

# ARCHITECTURE IN MOTION

AN EXPLORATION OF KINETIC SPACE




ARCHITECTURE IN MOTION: AN EXPLORATION OF KINETIC SPACE

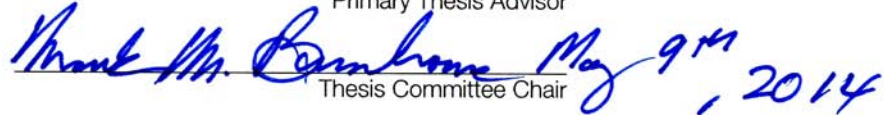
A DESIGN THESIS SUBMITTED TO THE DEPARTMENT OF ARCHITECTURE AND LANDSCAPE  
ARCHITECTURE OF NORTH DAKOTA STATE UNIVERSITY

By Jacob James Reimers

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



Primary Thesis Advisor



Thesis Committee Chair

May 2014 | Fargo, North Dakota



TABLE  
OF  
CONTENTS



07	FIGURES + TABLES
09	THESIS ABSTRACT
11	PROBLEM STATEMENT
12	STATEMENT OF INTENT
14	UNIFYING IDEA
16	THE PROPOSAL
18	NARRATIVE
20	USER/CLIENT DESCRIPTION
20	MAJOR PROJECT ELEMENTS
22	BASIC SITE INFO
30	PROJECT EMPHASIS
31	SPRING SCHEDULE
34	RESEARCH
44	RESEARCH SUMMARY
46	CASE STUDIES
74	HISTORICAL CONTEXT
80	THESIS GOALS
82	SITE NARRATIVE
100	SPATIAL REQUIREMENTS
104	CONCEPT MODEL
106	PROCESS SKETCHES
108	FORM GENERATION
110	FINAL DRAWINGS
132	THESIS EXHIBIT
136	STUDIO EXPERIENCE
138	REFERENCES
141	PERSONAL BIO



TABLES  
&  
FIGURES

04 FIG. 01 CITY OBLIQUE  
06 FIG. 02 WEATHERED PIER  
08 FIG. 03 SKYLINE 01  
10 FIG. 04 CITY IN MOTION  
12 FIG. 05 THE GARDEN  
15 FIG. 06 TWISTED  
16 FIG. 07 MASDAR 01  
19 FIG. 08 WINDWALL  
21 FIG. 09 CONCRETE FLOWER  
22 FIG. 10 REGION MAP  
24 FIG. 11 CITY MAP  
25 FIG. 12 SITE MAP  
26 FIG. 13 DUSABLE PARK  
28 FIG. 14 LANDMARKS  
32 FIG. 15 0-14  
34 FIG. 16 RUSHING WATER  
37 FIG. 17 GROWTH  
41 FIG. 18 TEA ROOM  
43 FIG. 19 LIGHT + SHADOW  
45 FIG. 20 YELLOW STAIR  
46 FIG. 21 MULTIPLE  
48 FIG. 24 FOG  
50 FIG. 25 SITE PLAN  
51 FIG. 26 SHADOWBOXX  
52 FIG. 27 THE HINGE  
53 FIG. 28 PROGRAM 01  
53 FIG. 29 CIRCULATION 01  
54 FIG. 30 GEOMETRY 01  
54 FIG. 31 MASSING 01  
54 FIG. 32 LIGHTING 01  
55 FIG. 33 THE HEARTH  
55 FIG. 34 KITCHEN  
55 FIG. 35 OPEN HOUSE  
56 FIG. 36 SECTION 01  
56 FIG. 37 PLAN 01  
57 FIG. 38 SEASIDE  
58 FIG. 39 ILLUMINATED  
60 FIG. 40 HALLWAY  
60 FIG. 41 DISCS  
60 FIG. 42 STAIRWELL  
62 FIG. 43 BASEMENT PLANS  
62 FIG. 44 UPPER LEVEL PLANS  
63 FIG. 45 SECTION/CIRCULATION  
64 FIG. 46 GEOMETRY 02  
64 FIG. 47 MASSING 02  
64 FIG. 48 LIGHTING 02  
65 FIG. 49 STRUCTURE  
66 FIG. 50 LIGHT SHOW  
68 FIG. 51 AWNING  
67 FIG. 52 CIRCULATION 02  
70 FIG. 53 ELEVATIONS  
70 FIG. 54 PANEL DETAIL  
70 FIG. 55 PANEL TEXTURE  
71 FIG. 56 MASSING 03  
71 FIG. 57 GEOMETRY 03  
78 FIG. 58 THE MARKET  
82 FIG. 59 DUSABLE 02  
85 FIG. 60 SITE 01  
87 FIG. 61 SITE 02  
88 FIG. 62 SITE 03  
89 FIG. 63 SITE 04  
90 FIG. 64 CHICAGO FOG  
91 FIG. 65 HI-LO TEMP  
92 FIG. 66 HUMIDITY  
93 FIG. 67 PRECIPITATION  
94 FIG. 68 SNOW  
95 FIG. 69 WIND  
96 FIG. 70 SUN & CLOUDS  
97 FIG. 71 SUN PATH  
98 FIG. 72 SITE SHADING  
99 FIG. 73 NOISE  
100 FIG. 74 SPACE ALLOCATION  
101 FIG. 75 MATRIX  
141 FIG. 76 PORTRAIT



NO SWIMMING





## TITLE

Architecture in Motion

## LOCATION

Chicago, IL

## TYPOLGY

Fine Arts Pavilion

24,000 ft<sup>2</sup>

## ABSTRACT

Architecture in motion: More than just an idea, it is a concept quickly becoming a reality. The real question is how will this concept shape architecture of the future. Exploration of kinetic architecture and tectonics will open a gateway to forms that can actively adapt to the programmatic needs of the user. Advances of material technology and construction processes have led us to the brink of a breakthrough. It is the job of the future designer to push beyond what we know as the boundaries of static form. I hope to explore the relationship between transformative space and meaningful architectural experience through the lens of an art pavilion in Chicago, IL.

Key Words: Kinetic, Transformative, Programmatic Evolution



10



## PROBLEM STATEMENT

How can kinetic architecture facilitate the programmatic evolution of a space?

LEFT: *fig. 04 - City in Motion: Chicago, USA*  
(Reimers, 2013)





STATEMENT

INT



# MENT OF MENT

## PROJECT TYPOLOGY

Fine Arts Pavilion  
Chicago, IL

## THE CLAIM

Through kinetic design and material choice we can create in a way that not only meets the demands of the current function, but also adapts over lifetime of the building.

actors - current and future occupants

action - conscious materiality choices and kinetically integrated design

object - the built environment

The space that is provided by the architect must fit the programmatic needs of the current occupants. The form may even follow their function. But if the program changes over time, can the form itself be designed to evolve along with?

Materiality is an area that the designer can make a lasting effect of the feeling of the space. The materials that exist today are constantly being used in new ways and being pushed beyond what was thought to be their limits. As material technology advances, so should the forms that they become a part of. Kinetic design has become a new area for architectural study; largely put into motion by our technological advances.

The building can become a living being, evolving with the user's needs. Therefore, it is crucial to design in a way that not only interacts with, but enhances the built environment around it.

## UNIFYING IDEA

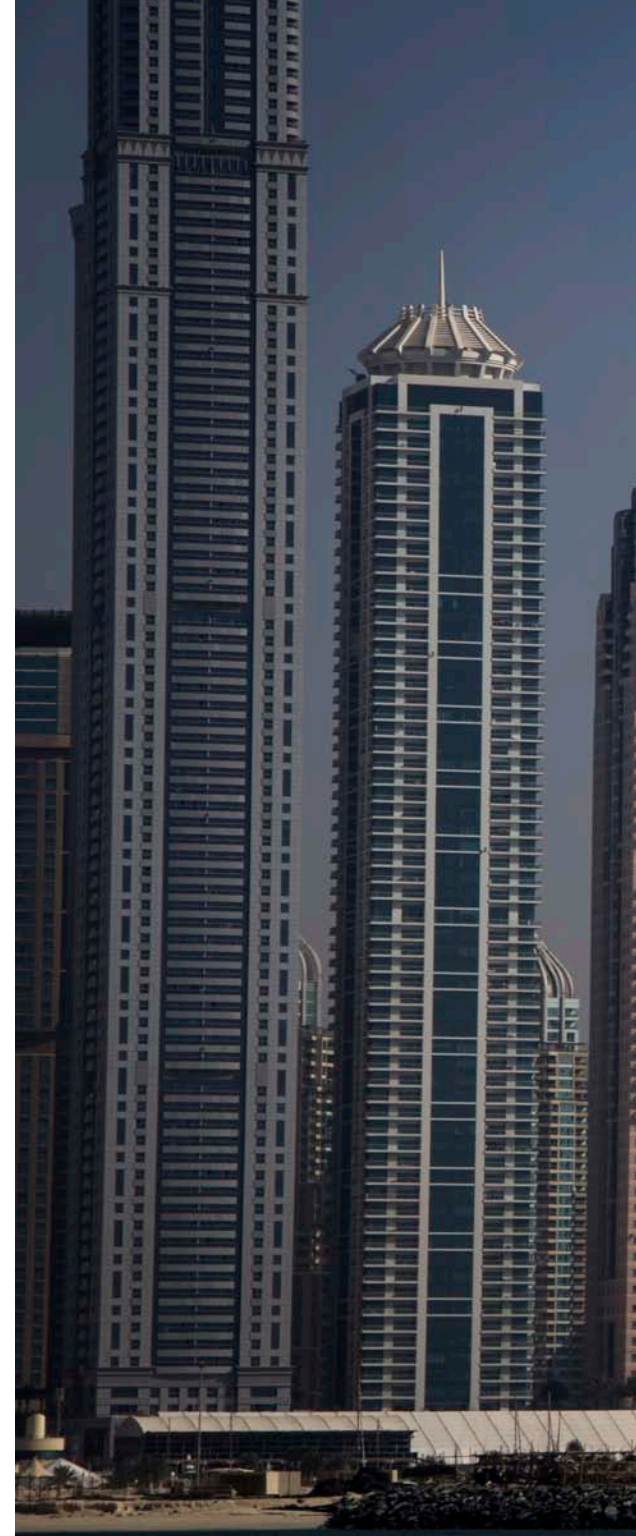
Through architecture that, in its very nature, evolves and adapts to a changing program, the door is open to a revolution in how the built environment is thought of. Design can now move from static form into the dynamic realm.

## PROJECT JUSTIFICATION

We are the designers of the future. This comes with a responsibility to not only the clients for which we initially built for, but for every occupant that may reside in the years to come. The way we utilize our built environment now will be drastically different than the way it is used decades from now. More than ever, the constructs of society and our public spaces is changing exponentially.

Through the design process, we hold a sort of ownership and relationship to our work. But how can we create works that, once they leave our sketchbooks and construction documents, are no longer an extension of ourselves, but rather a fixture that evolves with its every use?

Kinetic architecture has the potential to allow our designs to evolve in a way we may have never foreseen. As technology and complexity advances, we may see space that is able to cater to every changing need of the occupant. This avenue of design could enhance the sustainability of the built environment by prolonging a structure's usability and give bring a rich experience to the cityscapes in which they are constructed.



RIGHT : fig. 06 - Twisted: Dubai, UAE  
(Reimers, 2013)





THE

PI





THE

PROPOSAL

## THE NARRATIVE

I believe that we sit on the cusp of a revolution in what defines the spaces in which we reside. As technology advances, so does our ability to manipulate form and materiality. An architectural space is merely what is defined explicitly or ambiguously by boundaries that the designer puts in place. What happens when those boundaries move and evolve? What if the built environment was in a constant state of change? How could this change how we see space and push the boundaries of architecture? The potential is staggering and is a frontier that has just now begun to be explored. I think it is crucial that the places that designed today become the places we inhabit a century from now. From one user to next, the space adapts to their every need. What does it take to break through the barrier of static unchanging form and into a transient and kinetic space?

The challenge then becomes, how can a space be both adaptive and retain a certain character that doesn't leave the user feeling as if they were just another passerby? There is more meaning that a space demands than just functionality. Can architecture in motion evoke a reaction to the user? I want to see how this typology can influence and interact with the built environment around it. I have chosen to do an artisan studio and gallery as I believe that art is always evolving and is in many ways similar to the ideology of the form that I intend to explore. Art is all about inspiration and I want to create a space that is inspiration and gives the same feeling of freedom to explore that an art medium carries. I also want to provide a space in which can be used to revitalize the community's interest in craft and trades that seem to have become lost arts.

**PREVIOUS :** *fig. 07 - Masdar:* Abu Dhabi, UAE  
(Reimers, 2013)

**RIGHT :** *fig. 08 - Windwall:* San Francisco, USA  
(Reimers, 2013)



## USER/CLIENT DESCRIPTION

### Artisans

The pavilion will cater to the needs of both visiting artisans and those of the Chicago area. It will provide a rich diversity of exhibit space and gathering/workshop spaces. The arts are all-encompassing and the pavilion is a suitable venue for everything from sculpture to performance arts.

### Visitors

Visitors to the art pavilion will have a different experience with each visit over a period of time. The changing exhibits and workshops will be just one of many levels of experiential transformation. The alteration of the architecture itself provides a unique setting to encounter art in its various forms.

## MAJOR PROJECT ELEMENTS

- gallery space
- secondary flex gallery space
- plaza indoor/outdoor
- cafe + lounge
- flex meeting/conference space
- rest rooms
- workshop
- parking
- connection to river walk







CHICAGO, IL



DUSABLE PARK

PREVIOUS : fig. 10 - Region Map  
(Google Earth, 2013)  
LEFT : fig. 11 - City Map  
(iMaps, 2013)  
RIGHT : fig. 12 - Site Map  
(iMaps, 2013)





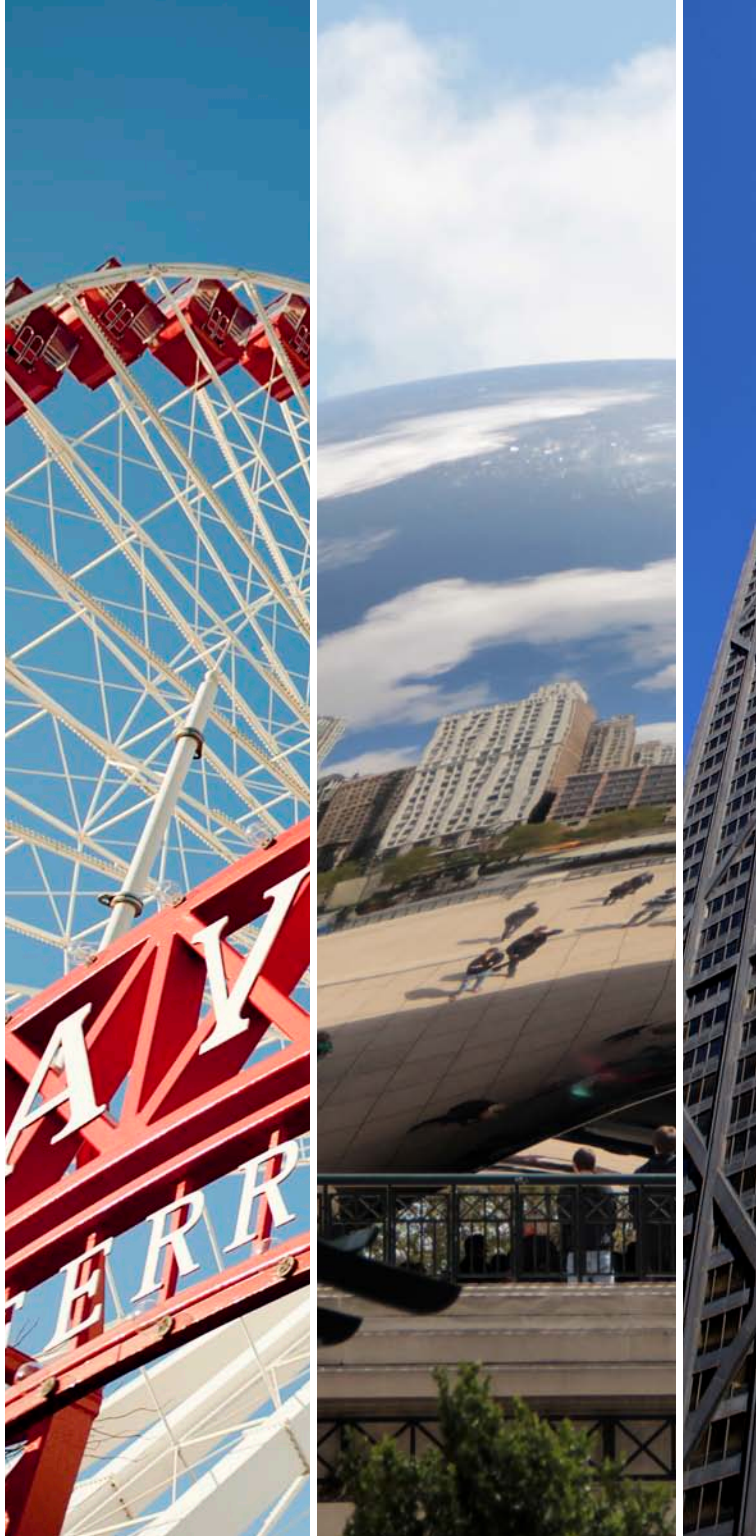


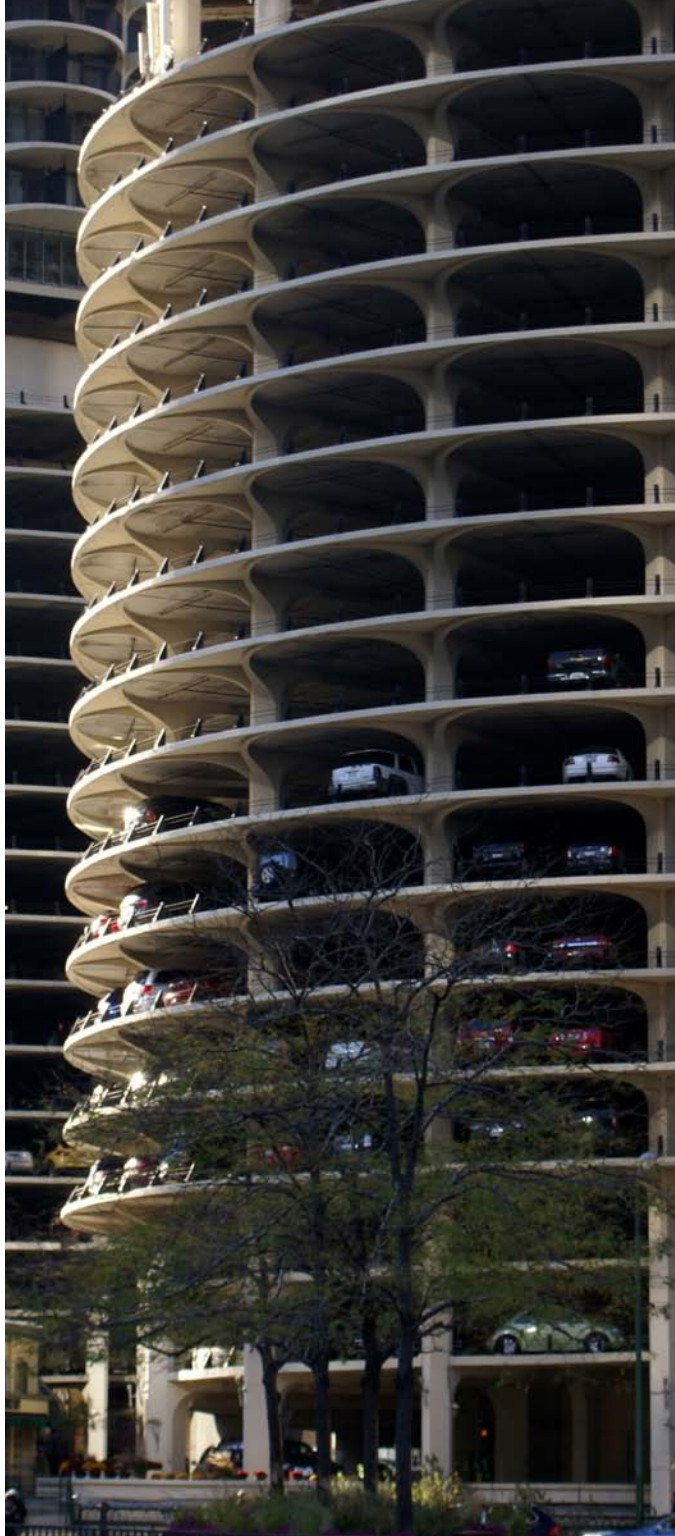


DuSable Park is located on Lake Michigan in downtown Chicago. It is close in proximity to Navy Pier. The site was under soil remediation to rid it of toxic waste left behind from its previous use as a mined ore depository. Upon completion of its decontamination it has been looked upon for a site of future development. At one point, it was planned to be part of the doomed Chicago Spire plaza. It is currently closed to the public and remains open for development. The major site challenges are accessibility and noise pollution, due to its proximity to a multi-tiered overpass. There is a lot of potential in this site though because of its location on the lake and the surrounding area contains many community attractions such as Navy Pier, canals, walking paths, and neighboring parks.

# LANDMARKS

RIGHT: *fig. 14 - Landmarks: Chicago, USA*  
(Reimers, 2013 & Grey, 2011)





## PROJECT EMPHASIS

This thesis project will focus on the relationship of user, program, and form and the changes that each may undergo over the life of a building. In this instance in particular, the user (the business owner), requires space that both provides a venue for artistic exploration but also a workspace that provides inspiration and community integration.

## A PLAN FOR PROCEEDING

### research direction

The research phase is ongoing and will be considered throughout the entirety of the project. Focus will include, but is not limited to; the theoretical premise, typology, historical context, site analysis, and program.

### design methodology

Throughout the research and design phases I plan to utilize a mixed method approach that incorporates both quantitative and qualitative data. The knowledge gained through this methodology will be used to inform the design and be represented in a variety of mediums throughout the project.

### documentation of design

The nature of a year long thesis demands that process be documented continually. This will occur through a variety of mediums: sketching, models, digital presentation, video/photos. Upon its completion, this data will be made available in both physical and digital form.

## SPRING SCHEDULE task|work days

---

project documentation	88
context analysis	5
conceptual analysis	10
spatial investigation	15
ecs passive and active system investigation	5
structural development	4
floor plan development	15
envelop development	10
material selection	10
section exploration	10
midterm reviews	10-Mar
revision and reflection	10
energy analysis	5
graphic rendering	20
model construction	7
presentation prep	7
presentation layout	1
cd of boards to advisor	14-Apr
plotting	3
exhibit installed	28-Apr
exhibit open	28-Apr
reviews	1-May
final documentation	12-May







THE

PROGRAM

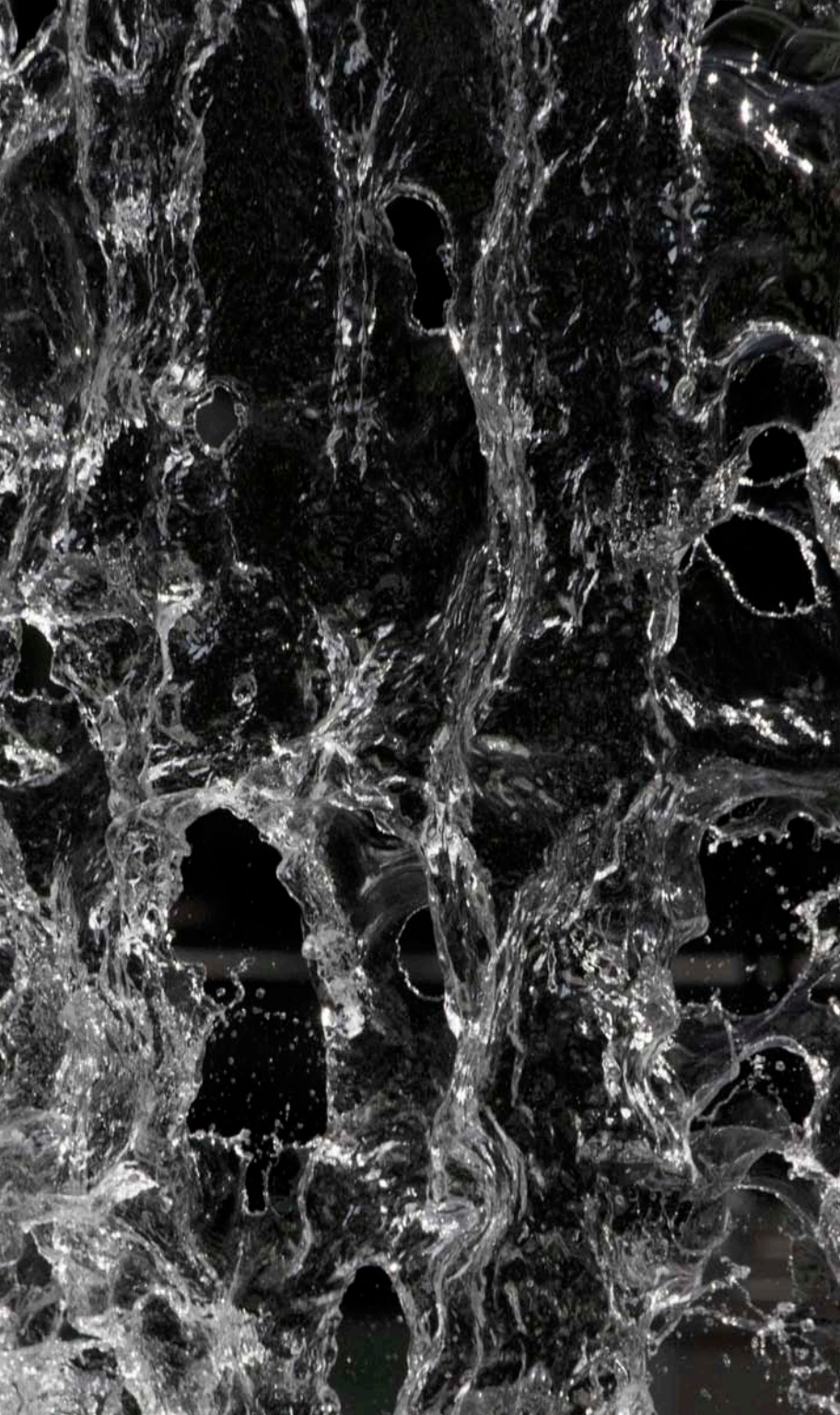
## THE RESEARCH

Architecture in its current state exists as a snap shot of the epoch in which it was designed and built. “It has a peculiar characteristic of being to a great extent a “petrified form” in space, in a particular time.” (Antoniades, 1992) But why cannot architecture be dynamic in way that we have only drawn on paper? Why can it not be kinetic?

