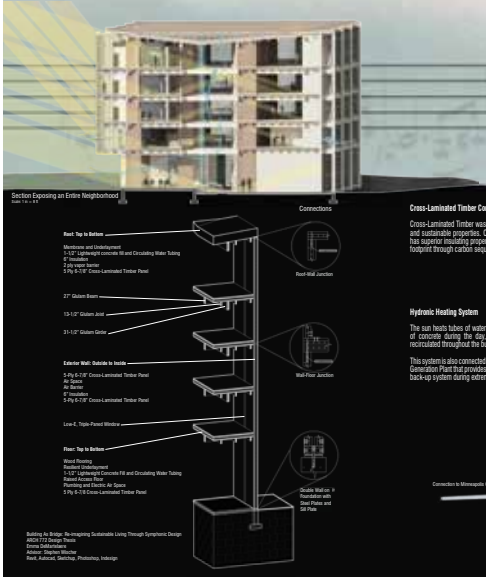
Cross-Laminated Timber was chosen for its natural beauty and sustainable properties. CLT is renewable, recyclable, has superior strength properties and reduces our carbon footprint through carbon sequestration.

Hydraulic Heating System

The sun heats tubes of water embedded in a 1-1/2" layer of concrete during the day, which is then stored and recirculated throughout the building at night.

This system is also connected to Minneapolis's Central Heat Generation Plant that provides steam and cooled water as a back-up system during extreme heating and cooling days.

Section Exposing an Entire Neighborhood
Scale: 1/8" = 1'-0"



Connectors

- Roof: Top to Bottom**
 - Insulation and Drainage
 - 1-1/2" Solid Concrete Slab and Circulating Water Tubing
 - 2" Drainage
 - 2" City Water Pipes
 - 2" 1/2" CLT Cross-Laminated Timber Panel
- 2nd Floor Joist**
 - 2" 1/2" CLT Joist
 - 15-1/2" Glulam Joist
 - 15-1/2" Glulam Joist
- Exterior Wall: Outside to Inside**
 - 2" 1/2" CLT Cross-Laminated Timber Panel
 - 1/2" Insulation
 - 1/2" Insulation
 - 2" 1/2" CLT Cross-Laminated Timber Panel
- Floor: Top to Bottom**
 - Wood Flooring
 - Insulation and Drainage
 - 1-1/2" Laminated Concrete F&D and Circulating Water Tubing
 - Insulation and Drainage
 - 1" 1/2" CLT Cross-Laminated Timber Panel
 - 1" 1/2" CLT Cross-Laminated Timber Panel

Quality Material is Incorporated with Smart Design and Craftsmanship

Connectors to Mechanical Control Heat Generation Plant

- Circulating Water Tubing
- Concrete
- Heat Exchanger
- Storage Tank

Figure 108 | Digital Display

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PREVIOUS STUDIO EXPERIENCE

SECOND YEAR | FALL 2012

Instructor: Stephen Wischer

Projects:

Tea House in Fargo,ND
Boathouse in
Minneapolis,MN

SECOND YEAR | SPRING 2012

Instructor: Phil Stahl

Projects:

Performing Arts Studio in
Moorhead, MN
Unconventional Dwelling
with a focus on
Biomimicry

THIRD YEAR | FALL 2013

Instructor: Paul Gleye

Projects:

Downtown Moorhead
Urban Renewal Library and
Hotel

THIRD YEAR | SPRING 2013

Instructor: Frank Kratky

Projects:

Steel Institute in Fargo, ND
Youth Center in
Chicago, IL

FOURTH YEAR | FALL 2014

Instructor: David Crutchfield

Projects:

Highrise in
San Francisco, CA

FOURTH YEAR | SPRING 2014

Study Abroad

Instructor: Paul Gleye

Projects:

Urban Renewal in Brussels,
Belgium

FIFTH YEAR | FALL 2015

Instructor: Stephen Wischer

Projects:

Thesis Research
Artefact Investigation

FIFTH YEAR | SPRING 2016

Instructor: Stephen Wischer

Projects:

Thesis Investigation and
Completion

ABOUT THE AUTHOR

EMMA DEMARTELAERE



HOME TOWN Fergus Falls, MN

PHONE (218) 731-5122

EMAIL emma.demartelaere@gmail.com

