



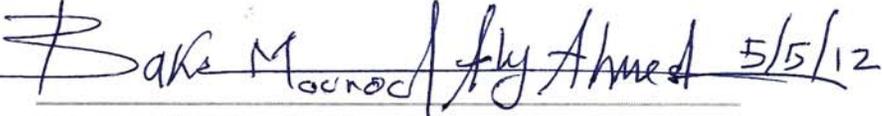
Hopeful  
Youth

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A Design Thesis Submitted to the  
Department of Architecture and Landscape Architecture  
of North Dakota State University  
By Jacob Zikmund

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

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 5/2/12

Thesis Committee Chair

September 2011  
Fargo, North Dakota

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This thesis examines the question, how can architecture encourage positive relationships and inspire hope in young cancer patients?

The project will study the affects of the natural and built environment and what role it plays on children with cancer. The ultimate goal is to create a space where children with cancer can have fun, relate to one another, and better gain a sense of hope and increase in morale.

It is a 25,000 square foot children's cancer recreational center located in Madeline Island, Wisconsin. This thesis presents a model for a new typology and addresses the issue of children being diagnosed with cancer in today's world.

"Children who suffer from cancer can often be excluded socially or feel alone in their struggle. Through architecture, they can have a space to relate with one another and regain a sense of hope and an increase in morale."

-Kari Allen

### Keywords:

Hope  
positive  
relationships  
architecture  
design

problem statement



How can architecture encourage positive relationships and inspire hope in young cancer patients?

statement of intent



# statement of intent

## typology

Children Cancer Recreational Center

## claim

Architecture has the ability to impact the lives of children with cancer and help them gain a sense of hope.

## premises

Architecture defines and influences what we do and how we feel in a space.

In order to increase morale among young cancer survivors/patients across the nation, a deeper, more aware connection must be made through commonality, friendship, and hope.

Many young children in today's world suffer from cancer. Through cancer, our youth can develop strong relationships with one another and gain a positive experience.

“Hope and positive experiences can be established by helping children with cancer realize they are not alone (Allen, 2011).” Through interaction with one another, optimism and a strong support system can develop.

## theoretical premise/unifying idea

Architectural design has the ability to bring people together, helping create a positive atmosphere for many young cancer patients/survivors. It is through this experience that personal relationships and hope can be attained.

## project justification

Children who suffer from cancer can often be excluded socially or feel alone in their struggle. It is important that these children suffering from cancer maintain a positive outlook on life. Through architecture, they can have a space to relate with one another and regain a sense of hope and increased morale.

the proposal



This thesis examines the question, how can architecture encourage positive relationships and invoke hope in young cancer patients? The typology for analyzing this problem is a children's recreational cancer center located in Madeline Island, Wisconsin. The theoretical premises/unifying idea that supports the research is, "Architectural design has the ability to bring children together, helping create a positive atmosphere for many young cancer/ patients survivors." The project justification is, "Children who suffer from cancer can often be excluded socially or feel alone in their struggle. Through architecture, they can have a space to relate with one another and regain a sense of hope and an increase in morale."



## narrative

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Architecture can help invoke experiences within the natural and built environment. It is these experiences that can help create relationships between people.

However, if a child is disabled and has to take an alternative route than the rest of the group, will that child's experience become negative for him/her? It is through this example that this project will explore how to create a similar and balanced experience for everybody, regardless of the constraints.

Many children diagnosed with cancer will suffer physical pain, but we can do something about their mental state. We sometimes forget that children suffering with cancer are no different than children who are not. It is imperative to encourage and invoke hope in children with cancer because it can be the driving force to get them through it.

Hope is a key factor in these kids' lives. It is what many cancer camps across the nation try to instill in these children.

---

It is a process through which friendship, commonality, and teamwork begin to build a foundation of hope. How can we do this more effectively and what else is part of the equation?

The proposed project will examine how architecture can help instill hope and positive relationships in children with cancer. I believe spatial development and the natural environment can impact the people within it. It is through these experiences that social interaction can occur and a sense of hope can be instilled in these young children.



## major project elements

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### community/gathering room

A large open space is essential for social interaction and as a gathering space. This space will be the main focus of the program, where kids can interact and play with one another. Lighting and materiality will be very important to the success of this space.

### kitchen / dining

A full kitchen and dining center will be available to the entirety of the camp. It will be a great space for social interaction and it will provide three meals a day.

### “break” room

A “break” room will be offered to the staff when they are feeling run down and tired. It will be essential that the staff is 100% healthy when working with the “campers.”

### medical

A full medical facility is pertinent to the children’s health. It will be fully equipped and staffed 24 hours a day, stocked with each child’s medical needs.

### staff / “camper” cabins

Overnight lodging will be provided to each staff member and all of the campers. There must be a ratio of two staff for every six campers. As a result, many of the staff will share cabins with the campers. The remaining staff will share cabins with one another.

### outdoor spaces

An important emphasis of this project is a connection with the natural environment. Much of this program will consist of activities outside, such as rock climbing, canoeing, fishing, boat rides, swimming, and a high ropes course.



owner

The facility will be owned and operated through the city of Madeline Island, Wisconsin. It will be funded by the city and also by other public/private sectors.

staff

Fifty volunteer employees will be working within the facility as medical staff, executive staff, and other aid resources. All staff will be on call 24 hours a day.

medical staff .....	10
park rangers .....	5
volunteer staff .....	40
executive staff members (programming) .....	5

children "campers"

One hundred fifty children who have been diagnosed with cancer will occupy the facility from the beginning of June through the end of August. From September through May, the facility will be rented and leased to the public to facilitate other special need programs and activities. Each child will have a specific need and in order to meet those needs, each member of the staff will be notified of each child's background and accommodations will be adjusted accordingly.

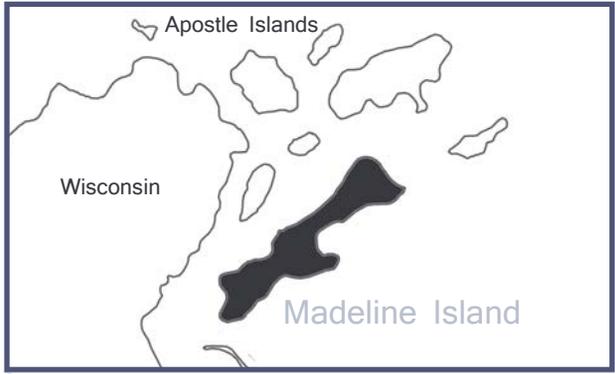
Stage 1 .....	Ages 5-9
Stage 2 .....	Ages 10-12
Stage 3 .....	Ages 13-15
Stage 4 .....	Ages 15-17

visitors

There will be a scheduled event in which the parents are allowed to visit for an afternoon. As a result, added programming and parking will be considered.

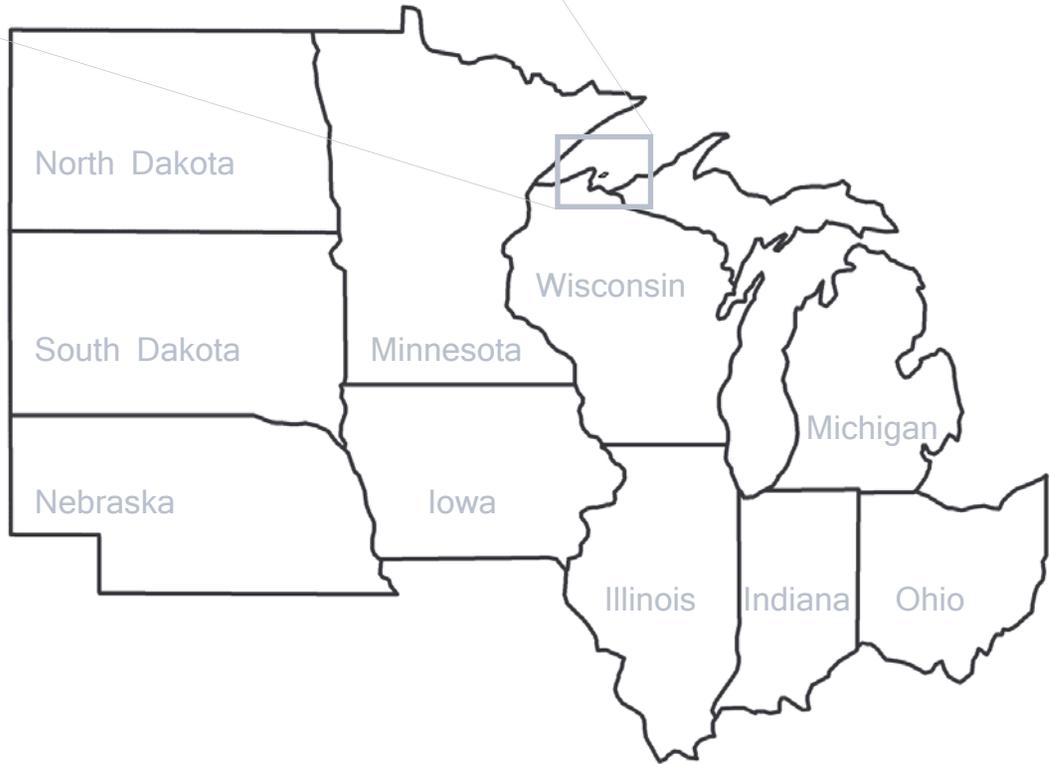


## site information



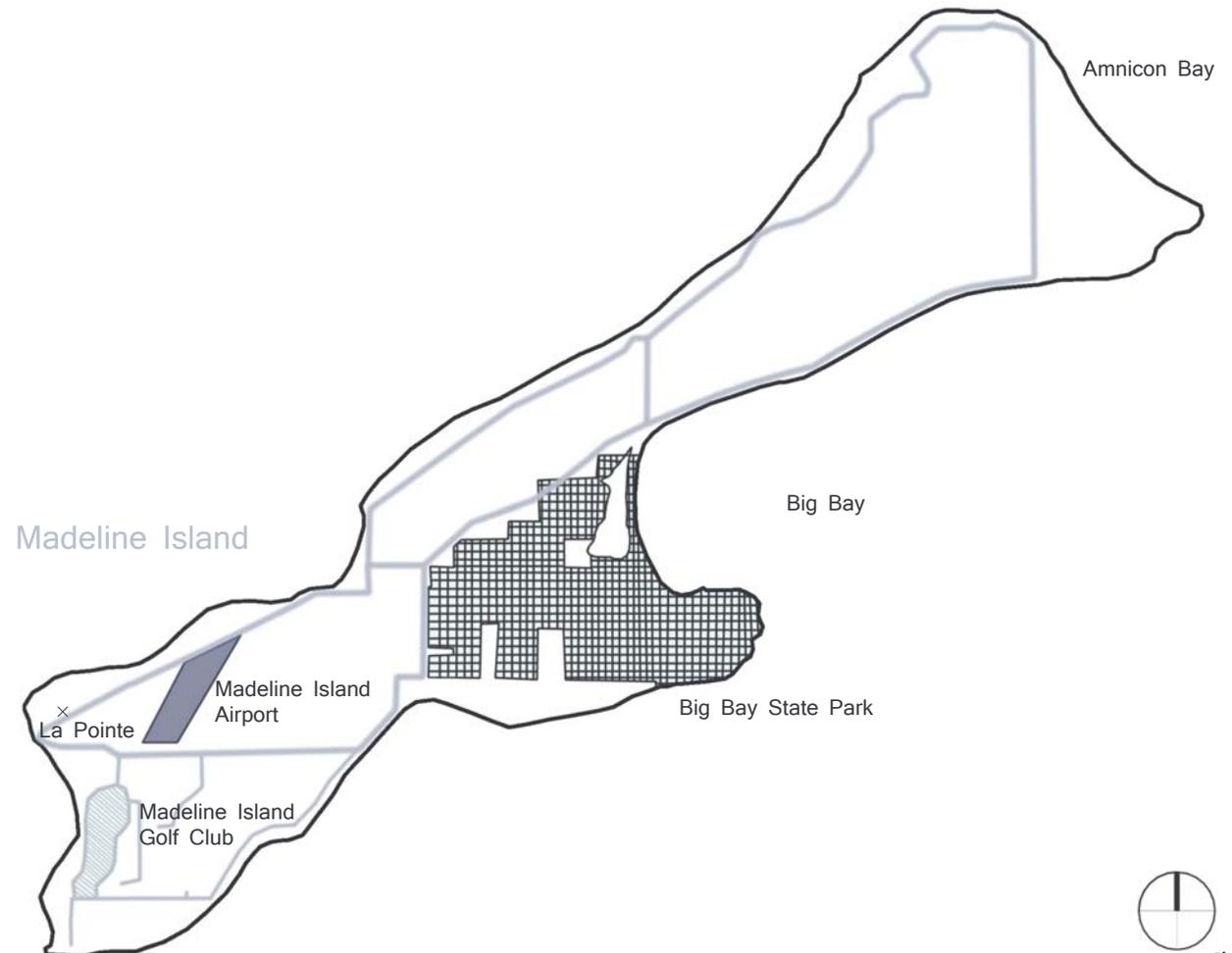
### regional

Madeline Island is located in the upper Midwest, in the Great Lakes region. Its climate has four standard seasons with cold, dry winters and warm, humid summers.



## city

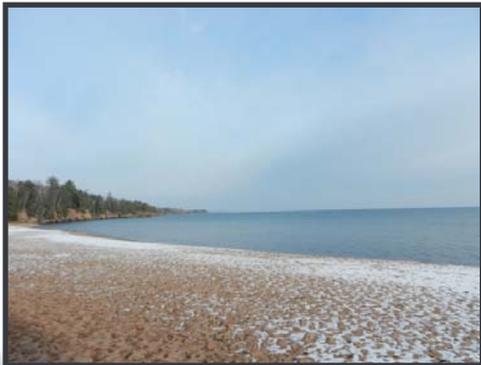
Located two miles northeast off the coast of Bayfield, Wisconsin is Madeline Island. It is located in Lake Superior just off the north tip of Wisconsin, about 90 miles east of Duluth. Madeline Island belongs to the state of Wisconsin and is the largest of the twenty two Apostle Islands. Out of all the Apostle Islands, Madeline Island is the only island that has advanced commercial development and its own airport. Madeline Island is roughly 14 miles long and 3 miles wide.



# Hy site information

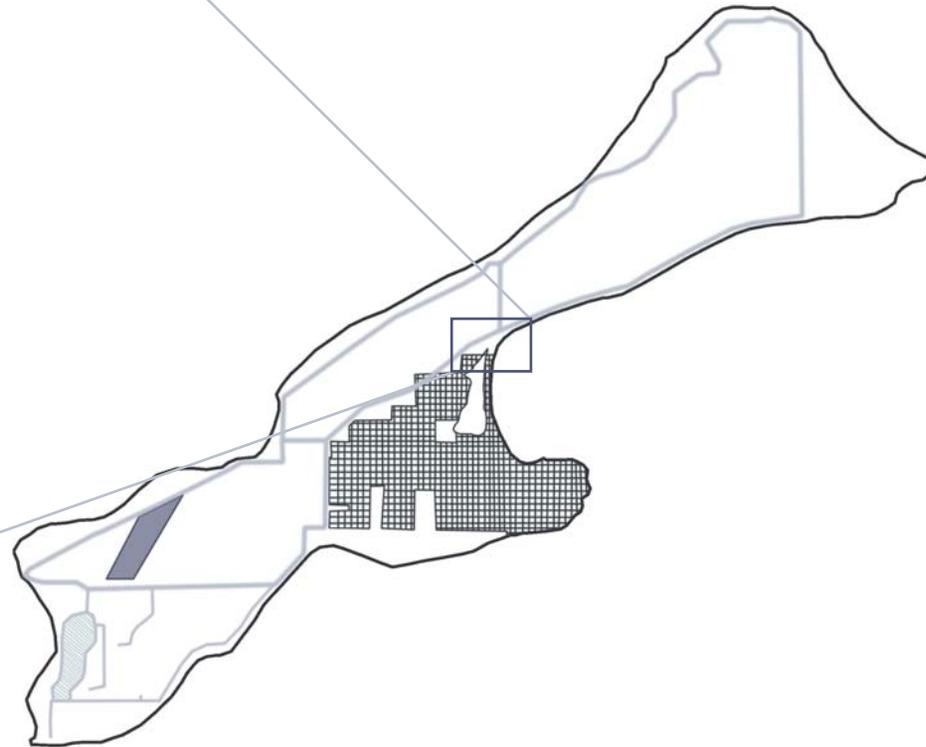


(Lasting Bridge, 2011)



## site

The southwestern part of Big Bay offers great scenery and views from all angles. Because the island is nestled within Big Bay, the temperature is a lot warmer and the prevailing winds are blocked naturally by trees and vegetation. It is not inhabited by any residents and provides a great place for a youth recreational cancer center.





### site importance

Madeline Island is not only a beautiful and pristine island, but it offers all of the amenities required for this project. It has breathtaking views surrounding the entire island and offers a very relaxing and peaceful atmosphere. Madeline Island also offers an array of activities for children of all ages to participate in, such as:

- hiking
- canoeing
- fishing
- swimming
- sunset campfires
- lake cruise

Overall, this site fulfills the needs of the program. It allows the children to have fun while building relationships with one another and helps them regain a sense of hope for their future.



## project emphasis

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This thesis examines how young cancer patients can experience joy and regain a sense of hope by simply having fun and interacting with one another. This social interaction will help them realize that they are not alone in their struggle.

Cancer is viewed at as an incurable disease in society today. Understanding that cancer is an illness and not a lifestyle is very important to establish in young children. The focus of this project will be toward a recreational facility that will give children with cancer a chance to forget about their illness and just be a carefree child for a week. It is an opportunity for them to spend time with kids their age who have been through similar situations. In the end, hope and



### research direction

The research for this thesis will be examined in several different directions to create a complex project. The first examination will focus on the theoretical premises/unifying idea. The following research will focus on the project typology, historical context, site analysis, and programmatic requirements.

### design methodology

In this thesis, I will employ a mixed method, quantitative/qualitative analysis approach. This model will follow and use the concurrent transformative strategy, which will implement both quantitative and qualitative data. Quantitative data will be gathered through archival searches such as internet articles, books, and journals. Qualitative data will be gathered through site visits, visiting other cancer camps, and interviewing cancer patients/survivors and other people associated with cancer. In order to successfully research this project, both types of research data will be used.

### documenting the design process

The documentation of this thesis will entail a couple different strategies. First, it will be documented on a weekly basis through sketches, drawings, sketch models, photographs, and scans. Once these strategies are produced, they will be retransmitted and stored digitally on my hard drive. Once these drawings/photographs are compiled, I will organize them and present them digitally along with my thesis. I will also lay them out in a three-ring binder at the final thesis presentation.

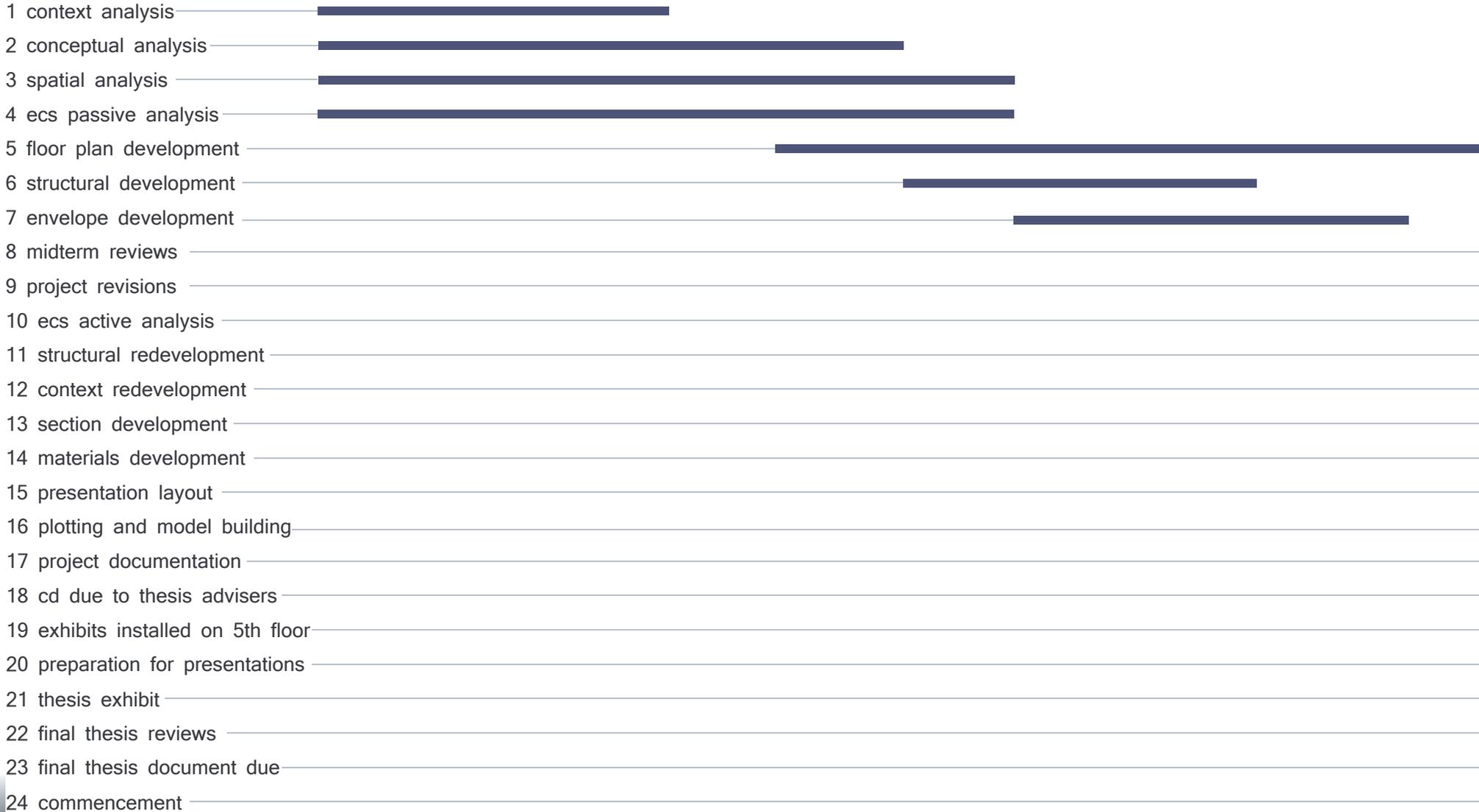


# plan for proceeding

## JANUARY

## FEBRUARY

01/09      01/16      01/23      01/30      02/06      02/13      02/20      02/27



March

APRIL

May

03/05

03/12

03/19

03/26

04/02

04/09

04/16

04/23

04/30

05/07



# the program document





## Introduction

No matter how grim or negative a situation can be, hope is something that can provide a way out. Without it, looking into the future when faced with a difficult present can seem very helpless. How can we instill hope and positive attitudes in youth who have been diagnosed with cancer? This is a particular question that I will aim to answer.

While trying to discover a solution, I stumbled across summer camps for kids with cancer. In particular, I will analyze Camp Goodtimes East, which is a summer cancer camp located in Coeur d ' Alene, Idaho. Throughout my research, I will be discussing every element of the camp and interviewing the staff and the children who attend the camp.

---

## Camp Goodtimes East

Camp Goodtimes East is a weeklong camp for children ages 5-17 who have cancer. It is a week filled with outdoor activities, bonfires, and making new friends. It is a typical summer camp, except that these children have cancer. One of the most important goals of the camp is to help these children “forget” that they have cancer for a week. Kari Allen, the official camp director at Camp Goodtimes East, says, “The goal is to have fun and participate in activities like a regular child.”

Camp Goodtimes East is located in Coeur d’Alene, Idaho, specifically at Camp Ross Point. This campground offers a riverfront beach, a high ropes course, rock climbing walls, housing, dining, and many other flexible spaces. As a result of everything Ross Point offered, it became the official campground of Camp Goodtimes East in 2005.

## Hands-on-Experience

Camp Goodtimes East took place from July 29 through August 7, 2011. I was fortunate enough to apply to camp and get accepted as a camp/cabin counselor. It was a very positive and life changing experience.



I was able to look into the lives of children who have cancer and get a better understanding of what it means to be diagnosed with cancer.

It was very evident to me that these children who attended camp made great changes by the time camp reached its end. Children who were shy and timid at the beginning of camp started to reach out more and more as the week went on. It started to raise questions such as, What is making these children more happy and confident? It seems odd that children who typically spend many years with just their family and live a fragile life will start rock climbing for the first time in their lives or doing the high ropes course. A person who has a better understanding of this is Kari Allen, Camp Goodtimes East director.

### Kari Allen “Kool”

Kari Allen is the head director and runs Camp Goodtimes East, which is sponsored by the American Cancer Society. She has been the lead director since 2007. This, however, has not been her first experience working with special needs children. “I worked in Ohio with special needs children and camp has been my whole life from the beginning,” says Allen. I found her background very interesting so I interviewed her.

---

## Interview

Me: Why did you become camp director at Camp Goodtimes East?

Kari Allen: Its something I came across and decided to give it a try. Camp has been my whole life and I have worked with special needs children in Ohio for some years.

Me: In your opinion, what are the positive effects camp has on these kids?

K.A.: These kids with cancer come back knowing that there are other kids fighting the same fight. Kids in treatment get to see kids out of treatment who survived. Also, families realize that there are other families out there going through the same thing, and positive relationships can occur. Children can step out of their element and become stronger and better. Also, camp becomes a “family” and the children stay in touch and it becomes a nice support system.

Me: Is there a noticeable difference between the children at the beginning of camp and towards the end of camp?

K.A.: Yes, at the beginning of camp they are afraid and hesitant, but towards the end -



they are laughing and feel comfortable. Many kids' attitudes did a "180" and children who were very fragile and who were not even eating solid foods began to do so. Children who were not very active began swimming and participating. It is remarkable to see the large steps they take during the course of a week

Me: How do you feel about the space you are provided with at camp? (Ross Point)

K.A.: It is a good spot. It is a level camp in comparison to most around our area. I would prefer if it was a more rustic setting and more out in the country. I would rather be on a lake than a river but it is still nice. It is also nice that we are fairly close to hospital in case of a serious emergency.

Me: Briefly describe the program at camp (buildings/activities).

K.A.: There are multiple cabins on site for sleeping arrangements and there are a few breakout spaces and a gym. Also there is a dining hall, medical cabin and a chapel which is used as a staff/meeting area.

Me: If you could add more program or space/facilities to the program, what would it be and why?

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K.A.: I wish we had a better medical cabin for the children and electricity offered to more spaces. Also, a bigger dining hall and meeting space would be nice.