**KINETIC** | KE'NETIK | - OF, RELATING TO, OR RESULTING FROM MOTION.

What is kinetic architecture? It could be argued whether or not there are any true built examples of this, and that is why I have chosen to explore the nature of what this could mean for the field of architect. I believe that with the even advancing material and construction technologies, we are on the cusp of a revolution in architecture. If the past is any example, this new era could be quite profound. The arch brought us the ability to span distance in a new and elegant way; steel brought unprecedented growth in load bearing and height capabilities. The integration of technology and modern materiality has the potential to revolutionize the way the built environment interacts and adapts to the world around it.





Kinetic design or adaptive design is experimental at this point. Examples can be found in installations and building skins at various scales. The ultimate achievement would be to be able to shift them from accessories or novelties into the focus of the space. Axel Ritter explains this in his book *Smart Materials*. Architecture is capable of not just tolerating alterations in the environment or occupant use, but intuitively adapting to the user's needs and responding to nature. This can be done at multiple levels from and can react and adapt to multiple stimuli, including light, sound, and movement. (Ritter, 2007)

So is kinetic architecture anything that involves movement in its design? I think that it goes beyond simply having a retractable roof on a sports stadium. Kinetic architecture is something that alters a space in a more meaningful way than that. Architecture is environment in which we exist. We live, work, and play in built space. Some of which is more meaningful and experiential than others. But even though architecture is so focused on its ability to contain life, it often does not reflect the nuances of the happenings within. It is a rigid form that once it takes its shape, is not altered too far beyond minor additions and renovations. Its lifespan is fixated in a particular space and time. (Antoniades, 1992)

This is what I believe is simply the accepted state of architecture currently. Occupants will change and the needs of the space change, this is inevitable. The chance that a building will always have the same function through its lifetime is quite slim and limited to a few typologies. Our current solution is to wait until our buildings have fallen into disuse or are not sufficiently meeting the needs of the user and then demolish and rebuild or renovate them. While these responses have their appropriate situations, they leave room for improvement. Some of this can be made up in quest for ultimate sustainability. Buildings that are net-zero, or made largely of recycled content, or even space that is on the edge of innovation that can stay relevant for longer than others. In *Building to Last*, Herb Greene states that “it may take generations, even centuries, to bring its additions and surfaces to full development, its basic forms and proportions will have to excite interest and curiosity. To achieve this level of response, an armature requires its architects to be poets.”

Existing architecture is a collage of everything that its tenants have modified and added to it throughout its lifespan. It is important that we consider this when designing for the long term. The space leaves our control when enters the real world. It becomes a shared space that is interpreted and interacted with uniquely by each user. (Greene, 1981) So if our goal is to make buildings that are not only suitable to the current programmatic needs –but also adaptable to whatever the future may bring, why not take its adaptability to the next level? What if the form could actively adapt to the users needs rather than simply tolerate the program until it was unfit to do so? This would revolutionize the way that we see design and the human experience.



”THE REDUCTIONIST STRATEGY HAS SINCE  
WHETHER ONE ATTEMPTS TO UTILIZE PSYCHO  
SOPHISTICATED METHODOLOGIES AND EVEN C  
TERMS WITH THE ESSENTIAL QUESTION OF M

The history of man has been a continuous process of invention and refinement. While, of course, there have been eras of stagnation, the indomitable wheel of progress moves onward. This advancement of technology, philosophy, and societal dynamics has taken place on various scales from macro to micro. In the last century we have seen a shocking and unprecedented evolution in the technologies that permeate our society. Even in the last two decades technology has reached a stage of exponential growth. With each new innovation comes a period of refinement, a period of optimization. Phones and computers become thinner, faster; cars become more fuel-efficient and cleaner; communication and information are disseminated at a rate never before seen. It is in this era that the stage is set for a new archetype in our built environment. Space that can evolve and is, at its core, transformative.

Such space has the power to bring a new

significance to our perception of time in the architectural experience. At one scale, structure can be continuously changing in its skin to adapt to light and other environmental conditions. At another scale it can be made to adapt to the programmatic evolution it may undergo throughout its lifetime. I believe that this concept is one that is both just being explored and also one that has its roots in the past.

My fear in such a development in architectural technology is that the spaces being produced have the potential to be devoid of all ritual and function in the pursuit of all function. The easiest solution to making such space work is to create empty shells that can be efficiently manipulated in their use and are extremely loosely grounded by their intended function. So the question at hand becomes this; can a space become both transformative and meaningful at multiple levels of the user's perception?

BECOME THE FUNDAMENTAL FRAMEWORK OF ARCHITECTURAL THEORY AND PRACTICE, LOGICAL, SOCIOLOGICAL, OR EVEN AESTHETIC VARIABLES. MORE RECENTLY, VARIOUS COMPUTERS HAVE BEEN APPLIED TO DESIGN, ALWAYS FAILING, HOWEVER, TO COME TO MEANING IN ARCHITECTURE.” -ALBERTO PEREZ-GOMEZ

As published by many phenomenological theorists, the state of architecture today is that which has been boiled down to a formulaic approach. Simple programming and square footages are often calculated to create the most efficient and cost effective space. But the result is just that, a space that is solely pragmatic. Alberto Perez-Gomez states,

”The reductionist strategy has since become the fundamental framework of architectural theory and practice, whether one attempts to utilize psychological, sociological, or even aesthetic variables. More recently, various sophisticated methodologies and even computers have been applied to design, always failing, however, to come to terms with the essential question of meaning in architecture.”

The concept that architecture is simply a derivative

of an equation or a systematic balance of variables is one that we must remain very weary of in our practice. While the relationship of architecture and mathematics is largely symbiotic, the formalistic approach of pure mathematics cannot validate imperfection, or the human variable. These intricacies are what give depth and character to the architectural experience.

In exploring this concept I have found inspiration in a few sources and at multiple scales. The first of which being that of traditional Japanese architecture. These spaces are both highly ritualized and very minimalist or even efficient in their essence. The Japanese house is a profound example to study. Its structure is light and airy, its spaces serve many functions, walls move and forms change to adapt to the current use. Yet each space is formed at an extremely anthropomorphic level. Their delicate approach to space planning is where I believe the idea of kinetic or transformative architecture of today finds its roots. The Japanese house is organized by a series of kens or bays; the ken being the dimension of one floor mat. These dimensions when scaled led to space with a sense of embodied harmony. But even with this embodiment came the ability to adapt to ever changing spatial needs. So much so that examples of transformation from typical dwelling to temple were common adaptations of Japanese architecture.

It is through this simplified architecture that

exist a certain poetic beauty. We see a space and through our visual perception may only see it in one frame of mind instead of seeing the hidden possibilities of the space. Pallasmaa argues that while most people are under the impression that we see the world around us with a certain amount of clarity, we are really only seeing a minute fraction of the information being presented to us. Walter Ong states that now more than ever, visual stimulation has increased to the point that we have lost sensitivity in our other sensory mechanisms. But in vision, again, the power of the unconscious is present. Dynamic vision is the essence of “focused” vision; in fact we can’t achieve meaningful sight through purely static vision. Our eyes move rapidly, yet unconsciously, to scan the field and give clarity and form to our perceived world. “We could think that our visually acquired image of the world is not a single “picture” at all, but a continuous plastic construct that keeps integrating singular precepts through memory.” (Pallasmaa, 2011)

Transformative architect, I believe, would then be





something that engages a stronger interplay with user and design, than simply being able to resolve the space immediately in our minds. The dialogue between the two components creates a sort of dynamic charge to the space, allowing each user to live a different experience through it. I believe this is a vital component to kinetic architecture.

Another example that I have drawn from is much more modern than the previous, in fact it is constantly at the forefront development. Technology of today is inspiring in that even as it becomes more and more slim and efficient, you still can feel the value of the product. I would point to the iPhone as one example of this. Its materiality and heft give the user the feeling that what they are holding is something that was carefully crafted for the user's experience. The form is constantly being revised, as are its inner workings that we experience through its usage. I think this can be applied to many pieces of modern technology, whether that is a set of well-

built headphones or laptop. Their evolution has been one that is always seeking to break it down into the most basic of components yet adding complexity to the experience.

Kinetic or transformative architecture of the modern era has the ability to achieve both ends of the scale through proper execution. I think that it is vital the transformation involves the user, that the evolution is made prominent and part of the experience itself. Depth can also be created in the quality of the materiality and its outward effect of the space through its embodied characteristics. I look forward to further exploration of a topic that I believe has the potential to shift our perception of and interaction with the built environment for generations to come.



# SUMMARY

The future of architecture is one that is grounded in both the past and reliant on the future. The growth of technology in the field is rapid evolving the workplace and the design process. We have seen immense amounts of progress in this area in the last 10 years. The technology of both design and construction practices has opened the both to many new forms and solutions to architectural problems. Kinetic architecture offers the ability to adapt to changes in the programmatic utility of a space. I believe that through the form of design, we can create space that is not only efficient in dealings with function but also meaningful and engaging to the user. The research that I conducted in this book was focused on several levels of this claim. First looking to roughly define what kinetic, or architecture in motion was. Exploring the static nature of buildings through the work of Antoniades and then looking for built examples of transformative space.

I think it is important to realize that are

many levels at which one could consider a space transformative. From there, the basis characteristics of kinetic space could be derived.

The potential danger in chasing after these heavily manipulative spatial layouts is that you can up with a space that has no purpose but to be all purpose. I explored this idea through the works of Juhani Pallasmaa and Alberto Perez-Gomez. Both theorist stress the importance of the participatory interaction of the user and the space. This concept is one that I plan on carrying throughout my design process. The experience is truly something that should be considered just as is the facade and layout of the space. Where I don't agree with these theorists is their quite negative stance on technology in design. As we progress onward, it is clear that technology is going to be a constant fixture of society. We need not shun it, but rather, embrace its advantages and be weary of its disadvantages. Technology is one of many tools that we should

implement into our design process.

With this in mind I set out to find some example that I thought were relevant to both meaningful experience and positive aspects of technology. I found examples of this in Japanese architecture. Its simplistic design fulfills both an evolving program while maintaining a very ritualistic space. I believe that this example shows that the two ends of the spectrum can coexist.

My second exploration was in that of well crafted technology that is made powerful through its materiality and experience. Through this, I believe that technology can be valued as more than just a passing luxury or commodity.

This research in combination with the case studies to follow should build up a strong base of knowledge as I set out to give a solution to the topic at hand.

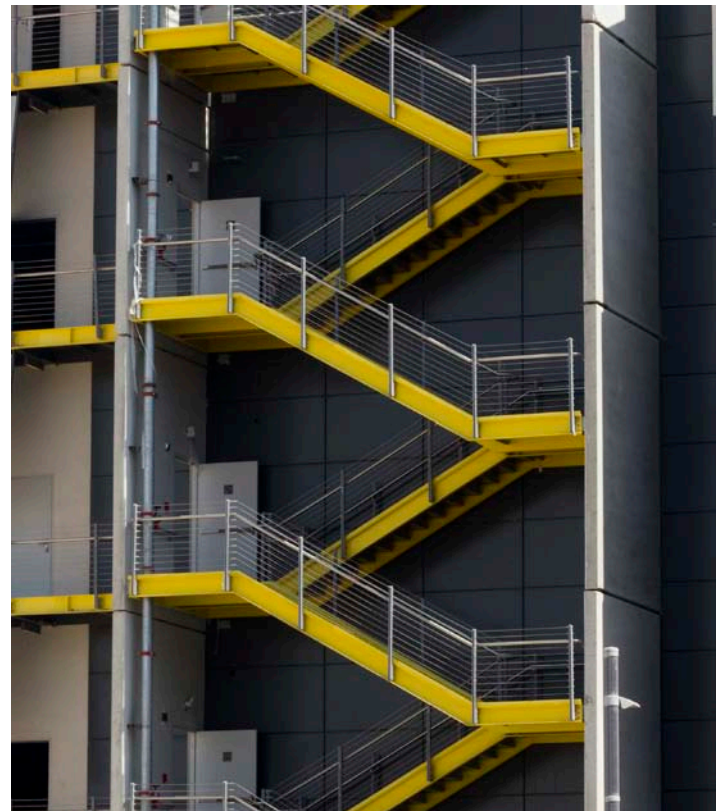


fig. 20 - Yellow Stair: Abu Dhabi, UAE  
(Reimers, 2013)



fig. 21 - Night Shadow, Washington, USA  
(Gentry, 2013)

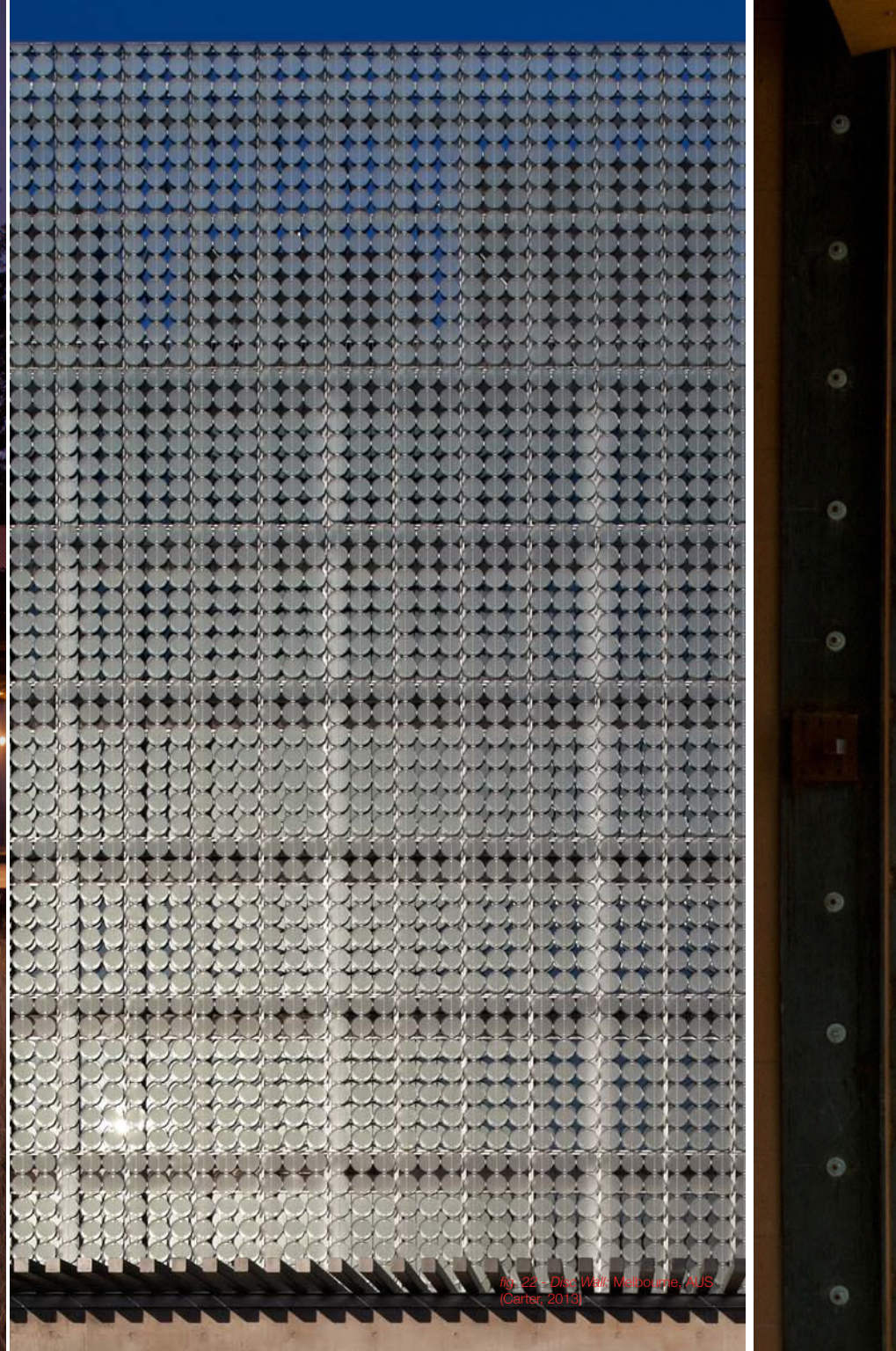


fig. 22 - Dice Walk, Melbourne, AUS  
(Carter, 2013)



*fig. 23 - Street Side: Brooklyn, USA  
(Dzikowski, 2013)*

# CASE STUDIES

## INTRODUCTION

Case studies are a critical tool in the development of a design philosophy. Especially when it is one that is unfamiliar or relatively untested. In the following pages, I will explore three different projects. They will be evaluated on their use of transformative elements and the way each one uniquely resolved its particular typology.







# SHADOW BOXX HOUSE

OLSON KUNDIG ARCHITECTS  
LOPEZ ISLAND, WASHINGTON, USA  
COMPLETED: 2010  
Sq FT: 3500

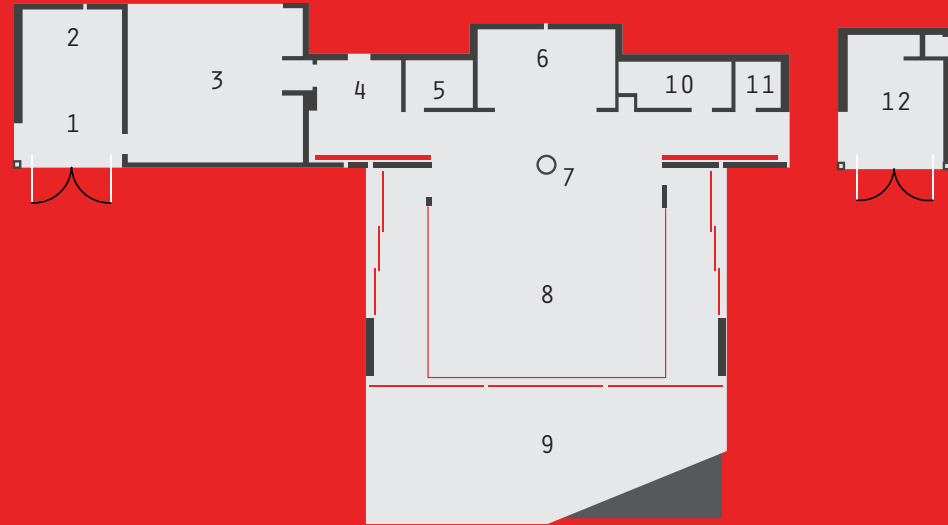
LEFT: fig. 24 - Fog  
(Jason Schmidt, 2010)



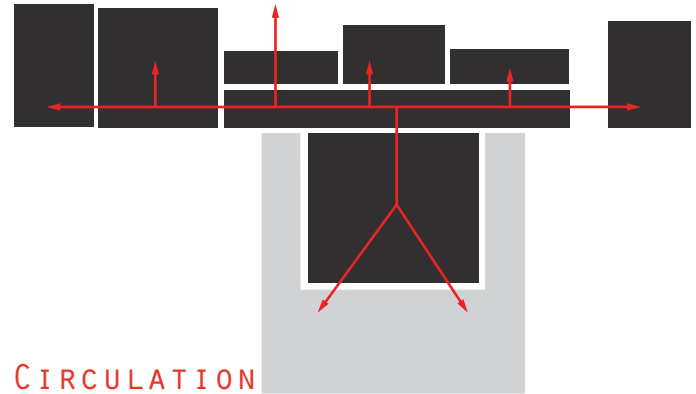




- BEDROOM 1
- BATH 2
- GARAGE 3
- ENTRY 4
- PANTRY 5
- KITCHEN 6
- FIREPLACE 7
- LIVING ROOM 8
- PORCH 9
- STORAGE 10
- TOILET 11
- BATH HOUSE 12



The Shadowbox House uses a combination of active and passive kinetic components to create moments of transition in throughout the space. By confusing the indoor/out boundary, these spaces retain characteristics of both and are an experience embodied in the interplay between the two. The residence is organized in a linear manner, all major spaces intersect a gallery that runs the length of the house. The main living space evolves to suit the current need. Custom designed furniture allows for lounging and sleeping around the hearth. A private guest room serves as a much more typical sleeping area. The bath house is a separate component on the opposite end. Its roof opens via a 5,000 pound counter-weight. This unique space can adapt to



**CIRCULATION**

different weather situations and the desire of the user. Its large operable glass facade further enhance its connection to the serene landscape the surrounds the space.

LEFT : fig. 27 - *The Hinge*: Washington, USA  
(Jon Gentry, 2007)

ABOVE : fig. 28 - *Program 01*

RIGHT : fig. 29 - *Circulation 01*

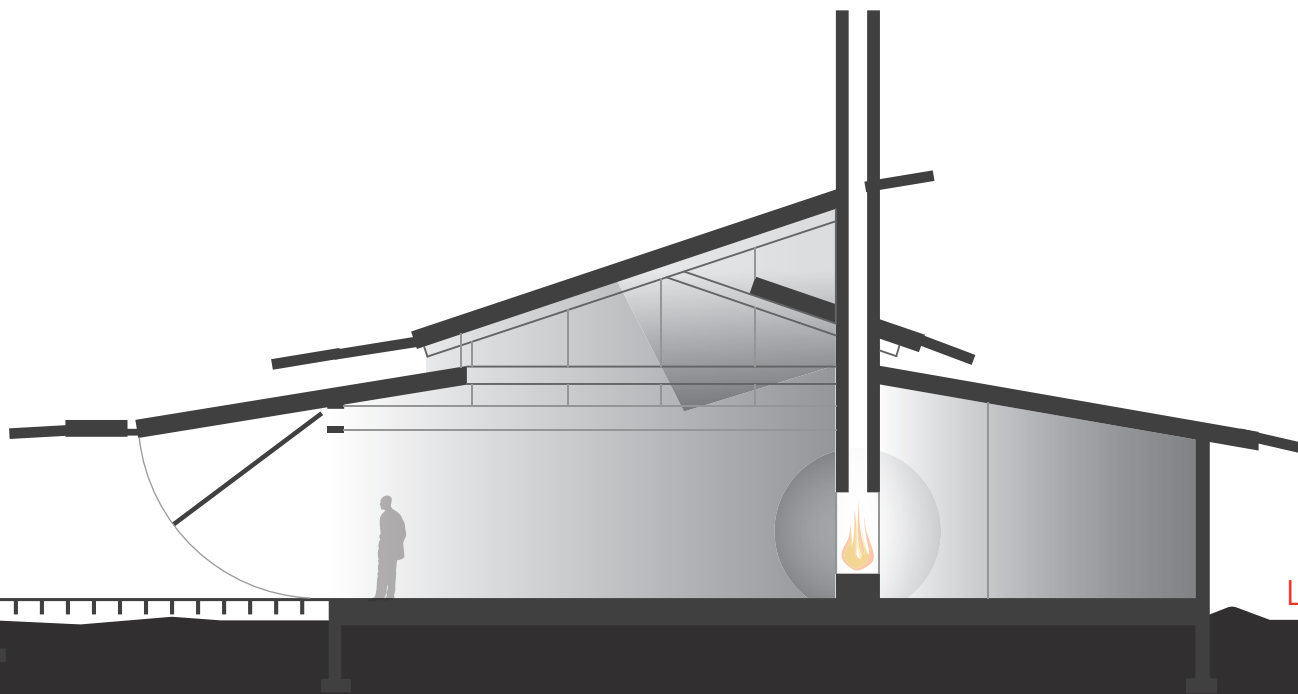
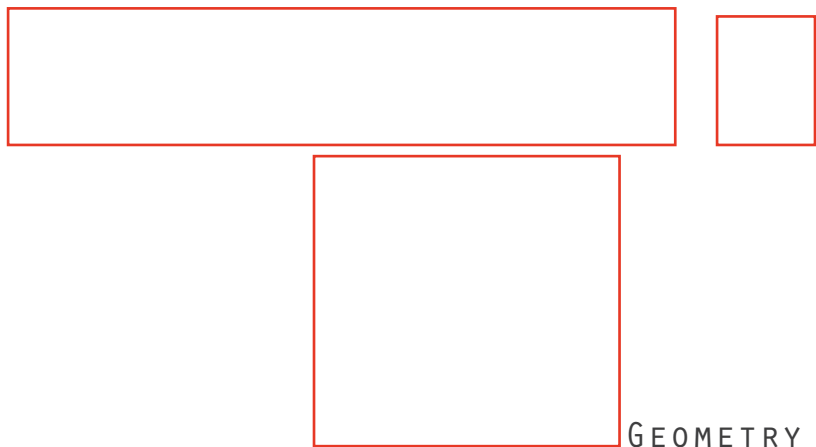




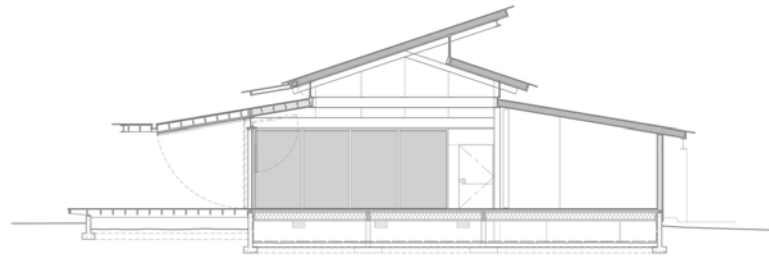
fig. 33 - The Hearth: Washington, USA  
(Jason Schmidt, 2010)



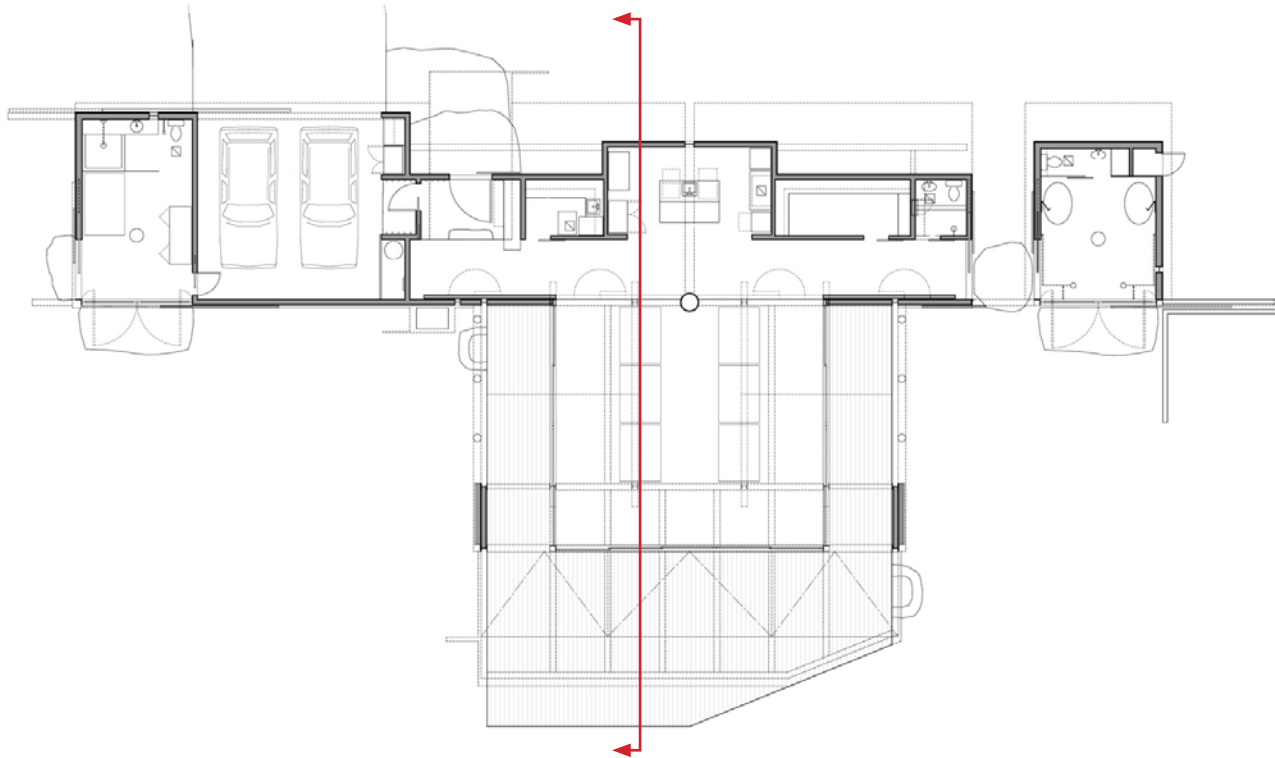
fig. 34 - Kitchen: Washington, USA  
(Jason Schmidt, 2010)



fig. 35 - Open House: Washington, USA  
(Jason Schmidt, 2010)



SECTION



PLAN





The materiality of the house was chosen quite meticulously, careful consideration given to the weathering aspects of each material type. The materials give the space a deeper experience through their tactile qualities; reclaimed oak, rusted Cor-Ten steel, rammed earth, unpainted gypsum, etc.

The house exists as a series of layers, several skins offer levels of protection from the elements to each space. The house is truly centered around the fireplace. Even its structure is footed in the steel clad chimney rising through the roof. Its innate character as a gathering space as well as the qualitative

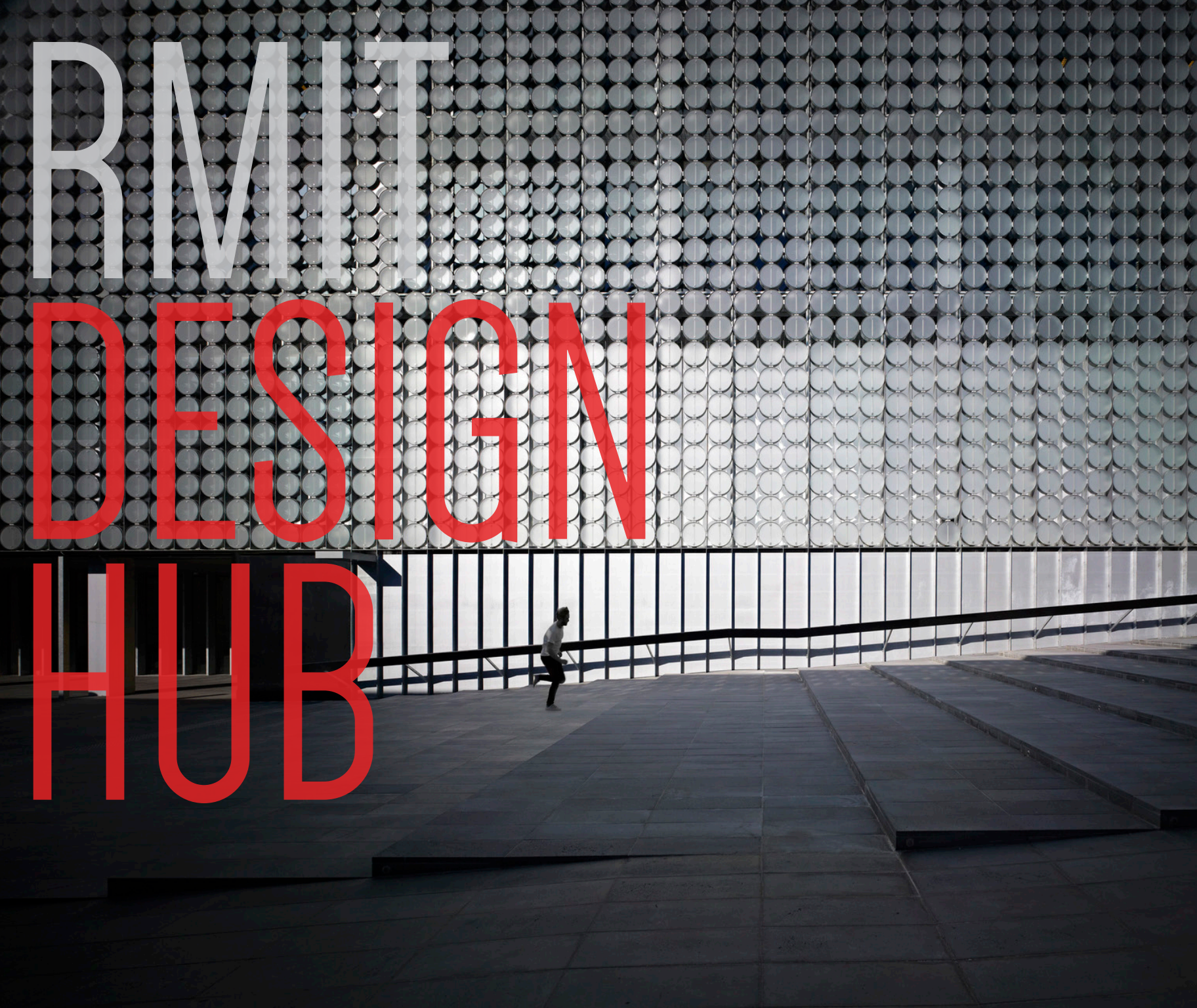
aspects that a fire brings to the space define the basic purpose.

Similarly to the other examples, this project utilizes mechanical kinetic fixtures to manipulate environmental qualities of the space. Its other transformative components are anthropomorphically scaled to allow easy and fluid interaction between user and architecture. I believe this is a key characteristic in creating meaningful space. It is also what makes this project quite different from the RMIT Design Hub. Its facilitation of human interaction give the user a much more conscious awareness of the experience.

RMIT

DESIGN

HUB



## SEAN GODSELL ARCHITECTS

MELBOURNE, AUSTRALIA

COMPLETED: 2012

Sq FT: 140,000

The Design Hub is simple in its form, just two stacked boxes. But its appearance is much more commanding than its simplified form. When asked why so many of his projects were boxes, architect Sean Godsell replied, “All architects fear being boring, the box is the hardest form to make interesting. By resolving the inner program with the form as simply as the box, the design was allowed to take on a much more nuanced exterior.

As you approach the building you begin to notice its intricate facade. Made up of 16,250 sand blasted glass discs, it is able to create unique interior conditions to best suit each space. Built upon a larger 3x7 disc frame, the sun-screen is held off the interior glazing to enhance airflow and cooling up the building. The screen is able to manipulate both light and heat gain.

The building itself contains schools of interdisciplinary post-graduate studies including; architecture, aeronautical engineering, industrial

design, landscape architecture, urban design, and fashion design. The interior floors are separated into highly adaptable and functional studio spaces or “warehouses.” The client desired space that would help facilitate interdisciplinary cooperation and unification, while also drawing in the life of the surrounding urban space. This case study interested me because of its goal to further integrate the community into what would normally be considered a private space.



fig. 40 - Hallway, Melbourne, AUS  
(Earl Carter, 2012)



fig. 41 - Discs, Melbourne, AUS  
(Earl Carter, 2012)

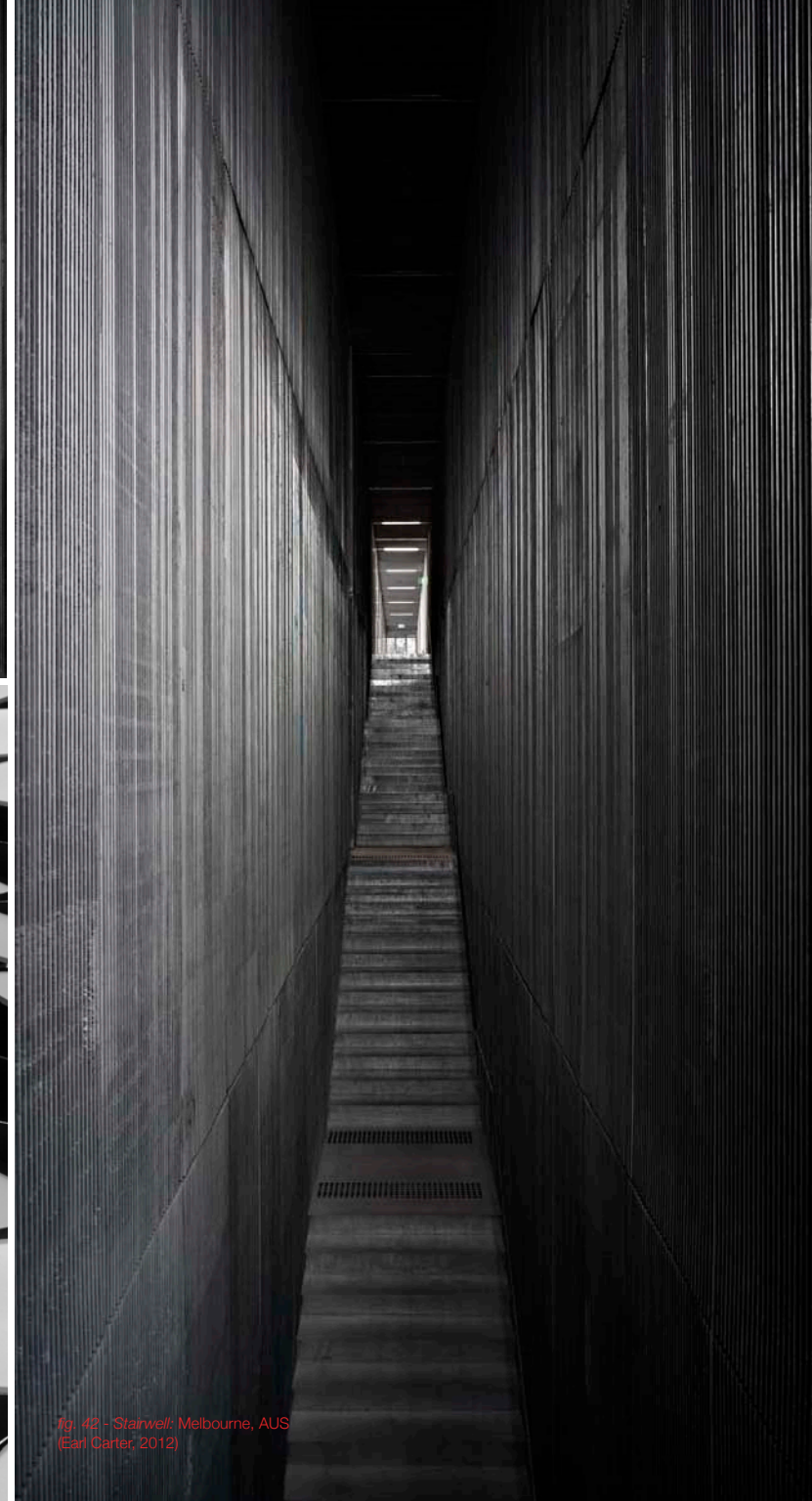


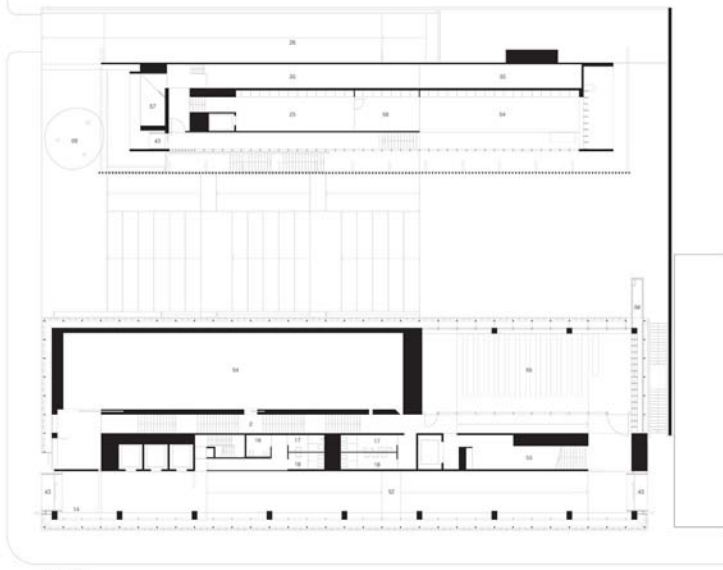
fig. 42 - Stairwell, Melbourne, AUS  
(Earl Carter, 2012)

The RMIT Design Hub is divided spatially into two major masses. The first set of boxes is on the ground floor and sub-level. These house gallery and exhibition space as well as graphic presentation space. Another key component is the cafe and vendor space that is integrated at street level to draw both students and the community into a collaborative space. The disc facade facilitates both a private and public quality, allowing the interiors to be both transparent yet separated from the outside.

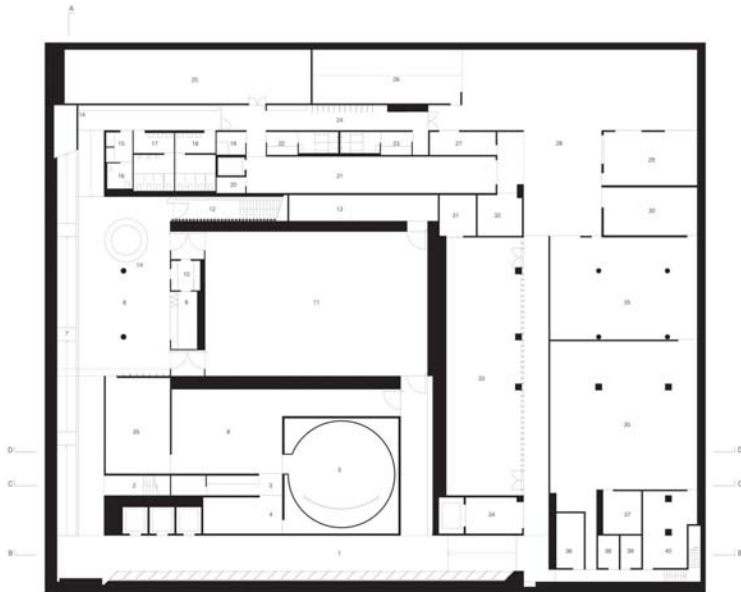
This is much different than the Shadowboxx house in terms of site and purpose. While both intend to blur their boundaries, the previous example does so to connect with nature. Yet it does so in a very private and secluded way that fits only the needs of the primary occupant and guest. The Design Hub on the other hand opens itself to the surrounding community and encourages interaction. The materiality is also quite different. Concrete and glass have much different tactile qualities than

reclaimed wood and rammed earth construction. The Design Hub seems to fit into its urban context while simultaneously making a statement through its material choice.

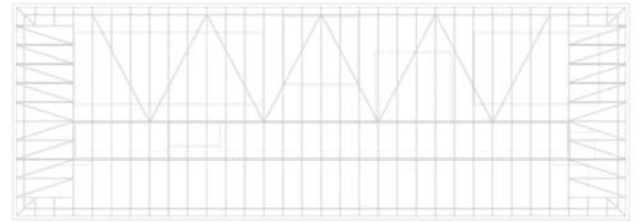
The programmatic separation are crucial to its success. A combination of open studios and breakout spaces allow for transformative programmatic elements to occur without physical interaction. This is similar to the way that many design studios are set up in the modern era. In a field where collaboration is so crucial, it is fitting that this space matches these needs.



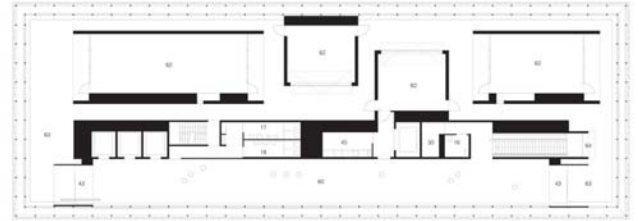
GROUND FLOOR



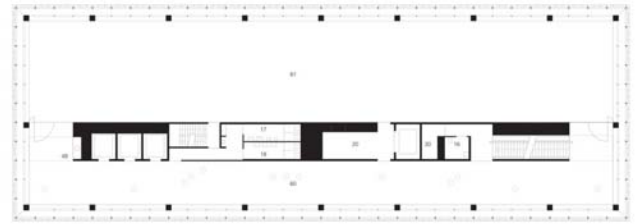
BASEMENT



ROOF PLAN



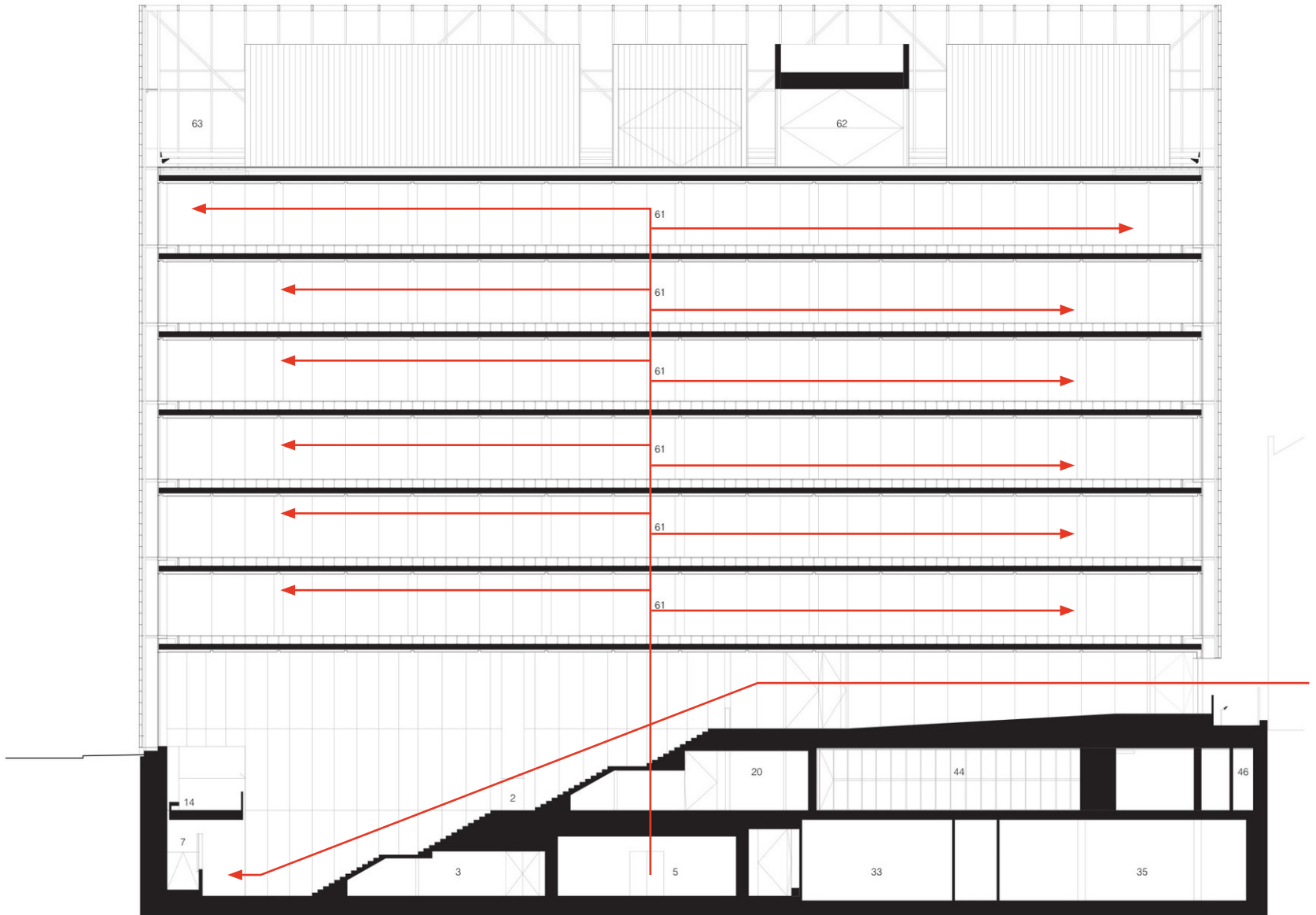
LEVEL 1



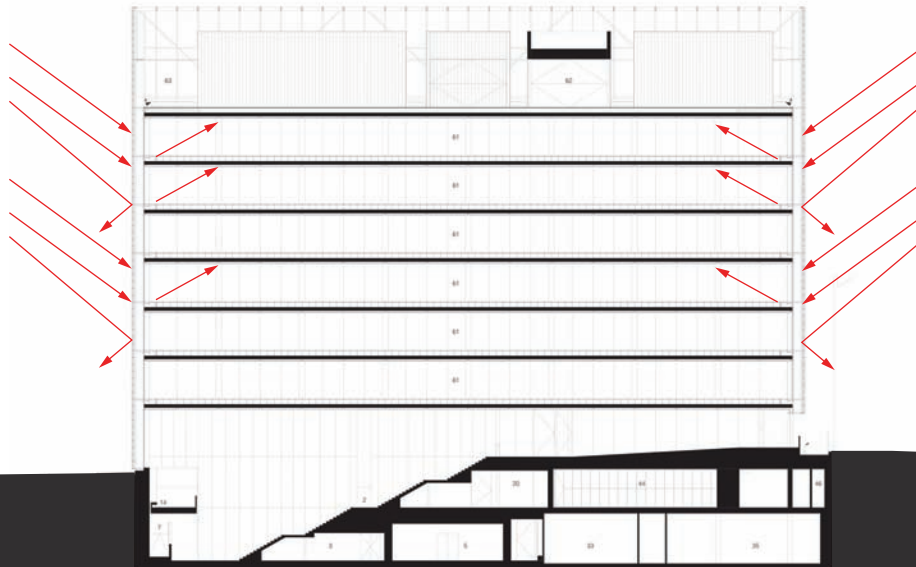
LEVEL 2

LEFT: fig. 43 - Basement Plans  
(Godsell, 2012)

ABOVE: fig. 44 - Upper Floor Plans  
(Godsell, 2012)



ABOVE: fig. 45 - Section/Circulation  
(Godsell, 2012)







RIGHT: fig. 49 - Structure  
(Godsell, 2012)

# WYCKOFF EXCHANGE

ANDRE KIKOSKI ARCHITECTS  
BROOKLYN, NEW YORK, USA

COMPLETED: 2011  
SQ FT: 10,000

66





The Wyckoff Exchange building is an interesting take on an adaptive reuse project. The space is a flexible commercial retail center that was formed out of the ashes of two warehouse. Much of the design was inspired by the industrial nature of its past. It is a modest approach yet adds immense richness to the street interface. Its design is centered around five sets of scissor doors that can be raised or lowered on the street side. By day they are opened to create a protective awning and expose the shops within. By night the close to secure the retail space. Clad in Cor-Ten, the provide a modern twist on the industrial nature of the building. Each panel is precisely laser cut to interact with the sunlight and create a screen for the street level. At night, LEDs behind the screen illuminate to create a colorful art detail and add to the community interaction even beyond retail hours.

The buildings circulation is quite simple, drawing in activity from the street. This area is a rapidly developing center for art and creativity and the Exchange building definitely adds to that scene.