### Daylight. Comfort. Health

According to Nick Baker in his book, *Daylight Design of Buildings*, “In the provision of a daylit environment three key aspects can be identified: visual performance, physiological conditions and visual quality.” Day lighting in a building is a very important aspect that can alter not only the design of the building but how it functions. As Baker stated above, visual performance, physiological conditions, and visual quality are all necessary for a successfully lit design and a positive state of well-being. Access to daylight within a building is very appreciated by the occupants within it. There have also been claims that workspaces that have been naturally lit show an increase in the productivity of the workers although it has not been scientifically proven. With that said, there are positive effects of daylight that are associated with health and well-being. It is the connection between the visual experience of the natural environment versus the built environment. Responding to nature can not only improve a design, but it can improve a person’s state of wellness.



As Baker states, “There are well-known disbenefits associated with the artificially lit environment.”

### “Body Clock”

A circadian rhythm can be summed up as an endogenously (built-in) driven 24-hour “body clock.” According to Baker’s research,

Doses of strong light are needed each morning to prompt the pineal gland to switch off production of melatonin. Receiving information on light levels from the retina, the pineal gland is a pea-sized organ at the base of the brain that performs several important regulatory functions, chiefly through the release of melatonin into the bloodstream during the hours of darkness. In this way, a wide range of body organs, including the brain, exhibit diurnal (or circadian) cycles of activity. Thus the release of melatonin at night makes us feel sleepy, suppresses our endocrinal system (to reduce stress), and damps down other functions that might interfere with sleep. All of these effects are then reversed during the daytime, when melatonin production is switched off.

This process our body goes through is very indicative of our natural response to daylight. However, to say that this process is completely turned on and off by the presence and absence of daylight would be an oversimplification.

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It is scientifically proven that circadian cycles still occur with the absence of daylight, but the cycle is slowed down by 1.1 hours out of 24, according to Baker.

These experiments show the importance of daylight and how our bodies fluctuate depending on the amount we receive. Depending on the amount of daylight we receive, our melatonin production will gradually lengthen and circadian desynchronization will occur if we do not get enough. As a result, lethargy, drowsiness, and other symptoms will result.

Proven to be scientifically sound, the amount of daylight we receive affects our bodies and wellness. In a closing statement, Baker says, "Daylight is a gift of Nature. A civilized man learns to use artificial light sources which free him from total dependence on daylight, he also learns to appreciate the value of daylight and become aware of its special advantages."

### Isn't Nature Neat

Exposing natural elements such as water, vegetation, and natural light can be positive influences and help reduce stress.



According to Roger S. Ulrich, Ph.D., in his book, Effects of Healthcare interior design on Wellness: Theory and Recent Scientific Research, “The intuition-based belief that visual exposure to trees, water, and other nature tends to produce restoration or recovery from stress dates as far back as the earliest large cities, such as ancient Rome” (Ulrich and Parsons, 1992).

It is this belief that caused many urban areas to establish parks and other forms of green spaces within the context of the city. Ulrich says,

New research also indicates that views dominated by nature content, in contrast to built or urban scenes lacking nature, foster more rapid and complete restoration in terms of another critical component of stress, the physiological. In laboratory research, visual exposure to everyday nature has produced significant recovery from stress within only five minutes or less, as indicated by positive changes in physiological measures such as blood pressure and muscle tension. (Ulrich and Simons, 1986; Ulrich et al., 1991).

With the natural setting combined with the built environment, a healthy, less stressful atmosphere can be created.

---

By creating positive distractions, the occupants can let go of stress and become less aware of negative distractions within their lives. In summary, Ulrich says, “Prolonged visual contact with nature may have persistent positive effects on psychological, physiological, and possibly behavioral components of stress. Over time, these effects may be manifested in higher levels of wellness or health.”



## theoretical research summary

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Throughout the theoretical research I tried to develop a better understanding of what my theoretical premise addresses: “Architectural design has the ability to bring people together, helping to create a positive atmosphere for many young cancer patients/survivors. It is through this experience that personal relationships and hope can be attained.” In order to do this I decided to break this statement down into different elements of research.

As I stated above, this past summer of 2011, I volunteered as a camp counselor for Camp Goodtimes East in Coeur d’ Alene, Idaho. This experience in my life became a catalyst for my thesis design. I saw great promise from this camp and decided that not only was this a jump start to my thesis but an opportunity to make it better. As the weeklong cancer camp came to an end, I began to ask myself many different questions about children with cancer. To get a better understanding of this I interviewed Kari Allen, a woman who has been working with children with cancer for many years and is Camp Goodtimes East Camp Director. She described the changes that occurred in the children throughout the course of the week and how in some cases it was almost indescribable.

---

I began to ask myself, “What kind of environment causes these changes within the children?” Thus began my research into innovations in healthcare design, day lighting and the effects it has on us, and how nature can affect our design process and way of thinking.

### Conclusion

I discovered that day lighting is a key element when creating a positive atmosphere for not only the building but the occupants within it. Also, different intensities of light can actually have an effect on a person’s circadian rhythm and regulate whether or not the person will be more apt to feel lethargic and drowsy. Natural environments tend to reduce stress in people over a short period of time and become even more effective over long durations. By creating positive experiences within a space through these strategies, it is my belief that positive experiences and relationships will be more apt to develop among these young teenagers and children with cancer. As a result I believe that these young people will be able to open up to one another and share experiences that they have in common with one another, potentially leading to friendships and hope for the future.

# case studies



## Aquatic Center

architect: Zaha Hadid Architects  
location/date: London England, 2011  
project type: Sports Facility / Swimming



(Directory, 2008)

## ARENA ZAGREB

architect: UPI - 2M  
location/date: Croatia, 2009  
project type: Multi-purpose Recreation Hall



(Directory, 2008)

## rehabilitation centre Groot Klimmendaal

architect: Architectenbureau k van Velsen BV, Hilversum Netherlands  
location/date: Arnhem, Netherlands 2011  
project type: Health



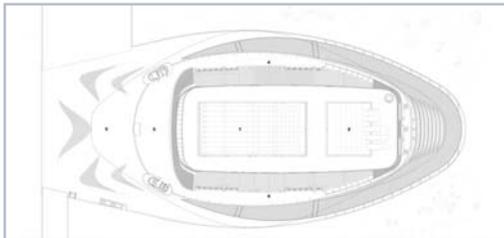
(Directory, 2008)



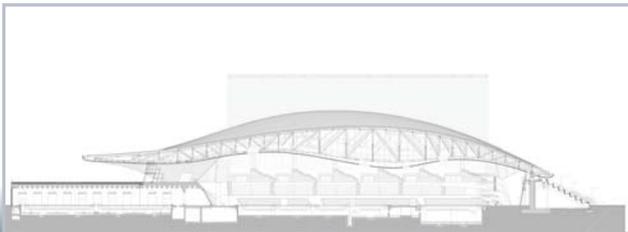
(Directory, 2008)

## Aquatic Center

architect: Zaha Hadid Architects  
 location/date: London England, 2011  
 project type: Sports Facility / Swimming



ground plan



section

## INTRO

The London Aquatic Center was a massive project designed for the 2012 Olympics. However, once the Olympics are over, what will become of this building? Zaha Hadid has an answer to this question. This building will become a sports facility and recreational swimming area/center for the community.

In the past, many of these high-end designs became bare and desolate once the Olympics were over. This design not only caters to the programmatic needs of the summer Olympics but also serves the community in its needs. It is a great example of utilizing the program within two very different criteria while still remaining functional after the Olympics.

## Program

- 17,500 ppl - during olympics
- 2,500 ppl - after olympics
- 50 meter competition pool
- 25 meter competition diving pool
- 50 meter warm up pool



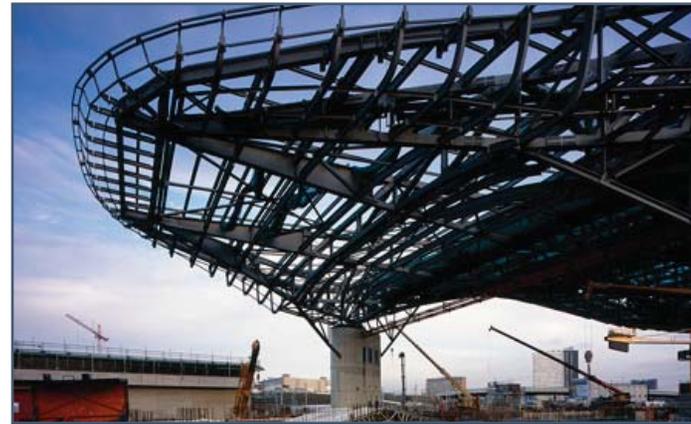
(Directory, 2008)



(Directory, 2008)



(Directory, 2008)



(Directory, 2008)



(Directory, 2008)

## Flexibility

Once the summer Olympics are over, the Aquatic Center will be transformed into a facility that can be used by the local community and other vendors. The two temporary constructed wings on the building will be removed. However, if there is a need for a major event afterwards, it is still possible to increase the capacity of the building.

Also, the Aquatic Center will be equipped with changing facilities, a cafe, and a new public plaza in the front end of the building. It will not only serve as a community center for the city after the Olympics, but if necessary it could house any major event.

## Program

add / remove space  
flexibility  
community  
dual program  
efficiency



(Directory, 2008)



(Directory, 2008)



(Directory, 2008)

## Form / Structure

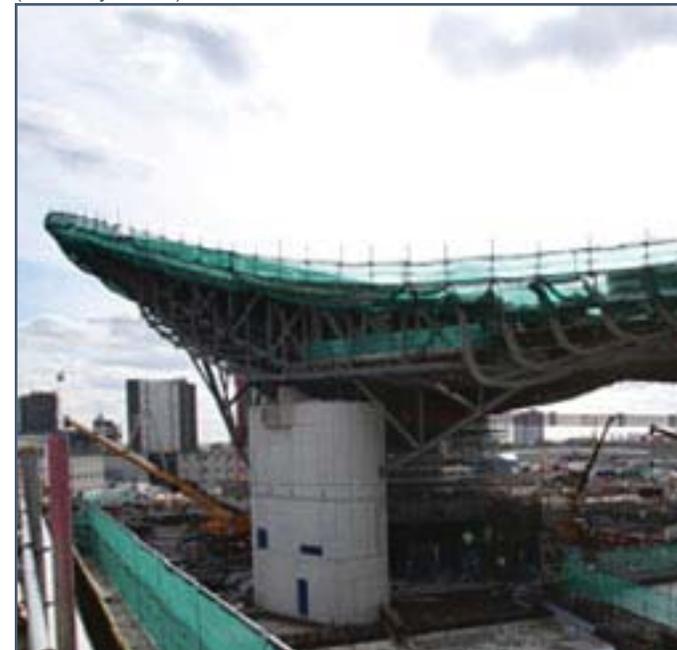
### Roof Structure

90 meter roof span:	one direction
160 meter roof span:	one direction
weight:	3,000 tons

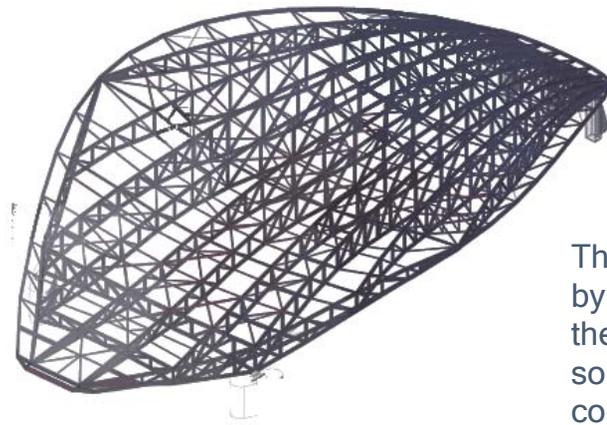
## Roof

The London Aquatic Center has a roof that is complex in every sense of the word. It not only curves 90 meters in one direction but also curves 160 meters in the other. The construction of this massive roof was extremely difficult, and precision and accuracy were necessary in order for it to be structurally sound.

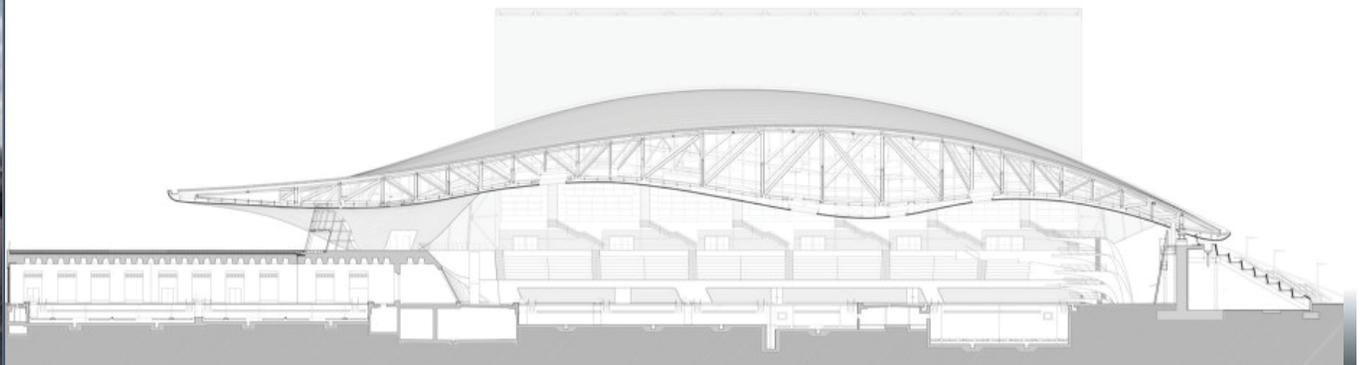
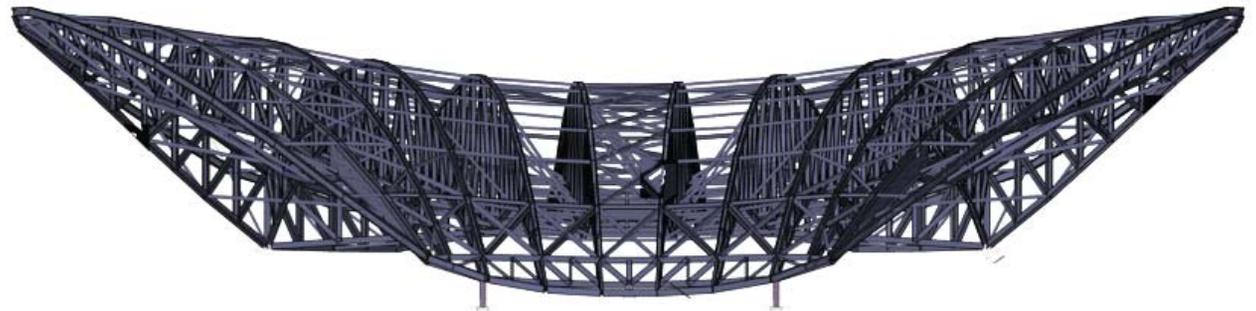
Construction of the Aquatic Center started in 2008 and was not completed until July of 2011.

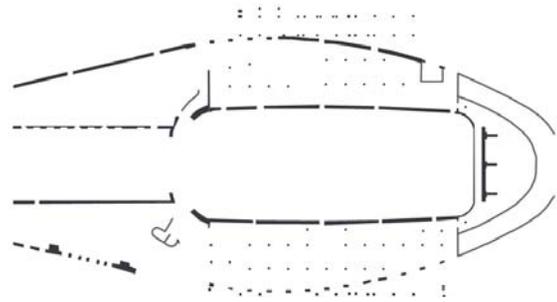


(Directory, 2008)

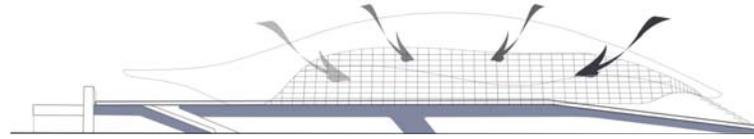


The entire roof system is supported by three points: two columns on the north side and one wall on the south. Although the roof has a complex shape, it is actually made up of basic fan trusses that run north to south.

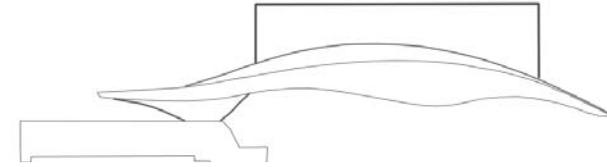




structure



natural light



massing

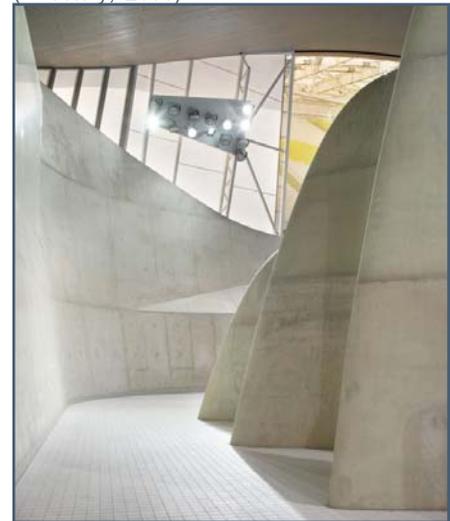
(Directory, 2008)



(Directory, 2008)



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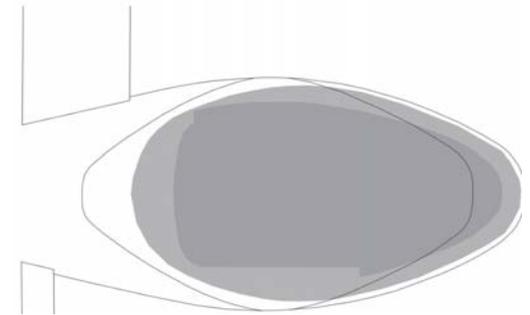
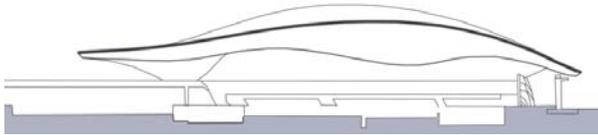
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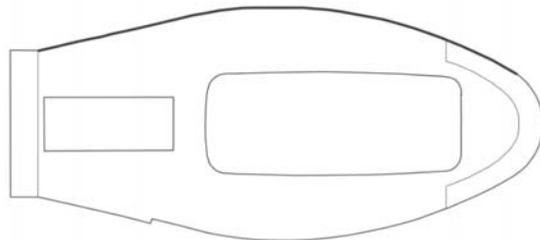
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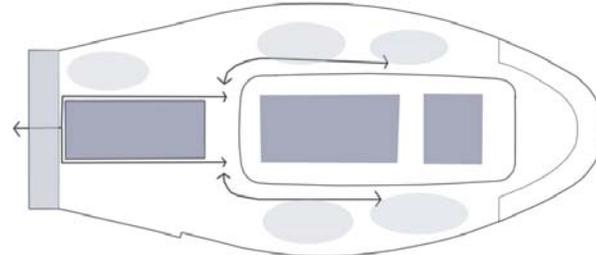
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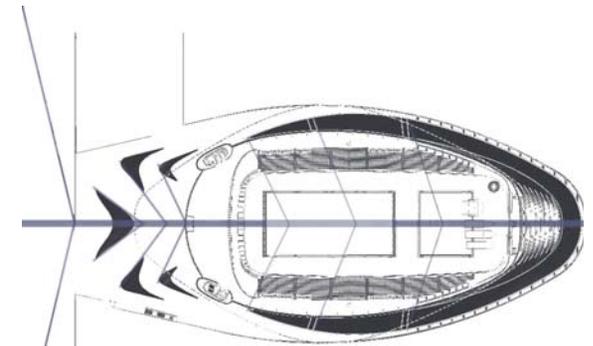
hierarchy



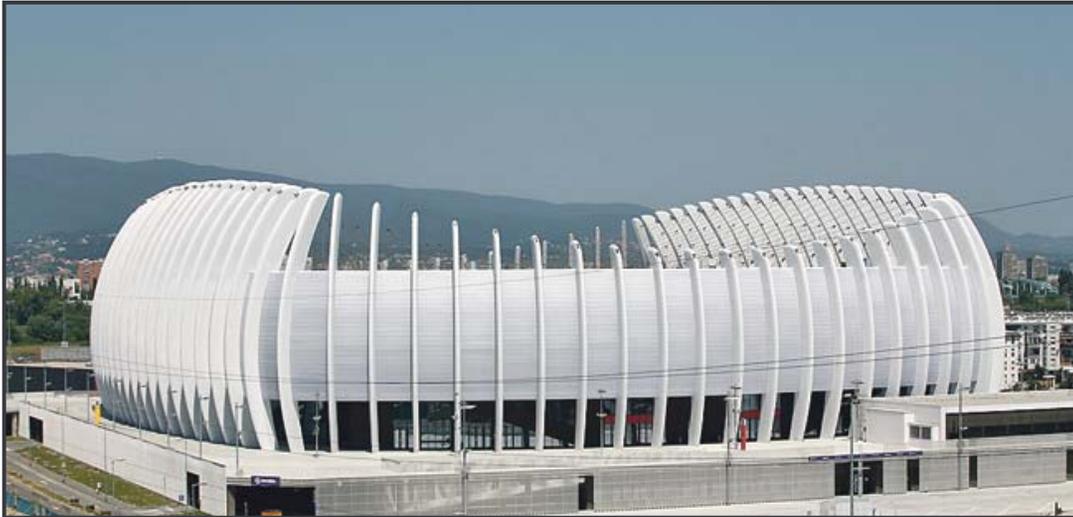
plan to section



circulation to use



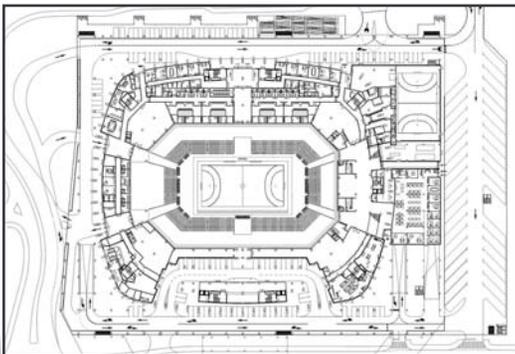
geometry



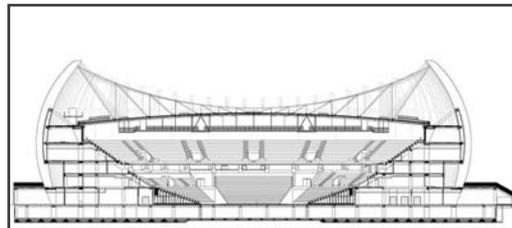
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## ARENA ZAGREB

architect: UPI - 2M  
 location/date: Croatia, 2009  
 project type: Multi-purpose Recreation Hall



ground plan



section

## INTRO

Arena Zagreb is a sports facility/multi-purpose center that offers the city of Zagreb everything from shopping to cultural and business events. It combines the orders of spatial layout and functionality and produces maximum flexibility as an end result. Multiple spaces can be used at the same time concerning code and fire regulation requirements. This particular design produces the maximum efficiency of circulation space and flexibility within a program.

### Arena Zagreb's Program

15,000 ppl - ice hockey / handball  
 16,500 ppl - basketball  
 24,000 ppl - concerts / side stage  
 950 - parking spaces

### Flexible Spaces Included:

- \* concerts
- \* exhibitions
- \* conferences
- \* fairs
- \* theatrical productions
- \* shopping / entertainment
- \* wellness center
- \* cafe/business centers
- \* city meetings

## Construction

Constructing this massive facility was heavily dependent on cranes and other high-skilled operated machinery. Although the scale of this project is considerably larger than my programmatic needs, the construction process and what types of materials/construction techniques will require cranes and other heavy machinery will be examined.

## Major Structural Elements

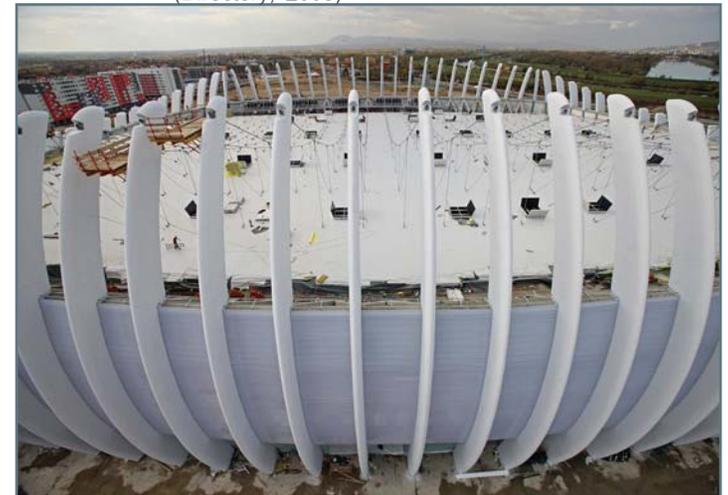
footprint: 90,340 m<sup>2</sup>  
columns: 86 pre-fabricated / prestressed  
roof: suspended steel roof structure  
concrete: monolithic reinforced concrete

## On-Site Construction:

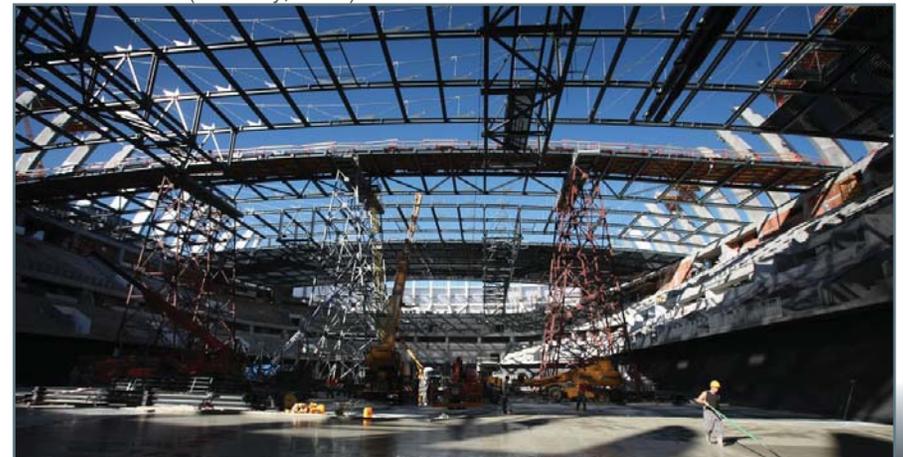
- \* vast space around constructed site
- \* access of equipment
- \* level ground for construction
- \* ease of transportation
- \* access of materials
- \* process



(Directory, 2008)



(Directory, 2008)



(Directory, 2008)

## Environmental Elements

### Sustainability

- \* Construction vs. Thermal Bridges
- \* Time of Year vs. Construction
- \* Thermal Bridges vs. Time of Year
- \* Usage vs Requirements
- \* Construction vs. Usage
- \* Requirements vs. Thermal Bridges

### Thermal Bridge:

a heat transfer between the interior and exterior of a building causing the building envelope to be penetrated resulting in a loss of energy.