It also serves a dual purpose in its programmatic usage. The space can be turned into a venue for local musicians and artists to perform and becomes a hub for nightlife in the community.



**PREVIOUS:** fig. 50 - Lightshow: Brooklyn, USA  
(AKA, 2012)

**LEFT:** fig. 51 - Awning: Brooklyn, USA  
(AKA, 2012)

**RIGHT:** fig. 52 - Circulation 01  
(Kikoski, 2012)



RETAIL SPACE/VENUE

RETAIL SPACE

RETAIL SPACE

RETAIL COURTYARD

STREET ACCESS

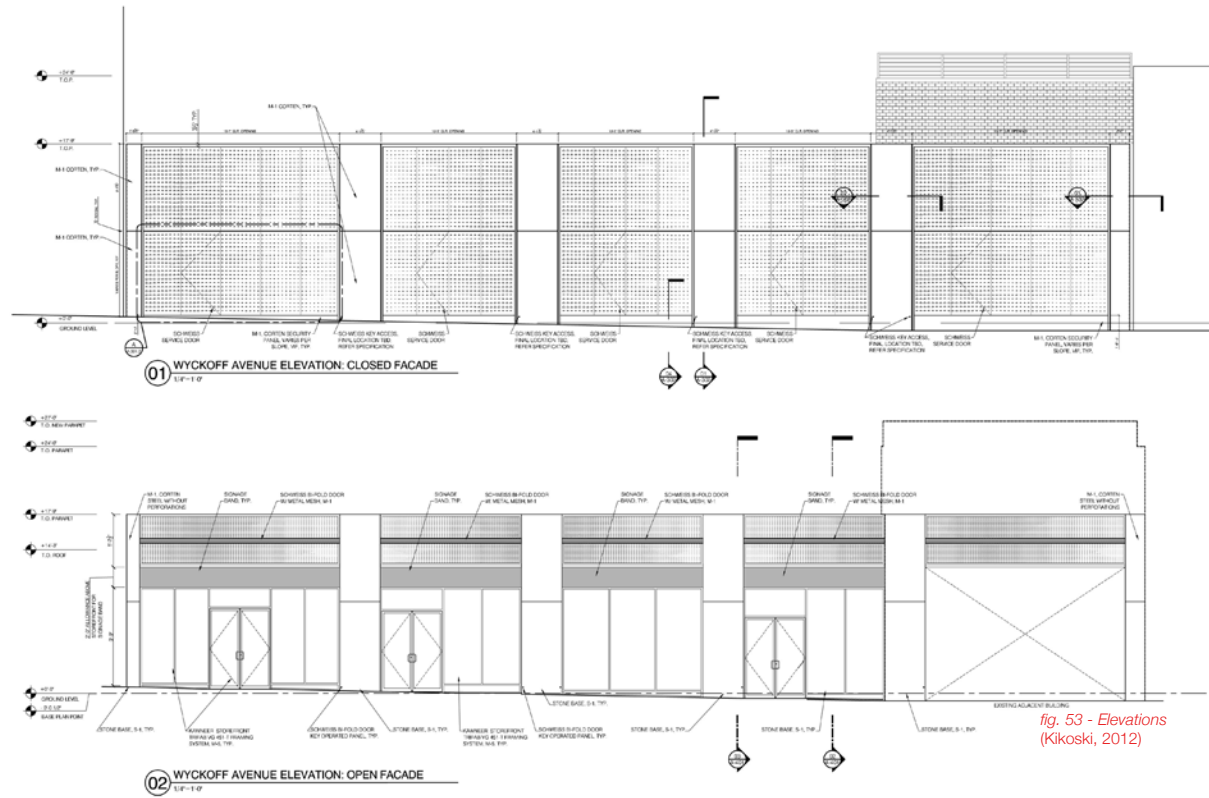


fig. 53 - Elevations  
(Kikoski, 2012)

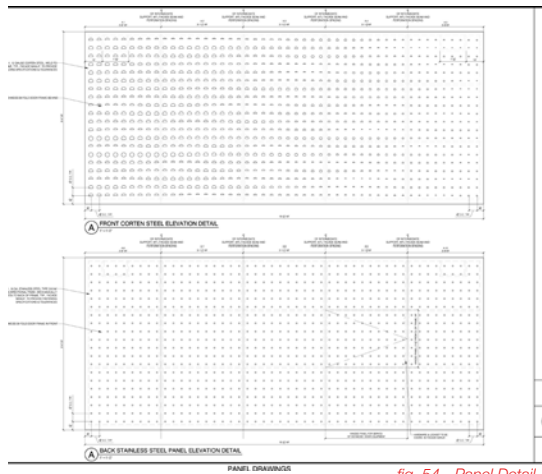


fig. 54 - Panel Detail  
(Kikoski, 2012)



fig. 55 - Panel Texture  
(Dzikowski, 2012)



fig. 56 - Massing 03  
(Reimers, 2013)

fig. 57 - Geometry 03  
(Reimers, 2013)



The dynamic quality created by the kinetic nature of this space is one that makes it very successful as a marketplace. It is similar in its design objective to the RMIT building as it is more a public space than anything else. The materiality is more on key with that of the Shadowboxx in that it utilizes much more earthy tactile materials to enrich the space itself.

This urban gem is inspiring to me as I carry

into the design process. It is a simple yet extremely powerful solution in facilitating user interaction. The automated nature of its kinetic components are refined yet still allow for participation from the user to create the atmosphere. This is where it differs from the RMIT building and similar to Shadowboxx.

# SUMMARY

I believe that the spaces that I have studied in the proceeding pages have oriented me in the right direction to start my design process. Each one had components that I really thought were powerful and interactive. Each one fit a different characteristic of the building I hope to design.

The Shadowboxx House's strength was in its anthropomorphic scale. It required direct user interaction to transform the space. I believe there is a very powerful moment created when the user is in control of the way the space adapts to a particular scenario. The actual act of sliding open the walls and opening it to the outside is something that I want to incorporate into my future work.

The RMIT building was a perfect example of implementing modern technologies into a kinetic building. Its materiality was much more modern than that of the Shadowboxx. Glass facade and concrete with a simplified form and clean lines. This obviously creates a much different experience than that of

a space constructed with reclaimed wood and rammed earth. But in its urban context, it is much more fitting. The technological aspect, too, finds home here much more easily than the very nature-centered Shadowboxx residence. The dynamic sun-screen is much more automated than that of the Shadowboxx, yet still required user participation at a different level. It created a sense of transparency of the space to the community which I think is vital in the site that I have chosen. The building houses the creative minds of Melbourne and it is important that there is interplay between them and the outside world. I think that an ideal building would utilize both technologically active and physically passive components as seen in these two projects. Both have their strengths and weaknesses and I think it is important to see value in each of the design solutions.

The Wyckoff Exchange building finds a middle ground between the two previous projects.



Programmatically, it is very similar to my project. It is a modern take on a street interfaced marketplace, gallery, and performance space.

Even the city context is quite similar to that of Chicago, a community that places a high value on the arts and creativity. What struck me the most was how seemingly simple of a solution this was. Formed from two warehouses, the space still retained much of their qualities, both in a material sense and in space planning. But it is this simplicity that allows for the space to be filled with so much energy. The relationship of the daytime and night facade and how it connected itself to its surrounding were well thought out and executed.

By allowing this space to programmatically transform completely, from shop to venue, I think is another one of its successes. The design is combines kinetic fixtures that are both automated and exist at a much more human scale than that of the RMIT building. Its materiality creates a dialogue

between the past and present, the user and the space. These are things that I will definitely consider throughout the design phase. They have been my goals since the inception of this thesis topic, but I found it difficult to resolve the dichotomy of efficient yet meaningful space. Each of these projects solved that issue to a varying degree but each in its own way. This study has reinforced my belief that transformative architecture has the power to create a meaningful impact on the community. Both visually and experientially.

# HISTORICAL CO

In order to begin to understand the impact of what we have defined as kinetic architecture, we must understand it in a broader historical context. Furthermore, I think it is critical that we look more in depth in the typology that I have set out to create and where its roots lie.

Transformative architecture is a concept that is both new and old simultaneously. I would argue the fundamental characteristics of kinetic space have been around since the beginning of built structure. Characteristics such as space with an evolving program and unique user experience. While they make lack movement in the literal sense that we may understand it, they carry elements of movement in their transformative qualities. Their movement lies in the shift of experience and the embodied perception of each change. Perhaps it is as simple as altering the experience each time the space is inhabited. The labyrinth is an extremely early example of a structure with these qualities.

Whether it is mythical or not, the concept of the labyrinth is one of an ever-changing user experience. It is unique in the sense that it both orients and disorients, creating both familiarity and unfamiliarity.

As mentioned earlier, Japanese architecture is an example of kinetic architecture in both a current and historic setting. It exemplifies the values of evolving space and program, but most importantly it retains a sense of tradition of ritual. The space, even in its efficient minimalist approach has intrinsic meaning, as it too becomes part of the ritual. Even today, examples of these qualities can be seen in Japanese architecture. With the extremely tight housing conditions of Japan, homes are built in the with meticulous attention to detail and functionality. Every space must serve multiple uses. These spaces evolve through expanding walls, furniture, movable partitions, space-conscious furniture, etc. Much like their older counterparts, I believe that the ritual is still inherent within.

# INTTEXT

So what makes these spaces so intriguing? Is it simply the fact that they can cram all of the functionality of a 2,500 sq ft home in the US into 400 sq ft? The homes and built space of today oftentimes are deluded and uninteresting because they need not consider each design decision as carefully as it would in a more limiting spatial condition. The typical space now is thrown together for consumption and then let fall into disrepair until it must be demolished and repurposed.

This commodification is similar to that of the image in today's culture as discussed by Juhani Pallasmaa. The inherent value in the experience of the image is the quality that is being lost in the "limitless production and commodification of images." He continues in stating they now are "often taken merely as shallow and fashionable surface of visual communication and artistic representation." These images no longer demand the level of interaction that was once required. They are understood in a

one-dimensional view and therefore do not facilitate the need for the imaginative process that is a unique quality of humans. The embodied or poetic image in contrary is one that interacts with the viewer at an experiential level. It must be perceived and interpreted. The power in of the embodied images lies in the necessary interaction of image and user. As the philosopher Gaston Bachelard states, "The image offered us by reading the poem now becomes really our own. It takes root in us. It has been given to us by another, but we begin to have the impression that we could have created it, that we should have created it." The image that is left open for interpretation allows for our unique imaginations to construct and contextualize the image we perceive. It is a liberating experience that is quite opposite to that of the mass-produced consumer image. Pallasmaa describes the two types of images as those meant to control and those meant to emancipate.

Pallasmaa sees our built spaces today in two categories. The first of which being the utilitarian form that strictly seeks to achieve maximum efficiency. This is similar to the iconified and commodified image used to sell and influence our commercial and political realms. The second is the image that seeks to appeal to our emotion but still falls short of the poignancy of a true embodied image. “Instead of being a lived and embodied existential metaphor, today’s architecture tends to project purely retinal images, architectural pictures as it were, for the seduction of the eye.” One of the biggest blows that architecture of the modern era has lost is the integration of the metaphor. The architectural metaphor allows for many interpretation and embodiments of the space, which ultimately lead to an experiential depth that cannot be orchestrated by any other means. The metaphor reaches into the subconscious and reactivates components of our biological being that cannot “arise from an

intellectualized concept, abstract formal idea, compositional refinement or a fabricated visual form.”

We have a responsibility as designers to not continue the perpetuation of the issues above. There is opportunity to bring the poetic and embodied image back into the realm of architecture. In our constant pursuit of newness and innovation, we must not forget the importance of the past and its ability to contextualize and give value to the future. “Today’s productions of architectural virtuosity may amaze us, but they are usually unable to touch our soul because their expression is detached from the existential and primordial ground of human experience and it has lost its ontological ground and echo.” (Pallasmaa, 2011)

It is also important that we not only understand the formalistic aspects of the topic in its relation to history, but also the site. Through connection of old and new, it is allowed to form its own narrative, making its own objectives more easily apparent.

The area that makes up DuSable Park is a 3-acre plot of land that is seemingly untouched and rugged compared to the surrounding cityscape. Its original formation came about from the construction of a lighthouse jetty in the early 1800's. The alteration in the current deposited the land that we see today. The surrounding area changed ownership several times in the next century leading to industrial development in the surrounding area. Ogdon Slip was created on the west side to connect incoming and outgoing freight to the railway inland. In the mid-1900's, Chicago enacted legislature that would only allow recreational and terminal use of the lakefront. But through a loophole Lake Point Tower was constructed and again, the area of DuSable

changed owners; this time with the intention of constructing two high-rise residential towers on the site. After those plans fell through, the park laid dormant until 1987. It was then that it became officially known as DuSable Park after the Haitian-French Jean Baptiste Pointe DuSable, who was the first non-native settler of the Chicago area.

Over the next two decades, the area once again fell victim to several plans that fell through included the site of a monument to DuSable, a parking lot, and the expansion to the plaza of the scrapped Chicago Spire project. In 2000, the site was deemed in need of soil remediation due to a high radioactive thorium content from ore dumping and processing during the industrial age. In 2001, an RFP went out for propositions for the site. Many of these focused on creating a community space for the public, reengaging the lakefront and Ogdon Slip. As of 2012 the remediation was completed and the land became once again up for development.

Its current development is ambiguous in setback by lack of financial investment. So what is to become of it? The site has a lot of potential due to its surroundings and its lakefront access. The neighboring Navy Pier and residential condos on the slip provide a lot of traffic to the area. The site's access is still somewhat limited and is in need of a solution. I believe that it is important for this space to be something that becomes more than just another lakefront park, but rather something that engages the community on a bigger scale. I believe that creating a new style of marketplace and communal green space combines attributes that were sought after in the original RFP's in 2001. The business center that I propose will allow opportunities for business that, until now, have not had an opportunity to thrive due to the extremely high cost of land and operation in this area. (Palmer, 2001)

Chicago has always been a home and cultural center for the arts. My goal is to continue Chicago's

rich tradition of being a city that fosters creativity. The art pavilion will provide much needed connection to the surrounding lakefront greenspace that draws thousands of visitors a day. Chicago's initiative to revitalize the lakefront from industrial powerhouse to cultural center will influence my project heavily. I hope to integrate the urban community into a space that can cultivate and inspire creativity through kinetic architecture.



# THESIS GOALS

Architecture is a field of questions and solutions. Throughout my schooling we have been tasked with a large array of questions that need to be solved, each one, I believe, has influenced and challenged my critical thinking, my design process and the things that I truly value. This thesis is an opportunity to take that body of knowledge and experience to a new level and perhaps not on find solutions, but more importantly raise deeper and more critical questions and discussion. While I realize that there is a certain amount of completeness that needs to be achieved for academic purposes, I believe the real value lies in the intentionally blank components that facilitate discussion.

## ACADEMIA

School is a place of exploration and discovering oneself through each project. There is a certain amount of freedom that exists in the institution that is restricted upon entering the field in most cases. Free

of budgets, demanding clients, and other realities, it is a place to push design to a place that it may only go in theory. I realize that this project will never be built and exists only in my mind, drawings, and writings and that it will never truly be complete. I hope that this endeavor will lay the ground work for not only myself, but for my peers once it is published. The future of architecture lies in the future architects and those who are seeking to push its boundaries. The integration of technology and design is happening more and more everyday. I hope that this change will always enhance rather than stunt our growth. My goal is to explore this topic of kinetic architecture through both ways of today, while contextualizing them in the past. I hope that not only does the end goal be an inspiring piece, but more importantly the process as a larger body of work.

## THE PROFESSION

As stated above, the field is one that is much more



weighted with the realities of the world than the former. But I hope that this project and the experience of its creation lays a strong foundation to build off of upon entering the workplace. It is important to maintain both a sense of pragmatism and vision in our field. I don't want to reach a level of stagnation, but rather be constantly gaining experience and knowledge in building design and practices. One of the overarching topics in this thesis is the conflict of quality design versus pure efficiency. Both has their place and I believe both can coexist through well thought out design. Architecture is so much more than designing a space for a client; it is designing an experience for not only the client, but also all who enter the space. I think that is something that is often lost or sidelined in the world today.

## PERSONAL

Much of my personal beliefs are as mention above and throughout this thesis book.

I simply seek to create an experience that goes beyond the internal function of the space. I believe that there is an innate quality to well crafted that give of a power and impact that is lost in rapidly commodified goods. There is a certain beauty to be found in the imperfection of human craft and the computer cannot replicate. And I while the computer is a power tool, I intend to it to only be one of many powerful tools used in this process. I have always found delight in crafting each model and drawing that I have done in my time here. I hope that at the end of this project that level craft and detail will show through my artifacts upon presentation.



SITE

NARRATIVE



fig. 59 - DuSable 02: Chicago, USA  
(Reimers, 2013)

## VIEWS/VISTAS

The site is situated along the shore of Lake Michigan. It juts into the water creating desirable views in three directions ( N,E, and S) The west edge meets the double overpass of Lake Shore Drive. This view is obviously less than desirable and I believe part of the design solution will be screening the West boundary for both visual and sound pollution purposes.

## BUILT STRUCTURES

There are no built structures on the site itself aside from the seawall on which it is built. Initial evaluation of the site resulted in a number of repairs that would need to be made to the seawall itself before further development. There are several built structures in the immediate context of the site. The first being the afore mentioned overpass. Navy Pier, Lake Point Tower, and several residential condos are visually present on the site.

## LIGHT QUALITY

The site is largely exposed to the sunlight. There is little protection on three sides. The overpass does cast long shadows across the site in the evenings, especially in the winter months. The overall intensity

is very strong and may prove to be quite straining during the summer months. This could provide an opportunity to implement adaptive sun-screening via the facade or other installations.

## VEGETATION

Currently the site is overgrown with various prairie grasses and small shrubs and trees. There is not much that is sizeable and definitely not purposefully planted on the site. The nature of the site as a park give respite to the surrounding built environment. I think it will be important to maintain a certain amount of “wild” land on the site to retain some of this quality.

## WATER

As mentioned, the site rests upon the shore of Lake Michigan. To the north end of the site runs the Ogden Slip and to the south, the Chicago River. The water itself is fairly clear of pollutants. Being that it is on a large body of water, wind chop and other conditions can be a factor. There is also a breakwall that protects the area from the larger waves of the lake.

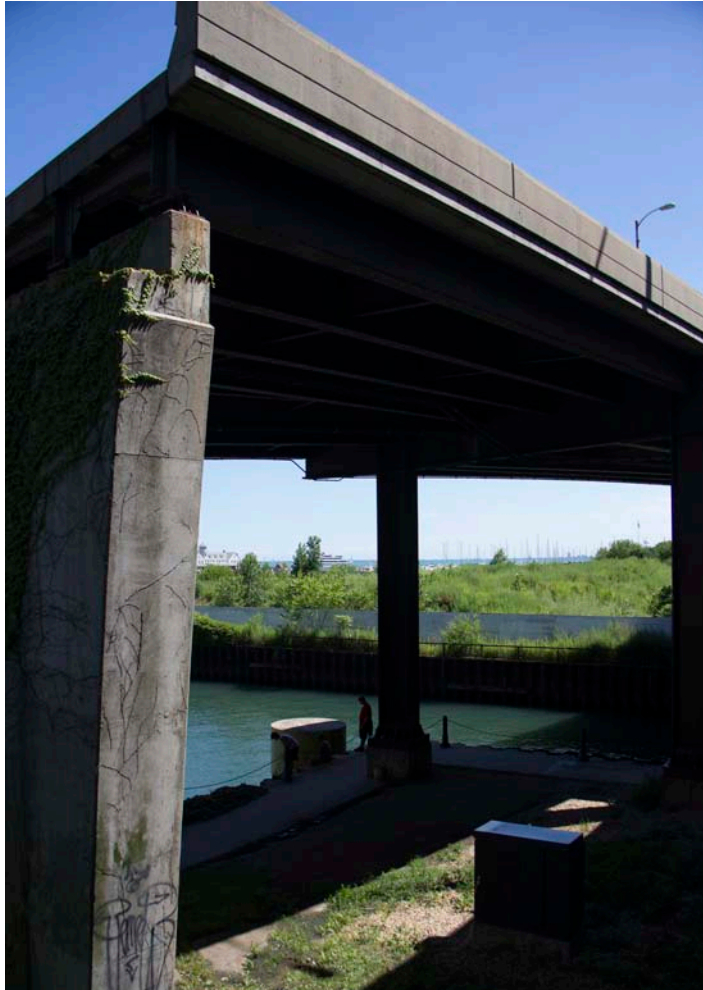


fig. 60 - Site 01: Chicago, USA  
(Reimers, 2013)

## WIND

The site offers little protection from the wind. The lack of terrain and proximity to the lake leave it vulnerable to strong winds. The overpass may help shield winds from the West, but the lakeside is very exposed to the elements.

## HUMAN CHARACTERISTICS

The site is currently fenced off and nearly impossible to reach without trespassing on private property. There are some signs of use though. Remnants of the construction work on the Chicago Spire site are present on the site. There is limited vehicle access, mostly to construction vehicles.

## DISTRESS

The site in general is quite untamed compared the surrounding parks and public space. Little to nothing is done to upkeep it. As stated before, the seawalls are in need of repair before development. The area to the west is the site of the doomed Chicago Spire. The overflow of visual neglect may be considered a distress on the DuSable site.

## SOILS

The soil that comprises the site was deposited by currents after the creation of a lighthouse jetty in the early 1800s. The Site become a common dumping ground for ore and other mined material throughout the industrial era. It is during this time that is believed that the soil became contaminated with radioactive thorium. Since its discovery in the early 2000s the site has complete soil remediation and has been deemed safe for redevelopment.

## WATER TABLE

The sites proximity to the lake brings the water table quite close to the surface and may cause issues when planting foundations into the site.

## UTILITIES

City electric, plumbing, gas, and water are easily accessible to the site.

## VEHICULAR TRAFFIC

The site is fenced off but does have a paved ramp leading down from the lower level of the overpass. There is an abundance of vehicular traffic adjacent to

the site on Lake Shore Drive, but no immediate path through the site.

## PEDESTRIAN TRAFFIC

In its current state, it is nearly impossible for pedestrians to enter the site without going through private property. There is little evidence to show any amount of consistent use of the site.

## TOPOGRAPHIC SURVEY

Most of the topography exists through the build up of period dumping of excavated soil onto the site. The rest is most flat with a sharp drop at the concrete seawall to meet the lake. There is about a 20 foot rise s coming from the entrance ramp on the west end through to the East end. It quickly tapers into flatter land.

## SITE CHARACTER

The site has a very wild quality to it as it has been neglected for many years. The site has access to many close attractions though. Its proximity to both the Ogden Slip and the Chicago River allow for integration of the waterways and the site. This could

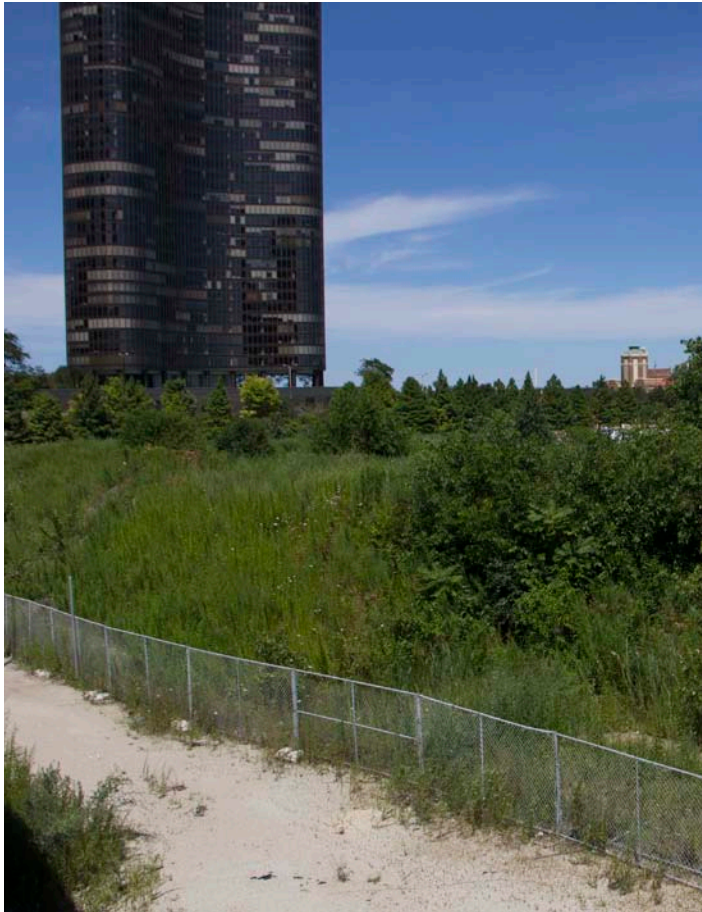


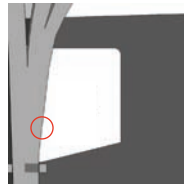
fig. 61 - Site 02: Chicago, USA  
(Reimers, 2013)

bring about some interesting interpretations of the sites past and its position in the shipping lane. Both ends of the site provide a dramatic backdrop; the Chicago skyline and Lake Michigan.

### EASEMENTS AND PROPERTY LINES

The development company MCL owns the property to the West of DuSable. Lake Shore Drive on the West and the lake on the other three sides effectively act as the sites property lines. MCL owns the right of way easements on the West side of the overpass.