## Relationships

### Added Features

- \* Design Intent
- \* Materials
- \* Usage
- \* Flexibility
- \* City Context
- \* Climate (considerable)

## ARENA ZAGREB

Location:  
Owner:  
Began Construction:  
Building Opened:

Zagreb, Croatia  
City of Zagreb  
July 20, 2007  
December 27, 2008

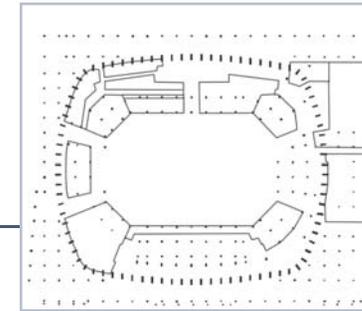


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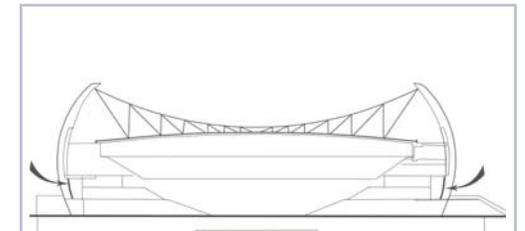
Although very uncommon in a sports hall, ARENA ZAGREB utilized a suspended roof-like structure to create a structure-free interior, meeting the programmatic needs.



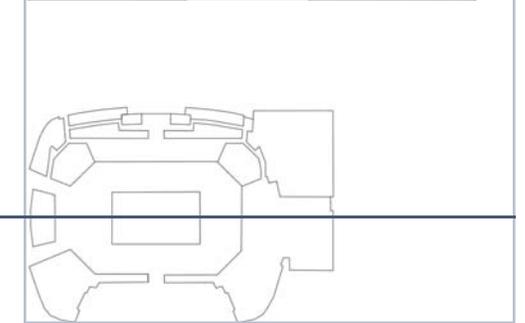
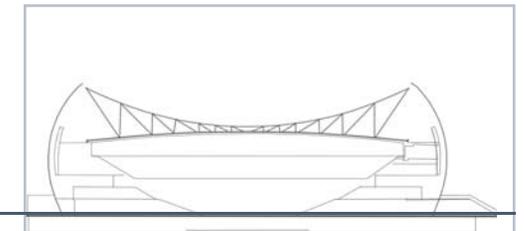
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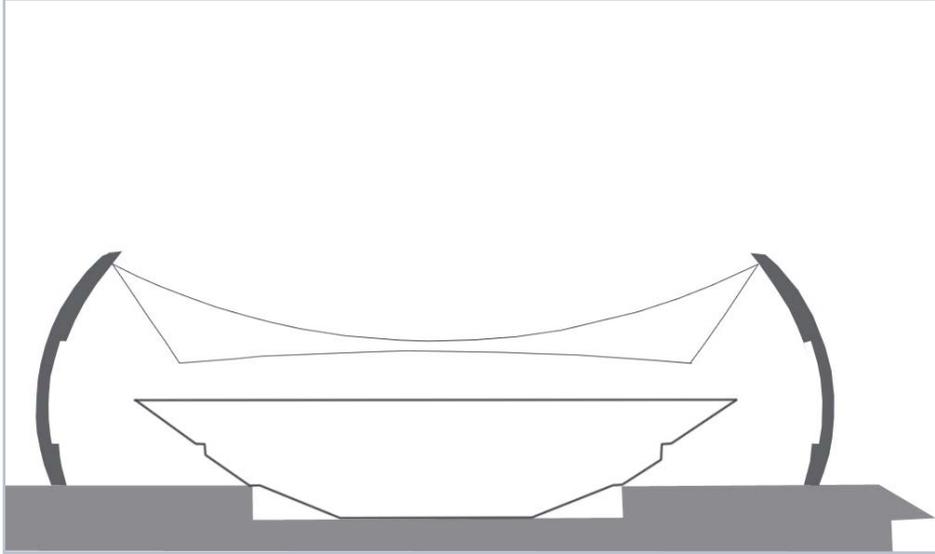
structure



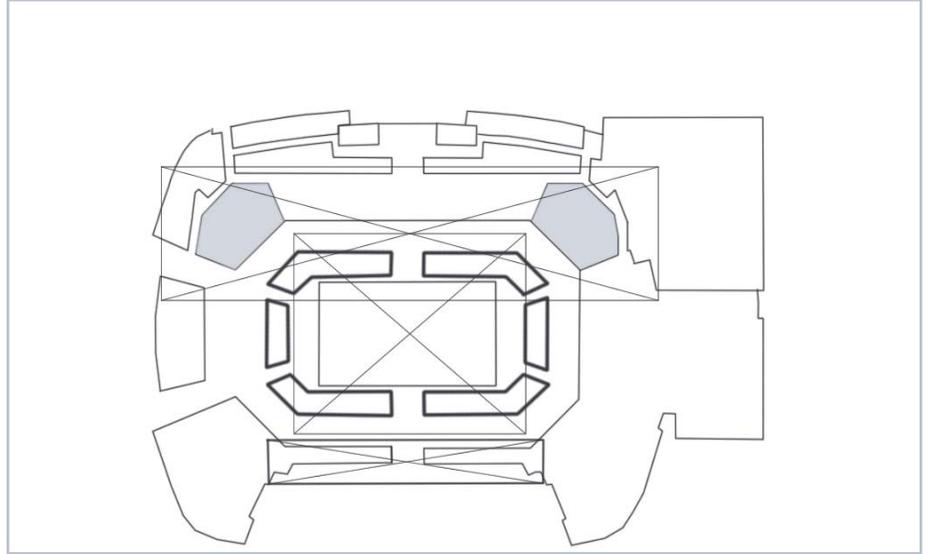
natural light



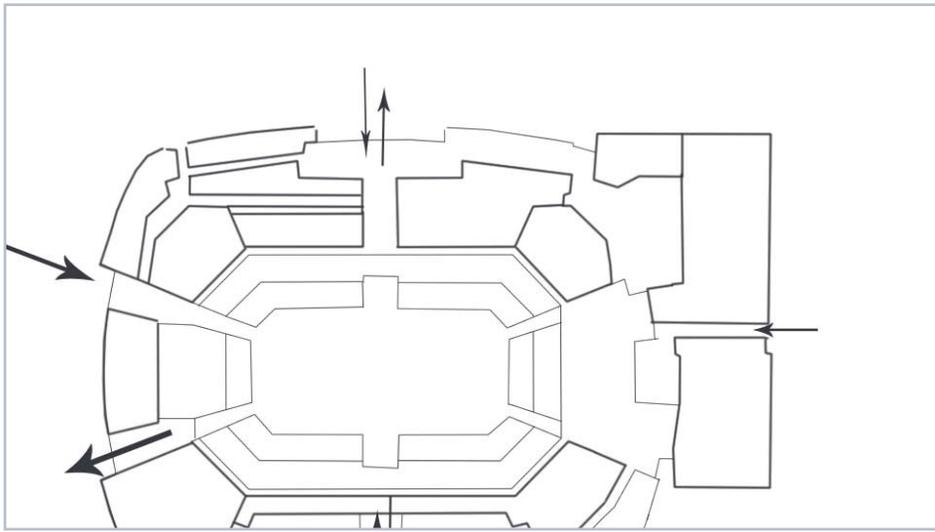
plan to section



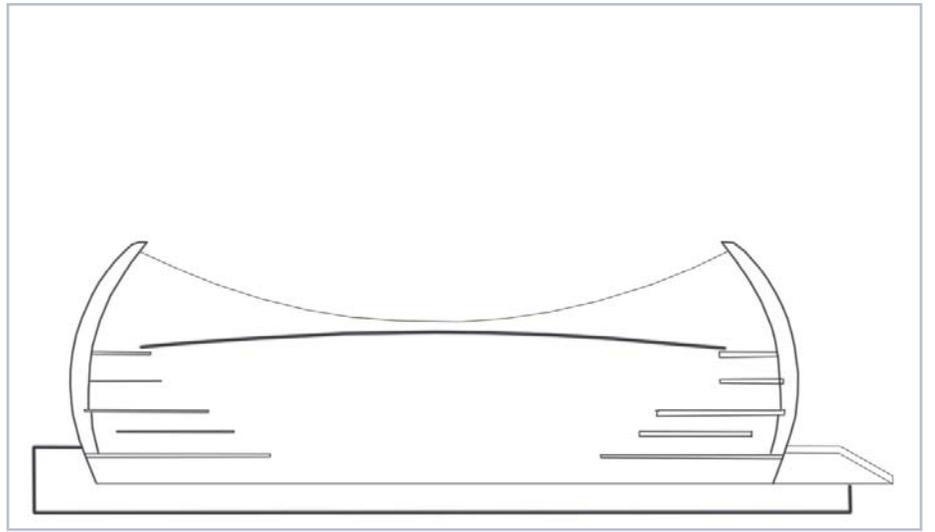
massing



geometry



circulation to use



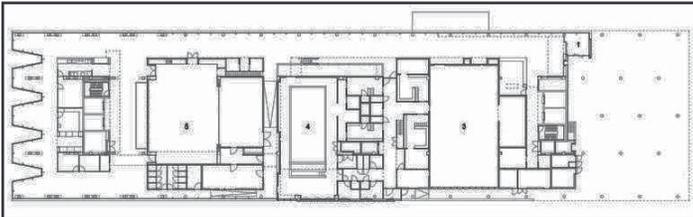
hierarchy



(Directory, 2008)

## rehabilitation centre Groot Klimmendaal

architect: Architectenbureau k van Velsen BV, Hilversum Netherlands  
 location/date: Arnhem, Netherlands 2011  
 project type: Health



ground plan



elevation

## INTRO

The rehabilitation centre in Arnhem, Netherlands is a healthcare facility combined with other program elements such as offices, swimming pools, restaurants, and more. The main focus of this design was to create a positive environment for the patients, in it and as a result increase their well-being and recovery process. This process / design method is a very natural and effective way to inspire and affect the people within it. The importance of this design was not to design another building that looked like a hospital, but to design a building that fits with its natural surroundings.

## Program

14,000 sqm [total]  
 Offices  
 Clinic  
 Ronald McDonald House  
 Sport Facilities  
 Restaurant  
 Theatre



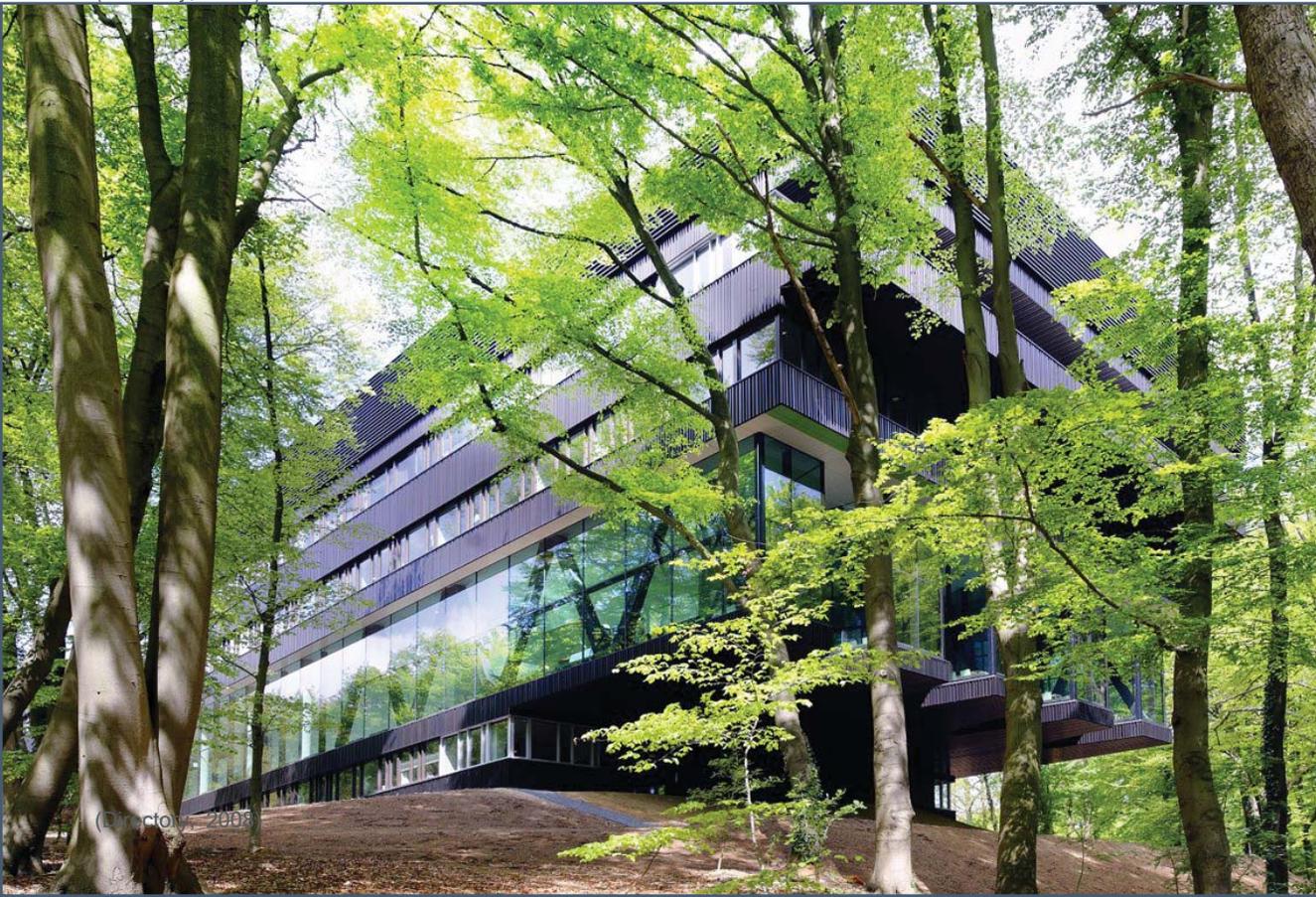
(Directory, 2008)



## Community

The community was a very important factor when considering the design for this facility. For example, not only patients of the building utilize the program, but members of the community use the swimming pool and other facilities as well. The building really gets used when the program allows it to function on many different levels. It is as if it were designed specifically as the city's "community center."

This design encourages interaction between people and nature and allows opportunities not only within the building but outside as well. With the correct orientation and a shallow interior, natural lighting plays a large role in the spaces. It is just one more strategy that uses nature to help inspire the character of the spaces.



(Directory, 2008)



(Directory, 2008)



(Directory, 2008)

Season to .....

## Nature

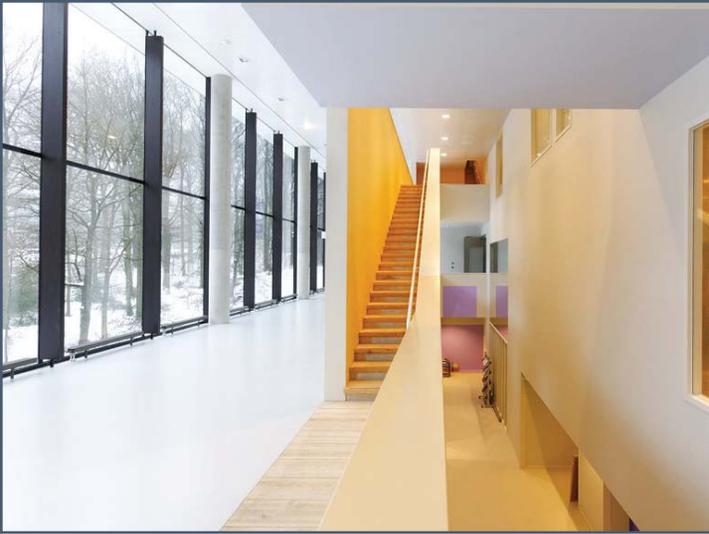
Including nature into a design can be difficult. There is a distinct relationship between the built and natural environment and combining the two into one can pose a challenge.

## Positive Environment

- Context
- Transparency
- Continuity
- Layering
- Diversity
- Lighting
- Experiencing Nature



(Directory, 2008)



(Directory, 2008)



(Directory, 2008)

## Adjusting

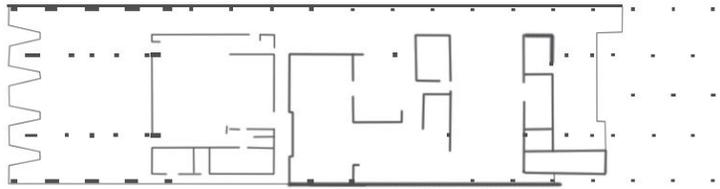
As the seasons change, the colors change and the buildings function starts to change as well. With deciduous trees surrounding the building, natural light can flood into the building in the middle of winter. Because of this, the buildings natural feel will not be compromised and the lighting can still be regulated.

## Season

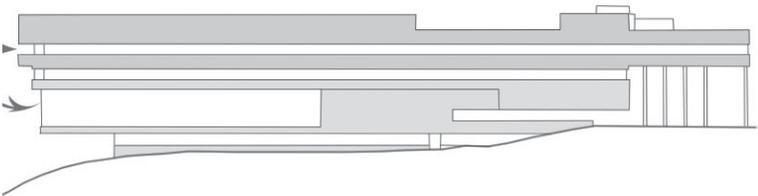
While allowing the building to be affected by nature, the design can also change with the seasons. This is an important element in design when trying to stay contextual with the site as well as sensitivity.



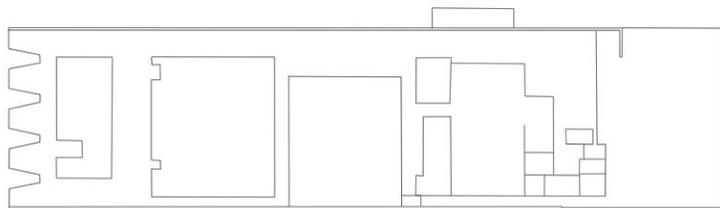
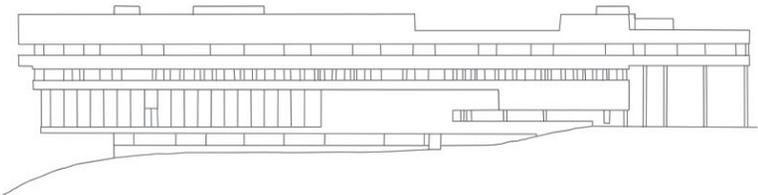
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structure

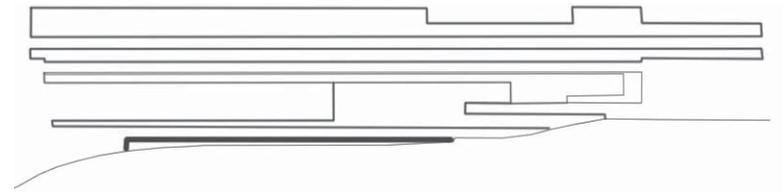


natural light

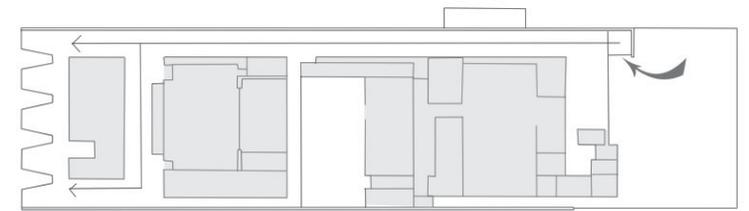


plan to section

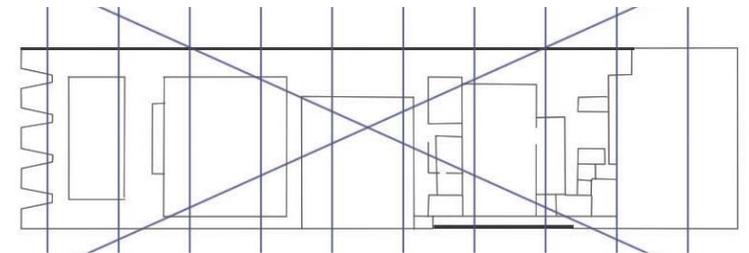




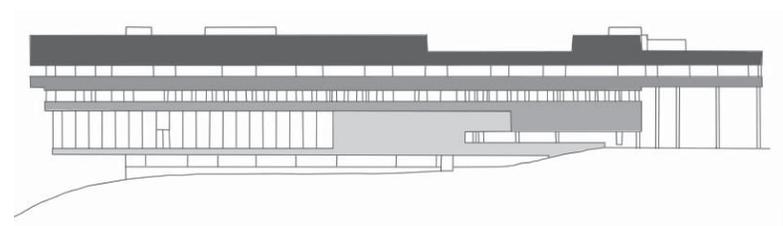
massing



circulation to use



geometry



hierarchy



## summary of case studies

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The examination of three case studies for this thesis included: the Aquatic Center by Zaha Hadid, ARENA ZAGREB by UPI-2M, and the Rehabilitation Centre by Architectenbureau k van Velsen BV. Each of these designs offered an array of different ideas and were presented with many challenges. Each one of these individual case studies were examined thoroughly through Clark and Pause's 11 Aspects of Design Analysis. However, depending on their relationship environmentally, socially, and culturally, some aspects were not used while many of the same aspects were repeated.

All three of these studies had one thing in common. Despite their programs and context within the city, each design recognized the need for flexibility and community. Allowing flexibility within the program, these designs were able to transform and cater to the needs of the occupants and the people of the city. The Aquatic Center was designed for the Olympics, but afterwards, what happens to it? ARENA ZAGREB is a very influential building located in the capital (largest city) of the Republic of Croatia. It is a large facility similar to the Aquatic Center, so how does it relate to the largest city in Croatia? Finally, the Rehabilitation Centre in the Netherlands is a healthcare facility but also offers many other non-related programs. What other purposes does this building serve?

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All of these cases respond to the question, “How can our design/program respond to the community and show its flexibility?” The Aquatic Center actually will reduce in size after the games and become a public center for the people of London. This is a great example of recognizing what the building will be used for after its intended purpose. ARENA ZAGREB serves its community as not only be a sports facility but also a center for concerts, shopping, and many other activities. It becomes the center of the city and allows constant interaction between the people of the city. This is a great example of how the city can start to revitalize a particular area and get the community directly involved. Finally, the Rehabilitation Centre offers a vast program to the community while still focusing on healthcare. Different spaces such as restaurants and sports facilities can be located throughout the building. The combination of nature mixed into the design as well as multi-purpose programming makes this a beautiful and successful design.

Although each case has different characteristics, their commonalities are strong. They presented great lighting strategies, materiality, sustainability, and a successful way of developing a multi-function, mixed-use space. Overall they offered great solutions to problems that would occur in the future and can be a valuable learning tool when preparing my thesis.

historical context



## La Pointe: Madeline Island History

Home of the Ojibway tribe, Madeline Island is referred to as “Moningwunakauning,” which means “The home of the golden-breasted woodpecker.” Madeline Island is located just off the coast of Bayfield, Wisconsin, in Lake Superior and is the largest island of the 22 Apostle Islands. It is roughly 14 miles long and 3 miles wide. The Apostle Islands occupy about 600 square miles in Lake Superior; however, they actually consist of about 77 square miles in land mass. According to Hamilton Nelson Ross in his book, La Pointe: Village Outpost on Madeline Island, “Lake Superior and its surrounding basin have been the subjects of much study by famous geologists. In fact, one of the greatest of them said,

There is no region of equal area in North America, east of the great cordilleras [Rockies], that surpasses this in geological interest, whether we consider the magnitude of the formations involved, the difficulties in the problems offered for solution, or the unique character of one of its great rock systems.



## historical context

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Madeline Island has always been an area of interest, whether because of its unique location as a defense against the Sioux Tribe or a convenient trading post for French and British explorers. As a result of its size and location, Madeline Island did not develop right away as a whole but rather as an initial “starting point,” and became the center of attention.

Located on the southwest point of Madeline Island, La Pointe is the island’s center of interest where settlement began. According to Hamilton Nelson Ross in his book, *La Pointe: Village Outpost on Madeline Island*, “It was one of the earliest areas of Indian settlement, fur trade, missionary activity, and commercial fishing in the interior of North America.” It was said that while the pilgrims landed at Plymouth Rock, Madeline Island was being explored simultaneously by the French. After La Pointe was discovered by the French in 1659, Le Sueur, a French explorer, established a trading post there in 1693, 34 years later. One hundred years later the British established a trading post in 1793 by a man named Michel Cadotte. By the year 1834, La Pointe became the main headquarters for the Northern Outfit of the American Fur Company and became a well established trading post. La Pointe’s development throughout the years is truly a remarkable and a historical success.

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From the origin of the Ojibway tribe's gods to the traders/explorers, religious missionaries, the voyageurs, the trappers and hunters, the fishermen, the loggers and miners, the entrepreneurs, and the summer tourists, La Pointe has continually redefined itself and become a successful commercialized and cultural city in the present day.

### Changing Health Care

Throughout the years, if an individual was sick or diagnosed with a serious infectious disease, the first step would be to see a doctor. From there on the patient would be diagnosed with the disease and a treatment plan would begin. It is this very process that has been in effect in our country for the last 60 years, if not more. According to Milton I. Roemer, M.D.,

The impact on patterns of medical care in American wrought by the hospital...probably exceeds that of all... other social entities. Certainly the average physician and the way he does his work have been more widely influenced by hospitals than by any other form of social organization. The force of the hospital is felt not only on the doctor's management of his own private patients who are hospitalized, but on the whole fabric of health service organization in the community.



## historical context

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Roemer's statement helps explain that healthcare is heavily focused on the "hospital." Although the "hospital" is very necessary and is our primary source of treatment in the United States, we must continue to look towards the future of healthcare reform and explore our options. According to Michael Crichton, M.D., "And we may expect these changes to represent more than improved technology and differently trained personnel. For there will certainly be a change in the function of hospitals, just as there has been a change in function during the past half century."

Both of these statements raise important questions about the historical context of healthcare and what direction it continues to go. How can we treat terminally ill children within a positive and influential context? What resources do we have around us that can positively affect the mood of an individual? How are the program requirements of a healthcare facility affected by change through time? Is treatment without "treatment" a form of healing an individual? Mark Berke, former president of the American Hospital Association in 1970, said in his presidential inaugural address, "These are times when we have to mold and to act, rather than be passive and react.....These are times when we must ourselves become change agents for society."