# PHOTO GRID





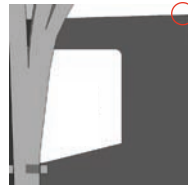
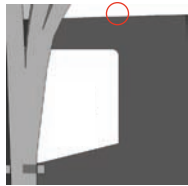
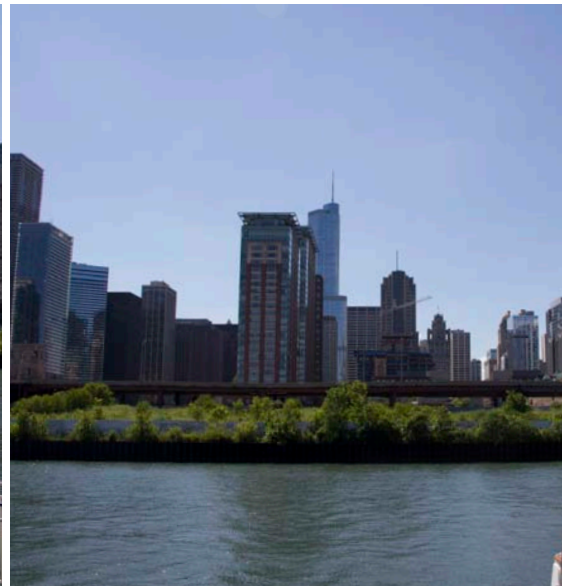
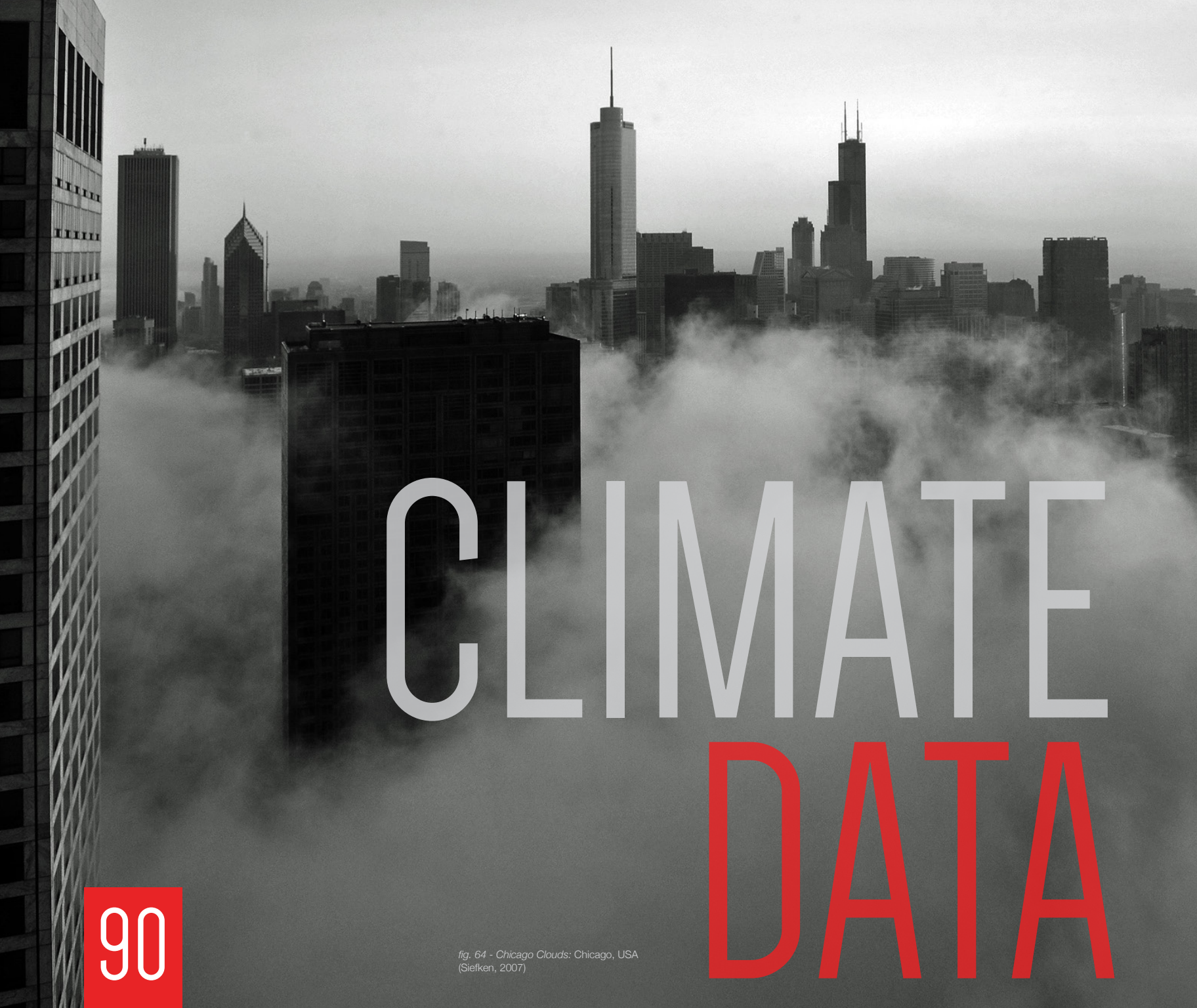


fig. 63 - Site 04: Chicago, USA  
(Reimers, 2013)

A black and white photograph of the Chicago skyline, with a thick layer of fog or low clouds obscuring the lower parts of the buildings. The Willis Tower is prominent in the center. The sky is overcast and grey.

# CLIMATE DATA

90

*fig. 64 - Chicago Clouds: Chicago, USA*  
(Sielken, 2007)

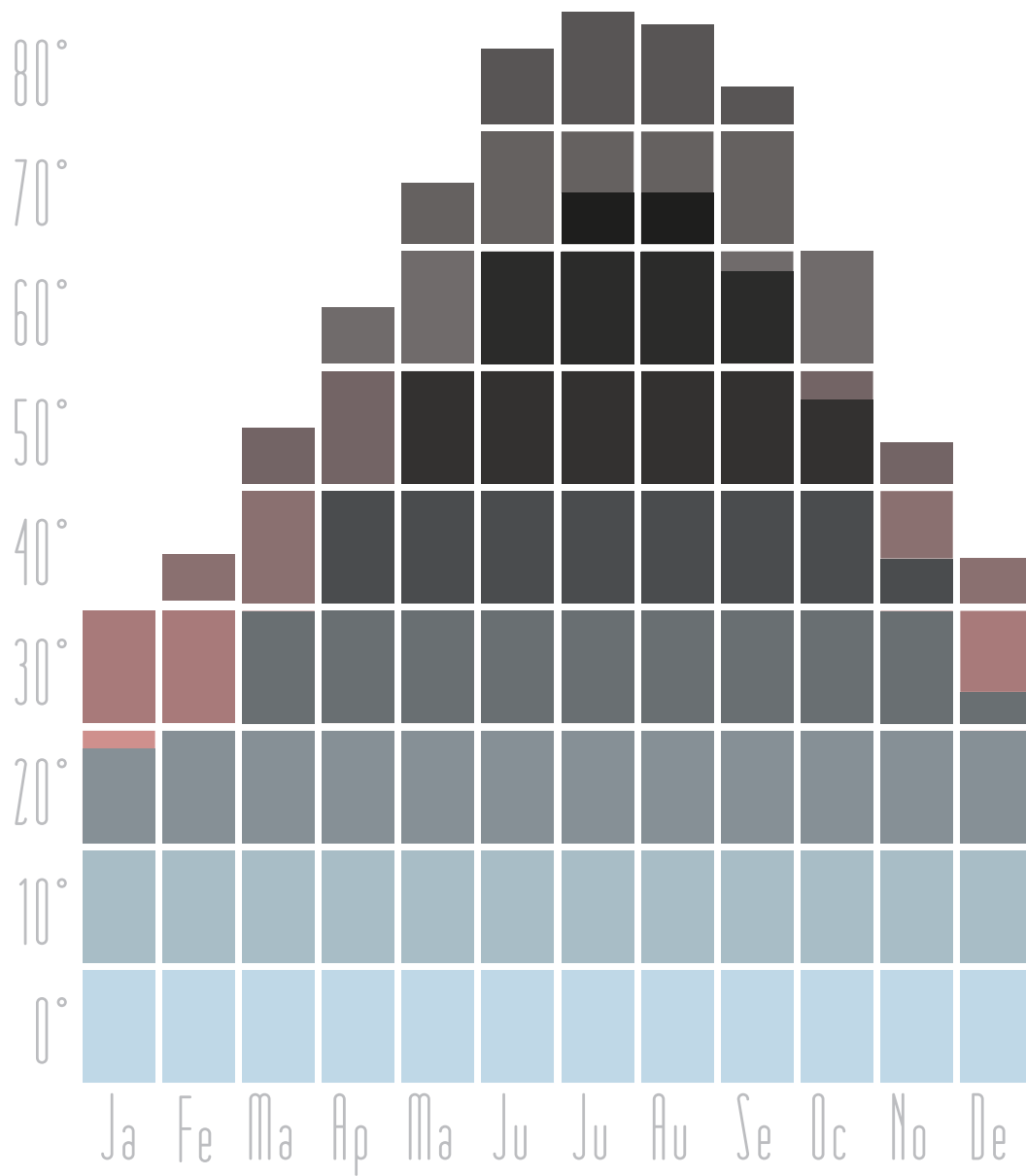


fig. 65 - Hi-Lo Temp  
(Reimers, 2013)

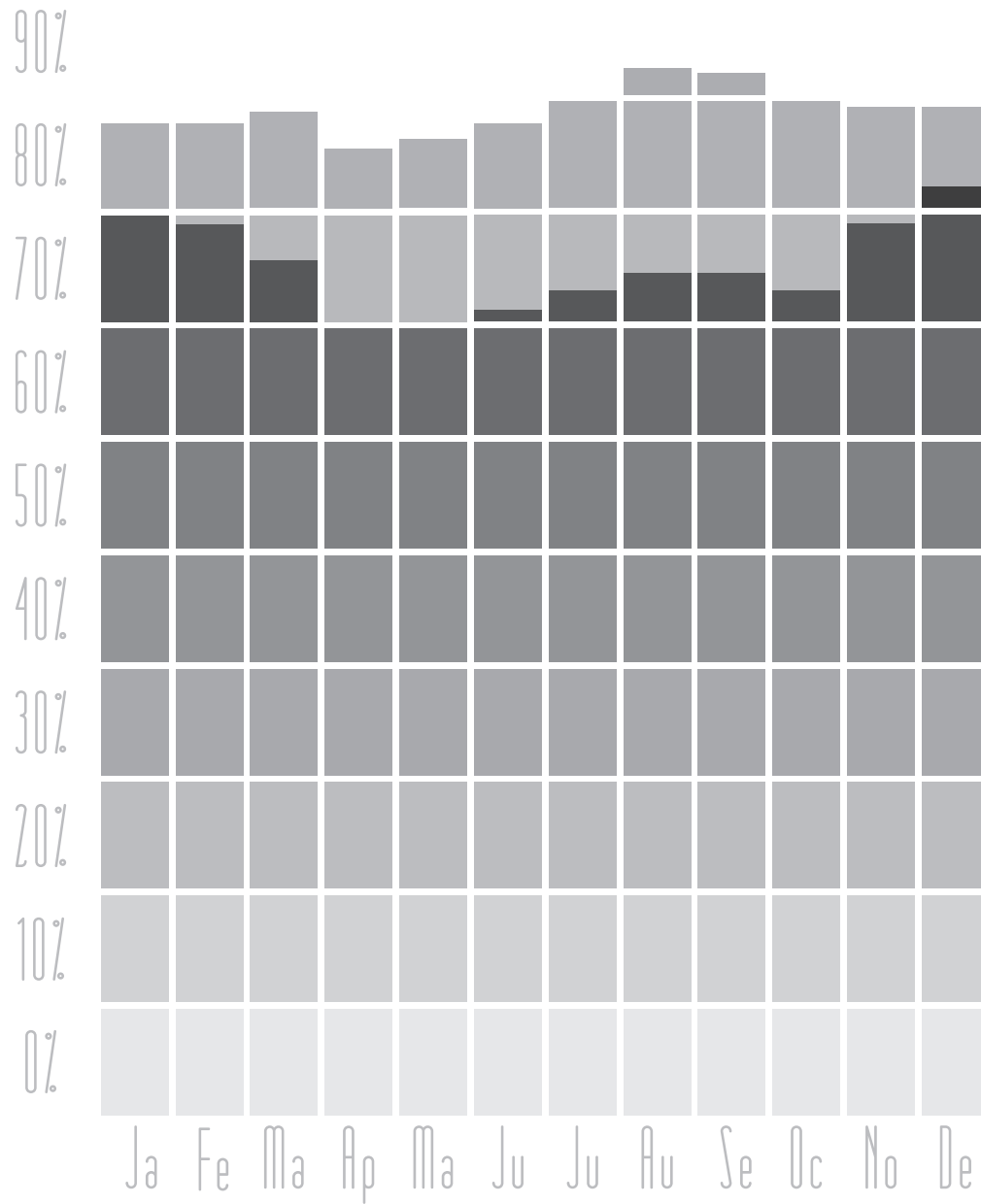


fig. 66 - Humidity  
(Reimers, 2013)

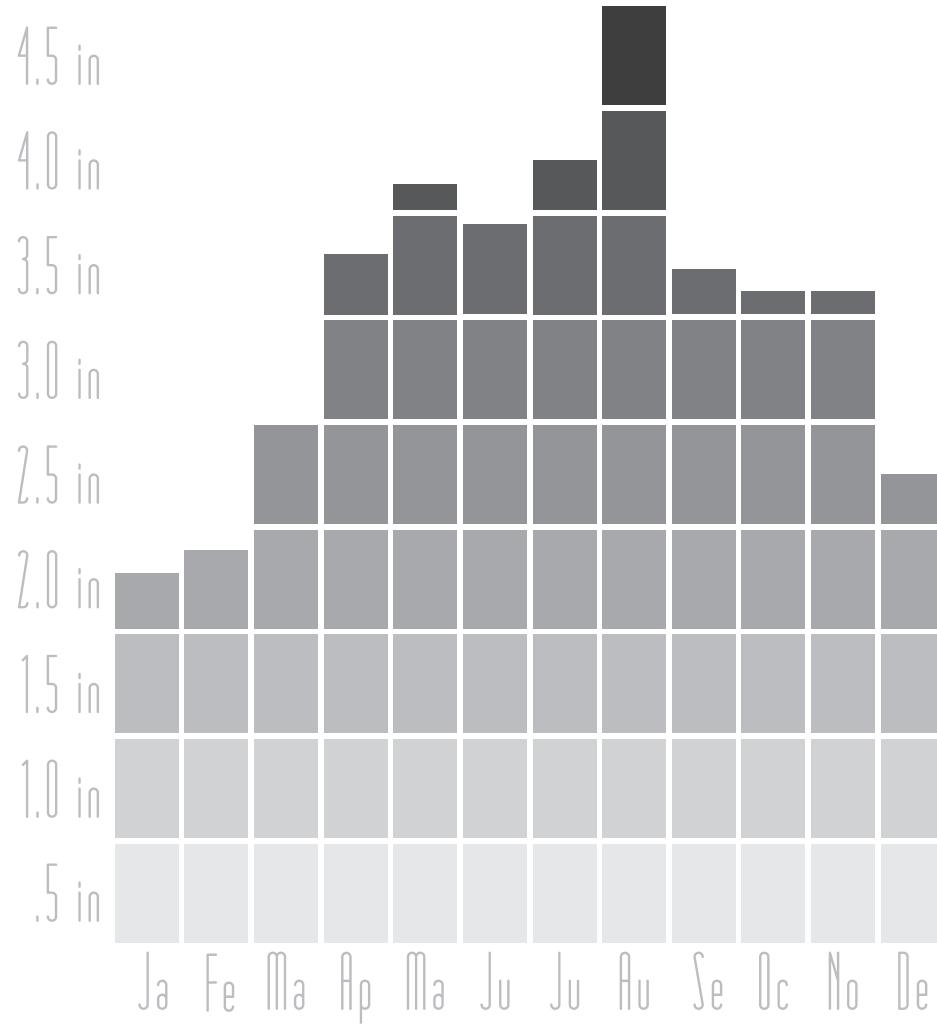


fig. 67 - Precipitation  
(Reimers, 2013)

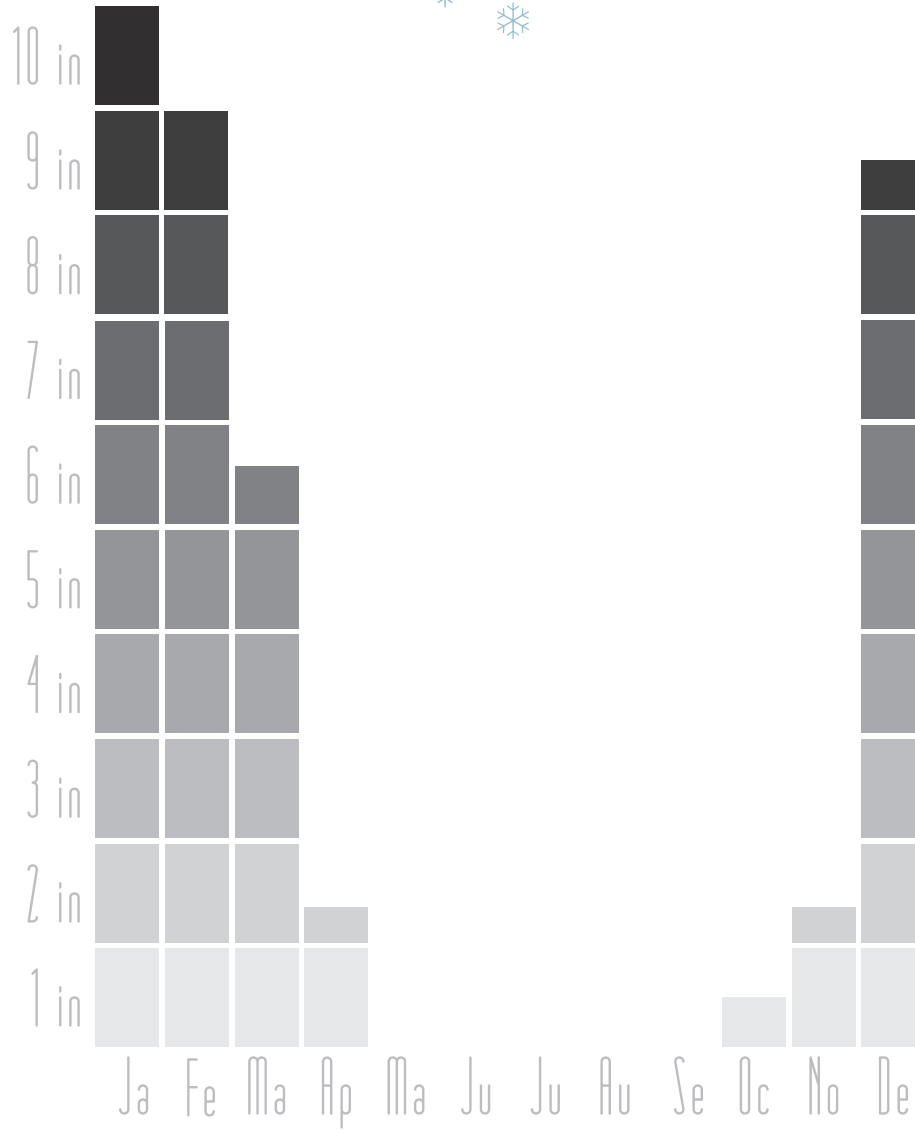


fig. 68 - Snow  
(Reimers, 2013)

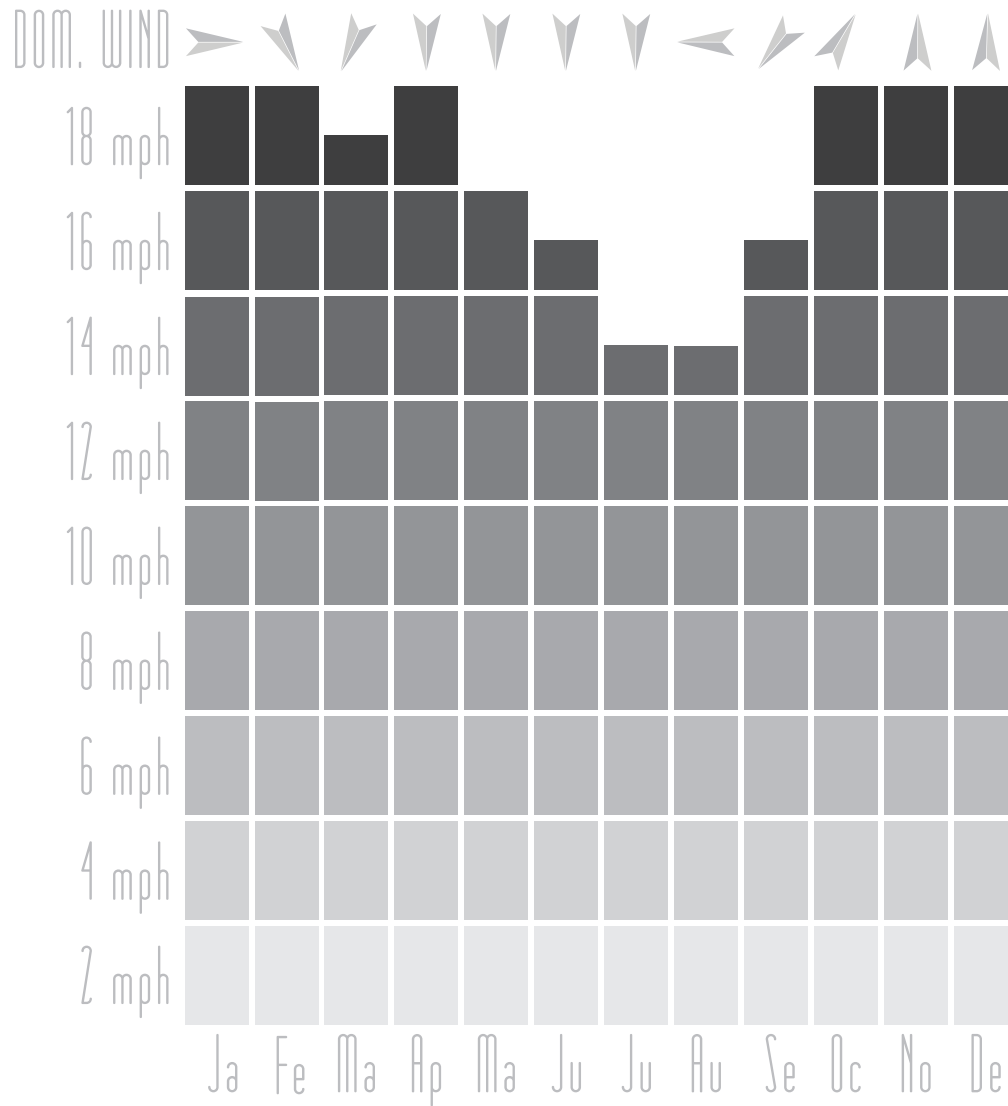


fig. 69 - Wind  
(Reimers, 2013)

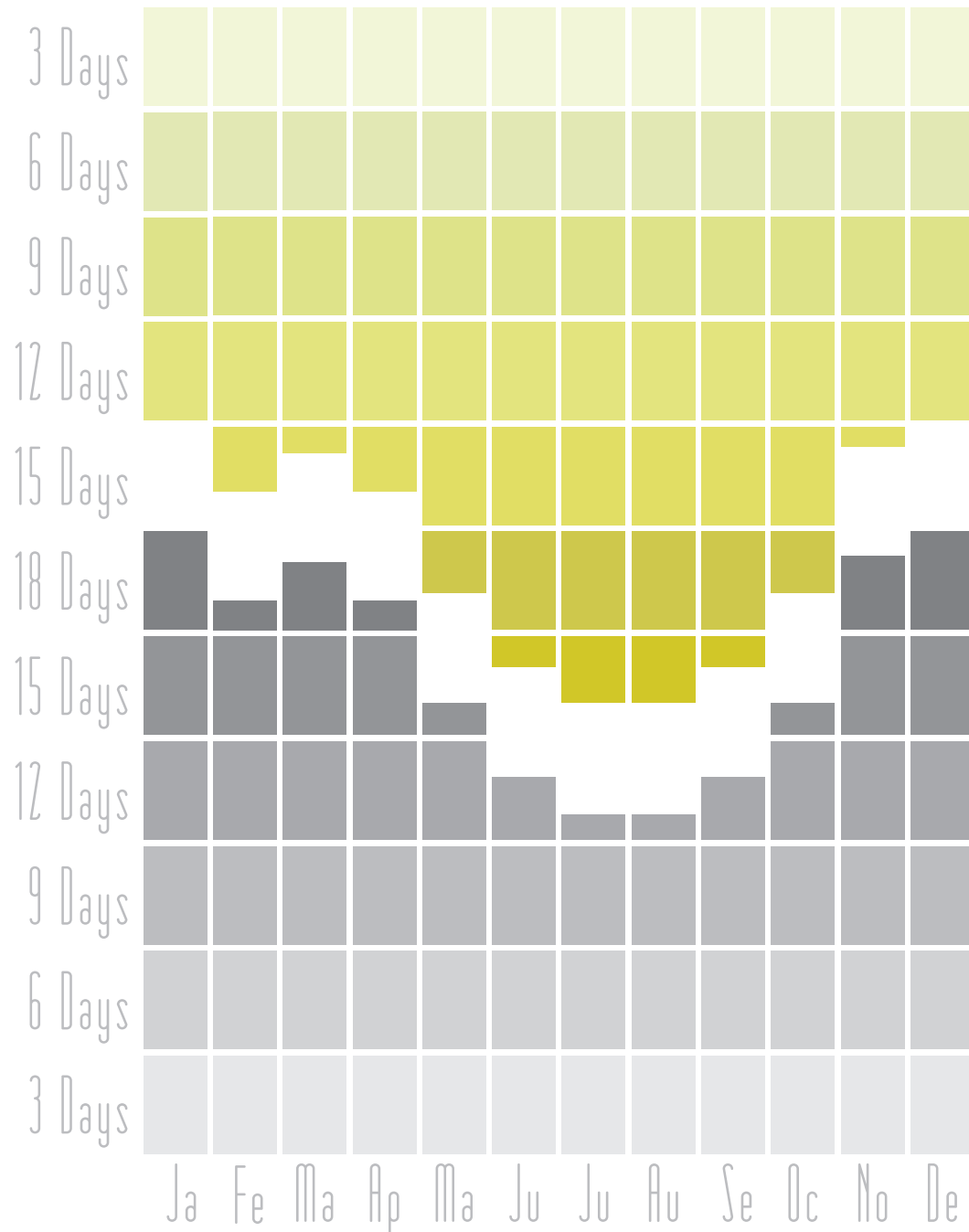


fig. 70 - Sun & Clouds  
(Reimers, 2013)



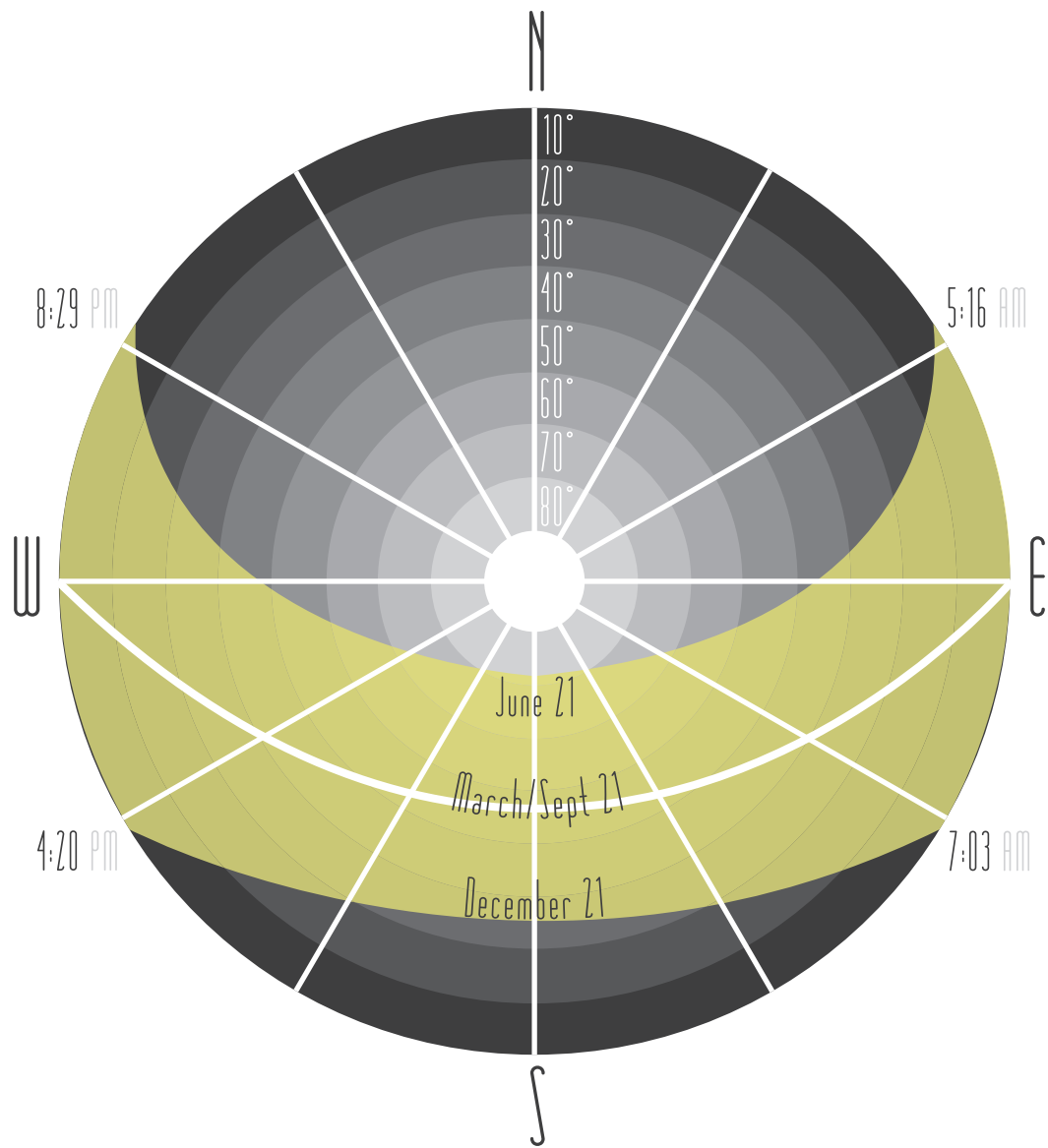


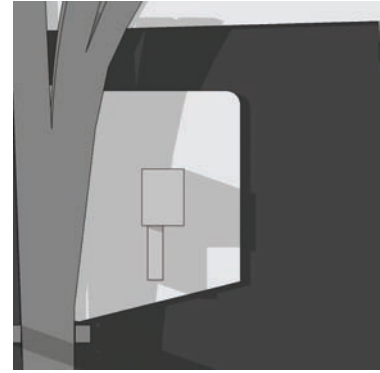
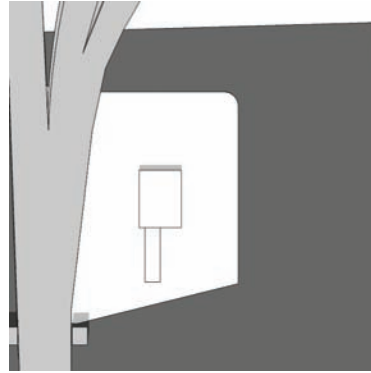
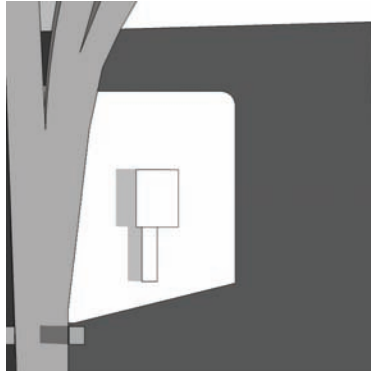
fig. 71 - Sun Path  
(Reimers, 2013)

8:00 AM

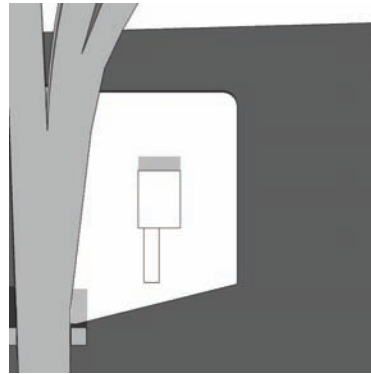
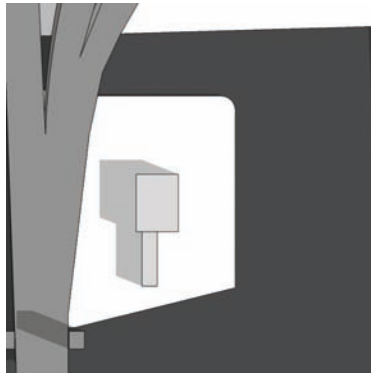
12:00 PM

6:00 PM

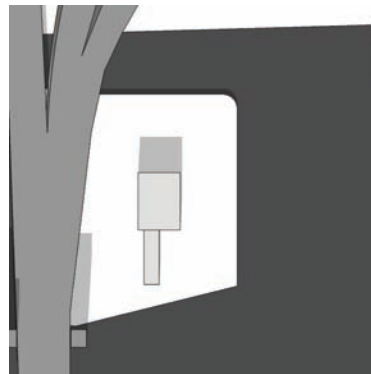
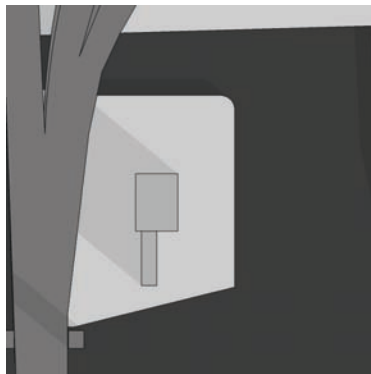
Summer Solstice



Equinox



Winter Solstice



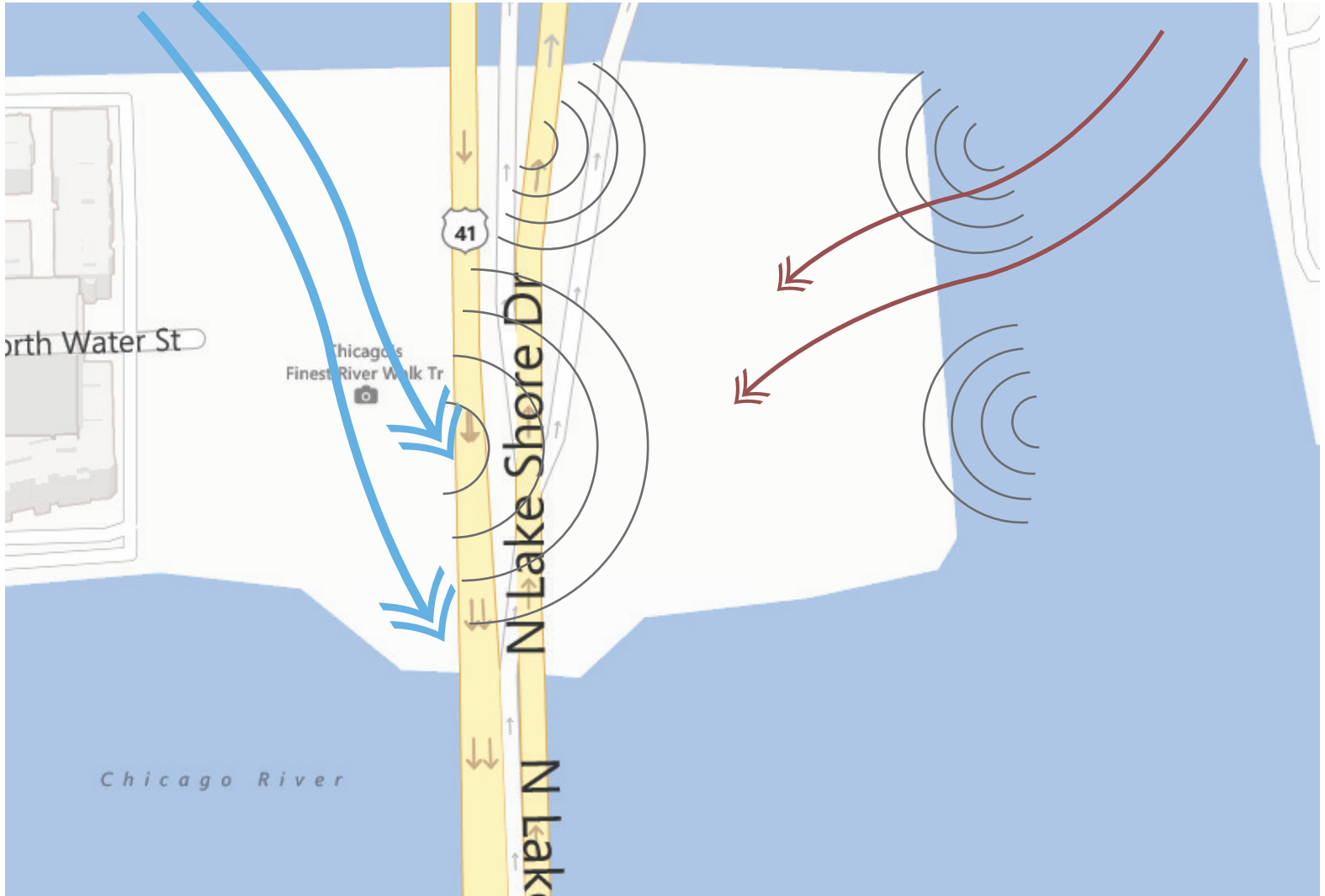


fig. 73 - Noise  
(Reimers, 2013)

# THE DESIGN PROCESS

100

## THE PROGRAM REQUIREMENTS

### SQUARE FOOTAGE + SPACES

The art pavilion will have the ability to expand and contract spaces based on the current usage of the occupant. The transformative nature of the structure will allow flexibility in the function of the spaces within.

Vestabule	250	
Lobby	990	
Cafe + Lounge	2500	
Main Gallery Space	2350	
Secondary Gallery Space	600	
Classroom/Group Meeting	1225	
Workspace	615	
Large Gathering/Gallery	3650	
Mechanical	1175	
Restrooms	1380	
Exhibit Storage	2850	
Circulation	1700	
Plaza Space	6000	
		Main Floor 12850
		Main Floor Expanded 18100
		Lower Level 6800
		Total 24900

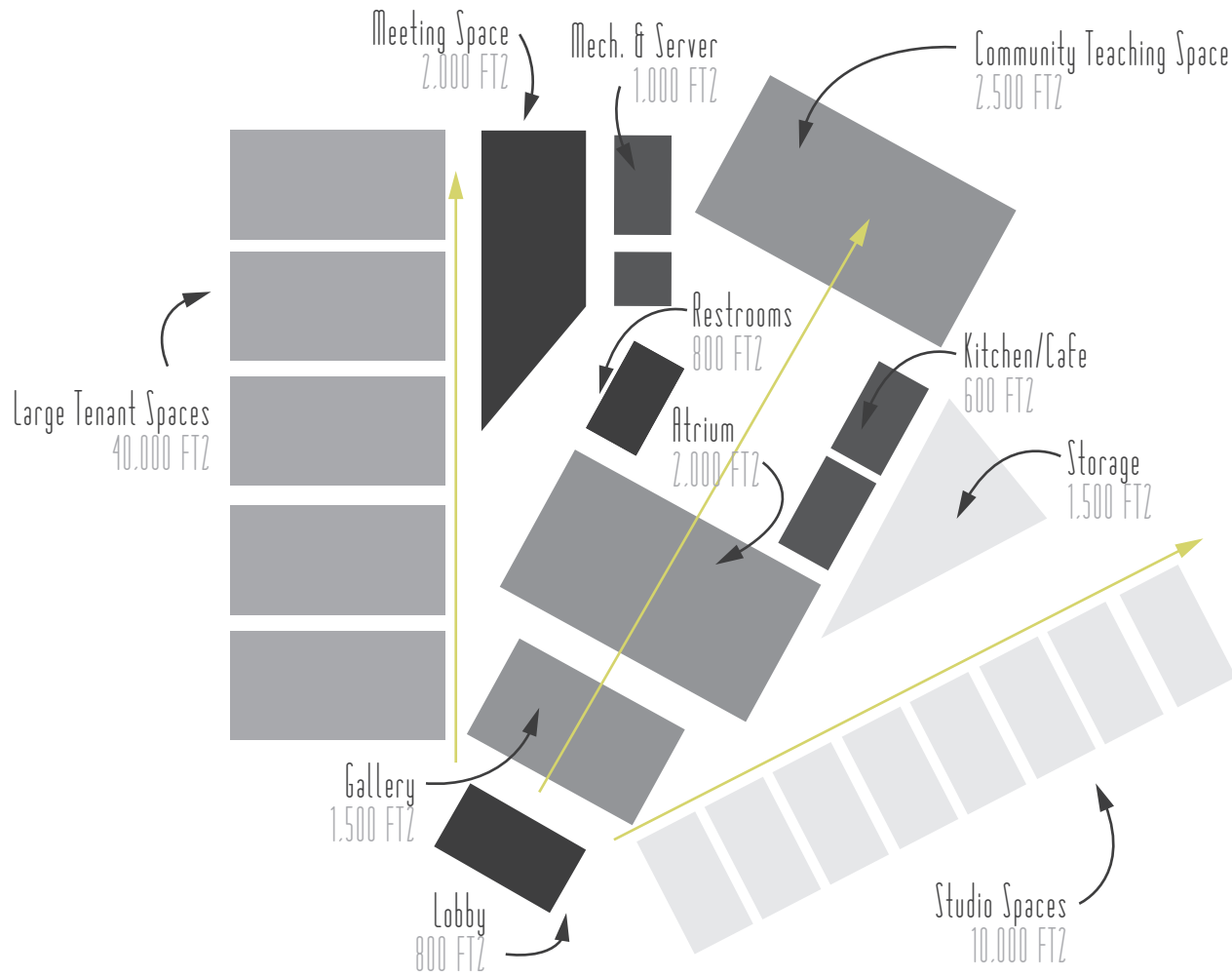


fig. 74 - Space Allocation  
(Reimers, 2013)

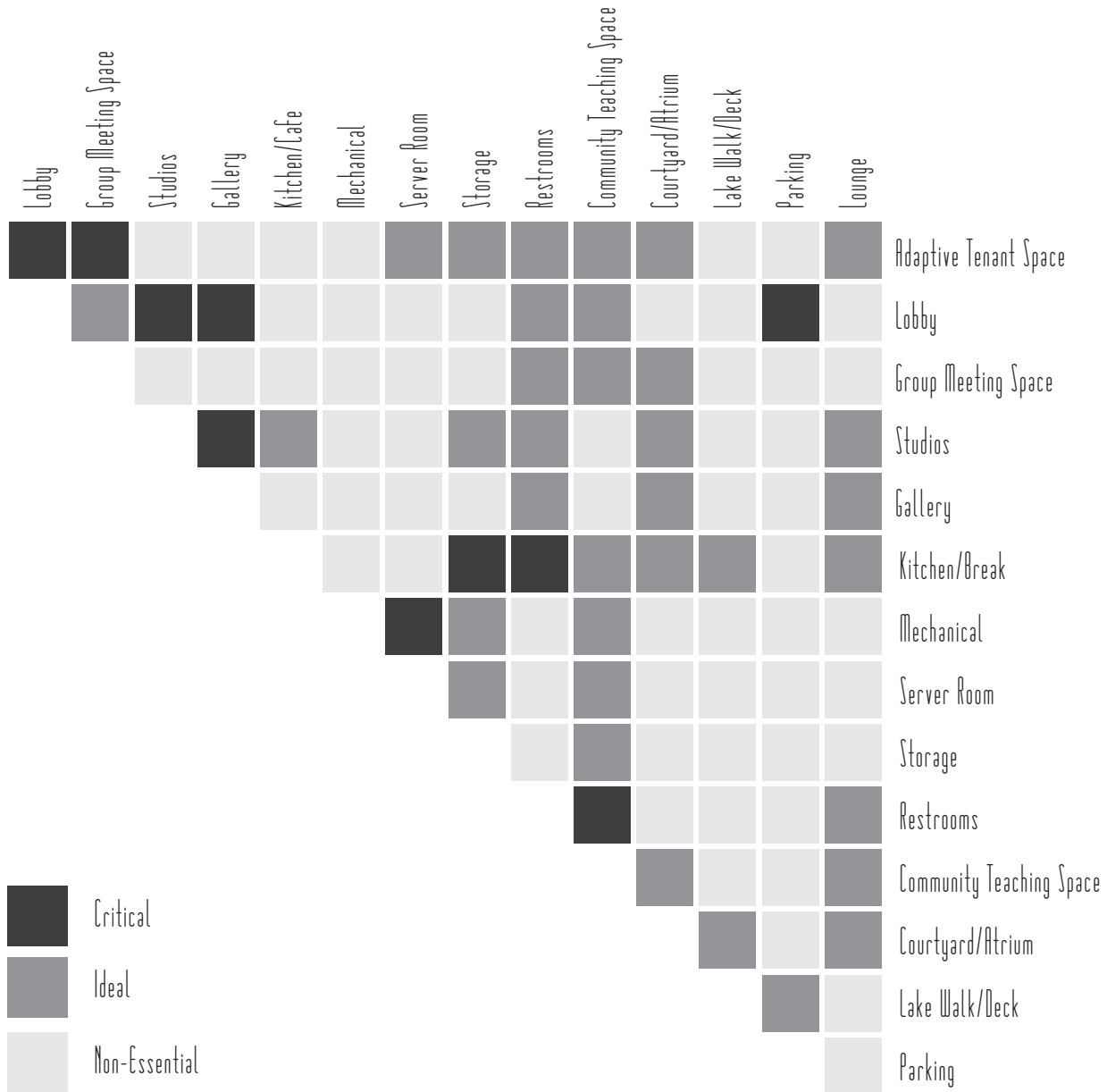


fig. 75 - Matrix  
(Reimers, 2013)

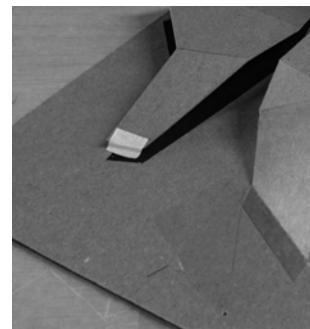
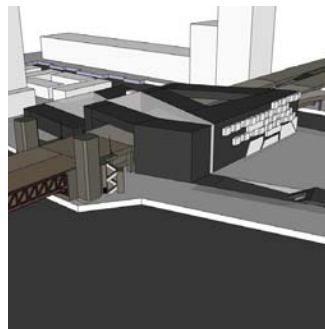
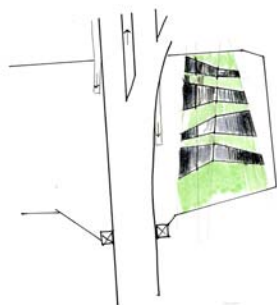
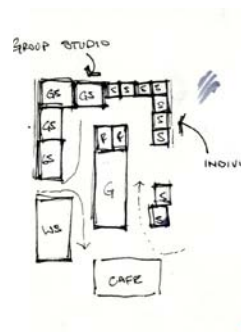
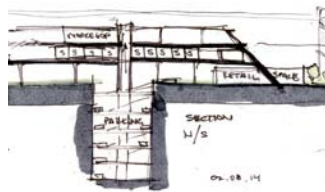
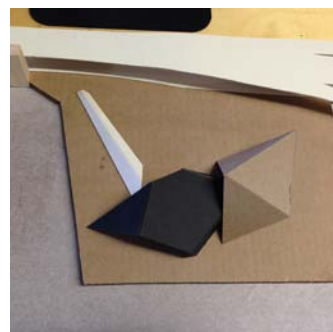
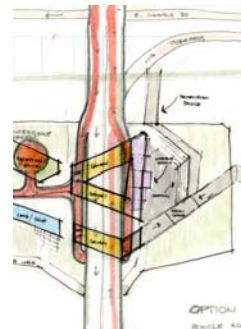
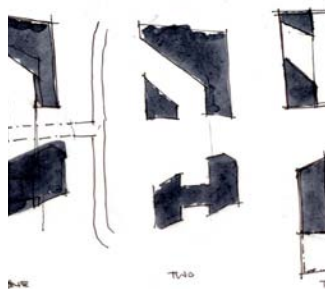
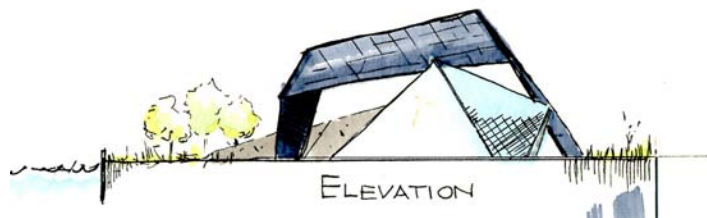
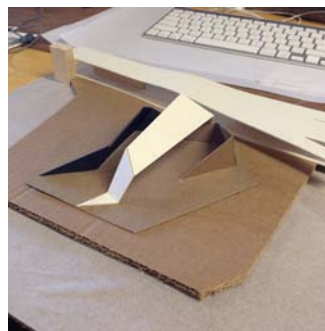
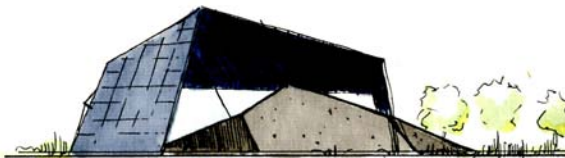