## Cancer Camps

Cancer camps throughout the nation have been started in almost every state in the past 30 years. It is a very new form of healthcare that is treating the diagnosis of “having cancer” in a whole new perspective. By no means are these camps trying to cure cancer, but rather invoke a positive influence on young teens/ children. The typical “cancer camp” is a weeklong camp that hosts children from ages 4-17 and lets them interact with other kids their age.

Happiness is Camping is a cancer camp for children, located in Blairstown, New Jersey. It was founded in 1980 and offers a program that can support around 400 children between the ages of 6-15. Happiness is Camping’s mission is to allow children to enjoy moments of joy, laughter, and fun.

Special Days Camps is a cancer camp that was founded by George and Carole Royer in 1978. This particular camp offers a special youth program to 5-6 year olds and offers weeklong programs to children ages 6-17. Throughout the country, most of these cancer camps are structured and function on the same level; however, the complexity of program and design increases every year.



## historical context

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Although these camps are very similar, there are a few areas in the nation that do not offer these programs. Unfortunately, the Midwest is short on these camps around the North Dakota, South Dakota, Minnesota, and Wisconsin area. I have met with a few teenagers from Bismarck (whose names I cannot disclose for legal purposes) who travel all the way to Coeur d' Alene, Idaho. This is a testament to the shortage of programs offered to children with cancer in this region. Through researching many different cancer camps around the nation it is very interesting to review the results.

Many of these programs were developed in the 1990s, however, some started in the 1980s and even the late 1970s. It is interesting to find that although these camps were set up particularly for children with cancer, the sites and program vary otherwise. Many of these camps do not have the proper programming such as, a friendly landscape (a slope between 1-5%), housing, and a spatial layout. A lot of cancer camps rent spaces and function only a few weeks out of the year. In my findings, it is a thriving and growing development, but a particular "typology" has not yet been defined.



thesis goal



#1

- reasoning within form -

#2

- school to licensure -

#3

- dream to reality -



## Success

A good friend once told me, “How can you be successful in something if you do not believe in what you are doing?”

Throughout the course of five years in “architecture school” it seemed that the end was never in sight. I found myself spending four years doubting and questioning my design, and the moment I finish a project, I seem to come up with a better solution. I remember myself as a second and third year student saying, “Thank goodness I do not have thesis because I have no idea what I would do it on.” I had no real drive or passion in a specific area and I had no solution to the absence, which was my thesis. Finally I came up with an idea in the summer of 2011. That summer experience as a camp counselor invigorated my imagination, motivated me to design, and most importantly made me believe in what I was doing.

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## Academic

To strive to compile all of the information I have learned throughout the years and focus them toward my thesis. Presenting a well thought-out, well-researched design that displays the work of a young talented student who is ready to enter the profession of Architecture.

## Professional

Successfully completing a strong thesis and entering the profession directly out of college is the goal. I would like my thesis to display a high level of skill involving overall design and technological programs utilized.

## Personal

I would like to raise the awareness of cancer in children. It is a struggle for not only the child who has it but the entire family as well. I would like my thesis to inspire thinking to improve this particular typology and to motivate communities to become more active in helping these young people. It is a very powerful thing to help someone, and it is my goal to utilize architecture to do just that for the rest of my career.

# site analysis





### Qualitative Research

Arriving to Madeline Island was like a trip taken to another world. Growing up in northeastern North Dakota, I was exposed to nothing but flat land and the closest body of water was a manmade dam 40 miles away. As I made my trek to Madeline Island, the land began to roll and bodies of water started to appear more and more frequently. Once I arrived at Bayfield, It was the first time in my life I got to experience Lake Superior. The vast body of water was an amazing view, and seeing my site (Madeline Island) in the distance made it that much better. I woke up the next morning before the sun rose and took a ferry across Lake Superior as the sun was rising.

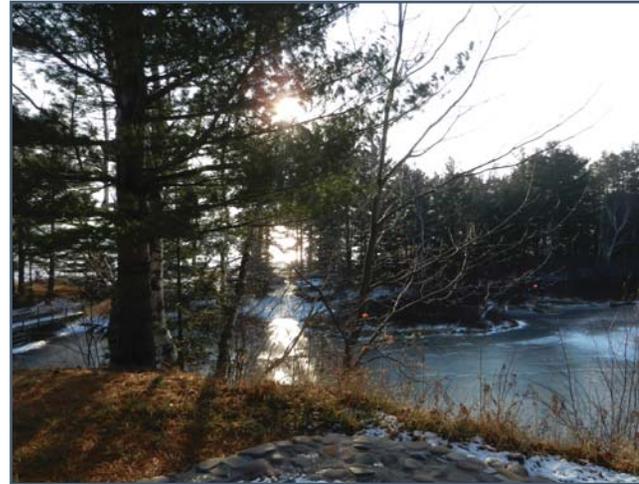


The island is covered in trees, both deciduous and coniferous, but because it was late fall the coniferous trees prominently stood out. As I arrived to the island I immediately set out towards my site. Once the summer tourist season is over, Madeline Island turns into a very quiet little town. The only store open on the entire island on the weekends before 11 am is a small coffee shop right off the bay. As I headed east on Big Bay Road, I noticed that I did not pass a single car. Seven short miles later I finally arrived at my site, Big Bay Town Park. It is a beautiful park surrounded by trees and inset within the island. The site specifically is located on the southern part of the island, but it is on the north side of Big Bay. Because of this, the site is protected from the vicious northwest winds and, as a result, the north side of the bay is open to the south sun. Thus the waves are very mild, and on a cold fall day the south sun can really warm you up. As I made my way to the site on foot, I came to a cliff that was about thirty feet taller than the beach below. The views looking south and east were stunning. Between my site lies a natural lagoon to the west and Lake Superior to the east. I immediately walked down the cliff to my site and started to analyze it. The entire ground was primarily covered in very fine beach sand and the water was perfectly clear.

On the north side of the site the cliffs are showered with very large sandstone and other rocks jutting out of the earth. It is a very pristine, untouched piece of land that is surrounded by nature. A few cabins reside on the edges of the cliff, but none that interfere with the site.

Overall it is a very beautiful, serene site surrounded by a lagoon and Lake Superior. It's a site covered with trees and vegetation and offers beautiful 360 degree views.





### Views & Vistas / Light

Within the natural landscape, the main views from the site look to the south and east. Because it is nestled in Big Bay, a microclimate is created. The site experiences lesser winds, more solar gain and warmth, and the distress of the waves coming to shore are minimal. There is a drastic rise in elevation to the north, which helps block out and stop prevailing winds from really affecting the site.

The light quality on the site is beautiful. From January through December this particular site receives ample south and east exposure.

- light quality
- wind
- views & vistas







## Vegetation

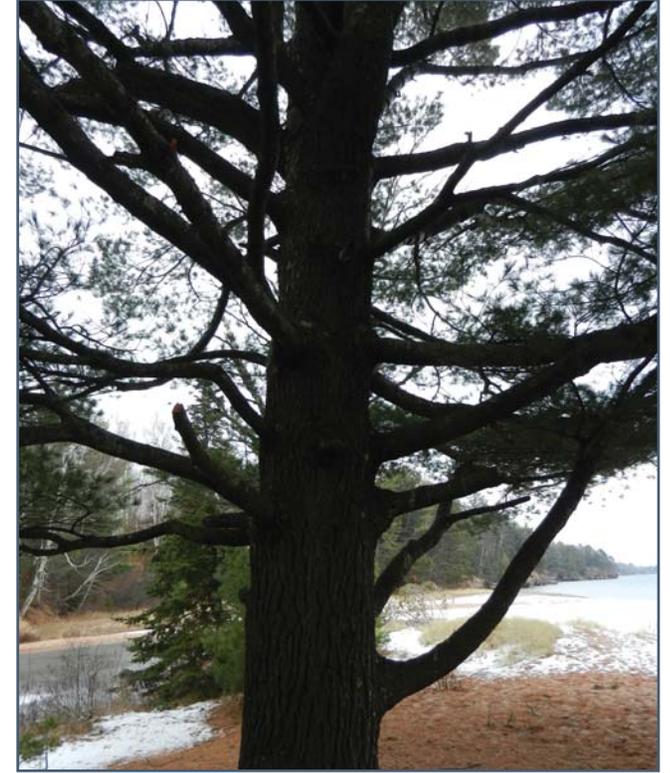
“There is that in the glance of a flower which may at times control the greatest of creation’s baraggart lords.”

-John Muir

Wildflowers located on the island bloom as much to as one to two weeks later than the wildflowers on the mainland. This is a result of the cold lake temperatures of Lake Superior cooling the climate on the island. Also, Madeline Island is home to many different species of ferns.

[exhausted list- All not included]



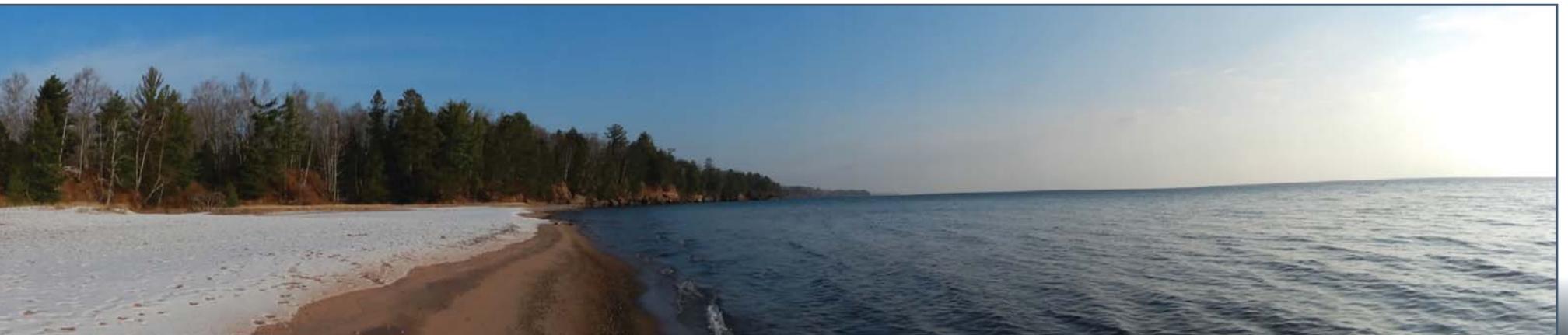


## Ferns

Bracken Fern  
Oak Fern  
Lady Fern  
Long Beech Fern  
Spinulose Woodfern  
Ostrich Fern  
Cinnamon Fern  
Sensitive Fern  
Interrupted Fern  
Royal Fern  
Common Polypody

## Summer Flowers

Wood Anemone  
Agrimony  
Blue Flag Iris  
Chicory  
Ivy, Ground  
Indian Pipe  
Pitcher Plant  
Rose, Wild  
Shinleaf  
Wild Mint  
Yarrow





## Water

Madine Island is fully surrounded by water, being an island. However, there is a lagoon located on site that allows a more intimate relationship compared to the overpowering Lake Superior. The lagoon runs parallel to Superior and offers different activities such as canoeing or kayaking.

Lake Superior's water is crystal clear from the sandy beach. It offers a great way to cool down in the hot summer months.



## Wind

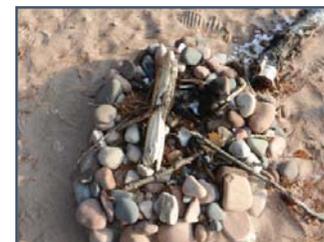
Located in Lake Superior, winds can reach chilling temperatures and disturb the comfort levels of both humans and animals. As a result of the elevated landforms to the north and the island's bay, the site is very protected from northwest and north winds. This also helps the waves become more mild and less aggressive because the wind is not pushing against them.





### Human Characteristics

Big Bay Town Park is heavily utilized during the summer months because it offers a public place to camp for anyone who is visiting the island. The population of the island rises from 200 people in the winter to 2,500 people in the summer. This drastic increase strains the land and occupies the landscape for around three months straight. Once the tourist season is over, the site does not see much of any human interaction. There are a few cabins located to the north that are settled on a ridge, but as far as the site goes it remains inactive from the fall through the spring.



## Distress

Throughout Madeline Island a great deal of distress occurs. The violent waves from Lake Superior continuously beat against the landscapes of Madeline Island and the rest of the Apostle Islands. Throughout time the waves eventually eroded the rock, and cave like formations were created. These particular caves immediately became an attraction and people have been coming to see them from all over the world since they were discovered.

As I was walking around the site I noticed a few trees that seemed to have uprooted. Located on the north side of the site t were remnants of a old foundation of some sort that was definitely out of place. This was an indicator that at one point there was human usage on the site.





## site analysis

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### Soils

The site contains two different types of soil:

- 7C-Beaches
- 34234-Rifle Peat

Beaches soil slope contains anywhere from a 2 to 12 percent slope whereas Rifle peat has a very minimal slope of 1 percent. The soil on the site is mainly classified as

- Silt
- Clay-Sand
- Water/Soil

The risk of concrete corroding on the site is very low contrasted to the high risk of uncoated steel corroding. Rifle Peat has a very high risk of frost, which needs to be considered within the design.

### Water Table

The water table is considerably high on the site. During the spring months of March through June “ponding” occurs. Ponding is when water stands within a closed depression. Without any sort of drainage the water will just rest there until it is removed by nature.

The surface runoff from the site is next to nothing because the slope is so minimal. Because the site is considerably narrow and its highest elevation is in the center, any water that does transfer onto the site can run off in either direction, keeping the site fairly dry year round.



## Materiality

visual form

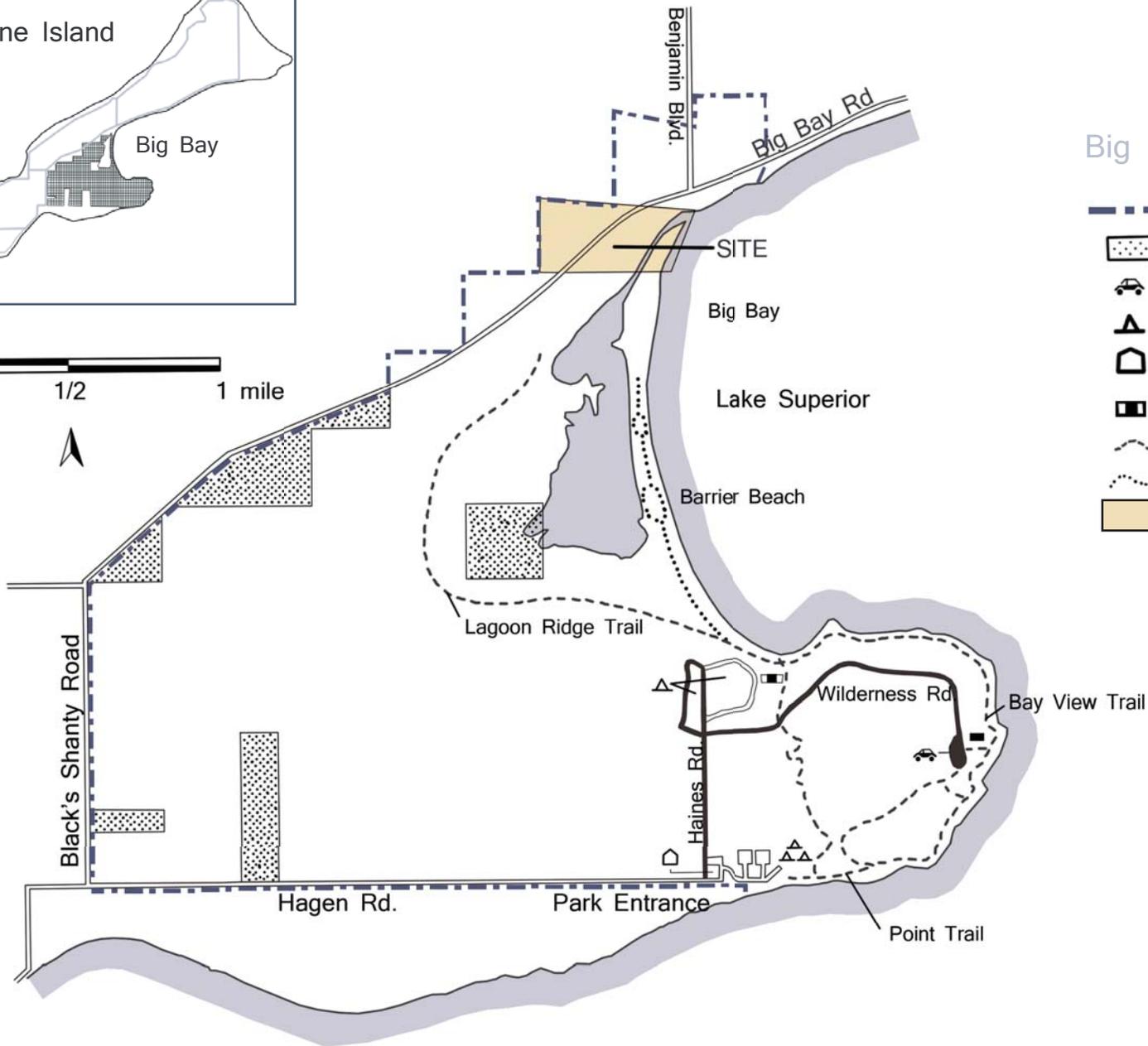
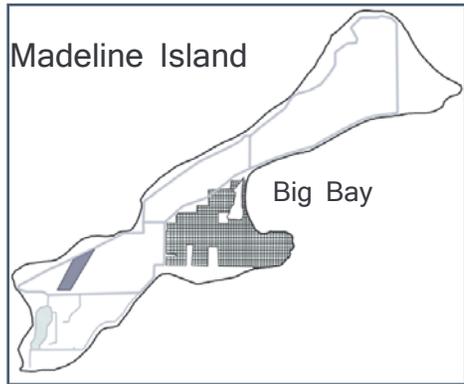
The spatial progression is one to be admired. From steep rocky terrain to fine flat beaches this site encompasses a little bit of everything. This site really portrays a very calm and soothing feeling.



## Texture

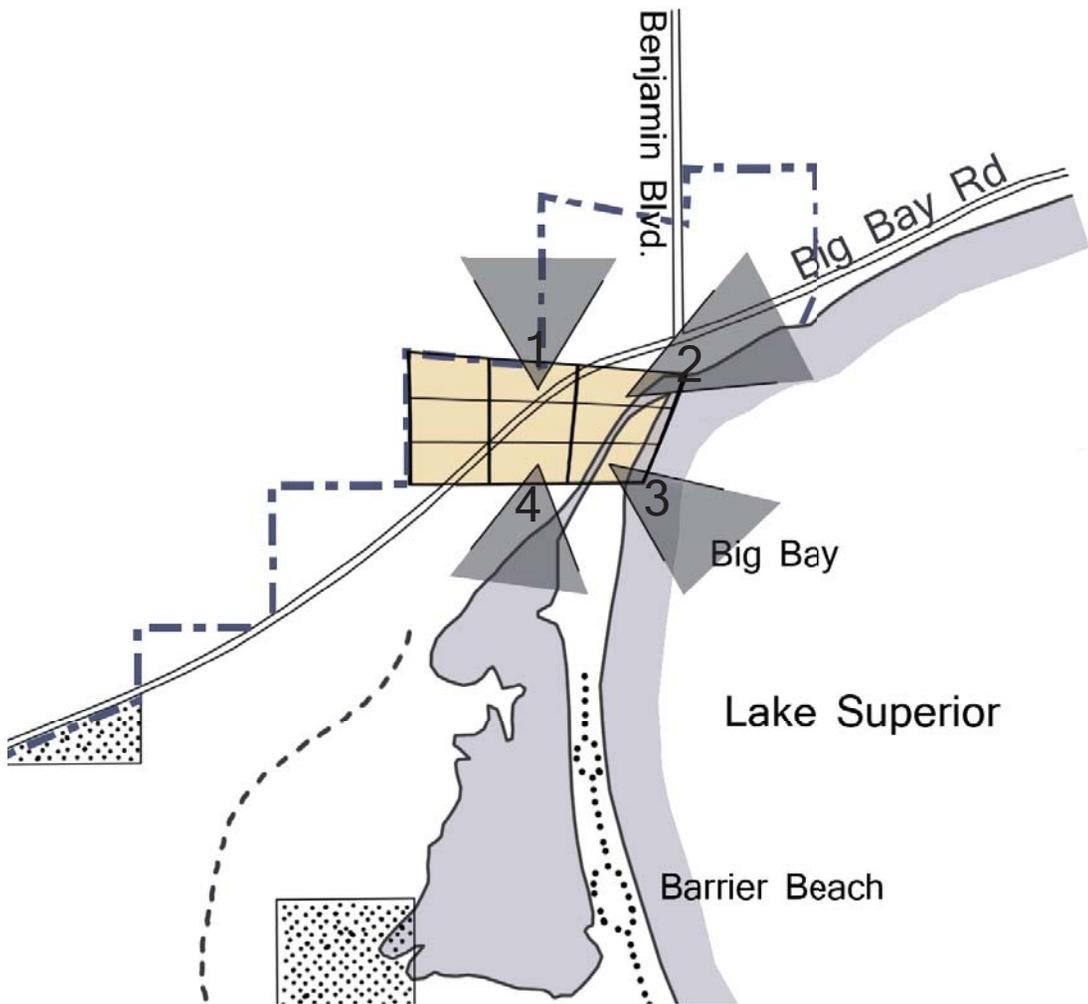
plant cover  
site character

Many textures can be seen on this site. Whether is the jagged rock edge on the north coast or very fine sand that lines Barrier Beach, an array of textures define the space.



Big Bay State Park

- Park Boundary
- Land Not Owned by Park
- Parking
- Campground
- Park Office
- Toilet
- Hiking Trail
- Nature Trail
- Site