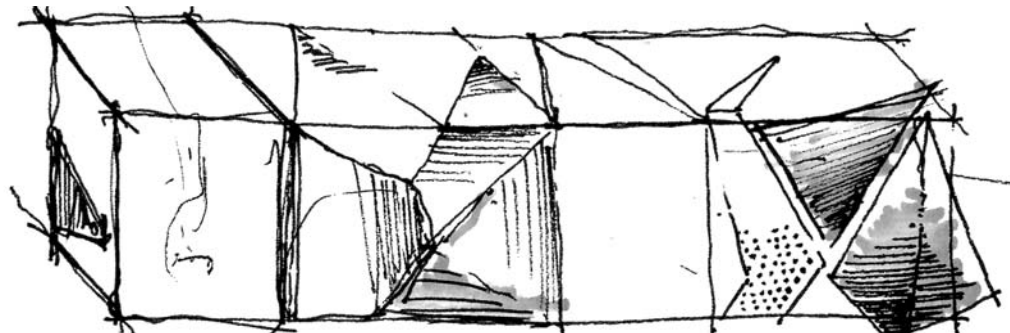
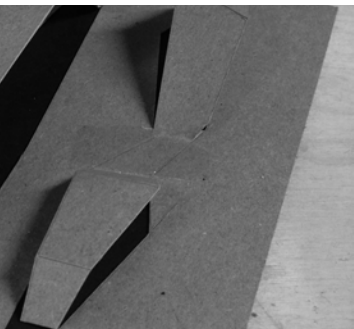
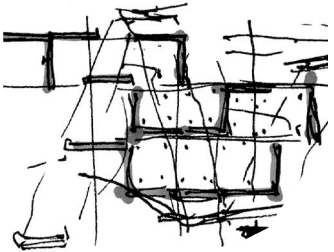
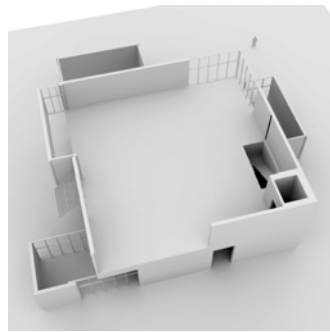
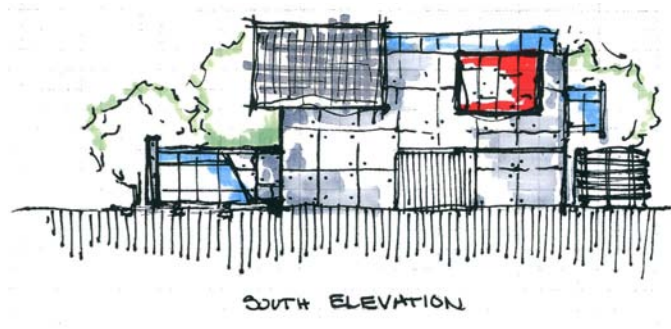
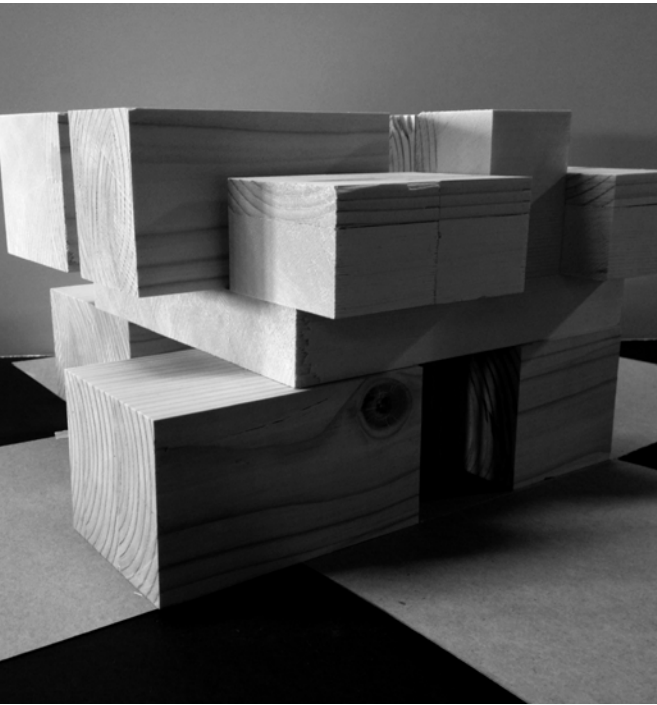
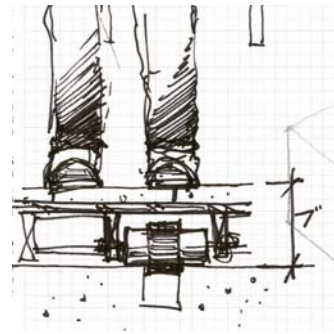
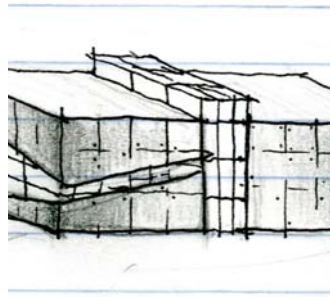
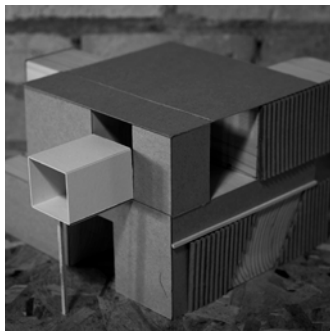
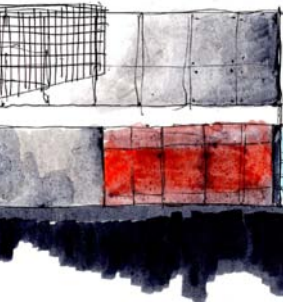


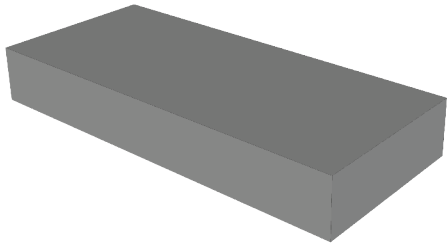
# CONCEPT MODEL

CAPTURING KINETIC MOTION  
WOOD + STEEL

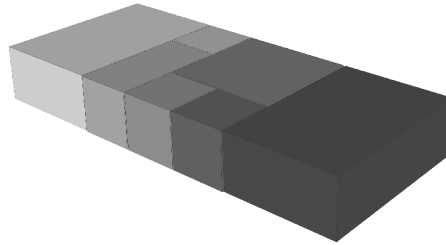
This model was generated before any design exploration had been done. I wanted to explore the notion of my research through something that was physically static but conceptually dynamic. I began with a grid and the fractured the plane with angular lines. By pushing and pulling the resulting spaces, I was able to create something that captured my idea of transformative architecture through an artifact that was immobile. The principles within this model influenced many of my design decision later on in the process.



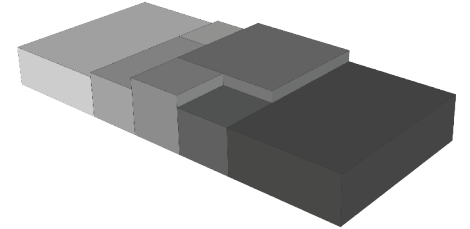




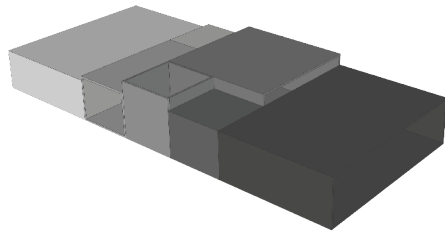
BASIC FORM



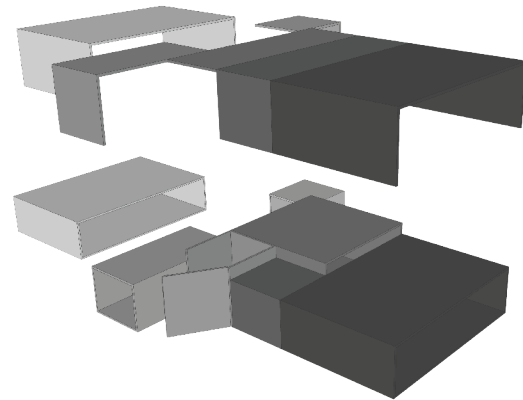
DIVISION OF PROGRAM



VOLUMETRIC VARIANCE



VOID CREATION



SKIN + KINETICS



# FINAL

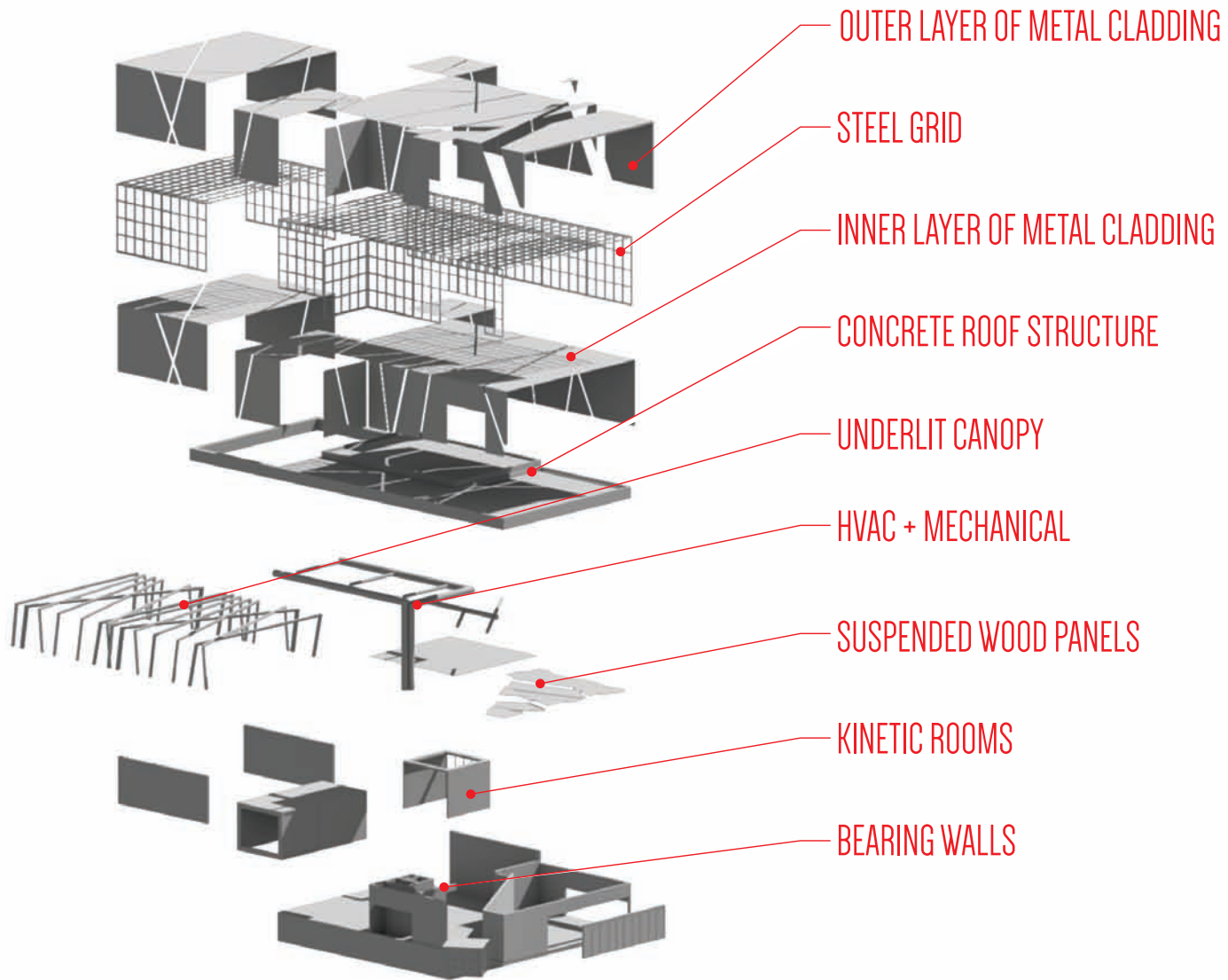


# DESIGN

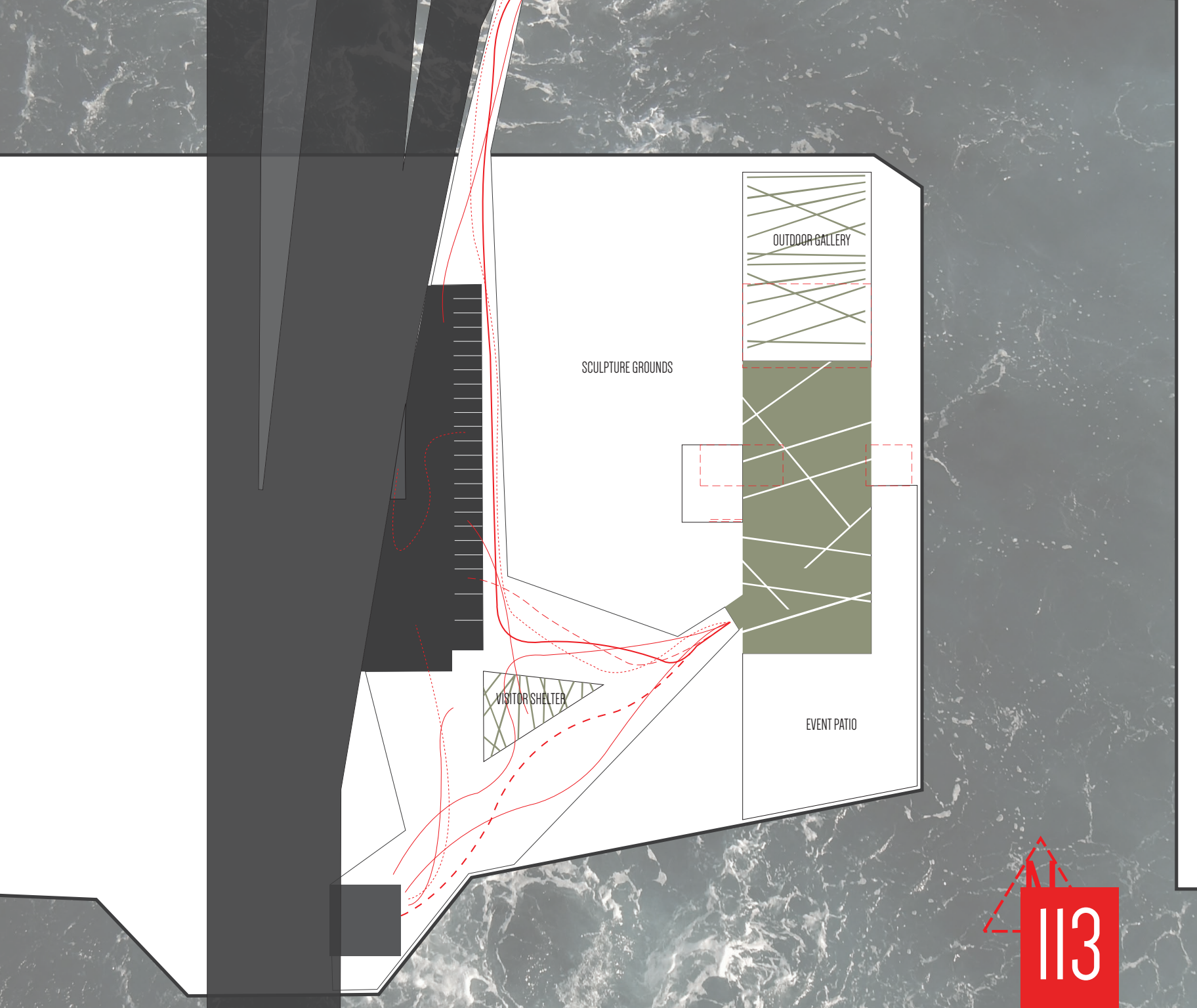


DUSABLE FINE ARTS PAVILION







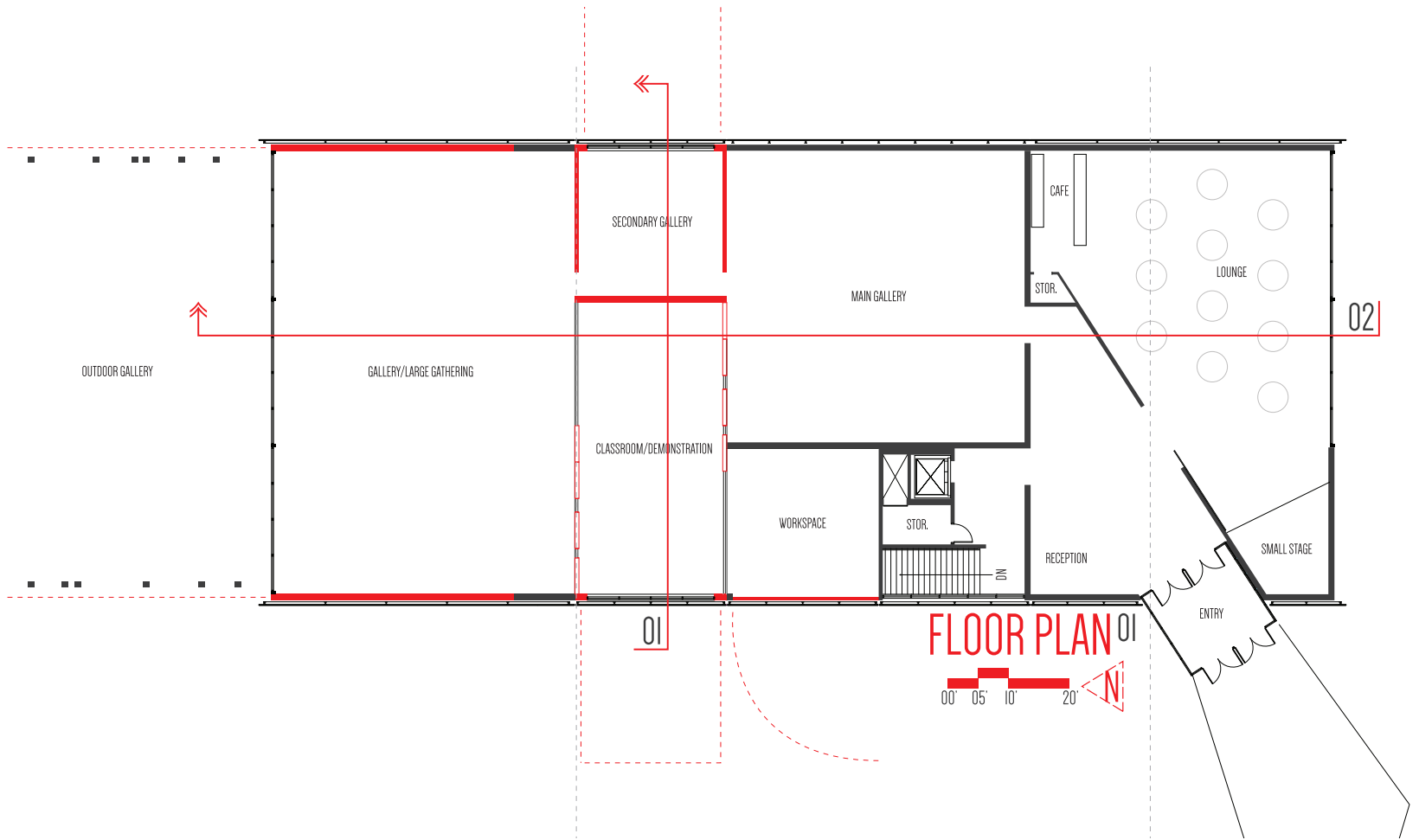


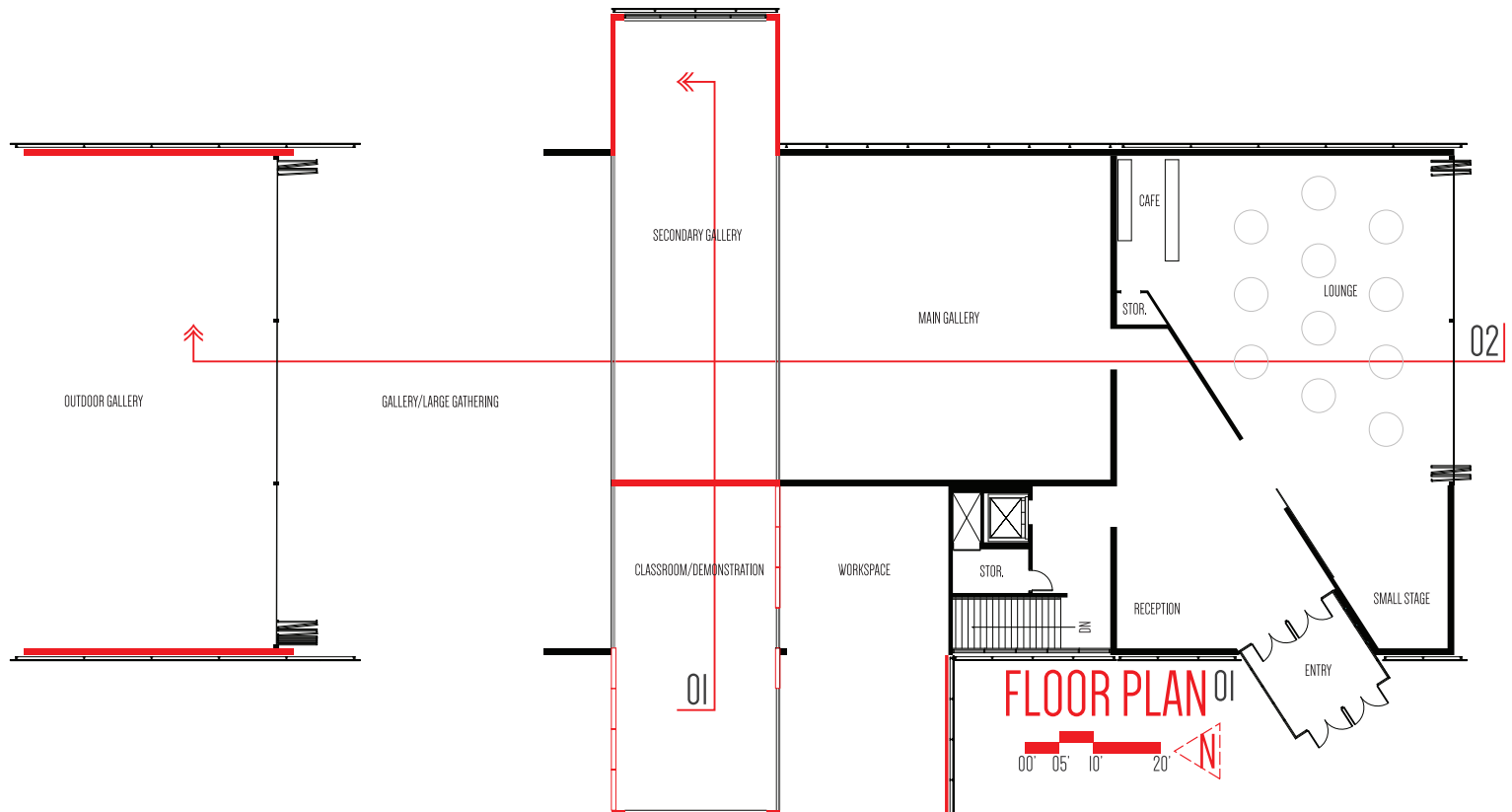
OUTDOOR GALLERY

SCULPTURE GROUNDS

VISITOR SHELTER

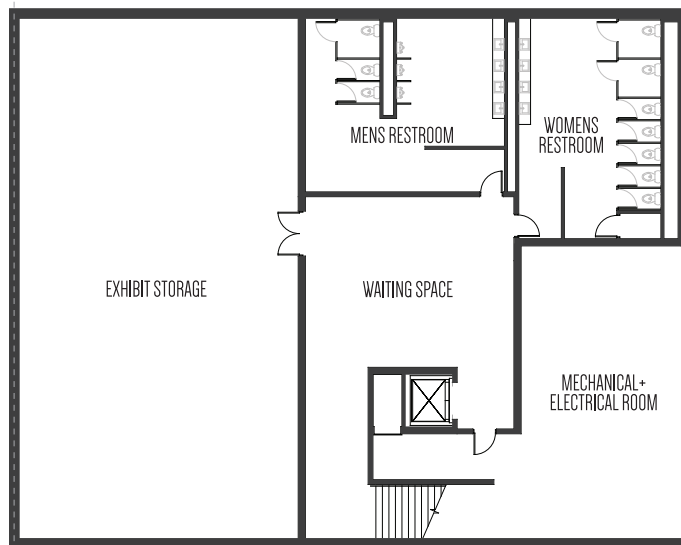
EVENT PATIO





The pavilion is simple in form, but complex in its capacity. The variation of volumes and spatial characteristics allows for a wide variety of events to occur within and outside of the walls. In the warm months, the building completely opens up onto the site to create a rich array of indoor and outdoor spaces. Kinetic components take advantage of views, allow natural ventilation, offer a unique

experience on the site. The main source of motion in is a track system, similar to a train car on a track. Motors within the walls allow for various parts of the building to translate across the site. With many configurations of the building, the possibilities are endless. The DuSable Fine Art Pavilion transcends its program and becomes part of the urban machine.



FLOOR PLAN 00





INTERIOR GALLERY SPACE

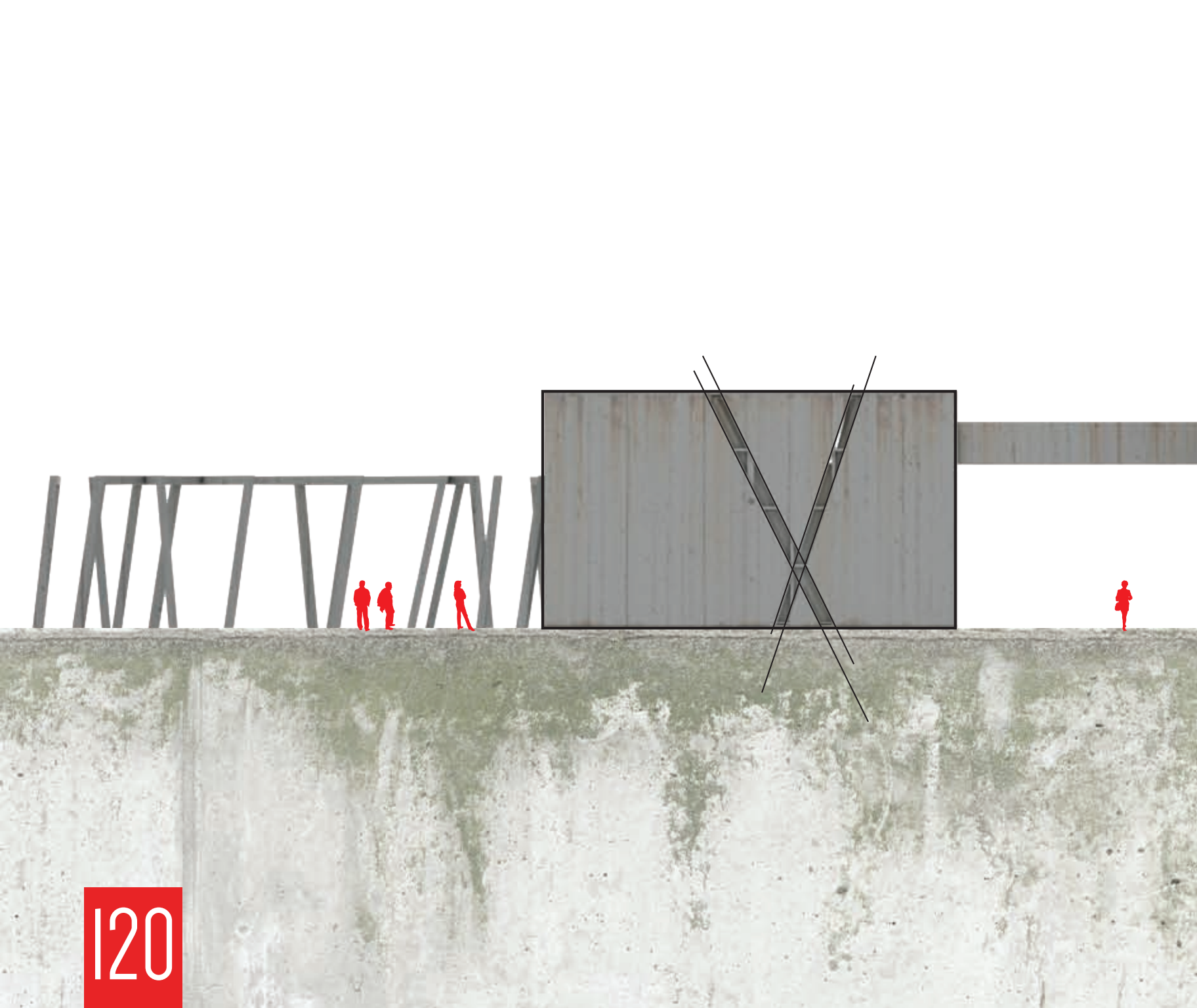




With a mixture of site cast concrete and weathering steel paneling, the materiality is reminiscent of the industrial past of the site. Dynamic motion is foretelling of the future.



# ELEVATION WEST







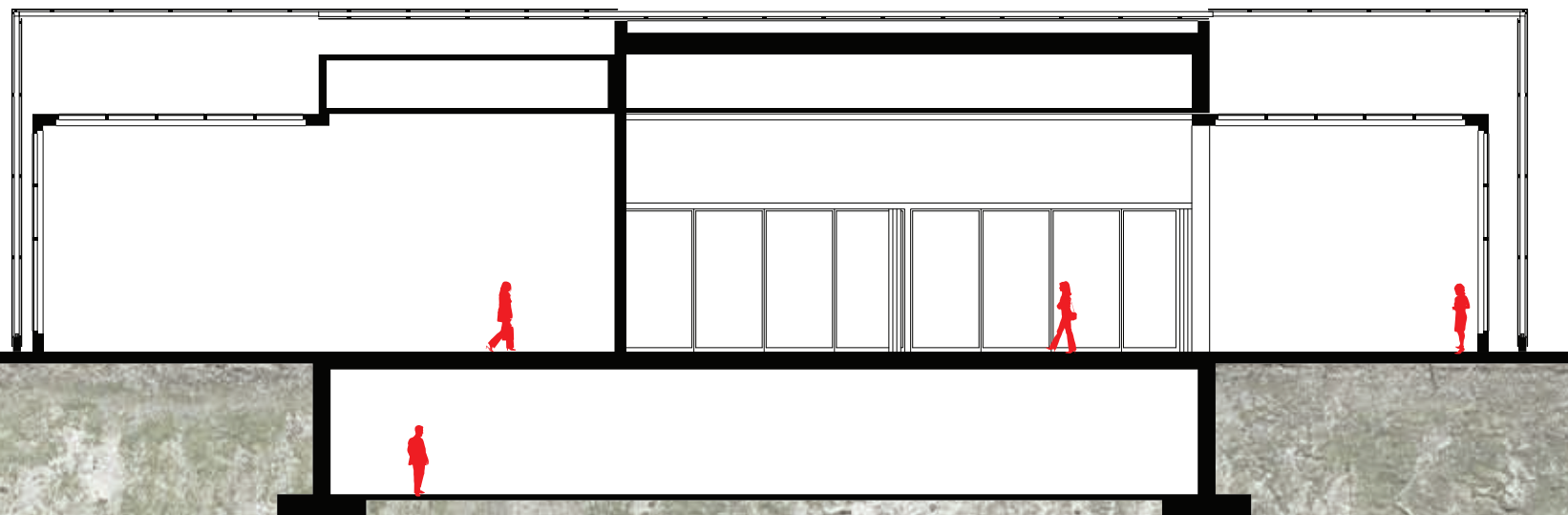
# ELEVATION EAST

## CAFE + LOUNGE

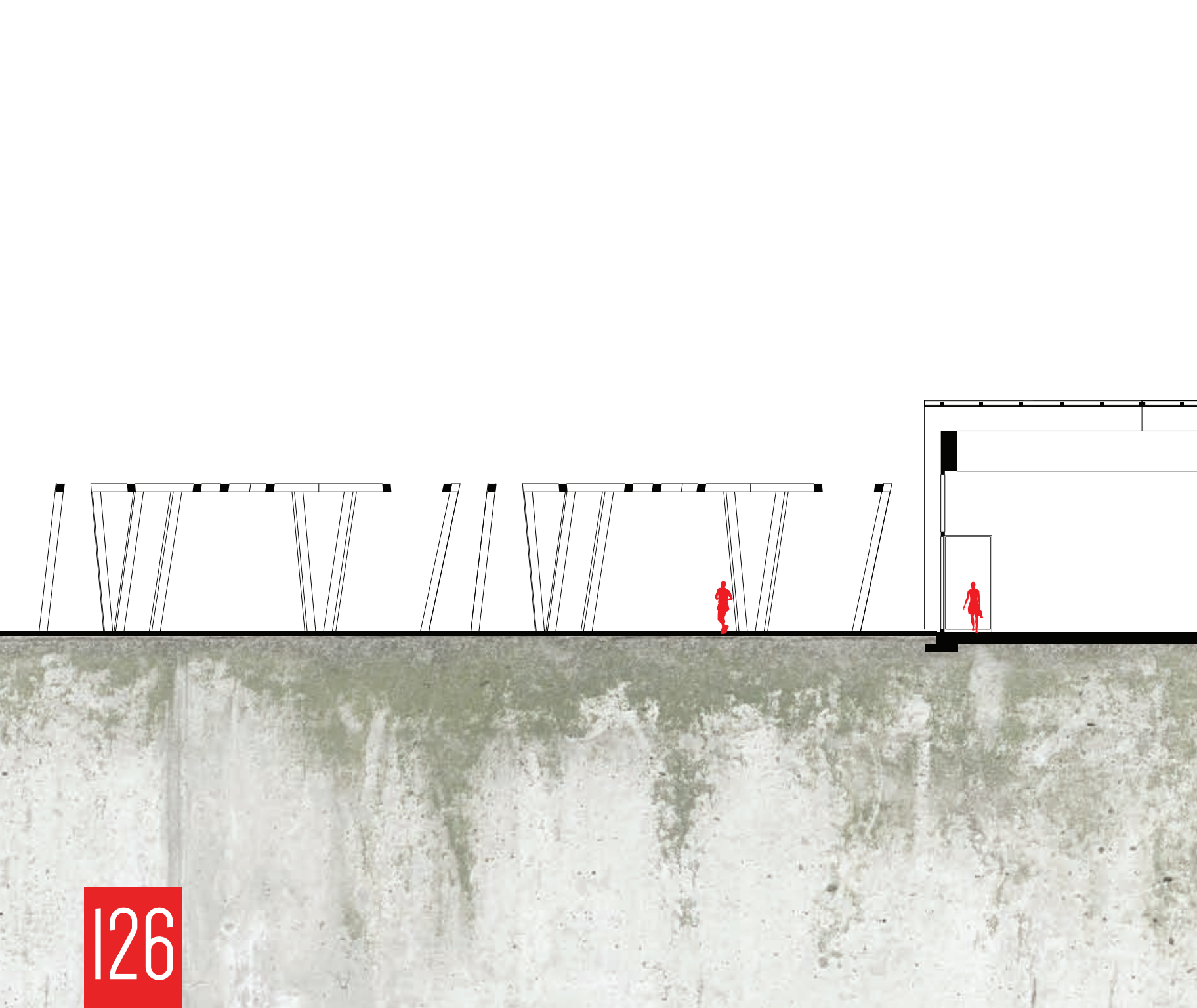
Nanawalls on the north and south end give the pavilion the ability to physically open up onto either of the two patios. Outdoor concerts, movies in the park, sculpture exhibitions, etc can all make use of the idealistic lake-front atmosphere that surrounds the site.

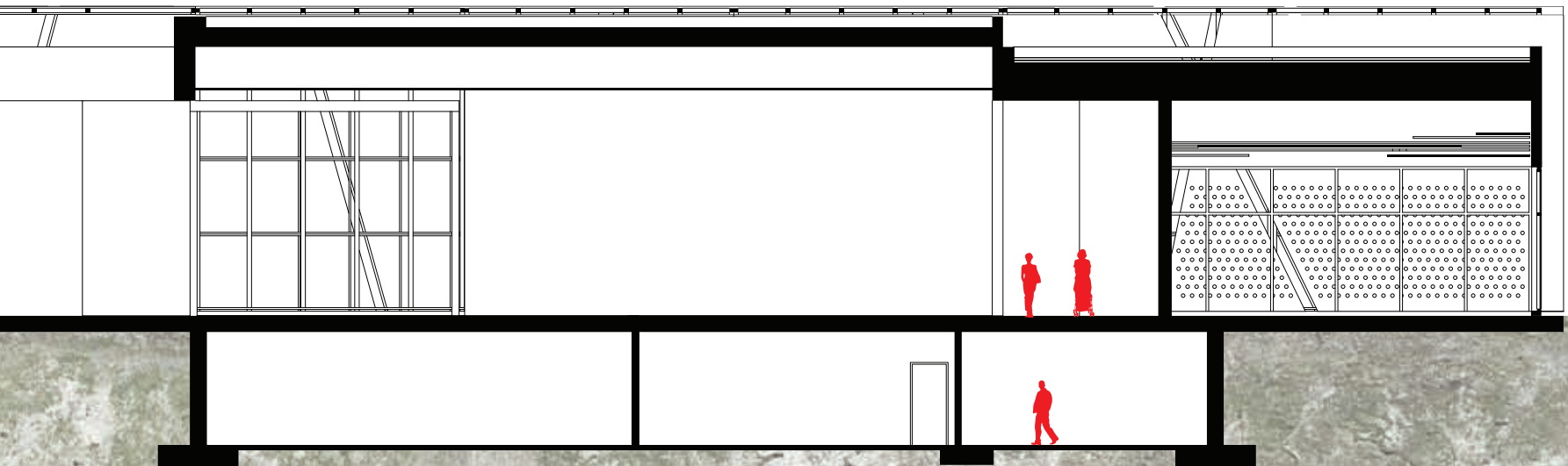




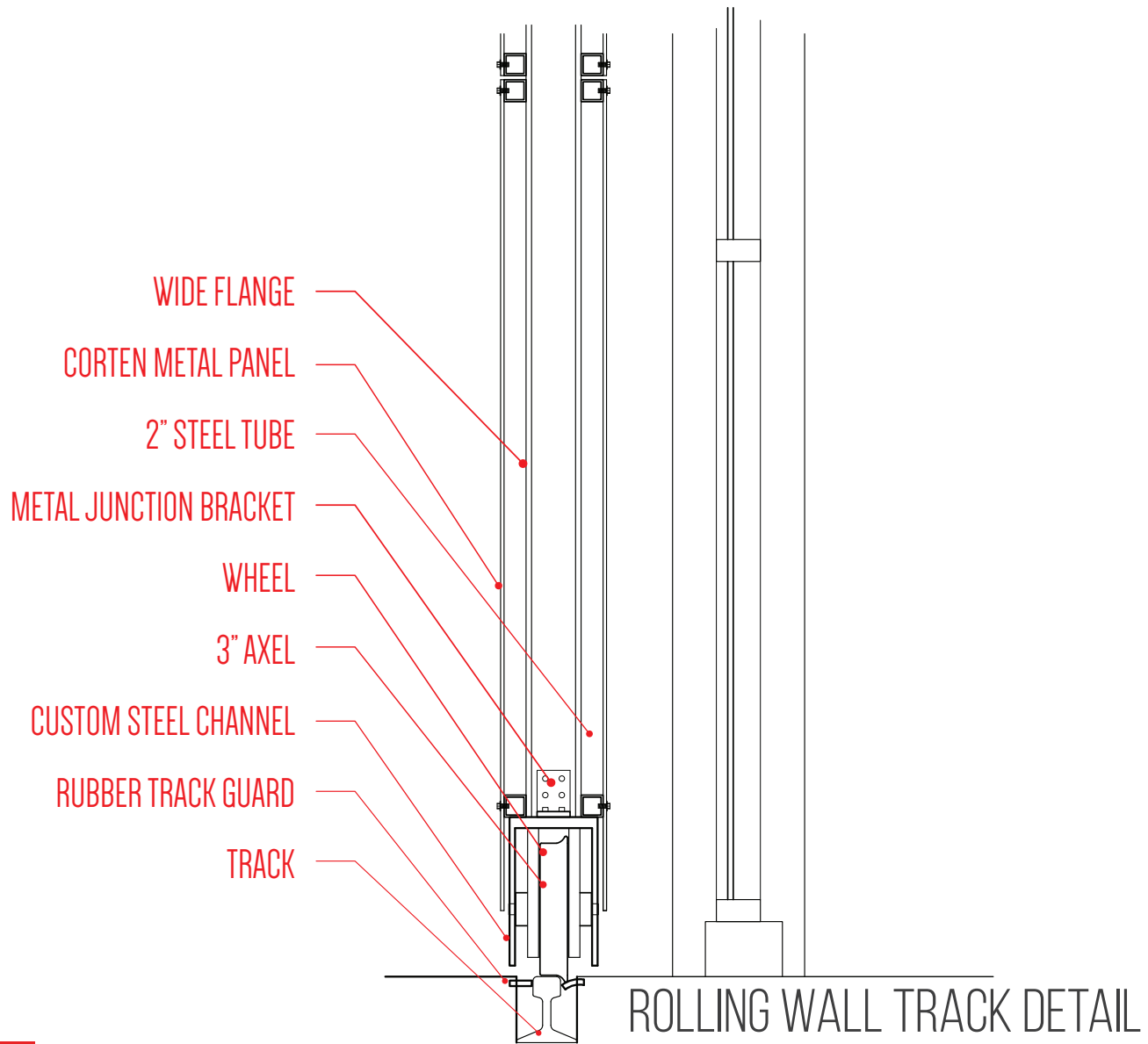


# SECTION 01

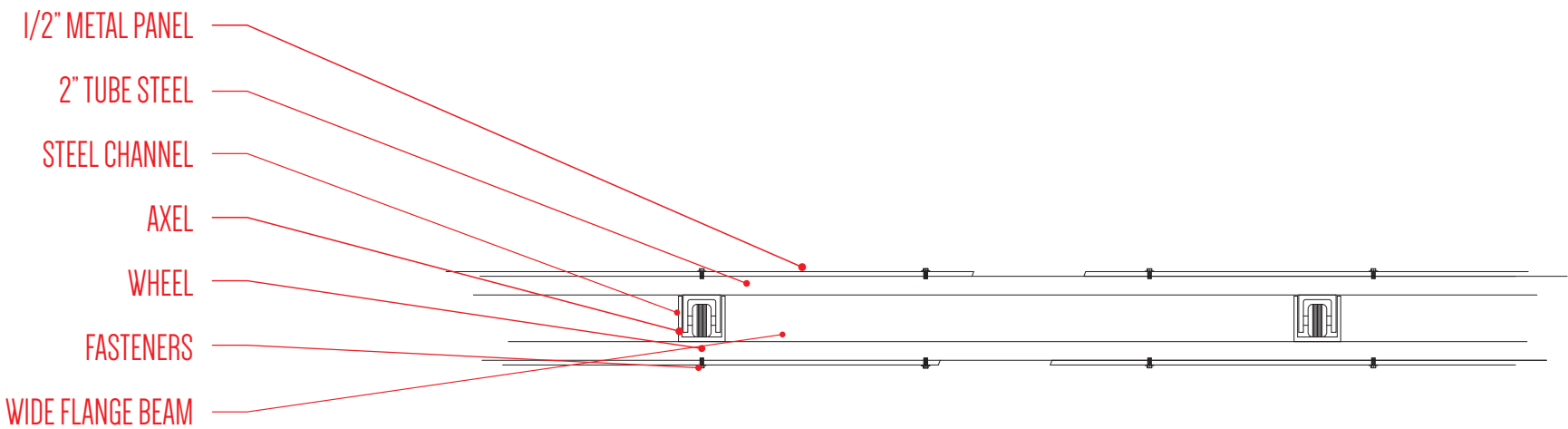




# SECTION 02



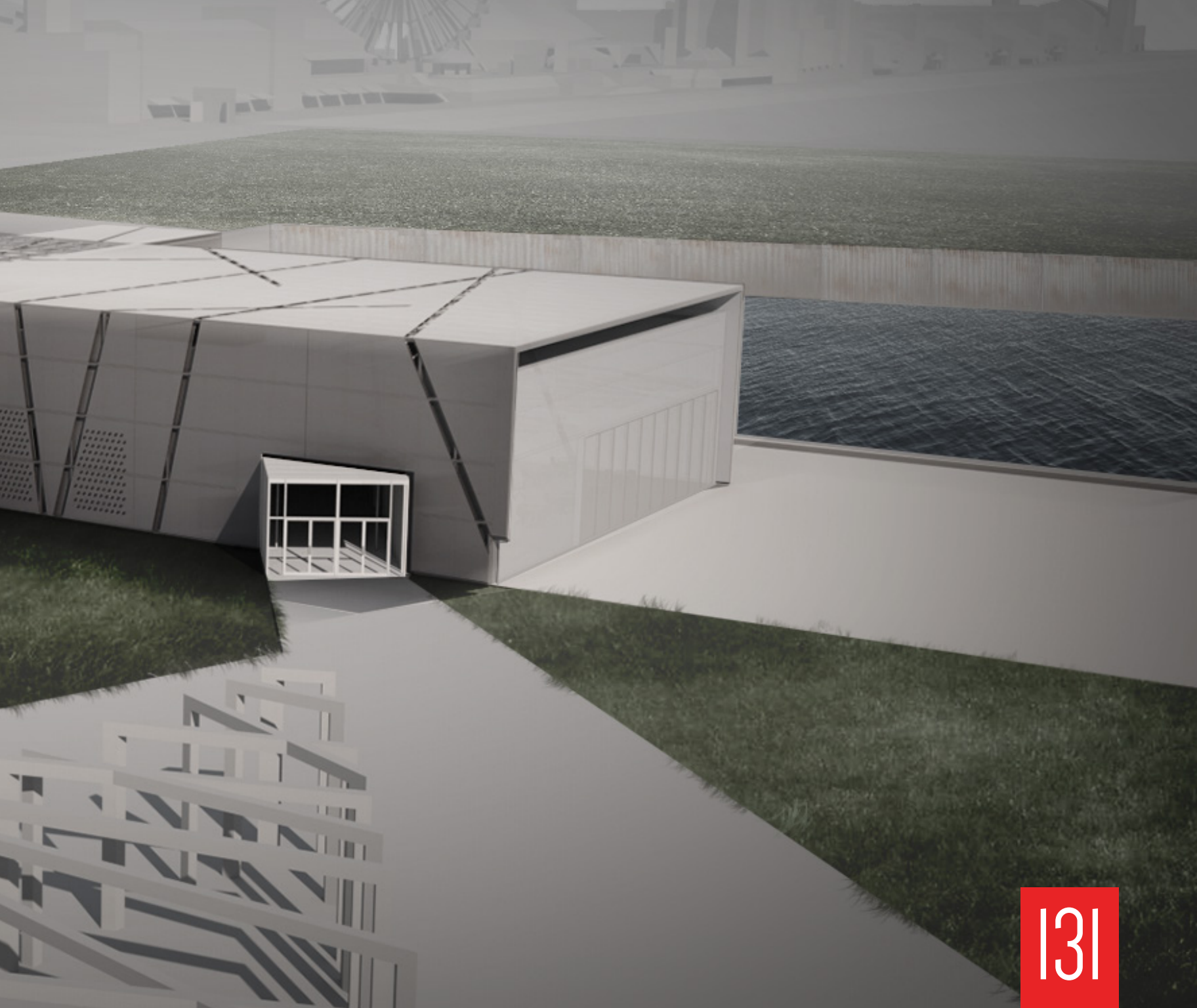




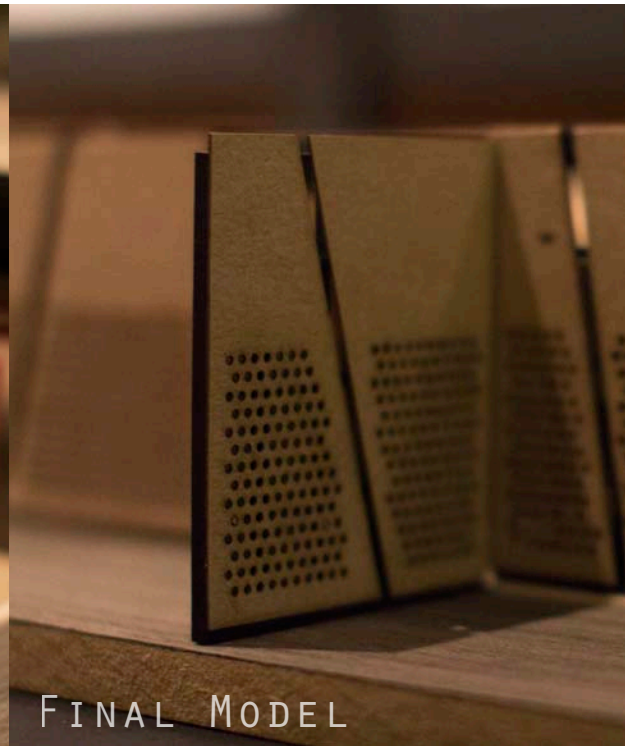
SLIDING ROOF DETAIL

## VIEW FROM BRIDGE

The DuSable Fine Arts Pavilion has the capability of adapting to an alteration in programmatic need. Shifting spaces allow the pavilion to reactively evolve to unique conditions. The spaces themselves, both fixed and kinetic, are flexible in their design.



# THESIS



FINAL MODEL

# EXHIBIT





CONCEPT MODEL



FINAL INSTALLATION

135

# STUDIO

## ARCH 271 DESIGN STUDIO I

Tea House  
Boat House

Joan Vorderbruggen  
Fall 2010

## ARCH 272 DESIGN STUDIO II

Montessori School  
Bird House Competition  
Dwelling

Cindy Urness  
Spring 2011

## ARCH 371 DESIGN STUDIO III

Animal Research Facility  
Mason Hall

Steve Martens  
Fall 2011

## ARCH 372 DESIGN STUDIO IV

NDSU STEM Building Exploration

Mike Christenson  
Spring 2012



# EXPERIENCE

## ARCH 471 DESIGN STUDIO V

Highrise  
DLR Competition

Don Faulkner  
Fall 2012

## ARCH 472 DESIGN STUDIO VI

Ghana School Masterplan  
Marvin Windows Competition  
International Studies - UAE

Don Faulkner + Frank Kratkey  
Spring 2013

## ARCH 771 DESIGN STUDIO VII

reGEN Boston Housing Competition  
Exploration through Artifact

Regin Schwaen  
Fall 2013

## ARCH 772 DESIGN STUDIO VIII

Design Thesis

Mike Christenson  
Spring 2014

# REF

Angel, J. (2010, March 14). Climate of chicago - description and normals. Retrieved from <http://www.sws.uiuc.edu/atmos/statecli/General/chicago-climate-narrative.htm>

Antoniades, A. (1992). Poetics of architecture. New York, NY: John Wiley and Sons.

Designalamic. (2013, January 22). Shadowboxx house. Retrieved from <http://designalamic.com/shadowboxx-house-olson-kundig-architects/>

Farrelly, E. (2013, May 22). Rmit design hub. Retrieved from <http://archcord.construction.com/projects/portfolio/2013/05/1305-RMIT-Design-Hub-Sean-Godsell-Architects.asp>

Greene, H. (1981). Building to last: Architecture as ongoing art. New York, NY: Architectural Book Publishing Co.

# REFERENCES

Pallasmaa, J. (2011). *The embodied image: Imagination and imagery in architecture*. New York, NY: AD Primers.

Perez-Gomez, A. (1983). *Architecture and the crisis of modern science*. Boston, Massachusetts: MIT

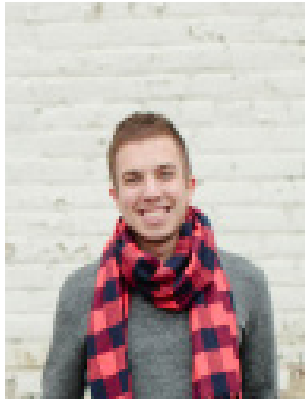
Perez-Gomez, A. (1994). *The space of architecture: Meaning as presence and representation*. San Francisco: William Stout Publishers.

Ritter, A. (2007). *Smart materials*. Berlin, Germany: Birkhauser.

Warmann, C. (2011, January 25). The wyckoff exchange by andre kikoski architect. Retrieved from <http://www.dezeen.com/2011/01/25/the-wyckoff-exchange-by-andre-kikoski-architect/>



# BIO



## JACOB JAMES REIMERS

20440 KENSFIELD TR.  
LAKEVILLE, MN 55044  
962.836.6486  
JACOB.REIMERS@MY.NDSU.EDU

HOMETOWN: SAVAGE, MN

“I wish to live deliberately, to front only the essential facts of life, and see if I could not learn what it had to teach, and not, when I came to die, discover that I had not lived.” -Thoreau

ABOVE: *fig. 76 - Portrait: Fargo, USA*  
(Koska, 2013)