1



2



3

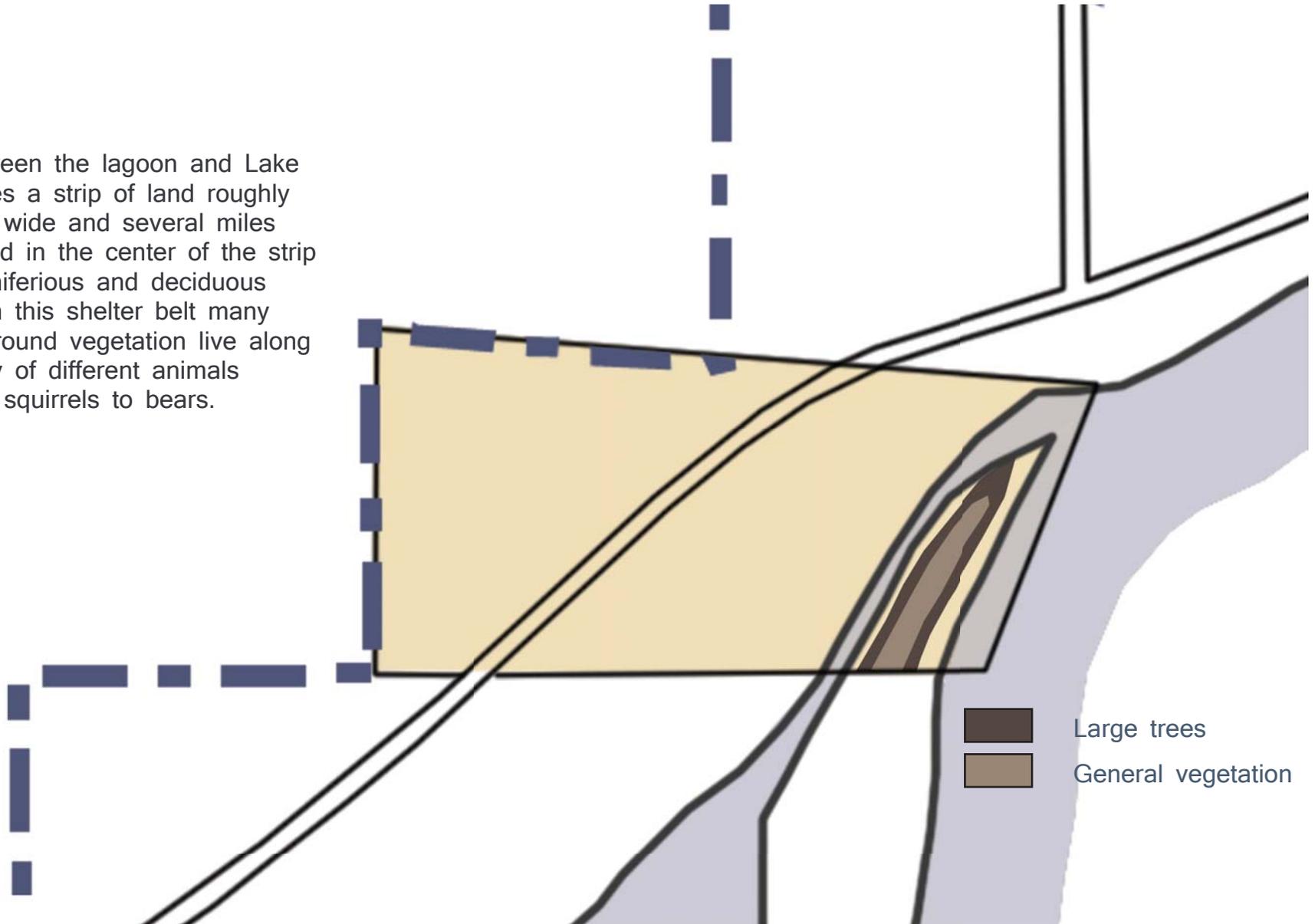


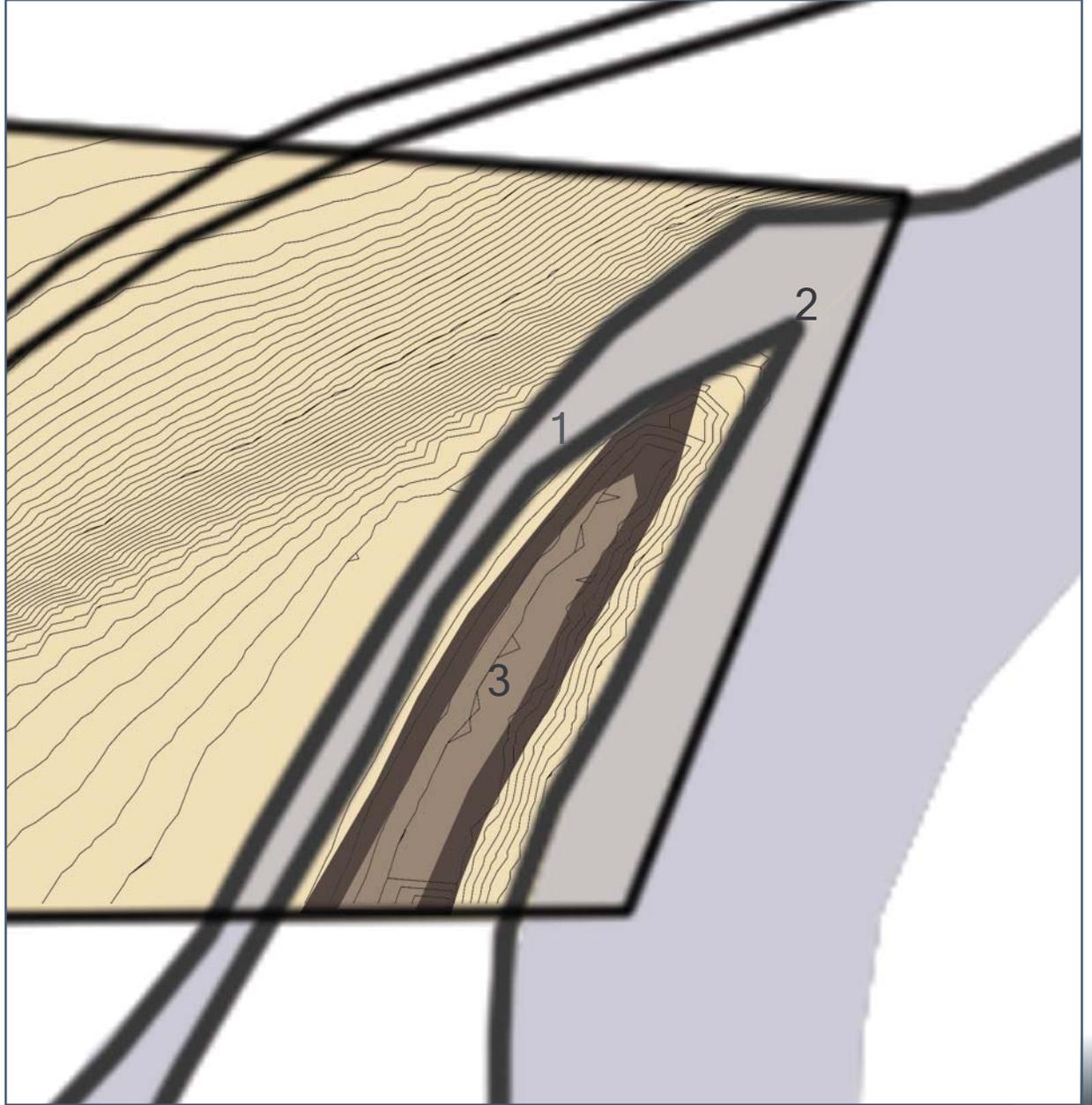
4



### Base Map

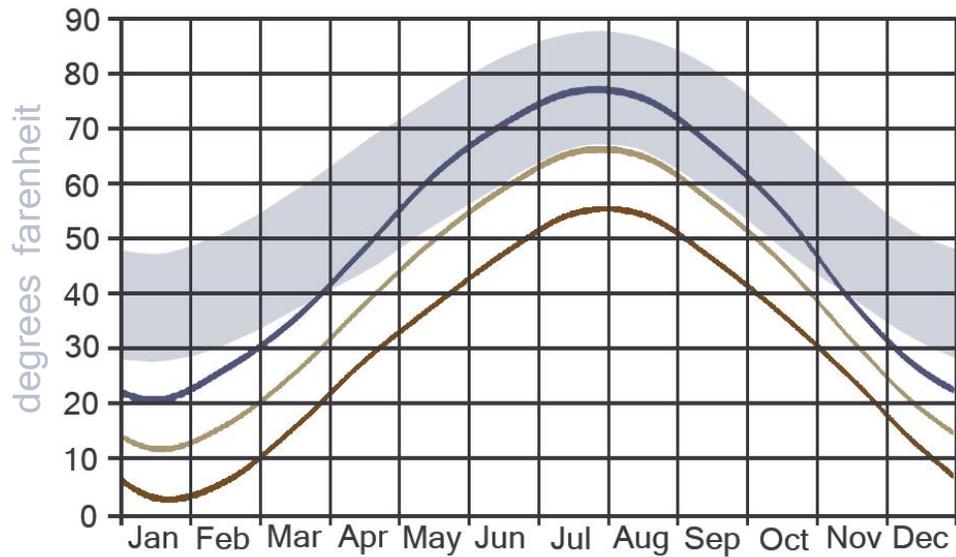
Located between the lagoon and Lake Superior lies a strip of land roughly 200-300 feet wide and several miles long. Located in the center of the strip are large coniferous and deciduous trees. Within this shelter belt many plants and ground vegetation live along with a variety of different animals ranging from squirrels to bears.





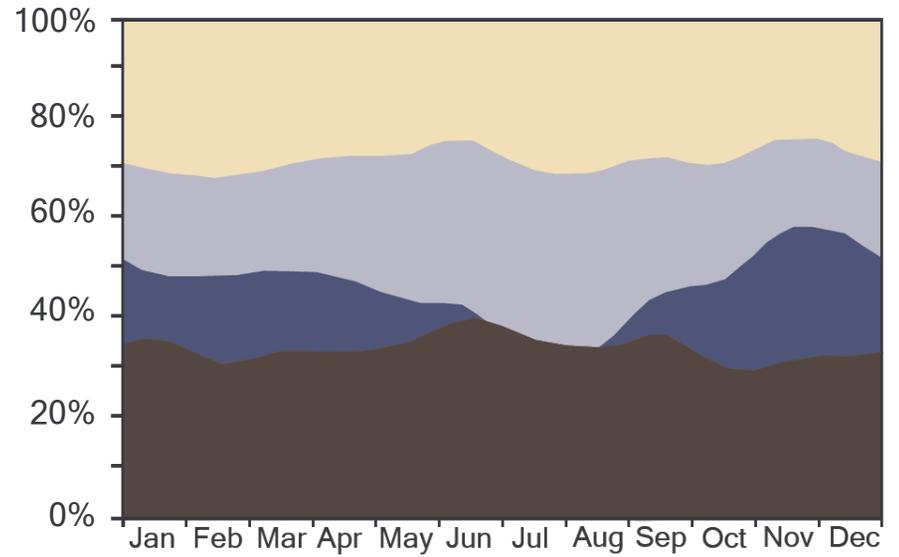


Average Temperature



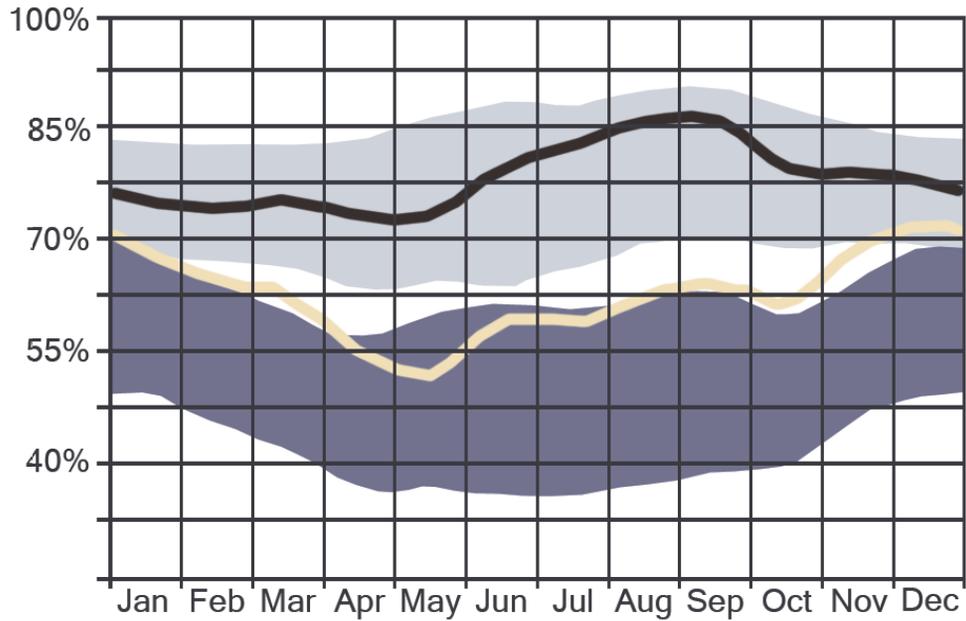
- Daily High
- Average
- Daily Low
- US Average

Cloudy Days



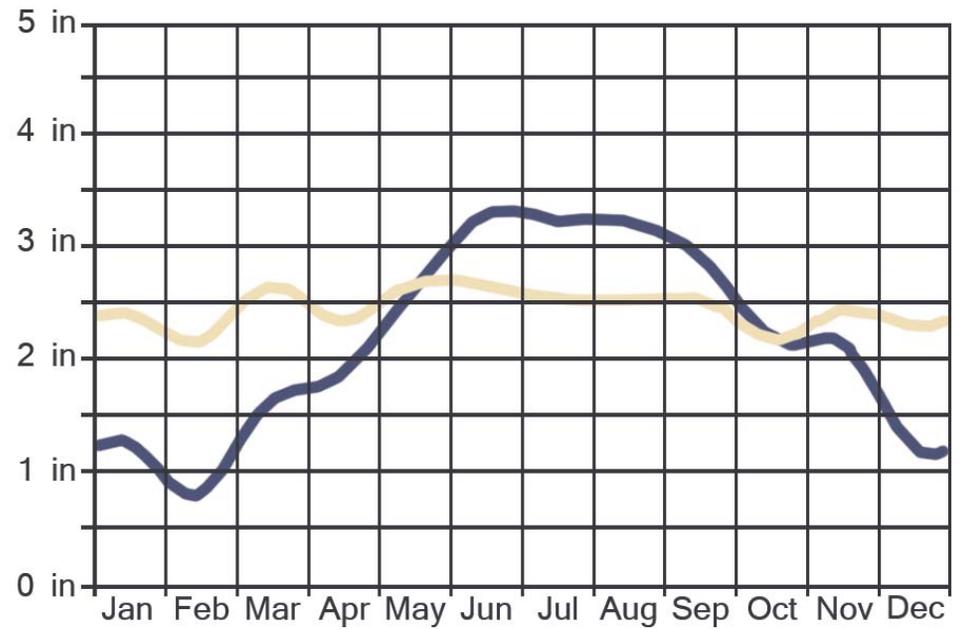
- Days clear of clouds
- Partly cloudy days
- Cloudy days
- Days with precipitation

### Humidity



- City morning
- City afternoon
- US afternoon average
- US morning average

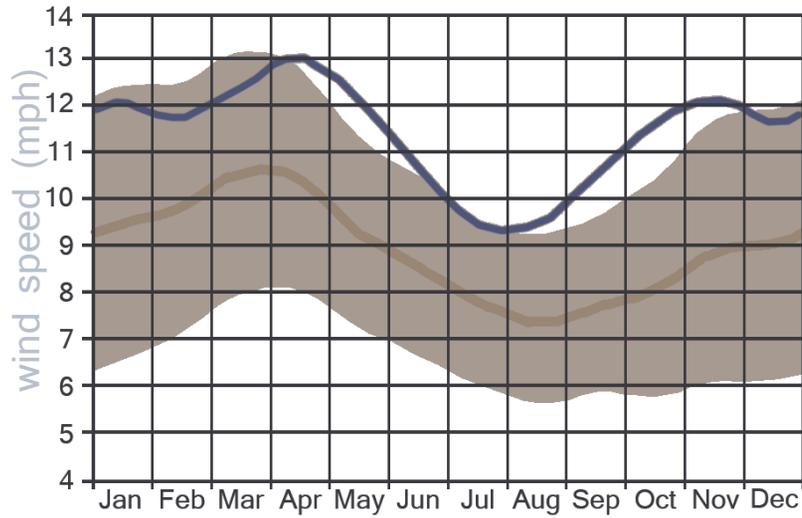
### Precipitation



- City average
- US average

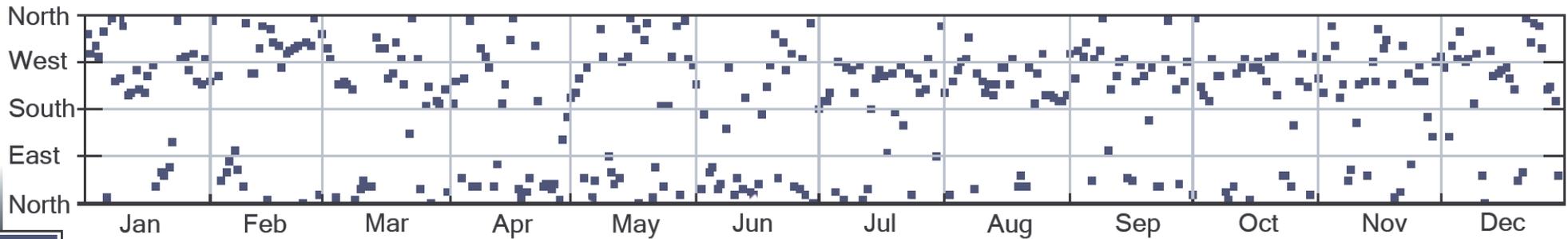


### Wind Speed

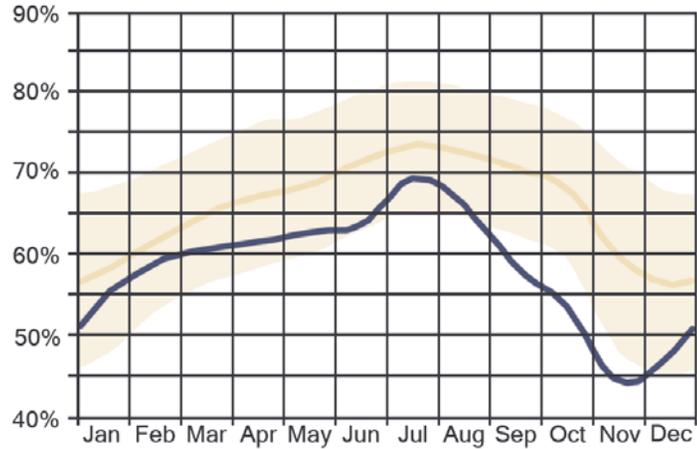


- City
- US average

### Wind Direction

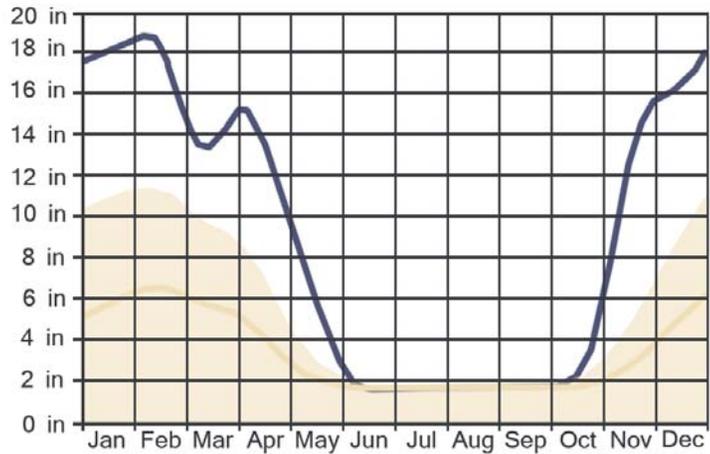


## Sunshine



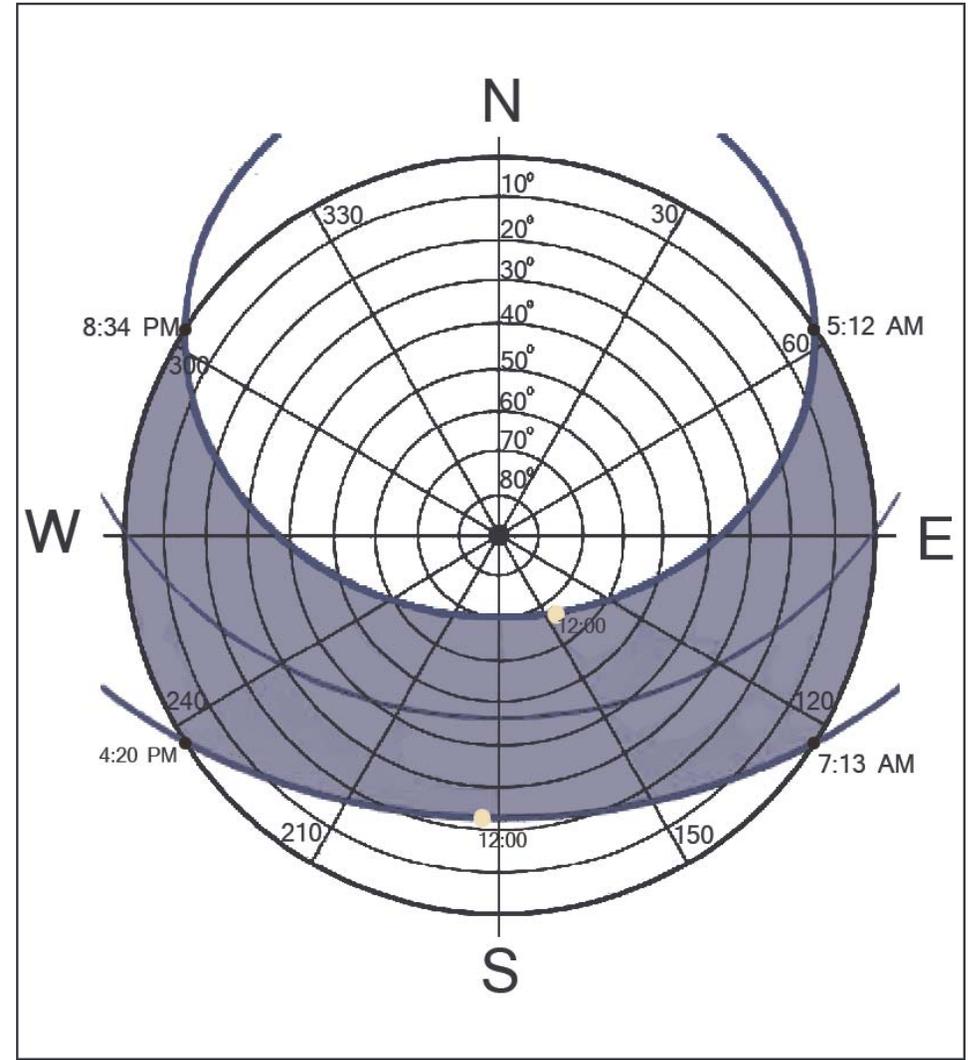
- City
- US average

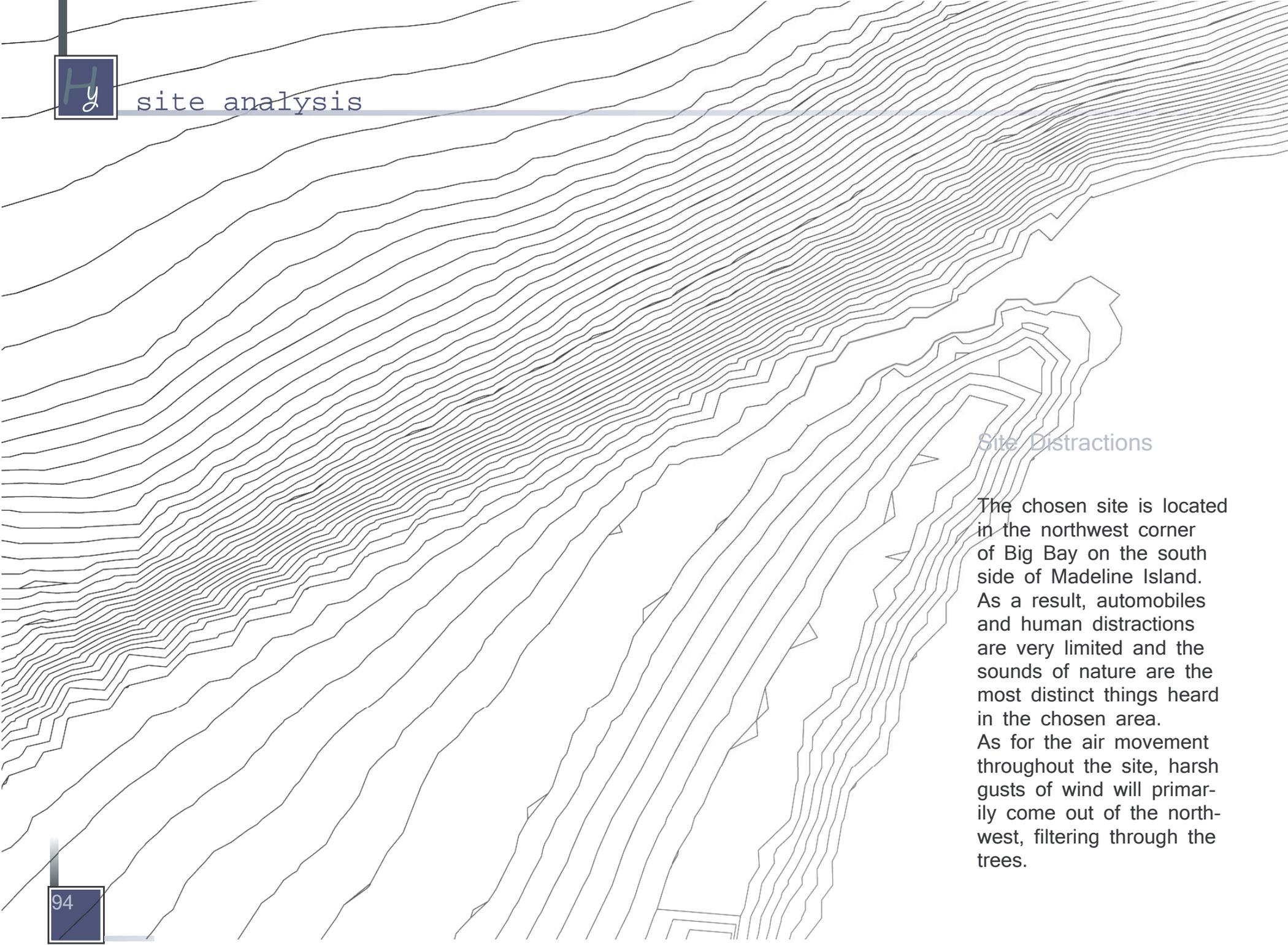
## Snowfall



- City
- US average

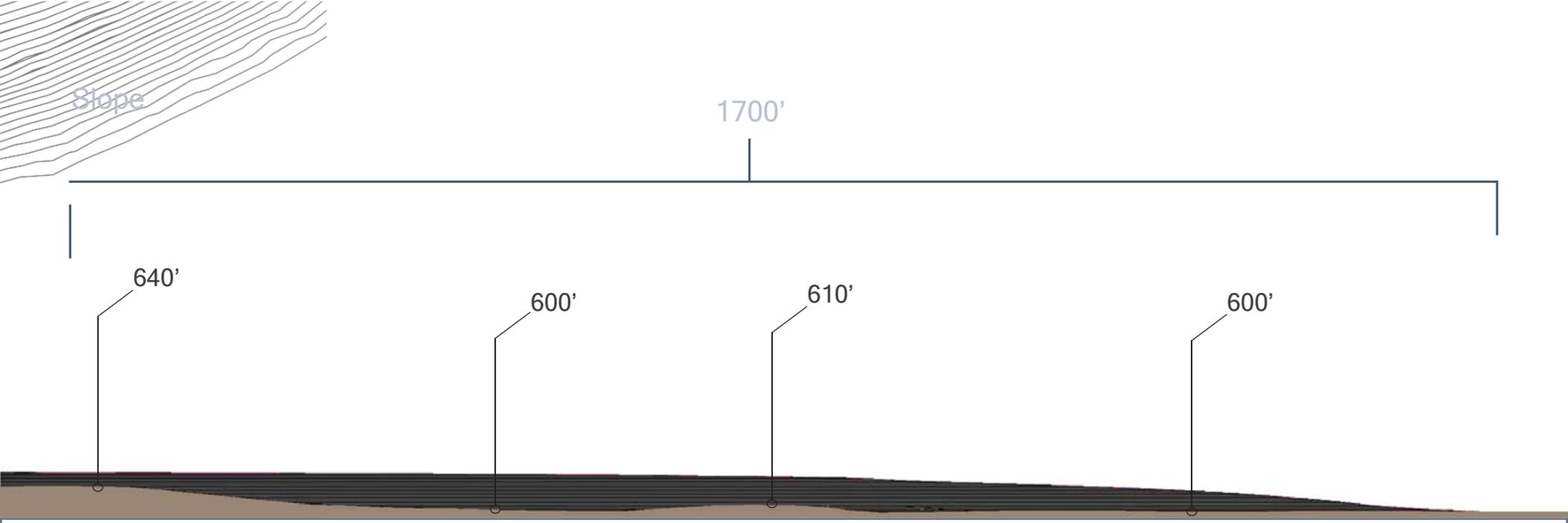
## Sun Path



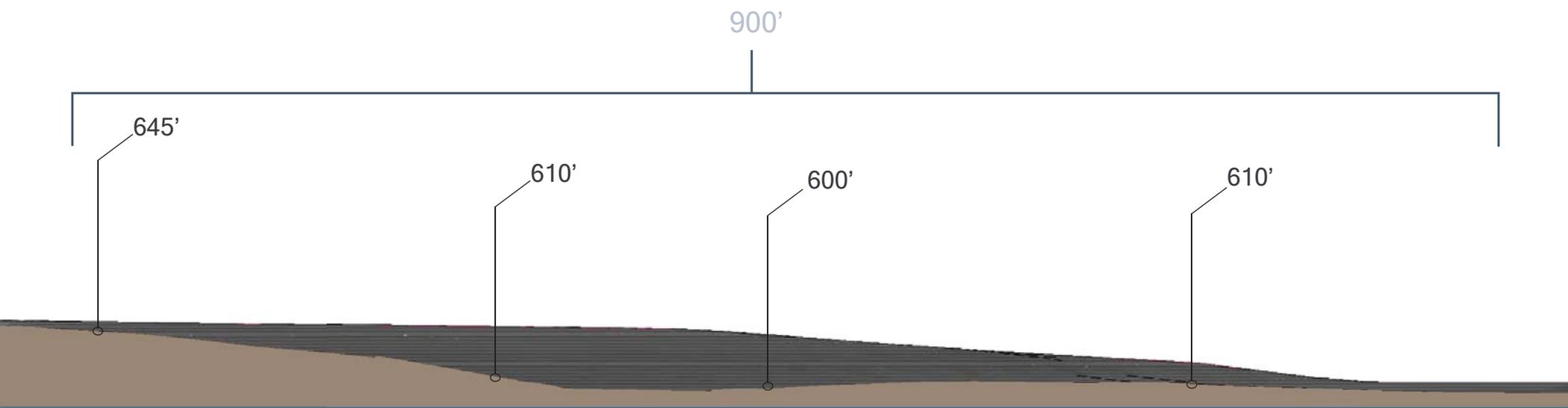


### Site Distractions

The chosen site is located in the northwest corner of Big Bay on the south side of Madeline Island. As a result, automobiles and human distractions are very limited and the sounds of nature are the most distinct things heard in the chosen area. As for the air movement throughout the site, harsh gusts of wind will primarily come out of the northwest, filtering through the trees.



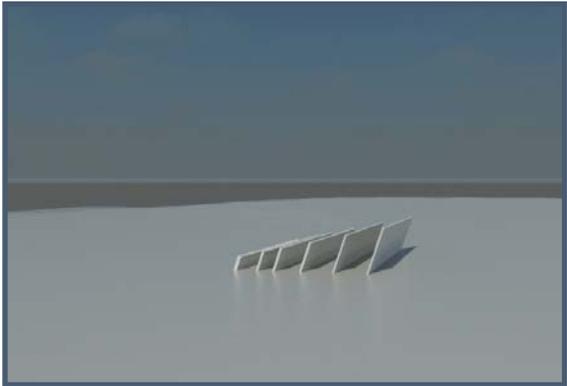
South Section



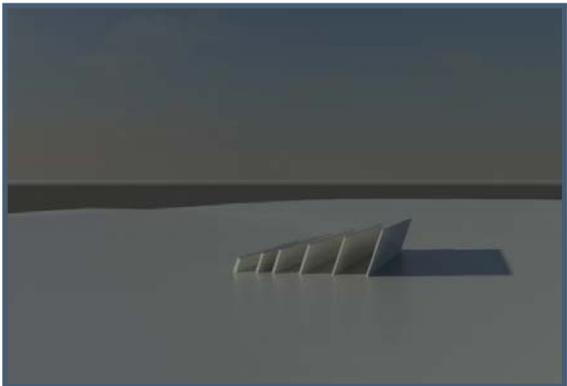
West Section



8 AM

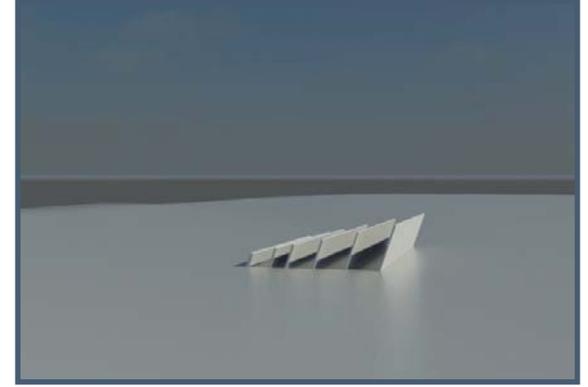


Noon

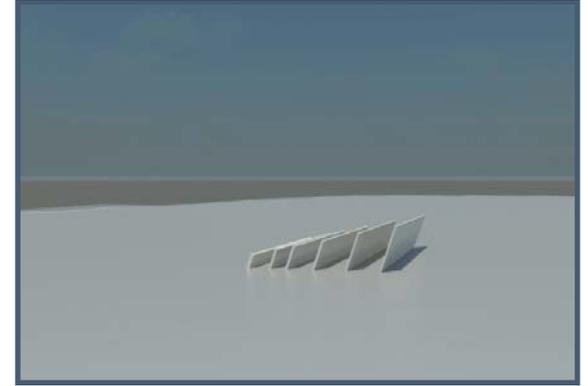


4 PM

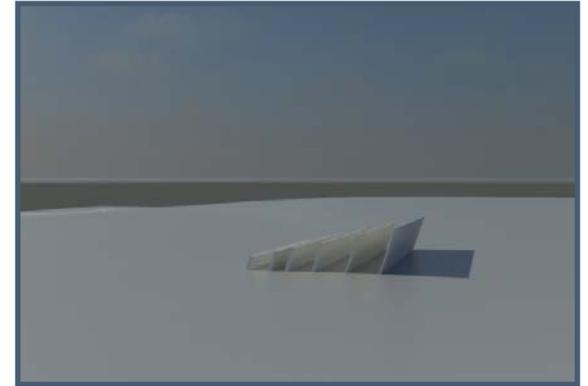
Spring Equinox



8 AM

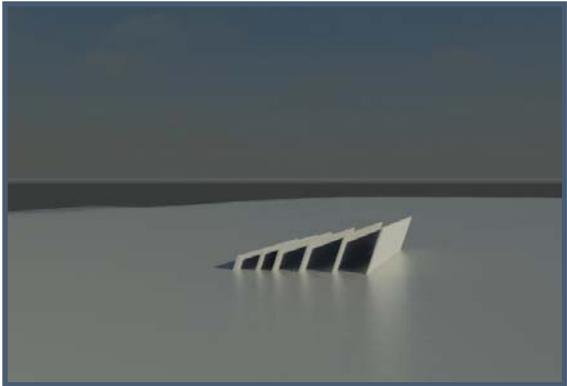


Noon

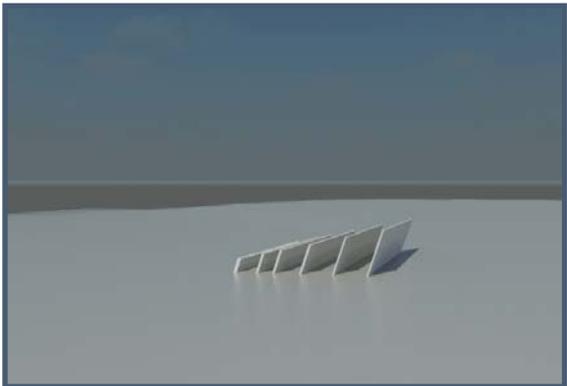


4 PM

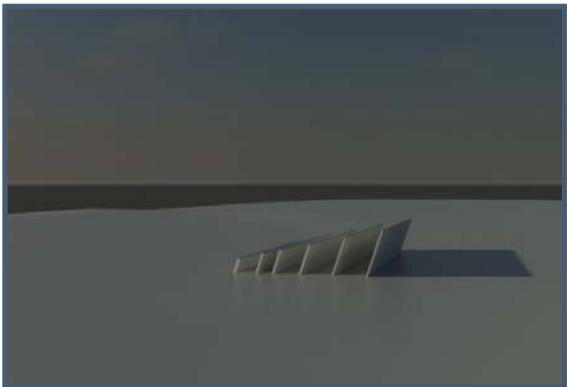
Summer Solstice



8 AM



Noon

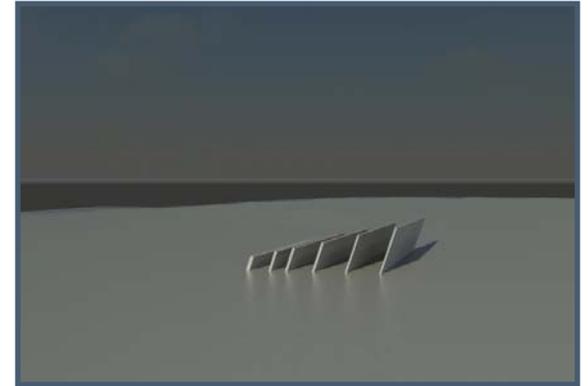


4 PM

Fall Equinox



8 AM



Noon



4 PM

Winter Solstice

program



- \* Flexibility
- \* Community
- \* Mixed-Use
- \* Re-Use

### Cancer Recreation Facility

Entrance/Lobby Atrium	1,500 ft <sup>2</sup>
Reception	100 ft <sup>2</sup>
Large Gathering Room	2,500 ft <sup>2</sup>
Director's Office	200 ft <sup>2</sup>
Private Offices @ [4]	400 ft <sup>2</sup>
Staff Break Room	600 ft <sup>2</sup>
Recreation Rooms @ [4]	1000 ft <sup>2</sup>
Small Conference	250 ft <sup>2</sup>
Large Conference	500 ft <sup>2</sup>
Dining Center	5,000 ft <sup>2</sup>
Kitchen	1,000 ft <sup>2</sup>
Medical Center	1,000 ft <sup>2</sup>
Camper Lodging	4,000 ft <sup>2</sup>
Counselor Lodging	2,000 ft <sup>2</sup>
Recreation Outdoor Field	2,000 ft <sup>2</sup>
Mechanical	6%
Circulation Space	12%
Restrooms	5%
Storage	3%

Total Footprint: ± 25,000 ft<sup>2</sup>

# Interaction Matrix

receptionist

---

lobby / atrium space

---

public restrooms

---

private restrooms

---

large gathering space

---

director's office

---

private offices

---

staff break room

---

recreation rooms

---

small conference room

---

large conference

---

dining center

---

kitchen

---

medical center

---

"camper" housing

---

counselor housing

---

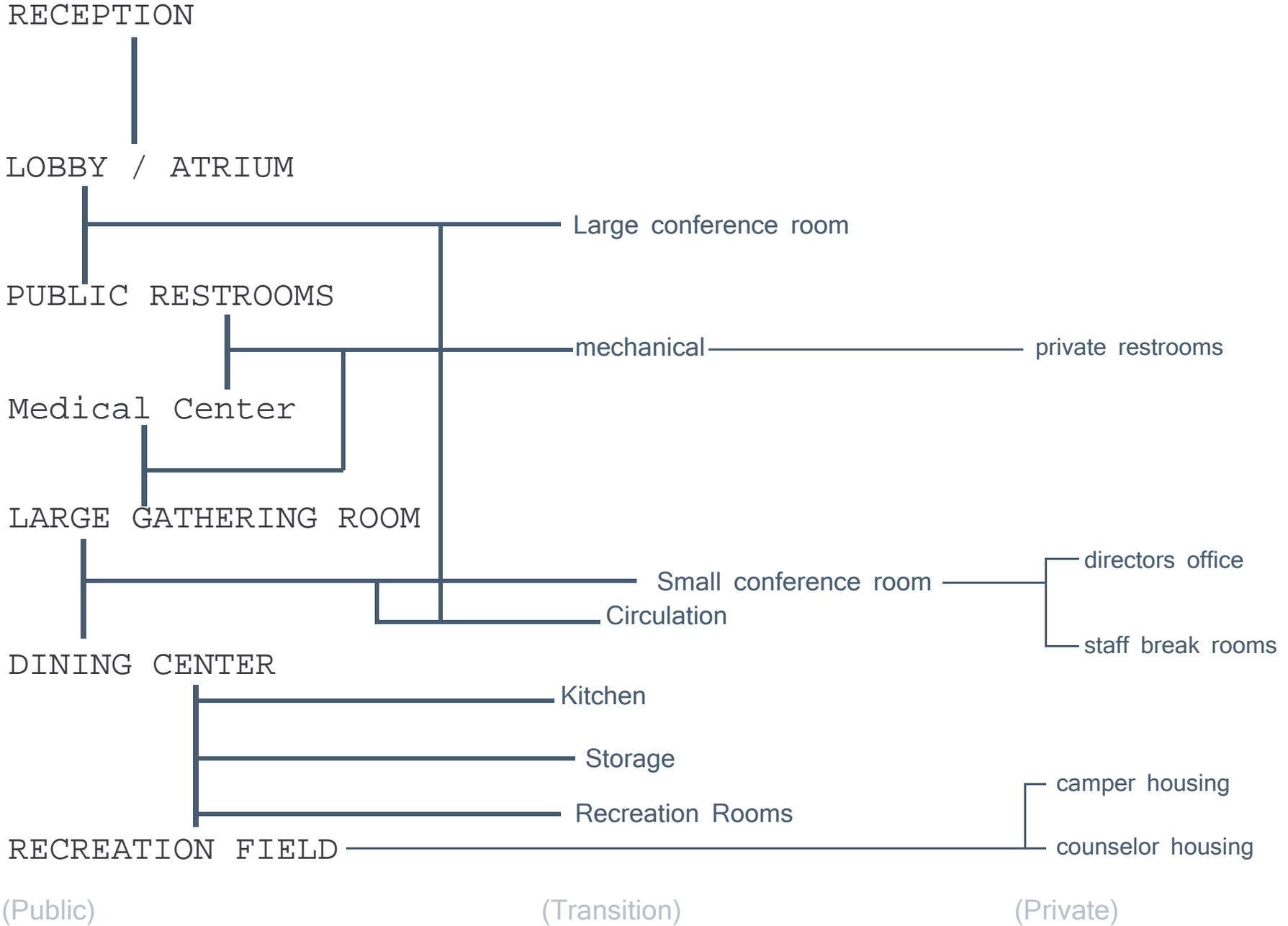
recreation field

---

storage

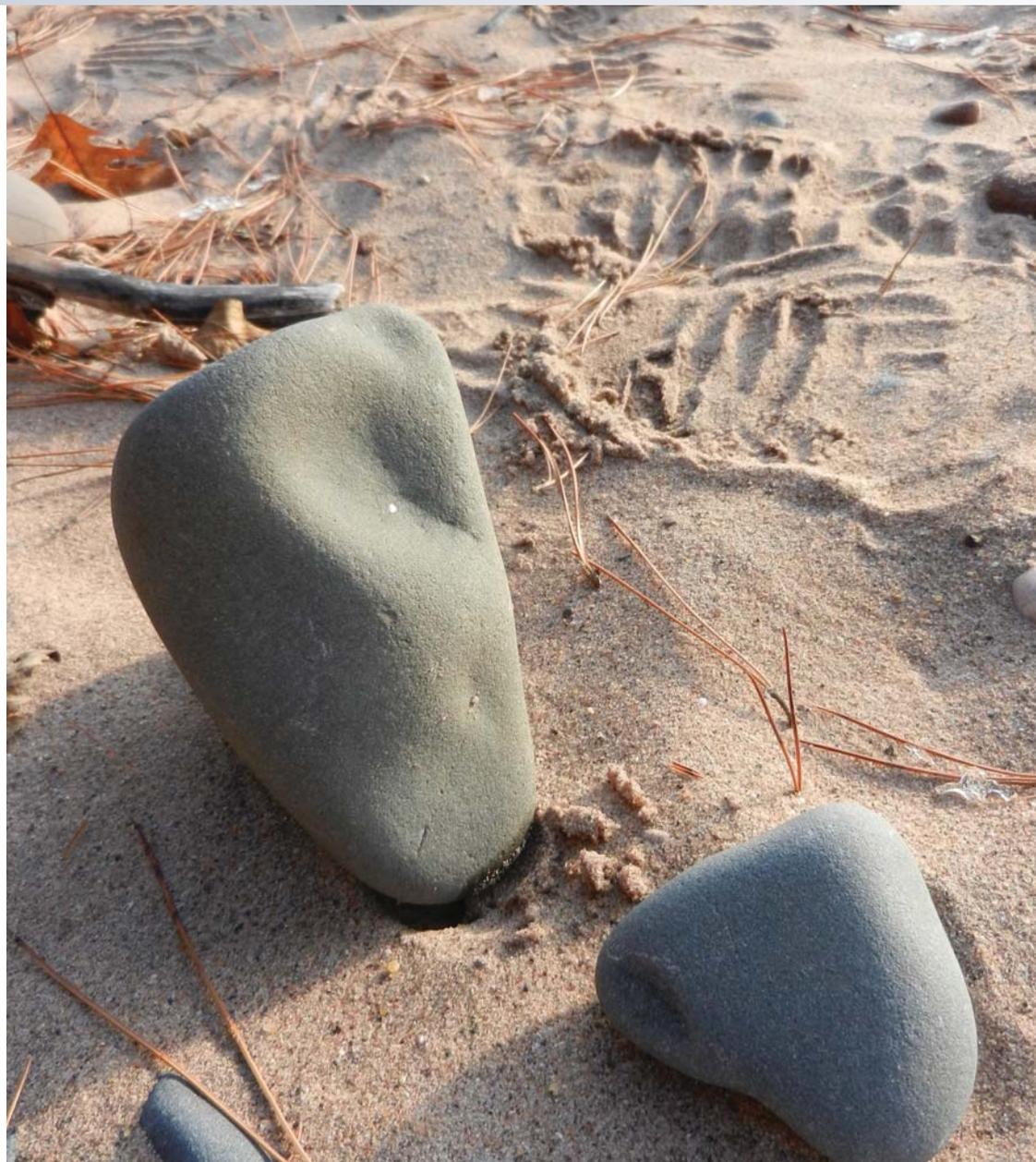
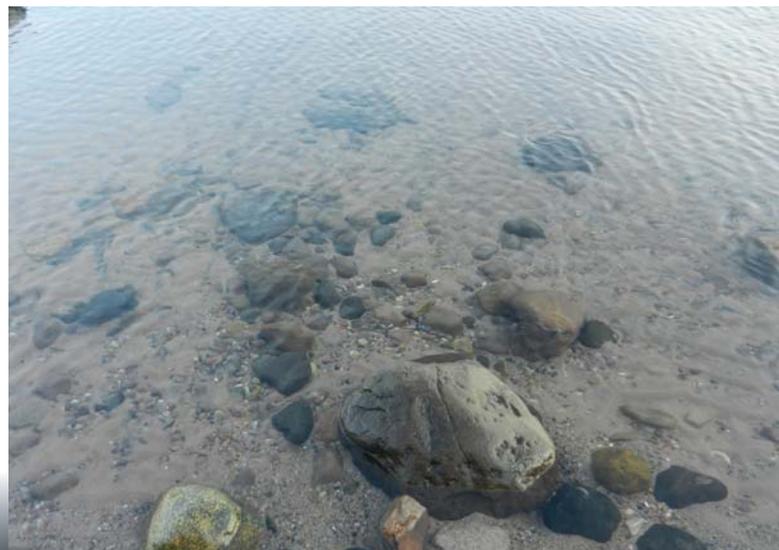
	reception	lobby / atrium space	public restrooms	private restrooms	large gathering space	director's office	private offices	staff break room	recreation rooms	small conference room	large conference	dining center	kitchen	medical center	"camper" housing	counselor housing	recreation field	storage
receptionist	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
lobby / atrium space	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
public restrooms	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
private restrooms	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
large gathering space	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
director's office	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
private offices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
staff break room	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
recreation rooms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
small conference room	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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dining center	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
kitchen	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										
medical center	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
"camper" housing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
counselor housing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
recreation field	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
storage	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>															

# Interaction Net

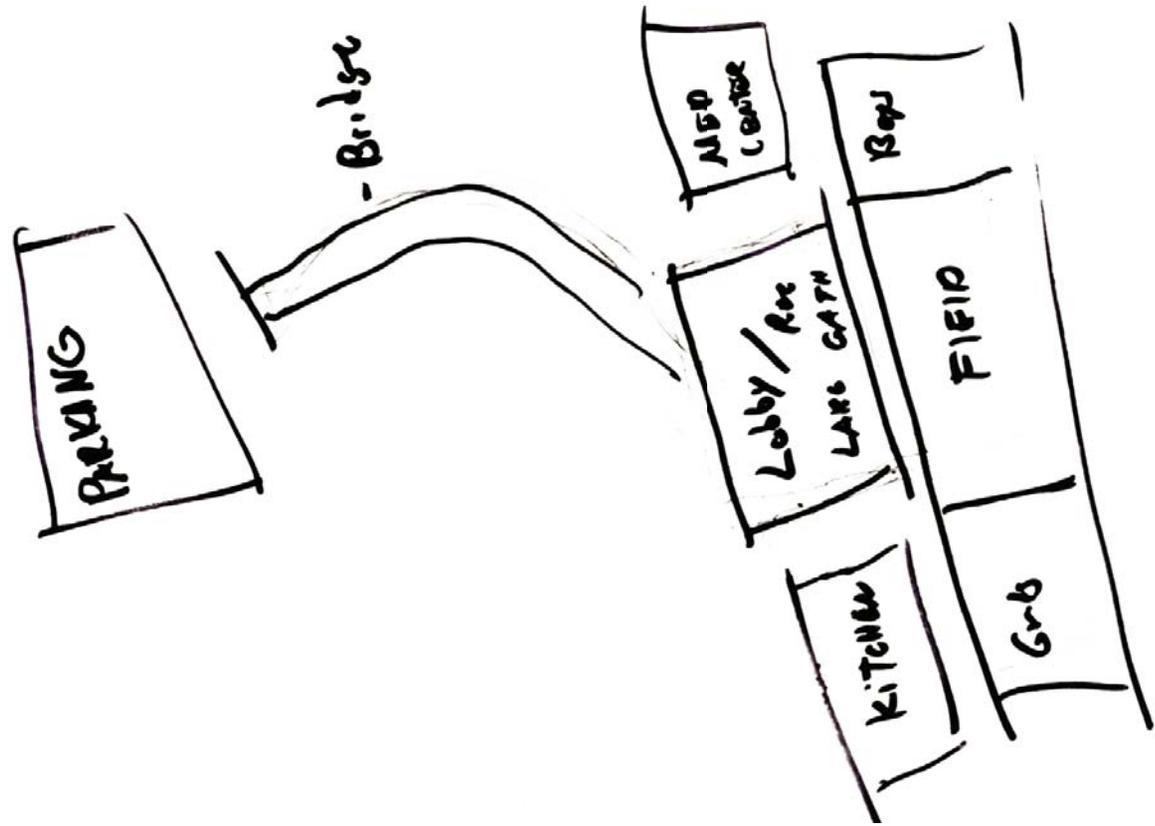
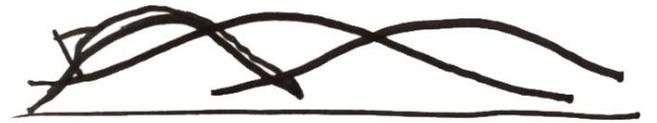
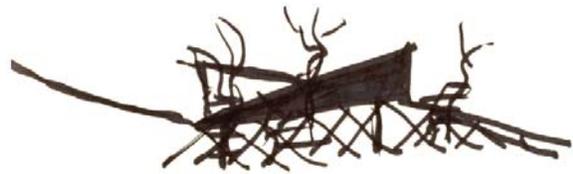




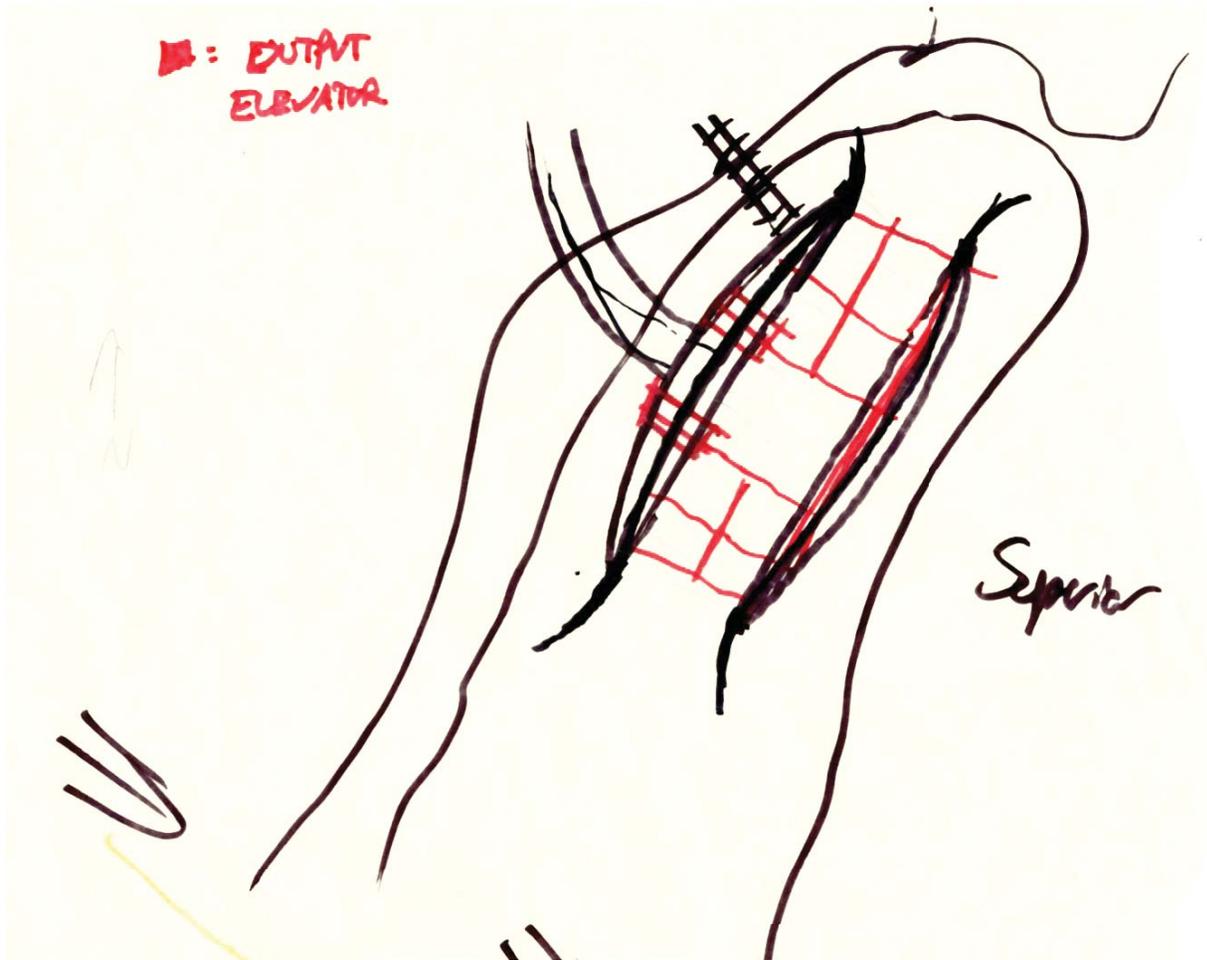
Flow of water  
Formation of Rocks  
Movement of light  
Natural Env vs Built Env





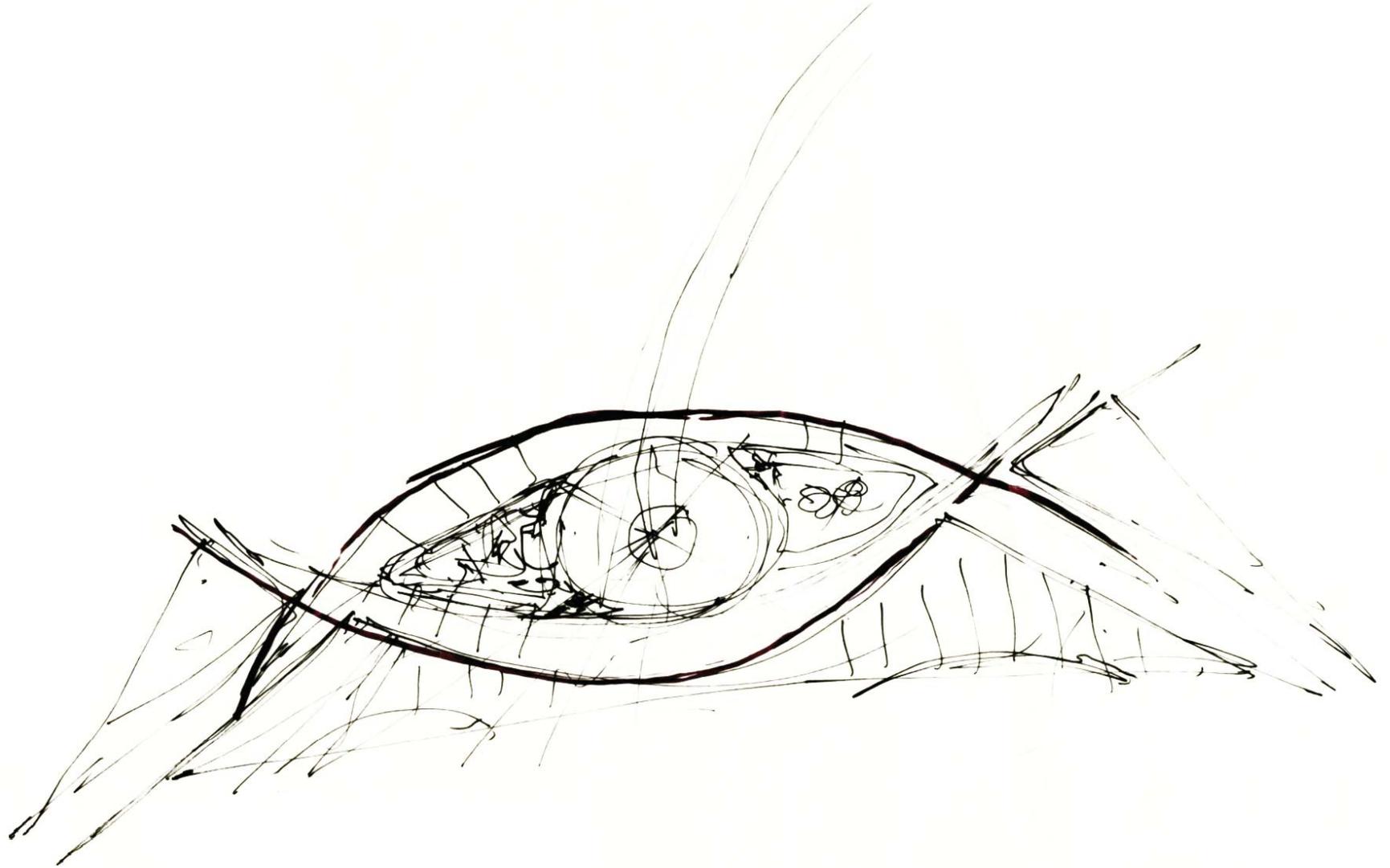


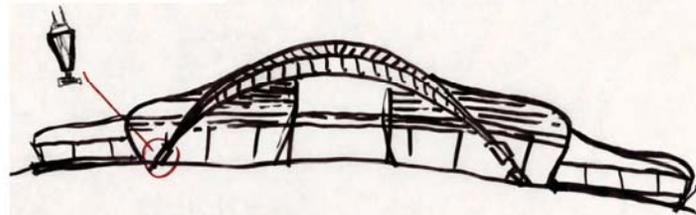
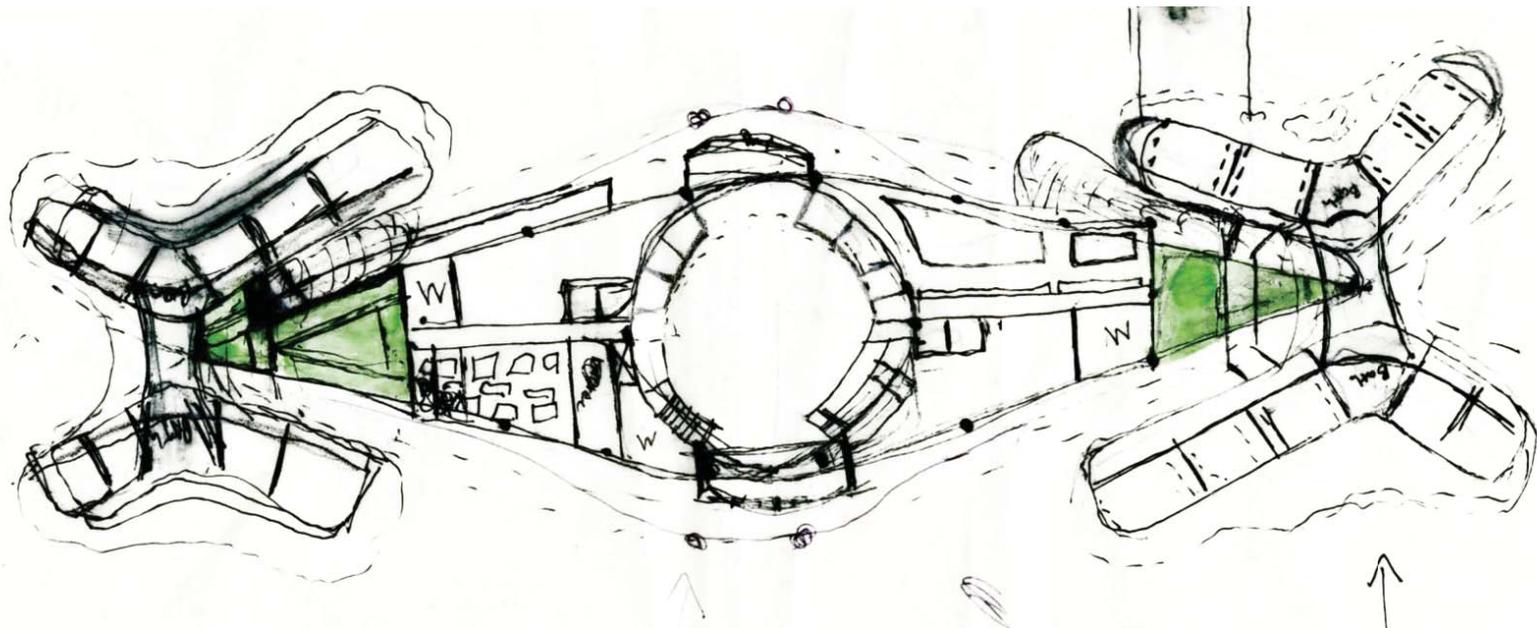
■: DUTAVT  
ELEVATOR



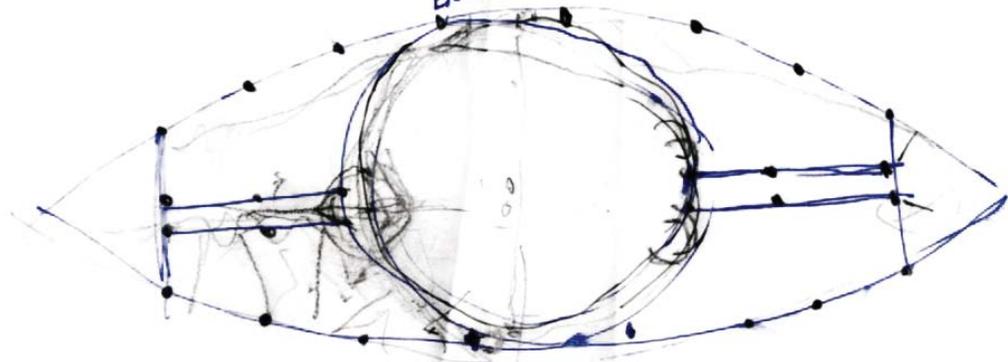
Superior



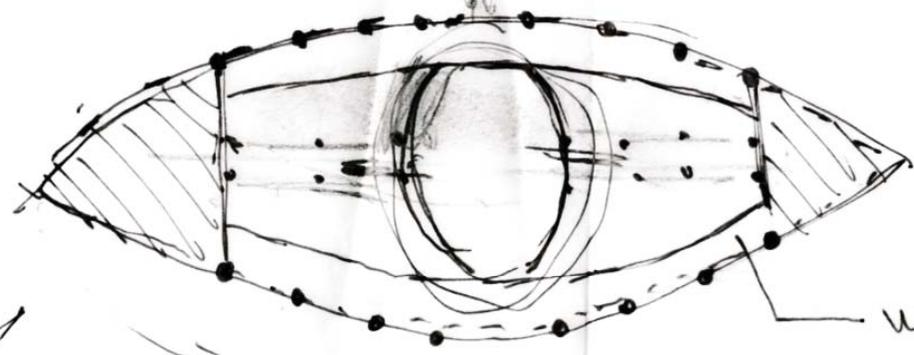




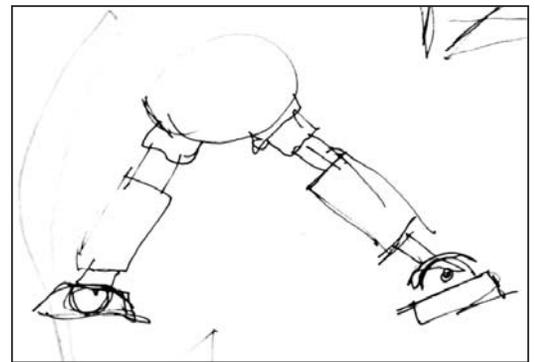
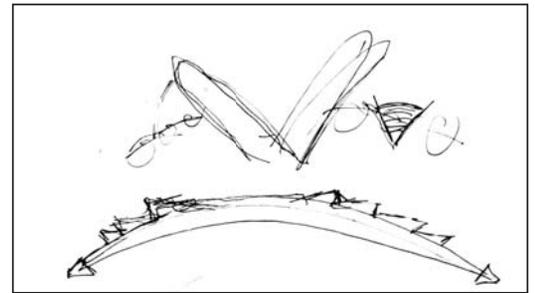
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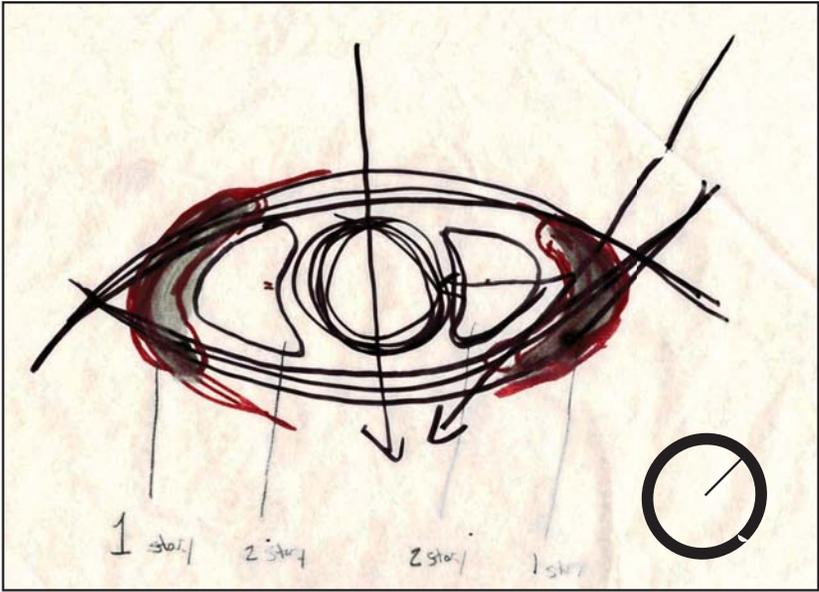
LEVEL 1



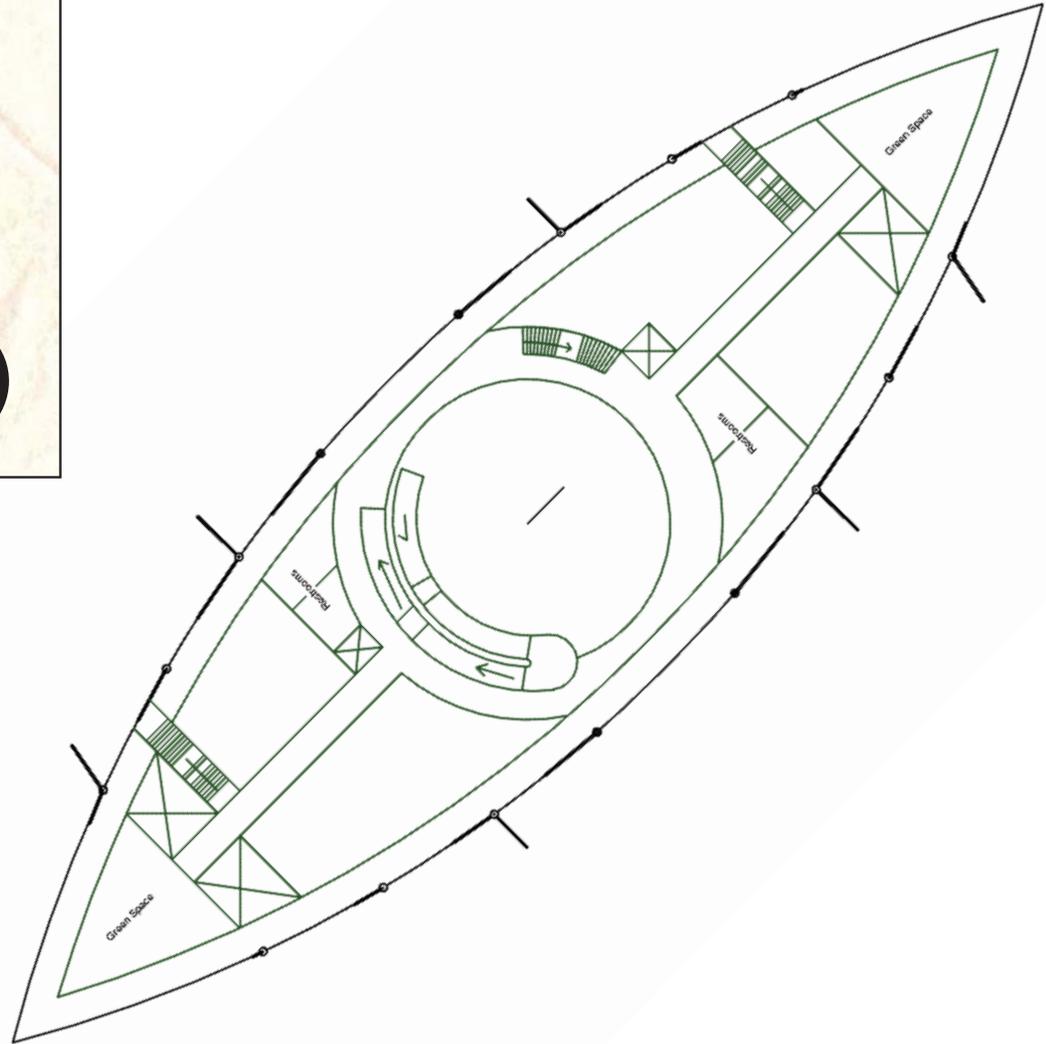
WALKWAY ACCESS AROUND BUILDING

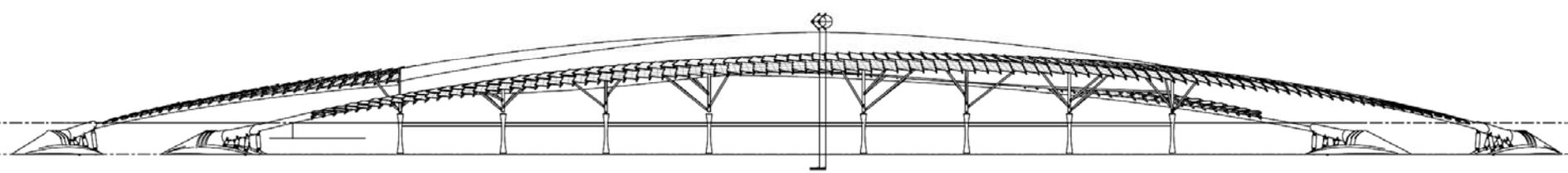
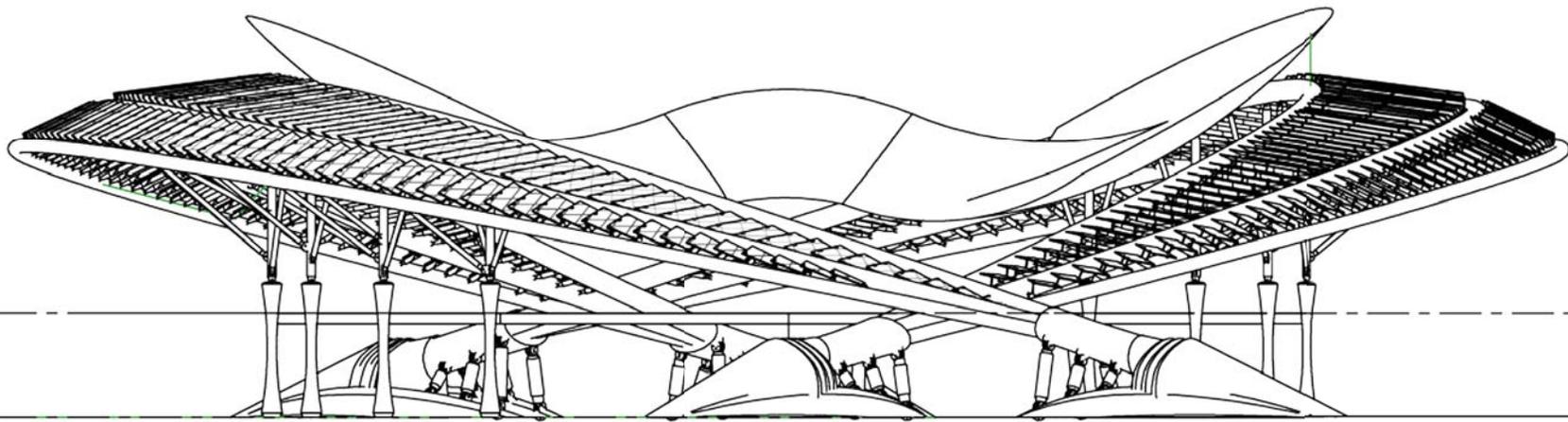


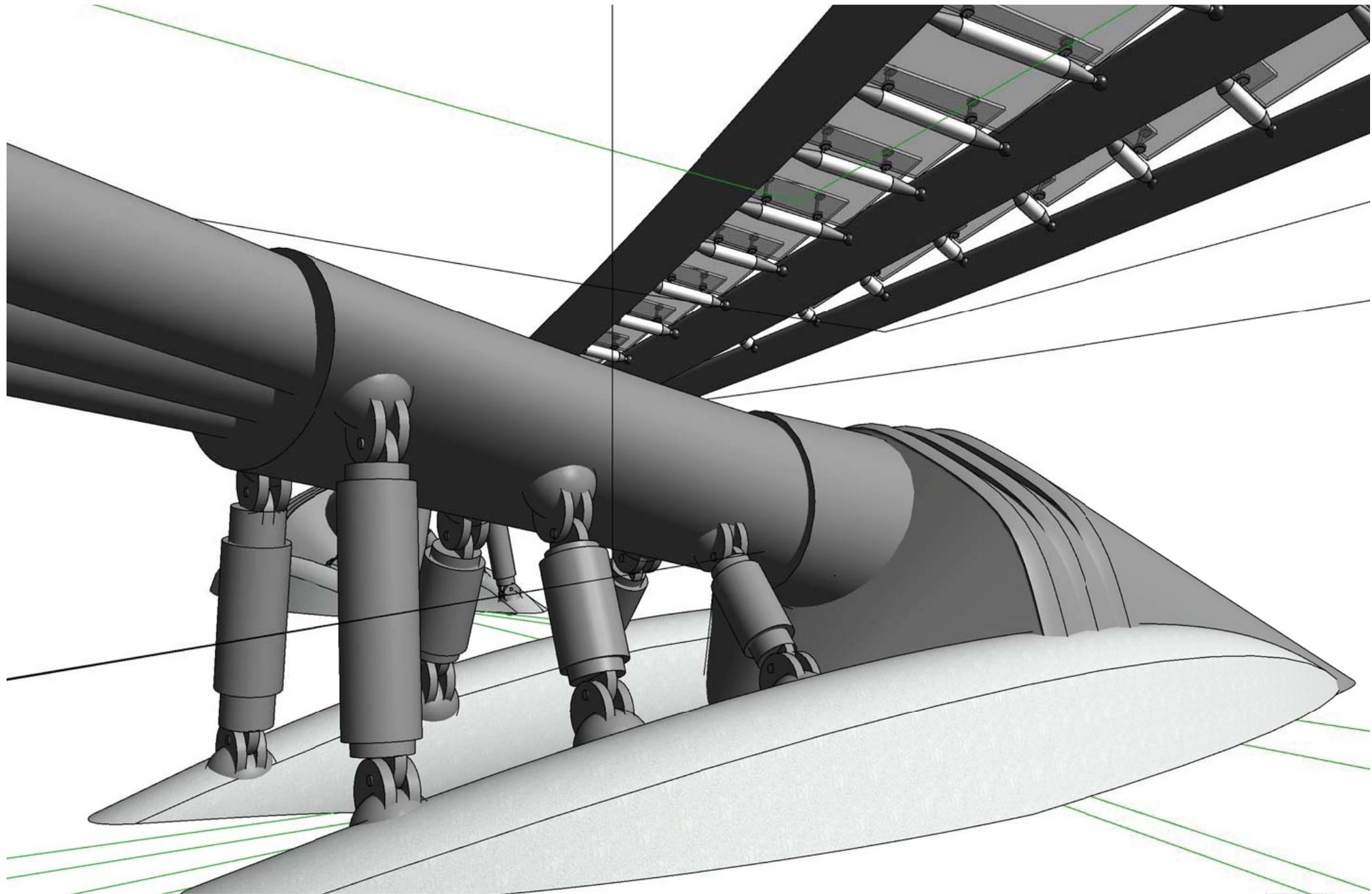
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121  
122

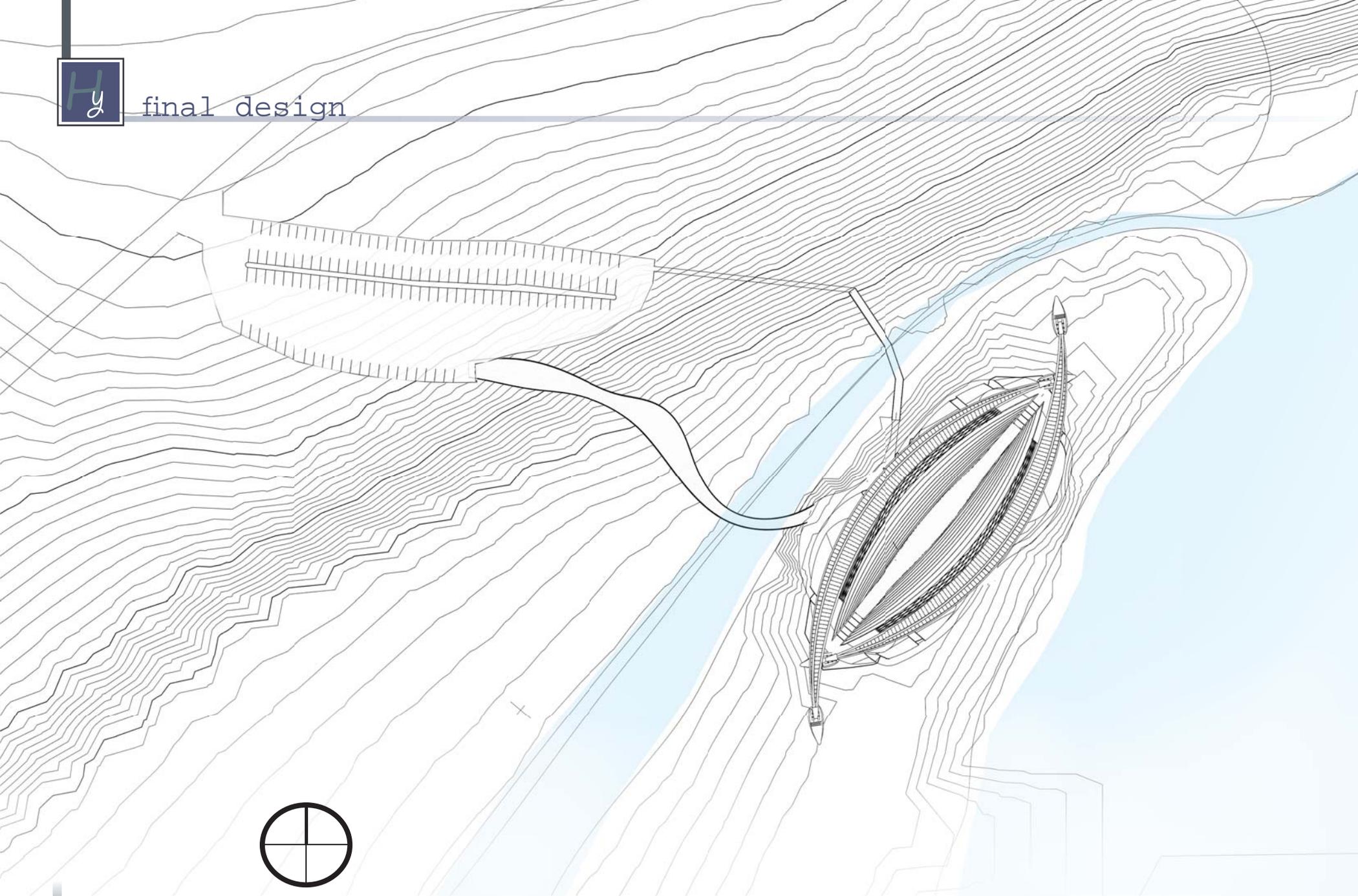


Level 2





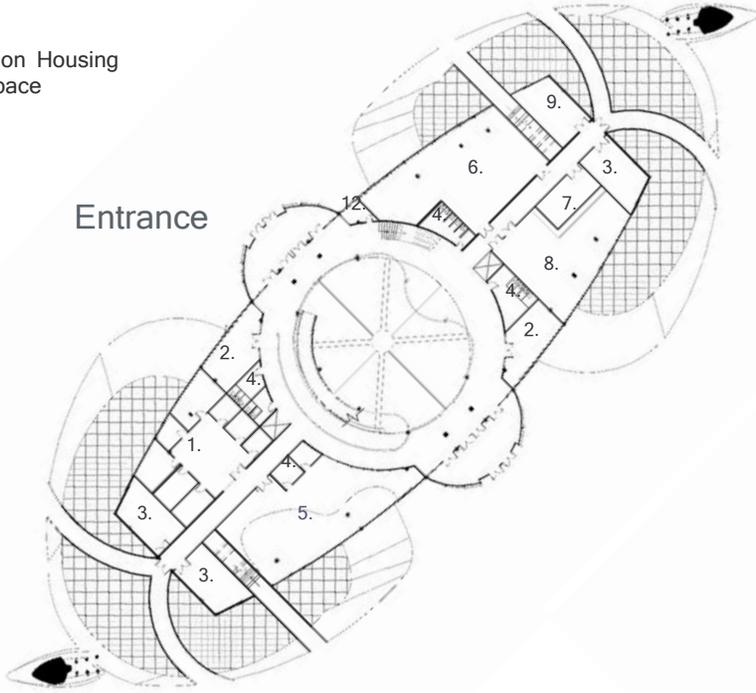




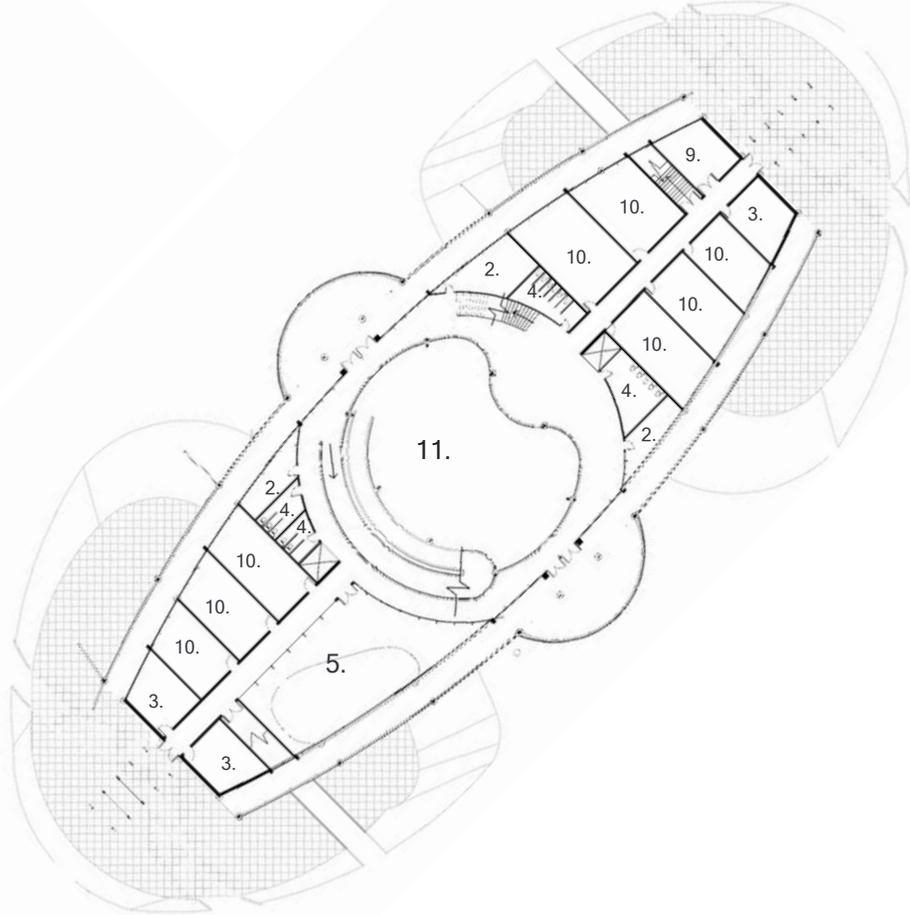
Site Plan

# Program

- 1. Medical Center / Administration
- 2. Conference / Break Room
- 3. Mechanical Room
- 4. Toilet / Shower
- 5. Pool Area
- 6. Recreation / Flexible Space
- 7. Kitchen
- 8. Dining Center
- 9. Storage
- 10. Camper / Administration Housing
- 11. Gathering / Atrium Space
- 12. Secretary



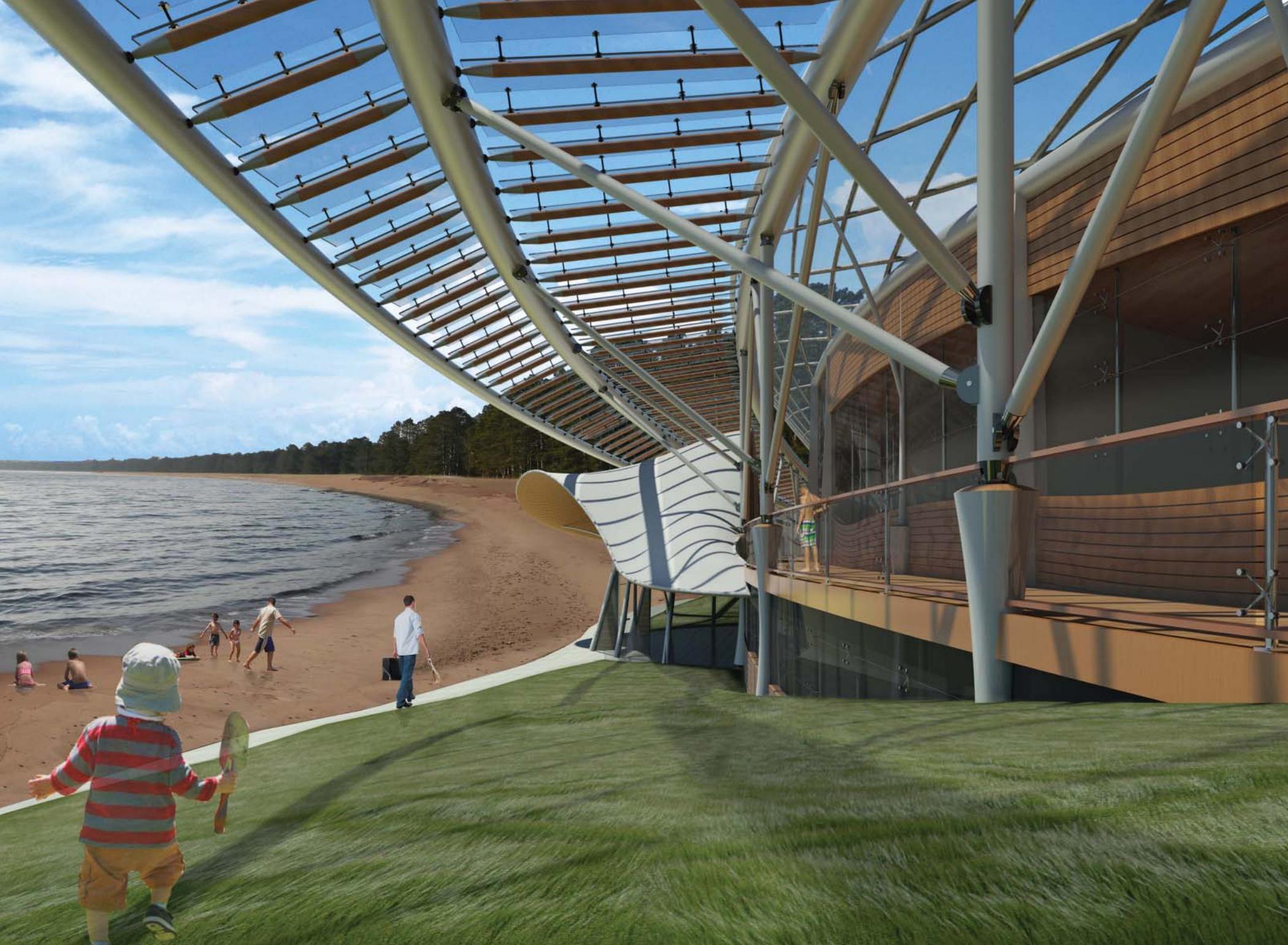
Main Level

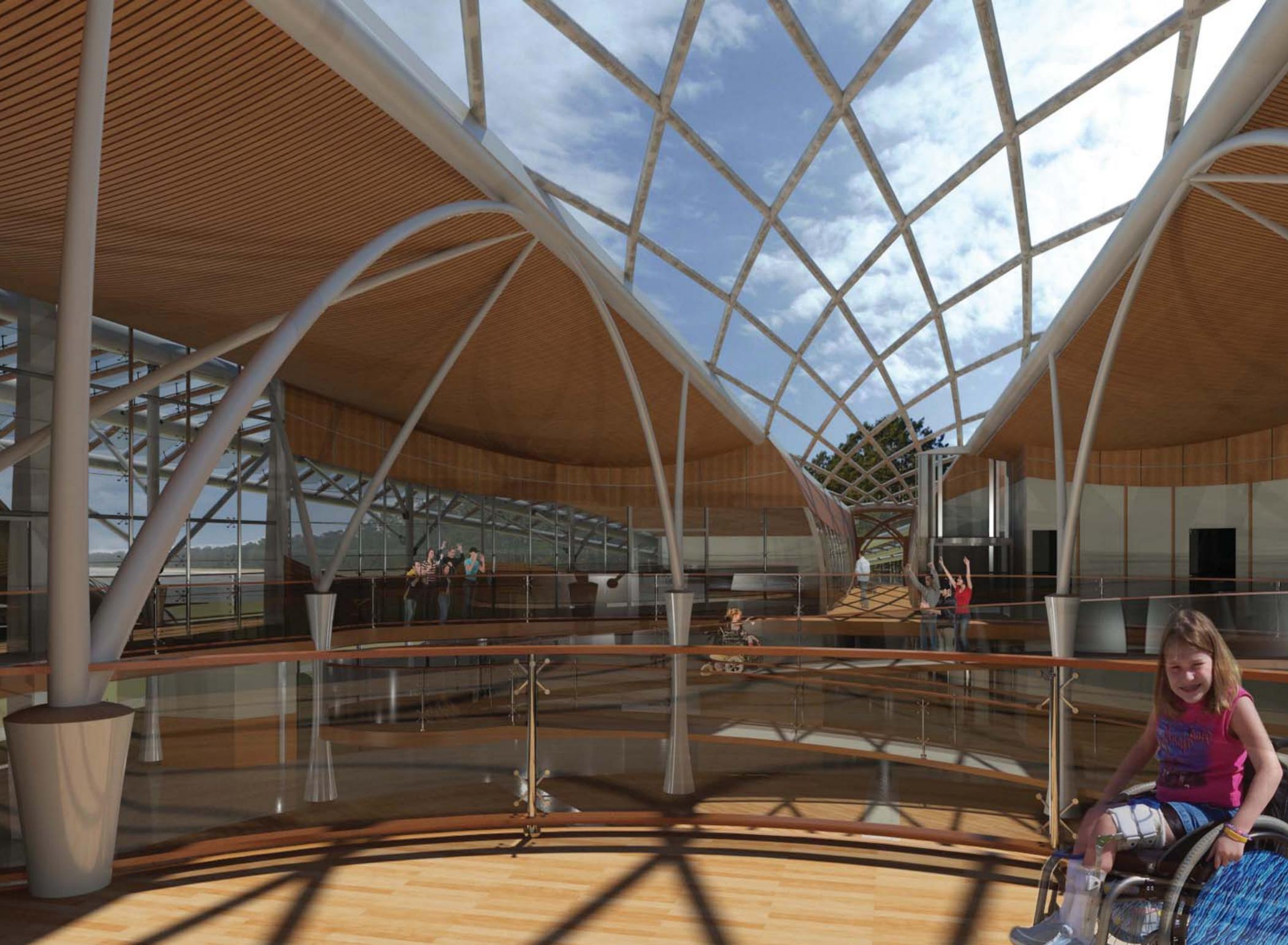


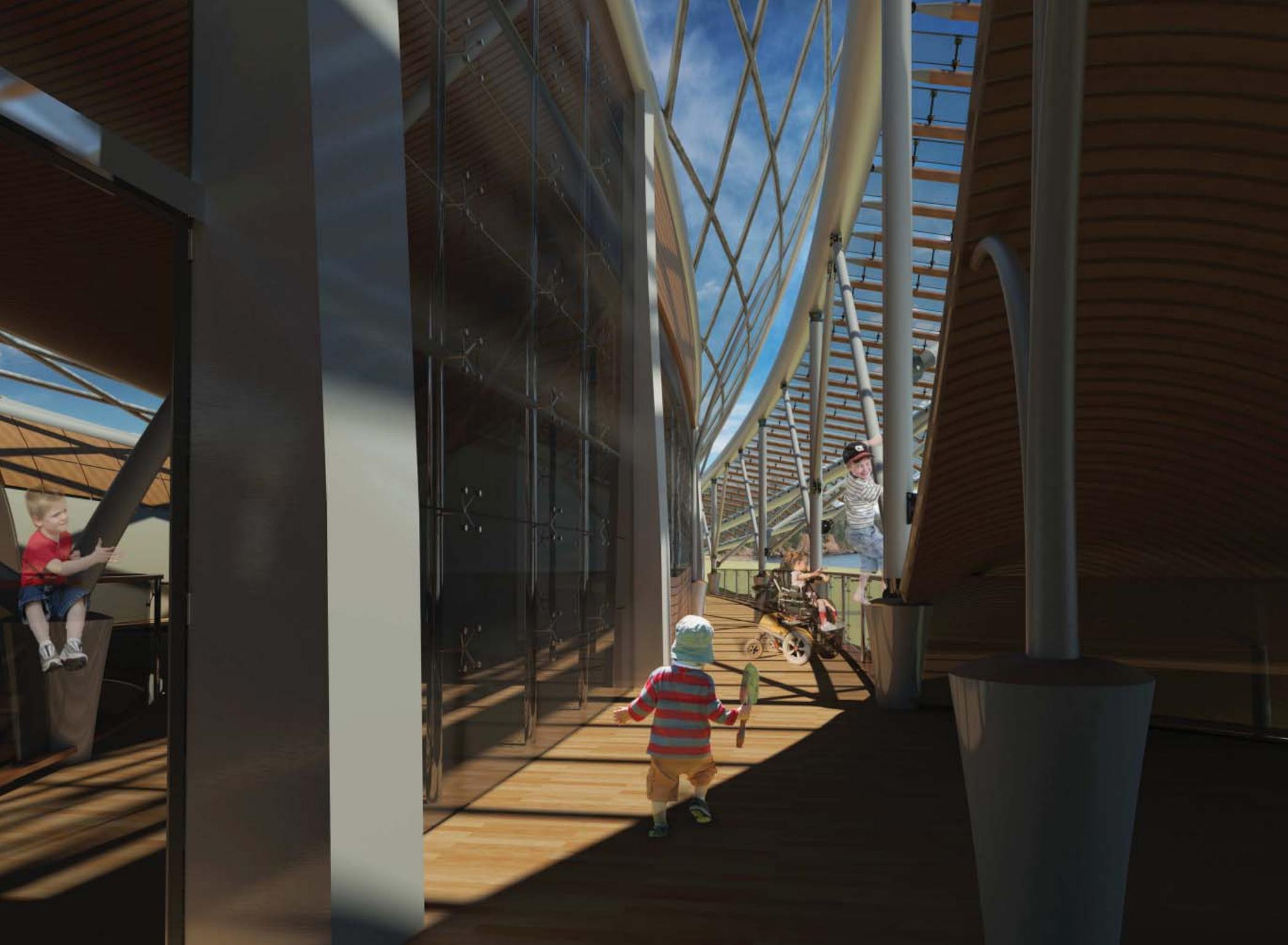
Level 2













### "Tree Structure"

Located throughout the entire building, these structural members support the 500 foot steel beam span. Because the soil does not contain properties that make up a good foundation, these tree structures allow the building to flex and move with the Earth.

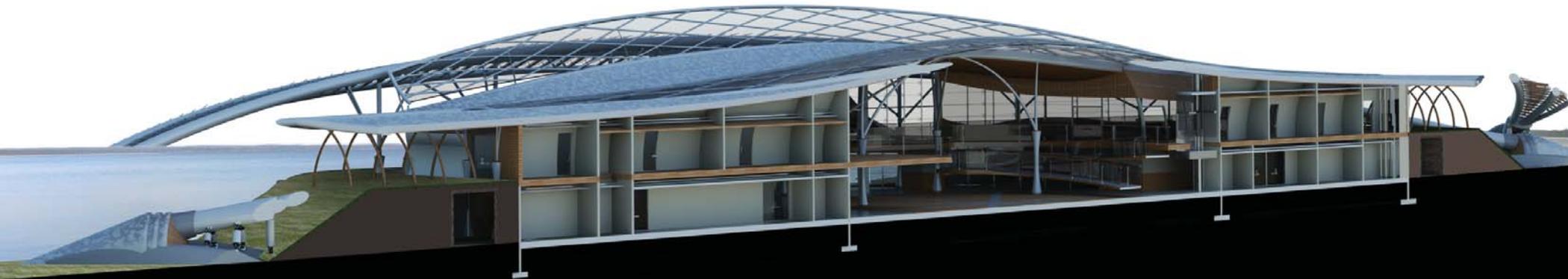
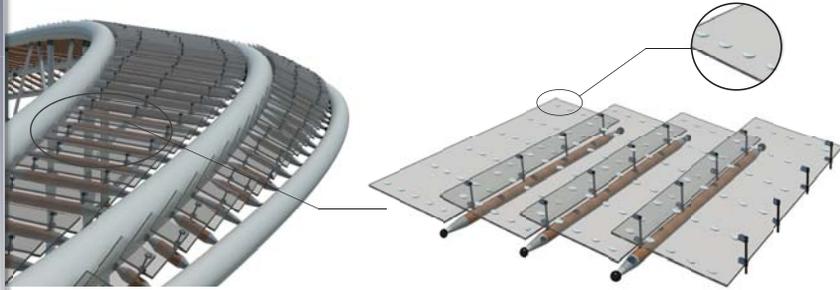
As you can see in the detail call outs this steel column to beam connection resembles a tree which allows the load to be dispersed more between each of the members.



### Solar Panels

Acting as a large scale shading device these solar panels are oriented south to maximize efficiency.

Each solar panel is a specific size depending on the compound curve of the structure. They are supported by a steel to bamboo connection, and within this connection the panels are angled accordingly.



### Water Collection

At the end of the building resides a large scale water collection system. The roof was designed to direct the water into this system.

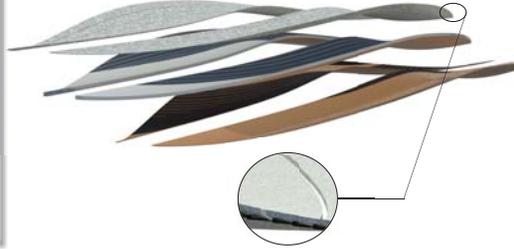
Once the water is collected it is transferred into plastic tubing that is used as in-floor heating and also heating in the roof panels to melt and snow or ice off during the winter months.



### Cladding Systems

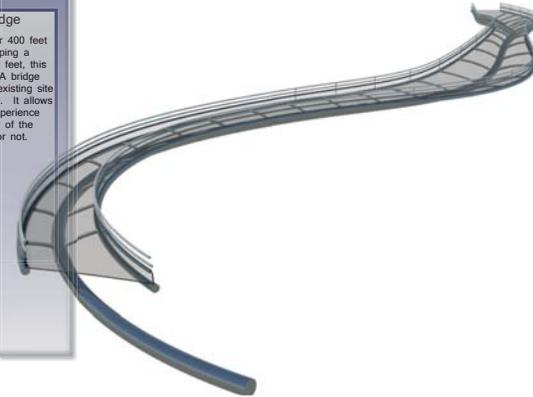
The exterior roof cladding consist of ZAINNER Panels that have a built in gutter system. These channels direct the water to the ends of the building where it transfers into the water collection system built into the landscape.

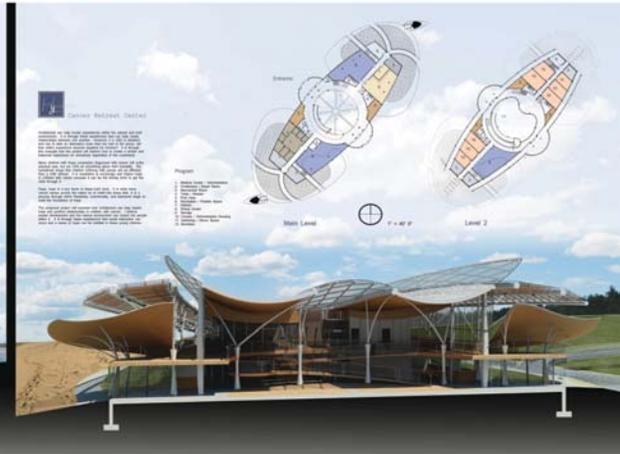
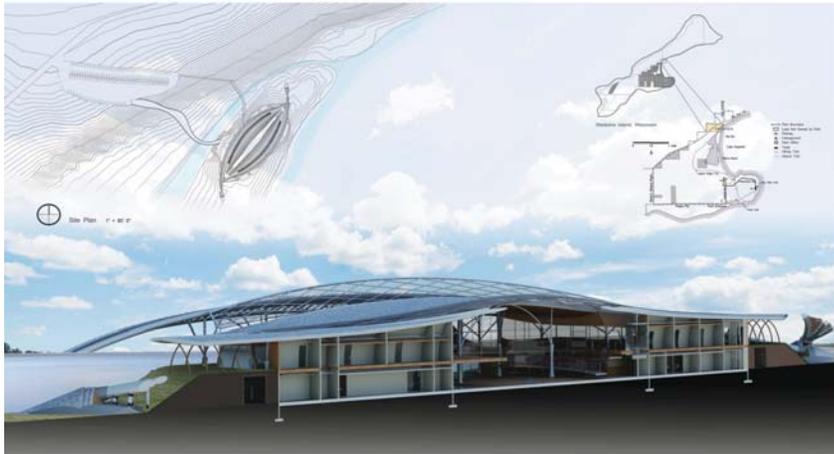
The interior ceiling is made up of bamboo. It is a compound curve that caters to the acoustical and lighting needs of the building.

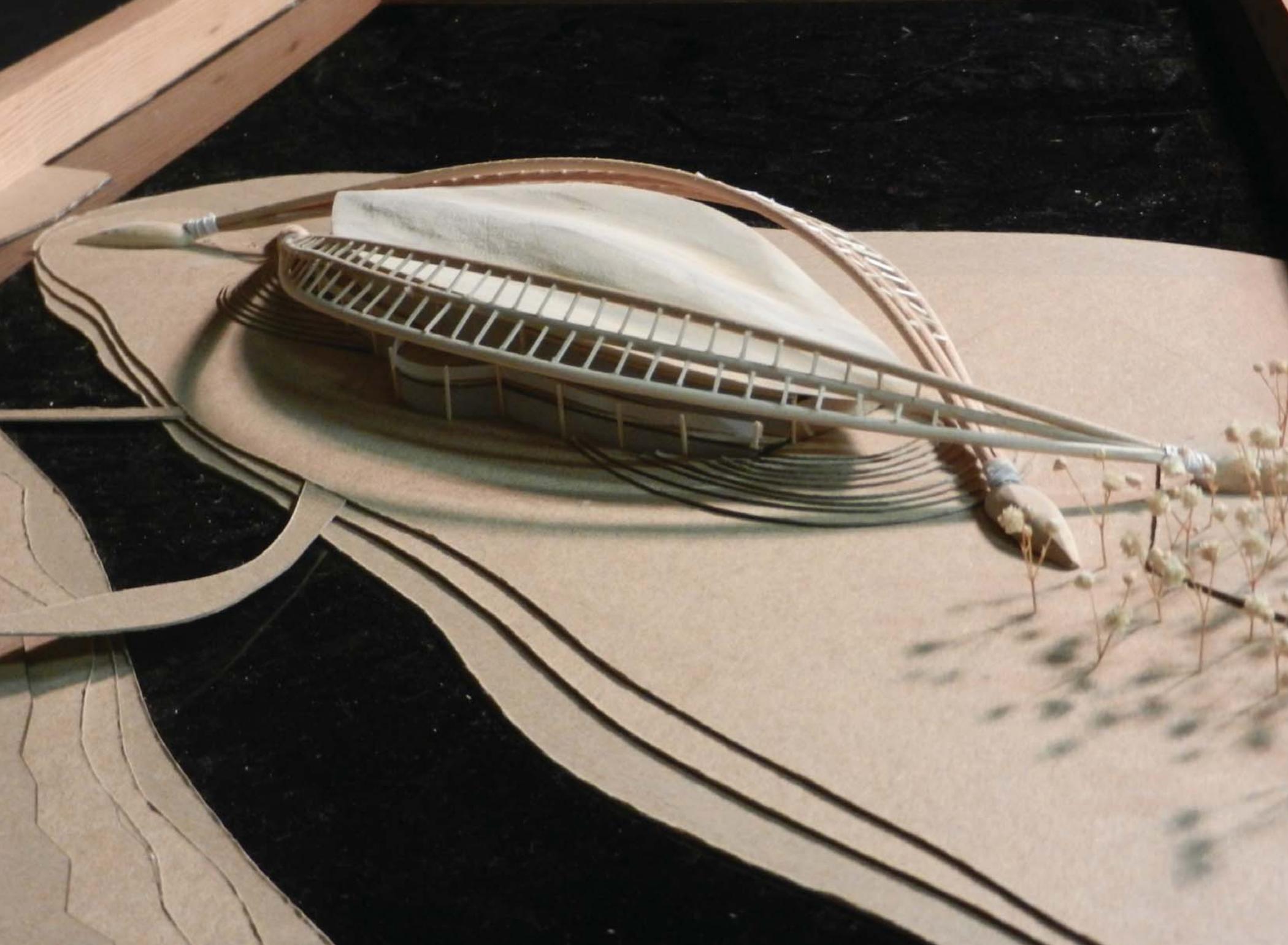


### Walkway Bridge

Extending over 400 feet long and dropping a distance of 30 feet, this pedestrian ADA bridge connects the existing site to the building. It allows anybody to experience the full beauty of the site disabled or not.







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# studio experience

## second year studio

'08 fall semester - Darryl Booker

tea house - Fargo, ND

boat house - Minneapolis, MN

'09 spring semester - Joan Vorderbruggen

dance academy - Fargo, ND

sustainable dwelling - Rocky Mountain National Park, CO



## third year studio

'09 fall semester - Paul Gleye

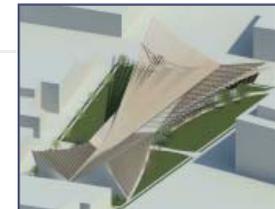
Center for excellence - Fargo, ND

Center for learning - Fargo, ND

'10 spring semester - David Crutchfield / Mike Christenson

"iterations" development within a space

performing arts center - Austin, TX



## fourth year studio

'10 fall semester - Bakr Mourad Aly Ahmed

high rise competition - San Francisco, CA

KKE design competition- - safe vault

'11 spring semester - Malini Srivastava

design build - passive house



## fifth year studio

'11 fall semester - Mark Barnhouse

water treatment plant - Linton, ND





jacob keith zikmund

“Don’t let schooling interfere with  
your education”

-mark twain

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